pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Southwest Regional Office
CLEAN WATER PROGRAM

Application Type	**Renewal**	Application No.	**PA0096342**
Facility Type	**Municipal**	APS ID	**805319**
Major / Minor	**Major**	Authorization ID	**1285831**

NPDES PERMIT FACT SHEET
INDIVIDUAL SEWAGE

Applicant and Facility Information

Applicant Name	**Fairchance-Georges Joint Municipal Sewer Authority**	Facility Name	**Fairchance-Georges STP**
Applicant Address	141 Big Six Road	Facility Address	141 Big Six Road
	Smithfield, PA 15478-1601		Smithfield, PA 15478-1601
Applicant Contact	Mr. Dennis Eicher	Facility Contact	Same as Applicant
Applicant Phone	(724) 564-1010	Facility Phone	Same as Applicant
Client ID	74949	Site ID	263584
Ch 94 Load Status	Not Overloaded	Municipality	Georges Township
Connection Status	No Limitations	County	Fayette
Date Application Received	August 27, 2019	EPA Waived?	No
Date Application Accepted		If No, Reason	Major Facility

Purpose of Application: Application for a renewal of an existing NPDES Permit for the discharge of treated Sewage.

Summary of Review

The applicant has applied for a renewal of an existing NPDES Permit, Permit No. PA0096342, which was previously issued by the Department on March 1, 2015. That permit expired on February 29, 2020.

WQM Permit 2685407 A-3, issued on April 24, 2017, approved construction of an expanded STP with Hydraulic Design Capacity 1.5 MGD and organic capacity of 2,502 lbs/day. Construction was completed in March of 2020. The expanded treatment process consists of equalization tank, mechanically cleaned fine bar screen, 4 SBRs, aerobic sludge digestion, UV disinfection, belt filter press and effluent pump station (for use during flood conditions).

The receiving stream, Georges Creek, is classified as a WWF and is located in State Watershed No. 19-G.

The applicant has complied with Act 14 Notifications and no comments were received.

The application states there are no stormwater related outfalls located at the STP. Part C will not contain language titled "Requirements Applicable to Stormwater Outfalls".

Sludge use and disposal description and location(s): Aerobic sludge digestion tanks are used for the treatment of Class B biosolids. A belt filter press is then used for the dewatering of digested sludge and solids are disposed of at a municipal landfill.

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-

Approve	Deny	Signatures	Date
X		William C. Mitchell, E.I.T. / Environmental Engineering Specialist	July 7, 2021
X		Christopher Kriley, P.E. / Program Manager	July 8, 2021

Summary of Review
day period at DEP's discretion), which will be considered in making a final decision on the application. Any person may request or petition for a public hearing with respect to the application. A public hearing may be held if DEP determines that there is significant public interest in holding a hearing. If a hearing is held, notice of the hearing will be published in the *Pennsylvania Bulletin* at least 30 days prior to the hearing and in at least one newspaper of general circulation within the geographical area of the discharge.

Discharge, Receiving Waters and Water Supply Information

Outfall No.	001	Design Flow (MGD)	1.5
Latitude	39º 48' 28.25"	Longitude	-79º 46' 5.79"
Quad Name	Smithfield	Quad Code	2007
Wastewater Description:	Sewage Effluent		
Receiving Waters	Georges Creek (WWF)	Stream Code	41340
NHD Com ID	99417118	RMI	13.3
Drainage Area	14.5	Yield (cfs/mi^2)	0.008
Q_{7-10} Flow (cfs)	0.116	Q_{7-10} Basis	PA Water Resources Bull. 12, Sta. 03072590, Georges Ck. at Smithfield with Storet Update
Elevation (ft)	991	Slope (ft/ft)	0.003
Watershed No.	19-G	Chapter 93 Class.	WWF
Existing Use	**All**	Existing Use Qualifier	None
Exceptions to Use	None	Exceptions to Criteria	None
Assessment Status	Impaired		
Cause(s) of Impairment	METALS, SILTATION		
Source(s) of Impairment	ACID MINE DRAINAGE, ACID MINE DRAINAGE		
TMDL Status		Name	

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

Nearest Downstream Public Water Supply Intake		Dunkard Valley Joint Municipal Authority	
PWS Waters	Monongahela River	Flow at Intake (cfs)	480
PWS RMI		Distance from Outfall (mi)	7.8

Changes Since Last Permit Issuance: No Changes to the Receiving Waters or Water Supply Information.

Treatment Facility Summary

Treatment Facility Name: Fairchance Georges STP

WQM Permit No.	Issuance Date
2685407 A-2 (Existing STP)	October 25, 2004
2685407 A-3 (Expanded STP)	April 24, 2017

Waste Type	Degree of Treatment	Process Type	Disinfection	Avg Annual Flow (MGD)
Sewage	Secondary With Ammonia Reduction	Sequencing Batch Reactor	Ultraviolet	0.695 (Year: 2018)

Hydraulic Capacity (MGD)	Organic Capacity (lbs/day)	Load Status	Biosolids Treatment	Biosolids Use/Disposal
1.5	2,502	Not Overloaded	Aerobic Sludge Digestion & Belt Filter Press	Landfill

Changes Since Last Permit Issuance: Expanded STP went online on March 31, 2020.

Compliance History

Operations Compliance Check Summary Report

Facility: Fairchance-Georges-JMSA_STP

NPDES Permit No.: PA0096342

Compliance Review Period: 06/24/2016 – 06/24/2021

Open Violations by Client Summary

None.

Inspection Summary

INSP ID	INSPECTED DATE	INSP TYPE	AGENCY	INSPECTION RESULT DESC	# OF VIOLATIONS
2691685	02/06/2018	Chapter 94 Inspection	PA Dept of Environmental Protection	No Violations Noted	0
3185133	04/30/2021	Compliance Evaluation	PA Dept of Environmental Protection	No Violations Noted	0
3171477	04/01/2021	Administrative/File Review	PA Dept of Environmental Protection	Violation(s) Noted	1
2768083	08/28/2018	Chapter 94 Inspection	PA Dept of Environmental Protection	No Violations Noted	0

Violation Summary

VIOL ID	VIOLATION DATE	VIOLATION TYPE	VIOLATION TYPE DESC	RESOLVED DATE	VIOLATION COMMENT
912455	04/01/2021	92A.44	NPDES - Violation of effluent limits in Part A of permit	06/24/2021	Numerous effluent violations of ammonia prior to May 2020.

Enforcement Summary

No enforcement actions.

DMR Violation Summary

Effluent limit violation summary

MONITORING END DATE	OUTFALL	PARAMETER	SAMPLE VALUE	PERMIT VALUE	UNIT OF MEASURE	STATISTICAL BASE CODE
07/31/2016	001	Ammonia-Nitrogen	4.3	2.0	mg/L	Average Monthly
07/31/2016	001	Ammonia-Nitrogen	16.7	3.0	mg/L	Weekly Average

07/31/2016	001	Ammonia-Nitrogen	33.9	12.5	lbs/day	Average Monthly
07/31/2016	001	Ammonia-Nitrogen	135.0	18.8	lbs/day	Weekly Average
05/31/2018	001	Ammonia-Nitrogen	3.1	3.0	mg/L	Weekly Average
08/31/2018	001	Carbonaceous Biochemical Oxygen Demand (CBOD5)	24	15	mg/L	Weekly Average
09/30/2018	001	pH	5.6	6.0	S.U.	Minimum
05/31/2019	001	Fecal Coliform	1920	1000	CFU/100 ml	Instantaneous Maximum
06/30/2019	001	Fecal Coliform	1245	1000	CFU/100 ml	Instantaneous Maximum
07/31/2019	001	Ammonia-Nitrogen	2.2	2.0	mg/L	Average Monthly
01/31/2020	001	Ammonia-Nitrogen	6.4	3.5	mg/L	Average Monthly
01/31/2020	001	Ammonia-Nitrogen	12.4	5.3	mg/L	Weekly Average
02/29/2020	001	Ammonia-Nitrogen	6.4	3.5	mg/L	Average Monthly
02/29/2020	001	Ammonia-Nitrogen	11.8	5.3	mg/L	Weekly Average
02/29/2020	001	Ammonia-Nitrogen	68.2	66.3	lbs/day	Weekly Average
03/31/2020	001	Ammonia-Nitrogen	9.4	3.5	mg/L	Average Monthly
03/31/2020	001	Ammonia-Nitrogen	11.2	5.3	mg/L	Weekly Average
03/31/2020	001	Ammonia-Nitrogen	54.8	43.8	lbs/day	Average Monthly
03/31/2020	001	Ammonia-Nitrogen	75.4	66.3	lbs/day	Weekly Average
04/30/2020	001	Ammonia-Nitrogen	3.9	3.5	mg/L	Average Monthly
04/30/2020	001	Ammonia-Nitrogen	8.0	5.3	mg/L	Weekly Average

Compliance Status:

Facility had numerous effluent violations in 201 through 2020 due to poor operation, specifically, override of SBR program mode. New plant operator corrected this practice and no effluent violations have occurred since April 2020.

Completed by: David Roote

Completed date: 6/25/2021

Development of Effluent Limitations

Outfall No. 001 **Design Flow (MGD)** 1.5
Latitude 39º 48' 28.25" **Longitude** -79º 46' 5.79"
Wastewater Description: Sewage Effluent

Technology-Based Limitations

The following technology-based limitations apply, subject to water quality analysis and BPJ where applicable:

Pollutant	Limit (mg/l)	SBC	Federal Regulation	State Regulation
$CBOD_5$	25	Average Monthly	133.102(a)(4)(i)	92a.47(a)(1)
	40	Average Weekly	133.102(a)(4)(ii)	92a.47(a)(2)
Total Suspended Solids	30	Average Monthly	133.102(b)(1)	92a.47(a)(1)
	45	Average Weekly	133.102(b)(2)	92a.47(a)(2)
pH	6.0 – 9.0 S.U.	Min – Max	133.102(c)	95.2(1)
Fecal Coliform (5/1 – 9/30)	200 / 100 ml	Geo Mean	-	92a.47(a)(4)
Fecal Coliform (5/1 – 9/30)	1,000 / 100 ml	IMAX	-	92a.47(a)(4)
Fecal Coliform (10/1 – 4/30)	2,000 / 100 ml	Geo Mean	-	92a.47(a)(5)
Fecal Coliform (10/1 – 4/30)	10,000 / 100 ml	IMAX	-	92a.47(a)(5)
Total Residual Chlorine	0.5	Average Monthly	-	92a.48(b)(2)

Comments: Impose the above Technology-Based Limitations for pH & Fecal Coliform.

Water Quality-Based Limitations

A “Reasonable Potential Analysis” (Attachment WQM 7.0 Output Data, Toxic Management Spreadsheet Version 1.3) was conducted.

The following limitations were determined through water quality modeling (output files attached):

Parameter	Limit (mg/l)	SBC	Model
$CBOD_5$ (5/1-10/31)	10	Average Monthly	WQM 7.0 Version 1.0b
$CBOD_5$ (11/1-4/30)	20	Average Monthly	WQM 7.0 Version 1.0b
Ammonia Nitrogen (5/1-10/31)	2.0	Average Monthly	WQM 7.0 Version 1.0b
Ammonia Nitrogen (11/1-4/30)	3.5	Average Monthly	WQM 7.0 Version 1.0b
Dissolved Oxygen	5.0	Minimum	WQM 7.0 Version 1.0b
Free Cyanide	0.004	Average Monthly	TMS Version 1.3
Total Zinc	0.14	Average Monthly	TMS Version 1.3

Comments: Part C.III. (Titled “WQBELs for Toxic Pollutants) has been added to the permit. The Authority has the opportunity to collect site-specific data and conduct a TRE. The Authority will have 2 years to complete the required studies and submit a Final WQBEL Compliance Report to the Department before having to comply with Final Permit Limits for Free Cyanide and Total Zinc. A Pre-Draft Letter/Survey for Toxic Pollutants will also be attached to the Draft Permit Issuance.

The Toxic Management Spreadsheet Version 1.3 modeling results recommends Monitoring for Total Boron, Total Copper, and Dissolved Iron.

The NPDES Permit Application indicates that the STP does not receive IW flow from an IU.

Best Professional Judgment (BPJ) Limitations

Comments: N/A

Anti-Backsliding

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

Previous limits can be used pursuant to EPA's anti-backsliding regulation 40 CFR 122.44 (l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued. Interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under §122.62). (2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

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

Additional Considerations:

Ultraviolet (UV) disinfection is used therefore Total Residual Chlorine (TRC) limits are not applicable. Routine monitoring of UV Transmittance will be at the same monitoring frequency that is used for TRC.

For pH, Dissolved Oxygen (DO) and UV Transmittance, a monitoring frequency 1/day has been imposed. In general, less frequent monitoring may be established only when the permittee demonstrates that there will be no discharge on days where monitoring is not required.

Sewage discharges will include monitoring, at a minimum, for E. Coli, in new and reissued permits, with a monitoring frequency of 1/month for facilities with a design flows >= 1 MGD per Chapter 92.a.61.

Nutrient monitoring is required to establish the nutrient load from the wastewater treatment facility and the impacts that load may have on the quality of the receiving stream(s). A 1/quarter monitor and report requirement for Total N & Total P has been added to the permit as per Chapter 92.a.61.

Mass loading limits are applicable for publicly owned treatment works. Current policy requires average monthly mass loading limits be established for CBOD5, TSS, and NH_3-N and average weekly mass loading limits be established for CBOD5 and TSS. Average monthly mass loading limits (lbs/day) are based on the formula: design flow (MGD) x concentration limit (mg/L) x conversion factor (8.34).

For POTWs with design flows greater than 2,000 GPD influent BOD_5 and TSS monitoring must be established in the permit, and the monitoring should be consistent with the same frequency and sample type as is used for other effluent parameters.

Monitoring frequency for the proposed effluent limits are based upon Table 6-3, Self-Monitoring Requirements for Sewage Dischargers, from the Departments Technical Guidance for the Development and Specification of Effluent Limitations. Please note that Monitoring Requirements were changed for Flow to 2/week Metered to be consistent with the guidance.

Whole Effluent Toxicity (WET)

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

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

The dilution series used for the tests was: 100%, 98%, 95%, 48%, and 24%. The Target Instream Waste Concentration (TIWC) to be used for analysis of the results is: 95%.

Summary of Four Most Recent Test Results

TST Data Analysis

(NOTE – Please see the attached DEP WET Analysis Spreadsheet).

Test Date	*Ceriodaphnia* Results (Pass/Fail)		*Pimephales* Results (Pass/Fail)	
	Survival	Reproduction	Survival	Growth
10/3/2017	PASS	PASS	PASS	PASS
10/30/2018	PASS	PASS	PASS	PASS
10/22/2019	PASS	PASS	PASS	PASS
10/26/2020	PASS	PASS	PASS	PASS

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

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

☐ **YES** ☒ **NO**

Comments: N/A

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

Acute Partial Mix Factor (PMFa): **1.0** Chronic Partial Mix Factor (PMFc): **1.0**

1. Determine IWC – Acute (IWCa):

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

[(1.5 MGD x 1.547) / ((0.116 cfs x 1.0) + (1.5 MGD x 1.547))] x 100 = **95.24%**

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

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

N/A

Type of Test for Permit Renewal: **Chronic Tests**

2a. Determine Target IWCa (If Acute Tests Required)

TIWCa = 0.9524 / 0.3 = 100**%**

2b. Determine Target IWCc (If Chronic Tests Required)

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

[(1.5 MGD x 1.547) / ((0.116 cfs x 1) + (1.5 MGD x 1.547))] x 100 = **95%**

3. Determine Dilution Series

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

Dilution Series = 100%, 98%, 95%, 48%, and 24%.

WET Limits

Has reasonable potential been determined? ☐ YES ☒ NO

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

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

N/A

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

N/A

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 August 31, 2023.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Free Cyanide	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite
Total Zinc	Report	Report	XXX	Report	Report	XXX	1/week	24-Hr Composite

Compliance Sampling Location: 001

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: September 1, 2023 through Permit Expiration Date.

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) [1]		Concentrations (mg/L)				Minimum [2] Measurement Frequency	Required Sample Type
	Average Monthly	Daily Maximum	Minimum	Average Monthly	Daily Maximum	Instant. Maximum		
Free Cyanide	0.05	0.08	XXX	0.004	0.006	0.01	1/week	24-Hr Composite
Total Zinc	1.84	1.94	XXX	0.14	0.15	0.15	1/week	24-Hr Composite

Compliance Sampling Location: 001

Proposed Effluent Limitations and Monitoring Requirements

The limitations and monitoring requirements specified below are proposed for the draft permit, and reflect the most stringent limitations amongst technology, water quality and BPJ. Instantaneous Maximum (IMAX) limits are determined using multipliers of 2 (conventional pollutants) or 2.5 (toxic pollutants). Sample frequencies and types are derived from the "NPDES Permit Writer's Manual" (362-0400-001), SOPs and/or BPJ.

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Flow (MGD)	Report	Report Daily Max	XXX	XXX	XXX	XXX	2/week	Metered
pH (S.U.)	XXX	XXX	6.0	XXX	XXX	9.0	1/day	Grab
DO	XXX	XXX	5.0	XXX	XXX	XXX	1/day	Grab
CBOD5 Nov 1 - Apr 30	250	375	XXX	20.0	30.0	40	2/week	24-Hr Composite
CBOD5 May 1 - Oct 31	125	185	XXX	10.0	15.0	20	2/week	24-Hr Composite
BOD5 Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS Raw Sewage Influent	Report	Report Daily Max	XXX	Report	XXX	XXX	2/week	24-Hr Composite
TSS	310	475	XXX	25.0	38.0	50	2/week	24-Hr Composite
Fecal Coliform (No./100 ml) Oct 1 - Apr 30	XXX	XXX	XXX	2000 Geo Mean	XXX	10000	2/week	Grab
Fecal Coliform (No./100 ml) May 1 - Sep 30	XXX	XXX	XXX	200 Geo Mean	XXX	1000	2/week	Grab
E. Coli (No./100 ml)	XXX	XXX	XXX	XXX	XXX	Report	1/month	Grab
UV Transmittance (%)	XXX	XXX	Report	XXX	XXX	XXX	1/day	Measured
Total Nitrogen	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite

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

Parameter	Effluent Limitations						Monitoring Requirements	
	Mass Units (lbs/day) (1)		Concentrations (mg/L)				Minimum (2) Measurement Frequency	Required Sample Type
	Average Monthly	Weekly Average	Instantaneous Minimum	Average Monthly	Weekly Average	Instant. Maximum		
Ammonia-Nitrogen Nov 1 - Apr 30	43	XXX	XXX	3.5	XXX	7	2/week	24-Hr Composite
Ammonia-Nitrogen May 1 - Oct 31	25	XXX	XXX	2.0	XXX	4	2/week	24-Hr Composite
Total Phosphorus	XXX	XXX	XXX	XXX	Report Daily Max	XXX	1/quarter	24-Hr Composite
Total Boron	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/week	24-Hr Composite
Total Copper	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/week	24-Hr Composite
Dissolved Iron	Report	Report Daily Max	XXX	Report	Report Daily Max	XXX	1/week	24-Hr Composite

Compliance Sampling Location: 001

WQM 7.0 Version 1.0b Evaluation
Annual Average Design Flow 1.5 MGD

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Warmer Period Modeling – 1.5 MGD Flow –

Input Data WQM 7.0 – Using Background & Reach Data from Previous Modeling

SWP Basin	Stream Code	Stream Name	RMI	Elevation (ft)	Drainage Area (sq mi)	Slope (ft/ft)	PWS Withdrawal (mgd)	Apply FC
19G	41340	GEORGES CREEK	13.300	991.00	14.50	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	0.008	0.00	0.00	0.000	0.000	20.0	0.00	0.00	25.00	7.20	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
Fairchance Geor	PA0096342	1.5000	1.5000	1.5000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	15.00	2.00	0.00	0.90
Dissolved Oxygen	5.00	6.70	0.00	0.00
NH3-N	2.00	0.15	0.00	0.60

Existing Fairchance Georges STP limits at Flow of 0.75 MGD

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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
19G	41340	GEORGES CREEK	10.400	945.00	18.37	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	0.008	0.00	0.00	0.000	0.000	20.0	0.00	0.00	25.00	7.20	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
Georges TWMA	PA0218391	0.1600	0.1600	0.1600	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5 (Existing Georges Twp Municipal STP Limits)	20.00	2.00	0.00	1.20
Dissolved Oxygen	4.00	6.70	0.00	0.00
NH3-N	3.00	0.15	0.00	0.60

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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
19G	41340	GEORGES CREEK	**10.020**	940.00	35.22	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	0.008	0.00	0.00	0.000	0.000	20.0	0.00	0.00	25.00	7.20	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	0.12
Dissolved Oxygen	3.00	6.70	0.00	0.00
NH3-N	25.00	0.00	0.00	0.60

No Discharge... hence... Reach Excluded

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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
19G	41340	GEORGES CREEK	8.600	920.00	40.00	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	0.008	0.00	0.00	0.000	0.000	20.0	0.00	0.00	25.00	7.20	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	20.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	0.12
Dissolved Oxygen	3.00	6.70	0.00	0.00
NH3-N	25.00	0.00	0.00	0.60

No Discharge here – Reach Extended

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WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES 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												
13.300	0.12	0.00	0.12	2.3205	0.00300	.813	16.27	20	0.18	0.962	20.24	7.01
10.400	0.15	0.00	0.15	2.568	0.00249	.862	17.23	20	0.18	0.127	20.27	7.01
10.020	0.28	0.00	0.28	2.568	0.00267	.933	18.66	20	0.16	0.530	20.49	7.02
Q1-10 Flow												
13.300	0.07	0.00	0.07	2.3205	0.00300	NA	NA	NA	0.18	0.972	20.16	7.00
10.400	0.09	0.00	0.09	2.568	0.00249	NA	NA	NA	0.18	0.128	20.18	7.01
10.020	0.18	0.00	0.18	2.568	0.00267	NA	NA	NA	0.16	0.541	20.33	7.01
Q30-10 Flow												
13.300	0.26	0.00	0.26	2.3205	0.00300	NA	NA	NA	0.19	0.933	20.50	7.02
10.400	0.32	0.00	0.32	2.568	0.00249	NA	NA	NA	0.19	0.123	20.56	7.02
10.020	0.62	0.00	0.62	2.568	0.00267	NA	NA	NA	0.17	0.497	20.98	7.03

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	Based on previous Modeling	2.21	Temperature Adjust Kr	☐
D.O. Saturation		80.00%	Use Balanced Technology	☐
D.O. Goal		5		

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WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES 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
13.300	Fairchance Geor	9.53	4	9.53	4	0	0
10.400	Georges TWMA	8.47	6	9.51	6	0	0
10.020		NA	NA	9.38	NA	NA	NA

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
13.300	Fairchance Geor	1.83	2	1.83	2	0	0
10.400	Georges TWMA	1.47	3	1.82	3	0	0
10.020		NA	NA	1.75	NA	NA	NA

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)		
13.30	Fairchance Geor	13.95	13.95	2	2	5	5	0	0
10.40	Georges TWMA	20	20	3	3	4	4	0	0
10.02		NA	NA	NA	NA	NA	NA	NA	NA

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
13.300	1.500	20.238	7.008
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
16.268	0.813	20.000	0.184
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
13.38	0.828	1.91	0.611
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.081	5.256	Tsivoglou	5
Reach Travel Time (days)			
0.962			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.096	12.34	1.80	5.08
0.192	11.39	1.70	5.19
0.289	10.51	1.60	5.37
0.385	9.69	1.51	5.58
0.481	8.94	1.42	5.79
0.577	8.25	1.34	6.01
0.674	7.61	1.27	6.22
0.770	7.02	1.19	6.42
0.866	6.48	1.13	6.61
0.962	5.98	1.06	6.70

DO Recovers > 5.0 criteria

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
10.400	1.660	20.271	7.009
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
17.232	0.862	20.000	0.183
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.21	0.914	1.23	0.613
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.454	4.330	Tsivoglou	5
Reach Travel Time (days)			
0.127			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.013	7.13	1.22	6.43
0.025	7.04	1.21	6.41
0.038	6.96	1.20	6.39
0.051	6.88	1.19	6.38
0.063	6.80	1.18	6.37
0.076	6.72	1.17	6.36
0.089	6.64	1.16	6.35
0.102	6.57	1.15	6.34
0.114	6.49	1.15	6.34
0.127	6.41	1.14	6.34

? DO > 5.0 criteria — See Next Reach for Recovery

4.5

WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
10.020	1.660	20.494	7.016
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
18.657	0.933	20.000	0.164
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
6.20	0.883	1.07	0.623
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.356	4.150	Tsivoglou	5
Reach Travel Time (days)			
0.530			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.053	5.91	1.04	6.36
0.106	5.64	1.01	6.39
0.159	5.37	0.97	6.43
0.212	5.12	0.94	6.48
0.265	4.88	0.91	6.55
0.318	4.66	0.88	6.62
0.371	4.44	0.85	6.69
0.424	4.23	0.83	6.70
0.477	4.03	0.80	6.70
0.530	3.84	0.77	6.70

} DO > 5.0 criteria & recovers

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES 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)
13.300	Fairchance Geor	PA0096342	1.500	CBOD5	Imposes 10 Avg 13.95		
				NH3-N	20 Max. 2	4	
				Dissolved Oxygen			5

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)
10.400	Georges TWMA	PA0218391	0.160	CBOD5	Existing Limits ok 20		
				NH3-N	3	6	
				Dissolved Oxygen			4

Note. No need to run this in Uniform Treatment (UT) Mode, and then take the least Stringent limits of EMPR and UT Mode and rerun in EMPR Mode. The same above limits will result. The above second discharges Existing limits remained unchanged, which is the desired result.

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Colder Period Modeling - 1.5 MGD Flow - Using Background & Reach Data from Previous Modeling

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
19G	41340	GEORGES CREEK	13.300	991.00	14.50	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	0.016	0.00	0.00	0.000	0.000	20.0	0.00	0.00	5.00	7.20	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
Fairchance Geor	PA0096342	1.5000	1.5000	1.5000	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	5.00	10.18	0.00	0.00
NH3-N	4.50	0.15	0.00	0.60

Existing Fairchance Georges STP Limits at 0.75 MGD

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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
19G	41340	GEORGES CREEK	10.400	945.00	18.37	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	0.016	0.00	0.00	0.000	0.000	20.0	0.00	0.00	5.00	7.20	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
Georges TWMA	PA0218391	0.1600	0.1600	0.1600	0.000	15.00	7.00

Parameter Data

Parameter Name	Disc Conc (mg/L)	Trib Conc (mg/L)	Stream Conc (mg/L)	Fate Coef (1/days)
CBOD5	25.00	2.00	0.00	1.50
Dissolved Oxygen	4.00	10.18	0.00	0.00
NH3-N	9.00	0.15	0.00	0.60

Existing Georges STP Mon.Path. STP Limits

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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
19G	41340	GEORGES CREEK	10.020	940.00	35.22	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	0.016	0.00	0.00	0.000	0.000	20.0	0.00	0.00	5.00	7.20	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	15.00	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	0.12
Dissolved Oxygen	3.00	10.18	0.00	0.00
NH3-N	25.00	0.15	0.00	0.60

No Discharge Here - Reach Extended

SA

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
19G	41340	GEORGES CREEK	8.600	920.00	40.00	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	0.016	0.00	0.00	0.000	0.000	20.0	0.00	0.00	5.00	7.20	0.00	0.00
Q1-10		0.00	0.00	0.000	0.000							
Q30-10		0.00	0.00	0.000	0.000							

Discharge Data

Name	Permit Number	Existing Disc Flow (mgd)	Permitted Disc Flow (mgd)	Design Disc Flow (mgd)	Reserve Factor	Disc Temp (°C)	Disc pH
		0.0000	0.0000	0.0000	0.000	15.00	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	0.12
Dissolved Oxygen	3.00	10.18	0.00	0.00
NH3-N	25.00	0.15	0.00	0.60

No Discharge Here - Reach Extended

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WQM 7.0 Hydrodynamic Outputs

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES 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												
13.300	0.23	0.00	0.23	2.3205	0.00300	.822	16.44	20	0.19	0.938	14.09	7.01
10.400	0.29	0.00	0.29	2.568	0.00249	.872	17.43	20	0.19	0.123	13.97	7.02
10.020	0.56	0.00	0.56	2.568	0.00267	.952	19.05	20	0.17	0.503	13.20	7.03
Q1-10 Flow												
13.300	0.15	0.00	0.15	2.3205	0.00300	NA	NA	NA	0.19	0.955	14.40	7.01
10.400	0.19	0.00	0.19	2.568	0.00249	NA	NA	NA	0.18	0.126	14.32	7.01
10.020	0.36	0.00	0.36	2.568	0.00267	NA	NA	NA	0.17	0.522	13.77	7.02
Q30-10 Flow												
13.300	0.51	0.00	0.51	2.3205	0.00300	NA	NA	NA	0.20	0.884	13.19	7.03
10.400	0.65	0.00	0.65	2.568	0.00249	NA	NA	NA	0.20	0.115	12.98	7.03
10.020	1.25	0.00	1.25	2.568	0.00267	NA	NA	NA	0.19	0.450	11.73	7.06

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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	From Previous Modeling	2.21	Temperature Adjust Kr	☐
D.O. Saturation		80.00%	Use Balanced Technology	☐
D.O. Goal		5		

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WQM 7.0 Wasteload Allocations

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES 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
13.300	Fairchance Geor	14.57	9	14.57	9	0	0
10.400	Georges TWMA	18.47	18	14.65	18	0	0
10.020		NA	NA	15.17	NA	NA	NA

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
13.300	Fairchance Geor	3.13	3.79	3.13	3.79	0	0
10.400	Georges TWMA	3.77	9	3.17	9	0	0
10.020		NA	NA	3.45	NA	NA	NA

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)		
13.30	Fairchance Geor	19.79	19.79	3.79	3.79	5	5	0	0
10.40	Georges TWMA	25	25	9	9	4	4	0	0
10.02		NA	NA	NA	NA	NA	NA	NA	NA

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
13.300	1.500	14.091	7.015
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
16.435	0.822	20.000	0.189
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
18.17	1.169	3.46	0.381
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
5.471	5.395	Tsivoglou	5
Reach Travel Time (days)			
0.938			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.094	16.71	3.34	5.24
0.188	15.37	3.22	5.26
0.281	14.14	3.11	5.41
0.375	13.01	3.00	5.63
0.469	11.97	2.89	5.88
0.563	11.01	2.79	6.15
0.656	10.13	2.69	6.41
0.750	9.31	2.60	6.66
0.844	8.57	2.51	6.90
0.938	7.88	2.42	7.13

} DO Recovers > 5.0 Criteria

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
10.400	1.660	13.973	7.017
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
17.433	0.872	20.000	0.188
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
9.23	1.232	2.94	0.377
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
6.925	4.460	Tsivoglou	5
Reach Travel Time (days)			
0.123			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.012	9.13	2.93	6.89
0.025	9.02	2.91	6.86
0.037	8.92	2.90	6.84
0.049	8.82	2.89	6.81
0.062	8.72	2.87	6.79
0.074	8.62	2.86	6.78
0.086	8.52	2.85	6.76
0.099	8.42	2.83	6.75
0.111	8.33	2.82	6.75
0.123	8.23	2.81	6.74

} DO > 5.0 criteria - See Next Reach for Recovery

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WQM 7.0 D.O.Simulation

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES CREEK

RMI	Total Discharge Flow (mgd)	Analysis Temperature (°C)	Analysis pH
10.020	1.660	13.201	7.030
Reach Width (ft)	**Reach Depth (ft)**	**Reach WDRatio**	**Reach Velocity (fps)**
19.048	0.952	20.000	0.173
Reach CBOD5 (mg/L)	**Reach Kc (1/days)**	**Reach NH3-N (mg/L)**	**Reach Kn (1/days)**
7.69	1.184	2.58	0.356
Reach DO (mg/L)	**Reach Kr (1/days)**	**Kr Equation**	**Reach DO Goal (mg/L)**
7.036	4.375	Tsivoglou	5
Reach Travel Time (days)			
0.503			

Subreach Results

TravTime (days)	CBOD5 (mg/L)	NH3-N (mg/L)	D.O. (mg/L)
0.050	7.37	2.53	7.09
0.101	7.05	2.49	7.16
0.151	6.75	2.44	7.23
0.201	6.46	2.40	7.31
0.251	6.19	2.36	7.39
0.302	5.92	2.32	7.48
0.352	5.67	2.27	7.57
0.402	5.43	2.23	7.65
0.452	5.20	2.19	7.74
0.503	4.98	2.16	7.83

DO > 5.0 criteria & recovers

SC

WQM 7.0 Effluent Limits

SWP Basin	Stream Code	Stream Name
19G	41340	GEORGES 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)
13.300	Fairchance Geor	PA0096342	1.500	CBOD5 Impose 20 Avg 40 Max	19.79		
				NH3-N Impose 3.5 Avg 7.0 Max	3.79	7.58	
				Dissolved Oxygen			5

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)
10.400	Georges TWMA	PA0218391	0.160	CBOD5 Existing Limits	25		
				NH3-N	9	18	
				Dissolved Oxygen			4

Note - No need to rerun in WTM mode, then take least stringent of WTM & EMPR mode limits & rerun in EMPR mode. The above same limits would result.

Toxics Management Spreadsheet Version 1.3 – Annual Design Flow 1.5 MGD

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Toxics Management Spreadsheet
Version 1.3, March 2021

Discharge Information

Instructions | Discharge | Stream

Facility: **Fairchance-Georges JMSA** NPDES Permit No.: **PA0096342** Outfall No.: **001**

Evaluation Type: **Major Sewage / Industrial Waste** Wastewater Description: **Sewage Effluent**

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
1.5	129	7	1	1				

					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		760									
	Chloride (PWS)	mg/L		85.5									
	Bromide	mg/L		0.424									
	Sulfate (PWS)	mg/L		48.3									
	Fluoride (PWS)	mg/L											
Group 2	Total Aluminum	µg/L		40									
	Total Antimony	µg/L		0.58									
	Total Arsenic	µg/L		0.64									
	Total Barium	µg/L		47									
	Total Beryllium	µg/L		0.3									
	Total Boron	µg/L		173									
	Total Cadmium	µg/L	<	0.2									
	Total Chromium (III)	µg/L		0.4									
	Hexavalent Chromium	µg/L	<	1									
	Total Cobalt	µg/L		1									
	Total Copper	µg/L		5									
	Free Cyanide	µg/L		4									
	Total Cyanide	µg/L		8.7									
	Dissolved Iron	µg/L		33									
	Total Iron	µg/L		50									
	Total Lead	µg/L		0.38									
	Total Manganese	µg/L		50									
	Total Mercury	µg/L	<	0.2									
	Total Nickel	µg/L		2									
	Total Phenols (Phenolics) (PWS)	µg/L	<	2									
	Total Selenium	µg/L	<	2									
	Total Silver	µg/L	<	0.5									
	Total Thallium	µg/L	<	0.5									
	Total Zinc	µg/L		76									
	Total Molybdenum	µg/L		2									
	Acrolein	µg/L	<	2									
	Acrylamide	µg/L											
	Acrylonitrile	µg/L	<	5									
	Benzene	µg/L	<	0.5									
	Bromoform	µg/L	<	0.5									

Group 3	Carbon Tetrachloride	µg/L	<	0.23										
	Chlorobenzene	µg/L	<	0.5										
	Chlorodibromomethane	µg/L	<	0.5										
	Chloroethane	µg/L	<	1										
	2-Chloroethyl Vinyl Ether	µg/L	<	5										
	Chloroform	µg/L		0.89										
	Dichlorobromomethane	µg/L	<	0.5										
	1,1-Dichloroethane	µg/L	<	0.5										
	1,2-Dichloroethane	µg/L	<	0.5										
	1,1-Dichloroethylene	µg/L	<	0.5										
	1,2-Dichloropropane	µg/L	<	0.5										
	1,3-Dichloropropylene	µg/L	<	0.47										
	1,4-Dioxane	µg/L	<	3.1										
	Ethylbenzene	µg/L	<	0.5										
	Methyl Bromide	µg/L		0.51										
	Methyl Chloride	µg/L		0.69										
	Methylene Chloride	µg/L	<	1										
	1,1,2,2-Tetrachloroethane	µg/L	<	0.5										
	Tetrachloroethylene	µg/L	<	0.5										
	Toluene	µg/L	<	0.5										
	1,2-trans-Dichloroethylene	µg/L	<	0.5										
	1,1,1-Trichloroethane	µg/L	<	0.5										
	1,1,2-Trichloroethane	µg/L	<	0.5										
	Trichloroethylene	µg/L	<	0.5										
	Vinyl Chloride	µg/L	<	0.5										
Group 4	2-Chlorophenol	µg/L	<	3.1										
	2,4-Dichlorophenol	µg/L	<	3.1										
	2,4-Dimethylphenol	µg/L	<	3.1										
	4,6-Dinitro-o-Cresol	µg/L	<	6.3										
	2,4-Dinitrophenol	µg/L	<	6.3										
	2-Nitrophenol	µg/L	<	3.1										
	4-Nitrophenol	µg/L	<	3.1										
	p-Chloro-m-Cresol	µg/L	<	3.1										
	Pentachlorophenol	µg/L	<	6.3										
	Phenol	µg/L	<	8.3										
	2,4,6-Trichlorophenol	µg/L	<	3.1										
Group 5	Acenaphthene	µg/L	<	1.6										
	Acenaphthylene	µg/L	<	1.6										
	Anthracene	µg/L	<	1.6										
	Benzidine	µg/L	<	4.2										
	Benzo(a)Anthracene	µg/L	<	1.6										
	Benzo(a)Pyrene	µg/L	<	1.6										
	3,4-Benzofluoranthene	µg/L	<	1.6										
	Benzo(ghi)Perylene	µg/L	<	1.6										
	Benzo(k)Fluoranthene	µg/L	<	1.6										
	Bis(2-Chloroethoxy)Methane	µg/L	<	3.1										
	Bis(2-Chloroethyl)Ether	µg/L	<	3.1										
	Bis(2-Chloroisopropyl)Ether	µg/L	<	3.1										
	Bis(2-Ethylhexyl)Phthalate	µg/L	<	3.1										
	4-Bromophenyl Phenyl Ether	µg/L	<	3.1										
	Butyl Benzyl Phthalate	µg/L	<	3.1										
	2-Chloronaphthalene	µg/L	<	3.1										
	4-Chlorophenyl Phenyl Ether	µg/L	<	3.1										
	Chrysene	µg/L	<	1.6										
	Dibenzo(a,h)Anthrancene	µg/L	<	1.6										
	1,2-Dichlorobenzene	µg/L	<	1										
	1,3-Dichlorobenzene	µg/L	<	1										
	1,4-Dichlorobenzene	µg/L	<	1										
	3,3-Dichlorobenzidine	µg/L	<	3.1										
	Diethyl Phthalate	µg/L	<	3.1										
	Dimethyl Phthalate	µg/L	<	3.1										
	Di-n-Butyl Phthalate	µg/L	<	3.1										
	2,4-Dinitrotoluene	µg/L	<	3.1										

	2,6-Dinitrotoluene	µg/L	<	3.1										
	Di-n-Octyl Phthalate	µg/L	<	3										
	1,2-Diphenylhydrazine	µg/L	<	3.1										
	Fluoranthene	µg/L	<	1.6										
	Fluorene	µg/L	<	1.6										
	Hexachlorobenzene	µg/L	<	3.1										
	Hexachlorobutadiene	µg/L	<	0.5										
	Hexachlorocyclopentadiene	µg/L	<	3.1										
	Hexachloroethane	µg/L	<	3.1										
	Indeno(1,2,3-cd)Pyrene	µg/L	<	1.6										
	Isophorone	µg/L	<	3.1										
	Naphthalene	µg/L	<	1.6										
	Nitrobenzene	µg/L	<	3.1										
	n-Nitrosodimethylamine	µg/L	<	3.1										
	n-Nitrosodi-n-Propylamine	µg/L	<	3.1										
	n-Nitrosodiphenylamine	µg/L	<	3.1										
	Phenanthrene	µg/L	<	1.6										
	Pyrene	µg/L	<	1.6										
	1,2,4-Trichlorobenzene	µg/L	<	0.43										
Group 6	Aldrin	µg/L	<											
	alpha-BHC	µg/L	<											
	beta-BHC	µg/L	<											
	gamma-BHC	µg/L	<											
	delta BHC	µg/L	<											
	Chlordane	µg/L	<											
	4,4-DDT	µg/L	<											
	4,4-DDE	µg/L	<											
	4,4-DDD	µg/L	<											
	Dieldrin	µg/L	<											
	alpha-Endosulfan	µg/L	<											
	beta-Endosulfan	µg/L	<											
	Endosulfan Sulfate	µg/L	<											
	Endrin	µg/L	<											
	Endrin Aldehyde	µg/L	<											
	Heptachlor	µg/L	<											
	Heptachlor Epoxide	µg/L	<											
	PCB-1016	µg/L	<											
	PCB-1221	µg/L	<											
	PCB-1232	µg/L	<											
	PCB-1242	µg/L	<											
	PCB-1248	µg/L	<											
	PCB-1254	µg/L	<											
	PCB-1260	µg/L	<											
	PCBs, Total	µg/L	<											
	Toxaphene	µg/L	<											
	2,3,7,8-TCDD	ng/L	<											
Group 7	Gross Alpha	pCi/L												
	Total Beta	pCi/L	<											
	Radium 226/228	pCi/L	<											
	Total Strontium	µg/L	<											
	Total Uranium	µg/L	<											
	Osmotic Pressure	mOs/kg												

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Toxics Management Spreadsheet
Version 1.3, March 2021

Stream / Surface Water Information

Fairchance-Georges JMSA, NPDES Permit No. PA0096342, Outfall 001

Instructions | Discharge | *Stream*

Receiving Surface Water Name: _____ 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	041340	13.3	991	14.5			Yes
End of Reach 1	041340	10.02	940	35.22			Yes

$Q_{7\text{-}10}$

Location	RMI	LFY (cfs/mi²)*	Flow (cfs)		W/D Ratio	Width (ft)	Depth (ft)	Velocity (fps)	Travel Time (days)	Tributary		Stream		Analysis	
			Stream	Tributary						Hardness	pH	Hardness*	pH*	Hardness	pH
Point of Discharge	13.3	0.008			20							100	7		
End of Reach 1	10.02	0.008			20										

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	13.3														
End of Reach 1	10.02														

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Toxics Management Spreadsheet
Version 1.3, March 2021

Model Results

Fairchance-Georges JMSA, NPDES Permit No. PA0096342, Outfall 001

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

☑ ***Hydrodynamics***

$Q_{7\text{-}10}$

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
13.3	0.12		0.12	2.321	0.003	0.593	11.853	20.	0.184	1.09	0.018
10.02	0.28		0.282					20.000			

Q_h

RMI	Stream Flow (cfs)	PWS Withdrawal (cfs)	Net Stream Flow (cfs)	Discharge Analysis Flow (cfs)	Slope (ft/ft)	Depth (ft)	Width (ft)	W/D Ratio	Velocity (fps)	Travel Time (days)	Complete Mix Time (min)
13.3	1.13		1.13	2.321	0.003	0.691	11.853	17.159	0.223	0.897	0.663
10.02	2.456		2.46								

☑ ***Wasteload Allocations***

☑ ***AFC*** CCT (min): 0.018 PMF: 1 Analysis Hardness (mg/l): 127.62 Analysis pH: 7.00

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	750	750	787	
Total Antimony	0	0		0	1,100	1,100	1,155	
Total Arsenic	0	0		0	340	340	357	Chem Translator of 1 applied
Total Barium	0	0		0	21,000	21,000	22,050	
Total Boron	0	0		0	8,100	8,100	8,505	
Total Cadmium	0	0		0	2.552	2.73	2.87	Chem Translator of 0.934 applied
Total Chromium (III)	0	0		0	695.729	2,202	2,312	Chem Translator of 0.316 applied
Hexavalent Chromium	0	0		0	16	16.3	17.1	Chem Translator of 0.982 applied
Total Cobalt	0	0		0	95	95.0	99.7	
Total Copper	0	0		0	16.911	17.6	18.5	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	22	22.0	23.1	

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	84.135	111	117	Chem Translator of 0.755 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	1.400	1.65	1.73	Chem Translator of 0.85 applied
Total Nickel	0	0		0	575.533	577	606	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	4.893	5.76	6.04	Chem Translator of 0.85 applied
Total Thallium	0	0		0	65	65.0	68.2	
Total Zinc	0	0		0	144.078	147	155	Chem Translator of 0.978 applied
Acrolein	0	0		0	3	3.0	3.15	
Acrylonitrile	0	0		0	650	650	682	
Benzene	0	0		0	640	640	672	
Bromoform	0	0		0	1,800	1,800	1,890	
Carbon Tetrachloride	0	0		0	2,800	2,800	2,940	
Chlorobenzene	0	0		0	1,200	1,200	1,260	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	18,000	18,000	18,900	
Chloroform	0	0		0	1,900	1,900	1,995	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	15,000	15,000	15,750	
1,1-Dichloroethylene	0	0		0	7,500	7,500	7,875	
1,2-Dichloropropane	0	0		0	11,000	11,000	11,550	
1,3-Dichloropropylene	0	0		0	310	310	325	
Ethylbenzene	0	0		0	2,900	2,900	3,045	
Methyl Bromide	0	0		0	550	550	577	
Methyl Chloride	0	0		0	28,000	28,000	29,400	
Methylene Chloride	0	0		0	12,000	12,000	12,600	
1,1,2,2-Tetrachloroethane	0	0		0	1,000	1,000	1,050	
Tetrachloroethylene	0	0		0	700	700	735	
Toluene	0	0		0	1,700	1,700	1,785	
1,2-trans-Dichloroethylene	0	0		0	6,800	6,800	7,140	
1,1,1-Trichloroethane	0	0		0	3,000	3,000	3,150	
1,1,2-Trichloroethane	0	0		0	3,400	3,400	3,570	
Trichloroethylene	0	0		0	2,300	2,300	2,415	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	560	560	588	
2,4-Dichlorophenol	0	0		0	1,700	1,700	1,785	
2,4-Dimethylphenol	0	0		0	660	660	693	
4,6-Dinitro-o-Cresol	0	0		0	80	80.0	84.0	
2,4-Dinitrophenol	0	0		0	660	660	693	
2-Nitrophenol	0	0		0	8,000	8,000	8,400	
4-Nitrophenol	0	0		0	2,300	2,300	2,415	
p-Chloro-m-Cresol	0	0		0	160	160	168	
Pentachlorophenol	0	0		0	8.723	8.72	9.16	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	460	460	483	

Acenaphthene	0	0		0	83	83.0	87.1	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	300	300	315	
Benzo(a)Anthracene	0	0		0	0.5	0.5	0.52	
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	31,500	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	4,500	4,500	4,725	
4-Bromophenyl Phenyl Ether	0	0		0	270	270	283	
Butyl Benzyl Phthalate	0	0		0	140	140	147	
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	861	
1,3-Dichlorobenzene	0	0		0	350	350	367	
1,4-Dichlorobenzene	0	0		0	730	730	766	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	4,000	4,000	4,200	
Dimethyl Phthalate	0	0		0	2,500	2,500	2,625	
Di-n-Butyl Phthalate	0	0		0	110	110	115	
2,4-Dinitrotoluene	0	0		0	1,600	1,600	1,680	
2,6-Dinitrotoluene	0	0		0	990	990	1,039	
1,2-Diphenylhydrazine	0	0		0	15	15.0	15.7	
Fluoranthene	0	0		0	200	200	210	
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	10.5	
Hexachlorocyclopentadiene	0	0		0	5	5.0	5.25	
Hexachloroethane	0	0		0	60	60.0	63.0	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	10,000	10,000	10,500	
Naphthalene	0	0		0	140	140	147	
Nitrobenzene	0	0		0	4,000	4,000	4,200	
n-Nitrosodimethylamine	0	0		0	17,000	17,000	17,850	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	300	300	315	
Phenanthrene	0	0		0	5	5.0	5.25	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	130	130	136	

☑ *CFC* CCT (min): 0.018 PMF: 1 Analysis Hardness (mg/l): 127.62 Analysis pH: 7.00

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

Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	220	220	231	
Total Arsenic	0	0		0	150	150	157	Chem Translator of 1 applied
Total Barium	0	0		0	4,100	4,100	4,305	
Total Boron	0	0		0	1,600	1,600	1,680	
Total Cadmium	0	0		0	0.291	0.32	0.34	Chem Translator of 0.899 applied
Total Chromium (III)	0	0		0	90.500	105	110	Chem Translator of 0.86 applied
Hexavalent Chromium	0	0		0	10	10.4	10.9	Chem Translator of 0.962 applied
Total Cobalt	0	0		0	19	19.0	19.9	
Total Copper	0	0		0	11.031	11.5	12.1	Chem Translator of 0.96 applied
Free Cyanide	0	0		0	5.2	5.2	5.46	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	1,500	1,500	1,575	WQC = 30 day average; PMF = 1
Total Lead	0	0		0	3.279	4.34	4.56	Chem Translator of 0.755 applied
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	0.770	0.91	0.95	Chem Translator of 0.85 applied
Total Nickel	0	0		0	63.924	64.1	67.3	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	5.24	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	13.6	
Total Zinc	0	0		0	145.257	147	155	Chem Translator of 0.986 applied
Acrolein	0	0		0	3	3.0	3.15	
Acrylonitrile	0	0		0	130	130	136	
Benzene	0	0		0	130	130	136	
Bromoform	0	0		0	370	370	388	
Carbon Tetrachloride	0	0		0	560	560	588	
Chlorobenzene	0	0		0	240	240	252	
Chlorodibromomethane	0	0		0	N/A	N/A	N/A	
2-Chloroethyl Vinyl Ether	0	0		0	3,500	3,500	3,675	
Chloroform	0	0		0	390	390	409	
Dichlorobromomethane	0	0		0	N/A	N/A	N/A	
1,2-Dichloroethane	0	0		0	3,100	3,100	3,255	
1,1-Dichloroethylene	0	0		0	1,500	1,500	1,575	
1,2-Dichloropropane	0	0		0	2,200	2,200	2,310	
1,3-Dichloropropylene	0	0		0	61	61.0	64.0	
Ethylbenzene	0	0		0	580	580	609	
Methyl Bromide	0	0		0	110	110	115	
Methyl Chloride	0	0		0	5,500	5,500	5,775	
Methylene Chloride	0	0		0	2,400	2,400	2,520	
1,1,2,2-Tetrachloroethane	0	0		0	210	210	220	
Tetrachloroethylene	0	0		0	140	140	147	
Toluene	0	0		0	330	330	346	

1,2-trans-Dichloroethylene	0	0		0	1,400	1,400	1,470	
1,1,1-Trichloroethane	0	0		0	610	610	640	
1,1,2-Trichloroethane	0	0		0	680	680	714	
Trichloroethylene	0	0		0	450	450	472	
Vinyl Chloride	0	0		0	N/A	N/A	N/A	
2-Chlorophenol	0	0		0	110	110	115	
2,4-Dichlorophenol	0	0		0	340	340	357	
2,4-Dimethylphenol	0	0		0	130	130	136	
4,6-Dinitro-o-Cresol	0	0		0	16	16.0	16.8	
2,4-Dinitrophenol	0	0		0	130	130	136	
2-Nitrophenol	0	0		0	1,600	1,600	1,680	
4-Nitrophenol	0	0		0	470	470	493	
p-Chloro-m-Cresol	0	0		0	500	500	525	
Pentachlorophenol	0	0		0	6.693	6.69	7.03	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	91	91.0	95.5	
Acenaphthene	0	0		0	17	17.0	17.8	
Anthracene	0	0		0	N/A	N/A	N/A	
Benzidine	0	0		0	59	59.0	61.9	
Benzo(a)Anthracene	0	0		0	0.1	0.1	0.1	
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	6,300	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	910	910	955	
4-Bromophenyl Phenyl Ether	0	0		0	54	54.0	56.7	
Butyl Benzyl Phthalate	0	0		0	35	35.0	36.7	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	N/A	N/A	N/A	
Dibenzo(a,h)Anthrancene	0	0		0	N/A	N/A	N/A	
1,2-Dichlorobenzene	0	0		0	160	160	168	
1,3-Dichlorobenzene	0	0		0	69	69.0	72.4	
1,4-Dichlorobenzene	0	0		0	150	150	157	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	800	800	840	
Dimethyl Phthalate	0	0		0	500	500	525	
Di-n-Butyl Phthalate	0	0		0	21	21.0	22.0	
2,4-Dinitrotoluene	0	0		0	320	320	336	
2,6-Dinitrotoluene	0	0		0	200	200	210	
1,2-Diphenylhydrazine	0	0		0	3	3.0	3.15	
Fluoranthene	0	0		0	40	40.0	42.0	
Fluorene	0	0		0	N/A	N/A	N/A	
Hexachlorobenzene	0	0		0	N/A	N/A	N/A	
Hexachlorobutadiene	0	0		0	2	2.0	2.1	

Hexachlorocyclopentadiene	0	0		0	1	1.0	1.05	
Hexachloroethane	0	0		0	12	12.0	12.6	
Indeno(1,2,3-cd)Pyrene	0	0		0	N/A	N/A	N/A	
Isophorone	0	0		0	2,100	2,100	2,205	
Naphthalene	0	0		0	43	43.0	45.1	
Nitrobenzene	0	0		0	810	810	850	
n-Nitrosodimethylamine	0	0		0	3,400	3,400	3,570	
n-Nitrosodi-n-Propylamine	0	0		0	N/A	N/A	N/A	
n-Nitrosodiphenylamine	0	0		0	59	59.0	61.9	
Phenanthrene	0	0		0	1	1.0	1.05	
Pyrene	0	0		0	N/A	N/A	N/A	
1,2,4-Trichlorobenzene	0	0		0	26	26.0	27.3	

☐ ***THH*** CCT (min): 0.018 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	500,000	500,000	N/A	
Chloride (PWS)	0	0		0	250,000	250,000	N/A	
Sulfate (PWS)	0	0		0	250,000	250,000	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	5.6	5.6	5.88	
Total Arsenic	0	0		0	10	10.0	10.5	
Total Barium	0	0		0	2,400	2,400	2,520	
Total Boron	0	0		0	3,100	3,100	3,255	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	
Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	4	4.0	4.2	
Dissolved Iron	0	0		0	300	300	315	
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	1,050	
Total Mercury	0	0		0	0.050	0.05	0.052	
Total Nickel	0	0		0	610	610	640	
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	0.25	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	3	3.0	3.15	
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	105	
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	34.6	
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	71.4	
Methyl Bromide	0	0		0	100	100.0	105	
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	59.8	
1,2-trans-Dichloroethylene	0	0		0	100	100.0	105	
1,1,1-Trichloroethane	0	0		0	10,000	10,000	10,500	
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	31.5	
2,4-Dichlorophenol	0	0		0	10	10.0	10.5	
2,4-Dimethylphenol	0	0		0	100	100.0	105	
4,6-Dinitro-o-Cresol	0	0		0	2	2.0	2.1	
2,4-Dinitrophenol	0	0		0	10	10.0	10.5	
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	4,200	
2,4,6-Trichlorophenol	0	0		0	N/A	N/A	N/A	
Acenaphthene	0	0		0	70	70.0	73.5	
Anthracene	0	0		0	300	300	315	
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	210	
Bis(2-Ethylhexyl)Phthalate	0	0		0	N/A	N/A	N/A	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	

Butyl Benzyl Phthalate	0	0		0	0.1	0.1	0.1	
2-Chloronaphthalene	0	0		0	800	800	840	
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	1,050	
1,3-Dichlorobenzene	0	0		0	7	7.0	7.35	
1,4-Dichlorobenzene	0	0		0	300	300	315	
3,3-Dichlorobenzidine	0	0		0	N/A	N/A	N/A	
Diethyl Phthalate	0	0		0	600	600	630	
Dimethyl Phthalate	0	0		0	2,000	2,000	2,100	
Di-n-Butyl Phthalate	0	0		0	20	20.0	21.0	
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	21.0	
Fluorene	0	0		0	50	50.0	52.5	
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	4.2	
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	35.7	
Naphthalene	0	0		0	N/A	N/A	N/A	
Nitrobenzene	0	0		0	10	10.0	10.5	
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	21.0	
1,2,4-Trichlorobenzene	0	0		0	0.07	0.07	0.073	

☑ *CRL* CCT (min): 0.663 PMF: 1 Analysis Hardness (mg/l): N/A Analysis pH: N/A

Pollutants	Stream Conc (µg/L)	Stream CV	Trib Conc (µg/L)	Fate Coef	WQC (µg/L)	WQ Obj (µg/L)	WLA (µg/L)	Comments
Total Dissolved Solids (PWS)	0	0		0	N/A	N/A	N/A	
Chloride (PWS)	0	0		0	N/A	N/A	N/A	
Sulfate (PWS)	0	0		0	N/A	N/A	N/A	
Total Aluminum	0	0		0	N/A	N/A	N/A	
Total Antimony	0	0		0	N/A	N/A	N/A	
Total Arsenic	0	0		0	N/A	N/A	N/A	
Total Barium	0	0		0	N/A	N/A	N/A	
Total Boron	0	0		0	N/A	N/A	N/A	
Total Cadmium	0	0		0	N/A	N/A	N/A	
Total Chromium (III)	0	0		0	N/A	N/A	N/A	

Hexavalent Chromium	0	0		0	N/A	N/A	N/A	
Total Cobalt	0	0		0	N/A	N/A	N/A	
Total Copper	0	0		0	N/A	N/A	N/A	
Free Cyanide	0	0		0	N/A	N/A	N/A	
Dissolved Iron	0	0		0	N/A	N/A	N/A	
Total Iron	0	0		0	N/A	N/A	N/A	
Total Lead	0	0		0	N/A	N/A	N/A	
Total Manganese	0	0		0	N/A	N/A	N/A	
Total Mercury	0	0		0	N/A	N/A	N/A	
Total Nickel	0	0		0	N/A	N/A	N/A	
Total Phenols (Phenolics) (PWS)	0	0		0	N/A	N/A	N/A	
Total Selenium	0	0		0	N/A	N/A	N/A	
Total Silver	0	0		0	N/A	N/A	N/A	
Total Thallium	0	0		0	N/A	N/A	N/A	
Total Zinc	0	0		0	N/A	N/A	N/A	
Acrolein	0	0		0	N/A	N/A	N/A	
Acrylonitrile	0	0		0	0.06	0.06	0.089	
Benzene	0	0		0	0.58	0.58	0.86	
Bromoform	0	0		0	7	7.0	10.4	
Carbon Tetrachloride	0	0		0	0.4	0.4	0.59	
Chlorobenzene	0	0		0	N/A	N/A	N/A	
Chlorodibromomethane	0	0		0	0.8	0.8	1.19	
2-Chloroethyl Vinyl Ether	0	0		0	N/A	N/A	N/A	
Chloroform	0	0		0	5.7	5.7	8.48	
Dichlorobromomethane	0	0		0	0.95	0.95	1.41	
1,2-Dichloroethane	0	0		0	9.9	9.9	14.7	
1,1-Dichloroethylene	0	0		0	N/A	N/A	N/A	
1,2-Dichloropropane	0	0		0	0.9	0.9	1.34	
1,3-Dichloropropylene	0	0		0	0.27	0.27	0.4	
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	29.7	
1,1,2,2-Tetrachloroethane	0	0		0	0.2	0.2	0.3	
Tetrachloroethylene	0	0		0	10	10.0	14.9	
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	0.82	
Trichloroethylene	0	0		0	0.6	0.6	0.89	
Vinyl Chloride	0	0		0	0.02	0.02	0.03	
2-Chlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dichlorophenol	0	0		0	N/A	N/A	N/A	
2,4-Dimethylphenol	0	0		0	N/A	N/A	N/A	
4,6-Dinitro-o-Cresol	0	0		0	N/A	N/A	N/A	

2,4-Dinitrophenol	0	0		0	N/A	N/A	N/A	
2-Nitrophenol	0	0		0	N/A	N/A	N/A	
4-Nitrophenol	0	0		0	N/A	N/A	N/A	
p-Chloro-m-Cresol	0	0		0	N/A	N/A	N/A	
Pentachlorophenol	0	0		0	0.030	0.03	0.045	
Phenol	0	0		0	N/A	N/A	N/A	
2,4,6-Trichlorophenol	0	0		0	1.5	1.5	2.23	
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	0.0001	
Benzo(a)Anthracene	0	0		0	0.001	0.001	0.001	
Benzo(a)Pyrene	0	0		0	0.0001	0.0001	0.0001	
3,4-Benzofluoranthene	0	0		0	0.001	0.001	0.001	
Benzo(k)Fluoranthene	0	0		0	0.01	0.01	0.015	
Bis(2-Chloroethyl)Ether	0	0		0	0.03	0.03	0.045	
Bis(2-Chloroisopropyl)Ether	0	0		0	N/A	N/A	N/A	
Bis(2-Ethylhexyl)Phthalate	0	0		0	0.32	0.32	0.48	
4-Bromophenyl Phenyl Ether	0	0		0	N/A	N/A	N/A	
Butyl Benzyl Phthalate	0	0		0	N/A	N/A	N/A	
2-Chloronaphthalene	0	0		0	N/A	N/A	N/A	
Chrysene	0	0		0	0.12	0.12	0.18	
Dibenzo(a,h)Anthrancene	0	0		0	0.0001	0.0001	0.0001	
1,2-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,3-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
1,4-Dichlorobenzene	0	0		0	N/A	N/A	N/A	
3,3-Dichlorobenzidine	0	0		0	0.05	0.05	0.074	
Diethyl Phthalate	0	0		0	N/A	N/A	N/A	
Dimethyl Phthalate	0	0		0	N/A	N/A	N/A	
Di-n-Butyl Phthalate	0	0		0	N/A	N/A	N/A	
2,4-Dinitrotoluene	0	0		0	0.05	0.05	0.074	
2,6-Dinitrotoluene	0	0		0	0.05	0.05	0.074	
1,2-Diphenylhydrazine	0	0		0	0.03	0.03	0.045	
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	0.0001	
Hexachlorobutadiene	0	0		0	0.01	0.01	0.015	
Hexachlorocyclopentadiene	0	0		0	N/A	N/A	N/A	
Hexachloroethane	0	0		0	0.1	0.1	0.15	
Indeno(1,2,3-cd)Pyrene	0	0		0	0.001	0.001	0.001	
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	0.001	
n-Nitrosodi-n-Propylamine	0	0		0	0.005	0.005	0.007	
n-Nitrosodiphenylamine	0	0		0	3.3	3.3	4.91	

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	

☑ ***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 Boron	Report	Report	Report	Report	Report	µg/L	1,680	CFC	Discharge Conc > 10% WQBEL (no RP)
Total Copper	Report	Report	Report	Report	Report	µg/L	12.1	CFC	Discharge Conc > 10% WQBEL (no RP)
Free Cyanide	0.053	0.082	4.2	6.55	10.5	µg/L	4.2	THH	Discharge Conc ≥ 50% WQBEL (RP)
Dissolved Iron	Report	Report	Report	Report	Report	µg/L	315	THH	Discharge Conc > 10% WQBEL (no RP)
Total Zinc	1.84	1.94	147	155	155	µg/L	147	AFC	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
Total Aluminum	750	µg/L	Discharge Conc ≤ 10% WQBEL
Total Antimony	5.88	µg/L	Discharge Conc ≤ 10% WQBEL
Total Arsenic	10.5	µg/L	Discharge Conc ≤ 10% WQBEL
Total Barium	2,520	µg/L	Discharge Conc ≤ 10% WQBEL
Total Beryllium	N/A	N/A	No WQS
Total Cadmium	0.34	µg/L	Discharge Conc < TQL
Total Chromium (III)	110	µg/L	Discharge Conc ≤ 10% WQBEL
Hexavalent Chromium	10.9	µg/L	Discharge Conc < TQL
Total Cobalt	19.9	µg/L	Discharge Conc ≤ 10% WQBEL
Total Cyanide	N/A	N/A	No WQS
Total Iron	1,575	µg/L	Discharge Conc ≤ 10% WQBEL
Total Lead	4.56	µg/L	Discharge Conc ≤ 10% WQBEL
Total Manganese	1,050	µg/L	Discharge Conc ≤ 10% WQBEL

Total Mercury	0.052	µg/L	Discharge Conc < TQL
Total Nickel	67.3	µg/L	Discharge Conc ≤ 10% WQBEL
Total Phenols (Phenolics) (PWS)		µg/L	Discharge Conc < TQL
Total Selenium	5.24	µg/L	Discharge Conc < TQL
Total Silver	5.76	µg/L	Discharge Conc ≤ 10% WQBEL
Total Thallium	0.25	µg/L	Discharge Conc < TQL
Total Molybdenum	N/A	N/A	No WQS
Acrolein	3.0	µg/L	Discharge Conc < TQL
Acrylonitrile	0.089	µg/L	Discharge Conc < TQL
Benzene	0.86	µg/L	Discharge Conc < TQL
Bromoform	10.4	µg/L	Discharge Conc < TQL
Carbon Tetrachloride	0.59	µg/L	Discharge Conc < TQL
Chlorobenzene	105	µg/L	Discharge Conc < TQL
Chlorodibromomethane	1.19	µg/L	Discharge Conc < TQL
Chloroethane	N/A	N/A	No WQS
2-Chloroethyl Vinyl Ether	3,675	µg/L	Discharge Conc < TQL
Chloroform	8.48	µg/L	Discharge Conc ≤ 25% WQBEL
Dichlorobromomethane	1.41	µg/L	Discharge Conc < TQL
1,1-Dichloroethane	N/A	N/A	No WQS
1,2-Dichloroethane	14.7	µg/L	Discharge Conc < TQL
1,1-Dichloroethylene	34.6	µg/L	Discharge Conc < TQL
1,2-Dichloropropane	1.34	µg/L	Discharge Conc < TQL
1,3-Dichloropropylene	0.4	µg/L	Discharge Conc < TQL
1,4-Dioxane	N/A	N/A	No WQS
Ethylbenzene	71.4	µg/L	Discharge Conc < TQL
Methyl Bromide	105	µg/L	Discharge Conc ≤ 25% WQBEL
Methyl Chloride	5,775	µg/L	Discharge Conc ≤ 25% WQBEL
Methylene Chloride	29.7	µg/L	Discharge Conc ≤ 25% WQBEL
1,1,2,2-Tetrachloroethane	0.3	µg/L	Discharge Conc < TQL
Tetrachloroethylene	14.9	µg/L	Discharge Conc < TQL
Toluene	59.8	µg/L	Discharge Conc < TQL
1,2-trans-Dichloroethylene	105	µg/L	Discharge Conc < TQL
1,1,1-Trichloroethane	640	µg/L	Discharge Conc < TQL
1,1,2-Trichloroethane	0.82	µg/L	Discharge Conc < TQL
Trichloroethylene	0.89	µg/L	Discharge Conc < TQL
Vinyl Chloride	0.03	µg/L	Discharge Conc < TQL
2-Chlorophenol	31.5	µg/L	Discharge Conc < TQL
2,4-Dichlorophenol	10.5	µg/L	Discharge Conc < TQL
2,4-Dimethylphenol	105	µg/L	Discharge Conc < TQL
4,6-Dinitro-o-Cresol	2.1	µg/L	Discharge Conc < TQL
2,4-Dinitrophenol	10.5	µg/L	Discharge Conc < TQL
2-Nitrophenol	1,680	µg/L	Discharge Conc < TQL
4-Nitrophenol	493	µg/L	Discharge Conc < TQL
p-Chloro-m-Cresol	160	µg/L	Discharge Conc < TQL
Pentachlorophenol	0.045	µg/L	Discharge Conc < TQL

Phenol	4,200	µg/L	Discharge Conc < TQL
2,4,6-Trichlorophenol	2.23	µg/L	Discharge Conc < TQL
Acenaphthene	17.8	µg/L	Discharge Conc < TQL
Acenaphthylene	N/A	N/A	No WQS
Anthracene	315	µg/L	Discharge Conc < TQL
Benzidine	0.0001	µg/L	Discharge Conc < TQL
Benzo(a)Anthracene	0.001	µg/L	Discharge Conc < TQL
Benzo(a)Pyrene	0.0001	µg/L	Discharge Conc < TQL
3,4-Benzofluoranthene	0.001	µg/L	Discharge Conc < TQL
Benzo(ghi)Perylene	N/A	N/A	No WQS
Benzo(k)Fluoranthene	0.015	µg/L	Discharge Conc < TQL
Bis(2-Chloroethoxy)Methane	N/A	N/A	No WQS
Bis(2-Chloroethyl)Ether	0.045	µg/L	Discharge Conc < TQL
Bis(2-Chloroisopropyl)Ether	210	µg/L	Discharge Conc < TQL
Bis(2-Ethylhexyl)Phthalate	0.48	µg/L	Discharge Conc < TQL
4-Bromophenyl Phenyl Ether	56.7	µg/L	Discharge Conc < TQL
Butyl Benzyl Phthalate	0.1	µg/L	Discharge Conc < TQL
2-Chloronaphthalene	840	µg/L	Discharge Conc < TQL
4-Chlorophenyl Phenyl Ether	N/A	N/A	No WQS
Chrysene	0.18	µg/L	Discharge Conc < TQL
Dibenzo(a,h)Anthrancene	0.0001	µg/L	Discharge Conc < TQL
1,2-Dichlorobenzene	168	µg/L	Discharge Conc ≤ 25% WQBEL
1,3-Dichlorobenzene	7.35	µg/L	Discharge Conc ≤ 25% WQBEL
1,4-Dichlorobenzene	157	µg/L	Discharge Conc ≤ 25% WQBEL
3,3-Dichlorobenzidine	0.074	µg/L	Discharge Conc < TQL
Diethyl Phthalate	630	µg/L	Discharge Conc < TQL
Dimethyl Phthalate	525	µg/L	Discharge Conc < TQL
Di-n-Butyl Phthalate	21.0	µg/L	Discharge Conc < TQL
2,4-Dinitrotoluene	0.074	µg/L	Discharge Conc < TQL
2,6-Dinitrotoluene	0.074	µg/L	Discharge Conc < TQL
Di-n-Octyl Phthalate	N/A	N/A	No WQS
1,2-Diphenylhydrazine	0.045	µg/L	Discharge Conc < TQL
Fluoranthene	21.0	µg/L	Discharge Conc < TQL
Fluorene	52.5	µg/L	Discharge Conc < TQL
Hexachlorobenzene	0.0001	µg/L	Discharge Conc < TQL
Hexachlorobutadiene	0.015	µg/L	Discharge Conc < TQL
Hexachlorocyclopentadiene	1.05	µg/L	Discharge Conc < TQL
Hexachloroethane	0.15	µg/L	Discharge Conc < TQL
Indeno(1,2,3-cd)Pyrene	0.001	µg/L	Discharge Conc < TQL
Isophorone	35.7	µg/L	Discharge Conc < TQL
Naphthalene	45.1	µg/L	Discharge Conc ≤ 25% WQBEL
Nitrobenzene	10.5	µg/L	Discharge Conc < TQL
n-Nitrosodimethylamine	0.001	µg/L	Discharge Conc < TQL
n-Nitrosodi-n-Propylamine	0.007	µg/L	Discharge Conc < TQL
n-Nitrosodiphenylamine	4.91	µg/L	Discharge Conc < TQL

Phenanthrene	1.05	µg/L	Discharge Conc < TQL
Pyrene	21.0	µg/L	Discharge Conc < TQL
1,2,4-Trichlorobenzene	0.073	µg/L	Discharge Conc < TQL

PMF - Annual Average Design Flow 1.5 MGD

Applicant:	Fairchance-Georges JMSA
Name of plant:	Fairchance-Georges STP
Permit Number:	PA0096342
Municipality:	Georges TWP
County:	Fayette
Receiving stream:	Georges Creek

The following program will calulate partial mix factors for acute and chronic conditions:

calculated fields

net stream flow (Qs cfs)=	0.116
discharge flow (Qd mgd)=	1.5
velocity (fps)=	0.18
width (feet) =	16.27
depth (feet) =	0.813
slope (ft/ft) =	0.003

complete mix time (min) = 0.02

FOR ACUTE CONDITIONS: IF COMPLETE MIX TIME < 15 MINUTES
THEN PMF = 1, IF > 15 MINUTES CALCULATE PMFa

PMFa = 1.000
or 100.00 %

FOR CHRONIC CONDITIONS: IF COMPLETE MIX TIME < 720 MINUTES
THEN PMF = 1, IF > 720 MINUTES CALCULATE PMFc

PMFc = 1.000
or 100.00 %

IWCc=[Qd * 1.547] / [(Qs*PMFc) + (Qd * 1.547)] = 0.9524

Target IWCc=IWCc/1= 0.952 95.24 %

IWCa=[Qd * 1.547] / [(Qs*PMFa) + (Qd * 1.547)] = 0.9524

Target IWCa=IWCa/0.3= 1.000 or 100.00 %

WET tests should pass if percentage for C.dubia LC50 and P.promelas LC50 are greater than the target IWCa (acute) or NOEC > target IWCc (chronic).

Program written by David Ponchione on April 8, 1999

Program run by : W. Mitchell on July 7, 2021

For Department use only

WET Summary - Annual Average Design Flow 1.5 MGD

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Reproduction
TIWC (decimal)	0.95
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Fairchance-Georges JMSA

Permit No.: PA0096342

Test Completion Date: 10/3/2017

Replicate No.	Control	TIWC
1	31	23
2	33	28
3	33	32
4	30	32
5	31	27
6	30	30
7	27	33
8	27	29
9	24	30
10	27	22
11		
12		
13		
14		
15		
Mean	29.300	28.600
Std Dev.	2.946	3.718
# Replicates	10	10

T-Test Result	4.8442
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	PASS

Test Completion Date: 10/30/2018

Replicate No.	Control	TIWC
1	24	32
2	22	26
3	9	18
4	10	29
5	23	27
6	26	34
7	23	37
8	29	39
9	22	34
10	22	35
11		
12		
13		
14		
15		
Mean	21.000	31.100
Std Dev.	6.446	6.226
# Replicates	10	10

T-Test Result	6.1577
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

Test Completion Date: 10/22/2019

Replicate No.	Control	TIWC
1	37	38
2	35	34
3	36	36
4	6	38
5	37	40
6	34	41
7	37	37
8	32	38
9	29	44
10	4	39
11		
12		
13		
14		
15		
Mean	28.700	38.500
Std Dev.	12.755	2.759
# Replicates	10	10

T-Test Result	5.3918
Deg. of Freedom	15
Critical T Value	0.8662
Pass or Fail	PASS

Test Completion Date: 10/26/2020

Replicate No.	Control	TIWC
1	34	32
2	34	41
3	3	7
4	37	35
5	35	39
6	41	38
7	31	35
8	35	37
9	32	40
10	36	34
11		
12		
13		
14		
15		
Mean	31.800	33.800
Std Dev.	10.486	9.830
# Replicates	10	10

T-Test Result	2.4995
Deg. of Freedom	16
Critical T Value	0.8647
Pass or Fail	PASS

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Ceriodaphnia
Endpoint	Survival
TIWC (decimal)	0.95
No. Per Replicate	1
TST b value	0.75
TST alpha value	0.2

Facility Name: Fairchance-Georges JMSA

Permit No.: PA0096342

Test Completion Date: 10/3/2017

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

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

Test Completion Date: 10/30/2018

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

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

Test Completion Date: 10/22/2019

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	0	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	0.900	1.000
Std Dev.	0.316	0.000
# Replicates	10	10

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

Test Completion Date: 10/26/2020

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5	1	1
6	1	1
7	1	1
8	1	1
9	1	1
10	1	1
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	10	10

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

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Survival
TIWC (decimal)	0.95
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Fairchance-Georges JMSA

Permit No.: PA0096342

Test Completion Date: 10/3/2017

Replicate No.	Control	TIWC
1	0.9	1
2	0.9	0.8
3	1	1
4	0.9	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.925	0.950
Std Dev.	0.050	0.100
# Replicates	4	4

T-Test Result	8.7263
Deg. of Freedom	4
Critical T Value	0.7407
Pass or Fail	**PASS**

Test Completion Date: 10/30/2018

Replicate No.	Control	TIWC
1	1	1
2	1	1
3	1	1
4	1	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	1.000
Std Dev.	0.000	0.000
# Replicates	4	4

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

Test Completion Date: 10/22/2019

Replicate No.	Control	TIWC
1	1	0.7
2	1	1
3	1	0.8
4	1	0.8
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	1.000	0.825
Std Dev.	0.000	0.126
# Replicates	4	4

T-Test Result	4.3913
Deg. of Freedom	3
Critical T Value	0.7649
Pass or Fail	**PASS**

Test Completion Date: 10/27/2020

Replicate No.	Control	TIWC
1	1	0.9
2	1	0.9
3	1	0.9
4	0.9	1
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.975	0.925
Std Dev.	0.050	0.050
# Replicates	4	4

T-Test Result	13.2898
Deg. of Freedom	5
Critical T Value	0.7267
Pass or Fail	**PASS**

DEP Whole Effluent Toxicity (WET) Analysis Spreadsheet

Type of Test	Chronic
Species Tested	Pimephales
Endpoint	Growth
TIWC (decimal)	0.95
No. Per Replicate	10
TST b value	0.75
TST alpha value	0.25

Facility Name: Fairchance-Georges JMSA

Permit No.: PA0096342

Replicate No.	Test Completion Date 10/3/2017 Control	TIWC
1	0.397	0.469
2	0.384	0.431
3	0.387	0.501
4	0.379	0.445
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.387	0.462
Std Dev.	0.008	0.031
# Replicates	4	4
T-Test Result	10.9974	
Deg. of Freedom	3	
Critical T Value	0.7649	
Pass or Fail	PASS	

Replicate No.	Test Completion Date 10/30/2018 Control	TIWC
1	0.309	0.269
2	0.3	0.274
3	0.205	0.238
4	0.249	0.309
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.266	0.273
Std Dev.	0.048	0.029
# Replicates	4	4
T-Test Result	3.1488	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

Replicate No.	Test Completion Date 10/22/2019 Control	TIWC
1	0.264	0.229
2	0.264	0.28
3	0.265	0.318
4	0.289	0.311
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.271	0.285
Std Dev.	0.012	0.041
# Replicates	4	4
T-Test Result	3.9279	
Deg. of Freedom	3	
Critical T Value	0.7649	
Pass or Fail	PASS	

Replicate No.	Test Completion Date 10/27/2020 Control	TIWC
1	0.315	0.361
2	0.334	0.333
3	0.406	0.392
4	0.343	0.42
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
Mean	0.350	0.377
Std Dev.	0.039	0.038
# Replicates	4	4
T-Test Result	4.7736	
Deg. of Freedom	5	
Critical T Value	0.7267	
Pass or Fail	PASS	

WET Summary and Evaluation

Facility Name	Fairchance-Georges JMSA
Permit No.	PA0096342
Design Flow (MGD)	1.5
Q_{7-10} Flow (cfs)	0.116
PMF_a	1
PMF_c	1

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	10/3/17	10/30/18	10/22/19	10/26/20
Ceriodaphnia	Reproduction	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	10/3/17	10/30/18	10/22/19	10/26/20
Ceriodaphnia	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	10/3/17	10/30/18	10/22/19	10/27/20
Pimephales	Survival	PASS	PASS	PASS	PASS

		Test Results (Pass/Fail)			
		Test Date	Test Date	Test Date	Test Date
Species	**Endpoint**	10/3/17	10/30/18	10/22/19	10/27/20
Pimephales	Growth	PASS	PASS	PASS	PASS

Reasonable Potential? NO

Permit Recommendations

Test Type	Chronic
TIWC	95 % Effluent
Dilution Series	24, 48, 95, 98, 100 % Effluent
Permit Limit	None
Permit Limit Species	