Brunner Island, LLC
REGULATORY DELIVERABLE
SUBMITTAL COVER SHEET

Date:	January 7, 2020	**Transmittal No.:**	BI-41-2020-01-07-v.2
DOCUMENT DESCRIPTION:		Brunner Island, LLC Outfall 001 Sampling Plan, as described in Paragraph 41 of the Consent Decree entered on November 8, 2019 and revised per PA DEP comments dated December 23, 2019.	
CONSENT DECREE REFERENCE:		Paragraph No.:	41
BRIEF DESCRIPTION OF OUTLINED REQUIREMENT:		Within 60 days of entry of the Consent Decree, Brunner shall submit to the Department, for review and approval, a plan with a schedule to sample ("Sampling Plan") all required NPDES permit application parameters to determine effluent quality at Outfall 001 without interference from the discharge from Outfall 007. Upon Department approval, Brunner shall implement the Sampling Plan in accordance with the schedule in the approved Sampling Plan. Brunner shall submit the sampling results to the Department within 60 days of receipt of the results. The Department will use its best efforts to perform a Water Quality-based Effluent Limitation ("WQBEL") analysis within 30 days of receipt of the sampling results. Based upon the Department's WQBEL analysis, the Department will determine if effluent limitations are necessary at Outfall 001. If limitations are necessary, Brunner shall submit a proposal to the Department, for review and approval, to permanently move the Outfall 001 monitoring point to avoid interference from the discharge at Outfall 007 (and Outfall 008 once that outfall comes on line).	

RECIPIENT(S):	
NAME:	ORGANIZATION:
Maria Bebenek	PA DEP Clean Water Program
Mary Greene (via email: mgreene@environmentalintegrity.org)	EIP
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TALEN ENERGY

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January 7, 2020

Maria Bebenek
Pennsylvania Department of Environmental Protection
Clean Water Program
Southcentral Regional Office
909 Elmerton Avenue
Harrisburg, PA 17110

BRUNNER ISLAND, LLC – OUTFALL 001 SAMPLING PLAN AS REQUIRED BY PARAGRAPH 41 OF THE CONSENT DECREE SIGNED JULY 31, 2019—REVISION NO. 1

Dear Ms. Bebenek:

Enclosed is the Outfall 001 Sampling Plan for Brunner Island, LLC, revised per PA DEP comments (letter dated December 23, 2019). This document is required per Paragraph 41 of the Consent Decree signed July 31, 2019 and entered November 8, 2019.

Should you have any questions regarding the revised Outfall 001 Sampling Plan, please contact me or Marcia Thiess, Regulatory Affairs Senior Professional, at (717) 268-1531 or via email (marcia.thiess@talenenergy.com).

Sincerely,

John Forbes
Plant General Manager

Enclosures

Cc:	M. Thiess	TALEN (BRUPT)
	C. Shamory	TALEN (CORP)
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Outfall 001
Sampling Plan

Description

As required under Paragraph 41 of the Consent Decree signed July 31, 2019, Brunner Island, LLC (Brunner Island) has prepared this Sampling Plan for all required NPDES permit application parameters to determine effluent quality at Outfall 001 without interference from the wastewater discharges from Outfalls 007 and 008. Upon approval from the Department, Brunner Island will implement this Sampling Plan in accordance with the schedule provided in Table 1, and will submit the sampling results to the Department within 60 days of receipt of the results. The Department will use its best efforts to perform a Water Quality-based Effluent Limitation (WQBEL) analysis within 30 days of its receipt of the sampling results. Based on the Department's WQBEL analysis, the Department will determine if effluent limitations are necessary at Outfall 001. If limitations or other permit modifications are necessary, such as relocating the NPDES permit renewal sampling location to avoid interference from the wastewater discharges from Outfalls 007 and 008, Brunner Island requests that the Department address these modifications as an addendum to the NPDES permit amendment application that was submitted to the Department on October 29, 2019.

Per Paragraph 41 of the Consent Decree signed July 31, 2019, Brunner Island proposes to amend its NPDES permit renewal sampling location for Outfall 001 due to potential monitoring interferences from Outfall 007 and Outfall 008. The daily monitoring location for Outfall 001 will remain in the existing location. The proposed permit renewal sampling location will be on the northeast side of the facility's discharge channel at approximate coordinates 40° 5' 33.98" N, 76° 41' 21.59" W (see Figure 1 of this Sampling Plan).

Outfall 001 is permitted to discharge non-contact condenser cooling water and cooling tower discharges, and contains parameters present in the intake water (Susquehanna River) and those added at the cooling tower and cooling water intake structure. Prior sampling results indicate potential interferences from the discharge of Outfall 007 upstream of the Outfall 001 sampling location. There is the potential for Outfall 008 to interfere with future sampling results at the existing sampling location as well.

The proposed permit renewal sampling location was selected based on results from CORMIX modeling under various flow scenarios (see model inputs and outputs on the pages of this Sampling Plan to follow). Modeling was performed for Outfall 007 alone, as well as for the combination of Outfall 007 and Outfall 008, at both high and low flow conditions in the discharge channel. The maximum spread of the Outfall 007 discharge plume alone is equal to approximately 16.7 feet from the southwestern edge of the discharge channel. The maximum spread of Outfall 007 and 008 combined is equal to approximately 30 feet from the southwestern edge of the discharge channel.

The discharge channel is approximately 100 feet wide and 2,400 long. The modeled plumes from Outfall 007 and Outfall 008 would not be expected to reach the northeast side of the discharge channel. By relocating the Outfall 001 permit renewal sampling location, Brunner Island can accurately sample the Outfall 001 discharge without interference.

The Outfall 001 permit renewal sampling protocol will be in accordance with Brunner Island's existing NPDES permit, which requires Outfall 001 to be sampled for Pollutant Groups 1 and 2 during one (1) sampling event. The required documents that will be completed as part of the required sampling will include sections of the NPDES Permit Application (Document 3800-PM-BCW0008b), and will include the Pollutant Identification and Analysis, and the Analysis Results Table for Pollutant Groups 1 and 2. Blank copies of these forms are included within this Sampling Plan for reference. The proposed Outfall 001 sampling schedule for the parameters listed in Pollutant Groups 1 and 2 is provided in Table 1. The NPDES permit renewal sampling requirements for Outfall 001 are provided in Table 2.

Table 1. Proposed Outfall 001 Sampling Schedule.

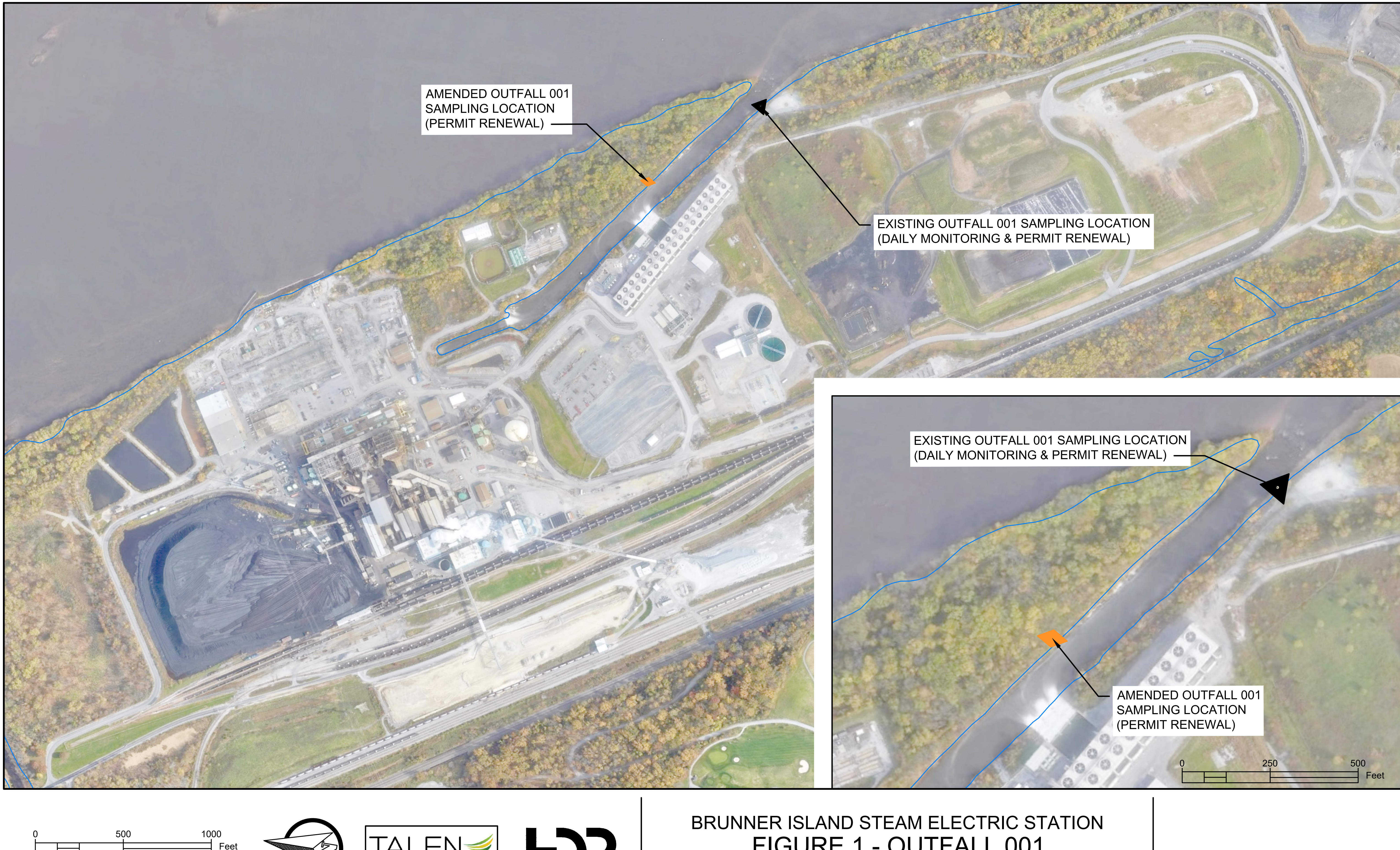
Task	Date
Brunner Island to Submit Outfall 001 Sampling Plan to the Department for Review and Approval	No Later than January 7, 2020[1], which corresponds to 60 days from entry of the Consent Decree, which was approved by the Court on November 8, 2019
Brunner Island to Perform Sampling at Proposed Outfall 001 Permit Renewal Sampling Location	No Later than 45 Days After March 1, 2020 (Start of Cooling Tower Operating Season)
Brunner Island to Submit Sampling Results to the Department	No Later than 60 Days from Brunner Island Receipt of Sampling Results[1]
Department to Perform Water Quality-based Effluent Limitation (WQBEL) Analysis	No Later than 30 Days from Department Receipt of Sampling Results[1]

[1] This date is imposed per the Consent Decree signed July 31, 2019 and approved by the Court on November 8, 2019.

Table 2. Outfall 001 NPDES Permit Renewal Sampling Requirements.

Parameter	Sampling Requirement
Pollutant Group 1	
BOD_5 (mg/L)	24-hour Composite
COD (mg/L)	24-hour Composite
TOC (mg/L)	24-hour Composite
TSS (mg/L)	24-hour Composite
Ammonia-Nitrogen (mg/L)	24-hour Composite
Temperature (ºF)	Grab
pH – Minimum (S.U.)	Grab
pH – Maximum (S.U.)	Grab
Fecal Coliform (No./100 mL)	Grab
Oil and Grease (mg/L)	Grab
Total Residual Chlorine (mg/L)	Grab
Total Phosphorus (mg/L)	24-hour Composite
TKN (mg/L)	24-hour Composite
Nitrite + Nitrate-Nitrogen (mg/L)	24-hour Composite
Total Dissolved Solids (mg/L)	24-hour Composite
Color (Pt-Co Units)	24-hour Composite
Bromide (mg/L)	24-hour Composite
Chloride (mg/L)	24-hour Composite
Sulfate (mg/L)	24-hour Composite
Sulfide (mg/L)	24-hour Composite
Surfactants (mg/L)	24-hour Composite
Fluoride (mg/L)	24-hour Composite
Total Hardness (mg/L)	24-hour Composite

Parameter	Sampling Requirement
Pollutant Group 2	
Aluminum, Total (µg/L)	24-hour Composite
Antimony, Total (µg/L)	24-hour Composite
Arsenic, Total (µg/L)	24-hour Composite
Barium, Total (µg/L)	24-hour Composite
Beryllium, Total (µg/L)	24-hour Composite
Boron, Total (µg/L)	24-hour Composite
Cadmium, Total (µg/L)	24-hour Composite
Chromium, Total (µg/L)	24-hour Composite
Chromium, Hexavalent (µg/L)	24-hour Composite
Cobalt, Total (µg/L)	24-hour Composite
Copper, Total (µg/L)	24-hour Composite
Cyanide, Total (µg/L)	Grab
Iron, Total (µg/L)	24-hour Composite
Iron, Dissolved (µg/L)	24-hour Composite
Lead, Total (µg/L)	24-hour Composite
Manganese, Total (µg/L)	24-hour Composite
Mercury, Total (µg/L)	24-hour Composite
Molybdenum, Total (µg/L)	24-hour Composite
Nickel, Total (µg/L)	24-hour Composite
Phenols, Total (µg/L)	Grab
Selenium, Total (µg/L)	24-hour Composite
Silver, Total (µg/L)	24-hour Composite
Thallium, Total (µg/L)	24-hour Composite
Zinc, Total (µg/L)	24-hour Composite



BRUNNER ISLAND STEAM ELECTRIC STATION

FIGURE 1 - OUTFALL 001 SAMPLING LOCATIONS

Summary of CORMIX Modeling at Brunner Island Outfall 001

Four CORMIX (Version 11) model runs were completed to estimate mixing of Outfall 001 with either Outfall 007 only or Outfalls 007 and 008 across Brunner Island's discharge channel (Table 3). CORMIX model inputs are provided in Table 4. The discharge channel is approximately 100 feet wide and extends approximately 2,400 ft (0.45 mi) from the condenser discharge point to the confluence with the Susquehanna River. The Brunner Island cooling tower discharges into the channel at approximately 1,015 feet upstream of the river confluence. Outfall 001 samples are taken near the river confluence for permit compliance purposes. Outfalls 007 and 008 discharge approximately 490 feet upstream of the Outfall 001 sampling location. CORMIX model results are provided in Table 5.

The modeling results indicate that for either the Outfall 007 scenario or the Outfall 007 and 008 scenario, the maximum spread across the discharge channel is approximately 16.6 feet and 29.9 feet, respectively, and occurs at the minimum flow scenario in the discharge channel.

Table 3. Model Scenarios.

Model Scenario	Outfall 001 Flow (MGD)*	Outfall 007 or Outfalls 007 + 008 Flow (MGD)**
Outfall 001 low flow, Outfall 007	335	0.52
Outfall 001 high flow, Outfall 007	795	0.52
Outfall 001 low flow, Outfalls 007 + 008	335	0.52 + 5.5
Outfall 001 high flow, Outfalls 007 + 008	795	0.52 + 5.5

*335 MGD is the minimum flow for the 5-yr DMR data set; 795 MGD was used to calculate effluent limits.
**Outfall 007 and 008 flows used to calculate effluent limits

Table 4. CORMIX Model Inputs.

Model Input	Value
Discharge Channel Width	100 ft
Discharge Channel Depth	3 ft
Outfall 001 Flow (Ambient)	Low Flow = 335 MGD High Flow = 795 MGD
Outfall 001 Temperature (Ambient)	90°F
Cross-section Bounded	Yes
Manning Coefficient (n)	0.05
Outfall 007 or 007 + 008 Flow	0.52 MGD 0.52 + 5.5 MGD
Port Diameter	6" for Outfall 007 12" for Outfalls 007 + 008
Outfall 007 / Outfall 008 Location	Single port discharge 2 ft from bottom perpendicular to channel
Outfall 007 / Outfall 008 Temperature	80°F

Table 5. CORMIX Model Results for Mixing Distance Across Discharge Channel.

Model Scenario	Spread Distance Across Discharge Channel at Outfall 001 Sampling Location (ft)
Outfall 001 low flow, Outfall 007	16.6
Outfall 001 high flow, Outfall 007	12.5
Outfall 001 low flow, Outfalls 007 + 008	29.9
Outfall 001 high flow, Outfalls 007 + 008	22.6

POLLUTANT IDENTIFICATION AND ANALYSIS

1. Summary of Required Analyses (see instructions):

Outfall / IMP No.	Pollutant Groups which must be sampled for and analyzed							Other Pollutants Analyzed
	Group 1	Group 2	Group 3	Group 4	Group 5	Group 6	Group 7	
	☐	☐	☐	☐	☐	☐	☐	
	☐	☐	☐	☐	☐	☐	☐	
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2. Is screening for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) required? ☐ Yes ☐ No

Method used:	Describe results:

3. Other Potentially Toxic Pollutants Known or Expected to be Present in the Discharge.

a. GC/MS "Five Peaks" Pollutants (see instructions).

Outfall / IMP No.	Group Number (3 - 6)	Chemical or Compound Name	Quantitation Limit (µg/L)	Avg Effluent Concentration (µg/L)	Max Effluent Concentration (µg/L)	No. Samples Positive / No. Analyzed
						/
						/
						/
						/
						/

b. Other Potential Pollutants.

Outfall / IMP No.	Chemical Substance or Compound Name	Reason/Suspected Reason for Presence in Discharge	Avg Concentration (µg/L)	Indicate if Presence is Known (K) or Suspected (S)

☐ If additional peaks were not available for one or more groups with the method used check here and attach an explanation of why the method was selected.

4. Additional Analysis Results Tables may be attached to provide any of the optional site-specific information discussed in Appendix A of the instructions.
Optional site-specific data is attached to this application? ☐ Yes ☐ No

ANALYSIS RESULTS TABLE
POLLUTANT GROUP 1

Please read instructions carefully before completing this form.

APPLICANT NAME	

☐ **Outfall / IMP Number _____** (Show location of sampling point on Line Drawing)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results (Specify Source: _____)
☐ Background (Upstream) Sampling Results (Specify Location: _____)
☐ New Discharge (Basis for Information: _____)

POLLUTANT GROUP 1 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
BOD_5 (mg/L)										
COD (mg/L)										
TOC (mg/L)										
TSS (mg/L)										
Ammonia-Nitrogen (mg/L)										
Temperature (Winter) (°F)		XXX		XXX		XXX		XXX	XXX	
Temperature (Summer) (°F)		XXX		XXX		XXX		XXX	XXX	
pH – Minimum (S.U.)		XXX	XXX	XXX		XXX		XXX	XXX	
pH – Maximum (S.U.)		XXX	XXX	XXX		XXX		XXX	XXX	
Fecal Coliform (No./100 mL)		XXX		XXX		XXX			XXX	
Oil and Grease (mg/L)										
TRC (mg/L)		XXX		XXX		XXX				
Total Phosphorus (mg/L)										
TKN (mg/L)										
Nitrite + Nitrate-Nitrogen (mg/L)										
Total Dissolved Solids (mg/L)										
Color (Pt-Co Units)		XXX		XXX		XXX				
Bromide (mg/L)										
Chloride (mg/L)										
Sulfate (mg/L)										
Sulfide (mg/L)										
Surfactants (mg/L)										
Fluoride (mg/L)										
Total Hardness (mg/L)										

ANALYSIS RESULTS TABLE
POLLUTANT GROUP 2

Please read instructions carefully before completing this form.

APPLICANT NAME	

☐ **Outfall / IMP Number _____** (Show location of sampling point on Line Drawing)
☐ Treatment Facility Influent Sampling Results (Show location of sampling point on Line Drawing)
☐ Intake Sampling Results (Specify Source: _____)
☐ Background (Upstream) Sampling Results (Specify Location: _____)
☐ New Discharge (Basis for Information: _____)

POLLUTANT GROUP 2 PARAMETERS	CONCENTRATION / MASS PRESENT						No. Analyses	No. "Non-Detect" Results	QL Used	Method Used
	Min/Max Daily Value		Max Avg Monthly Value		Long-Term Avg Value					
	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)	Conc	Mass (lbs/day)				
Aluminum, Total (µg/L)										
Antimony, Total (µg/L)										
Arsenic, Total (µg/L)										
Barium, Total (µg/L)										
Beryllium, Total (µg/L)										
Boron, Total (µg/L)										
Cadmium, Total (µg/L)										
Chromium, Total (µg/L)										
Chromium, Hexavalent (µg/L)										
Cobalt, Total (µg/L)										
Copper, Total (µg/L)										
Cyanide, Total (µg/L)										
Iron, Total (µg/L)										
Iron, Dissolved (µg/L)										
Lead, Total (µg/L)										
Manganese, Total (µg/L)										
Mercury, Total (µg/L)										
Molybdenum, Total (µg/L)										
Nickel, Total (µg/L)										
Phenols, Total (µg/L)										
Selenium, Total (µg/L)										
Silver, Total (µg/L)										
Thallium, Total (µg/L)										
Zinc, Total (µg/L)										