Georgia Power Plant Branch

NPDES Permit No. GA0026051

Ash Pond Dewatering Plan

Revised August 2017

Background

Plant Branch, located on Lake Sinclair in Putnam County, began construction in 1961 and by 1969 had four units in operation. Plant Branch delivered safe, reliable and affordable energy to the community for decades. Plant Branch was retired in April 2015. Now that the plant is no longer operating, a dewatering process is necessary to facilitate permanent closure of the ash ponds.

Plant Branch will remove three ash ponds (Ponds B, C & D) and consolidate them with the one remaining onsite ash pond (Pond E). Pond E will be closed in place using advanced engineering methods in accordance with the State's Coal Combustion Residuals (CCR) Rule. One ash pond, Ash Pond A, has been removed as it was never part of the wastewater system. The remaining ponds currently contain the approximate water volumes, subject to change as result of dewatering activities and precipitation:

Ash Pond B	3,303,324 ft^3
Ash Pond C	4,798,749 ft^3
Ash Pond D	14,407 ft^3
Ash Pond E	31,108,551 ft^3

Purpose

This Ash Pond Dewatering Plan (Plan) describes the additional procedures, safeguards and enhanced wastewater treatment measures that Georgia Power will implement to ensure the facility's NPDES permit effluent limitations continue to be met and the receiving waterbody continues to be protected during the ash pond dewatering process. This Plan provides an overview of the wastewater treatment system, describes the key processes, details of the major process control measurements being performed, and explains the effluent monitoring to be completed during dewatering.

This Plan will be implemented upon commencement of active ash pond closure activities. Prior to the closure process beginning, ash pond discharges will not cause water levels to drop beyond normal historical operation. Following approval of the dewatering plan by EPD, and prior to commencement of dewatering, Georgia Power will provide EPD with notification of dewatering implementation. As explained below, in addition to the additional requirements implemented during the dewatering process, Georgia Power will continue to meet the effluent limitations of the plant's NPDES permit and comply with all requirements of the NPDES permit.

Wastewater Treatment System

The wastewater treatment system for dewatering the ash ponds will be a physical-chemical treatment plant that consists of sodium hypochlorite addition, equalization tank, pH adjustment, followed by solids separation by flocculation/clarification, and finally effluent quality control monitoring (Treatment System). Solids from the clarifier will be returned to the dewatered ash pond to be incorporated as part of the overall ash pond closure process. Figure 1 provides a description of the Treatment System.

<u>Location</u>
The Treatment System will be located adjacent to and within the drainage area of Plant Branch's Ash Pond B. Location of the Treatment System in this area assures that, in the unlikely event of an overflow, any water from the Treatment System remains within the NPDES wastewater drainage area of the ash pond and will not be discharged except in compliance with this Plan and the NPDES permit.

The Treatment System will operate on an as-needed basis up to 24 hour per day. Under initial operation, the Treatment System will be configured to treat 2,500 gpm; however, the Treatment System may upgraded to treat a maximum of 4,000 gpm. In accordance with the NPDES permit, Georgia Power will provide EPD with advanced notice of any treatment system upgrades.

Influent

As shown by Figure 2, wastewater from Ash Ponds C, D and E flows to Ash Pond B. Wastewater will then be pumped to the Treatment System directly from Ash Pond B. The intake for the influent pump is operated to minimize solids inflow to the Treatment System. As the water level in the ash pond drops, treatment operations may cease until the volume of water in the pond is adequate for operations, or other measures may be implemented to provide sufficient water volume for pumping to the Treatment System. Water levels in the ash ponds fluctuate based upon storm water inflows, upstream ash pond management, and dewatering activities. As overall water volumes in the ash ponds decrease, operation of the Treatment System may be intermittent and on an "as needed" basis, although continuous operation may be utilized in response to wet weather conditions.

GPC will monitor the influent for pH and turbidity. These parameters will be used as a guide for treatment requirements. Influent flow rates will be managed to limit ash pond draw-down at a rate of no greater than one foot per week or a rate to ensure structural integrity of the impoundment as determined by the Dam Safety Engineer.

Sodium Hypochlorite Addition

All water pumped to the Treatment System will be treated with sodium hypochlorite to control biological growth in the Treatment System. Treating the water for biological growth improves the Treatment System efficiency and reduces maintenance. Based upon the demand for chlorine in the water being pumped into the Treatment System, sodium hypochlorite addition will be adjusted. The dosage rate for sodium hypochlorite will depend upon the flow rate, sediment load, and water temperature. Residence time will be provided in the equalization tank. The equalization tank also provides a means to recycle water.

pH & Coagulant

After the equalization tank pH adjustment is performed, the pH of the water pumped to the Treatment System will be continuously tested before it enters the clarifier. Based upon the pH measurement, the pH is adjusted to the optimal range for coagulation. Following pH adjustment, a coagulant and polymer may be injected into the flow to aid in flocculation prior to entering the clarifier section. The dosage rates for all chemicals will depend upon the flow rates, sediment loads, and inlet pH. Dosage rates will be documented and kept on-site.

Clarifier

The treated water will then flow into a clarifier and the flocculated material will settle to the bottom of the clarifier. A pump will pull the underflow at the bottom of the clarifier towards the underflow discharge point and will be pumped to a tank for return to the ash pond. Clarified water will flow in an upward direction over a set of weirs and into the clearwell tanks.

Clearwell Tanks

The clearwell tanks will gravity-fill from the weir overflows. The clearwell will be tested for oxidation reduction potential (ORP) so the free chlorine residual from the sodium hypochlorite feed on the inlet is removed before water leaves the Treatment System. As water moves through the Treatment System, some of the free chlorine will be consumed and any remaining chlorine will be neutralized in the clearwell. Sodium bisulfite will be maintained on site, as a backup, to remove any residual chlorine. Continuous effluent monitoring will also be performed to verify the absence of total residual chlorine.

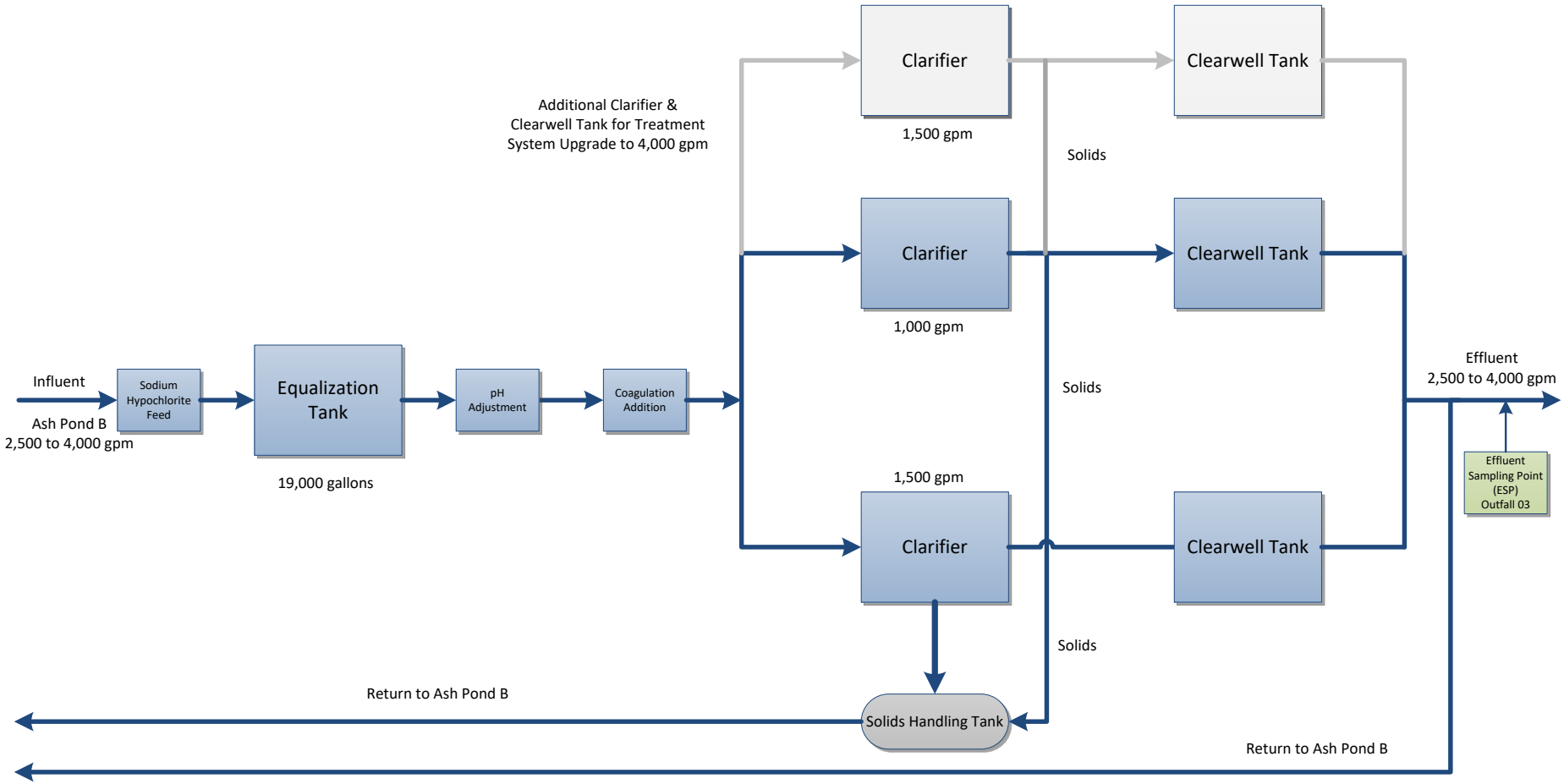
Each tank will have a set of instrumentation that checks the quality of the treated water. During operation, effluent from the clarifier will be continuously tested for flow, pH and turbidity, and this information will be used to monitor the Treatment System operation. If an inline instrument detects a reading above a quality standard set point, the effluent will not be discharged and instead will be diverted back to the ash pond.

Upon initial startup of the Treatment System, samples of the treated water will be tested to verify the Treatment System is operating as designed. In the event any system issues are identified, the treated effluent will be recycled back to the ash pond until the treatment system efficacy is established. Only after initial treatment efficacy is established will treated effluent will be routed to Outfall 03.

Operation

The operational oversight of the Treatment System will be performed by a certified wastewater treatment plant operator in accordance with the certification requirements of the Georgia water and wastewater treatment plant operator's and laboratory analysts rule.

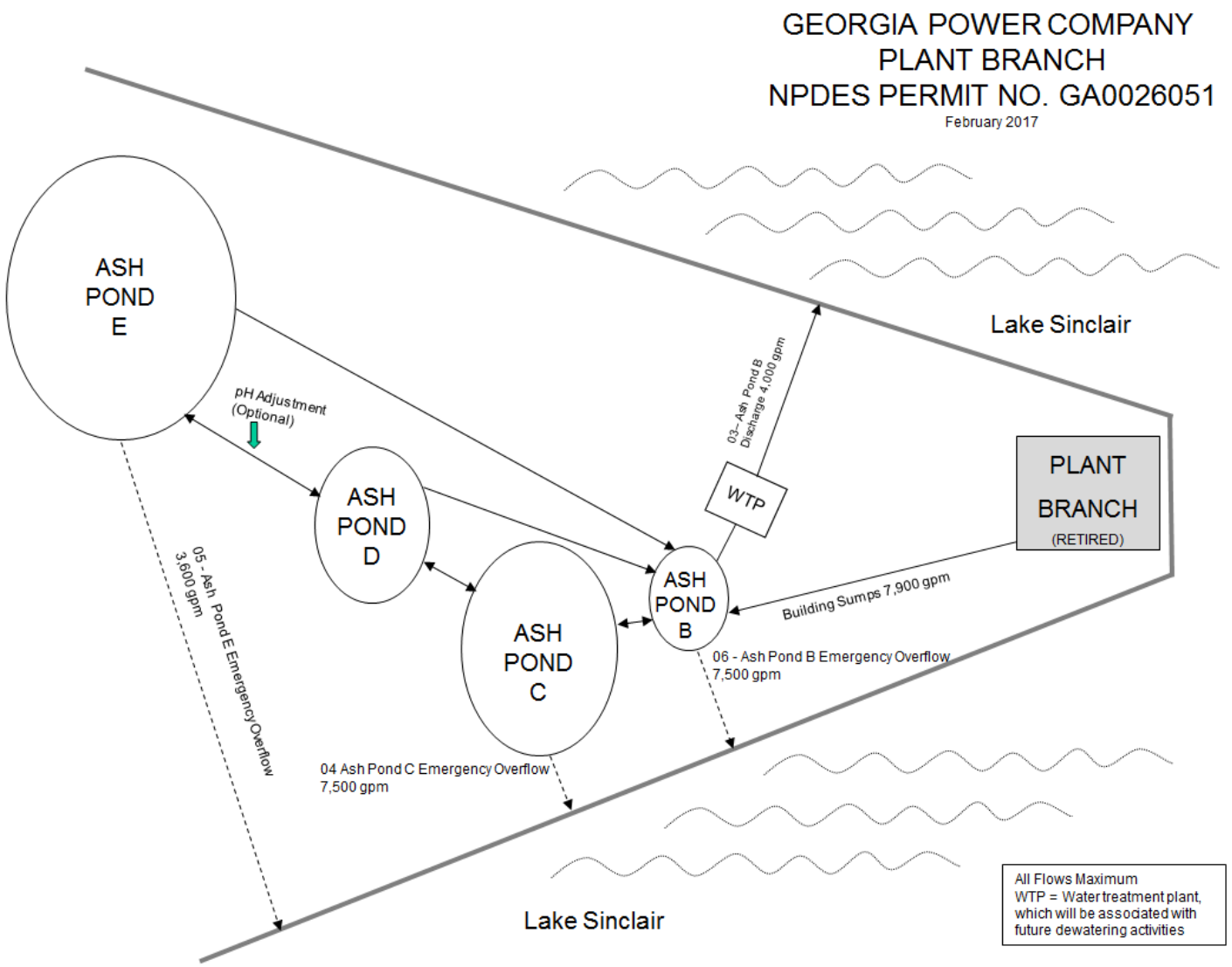
FIGURE 1



Plant Branch Treatment System Schematic

with an option to upgrade from 2,500 gpm to 4,000 gpm

FIGURE 2


GEORGIA POWER COMPANY
PLANT BRANCH
NPDES PERMIT NO. GA0026051
February 2017
ASH POND E
ASH POND D
ASH POND C
ASH POND B
pH Adjustment (Optional)
03– Ash Pond B Discharge 4,000 gpm
WTP
PLANT BRANCH
(RETIRED)
Building Sumps 7,900 gpm
05 - Ash Pond E Emergency Overflow 3,600 gpm
06 - Ash Pond B Emergency Overflow 7,500 gpm
04 Ash Pond C Emergency Overflow 7,500 gpm
Lake Sinclair
Lake Sinclair
All Flows Maximum
WTP = Water treatment plant, which will be associated with future dewatering activities

Process Control Monitoring

Each day following Treatment System startup, pH and turbidity of the influent and effluent of the System will be verified prior to discharge of treated water to the permitted outfall. Effluent sampling of the Treatment System discharge for turbidity and pH will be performed continuously in the discharge line following the clearwell tank. The sampling point will be labeled as ESP (Effluent Sampling Point). Upon verification the Treatment System performs as expected, the discharge will be routed to Outfall 03.

During discharge operations, pH, chlorine and turbidity are continuously measured and the discharge will be visually inspected. If the treated effluent indicates a change during operations, discharge to the permitted outfall will be automatically diverted and the treated water will be recycled to the ash pond while adjustments are made. After any issues are resolved, the Treatment System will be returned to normal operation with discharge to Outfall 03 following verification the system performs as expected.

Maintenance

Instrumentation for use on the site will be maintained to ensure optimal performance and provide accurate results. Each piece of technical equipment will be calibrated at the manufacturer's recommended intervals and more often if deemed necessary by on-site personnel. The instrumentation includes a turbidity meter, a pH meter, flow meters, and the chemical feed pumps.

Testing

Samples are collected from both the influent (ash pond) and the Treatment System ESP to guide system operation and compare against the Effluent Quality Standards (EQSs) listed below. The results will be used to verify that the Treatment System is performing optimally, as well as to obtain data to establish and update the correlation between the total suspended solids (TSS) and turbidity of the Treatment System effluent. TSS/turbidity control is an indicator of treatment system efficient operation that is correlated to metals removal efficiencies as further confirmed by weekly monitoring results. The initial TSS and turbidity correlation curve and EQSs results will be provided to EPD prior to commencement of dewatering activities. All EQSs results including TSS and turbidity correlation curves will be available onsite for EPD review. TSS correlation to turbidity will be used to establish a turbidity set-point for the effluent. Effluent reaching this set-point will be recycled back to the ash pond for additional treatment.

Effluent Quality Standards (EQSs)

- **pH**: 6.4 to 8.6 operational limits
- **Turbidity**: Determined by TSS correlation
- **Flow rate**: 2,500 initial (4000 gpm upgrade max)
- **Total Suspended Solids** (TSS): <26 mg/L; determined by turbidity correlation
- **Oil & Grease**: <15 mg/L daily average with 20 mg/L daily maximum over a monthly Period
- **Total Residual Chlorine:** Zero

Analytical Instrument Description

The following instrumentation (or equivalent) will be used:

- **pH**: Hach DPD1P1 pH probe with a Hach SC200 transmitter
- **Turbidity**: Hach 1720E Turbidimeter with a Hach SC200 transmitter
- **Chlorine**: Wallace and Tiernan SFC/ Analyzer with a Hach SC200 transmitter
- **Flow rate**: Siemens Mag 5100 W 8" magnetic flow meter with Siemens Mag5000 transmitter

Monitoring and Reporting

Lake Monitoring

Effluent Characteristics mg/L or (Units)	Requirement	Measurement Frequency	Sample Type	Sample Location
pH (s.u.)	Report	2/Month	Grab	Upstream & Downstream*
TSS	Report	2/Month	Grab	Upstream & Downstream*
Oil & Grease	Report	2/Month	Grab	Upstream & Downstream*
Turbidity (NTU)	Report	2/Month	Grab	Upstream & Downstream*
TDS	Report	2/Month	Grab	Upstream & Downstream*
$BOD_{5\text{-day}}$	Report	2/Month	Grab	Upstream & Downstream*
Copper, total	Report	2/Month	Grab	Upstream & Downstream*
Selenium, total	Report	2/Month	Grab	Upstream & Downstream*
Arsenic, total	Report	2/Month	Grab	Upstream & Downstream*
Mercury, total	Report	2/Month	Grab	Upstream & Downstream*
Chromium, total	Report	2/Month	Grab	Upstream & Downstream*
Lead, total	Report	2/Month	Grab	Upstream & Downstream*
Cadmium, total	Report	2/Month	Grab	Upstream & Downstream*
Zinc, total	Report	2/Month	Grab	Upstream & Downstream*
Nickel, total	Report	2/Month	Grab	Upstream & Downstream*
Ammonia	Report	2/Month	Grab	Upstream & Downstream*
TKN	Report	2/Month	Grab	Upstream & Downstream*
Nitrate/Nitrite	Report	2/Month	Grab	Upstream & Downstream*
Organic Nitrogen	Report	2/Month	Grab	Upstream & Downstream*
Phosphorus	Report	2/Month	Grab	Upstream & Downstream*
Ortho-phosphorus	Report	2/Month	Grab	Upstream & Downstream*
Hardness	Report	2/Month	Grab	Upstream & Downstream*

Sampling and monitoring to be performed using standard methods as provided for in 40 CFR Part 136, which will be sufficiently sensitive.

* Downstream lake sampling shall occur near Latitude: 33.196636 and Longitude: -83.295389; Upstream (background) lake sampling shall occur near Longitude: 33.180392 and Longitude: -83.322964.

Effluent Monitoring

Effluent Characteristics mg/L or (Units)	Monthly Average	Daily Maximum	Measure Frequency	Sample Type	Sample Location
Flow (MGD)	Report	Report	Daily	Continuous	Final Effluent
pH (s.u.)	Report	Report	Daily	Continuous	Final Effluent
TSS	Report	Report	Weekly	Grab	Final Effluent
Oil & Grease	Report	Report	Weekly	Grab	Final Effluent
Turbidity (NTU)	Report	Report	Weekly	Grab	Final Effluent
TDS	Report	Report	Weekly	Grab	Final Effluent
TRC	Report	Report	Weekly	Grab	Final Effluent
$BOD_{5\text{-day}}$	Report	Report	Weekly	Grab	Final Effluent
Copper, total	Report	Report	Weekly	Grab	Final Effluent
Selenium, total	Report	Report	Weekly	Grab	Final Effluent
Arsenic, total	Report	Report	Weekly	Grab	Final Effluent
Mercury, total	Report	Report	Weekly	Grab	Final Effluent
Chromium, total	Report	Report	Weekly	Grab	Final Effluent
Lead, total	Report	Report	Weekly	Grab	Final Effluent
Cadmium, total	Report	Report	Weekly	Grab	Final Effluent
Zinc, total	Report	Report	Weekly	Grab	Final Effluent
Nickel, total	Report	Report	Weekly	Grab	Final Effluent
Ammonia	Report	Report	Weekly	Grab	Final Effluent
TKN	Report	Report	Weekly	Grab	Final Effluent
Nitrate/Nitrite	Report	Report	Weekly	Grab	Final Effluent
Organic Nitrogen	Report	Report	Weekly	Grab	Final Effluent
Phosphorus	Report	Report	Weekly	Grab	Final Effluent
Ortho-phosphorus	Report	Report	Weekly	Grab	Final Effluent
Hardness	Report	Report	Weekly	Grab	Final Effluent

Sampling and monitoring to be performed using standard methods as provided for in 40 CFR Part 136, which will be sufficiently sensitive.

Reporting and Notification

Effluent and instream monitoring results will be submitted to EPD via e-mail by the 15th day of the month following the sampling period. Results shall be submitted in an Excel spreadsheet to both the EPD compliance office and the EPD industrial permitting unit. Laboratory analysis and data sheets shall be retained on site. The first report will be submitted the month following system startup.

Immediate (within 24 hours) notification to both the EPD compliance office and industrial permitting unit will occur if any of the EQSs for pH, total residual chlorine, or turbidity are not achieved, and the automatic recirculation system fails.