Georgia Power Plant McDonough-Atkinson

NPDES Permit No. GA0001431

Ash Pond Dewatering Plan

Revised May 2018

Purpose

This updated Ash Pond Dewatering Plan (Plan) describes the additional procedures, safeguards and enhanced wastewater treatment measures that Georgia Power Company (GPC) is implementing 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. There is approximately 0.5 million gallons of water remaining in the ash pond in Ash Pond 3 and 6.7 million gallons in Ash Pond 4. This volume is subject to change based on weather conditions and dewatering activities.

As explained below, in addition to the requirements implemented during the dewatering process, GPC 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 pond is a physical-chemical treatment plant (Treatment System) that consists of enhanced clarification, flocculation, equalization, and finally, filtration. Solids are periodically returned to the Ash Ponds 3 or 4. The Treatment System is capable of treating up to 750 gallons per minute. Figures 1 and 3 provide the location and layout of the Treatment System.

Location

The Treatment System is located adjacent to and within the drainage area of the plant's ash pond system. 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 plant's ash pond system and will not be discharged except in compliance with this Plan and the NPDES permit.

The Treatment System operates on an as-needed basis up to 24 hours per day. In accordance with the NPDES permit, GPC will provide EPD with advanced notice of any treatment system modifications. Draw-down levels along the ash pond dikes will occur 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.

Influent

As shown by Figure 2, wastewater is pumped directly to the Treatment System directly from the ash pond. The intake for the influent pump is operated to minimize solids inflow to the Treatment System. Ash Pond 4 water levels are maintained by storm water from the ash pond system and a series of ash pond dewatering wells. 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 pond fluctuate based upon storm water inflows, upstream ash pond management, and dewatering activities. As overall water volumes in the ash pond 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.

Chemical Treatment

The chemical feed system is composed of four chemical feed pumps. Three pumps feed the clarifier and one pump feeds the Modutank. Each pump is housed in a chemical storage unit with the chemical feed container. The pumps control the volume and rate of each chemical supplied to the Treatment System. Each pump is mounted on a skid with the controls, calibration cylinder, and the peristaltic motor. Each of the skids has leak containment and is fed from the chemical container located in its respective chemical storage unit.

Each chemical added to the Treatment System serves a specific function in the treatment process. The first chemical addition to the Treatment System is a ferric chloride solution (ferric chloride and hydrochloric acid). The ferric chloride solution serves to begin the coagulation process to remove suspended and

dissolved particles in the wastewater, initiating the flocculation process. The second chemical addition to the process is the magnesium hydroxide slurry (magnesium hydroxide and brucite). The magnesium hydroxide slurry's function is to adjust the pH, add alkalinity to the process water, and enhance flocculation and metal precipitation. In conjunction with the magnesium hydroxide slurry, a liquid polymer is added to the process. The function of the liquid polymer is to increase flocculation and add weight and size to the flocculent to increase settling. A sodium borohydride feed is also available to provide additional wastewater treatment in the Modutank.

Clarification

The clarifier is a Lamella Clarifier Model LGS 2500. The influent wastewater passes through the flow meter to the rapid mixing tank. The rapid mixing tank is a 500-gallon tank where the addition of the ferric chloride solution takes place. The estimated retention time in the rapid mix tank is 60 seconds, where the ferric chloride solution will begin to coagulate the smaller particles dissolved/suspended in the wastewater. From the rapid mix tank, the wastewater is gravity fed to the slow mix tank where the magnesium hydroxide slurry and the liquid polymer addition take place. The slow mix tank has an estimated retention time of approximately three (3) minutes, and is where flocculation will begin to take place. The slow mix tank gravity feeds into the clarifier. In the clarifier, the wastewater goes through a series of inclined plates to induce settling of the flocculants. The flocculants will settle to the bottom of the clarifier as sludge, while the wastewater will flow out of the clarifier by gravity to the Modutank.

Modutank

Once the wastewater has passed through the clarifier, it is gravity fed to the Modutank. The Modutank serves as a settling area to remove additional flocculent from the wastewater prior to going to the filtering system. The Modutank has a series of adjustable baffles and other flow disruption processes. The baffles allow further settling of the flocculent prior to entering the storage area of the Modutank. Passage from the baffled section of the Modutank to the storage area is controlled by the use of a weir. The weir is located after the second baffle and placed at the top of the partition between the baffled section and the storage area. The storage area serves as the contingent final stage of the settling process prior to transfer to the sand filtering system.

Filtration

The sand filtration system is composed of four vessels which contain gravel and a sand pack to remove solids in the wastewater to a size of approximately 25 microns. The filtration system is a loose media system and as such the size removal (i.e. 25 microns) by the media filter has to be an approximation. The filtration system has four separate housings for the gravel and sand packs. Each enclosure has access through 8-inch portholes for removal/replacement of the gravel and sand filter packs; removal/replacement is necessary if the pack/s lose effectiveness. The filtration system has a backwash system to allow for the removal of accumulated particulates. The frequency of the backwash operation is determined by differential pressure gauges located on the filtration system.

Following sand filtration, wastewater is then fed into the bag filtration system. The bag filtration system is composed of one vessel with sixteen 5-micron sock filters. The wastewater passes through the bag filter system as an additional particulate removal step prior to discharge. The bag filter system has pressure differential gauges that require monitoring to determine when a change of the sock filters is required. The pressure differential gauges are monitored frequently by on-site personnel to ensure change-out of the bag filter when needed. The bag filtration system is the final wastewater treatment process prior to the discharge.

Operation

The operational oversight of the Treatment System is performed by a certified wastewater treatment plant operator in accordance with the certification requirements of the water and wastewater treatment plant operator's and lab analyst's rules.

FIGURE 1

Treatment System Layout

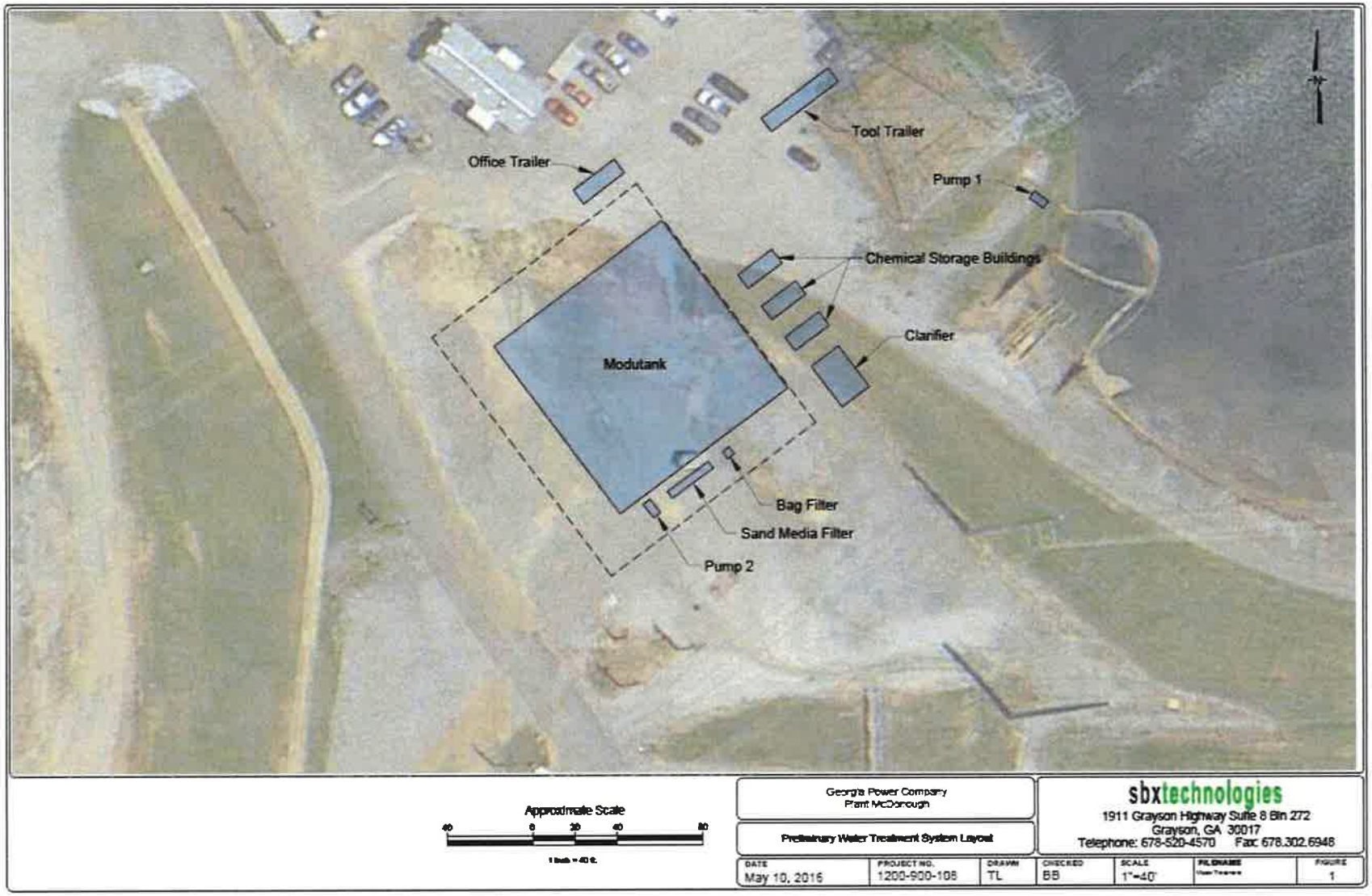


FIGURE 2

Plant McDonough Treatment System Schematic

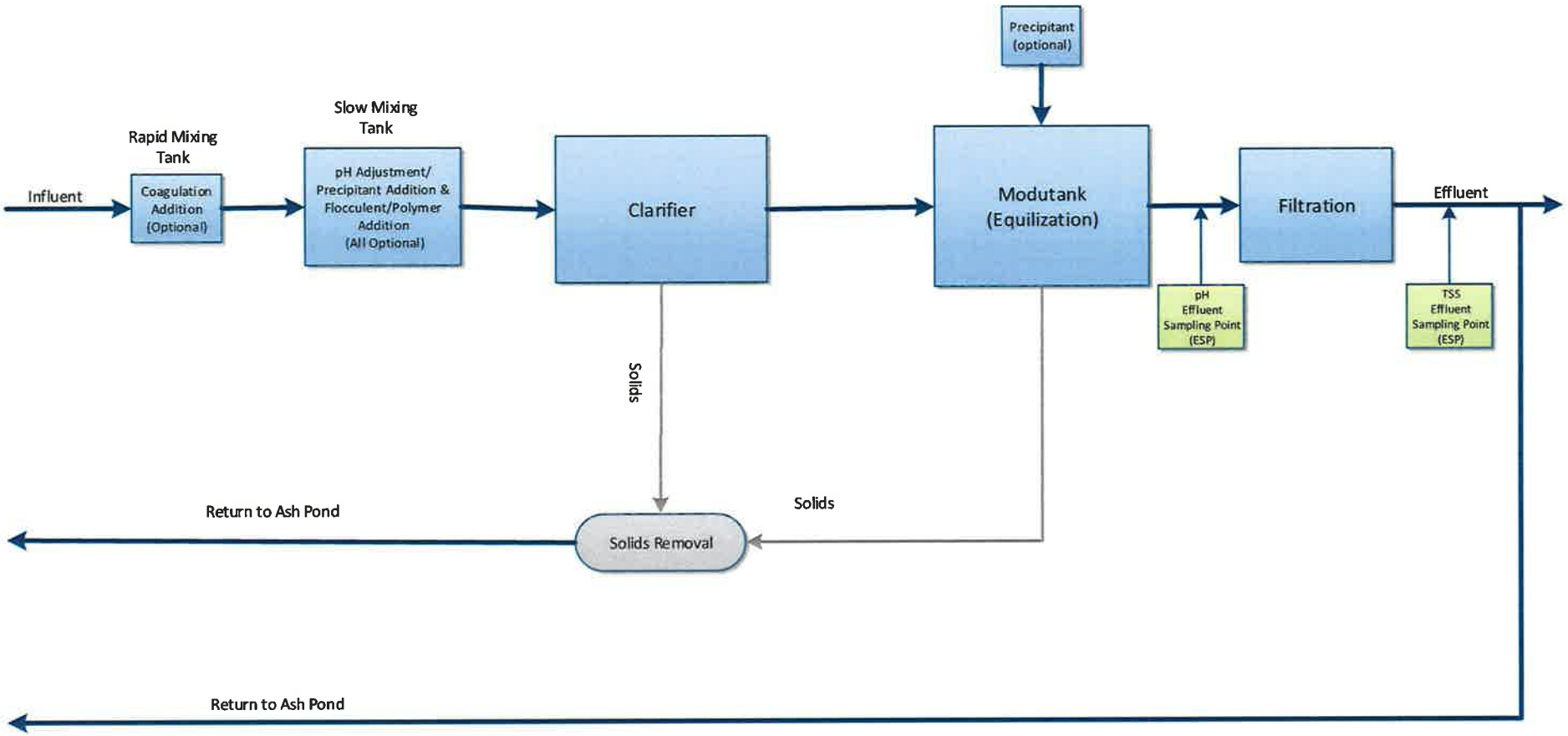
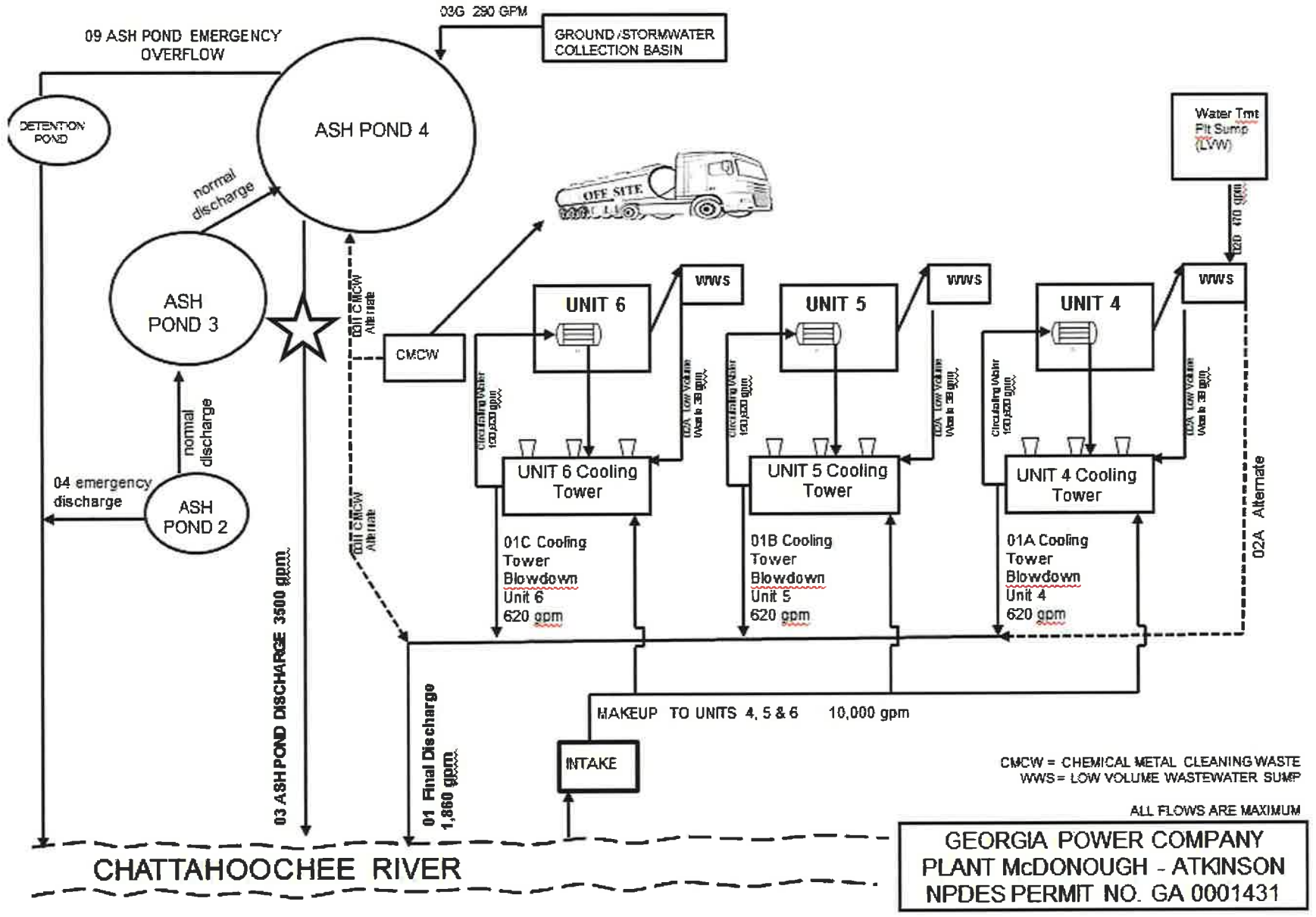


FIGURE 3

Treatment System Location



☆ Treatment System Location

Process Control Monitoring

Control System

The System has a master control panel (referred to as the Motor Control Unit) where the main electrical feed is supplied. From the Motor Control Unit, all processes have the ability to be isolated at each individual component. Alarms are placed on each of the pumps to alert on-site personnel of equipment failures so that shutdown procedures can be initiated and maintenance performed. Each alarm is routed to the Motor Control Unit and the office trailer.

Each of the monitoring devices' (flow meters, TSS meter, pH meter) output will be routed to the office trailer where a data logger is housed. Field sampling data is maintained in the office trailer in the daily log and in a spreadsheet. Field sampling parameters include pH, turbidity, and other site-specific parameters as needed. The field sampling parameters are used to determine the effective rates of chemical addition and treatment efficiency. Field monitoring also takes place at Ash Pond 4.

Maintenance

Instrumentation for use on the site is maintained to ensure optimal performance and provide accurate results. Each piece of technical equipment is 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, a TSS meter, flow meters, and the chemical feed pumps.

Testing

Samples are collected from both the influent (ash pond) and the Effluent Sampling Points (ESPs) to guide system operation. The results will be used to verify that the Treatment System is performing optimally.

Effluent Quality Standards (EQSs)

- pH: 6.4 to 8.6 operational limits
- Flow rate: <750 gpm
- Total Suspended Solids (TSS): <26 mg/L

Turbidity Meter

The turbidity meter is a LaMotte 2020 (or equivalent) portable turbidity meter for use during the daily sampling to determine the clarity of the water. The turbidity meter comes with standard solutions that includes a 10 NTU and 0 NTU calibration vials. The meter is calibrated daily and checked prior to any sampling. The check includes the measuring of the 0 NTU calibration vial. Each sample is also analyzed with the manufacturer supplied blank sample for further measurement accuracy. This system is for information purposes only to determine optimal performance.

pH Meters

Two (2) pH meters are used in the daily operations of the system. The first pH meter is a Hach portable/benchtop pH meter used for the daily sample collections during operation. The second pH meter is a pH probe supplied by Insite IG and is permanently installed in the Modutank effluent. The pH meters are for daily sampling to determine the initial pH of the water into the system and at the effluent from the Modutank for pH treatment requirements. The Modutank effluent pH meter is set to reject the effluent discharge and recycle water to the ash pond if the monitoring of the ESP indicates a pH outside of 6.0 to 8.9 standard units.

The pH meters utilize a three-point calibration of 4.00, 7.00, and 10.00 standard units. Prior to each sampling event, the pH meter is checked against each calibration solution. If the meter is outside +/- 0.10 pH units from the calibration solution, the meter will be recalibrated to ensure accurate measurements. The permanent pH meter installed in the Modutank for operational observations of the process and accuracy is checked by a grab sample collected from the effluent area of the Modutank when necessary. At a minimum, one sample is collected each day to check the calibration of the permanently installed meter. The grab sample is analyzed by the meter in the office trailer and if the measurements are outside of the accepted range (+/-0.10 units), the meter is recalibrated. pH monitoring is for information purposes only to determine system performance and pH adjustment needs.

TSS Meter

An in-line TSS meter is utilized for effluent wastewater monitoring at the ESP prior to final discharge at the permit compliance monitoring location. The calibration of the meter is performed in accordance with manufacturer's recommendations. The TSS meter is set to reject the effluent discharge and recycle water to the ash pond if the monitoring of the effluent indicates a TSS concentration $\geq$ 26 mg/L.

Monitoring and Reporting

Stream 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.

* Instream sampling shall occur at approximately 500ft upstream and downstream of the final discharge to the Chattahoochee River.

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	Daily	Continuous	Final Effluent
TDS	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.

Immediate (within 24 hours) notification to both the EPD compliance office and industrial permitting unit will occur and a corrective action plan implemented if any of the pH or TSS target concentrations are not achieved, and the automatic recirculation system fails or visible foam other than trace amounts is discharged to waters of the State.