MUD CREEK WPCP

STANDARD OPERATING PROCEDURES

Revised April 2018
Revised October 2019
Revised January 2020

Facility Overview

CITY OF VALDOSTA
MUD CREEK WATER POLLUTION CONTROL PLANT
1638 Old Statenville Hwy.
Valdosta, Ga. 31606
NPDES Permit No. GA0020222

The Mud Creek WPCP is situated east of Inner Perimeter Rd. off of Ga. Highway 94 (New Statenville Highway). The plant was originally constructed in 1977 and was expanded to a capacity of 3.22 MGD in 1986. In 2011, the plant was expanded to its current capacity of 5.7 MGD, with peak hourly flow of 17.0 MGD. The Mud Creek facility serves the southeastern portion of the collection service area. The plant is currently permitted to treat an average daily flow of 3.22 MGD of wastewater and a peak hourly flow of 8.05 MGD. The Mud Creek WPCP consists of the following process units:

- Influent pump station consisting of three submersible/dry-pit pumps
- Preliminary treatment which includes screening and grit removal.
- Activated sludge process including six aeration basins
- Six secondary clarifiers
- Three Nova stainless steel screen disk filters, two Aqua-Aerobics disk cloth filters
- Post aeration process
- UV disinfection
- Plant has re-use water system which has four pumps along with three hypochlorite feed pumps
- Waste activated sludge is pumped to aerobic digester; sludge is dewatered using two belt presses; dewatered sludge is landfilled.

Plant Hydraulics

The Mud Creek WPCP consists of both pumped and gravity flow components. Raw wastewater flows into the pump station by gravity. From the pump station, the flow is pumped to the screening and grit removal system. The grit chamber effluent channel weir acts as the first hydraulic control point. Gritted effluent flows to a splitter box and weirs split the flow to the four aeration train tanks by gravity. Effluent weirs serve as control points for gravity flow through each aeration train and flow is matched to the four secondary clarifiers. The clarifier v-notch weirs act as the next control points in the gravity-flow system.

From the clarifiers, the secondary effluent flows by gravity to five filters, (two Aqua Disks/three Nova Ultra-screen). Flow valves are used to distribute the flows to the filters as needed. After filtration, tertiary effluent flows by gravity to a re-aeration tank, where an effluent weir acts as the next control point. Finally, flow enters the UV disinfection system, treated wastewater flows through UV tubes before final weirs, where flow goes by gravity to outfall to Mud Creek.

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SOP: EMERGENCY CALL OUT

- If situation (alarms, power outage, other concerns) arises at plant during off hours (nights/weekends/holidays) plant operator to call Supt. or Asst. Supt
- Supt or Asst. Supt will come out to plant, assess emergency and determine course of action.

SOP: PLANT/EQUIPMENT INSPECTION ROUNDS

Procedure:
Plant Operators will perform the following Plant Inspection rounds in accordance to the schedule listed below:

A-shift	7:15 a.m.	10:00 a.m.	1:30 p.m.
B-shift	3:15 p.m.	6:00 p.m.	9:30 p.m.
C-shift	11:15p.m.	2:00 a.m.	5:30 p.m.

Inspection checklist will be checked off after each inspection round and signed by operator.

Areas and equipment to check:

- Influent Pump Station: Inspect raw sewage pumps for proper operation, check for abnormal temp's, vibrations or noise, inspect packing on pumps for proper leakage (*Note: 3-11 and 11-7 shift are not to go down in lower level); inspect wet well; record any notable differences (color, odor, etc.) in the raw sewage in the operator's log.
- Sludge Inventory Tank: Check level in tank; Check blowers for abnormal temps, vibrations or noise.
- Aeration Basin Blowers: Check blowers for vibrations or noise.
- Influent Head Works: Inspect bar screens for proper operation, check bar screen motors for abnormal temps, vibrations or noise; check grit basin for flow; record also any notable differences (color, odor, etc.) in the operator's log.
- Aeration Basins: Check aeration basins for proper air flow and mixing; record any odors present or changes in color or make up of mixed liquor.
- Secondary Clarifiers: Check for proper flow from aeration basins; check for proper sludge settling (any pin floc or solids going over weirs); check drive motors for abnormal temp's, vibrations or noise; check scum boxes, make sure not stopped up;
- Return Activated Sludge Pump Room: Check pumps and motors for any abnormal temp's, vibrations or noise, check packing, proper leakage; check controls for pumping rates
- Disk Filters: Check for proper operation/flow.
- Re-Aeration Basin: When in operation, check for proper air flow
- Belt Presses: Check area for any problems, leaks, unusual noise, etc.
- Composite samplers at Influent and Effluent: Check operation/temp of samplers every 2 hours and record in log-sheet on computer.

SOP: DISSOLVED OXYGEN FIELD MEASUREMENTS WITH HAND-HELD D.O. METER

Scope: This procedure describes calibration and taking field measurement of Dissolved Oxygen (D.O.) levels with handheld dissolved oxygen meter.
Frequency: Aeration basins – every 4 hours; Plant effluent – once per day
Safety: Precautions around open tanks, slippery surfaces
Equipment: Portable field YSI Dissolved Oxygen Meter
Deionized water and squirt bottle
Procedure:

Calibration of field Dissolved Oxygen Meter

*Note: Instrument calibration must be performed daily just before use.

- Review and follow manufacturer's instructions for instrument operation and calibration.
- Check probe membrane. Be certain that membrane is free of air bubbles.
- Make sure sponge inside probe housing is damp.
- Turn meter on
- Observe the dissolved oxygen readout. When the dissolved oxygen values have stabilized, adjust the instrument as necessary.
- After the instrument has been calibrated, record the dissolved oxygen reading and temperature on D.O. Calibration log sheet on computer.

A. Sample D.O. field Measurement

- Calibrate the field meter as described above.
- Testing D.O.s on aeration basin: D.O.s are tested at south end of basin close to tank D.O. probes. Lower probe to about 2 ft. below surface. Allow time for D.O. readings to stabilize. Record the dissolved oxygen value to the nearest 0.1 mg/l on field notepad. Record DO result on AB log sheet on computer. Check D.O. result against tank D.O. probe, make note if not within 0.5 mg/l.
  Acceptable D.O. range in ABs: 1-4mg/l; when D.O. is measured below 1 mg/l, note and report to Supervisor.

  Taking DO of plant final effluent: DO's are taken at the UV effluent weir. Remove small cover and lower probe below water surface. Allow reading to stabilize, record DO level. Place cover back over opening. Record Dissolved Oxygen reading on DO log sheet on computer. Any DO measurement below 6.0 mg/l is to be reported to supervisor.

  *DO measurement of plant effluent measured daily at 7:30, if not taken then, needs to be taken at some time during day for permit monitoring, once/day.
  *DO meter calibrated before use. Recorded on Calibration record on SCADA.

B. QA/QC

- A Field Sample Duplicate is simply obtained by taking a second measurement at sample site. Procedure: Once the initial DO is measured and recorded, probe is taken out of water for few seconds and then placed back in water as was previously done. Measurement taken as stated above and recorded in log sheet on computer.

QC Frequency: Duplicates: Every 10-sample measurement

Internal Calibration Check Standard: Once/day or additional as needed.

SOP: INFLUENT/EFFLUENT pH ANALYSIS (Lab bench pH meter)

Scope: This procedure can be used to measure pH of wastewater, industrial, sludge Biosolids, storm water, surface, and groundwater samples.

REF: Standard Methods, 22nd Edition

Equipment/supplies:

Lab pH meter with pH probe with automatic temperature probe;
pH standard buffer solutions 4.0, 7.0, and 10.0
Lab

Procedure:

pH Meter Calibration

*Note: pH meter calibrated once/day using three buffers and recorded on pH calibration record (day shift)

- Pour up three buffers solutions, (pH 4; pH 7; and pH 10)
- Press CAL;
- Rinse pH probe with DI water and place in 1st buffer (4.0), press next, then start; wait for stable reading; accept buffer
- Take probe out of 1st buffer, rinse probe DI water and place in 2nd buffer (7.0); press next, then start; wait for stable reading; accept buffer
- Take probe out of 2nd buffer; rinse probe DI water and place in 3rd buffer (10.0); press next, then start; wait for stable reading; accept buffer
- Take probe out of 3rd buffer; rinse probe DI water and place pH probe in one of the buffers for buffer check; press measure; allow for stable reading; record measurement in calibration record (buffer check).

pH Measurement

- Take pH probe out of pH buffer, rinse with DI water; place probe in sample and allow for stable reading, record reading in log sheet for sample.
- Repeat above for next sample(s);
- After final measurement, rinse pH probe and place in buffer storage solution.

QA/QC

- Buffer check after daily calibration and recorded
- Duplicate checked on every 10th analysis.

SOP: Total Suspended Solids Dried at 103 - 105 ^{0}C (*Standard Methods 22ND Ed.* 2540 D.)

Scope: A well-mixed sample of activated sludge (mixed liquor) is filtered through a weighed standard glass-fiber filter and the residue retained on the filter is dried to a constant weight at 103^0 to 105^{0}C. The increase in weight of the filter represents the total suspended solids.

Interferences:

Exclude large floating particles or submerged gathered masses of nonhomogeneous materials from the sample if it is not representative of that sample.

Sample Handling, Preservation and Preparation:

Analysis is performed on grab samples from various basins in process. Samples are analyzed on same day of collection.

Safety: Gloves

Reagents: DI water

Apparatus:

Drying oven, for operation at 103 to 105^{0}C.
Analytical balance, 10 to 200 g capacity, capable of weighing up to 0.0001 g (0.1 mg).
Filtration apparatus (vacuum pump with reservoir) or aspirator.
Desiccator provided with a desiccant containing a color indicator of moisture concentration.
Graduated cylinders; 25-ml, 50-ml, 100-ml, 250-ml, 500-ml.
Glass-fiber filter disks, 2.4 cmto 4.7 cm; Whatman grade 934AH, Gelman type A/E, Millipore type AP40, or equivalent.
Suction Flask, 250-ml.
Buchner funnel, 125 mm
Dish tongs
Forceps, smoothed tip

Preparation of glass-fiber filter disk:

Note: Do not handle the glass fiber filters.
Note: Discard any filters that are torn or contain holes.
1.) Place the glass-fiber filter disk in the Buchner funnel. Be careful not to tear.
2.) Connect to filtration apparatus and turn on vacuum.
3.) Wash disk with three successive 25-ml portions of reagent-grade water.
4.) Continue suction until all traces of water are removed.
5.) Discard rinse filtrate from filter flask.
6.) Remove filter from funnel and transfer to the drying over for a period of 1 hour.
7.) Remove from drying oven and transfer to the desiccator.
8.) Let filter cool to room temperature in desiccator.

Procedure:

1.) Select filter and weigh on an analytical balance.
2.) Record filter weights.
3.) Connect to filtration apparatus and begin suction.
4.) Wet the filter with a small volume of reagent-grade water to seat it.
5.) Stir sample thoroughly, remove the appropriate volume into a graduated cylinder and filter.
6.) The appropriate volume would be that which would yield between 2.5 and 200mg or residue.
7.) If filtration time exceeds 10 minutes, decrease the sample volume or use a larger filter to ensure a representative sample can be filtered.
8.) Rinse with three successive 10-ml volumes of reagent-grade water, allowing complete drainage between washings and continue suction for about 2 minutes after filtration is complete.
9.) Remove the filter from the filtration apparatus, transfer to the drying oven for at least 1 hour at 103 to 105^{0}C.
10.) After drying is complete, transfer to the desiccator and allow to cool to room temperature.
11.) Select filter and re-weigh 3 times on an analytical balance.
12.) Record filter weights.

Calculation:

$$\text{mg total suspended solids/L} = \frac{(A - B) \times 1000}{\text{sample vol., ml}}$$

where:

A = weight of dish/filter + dried residue, mg, and
B = weight of dish/filter, mg.

Each sample will be analyzed with two crucibles with equivalent volumes. The average of the two results will be reported.

QA/QC:
Duplicate analysis every 10th analysis and recorded.
A reference weight in the range of the weight of the samples and filters is weighed on the analytical balance prior to running samples to check for precision and accuracy once per month and recorded on bench sheet.
Blank (DI water) ran once per month and recorded.

Refer to the Quality Manual
The laboratory must keep a calibration certificate demonstrating the traceability to NIST standards. The weights must be ASTM type 1, 2, or 3 (Class S or S-1). Reference weights must be recertified every 5 years and documented.

SOP: DRAWING SUPERNATANT INVENTORY TANK (AEROBIC DIGESTER)

Scope: This procedure is used to get as much water as possible out of digested sludge (thicken) before dewatering with belt press.

Procedure:

- Drawing the supernatant off of aerobic digester or (inventory tank) is done on as needed basis, based on volume in tank.
- Turn off blowers and allow sludge to settle.
- After a clear supernatant is visible, lower pump down into clear supernatant using winch, turn pump on, make sure pumping clear water. As pumping out clear water, pump will need to be lowered as needed until sludge level is reached, once sludge level is reached, DO NOT PUMP SLUDGE. Turn pump off.
- After clear supernatant is drawn off digester. Pump can be pulled up
- Clean pump of any rags or debris and dispose of.
- Turn blowers back on.
- Record in plant operations computer logbook.

SOP: TAKING DEPTH OF BLANKET - SECONDARY CLARIFIERS (DOB's)

Scope: Measurement of settled sludge in secondary clarifiers aids in the process of MLSS's in aeration basins.

DOB's are taken once on every shift, and taken more often as needed, i.e. high flows

Primary Method is using Cerlic Multitracker solids meter for DOB's;
Procedure for using solids meter:

- Turn unit on and let warm up.
- Take measurements from center of walkway, when arms/manifold are 90 degrees of walkway.
- Lower solids probe into water lowering slowly, unit starts at 16 ft., once meter reaches fluff of blanket 300-500 mg/l solids it will beep/vibrate; continue to lower to reach top of blanket, when solids reach 2000-3000+, this is level of blanket.
- Record levels on record sheet.

Procedure for using 15 ft. sludge judge:

- Before using, check sludge judge for cracks, or breaks.
- Take measurement halfway on walkway.
- Take measurement when scum arms are at north and south position on clarifier.
- Lower sludge judge in water slowly until touches bottom, slowly and holding sludge as straight as possible raise out of water until end of sludge judge can be seen. Note depth of sludge in tube. Holding sludge as straight as possible and slowly walk over to weir and release water of tube by bumping the bottom of sludge judge on edge of weir. Once empty, place sludge back in cover tube on walkway.
- Record depth on record sheet.

SOP: SECONDARY CLARIFIER WEIR CLEANING

Scope: Keep algae build up on weirs to minimum as not to slough off and clog clarifier effluent pipe

Safety: PPE; gloves, safety glasses, Tyvek suit, hip waders

Procedure:

Note: 2-person task

- Put filters that are in operation into manual backwash and open sludge valves.
- Put on protective gear (PPE), suits, gloves, safety glasses
- One worker will get safely down in trough and use hose to wash build up off of weir and walls of troughs.
- One worker will handle hose to worker in trough and monitor task.
- After task complete, workers will roll hoses out of way.
- After 30-45 min. of finishing task of cleaning, filters will be turned back into Auto and sludge valves closed.

Note: Usually after cleaning clarifiers, filters that were on will be drained and hosed also.

SOP: AQUA DISK FILTER CLEANING

Scope: Covers the procedures for periodic draining and cleaning Aqua-Disk filters.
Safety: PPE: gloves and eye protection

Procedure:

- Discontinue flow to the filter by manually closing the Influent Valve.
- Turn all switches on control Panel in the OFF position.
- Open the filter Drain Valve and allow water to drain from filter. Hose tank walls as the tank drains.
- Using hose without nozzle, wash cloth disk off. **DO NOT** use high pressure water to clean cloth. This could damage cloth. With assistance from coworker, run filter drive in manual to rotate disks over, after drive is back into OFF position continue to wash cloth disk. While washing filter, try to wash solids towards drain as much as possible.
- After washing filter is completed, to remove solids from bottom of tank: close drain valve and add reuse water to tank up to the bottom of cloth disks. Turn sludge valve switch to ON position and turn sludge pump switch to ON position. After 5-10 minutes, turn sludge pump to OFF; and turn sludge valve to OFF position.
- Open drain valve and drain water and wash bottom of tank as good as possible.
- If filter is to be put back in operation, place all controls back in AUTO and open influent valve and slowly begin filling. If filter is not put back in operation fill to top of cloth disk with reuse water.

SOP: NOVA FILTER CLEANING

Scope: Covers the procedures for draining and cleaning NOVA filters.
Safety: PPE: gloves; eye protection

Procedure:

- Discontinue flow to the filter by manually closing the Influent Valve.
- Open drain valve by placing switch sludge discharge valve in open position
- Turn filter drive and backwash switches to OFF position
- Remove covers on both sides.
- Turn on filter drive and wash down screens. Do not let nozzle come in contact with screens.
- Inspect filter screens for any damage, loose parts.
- Wash down trays on influent side.
- Spray filter with cleaner and rinse filters with hose.
- After cleaning is complete, place unit back in service or leave in standby.

SOP: BELT PRESS –SLUDGE DEWATERING

Scope: Solids handling is necessary to further process settled solids from the liquid treatment processes.
Purpose: Sludge dewatering is the process of removing moisture from solids to reduce its volume and produce a cake-like material suitable for disposal to the landfill.
Safety: PPE: Gloves; eye protection

Dewatering System Startup
Starting up the dewatering system requires all the required subsystems in a ready to start Automatic mode. The dewatering subsystems are controlled by the BFP local control panel selected to dewater the sludge.
The following procedure is for operating Dewatering System in Manual (Hand) Mode.

In this mode, system components are started with their respective start pushbuttons, which are accessed by touching the manual control touch zone that displays the Manual control screen.
Note: Emergency Stop pushbuttons will always stop all equipment.

Dewatering System Pre-start-up
The dewatering system is comprised over several subsystems. Each subsystem must be checked and ready to operate before the startup of the dewatering system is initiated. The equipment to be checked before startup is:

1. Sludge Holding Tank level – Determine the amount of solids to be dewatered and time required at a specific flow rate

2. Sludge Transfer Pump - Valves must be in the correct position and pumps ready to operate in Automatic

3. Wash water Pumps – Valves must be in the correct position, reuse water available and pumps ready to operate in Automatic

4. Polymer System – Polymer must be available, the valves must be in the correct position, reuse water must be available for dilution water and the system must be ready to operate in Automatic.

5. BFP – The valves must be open; the press must be ready to operate.

6. BFP Conveyor system – Verify that the conveyor system is ready to run.

7. Solids Disposal system – Verify that the dump truck that the solids is going to be discharged into is in position under the conveyor discharge point and ready to receive solids.

Manual Mode Startup and Shutdown of Dewatering System:

1. Notify pertinent personnel that the dewatering system is going to be operated.

2. Select which dewatering systems will be operated (1, 2 or both). Collect appropriate sample bottles from lab for filtrate, liquid sludge, and sludge cake samples. Get clipboard with blank Belt Press Operation report sheet on it from Asst. Supt.'s office.

3. Go downstairs to sludge pump room and reset flow totalizers.

4. Determine if there is sufficient polymer on hand to process the quantity of sludge desired to be dewatered.

5. Check all subsystems are ready to operate properly as outlined in the Pre-startup section above.

6. Use the human machine interface (HMI) touch screen and touch Manual Mode and the Manual light will illuminate.

7. Subsystems must be manually started in correct order.

8. Turn the hydraulic system on first.

9. Wait 10-15 seconds for the hydraulic pressure to build up and tension the belts properly

10. Start the conveyor system and check it for proper operation.

11. Start the pressure section of the BFP and check it for proper operation.

12. Start the gravity section of the BFP and check it for proper operation

13. Start the feedbox and check it for proper operation.

14. Open wash water valve.

15. Start the wash water booster pump and check for proper operation.

16. Allow belts to run for 5 min. before running sludge, to allow them to be fully wet.

17. Turn polymer feed system on, allow to run for 15 sec., then turn on sludge pump

18. Set the desired sludge flow rate by imputing the flow on the HMI screen.

19. Adjust the polymer speed/dosage rate to produce adequate water to floc separation without overdosing using the HMI screen.

20. Close the feedbox drain to direct the sludge to the feedbox and onto the gravity belt.

21. Adjust the feedbox, gravity belt and pressure belt speeds using the HMI to produce optimum dewatering.

22. Collect samples of filtrate, liquid sludge and sludge cake after first truckload of sludge. Take samples to lab for analysis.

23. Log pertinent data on Belt Press Report throughout dewatering process.

24. When the desired amount of sludge has been dewatered, stop the sludge transfer pump and polymer system.

25. Open the feedbox drain.

26. Begin the wash down of the press after the remaining cake has left the press and the belts are still running using the HMI screen.

27. Manually wash the press and area around the dewatering system off during the wash down cycle.

28. Manually turn off the wash water pumps using the HMI.

29. Close wash water valve.

30. Manually turn off the gravity belt using the HMI.

31. Manually turn off the pressure belts using the HMI.

32. Manually turn off the hydraulic system using the HMI.

33. Manually turn off the conveyor system using the HMI.

34. Record total gals. dewatered from totalizer in pump room on Belt Press Operation Report

35. Notify the pertinent personnel that the dewatering process is complete.

BELT PRESS EMERGENCY SHUTDOWN:

The emergency shutdown is designed to stop the equipment only in emergency situations. Do <u>not</u> use this procedure to shut down the dewatering system during normal operations. The Emergency Stop cycle will initiate the following sequence of events:

1. Sludge feed pumps stops
2. Polymer systems stops
3. BFP stops
4. Conveyor system stops
5. Wash water pump stops
6. Hydraulic system stops
7. Alarm is activated locally and remotely (SCADA)

Sampling and Monitoring

INTRODUCTION

The laboratory at the MUD CREEK WPCP performs analyses necessary both for compliance with requirements specified by the plant's NPDES permit and process control. Quality Assurance is critical in producing sound, defensible data. This data provides the evidence upon which critical decisions are made. This packet is a synopsis of sampling and monitoring activities performed by laboratory personnel and operations.

I. PROCEDURES for HANDLING SAMPLES

- Samples are collected to fulfill permit requirements for testing plant influent, effluent, and sludge handling and disposal as well as industrial and process control monitoring. Samples are identified by the sample site (i.e., influent or effluent), collection dates, and times, name of collector. Wastewater testing requirements are summarized below. Schematic reference numbers correspond to those on the plant sampling point schematic below.

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STANDARD OPERATING PROCEDURES
(Lab Analysts)

NPDES Permit Sampling Requirements

Sample Location	Sample Type	Schematic Reference	Parameters	Monitoring Frequency
Influent	24-hr Composite*	1	Biochemical Oxygen Demand / Total Suspended Solids	Three Times Weekly
Effluent	24-hr Composite*	2	Biochemical Oxygen Demand / Total Suspended Solids / Ammonia-Nitrogen / Total Phosphorus	Three Times Weekly
Effluent	Continuous	3	Flow	Totalized Daily
Effluent	Grab	3	Dissolved Oxygen / pH	Daily
Effluent	Grab	3	Fecal Coliform	Twice Weekly
Effluent	24-hr Composite	3	Ortho-P / Total Kjeldahl Nitrogen / Nitrate-Nitrite / Total Recoverable Zinc	One day/month
Effluent	24-hr Composite	3	Whole Effluent Toxicity Test	Annually
Effluent	24-hr composite	3	Long-term BOD	One/five years
Receiving Stream	Grab		Total Hardness	One day/month
Receiving Stream	--		Streamflow	One day/week
*See below	Grab		Dissolved Oxygen	One day/week
*See below	Grab		pH	One day/week
*See below	Grab		Temperature (Degrees F)	One day/week
*See below	Grab		Conductivity	One day/week
*See below	Grab		Fecal Coliform Bacteria (#/100ml)	Quarterly

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(Plant Operators)

Process Control Monitoring Sampling

Sample Location	Sample Type	Schematic Reference	Parameters	Monitoring Frequency
Aeration Basin	Outlet Grab	4	30-min Settleability	Five Times Weekly
Aeration Basin	Outlet Grab	4	Total Suspended Solids	Daily
Aeration Basin	Contents in Place	4	Dissolved Oxygen	Daily
Clarifier	Contents in Place	5	Blanket Depth	Daily
Return Sludge	Grab	6	Total Suspended Solids	Daily
Digester & Dewatering	Grab	7 & 8	Total Suspended Solids / Volatile Suspended Solids / % Cake	As Needed

- A flow-proportional automatic sampler is used to obtain sample from the influent channel upstream of the raw wet-well and effluent after the ultraviolet (UV) disinfection. These samplers receive signals from the flow meter so that sampling is done in a flow proportional mode. Samplers have refrigeration units that maintain sample temperature at $\leq 5°C$.

- The lab analyst or operator collects samples from the automatic samplers during the initial plant check between 7am – 8am by replacing the filled polyethylene sample containers and transporting samples directly to the lab. Samples again, are identified by the sample day (date majority of composite sample is collected), collection date (date sample remove from sampler), site (i.e., influent/effluent), sample type, and exact sample collection time. If samples are not analyzed immediately, they are preserved using specific preservation techniques as listed in Standard Method 22nd Edition preservation table. The hold time is calculated by the collection date, but the sample date is the date for which the results are reported. All sample preservation bottles are clearly labeled with a durable marking with the sample ID, time and date of collection, chemical preservation (if any is required), initials of analyst/operator and the intended analysis.

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II. COLLECTING REPRESENTATIVE SAMPLES

The analytical results of a sample are only as accurate as the quality of the sample taken. If your sample collection technique is poor, then no matter how accurate your lab procedures are, the results will be poor. By sampling according to set procedures, you reduce the chance of error and increase the accuracy of your sample results.

- Flow Measurement Device and Method
  Automatic sampler – MUD CREEK utilizes two (2) ISCO 4700 Refrigerated Samplers, one (1) each at the influent and effluent respectively. These devices collect samples by periodically pumping a sample into a sample bottle or sample bottles. The sampler is triggered to sample by the amount of liquid that passes by a flow-measuring device (flow-proportioned).

- Sample Types
  Grab – Each sample shows the characteristics of the water at the time of sampling only. This type of sampling is done for such procedures as batch discharge, constant waste stream characteristics, and when the parameter tested deteriorates rapidly.
  Composite – MUD CREEK utilizes a 24hr composite whereby the individual samples are taken and deposited in the same collection bottle. There are two (2) common methods for collecting this type sample; Time paced – samples are collected at set increments of time and Flow paced – samples are taken when a measured volume of water passes over the sensor of a flow meter. Flow paced is the preferred method as it gives the most representative sample.

III. EQUIPMENT CLEANING

- Sampler cleaning – The case can be cleaned with soap and water and rinsed down thoroughly. The sampler head and housing can be cleaned in the same manner if connecter terminals are covered.
- Tube cleaning – The sampler tubing is cleaned at least once every two (2) weeks using the following procedure:
  1. Pump hot tap water through the tubing and run the sampler for at least two (2) minutes.
  2. Rinse the tubing with a 20% hydrochloric acid solution for two (2) minutes. Safety precautions must be used when handling this chemical solution; where safety gloves and glass.
  3. Rinse tubing again by pumping hot water through for two (2) minutes.
  4. Finally, rinse the tubing by pumping distilled water through for at least one (1) minute. Afterwards, stop the pump and allow water to sit in the line for another minute. Then continue pumping distilled water through the tubing for final rinse.
     Note: Based on wear and tear, old tubing will be replaced with new tubing as needed.

IV. REPORTING

All reports or information submitted in compliance with this permit or requested by EPD must be signed and certified by a principal executive officer, elected official, or other authorized representative. Required analytical results obtained by the permittee shall be summarized on a discharge Monitoring Report form and any additional EPD specified forms. Monitoring results shall be submitted to the EPD postmarked no later than the 15th day of the month following the end of the reporting period. The EPD may require in writing that additional monitoring results be reported.

V. MONITORING PROCEDURES

All analytical methods, sample containers, sample preservation techniques, and sample holding times must be consistent with the techniques and methods listed in 40 CFR Part 136. The analytical method used shall be sufficiently sensitive. EPA approved methods must be applicable to the concentration ranges of the NPDES permit samples.

VI. RECORDING OF RESULTS

For each required parameter analyzed, the permittee shall record:

The exact place, date, and time of sampling, and the person(s) collecting the sample.
For flow proportional composite samples, this shall include the instantaneous flow and the corresponding volume of each sample aliquot, and other information relevant to document flow proportional of composite samples;

- The dates and times the analyses were performed;
- The person(s) who performed the analysis;
- The analytical procedures or methods used; and
- The results of all required analysis

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WET WEATHER/EMERGENCY OPERATING PLAN

The goal of this Wet Weather Operating Plan is to establish operating procedures for the Mud Creek WPCP to:

- Maximize treatment of wet weather flows thereby minimize pollution of the receiving waters;
- Prevent sewer overflows and spills;
- Maintain the stability and efficiency of the facility;
- Facilitate recovery of normal operation and performance following a wet weather event.

Mud Creek WPCP was expanded from 3.22 MGD ADF to 5.7 MGD ADF with a 17.0 MGD peak flow capacity. The normal dry weather flow is 2.8 MGD ADF. During heavy rain events, the treatment plant experiences high flows because of inflow and infiltration (I&I) of groundwater into collection system.

When the treatment plant experiences high flows due to a heavy rain event, plant personnel must follow the following procedures to meet the goals listed above.

Monitoring Weather:
The Utilities Director receives e-mail notifications of possible severe weather conditions in the area from Lowndes County Emergency Management, which is forwarded to the Plant Superintendent. Also, operations staff monitor weather conditions via computer and cell phone.

Before Wet Weather Event:
Constantly monitor weather.
Verify all equipment is in working order.
Ensure all chemical storage tanks are stocked. (Alum and hypochlorite)
Ensure pumping station is at low level.
Ensure pumping station is clean of floating materials.
Ensure standby personnel and extra personnel are ready to be called if needed.
If weather event is forecasted during 2nd and/or 3rd shifts, additional personnel will be assigned to shift(s) to assist in operations during event.

During Wet Weather Event:

PLANT SUPTINTENDENT and/or ASSISTANT SUPERINTENDENT ARE TO BE NOTIFIED, IF NOT ONSITE, THAT WET WEATHER PROCEDURE IS BEING IMPLEMENTED.

WET WEATHER PROCEDURES:
During normal operation, plant wet well is monitored via SCADA (Supervisory Control and Data Acquisition) at the OWS (Operator Workstation); operators use the flow set-point/level trim adjustment to manipulate the pumps keeping wet well level within operating zone (10.5ft. -12.5 ft.). During/after heavy rainfall, flow to plant increases and wet well level starts rising. Operators adjust the flow set-point as needed to keep wet well level in operating zone. The flow set-point/level trim adjustments operate in auto up to 7.0 MGD. Once 6.99 flow is reached, flow set-point/level trim adjustments cannot be made; pump(s) are taken out of auto mode and placed in manual mode. Using manual mode, operators adjust speed of pump(s) at OWS to keep wet well level below 15 feet. This procedure must be followed closely as the operator manually controls flow to the head works.

The following can be done prior to forecasted weather event (severe thunderstorms, heavy rain) or when flow to headwork reaches >6.0 MGD.

Start flow through second influent force main by opening valves at flow meter in front of head works. Open valves slowly to prevent flooding up top.

Start flow through offline bar screen channel by opening channel influent and effluent Gates. Turn bar screen and compactor on and in AUTO, monitor bar screen operation in Auto. As flow increases, and if needed, place bar screen operation to continuous run (manual operation).

Start flow through offline UV channel by opening influent and effluent gates. Turn UV system on. Activate additional UV rows as needed.

Monitor grit removal system operation; adjust grit system on/off intervals as needed.
Position dump truck under grit/trash chute if high flows begin. High flows will over-run dumpster.

Monitor flow from East Train (ET) and West Train (WT), adjust gates/weirs at headworks. When flow is high, more flow needs to be directed to ET.

Monitor sludge blanket levels in clarifiers and adjust RAS return rate accordingly. As flow increases to clarifiers, RAS flows must be adjusted. WAS rates will be adjusted according to lab analysis on biomass.

Monitor flows and ensure enough filters are operating to handle the flow. (Aqua Disk can handle up to **2.0 MG**; Nova's can handle up to **4.0 MG**)

UV disinfection:

Clarity of treated water going to UV process is important in the disinfecting capability of UV light. During rain events, color and turbidity will increase in the treated water flowing to UV chamber. To aid in the removal of some of these contaminants, alum is added to waste stream flowing to clarifiers.

*During normal dry weather flow, the plant operates half the secondary treatment systems (aeration basins and secondary clarifiers). As a result, there are empty aeration basins to use as EQ basins during rain events.

When high flow and long rain duration deems it necessary, direct flows using appropriate gates to the empty ABs; turn on aeration and monitor flow into basins. Wastewater can be stored and drained from the basin back to the pumping station when rain event is over.

*City vacuum truck will be called as needed to pump out trash/scum build up in pump station during rain event.

*Monitor plant for any overflows/spills during rain event. If an overflow/spill is observed during rain event, notify the Utilities Director and Environmental Manager as soon as possible.

*E-mail daily updates to Director and Assistant Director during rain event.

LOSS OF POWER:
Mud Creek WPCP receives power from Georgia Power via two separate sub-station lines, Knight's Creek and Mud Creek. Both lines feed into the electrical switchgear room where operators can view power supply from both lines on SCADA. (SEE SOP AND GOALS FOR SWITCHGEAR BELOW). If power is lost from one feed line, the switch gear transfers all power to the one remaining active feed line. In the event both power sources (feeds) are lost, the operator must immediately notify the Superintendent, if not on site, who will then notify the Director and Assistant Director.

After Wet Weather Event:
As flow levels come down, plant operations will begin to be put back to normal operation.

When flow to head works drops below 6.0 MGD

Stop flow through one of the influent force mains (*see below) by closing the valves at flow meter in front of head works. *Place the force main that was offline at the time of rain event into operation.

Stop flow through one of bar screen channels, rotate the one that was offline into service. Ensure both gates are down completely, and no water is coming back into channel.

Do not stop flow through both UV channels at this time. Flow will be changed to one channel as water clarity improves.

Monitor grit system; adjust on/off timer intervals as needed.

Adjust RAS flows as flow dictates.

Take appropriate number of filters out of operation as flow decreases.

Begin to turn Alum feed rate down as %T increases and color decreases.

*If any empty basins were used as EQ basins during rain event, begin to drain back to pumping station as flow levels allow.

E-mail Director and Assistant Director status report of operations following the rain event.