

Approved By
Shan Sundaram

Vogle Electric Generating Plant



Procedure Number Rev
35570-C 47

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OPERATION OF THE POTABLE WATER SYSTEMS

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OPERATION OF THE POTABLE WATER SYSTEMS

PROCEDURE USAGE REQUIREMENTS-	SECTIONS
Continuous Use: Procedure must be open and readily available at the work location. Follow procedure step by step unless otherwise directed.	All Checklists
Reference Use: Procedure or applicable section(s) available at the work location for ready reference by person performing steps.	4.0 To End (Except all Checklists)
Information Use: Available on plant site for reference as needed.	1.0 To 3.4



INFORMATION USE

1.0 PURPOSE

This procedure provides specific instructions for the operation and chemical surveillance of the potable water systems:

4.0 OPERATION OF THE PLANT POTABLE WATER SYSTEM

4.5 PHOSPHATE BASE UNIT REFILL

4.6 ADDING SODIUM HYPOCHLORITE (NaOCl) TO NaOCl CHEMICAL INJECTION TANK VIA 55 GALLON DRUMS

5.0 SURVEILLANCE

5.1 PLANT POTABLE WATER

6.0 TRAINING CENTER POTABLE WATER

7.0 RECREATION AREA POTABLE WATER

2.0 PRECAUTIONS AND LIMITATIONS


2.1 Sodium hypochlorite causes severe burns. Avoid contact to eyes, skin, or clothing. Do not breathe vapors. Vacate poorly ventilated areas as soon as possible and do not return until odors have dissipated. Always wear safety glasses or goggles and rubber gloves or equivalent when handling sodium hypochlorite.

2.2 Potassium permanganate is a strong oxidizer. Contact with other material may cause fire. It is harmful if swallowed or inhaled. Keep from contact with clothing and other combustible material. Avoid contact with eyes, skin, and clothing. Keep container tightly closed and away from heat. Always wear safety glasses or goggles and rubber gloves or equivalent when handling potassium permanganate.

2.3 Sodium phosphate may be irritating on contact with skin, eyes or mucous membranes. Contact with eyes may cause burns and it may be harmful if swallowed. Safety glasses and gloves should be worn at all times.

2.4 The Chemistry Manager is responsible for potable water treatment system permit implementation and control, ensuring site compliance with state rules and regulations, reporting requirements, and qualification and certification of personnel who operate and analyze potable water systems.

2.5 Microbiological samples must be received by EPD's water laboratory within 24 hours of collection. Any sample that is over 30 hours old will not be analyzed by the EPD. Replacement samples must also be less than 30 hours old. A "Failure to Monitor" violation will be issued if a replacement sample is not received.

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2.6 Mobile or portable chemical product storage tanks, 55-gallon drums, and other small containers should be positioned or located so as to prevent spilled chemical products from reaching drainage structures. A secondary means of containment, such as dikes, basins, or spill pallets, should be provided as needed.

3.0 **MATERIALS**

3.1 Sodium hypochlorite (NaOCl)

3.2 Light Soda Ash (Na₂CO₃) - C.P. grade.

3.3 Potassium Permanganate (KMnO₄) - Filter Oxidizing chemical

3.4 Sodium phosphate, tribasic

REFERENCE USE

4.0 **OPERATION OF THE PLANT POTABLE WATER SYSTEM**

NOTE

Subsections of section 4.0 may be performed concurrently or in any order as required

4.1 **NORMAL CHLORINATION METHOD**

4.1.1 Ensure an adequate supply of sodium hypochlorite (NaOCl) is available in the 250-gallon chemical addition tank. If not, proceed to section 4.6 of this procedure.

NOTE

It may be necessary to dilute the concentrated sodium hypochlorite (NaOCl) to a concentration that will prevent the need to prime the chemical injection pumps frequently and allow for uninterrupted automatic operation.

4.1.2 Sodium hypochlorite injection into the Potable Water System using pump C-2417-P4-507.

4.1.2.1 Ensure OPEN/Open C-2417-U4-615 hypochlorite tank outlet isolation.

4.1.2.2 Ensure OPEN/Open C-2417-U4-612, hypochlorite pump C-2417-P4-507 discharge isolation.

4.1.3 The pump can be primed by placing handswitch C-HS-17422B in the HAND position.

4.1.4 Ensure the pump is primed and set pump stroke to appropriate setting to maintain desired residual Cl_2 . Adjust pump stroke as needed to maintain desired residual chlorine.

NOTE

If adding NaOCl with pump in HAND (manual), sample eyewash residual while pump is running. Once desired concentration in free residual chlorine is noted handswitch C-HS17422B can be placed in OFF to stop addition or AUTO to maintain desired concentration.

4.1.5 Place the handswitch C-HS17422B in the HAND position for manual operation or in the AUTO position for normal operation.

NOTE

A free residual chlorine of at least 0.2 ppm should be maintained at the visitor center. If analysis results indicate a free residual of <0.2 ppm adjust Cl_2 feed. If after four hours chlorine residual does not return within the required concentration range, immediately notify Chemistry supervision.

4.1.6 After the Cl_2 feed rate has been adjusted, sample the potable water periodically to ensure the free residual Cl_2 is 0.2-3.0 ppm.


- a. Make further adjustments as analysis results indicate.

4.2 ALTERNATE CHEMICAL ADDITION METHODS

NOTES

- a. Ensure appropriate safety measures are taken while performing alternate method of chemical addition.
- b. Inject as necessary to maintain free residual chlorine 0.2 – 3.0 ppm and phosphate total concentration 2-6 ppm.
- c. If addition of chemicals is necessary thru potable water storage tank manway, notify Chemistry Manager or designee.
- d. When adding chemicals through the manway the presence of another person may be necessary.

4.2.1 Chemical addition to potable water storage tank.

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4.2.1.1 Add sodium hypochlorite and/or sodium phosphate through the manway of the Potable Water Storage Tank.

4.3 PHOSPHATE ADDITION

4.3.1 Ensure an adequate supply of phosphate is available in the chemical addition tank.

4.3.2 To inject phosphate into the Potable Water System, Ensure OPEN/Open valve C-1408-U4-579, phosphate skid to potable water isolation.

4.3.3 Plug the pump in the dedicated receptacle.

4.3.4 Set pump stroke/speed to appropriate setting to maintain desired phosphate concentration.

4.4 NAOCL SYSTEM SHUTDOWN FOR PLANT POTABLE WATER SYSTEM

4.4.1 Place handswitch C-HS 17422B in the OFF position.

4.4.2 CLOSE valve C-2417-U4-615, hypochlorite tank outlet.

4.4.3 CLOSE valve C-2417-U4-612, hypochlorite pump C-2417-P4-507 discharge isolation.

4.5 PHOSPHATE BASE UNIT REFILL

NOTES

- a. The following steps require two chemistry-qualified personnel.
- b. Checklist 1 shall be performed when performing section 4.5

4.5.1 Move a phosphate refill container to the phosphate tote base unit location.

4.5.2 Verify and Independently verify contents of the refill container is phosphate (Nalco Product # 7399)

4.5.3 Verify the transfer hose is connected to the top bung of the phosphate tote base unit

- a. Place empty bucket below the connection of the bottom outlet and hose connection.
- b. Remove the transfer hose cap
- c. Complete the connection by connecting the opposite end of the transfer hose to the bottom outlet of the refill phosphate container.



NOTE

Vent paths may be established by removing a cap or plug on top of either unit.


- 4.5.4 Ensure open and/or OPEN as necessary the phosphate tote base unit vent, in order not to pressurize the tank.
- 4.5.5 Open a vent on the phosphate refill container to prevent vacuum.
- 4.5.6 Carefully open the bottom outlet valve on the phosphate refill container and transfer the desired amount to the phosphate tote base unit.
- 4.5.7 Observe phosphate tote base unit level as tank is refilled. Do not allow tank to over flow.
- 4.5.8 When desired amount has been added, close the refill phosphate container bottom outlet valve.
- 4.5.9 Disconnect the transfer hose from the bottom outlet valve, containing any spillage in bucket.
- 4.5.10 Replace transfer hose cap

4.6 ADDING SODIUM HYPOCHLORITE (NaOCl) TO NaOCl CHEMICAL INJECTION TANK VIA 55 GALLON DRUMS

NOTE

Checklist 2 shall be performed in conjunction when performing section 4.6

- 4.6.1 Verify and Independently verify that the content of the drum to be added is Sodium Hypochlorite.
- 4.6.2 Open drum and install drum pump.
- 4.6.3 Ensure transfer hose is placed within the Injection tank. If necessary, secure the transfer hose.
- 4.6.4 Connect power to the drum pump.
- 4.6.5 Start the drum pump and transfer the desired amount of sodium hypochlorite.
- 4.6.6 Once transfer is completed, stop and then remove the drum pump.
- 4.6.7 If necessary, replace drum plugs.

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5.0

SURVEILLANCE

The Recreation Area and Training Center potable water systems may be left unattended for up to four consecutive days during periods of low usage (i.e. weekends and holidays), provided that the hypochlorite containers are filled to ensure that there will be an adequate supply of hypochlorite. Plant Potable Water shall be analyzed and results recorded every day including weekends and holidays.

Most surveillances are performed daily. Samples should be taken at approximately the same time daily if possible. Data should be recorded on the appropriate Work Sheet and entered in the chemistry Open CDM database. It is permissible and desired to log routine data on the same line of the Work Sheet as long as the times are approximately (within about four hours) the same. Out of specification samples will be tracked on Open CDM or the appropriate work sheet and additional samples will be taken and logged until their subsequent return to specification. If system does not meet specifications within a 24-hour period, the initial out of specification sample result will be logged on the state well water report.



5.1 PLANT POTABLE WATER

NOTE

All appropriate data points should be entered into Open CDM, if available, on a timely basis.


5.1.1 Daily

a. Distribution System

- (1) Collect a sample from the maintenance shop break room daily and analyze for free chlorine and pH. Log results on Work Sheet 1A and/or tickler card.
- (2) Collect a sample from a tap at the Visitor Center (not a drinking fountain) daily and analyze for free chlorine and pH. Log results on Work Sheet 1 and/ or the tickler card.
- (3) If any of the results are out of limits, notify Laboratory supervision.

b. Chlorination Building

- (1) Record the date and time on the Data Sheet and/or the tickler card.
- (2) Observe "gallons" reading on the totalizing meter and record this figure in the "Meter Reading" column on Work Sheet 1A and/or the tickler card. To determine gallons of water processed per day, subtract the previous day's reading from the current reading, and record this figure in the "Water treated" column of Work Sheet 1 and/or the tickler card.
- (3) Observe gallons of sodium hypochlorite remaining in the tank and record this figure in the appropriate place on Work Sheet 1A and/or the tickler card. Tank level should not be allowed to go below 25 gallons to ensure pump does not pump dry unless needed for maintenance activity.
- (4) If Sodium Hypochlorite was added to the NaOCL chemical injection tank via 55 gallon drum per section 4.6, record the gallons of bleach added on Work Sheet 1 and of the tickler card.
- (5) If Phosphate was added to the Phosphate base unit via a phosphate refill container per section 4.5, record the gallons of phosphate added on Work Sheet 1 and/or the tickler card.

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5.1.2 Weekly

- a. Collect a sample from the in-service well at C-1408-U4-537 (well 1) or C-1408-U4-538 (well 2) and analyze for pH and turbidity.
- b. Record the pH analysis results on Work Sheet 1 and/or the tickler card. Record the turbidity results on Work Sheet 1A and or the tickler card.

5.1.3 Twice Weekly

- a. Collect a sample from a tap at the Visitor Center (not a drinking fountain). Sample at maintenance shop break room when directed by lab supervision.
- b. Analyze for total phosphate, ortho phosphate, and alkalinity.
- c. Record distribution results on Work Sheet 1 and/or the tickler card. Record break room total phosphate results on Work Sheet 1A or tickler card.

5.1.4 Monthly


- a. Forward a copy of completed Work Sheets if utilized, to the chemistry nuclear specialist who prepares the State of Georgia Well Water Plant Report (see example on Figure 2).

5.1.5 Quarterly

NOTE

Total Coliform bacteria analysis samples should be collected after 1100 hrs. The samples must be received by the Georgia Department of Natural Resources within 24 hours and they must begin analysis within 30 hours from the time that the site obtained the sample.

- a. Collect one sample from the Visitor Center (not a drinking fountain) for total coliform bacteria analysis.

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- b. Collect this sample on the third Wednesday of March, June, September, and December. A treated bottle accompanied by directions for collections, packaging, and return to the state will be provided by the Georgia Department of Natural Resources. This sample is to be sent by Fedex, UPS, or other overnight carrier to:

Georgia Department of Natural Resources
Water Laboratory
455 14th St., N.W.
Atlanta, Georgia 30318-7900


5.1.6 REPEAT MONITORING FOR TOTAL COLIFORM

5.1.6.1 If the Division notifies the site that it has received a sample after 24 hours from the time the sample was obtained or if the Division notifies the site that it analyzed a sample after 30 hours from the time that the sample was obtained, the site must collect additional samples as directed by the Division.

5.1.6.2 If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result. Contact Environmental Affairs for assistance as needed. A system which normally collects one routine sample per month or fewer must collect no fewer than four repeat samples for each total coliform-positive sample found. The Division may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Repeat samples should be taken as follows:

- One sample at original coliform-positive sample point
- One sample downstream of original point
- One sample upstream of original point
- One sample from any other location in the system.

If the original sample point was an endpoint or one point away from the end, then sample the required downstream sample elsewhere in the system and note where appropriate.

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5.1.7 Annually

NOTE

Each room containing a sample point for lead and copper sampling must be without water flow (i.e., a bathroom with a sink to be sampled must not have the urinal or toilet flushed or sink used) for at least 6 hours prior to sampling.

a. Collect one (1) sample each of treated water from any tap in the Plant Potable Water Distribution System for the following analyses:

- One sample for nitrate analysis.
- One sample for nitrite analysis.

b. After samples are collected send to:

Georgia EPD Metals Lab
455 14th St., N.W.
Atlanta, Georgia 30318-7900


5.1.8 Once Every Three Years

a. When preparing to collect samples for lead and copper, obtain copies of the OUT OF SERVICE sign (see Figure 5).

- (1) Flush each sample line for at least 30 minutes prior to isolating the lead and copper sample location.
- (2) After flushing is complete, post the OUT OF SERVICE sign at the entrance of the room.
- (3) After six hours, in accordance with EPD directions contained with the sample bottles provided by Georgia EPD, collect ten (10) samples each of treated water from designated taps (see Table 1) in the Plant Vogtle Distribution System for lead/copper analysis.

b. After samples are collected send to:

Georgia EPD Metals Lab
455 14th St., N.W.
Atlanta, Georgia 30318-7900

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5.1.9 Other Frequency

5.1.9.1 Using bottles provided by Georgia EPD,

a. Collect one (1) sample, in accordance with EPD instructions accompanying bottles, of treated water for the following analyses:

1. Inorganic contaminants (IOCs) once every three years or as required by EPD,
2. Volatile organic contaminants (VOC) analysis once every three years or as required by EPD,
3. Total Trihalomethanes (TTHMs) once every three years or as required by EPD, and
4. Haloacetic Acids (HAA5) once every three years or as required by EPD.

b. After samples are collected, send in accordance with EPD instructions to:

Georgia Department of Natural Resources
Water Laboratory
455 14th St., N.W.
Atlanta, Georgia 30318-7900

5.1.10 Upon Request for placing well #2 in service

- a. Collect samples from makeup well 2 at valve C-1408-U4-538.
- b. Analyze for turbidity per procedure 32018-C "Determination of Turbidity" to support Operations return to service.
- c. Turbidity limit to return the well to service is ≤ 3.5 NTU.
- d. Log turbidity results on Work Sheet 1A and/or tickler card.



5.2 GUIDELINES FOR TREATMENT CHEMICALS (PLANT POTABLE WATER SYSTEM)

Guidelines for Drinking Water Parameters

Parameter	Units	Target	Specification
pH		7.1-8.4	7.0 – 8.5
Free Chlorine	ppm – Cl ₂	≥0.2	0.2 – 3.0
Total phosphate	ppm	3.2-4.8	2-6

The targets for pH and free chlorine are met in the Plant Potable Water Distribution System.

5.2.1 If either of the parameters is out of limits, take corrective actions to return them to the normal range. If they do not return to the normal range within four hours, notify laboratory supervision.

6.0 TRAINING CENTER POTABLE WATER


NOTE

All appropriate data points should be entered into Open CDM, if available, on a timely basis.

6.1 DAILY

6.1.1 Pump House

- a. Observe “gallons” reading on the totalizing meter and record this figure in the “Meter Reading” column on Work Sheet 2A and/or tickler card. To determine gallons of water processed per day, subtract the previous day’s reading from the current reading, and record this figure in the “Water treated” column of Work Sheet 2 and/or tickler card A and/or tickler card.
- b. Measure free Chlorine and pH at TC-V-1 located on the Sand Filter discharge. Log results on Work Sheet 2A and/or the tickler card.

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6.1.2 Distribution System

- a. Measure free chlorine and pH of a water sample collected from any tap located in the distribution system. Record results on Work Sheet 2 and/or tickler card.
- b. If needed adjust the chlorine concentration in the chemical solution tank or adjust the chlorine pump stroke to meet the specifications.

6.1.3 Chemical Addition Tank

NOTE

- a. The applicable step(s) of Checklist 3 shall be performed in conjunction with performing applicable step 6.1.3.1.a thru 6.1.3.1.e. On the initial opening of chemicals perform a verification and independent verification of chemical, afterward only a verification is needed.
- b. If necessary, chemical ratios may be lowered or increased to maintain the desired concentration with lab supervision approval.

6.1.3.1 Fill chemical addition tanks when level decreases to about 1/2 full or less.

- a. NaOCl pretreatment containers
 - (1) Verify the refill container is that of sodium hypochlorite and label container.
 - (2) Fill the two (2) NaOCl pretreatment containers at a ratio of approximately 2 liters/50 gallons.
 - (3) Record mls of NaOCl on Work Sheet 2 and/or tickler card.
- b. NaOCl post-treatment container.
 - (1) Verify the refill container is that of sodium hypochlorite and label container.
 - (2) Fill the NaOCl post-treatment container at a ratio of approximately 9 liters/50 gallons.
 - (3) Record mls of NaOCl on Work Sheet 2 and/or tickler card.




- c. Phosphate post-treatment container
 - (1) Verify the refill container is that of Nalco 7399 phosphate and label container.
 - (2) Fill the phosphate post-treatment container at a ratio of approximately 3 liters/50 gallons.
 - (3) Record mls of phosphate on Work Sheet 2 and/or tickler card.
- d. Potassium permanganate container
 - (1) Verify the refill container is that of Potassium permanganate and label container.
 - (2) Fill the Potassium permanganate container at a ratio of 100 grams/50 gallons.
 - (3) Record grams potassium permanganate added into Potassium permanganate container on Work Sheet 2A and/or tickler card.
- e. Record grams of soda ash added to the tank on Work Sheet 2 and/or tickler card.

6.2 WEEKLY

NOTE

To perform 6.2.1 and 6.2.2, it is preferred the well pump be running. To accomplish this, the tank blowdown valve TC-V-12 can be opened slightly until the tank level lowers enough to start the automatic makeup.

- 6.2.1 Collect a sample of the well water at TC-V-2. Analyze this sample for pH and log results on Work Sheet 2 and or the tickler card.
- 6.2.2 Measure free chlorine at TC-V-5. This chlorine concentration is determined by chemistry supervision based on vendor recommendations. This chlorine value is not logged.

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6.2.3 Check the water in the tank to verify that there is a slight pink color. This check is performed to determine potassium permanganate presence. This can be checked at TC-V-4, or the tank blowdown.

a. If presence of potassium permanganate is excessive and/or is present in the distribution perform the following;

- (1) Secure the potassium permanganate pump
- (2) If necessary, feed and bleed the tank by manipulating TC-V-4
- (3) If necessary, flush the distribution system to remove all presence of potassium permanganate.
- (4) If necessary, dilute the contents of the potassium permanganate container
- (5) Once conditions are satisfactory per 6.2.3, set the pump stroke to approximately 50% of the previous setting.

6.3 TWICE WEEKLY

6.3.1 Collect a sample from any tap in the training center and analyze for phosphate and alkalinity. Record analysis on Work Sheet 2 and/or tickler card.

6.4 MONTHLY


6.4.1 Complete Work Sheet 2 and Work Sheet 2A if utilized, and forward them to the chemistry nuclear specialist who prepares the State of Georgia Well Water Plant Report (see example Figure 3).

6.5 QUARTERLY

NOTE

Total Coliform bacteria analysis samples should be collected after 1100 hrs. The samples must be received by the Georgia Department of Natural Resources within 24 hours and they must begin analysis within 30 hours from the time that the site obtained the sample.

6.5.1 Collect a sample from any tap in the Training Center Distribution System for total coliform bacteria analysis.

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6.5.2 Collect this sample on third Wednesday of March, June, September, and December. A treated bottle accompanied by directions for collection, packaging, and return to the state will be provided by the Georgia Department of Natural Resources. This sample is to be sent by Fedex, UPS, or other overnight carrier to:

Georgia Department of Natural Resources
Water Laboratory
455 14th Street, N.W.
Atlanta, Georgia 30318-7900


6.6 REPEAT MONITORING FOR TOTAL COLIFORM

6.6.1 If the Division notifies the site that it has received a sample after 24 hours from the time the sample was obtained or if the Division notifies the site that it analyzed a sample after 30 hours from the time that the sample was obtained, the site must collect additional samples as directed by the Division.

6.6.2 If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result. Contact Environmental Affairs for assistance as needed. A system which normally collects one routine sample per month or fewer must collect no fewer than four repeat samples for each total coliform-positive sample found. The Division may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Repeat samples should be taken as follows:

- One sample at original coliform-positive sample point
- One sample downstream of original point
- One sample upstream of original point
- One sample from any other location in the system.

If the original sample point was an endpoint or one point away from the end, then sample the required downstream sample elsewhere in the system and note where appropriate.

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6.7 ANNUALLY

NOTE

Bottles are to be provided by the Georgia Department of Natural Resources.

6.7.1 Collect one (1) sample each of treated water from any tap in the Training Center Distribution System for the following analysis:

- One sample for nitrate analysis.
- One sample for nitrite analysis.

NOTE

Each room containing a sample point for lead and copper sampling must be without water flow (i.e., a bathroom with a sink to be sampled must not have the urinal or toilet flushed or sink used) for at least 6 hours prior to sampling.

6.7.2 Pb and Cu Sampling

6.7.2.1 When preparing to collect samples for lead and copper, obtain copies of the OUT OF SERVICE sign (see Figure 5).

6.7.2.2 Flush each sample line for at least 30 minutes prior to isolating the lead and copper sample location.

6.7.2.3 After flushing is complete, post the OUT OF SERVICE sign at the entrance of the room.

6.7.2.4 After six hours, in accordance with EPD directions contained with the sample bottles provided by Georgia EPD, collect the required number of samples of treated water from any designated taps (see Table 2) in the Training Center Distribution System for the lead/copper analyses. Only one sample can be taken from any designated location.

6.7.3 Send all samples to:

Georgia EPD Metals Lab
455 14th St., N. W.
Atlanta, Georgia 30318-7900



6.8 OTHER FREQUENCY

6.8.1 Using bottles provided by Georgia EPD, collect one (1) sample, in accordance with EPD instructions accompanying bottles, of treated water for the following analyses:

- Inorganic contaminants (IOCs) once every three years or as required by EPD,
- Volatile organic contaminants (VOCs) once every three years or as required by EPD,
- Total Trihalomethanes (TTHMs) once every three years or as required by EPD, and
- Haloacetic Acids (HAA5) once every three years or as required by EPD.

6.8.2 After samples are collected, send in accordance with EPD instructions to:

Georgia Department of Natural Resources
Water Laboratory
455 14th St., N.W.
Atlanta, Georgia 30318-7900


6.9 GUIDELINES FOR TREATMENT CHEMICALS (TRAINING CENTER POTABLE WATER SYSTEM)

6.9.1 Concentration Guidelines for Treatment Chemicals

Parameter	Units	Target	Specification
pH		7.0-8.4	7.0 - 8.5
Free Chlorine	ppm Cl ₂	≥0.2	0.2 - 3.0
Total Phosphate	ppm	3.8-5.5	2-6

The targets for pH, free chlorine, total phosphate are met in the Training Center Distribution System.

6.9.2 If the above parameter(s) is/are out of limits, take corrective actions to return them to the normal range. If they do not return to the normal range within four hours, notify laboratory supervision.

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6.10 ALTERNATE CHEMICAL INJECTION METHOD FOR THE TRAINING CENTER SYSTEM


NOTE

This means of chemical injection is intended for periods of time when the installed ratio feeder is out of service or unavailable.

- 6.10.1 SECURE the KMnO4 injection pump power supply by turning the designated switch north wall to the OFF position.
- 6.10.2 CLOSE TC-V-30 Chemical injection line isolation valve.
- 6.10.3 To flush residual KMnO4 from system, THROTTLE OPEN TC-V-12 pressurized tank blowdown valve.
- 6.10.4 When no more pink coloration is evident at sample valve TC-V-4, CLOSE TC-V-12 Pressurized tank blowdown valve.
- 6.10.5 OPEN TC-V-20 Carbon sand filter bypass valve.
- 6.10.6 ADD sufficient NSF grade NaOCl to the two pre-treatment tanks to achieve a dilution of approximately 3 gallons NaOCl to 50 gallons of water or to a dilution ratio approved by chemistry supervision.
- 6.10.7 Verify desired free chlorine residual at TC-V-1 and within the Training Center distribution system. The Training Center sample may require a couple of hours to flush the distribution lines.

6.11 SECURING ALTERNATE INJECTION METHOD

- 6.11.1 DRAIN and REFILL the pre-treatment tanks to achieve normal dilution levels.
- 6.11.2 CLOSE TC-V-20 Sand filter bypass valve.
- 6.11.3 OPEN TC-V-30 Chemical injection line isolation valve.
- 6.11.4 ENERGIZE KMnO4 injection pump by returning pump switch to the ON position.

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7.0 RECREATION AREA POTABLE WATER

NOTE

All appropriate data points should be entered into Open CDM, if available, on a timely basis.

7.1 DAILY

7.1.1 Pump House

- a. Observe "gallons" reading on the totalizing meter and record this figure in the "Meter Reading" column on Work Sheet 3A and/or tickler card. To determine gallons of water processed per day, subtract the previous day's reading from the current reading, and record this figure in the "Water treated" column of Work Sheet 3 and/or tickler card.
- b. Measure free chlorine and pH of water sample collected from the tank outlet. The outlet is located at the left end of the pressure tank. Log results on Work Sheet 3A and/or tickler card.

7.1.2 Distribution System

- a. Measure free chlorine and pH of a water sample collected from any tap located in the distribution system. Record pH and chlorine results on tickler card and/or Work Sheet 3 with pH in the treated column.
- b. If needed adjust the chlorine concentration in the chemical solution tank or adjust the chlorine pump stroke to meet the specifications in Step 7.8.1. If the chlorine level is low, raise the pump stroke 1% - 3%. If the level is high, lower the stroke 1% - 3%.

7.2 WEEKLY

7.2.1 Measure the pH of the raw water sample. The sample is collected from the faucet in the right corner of the pump house. Record pH on Work Sheet 3 and/or tickler card.

- a. If the pump is not running, it can be turned on by:
 - (1) Shutting circuit breaker #13 OFF at the breaker panel.
 - (2) Collect the raw water sample.
 - (3) After collecting the sample, turn the circuit breaker #13 ON.

7.3 AS NEEDED

NOTES

- a. Monitor NaOCl level to ensure adequate lead time for reordering.
- b. Checklist 4 shall be performed in conjunction with performing step 7.3.2. On the initial opening of the below chemical perform a verification and independent verification of chemical, afterward only a verification is needed.

7.3.1 Chemical Addition Tanks (NaOCl pretreatment containers)


- a. Verify the refill or supply container is that of sodium hypochlorite
- b. Fill two (2) NaOCl pretreatment containers at a ratio of approximately 2 gallons/50 gallons, or if pump specifications permit higher concentrations may be used.
- c. Record gallons of NaOCl added on Work Sheet 3 and/or tickler card.

NOTE

Soda Ash should not be added to undiluted NaOCl containers.

7.3.2 When pH is low, add soda ash and record grams of soda ash added to the tank on Work Sheet 3 and/or tickler card.

7.3.3 Do housekeeping inside pump house.

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7.4 MONTHLY

Complete Work Sheets 3 and Work Sheet 3A if utilized and not entered into Open CDM, and forward them to the chemistry nuclear specialist who prepares the State of Georgia Well Water Plant Report (see example Figure 4).

7.5 QUARTERLY

NOTE

Total Coliform bacteria analysis samples should be collected after 1100 hrs. The samples must be received by the Georgia Department of Natural Resources within 24 hours and they must begin analysis within 30 hours from the time that the site obtained the sample.

7.5.1 Collect a sample from any tap in the Recreation Area Distribution system for total coliform bacteria analysis.

7.5.2 Collecting sample on the third Wednesday of March, June, September, and December. A treated bottle accompanied by directions for collections, packaging, and return to the state will be provided by the Georgia Department of Natural Resources. This sample is to be sent to:

Georgia Department of Natural Resources
Water Laboratory
455 14th Street, N.W.
Atlanta, Georgia 30318-7900

7.6 REPEAT MONITORING FOR TOTAL COLIFORM

7.6.1 If the Division notifies the site that it has received a sample after 24 hours from the time the sample was obtained or if the Division notifies the site that it analyzed a sample after 30 hours from the time that the sample was obtained, the site must collect additional samples as directed by the Division.



7.6.2 If a routine sample is total coliform-positive, the public water system must collect a set of repeat samples within 24 hours of being notified of the positive result. Contact Environmental Affairs for assistance as needed. A system which normally collects one routine sample per month or fewer must collect no fewer than four repeat samples for each total coliform-positive sample found. The Division may extend the 24-hour limit on a case-by-case basis if the system has a logistical problem in collecting the repeat samples within 24 hours that is beyond its control. Repeat samples should be taken as follows:

- One sample at original coliform-positive sample point
- One sample downstream of original point
- One sample upstream of original point
- One sample from any other location in the system.

If the original sample point was an endpoint or one point away from the end, then sample the required downstream sample elsewhere in the system and note where appropriate.

7.7 ANNUALLY

7.7.1 Collect a sample each of treated water from any tap in the Recreation Area Distribution System for nitrite and nitrate analysis. Bottles are furnished by the Georgia Department of Natural Resources.

7.7.2 Send nitrite and nitrate samples to:

Georgia Department of Natural Resources
Water Laboratory
455 14th St., N.W.
Atlanta, Georgia 30318-7900


7.8 GUIDELINES FOR TREATMENT CHEMICALS (RECREATION AREA POTABLE WATER SYSTEM)

7.8.1 Guidelines for Drinking Water Parameters

Parameter	Units	Target	Range
pH		8.0	7.0 - 8.5
Free Chlorine	ppm Cl ₂	≥0.2	0.2 - 3.0

The targets for pH and chlorine are met at the Recreation Area Distribution System.

7.8.2 If either of the parameters is out of limits, take corrective actions to return them to the normal range. If they do not return to the normal range within four hours, notify laboratory supervision.


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8.0 **REPORTING**

- 8.1** After receipt of completed Work Sheets 1, 2, and 3, if utilized and not entered into Open CDM, the Chemistry Nuclear Specialist prepares the State of Georgia Well Water Plant Report (see examples on Figures 2, 3, and 4).
- 8.2** After approval by the Chemistry Manager, the State of Georgia Well Water Plant Report should be forwarded to the SNC Environmental Affairs. SNC Environmental Affairs will forward this report to the Georgia Environmental Protection Division by the tenth day of the month. Also, Chemistry will transmit the original State of Georgia Well Water Plant Report to document control. A copy will also be provided to Chemistry and NSAC.
- 8.3** Data entered into Open CDM is to be considered a plant record with a twelve-year retention time and are maintained by Document Control.
- 8.4** The Work Sheets are not a plant record. These Work Sheets, if used, should be maintained in the Chemistry department files as desired to aid in troubleshooting.

9.0 **REFERENCES**

- 9.1** State of Georgia Department of Natural Resources Environmental Protection Division - Permit to Operate a Non-Transient Non-Community Public Water System, Permit No. PG0330017 (Plant Vogtle Makeup Wells #1 and #2A).
- 9.2** State of Georgia Department of Natural Resources Environmental Protection Division - Permit to Operate a Non-Transient Non-Community Public Water System, Permit No. PG0330035 (Plant Vogtle Simulator Building).
- 9.3** State of Georgia Department of Natural Resources Environmental Protection Division - Permit to Operate a Public Transient Non-community Water System, Permit No. NG0330036 (Recreation Area Potable Water).
- 9.4** Georgia State Drinking Water Act of 1977, Ga. Laws 1977, and the Rules, Chapter 391-3-5 adopted pursuant to the Act, 1983.
- 9.5** Georgia Certification of Water and Wastewater Treatment Plant Operators and Laboratory Analysts Act, as amended and the Rules adopted pursuant to the Act, November 1982.

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9.6 PROCEDURES

- 9.6.1 00152-C, "Federal and State Reporting Requirements"
- 9.6.2 30025-C, "Periodic Analysis Scheduling Program"
- 9.6.3 32314-C "Determination of Residual Chlorine"
- 9.6.4 32014-C "Determination of pH"
- 9.6.5 32018-C "Determination of Turbidity"
- 9.6.6 32022-C "Determination of Alkalinity"
- 9.6.7 32421-C "Determination of Phosphate"

END OF PROCEDURE TEXT

**WORK SHEET 1A
PLANT POTABLE WATER SYSTEM**

		Maintenance Shop Break Room				Raw Water			
		Free Chlorine	pH	Total phosphate	Meter Reading	Bleach Level	Well #	Turbidity	
Date	Time	0.2 – 3.0	Monitor	2-6	Gallons		(in service)	Monitor *	Initials

* Turbidity must be below 3.5 NTU to valve Well #2 into the distribution header.

Reviewed by _____ Date _____

WORK SHEET 2
TRAINING CENTER POTABLE WATER SYSTEM

Date/Time	Treatment			Analysis							Initials
	Water Treated	Bleach Added	Na ₂ CO ₃ Added	Phosphate Added	pH		Free Chlorine	Alkalinity	Total Phosphate	Ortho Phosphate	
	Gallons	ml	Grams	ml	Untreated	Treated	0.2 - 3.0	Monitor	2 - 6	Monitor	

Reviewed by _____ Date _____

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WORK SHEET 3A RECREATION CENTER POTABLE WATER SYSTEM

Date	Time	Tank Outlet		Meter Reading Gallons					Initials
		Free Chlorine 0.2 - 3.0	pH 7.0 - 8.5						

Reviewed by _____ Date _____

TABLE 1

Plant Makeup System Pb & Cu Tier I Sampling Sites (Primary)_

Sample No.	Location
Sample Point #2	Production Warehouse Kitchen Sink
Sample Point #3	Water Treatment Bldg Restroom Sink
Sample Point #4	Main PESB Janitor's Sink
Sample Point #5	Service Bldg Janitor's Sink
Sample Point #6	Maint. Bldg 2nd Floor Men's Room Sink
Sample Point #17	Admin. Bldg Kitchen Sink
Sample Point #18	Visitor's Center Men's Room Sink
Sample Point #19	U1 NSCW Chemical Control Bldg. Sink
Sample Point #21	Production Warehouse Janitor's Sink
Sample Point #24	Water Treatment Plant Janitor's Sink

TABLE 2

Simulator System Pb & Cu Tier I Sampling Sites (Primary)_

Sample No.	Location
Sample Point #1	South Wing Kitchen Sink
Sample Point #2	South Wing HP Lab Sinks
Sample Point #3	South Wing Chemistry Lab Sinks
Sample Point #4	East Wing Men's Restroom Sink
Sample Point #6	West Wing Janitor's Sink
Sample Point #7	West Wing Test Shop Sink
Sample Point #8	West Wing Mechanical Skills Sink
Sample Point #9	West Wing Electrical Skills Sink
Sample Point #10	Basement Men's Restroom Sink
Sample Point #12	West Wing Women's Restroom Sink

Notes applicable to Table 1 & Table 2.

Note 1 – No lead and copper sampling is required for the Recreation Area system.

Note 2 – Should any of the sample sites listed above become unfeasible, contact Chemistry Supervision for alternate sampling sites.

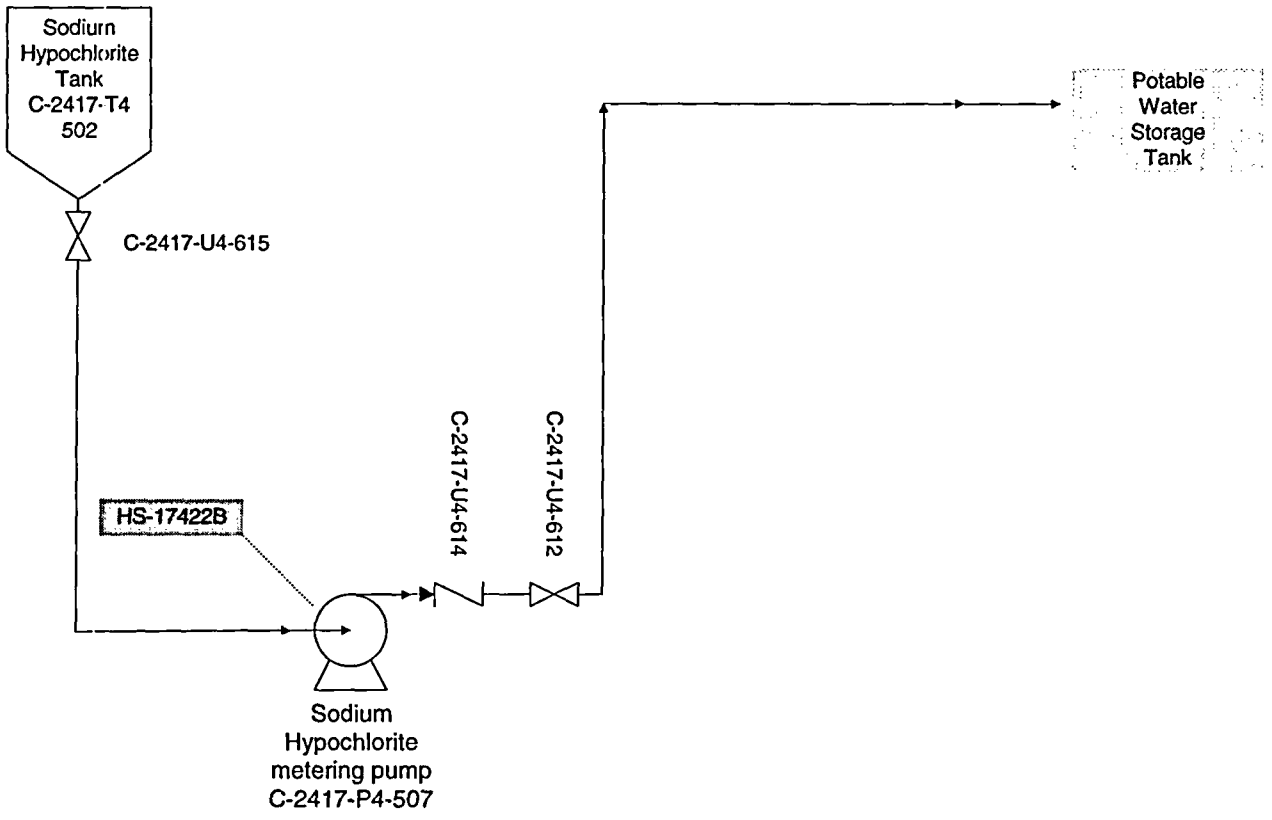



FIGURE 1

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Shan Sundaram
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1/18/2006

Vogtle Electric Generating Plant 
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FIGURE 2

Water Supply Section

BURKE
COUNTY

**ENVIRONMENT PROTECTION DIVISION
DEPARTMENT OF NATURAL RESOURCES
WELL OR SPRING WATER PLANT REPORT**

MONTH OF _____ 20__

Operation of the Plant Vogtle Makeup Wells #1 & #2A Water Plant Water Plant PG0330017

Day of Month	Thousands of Gal ons Water Treated	Gal NaOCl Used	Pounds of Fluoride Used	Pounds of Other Chemical Used	Hydrogen Ion Concentration (pH value)		Residual Free Chlorine	Laboratory Test mg/l			
					Untreated	Treated		Fluoride		Iron	
								Untreated	Treated	Untreated	Treated
1											
2											
3											
4											
5											
6											
7											
8											
9											
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24											
25											
26											
27											
28											
29											
30											
31											
TOTAL					FLUORIDE COMPOUND USED			N/A			
AVG.					CHLORINE COMPOUND USED			NaOCl			
MAX.					OTHER CHEMICALS USED			N/A			
MIN.											

(EXAMPLE) _____
Chemistry Manager

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Shan Sundaram

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FIGURE 3

Water Supply Section

**ENVIRONMENT PROTECTION DIVISION
DEPARTMENT OF NATURAL RESOURCES
WELL OR SPRING WATER PLANT REPORT**

BURKE
COUNTY

MONTH OF _____ 20__

Operation of the Plant Vogle Simulator Building

Water Plant PG0330035

Day of Month	Thousands of Ga Ions Water Treated	mls NaOCl Used	Pounds of Fluoride Used	ml's of Other Chemical Used	Hydrogen Ion Concentration (pH value)		Residual Free Chlorine	Laboratory Test mg/l				
					Untreated	Treated		Fluoride		Iron		
								Untreated	Treated	Untreated	Treated	
1												
2												
3												
4												
5												
6												
7												
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27												
28												
29												
30												
31												
TOTAL					FLUORIDE COMPOUND USED			N/A				
AVG.					CHLORINE COMPOUND USED			NaOCl				
MAX.					OTHER CHEMICALS USED							
MIN.												

(EXAMPLE)

Chemistry Manager

Approved By
Shan Sundaram

Vogle Electric Generating Plant



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FIGURE 4

Water Supply Section

**ENVIRONMENT PROTECTION DIVISION
DEPARTMENT OF NATURAL RESOURCES
WELL OR SPRING WATER PLANT REPORT**

BURKE
COUNTY

MONTH OF _____ 20__

Operation of the Plant Vogle Employee Recreational Area Water Plant NG0330036

Day of Month	Thousands of Gallons Water Treated	lbs NaOCl Used	Pounds of Fluoride Used	Pounds of Other Chemical Used	Hydrogen Ion Concentration (pH value)		Residual Free Chlorine	Laboratory Test mg/l			
					Untreated	Treated		Fluoride		Iron	
								Untreated	Treated	Untreated	Treated
1											
2											
3											
4											
5											
6											
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29											
30											
31											
TOTAL					FLUORIDE COMPOUND USED			N/A			
AVG.					CHLORINE COMPOUND USED			NaOCl			
MAX.					OTHER CHEMICALS USED			N/A			
MIN.											

(EXAMPLE) _____
Chemistry Manager



FIGURE 5

OUT OF SERVICE

This room's potable water is out of service for lead/copper sampling of the drinking water system. There must be no water flow in this room for at least 6 hours prior to sampling.

**IF YOU HAVE ANY QUESTIONS,
PLEASE CONTACT CHEMISTRY AT
EXT.**

CHECK LIST 1

PLANT POTABLE WATER PHOSPHATE BASE UNIT REFILL

NOTE

The following steps require two qualified chemistry personnel

Steps	Actions	Verified by	Independently Verified by
4.5.1	Move a phosphate refill container to the phosphate tote base unit location.		NA
4.5.2	Verify and independently verify contents of the refill container is phosphate (Nalco Product # 7399)		
4.5.3	Verify the transfer hose is connected to the top bung of the phosphate tote base unit		NA
	a. Place a empty bucket below the connection of the bottom outlet and hose connection.		NA
	b. Remove the transfer hose cap		NA
	c. Complete the connection by connecting the opposite end of the transfer hose to the bottom outlet of the refill phosphate container.		NA
4.5.4	Ensure Open and/or OPEN as necessary the phosphate tote base unit vent, in order not to pressurize the tank.		NA
4.5.5	Open a vent on the phosphate tote unit to prevent vacuum.		NA
4.5.6	Carefully open the bottom outlet valve on the phosphate refill container and transfer the desired amount to the phosphate tote base unit.		NA
4.5.7	Observe phosphate tote base unit level as tank is refilled. Do not allow tank to over flow.		NA
4.5.8	When desired amount has been added, close the refill phosphate container bottom outlet valve.		NA
4.5.9	Disconnect the transfer hose from the bottom outlet valve, containing any spillage in bucket.		NA
4.5.10	Replace the transfer hose cap.		NA

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CHECK LIST 2

PLANT POTABLE WATER SODIUM HYPOCHLORITE INJECTION TANK REFILL

Steps	Actions	Verified by	Independently Verified by
4.6.1	Verify and Independently verify that the content of the drum to be added is Sodium Hypochlorite		
4.6.2	Open drum and install drum pump.		NA
4.6.3	Ensure transfer hose is placed within the Injection tank. If necessary, secure the transfer hose.		NA
4.6.4	Connect power to the drum pump.		NA
4.6.5	Start the drum pump and transfer the desire amount of sodium hypochlorite.		NA
4.6.6	Once transfer is completed, stop the drum pump and remove.		NA
4.6.7	If necessary, replace drum plugs.		NA



CHECK LIST 3

**TRAINING CENTER POTABLE WATER
CHEMICAL INJECTION TANK REFILL**

NOTE

On the initial opening of the below chemical perform a verification and independent verification of chemical, afterward only a verification is needed.

Steps	Actions	Verified by	Independently Verified by
6.1.3.1.a	NaOCl pretreatment containers	NA	NA
	(1) Verify the refill container is that of sodium hypochlorite and label container.		
	(2) Fill the two (2) NaOCl pretreatment containers at a ratio of approximately 2 liters/50 gallons.		NA
	(3) Record mls of NaOCl on Data Sheet 2.		NA
6.1.3.1.b	NaOCl post-treatment container.	NA	NA
	(1) Verify the refill container is that of sodium hypochlorite and label container.		
	(2) Fill the NaOCl post-treatment container at a ratio of approximately 9 liters/50 gallons.		NA
	(3) Record mls of NaOCl on Data Sheet 2.		NA
6.1.3.1.c	Phosphate post-treatment container	NA	NA
	(1) Verify the refill container is that of Nalco 7399 phosphate and label container.		
	(2) Fill the phosphate post-treatment container at a ratio of approximately 2 liters/50 gallons.		NA
	(3) Record mls of phosphate on Data Sheet 2.		NA
6.1.3.1.d	Potassium permanganate container	NA	NA
	(1) Verify the refill container is that of Potassium permanganate and label container.		
	(2) Fill the Potassium permanganate container at a ratio of 100 grams/50 gallons.		NA
	(3) Record grams potassium permanganate added into Potassium permanganate container on Work sheet 2		NA
6.1.3.1.e	When needed for pH control, record grams of Na ₂ CO ₃ added on Work sheet 2.		NA

CHECK LIST 4

**RECREATION AREA POTABLE WATER
CHEMICAL INJECTION TANK REFILL**

NOTE

On the initial opening of the below chemical perform a verification and independent verification of chemical, afterward only a verification is needed.

Steps	Actions	Verified by	Independently Verified by
7.3.1	NaOCl pretreatment containers	NA	NA
	(a) Verify the refill container is that of sodium hypochlorite and label container.		
	(b) If necessary, fill the two (2) NaOCl pretreatment containers at a ratio of approximately 2 gallons/50 gallons.		NA
	(c) Record volume of NaOCl on Data Sheet 3.		NA
7.3.2	When needed for pH control, record grams of Na ₂ CO ₃ added on Data Sheet 3.		NA