OPERATION OF THE SEWAGE TREATMENT PLANT

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.	NONE
Reference Use:	Procedure or applicable section(s) available at the work location for ready reference by person performing steps.	ALL
Information Use:	Available on plant site for reference as needed.	NONE

REFERENCE USE

1.0 PURPOSE

To provide instructions for proper operation, waste water sampling and analysis, chemical addition, routine maintenance and response to malfunctions of the Clow Aer-O-Flo Sewage Treatment Plant.

3.0 PROCEDURE
3.1 BIOLOGICAL PROCESS OF SEWAGE TREATMENT
3.2 DESCRIPTION AND OPERATION OF THE SYSTEM
3.3 SAMPLING, ANALYSIS, AND CONTROL OF CHEMICAL PARAMETERS
3.4 CHLORINE ADDITION AND CONTROL
3.5 ROUTINE MAINTENANCE
3.6 SCHEDULED MAINTENANCE
3.7 MALFUNCTIONS
3.8 SLUDGE REMOVAL
3.9 RECEIPT OF WASTEWATER, SLUDGE, CHEMICALS OR GREASE
4.0 ACCEPTANCE CRITERIA
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ATTACHMENT 11 DECANTING HOLDING TANKS
ATTACHMENT 12 ADDING SODA ASH TO THE SEWAGE TREATMENT PLANT
ATTACHMENT 13 PLACING LIFT PUMP(S) IN SERVICE
ATTACHMENT 14 REMOVING LIFT PUMP(S) FROM SERVICE

2.0 PRECAUTIONS AND LIMITATIONS

2.1 Sanuril chlorination system tablets are a tabulated form of calcium hypochlorite. Normal safe chemical handling precautions and limitations apply.

2.2 Calcium 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 goggles and rubber gloves when handling calcium hypochlorite.

2.3 When work is being performed inside the handrails of a sewage treatment plant with grating removed, a life vest should be worn.

2.4 Use good electrical practices and caution when working around electrical hazards or boxes containing exposed circuits and components. Refer to NMP-SH-003, "Electrical Work Practices" for specific guidelines on electrical safety.

3.0 PROCEDURE

3.1 BIOLOGICAL PROCESS OF SEWAGE TREATMENT

3.1.1 Aerobic digestion is the use of aerobic microorganisms for biochemical decomposition of organic matter to inorganic or stable solids.

3.1.2 The process works through formation of a brownish floc-like substance principally composed of organic matter from sewage and inhabited by bacteria, fungi and protozoa.

3.1.3 Microorganisms reduce the amount of solids suspended in wastewater by absorbing colloid and dissolved organic matter and ammonia from the floc.

3.1.4 Nutrients from organic matter are absorbed by microorganisms and converted into insoluble non-putrescible solids.

3.1.5 A specific group of microorganisms is involved in each step of sewage processing.

3.2 DESCRIPTION AND OPERATION OF THE SYSTEM

NOTE

Refer to Figure 1, for component locations.

3.2.1 Surge Tank

3.2.1.1 The 24,655 gallon surge tank is designed to accommodate surges of influent which can then be evenly distributed to the three treatment units over an extended period of time.

3.2.1.2 The tank is equipped with comminutor, submergible pumps, blowers, air diffuser system, air lift chamber, flow control boxes and air lift pumps which function as listed below.

a. Solids in the influent are shredded by the comminutor to allow for quicker and more efficient processing of wastes.

b. Float switches start and stop the submergible pumps located on the east side of the surge tank approximately 1/3 the length from the inlet. These pumps transfer influent feed to #3 treatment unit flow control box. Excess flow is returned to the surge tank by an overflow line. The operation of these pumps is controlled by hand-off-auto switches located in the #3 unit electric control box.

c. Blowers supply compressed air to diffusers to keep the solids suspended and to the air lift pumps for motive air. The two blowers can be automatically alternated by a timer located in the control box at the west side of Unit 1 STP. Blowers may also be operated in "Hand" position and altered as needed by STP operator.

d. Submergible pumps, located between the blowers and the airlift chamber, transfer influent into airlift chamber. Excess flow is return to the surge tank. Float switches start and stop these pumps in the automatic mode.

e. Air lift pumps transfer influent from the surge tank airlift chamber into both or either #1 or #2 unit flow control boxes, with the excess returning to the surge tank over flat plate weirs.

f. Flow distribution to the three treatment units should be balanced to optimize the operation of each unit. Any unit train may be taken out of service as flow and surge capacity permit.

3.2.2 Treatment Units 1 and 2

3.2.2.1 Treatment Units 1 and 2 are 3-zone package aeration plants, which contain an aeration zone, a clarifier zone, a sludge digester tank and associated systems.

a. The aeration compartment is one large undivided compartment. Aeration is provided by a blower fed Air Diffuser System located on the east side of the compartment.

b. The Water Spray System, powered by an electric pump, provides froth control by spraying clarifier supernatent onto the aeration compartment water surface.

c. The clarifier, comprised of two separate hoppers, acts as a sludge settling compartment for treated sewage.

d. The Sludge Return System recycles activated sludge from the bottom of the primary clarifier to the aeration chamber via the air lift sludge pump. The return system from the secondary clarifier only recycles sludge to the middle of the aeration chamber.

e. Sludge return air valves can be adjusted to regulate the amount of sludge returned to the aeration compartment.

f. Floating solids in the clarifier are removed by the Air Lift Skimmer System and returned to the aeration compartment.

g. Blowers power all systems of the treatment unit except the Water Spray System.

h. An aerobic sludge digester tank is provided to allow for storage of excess sludge.

3.2.2.2 Calcium hypochlorite, sodium hypochlorite, or other disinfecting agents are released into the treated effluent after the effluent enters the chlorine contact chamber. Treated effluent is discharged to the lift station as combined flow from the treatment plants

3.2.3 Treatment Unit 3

NOTE

Unit 3 Comminutor may be operated in either the On or Off position as determined by the STP operator when in service.

3.2.3.1 Treatment Unit 3 is designed and operated in the same manner as Units 1 and 2 except as noted below. If necessary, the comminutor may be placed in manual.

a. An influent cominutor and bar screen are located at the inlet of Unit 3 after the flow control box.

3.2.4 Lift Station

3.2.4.1 The lift station is a sump into which the effluent from the treatment units drains, which pumps the combined effluent back up to the WWRB. The pumps are mounted above the sump in a weather protective enclosure and draw suction from the sump near the bottom.

3.2.4.2 The pumps are controlled by handswitches located in a control box on the north side of the lift station. In the automatic mode, sump level control floats start and stop the pump. These pumps may be alternated to promote pump lift if flow conditions allow.

3.2.4.3 A high level alarm light is activated by the top level float. This alarm light is located along side of the control box on the north side of the lift station. In the event of pump failure, the lift station sump will overflow to the river through the outfall that was in use during the plant construction phase. This is a NPDES breakdown reportable occurrence.

3.2.4.4 The pump environmental shelter is equipped with a heater for freeze protection. The heater control switch is located by the alarm light. Ensure if freezing conditions are indicated the freeze protection heater is turned on.

3.2.4.5 The discharge of the lift station pump(s) is directed to the appropriate WWRB through the 3 way 4 inch valve, A2119-U4-503, located about 30 feet west of the NW corner of the north WWRB.

3.2.5 Sewage Treatment Holding Pond

3.2.5.1 In case of STP system breakdown/outage, the influent raw sewage may be redirected to the Sewage Treatment Holding Pond, at the discretion of Chemistry Supervision. The Sewage Treatment Holding Pond is located northeast of the STP and it is gravity fed from the last sewage influent manhole above and to the south of the STP.

3.5.1.2 Refer to Attachment 3 for instructions on pumping down the Sewage Treatment Plant Holding Pond.

3.3 SAMPLING, ANALYSIS, AND CONTROL OF CHEMICAL PARAMETERS

3.3.1 Dissolved Oxygen (DO)

3.3.1.1 DO level 0.5 ppm is essential for supporting aerobic microorganisms which degrade and digest organics and solids in sewage wastewater. Analysis shall be performed weekly to maintain these DO levels.

3.3.1.2 If results are not within specified targets, the DO content can be controlled by regulating the amount of air emitted from aeration compartment diffusers using the methods listed below.

a. For DO results below 0.5 ppm, increase the compressed air flow rate to diffusers by turning air diffuser drop line valves slightly or adjust blower timer in affected unit control panel to increase aeration time.

3.3.2 pH Determination

3.3.2.1 Attempts should be made to maintain pH between 6.0 - 9.0 to ensure final effluent meets N.P.D.E.S. limits and to ensure viable populations of microorganisms which are sensitive to extreme pH values.

3.3.2.2 Observe pH value and measure wastewater temperature. Record both values on Work Sheet 2. For this application the sample temperature is not required to be 25° ± 3°C.

NOTE

The pH on the units may drop low and 1 or 2 bags of soda ash are added to the affected unit's aeration chamber to raise pH. pH in each unit has been known to drop as low as 3.1.

3.3.2.3 A low pH could indicate low sewage input into the Sewage Treatment Plant. If this occurs, digestible matter from the sludge holding tank may be added to reactivate the treatment process.

3.3.3 Settleability (% Settleable Solids)

3.3.3.1 The volume of sludge present in the aeration compartment indicates load on the Sewage Treatment Plant. If the amount of suspended solids becomes extremely high or low, the plant will be inefficient at processing wastes.

3.3.3.2 Settleability shall be determined as per Chemistry Procedure 32432-C. Obtain settleable solids value and record results on Work Sheet 2.

3.3.3.3 If settleability results exceed 80%, divert excess sludge from the clarifier to the sludge holding tank.

3.3.3.4 If settleability results are below 20%, add sludge to the aeration compartment by scraping the clarifier walls and diverting sludge to the aeration compartment.

3.3.4 Free Residual Chlorine

3.3.4.1 Calcium hypochlorite, sodium hypochlorite, or other disinfecting agents is added to the final effluent to destroy pathogenic microorganisms prior to discharge. To accomplish this, free residual chlorine should be maintained greater than 0.5 ppm.

3.3.4.2 Samples for chlorine analysis shall be taken each day, Monday through Friday except on holidays, from the final effluent at the lift station.

3.3.4.3 Record residual chlorine value in ppm on Work Sheet 2.

3.3.5 Biochemical Oxygen Demand (BOD)

3.3.5.1 Refer to VEGP Procedure 36001-C, "NPDES Permit Implementation And Control" for instructions on sample bottle preparation and on collection and shipping of BOD samples.

NOTE

BOD sample shall be shipped overnight, so that the offsite laboratory should receive the sample(s) the following morning after collection.

3.3.5.2 BOD sample shall be collected at final effluent lift station chamber after chlorination. This sample is only taken when there is a discharge to the Savannah River. Samples shall be packed in ice immediately after collection and taken to the receiving warehouse on the day of collection and shipped overnight. The sample is sent to the GPC Environmental Laboratory.

3.3.5.3 If BOD results are greater than 30 ppm the problem may result from under aeration or system flooding.

a. If under aeration occurs, increase the amount of air to the aeration compartment as per Step 3.3.1.6 of this procedure.

b. If system flooding occurs, reduce the liquid load on the plant by adjusting the influent regulation valve for the appropriate treatment unit.

3.3.6 Physical Description of Wastewater

3.3.6.1 Color, odor and amount of foaming provide a quick means of determining if the treatment plant is operating properly. These characteristics shall be noted daily on Work Sheet 1. Any deviations from the normal operating characteristics shall be brought to the attention of the Laboratory Supervisor or his designee.

3.4 CHLORINE ADDITION AND CONTROL

3.4.1 Chemical Addition

3.4.1.1 Chlorine content of the effluent may be controlled by varying the number of slow dissolving calcium hypochlorite tablets in the unit effluent streams, or by varying the addition rate of sodium hypochlorite solution if used.

3.4.1.2 The rate selected will try to maintain greater than 0.5 ppm of free residual chlorine in the final effluent as a target value.

3.4.1.3 Ensure that Sanuril System Feed Tubes are filled each day, Monday through Friday except holidays, when in use.

3.5 ROUTINE MAINTENANCE

3.5.1 Daily Maintenance

3.5.1.1 Remove any large objects such as rocks or blocks of wood from comminutor. Ensure comminutor is switched off prior to removing debris.

3.5.1.2 Use a large dip net or equivalent to remove any floating solids from the clarifier.

3.5.1.3 Check to see that clarifier skimmers are approximately 1/4 inch to 1/2 inch below the water surface. If not, adjust the T-type allen nut located 6 inches from the top of the skimmer, for Units 1 and 2; and T-type wrench located above waterline for Unit 3, as needed.

3.5.1.4 Wash down the water spray nozzles with a water hose and check for proper nozzle spray action. If clogging occurs, lift nozzle cap and allow water to flow freely for several seconds.

3.5.1.5 Flush the spray nozzle pump chamber with a water hose to prevent accumulation of debris.

3.5.1.6 Wash down exposed piping and grating with a water hose.

3.5.1.7 If required gently scrape sludge from the clarifier walls to ensure adequate recycling by the sludge return system.

3.5.2 As Needed Maintenance

3.5.2.1 Hydroflushing of sludge return piping and skimmers is only necessary if clogging occurs.

3.5.2.2 Exposed painted surfaces should be touched up to prevent corrosion.

3.6 SCHEDULED MAINTENANCE

3.6.1 The Maintenance Department is responsible for keeping records of and performing maintenance on the Clow Sewage Treatment Plant equipment.

3.7 MALFUNCTIONS

3.7.1 Refer to Table 1, Aer-O-Flow Visual Checklist, if problems occur in sewage plant operation.

3.7.2 If any equipment malfunctions, notify the Lab Supervision or designee and generate a Condition Report to have a Work Order initiated.

3.7.3 Note any malfunctions and corrective actions taken on the comment section of Work Sheet 1.

3.8 SLUDGE REMOVAL

3.8.1 Sludge from the Sewage Treatment Plant is removed and transported offsite to an approved disposal area by contracted vendor. Sludge shall be sampled and counted for Gross Activity before it leaves plant site, per Procedure 33031-C. Transfer data package to the Chemistry Supervisor.

3.8.2 Notify the Environmental Specialist when sludge is removed for offsite disposal. Sludge is reported on the quarterly operational monitoring report.

NOTE

If tanks can be isolated and influent is stopped, one tank sample may be analyzed by gamma spec analysis. If results meet acceptance criteria, the tank contents can be shipped offsite without additional samples.

3.8. 3 Add soda ash to obtain a pH of between 6-9 in the holding tank.

3.9 RECEIPT OF WASTEWATER, SLUDGE, CHEMICALS OR GREASE

3.9.1 Wastewater and Sludge

3.9.1.1 Transfers of sewage sludge and wastewater can be received on a regular basis. The training center septic tank is a typical example of this type of receipt. Wastewater and sludge shipments from outside Southern Company shall not be received without Chemistry supervision approval.

3.9.1.2 Small volumes of thin sludge and wastewater (i.e. less than about 500 gallons) can be off loaded directly into the STP surge tank. Smaller volumes of wastewater can be added directly into an operating unit's aeration chamber, if needed.

3.9.1.3 Larger volumes of wastewater and sludge should be added to the STP holding pond so that the sludge can undergo digestion by the pond's facultative process prior to being pumped back to the surge tank.

3.9.1.4 Exceptions to the previous steps in this section may be approved by Chemistry supervision on a case by case basis.

3.9.2 Chemicals

3.9.2.1 Chemicals, bulk detergents and other compounds can severely degrade the biological health of the aerobic digestion process of the STP units.

3.9.2.2 No chemicals, other than approved wastewater treatment chemicals, may be added to the sewage treatment plant without specific Chemistry supervision approval.

3.9.3 Grease

3.9.3.1 Grease, like that from the service building's grease trap, can be detrimental to optimum STP operation. Grease can emulsify in the air diffusers and clog system piping.

3.9.3.2 Grease should not be added to the sewage treatment plant without careful consideration and specific approval of Chemistry Supervision.

4.0 **ACCEPTANCE CRITERIA**

4.1 Chemical and physical parameters of the final effluent should be maintained within the targets specified below.

4.1.1 pH: 6.0-9.0 Target - 7.0

4.1.2 Free Residual Chlorine: Greater than 0.5 ppm

NOTE

Collect combined BOD sample at Final Effluent Lift Station.

4.1.3 Biochemical Oxygen Demand: 30 ppm or less

4.1.4 There shall be no discharge of floating solids or visible foam in other than trace amounts.

4.2 Chemical and physical parameters of the aeration compartment wastewater shall be maintained within the limits specified below.

4.2.1 Dissolved Oxygen: Greater than 0.5 ppm

4.2.2 pH: 6.0-9.0

4.2.3 Settleability: 20% - 80% (Target 60- 80%)

4.2.4 No septic odor

5.0 REFERENCES

5.1 National Pollutant Discharge Elimination System Permit No. GA 0026786. Issued June 6, 1999.

5.2 Standard Methods for the Examination of Water and Waste Water. 15th Edition, 1980. APHA-AWWA-WPCF.

5.3 Clow/Aer-O-Flow Sewage Treatment Plant Operation and Maintenance Instructions. Instruction Number 402. Clow Waste Treatment Division. (SCS Document No. 1X2AC13-2)

5.4 PROCEDURES

5.4.1 32438-C, "Determination of Dissolved Oxygen"

5.4.2 32432-C, "Determination of Settleable Solids in Sewage"

5.4.3 36001-C, "NPDES Permit Implementation And Control"

5.4.4 32014-C, "Determination of pH"

5.4.5 33031-C, "Gamma Analysis Of Sewage"

5.4.6 NMP-SH-003, "Electrical Work Practices"

END OF PROCEDURE TEXT

TABLE 1

AER-O-FLO VISUAL CHECK LIST

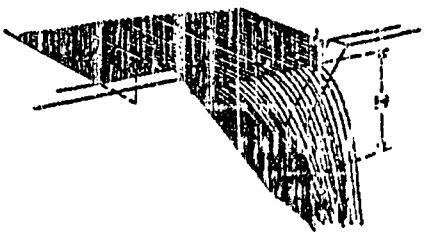
	EQUIPMENT OPERATION	AERATION CHAMBER	CLARIFIER CHAMBER	EFFLUENT	COMMENTS AND CORRECTIONS
1.	All equipment operating properly.	Air bubbles rising. Chocolate color. Little or no foam. 20%-50% solids. More than 1 ppm D. O.	Surface clear to a depth of 18 or more inches.	Clear, sparkling. No solids. More than 1 ppm D. O.	All good-continue same operation.
2.	Equipment Operating Properly	Few or no air bubbles rising. Black color. No D. O.	Dark and murky.	Murky. Odor. High solids.	Check for major air leaks. Clean diffusers and/or air lines. When corrected aerate continuously until brown color and D. O. return. Then return to time clock operation.
3.	Equipment not operating (Check time clock first-may be on "off" cycle.	Same As Above	Same As Above	Same As Above	Check for: power outage, fuses blown-replace. Reset circuit breaker. Motor overload-push reset button. Check overload heaters if reset does not start motor. Check "V" belt drive.
4.	All equipment operating properly.	Air bubbles rising. Light muddy color, too much foam. 5%-15% solids. Murky supernatant poor separation of liquid and solids.	Murky, no visible sludge blanket, Floating sludge in some areas.	Murky, high solids.	Overaeration-plant is running too much. Reduce running time to minimum necessary to maintain brown color. Common during start-up period. Use commercial defoamer if necessary.
5.	All equipment operating properly. D. O.	Air bubbles rising. Chocolate or gray color. 10%-25% solids. 1-3 ppm	Murky, large chunks of floating sludge.	Murky. High solids.	Probably due to inadequate sludge return-scrape tank more often-check return pump (should be returning 1/3 pipe full). (See Special Maintenance Section) Also, see Item 4 on checklist.

TABLE 1

AER-O-FLO VISUAL CHECK LIST

	EQUIPMENT OPERATION	AERATION CHAMBER	CLARIFIER CHAMBER	EFFLUENT	COMMENTS AND CORRECTIONS
6.	All equipment operating properly.	Air bubbles rising. Chocolate color. 20%-30% solids. 1-3 ppm D. O.	Clear at surface, visible sludge blanket 12" or so below surface.	Not murky. Excessive solid particles. D. O. approximately 1 ppm.	May be due to excessive sludge return and/or skimming (See Special Maintenance Section). Possibly due to inadequate -return (See Item 5). Also check B.O.D. and flow-plant may be overloaded.
7.	All equipment operating properly skimmer	Same	Much floating material.	Clear, no solids. D. O. more	May be due to clogged or improperly set skimmer-adjust or unclog. (SEE except than 1 ppm. Special Maintenance Section)
8.	All equipment operating properly except return pump	Same	Same as Item 5	Same as Item 5	Probably due to clogged sludge return-check air supply lines (See Special Maintenance Section)
9.	Equipment will on manual but not on automatic	Same as Item 2	Same as Item 2	Same as Item 2	Possible failure of time work on clock-have electrician check. Overload may be released-push reset button.
10.	All equipment operating except spray system	Same as Item 1	Same as Item 1	Same as Item 1	Possible spray pump not operating-check power supply and push reset. Possible pump plugged-remove pump and clean intake. Possible clogged nozzles-clean.
11.	All equipment operating properly	Air bubbles rising. Light muddy color. Yellow foam, grease balls. No D. O.	Murky. Brownish-yellow floating greasy sludge. Excessive grease.	Murky. Excessive solids.	Possible excessive amounts of grease coming into plant. Investigate and locate source of grease. Terminate any disposal of grease via sewage system

TABLE 2
Discharge from Triangular Notch Weirs with End Contractions



Head (H) in Inches	Flow in Gallons per Min 60° Notch
1	1.27
1¼	1.21
1½	3.53
1¾	5.13
2	7.16
2¼	9.62
2½	12.5
2¾	15.9
3	19.7
3¼	24.1
3½	29.0
3¾	34.5
4	40.5
4¼	47.2
4½	54.4
4¾	62.3
5	70.8
5¼	80.9
5½	89.9
5¾	100
6	112
6¼	124
6½	136

Based on formula:

$$Q = (C)\,(4/15)\,(L)\,(H)\sqrt{2gH}$$

in which Q = flow of water in cu. ft. per sec.
L = width of notch in ft. at H distance above apex
H = head of water above apex of notch in ft.
C = constant varying with conditions, .57 being used for this table
a = should be not less than ¾ L.

For 90° notch the formula becomes $Q = 2.4381H^{5/2}$
For 60° notch the formula becomes $Q = 1.4076H^{5/2}$

FIGURE 1 - Sewage Treatment Plant Layout

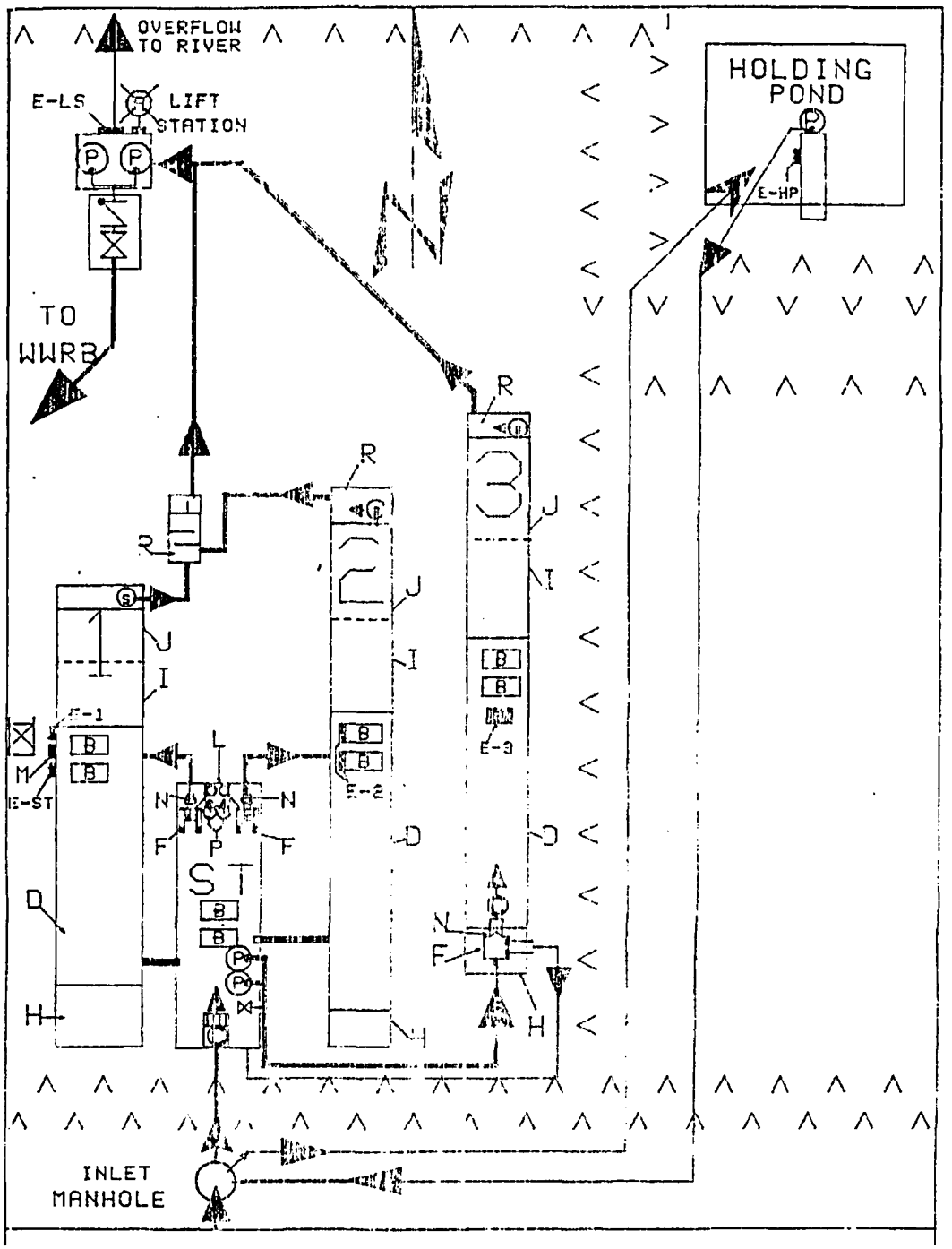
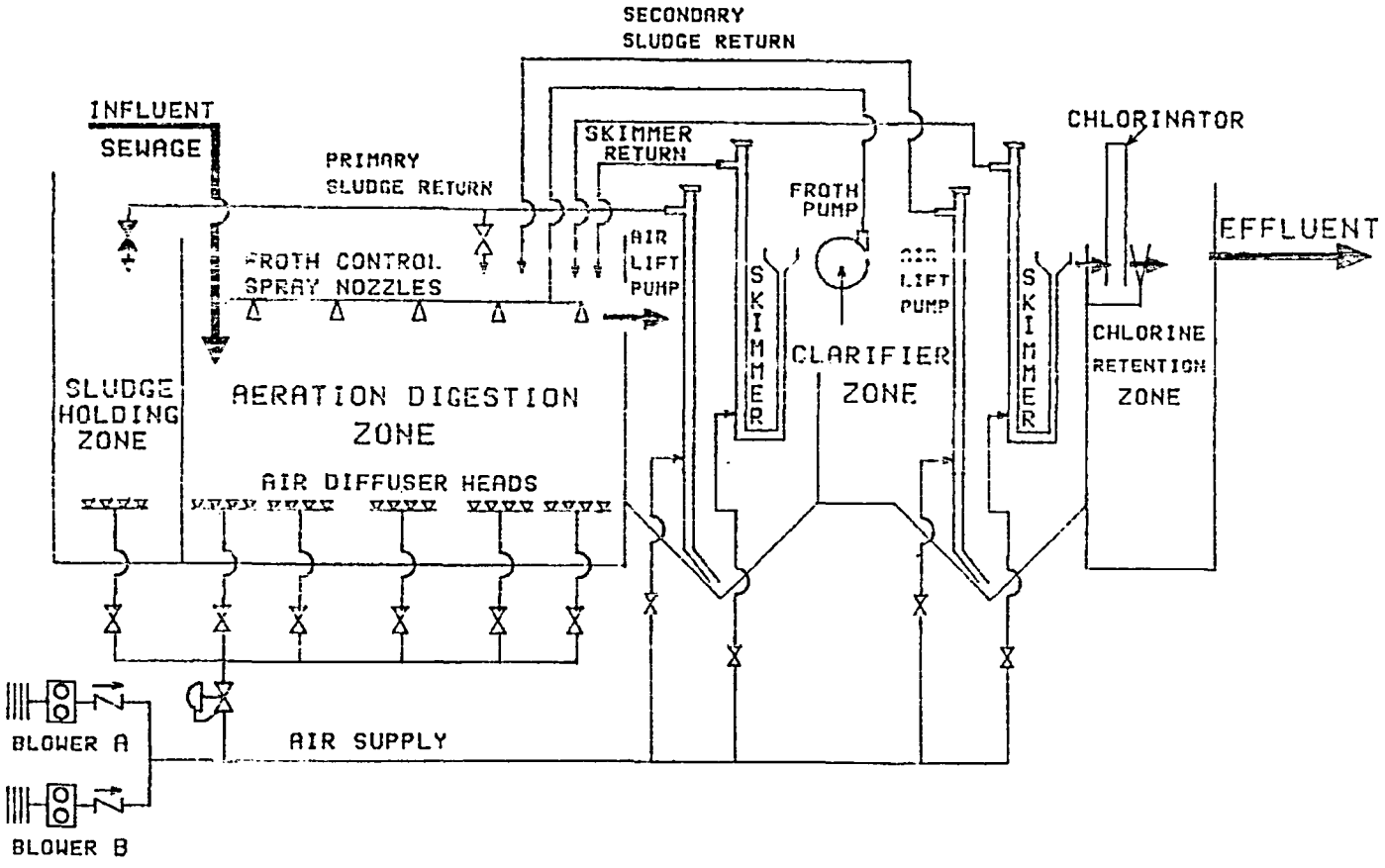


FIGURE 1 (CONT'D.)

SEWAGE TREATMENT PLANT LEGEND

A	Alarm light
B	Blower
C	Comminutor
D	Treatment unit digestion/aeration zone
E	Electric control box
F	Flow control box
H	Treatment unit sludge holding zone
I	Treatment unit primary clarifier zone
J	Treatment unit secondary clarifier zone
L	Air lift pump
M	Main disconnect/breakers
N	60° Vee notch weir
R	Treatment unit chlorination retention zone
S	Tablet chlorination unit
V	Sloped ground
X	Transformer/power feed



SEWAGE TREATMENT PLANT TYPICAL FLOW DIAGRAM
FIGURE 2

Sheet 1 of 1

WORK SHEET 1

DAILY CHECKS

	Surge Tank	Stp 1	Stp 2	Stp 3
Flow	N/A			
Blowers Operating				
Check Comminutor		N/A	N/A	
Clean Bar Screens	N/A	N/A	N/A	
Wash Down				
Remove Trash				
Check & Adjust Skimmers	N/A			
Remove Solids from Clarifier	N/A			
Check Sludge Return	N/A			
Aeration Chamber Septic Odor, Yes or No	N/A			
Aeration Chamber Color	N/A			
Aeration Chamber Foaming	N/A			
Check Chlorination Equip	N/A			
Cl_2 Residual at Lift Station				

Remarks

DATE: _____

PERFORMED BY: _____

Sheet 1 of 1

WORK SHEET 2

WEEKLY ANALYSIS

Aeration Tank	Stp 1	Stp 2	Stp 3
DO_2			
pH @ Temp.			
% Settleable Solids			

Clarifiers	Stp 1	Stp 2	Stp 3
Scrape Walls			

Final Effluent
pH @ Temp. at Lift Station
Cl_2 Residual

DATE: _____

PERFORMED BY: _____

ATTACHMENT 1

INITIATING FLOW TO THE SURGE TANK

1.0 At CNBJ07C panel, ensure the following breakers are in the "ON" position, if available:

a. C-2119-R2-001-M01

b. C-2119-R2-001-M02

c. C-2119-R2-001-M03

d. C-2119-R2-001-M04

2.0 Configure electric lift pump toggle switches (located in lower of panel) by either configuration below:

a. One pump in "HAND" and the other pump in "OFF" position or

b. Both pumps in "AUTO" position.

3.0 Verify that the electric lift pump(s) configured in step 2 is/are working by observing that the surge tank air lift trough (located on north end of Surge tank) is filling/overflowing.

4.0 START a surge tank blower by placing either blower toggle switch into the "HAND" position. Only one blower should be in service.

5.0 Verify that blower is supplying air to surge tank aeration nozzles.

6.0 OPEN OR CHECK OPEN C-2119-U4-518.

7.0 Place CHS-0694 (Comminutor) in "HAND" position.

8.0 PRESS AND RELEASE "START" button on control panel for C-2119-001-M05 (Comminutor)

9.0 Monitor unit performance.

SHEET 1 OF 1

ATTACHMENT 2

ISOLATING FLOW TO SURGE TANK

NOTE

Isolating flow to the STP may not be necessary under some circumstances. Sewage flow may continue to the STP for short periods of time (typically less than 12 hours) without electrical power. Always perform attachment 1 upon restoration of power.

1.0 Verify that the Holding Pond has adequate capacity to receive flow from the plant.

2.0 Place Comminutor hand switch CHS-0694 in "OFF" position.

3.0 CLOSE C-2119-U4-518.

NOTE

Flow to the holding pond may take up to 20 minutes to appear due to time required to backfill to the diversion pipe following initial line up.

4.0 Periodically monitor flow to and level of the Holding pond.

SHEET 1 OF 1

ATTACHMENT 3

PUMPING DOWN THE HOLDING POND TO THE SURGE TANK

1.0 Ensure that the Surge tank is in service and adequate room is available in the Surge tank to receive flow from holding pond.

2.0 START the holding pond pump by placing pump control lever CHS-0703 in the "ON" position. (Located locally at pump)

3.0 Periodically monitor holding pond and surge tank levels.

NOTE

Some wastewater will back flow through the holding pond pump when it is secured.

4.0 When desired transfer is complete, switch off CHS-0703.

SHEET 1 OF 1

ATTACHMENT 4

INITIATE FLOW TO STP #1

1.0 Ensure that a Surge tank blower is in operation and that an electric feed pump(s) is filling the gray air lift trough.

2.0 OPEN C-2119-U4-526.

3.0 THROTTLE OPEN C-2119-U4-527 to achieve desired flow rate (see table 2).

NOTE

Air flow to air lift pump may also be adjusted by throttling C-2119-U4-547.

4.0 At panel CNBJ07D;

a. Ensure all necessary breakers are in the "ON" position.

b. Place one blower toggle switch, located in lower right area of panel, in the "AUTO" or "HAND" position as desired.

(1) C-2119-R2-001-M07 (Blower "A")

(2) C-2119-R2-001-M08 (Blower "B")

5.0 Monitor unit performance.

SHEET 1 OF 1

ATTACHMENT 5

INITIATE FLOW TO STP #2

1.0 Ensure that a Surge tank blower is in operation and that an electric feed pump(s) is filling the gray air lift trough.

2.0 OPEN C-2119-U4-524.

3.0 THROTTLE OPEN C-2119-U4-525 to achieve desired flow rate (see table 2).

NOTE

Air flow to air lift pumps may also be adjusted by throttling C-2119-U4-546.

4.0 Remove access covers on STP #2's blower "A" and "B";

a. Ensure all necessary breakers are in the "ON" position.

b. Place one blower toggle switch, located in lower right area of blower A's panel, in the "AUTO" or "HAND" position as desired.

NOTE

Blower "B" is controlled from Blower "A" panel.

5.0 Monitor unit performance.

ATTACHMENT 6

INITIATE FLOW TO STP #3

1.0 Ensure that the surge tank has sufficient level to support STP #3 feed pump operation. (Feed pumps are located east wall near the comminutor.)

2.0 OPEN OR CHECK OPEN C-2119-U4-540.

3.0 OPEN OR CHECK OPEN C-2119-U4-520.

4.0 OPEN OR CHECK OPEN C-2119-U4-522.

NOTE

The blower to be started in the following step will normally be ran in "AUTO" but may be ran in "HAND" if necessary.

5.0 At STP #3 control panel CNBJ03, START one of the following blowers;

a. C-2119-R2-003-C01

b. C-2119-R2-003-C02

NOTE

The feed pump to be started in the following step will not work in "AUTO" and must be ran in "HAND" position.

6.0 At STP #3 control panel CNBJ03, START one of the following pumps in "HAND";

a. C-2119-R2-P02

b. C-2119-R2-P03

7.0 Throttle C-2119-U4-523 as desired to change feed rate to STP#3.

8.0 Monitor unit performance.

SHEET 1 OF 1

ATTACHMENT 7

SECURING FLOW TO STP#1

NOTE

Step 1.0 may be skipped if intent is to only secure blowers to support maintenance or PM (generally for less than one shift).

1.0 CLOSE C-2119-U4-526 and C-2119-U4-527.

NOTE

Normally, blowers are left in service at all times to provide aeration.

2.0 If required, secure blower by positioning the appropriate toggle switch to "Off" position.

a. C-2119-R2-001-M07 (Blower "A")

b. C-2119-R2-001-M08 (Blower "B")

ATTACHMENT 8

SECURING FLOW TO STP #2

NOTE

Step 1.0 may be skipped if intent is to only secure blowers to support maintenance or PM (generally for less than one shift).

1.0 CLOSE C-2119-U4-524 and C-2119-U4-525.

NOTE

Normally, blowers are left in service at all times to provide aeration.

2.0 If required, secure blower by positioning the appropriate toggle switch to "Off" position.

a. C-2119-R2-002-M01 (Blower "A")

b. C-2119-R2-002-M02 (Blower "B")

SHEET 1 OF 1

ATTACHMENT 9

SECURING FLOW TO STP#3

1.0 Secure flow by securing the operating feed pump. At STP#3 control panel CNBJ03, place the appropriate toggle switch in "OFF" position.

a. C-2119-R2-001-P02 (Feed pump "A")

b. C-2119-R2-001-P03 (Feed pump "B")

NOTE

Normally, blowers are left in service at all times to provide aeration.

2.0 If required, secure blower by positioning the appropriate toggle switch to "Off" position.

a. C-2119-R2-003-C01 (Blower "A")

b. C-2119-R2-003-C02 (Blower "B")

SHEET 1 OF 1

ATTACHMENT 10

REDIRECTING SLUDGE TO THE HOLDING TANK

NOTE

When settable solids are high, sludge may be redirected to that units holding tank. These valves are not numbered locally or on the P & ID. This attachment applies to all three sewage plants.

1.0 OPEN the sludge return valve that feeds the holding tank. This valve can be found by tracing back the 4" pipe from the holding tank to the southernmost valve on the sludge return line.

NOTE

It is normally unnecessary to shut the sludge return valves that feed the aerator. The sludge will largely follow the "path of least resistance" and flow to the holding tank.

2.0 Monitor holding tank level.

3.0 When desired volume has been transferred, close the sludge return valve that feeds the holding tank.

SHEET 1 OF 1

ATTACHMENT 11

DECANTING HOLDING TANKS

1.0 Secure air flow to the holding tank to be decanted. The air isolation valve is not tagged locally nor does it have a P&ID number but can be easily located as the southernmost air isolation valve.

2.0 Let sludge settle for at least one hour.

3.0 Lower a portable sump pump into the holding tank until submerged.

4.0 Direct sump pump discharge hose to either the surge tank or an aeration chamber.

5.0 Start the portable sump pump.

6.0 Slowly lower the sump pump noting when the discharge turns from clear to dark.

7.0 Raise the sump pump to the point that the discharge flow is clear.

8.0 Monitor pumping until all supernatant is decanted. Repeat steps 6 and 7 as needed.

SHEET 1 OF 1

ATTACHMENT 12

ADDING SODA ASH TO THE SEWAGE TREATMENT PLANTS

NOTE

Soda Ash comes in 50 lb bags stored in the STP shed.

1.0 Ensure that the unit's blowers are running during the addition.

NOTE

Add (1) 50 lb bag for pH between 5.0– 6.5. Add (2) 50 lb bags for pH below 5.0

2.0 Add soda ash to the aeration chamber or holding pond.

3.0 Rinse down any dry soda ash that may be on grating or pipes.

ATTACHMENT 13

PLACING LIFT PUMP(S) IN SERVICE

NOTE

a. During periods in which the lift station is out of service and wastewater effluent is being discharged directly to the river, sample effluent daily for BOD.

b. The panel disconnect switch is located on the north side of the lift station.

1.0 PLACE the panel disconnect switch in OFF.

NOTE

a. Normally both pumps are run simultaneously.

b. Pumps will not operate while panel door is open due to a door closure safety mechanism.

2.0 OPEN panel door.

3.0 Place desired pump(s) in the ON position as follows:

a. POSITION breaker **C2119R2501M01** to ON for PUMP **C2119R2501P01.**

b. POSITION breaker **C2119R2501M02** to ON for PUMP **C2119R2501P02.**

4.0 CLOSE panel door.

NOTE

After pumps have been started, lift pump(s) should automatically turn on and off based on lift station sump level.

5.0 To START pump, place PANEL DISCONNECT SWITCH to the ON position.

ATTACHMENT 14

REMOVING LIFT PUMP(S) FROM SERVICE

NOTE

a. During periods in which the lift station is out of service and wastewater effluent is being discharged directly to the river, sample effluent daily for BOD.

b. The panel disconnect switch is located on the north side of the lift station.

1.0 PLACE panel disconnect switch in OFF.

NOTE

Pumps will not operate while panel door is open due to a door closure safety mechanism.

2.0 OPEN panel door.

3.0 Position desired pump(s) in the OFF position as follows:

a. POSITION breaker **C2119R2501M01** to OFF to STOP pump **C2119R2501P01.**

b. POSITION breaker **C2119R2501M02** to OFF to STOP pump **C2119R2501P02.**

4.0 CLOSE panel door.

NOTE

By leaving panel disconnect in ON, the heater and fan will continue to work. Lift pump(s) should automatically turn on and off based on lift station sump level if associated breaker is in ON position.

5.0 PLACE panel disconnect switch to the ON position.