

To: D. A. Miller

From: W. B. Genetti
Date: May 1, 1991

Subject: WASTE WATER TREATMENT SYSTEM - OPERATING
MANUAL

VISTA

Interoffice
Communication

Attached is the reference manual for the Waste Water Treatment System. This manual is designed to be a "how - to" step by step procedure for operation of the ponds.

There are only limited explanations included in the process description sections. A more detailed description is contained in the Bio Ponds Operating Manual - Revised completed by T. A. Madigan in July of 1989.



Berlin Genetti
Coop Process Engineer

THE
HOW – TO
MANUAL
FOR THE
WASTE WATER
TREATMENT
SYSTEM

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

INTRODUCTION

Wastewater from the Vinyl, Compound, and Plasticizer areas of the plant is discharged to the waste water treatment ponds for physical and biological treatment prior to discharge to James Creek. The plant has an NPDES permit from the state of Mississippi which outlines Quantities of water contaminants that can be discharged into the creek.

The following summary briefly describes the major units of the ponds and their primary functions.

A. Pond 1

Pond 1 consists of two concrete settling basins that separate PVC resin from the wastewater. The resin collects in the bottom of the basins and is periodically reclaimed by the resin reclaim system.

B. Pond 3

Pond 3 is a small equalization lagoon in which wastewater pH is adjusted and fertilizer is added. Limited biological treatment occurs in this pond.

C. Biodisc

The biodisc consists of three rotating biological contactors which are highly aerated and remove approximately 60% of the influent Biological Oxygen Demand (BOD).

D. Pond 4

Pond 4 is a highly mixed and aerated lagoon that accomplishes further BOD removal.

E. Pond 5

Pond 5 is a large and partially aerated lagoon in which Biological Total Suspended Solids (TSS) settle out and are biodegraded. A small amount of final BOD removal occurs in Pond 5.

F. Pond 6

Pond 6 is a small lagoon prior to the out fall that settles minor quantities of TSS that carry

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INTRODUCTION (Continued)

over from pond from pond 5. Treated waste water flows from Pond 6 to James Creek.

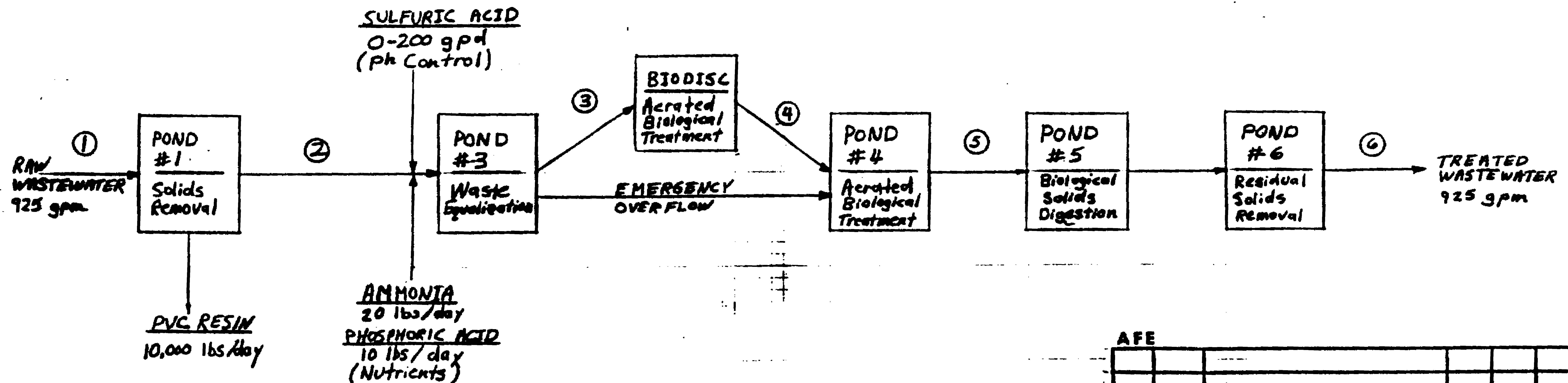
Storm water accumulated in the plant is discharged from two storm water pits located on the south-east side of the plant. These pits have NPDES permit limits and must be monitored.

The following is a description of the storm water pits:

- a. Storm water flows from the rain sewer into a pit. This pit settles solids out of the water before being discharged.
- b. The water is discharged from a weir south of the pit.
- d. The pits are dredged as the solids begin to accumulate.

The Breathing Air Compressor has a weir leaving the plant on the west side of the plant.

BIOPONDS PROCESS FLOW DIAGRAM



BIOPONDS WATER QUALITY (Average Conditions)

①	②	③	④	⑤	⑥
BOD - 125 ppm COD - 300 ppm TSS - 900 ppm ph - 5-12	BOD - 125 ppm COD - 300 ppm TSS - 50 ppm ph - 5-12	BOD - 125 ppm COD - 300 ppm TSS - 10 ppm ph - 5-10	BOD - 50 ppm COD - 150 ppm TSS - 50 ppm ph - 6-10	BOD - 20 ppm COD - 50 ppm TSS - 50 ppm ph - 7-8	BOD - 10 ppm COD - 25 ppm TSS - 10 ppm ph - 7-8

AFE

ISU	DATE	DESCRIPTION	BY	CKD	APD
CONOCO CHEMICALS ABERDEEN MISSISSIPPI BIOPONDS PROCESS FLOW SCALE:					
APPD: DATE:		No.			

WASTE WATER TREATMENT SYSTEM
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AERATORS [Responsible: Utility Technician]

Check Twice Daily (once each shift)

POND	# AERATORS	MINIMUM IN OPERATION
Pond 3	2	2
Pond 4	8	5
Pond 5	2	1

If an aerator is off:

1. Check power breaker. (MCC next to Pond 3)
2. If power is off:
 - a. Check with Utilities Supervisor for reason.
 - b. If no reason - turn on.
3. If power is on:
 - a. Report to Utilities Supervisor (3575).
 - b. Report to Environmental Coordinator (3637).
 - c. Write work order to get fixed.

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AERATORS PROCESS DESCRIPTION

Aerators are used in the waste water treatment ponds for the following reasons:

1. Mixing the water to equalize the pH.
2. Add oxygen to the water for the microorganisms.
3. Increase the waters Dissolved Oxygen (DO) content.

WASTE WATER TREATMENT SYSTEM
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AMMONIA [Responsible: Utility Technician]

Check and record the ammonia concentrations on Monday, Wednesday, and Friday at:

1. Inlet to Biodisc.
2. Outlet to Biodisc.
3. Outlet of Pond 4.

SAMPLING PROCEDURES

Use the following procedure to Check the ammonia concentration:

1. Fill the sample cup to the 25 ML mark.
2. Add 3 drops of A-1500 Stabilizer Solution.
3. Snap the tip of the Chemet ampoule in the sample.
4. After one minute compare with color standard (results in parts per million [PPM]).

Replace Chemet ampoules and Stabilizer Solutions at the storeroom.

SETTING FEED RATES

Pond 4 concentration:

1. Is greater than 0.5 PPM set the ammonia feed rate at 5 to 8%.
2. Is less than 0.5 PPM set the ammonia feed rate at 15-20%.

AMMONIA TANK LEVEL

Check and record the level in the ammonia tank daily.

Ammonia should be purchased when the ammonia tank level drops to 12 inches. Ammonium Nitrate can be purchased from the local coop and added manually as an alternative to anhydrous ammonia.

AMMONIA UNLOADING

1. Yard operator weighs truck in and notifies Utility

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

AMMONIA (Continued)

AMMONIA UNLOADING (Continued)

Technician or Supervisor.

2. Utility Technician is to verify:
 - a. The tank is ready and will hold the amount to be put into it.
 - b. The safety shower and eye wash are in good condition.
 - c. A water hose is hooked up and ready for use if needed.
3. The truck driver has been trained on what and how to do the handling and unloading of their truck.
4. The Utility Technician will verify that the driver has following on the truck:
 - a. A.P. MFG. date and test rated hose. Dated within 5 years to date.
 - b. 5 gallons of clean water.
 - c. Ammonia mask with 2 spare canisters for NH₃ use.
 - d. Must be wearing safety or leather shoes.
5. When unloading, hook-ups and disconnects:
 - a. Utility Supervisor and driver to fill out check sheet (see attached form), sign and date.
 - b. Driver must know location of safety shower, eye wash and water hose.
 - c. Must wear face shield, chemical goggles, rubber or impervious to ammonia gloves and clothing to cover the skin.
 - d. Unload only in daylight hours.

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AMMONIA PROCESS DESCRIPTION

Ammonia is added continuously to the sump in order to fertilize the water prior to biological treatment. Nitrogen is needed for the growth of the microorganisms in pond 3, the biodisc and in ponds 4 and 5.

Anhydrous ammonia is stored under pressure in a 1500 gallon horizontal tank located inside of the acid dike. Ammonia vapor from the tank passes through a pressure regulator, a fine metering valve and a rotameter and is then bubbled into the bottom of the mixing sump.

The ammonia feed rate is set according to the ammonia concentration in pond 4, which assures that the feed is sufficient for acceptable biological treatment. A typical feed rate of ammonia is approximately 20 lbs/day.

ANHYDROUS AMMONIA UNLOADING FORM
CHECK SHEET

The following items have been checked and permission given to unload Anhydrous Ammonia into bulk storage tank.

BULK STORAGE TANK (SIZE 4' DIAMETER BY 15' LONG)
INCHES IN SIGHT GLASS _____ (VISIBLE PAIR IS 11" ABOVE BOTTOM OF TANK)

AIR HOSES INSPECTED YES _____ NO _____

MATERIAL UNLOADING HOSES YES _____ NO _____

HOSE FITTING YES _____ NO _____

HOSE GASKETS YES _____ NO _____

AMMONIA GAS MASK W/2 SPARE
CANISTERS ON TRUCK YES _____ NO _____

SAFETY CLOTHING WORN YES _____ NO _____

SAFETY BOOTS OR LEATHER SHOES YES _____ NO _____

SAFETY RUBBER GLOVES OR GLOVES
IMPERVIOUS TO AMMONIA YES _____ NO _____

FACE SHIELD AND GOGGLES YES _____ NO _____

SAFETY SHOWER LOCATED AND OKAY YES _____ NO _____

AMMONIA WEIGH 1 GALLON - 6.4 POUNDS
TANK CAP - 1500 GALLONS - 9600 POUNDS

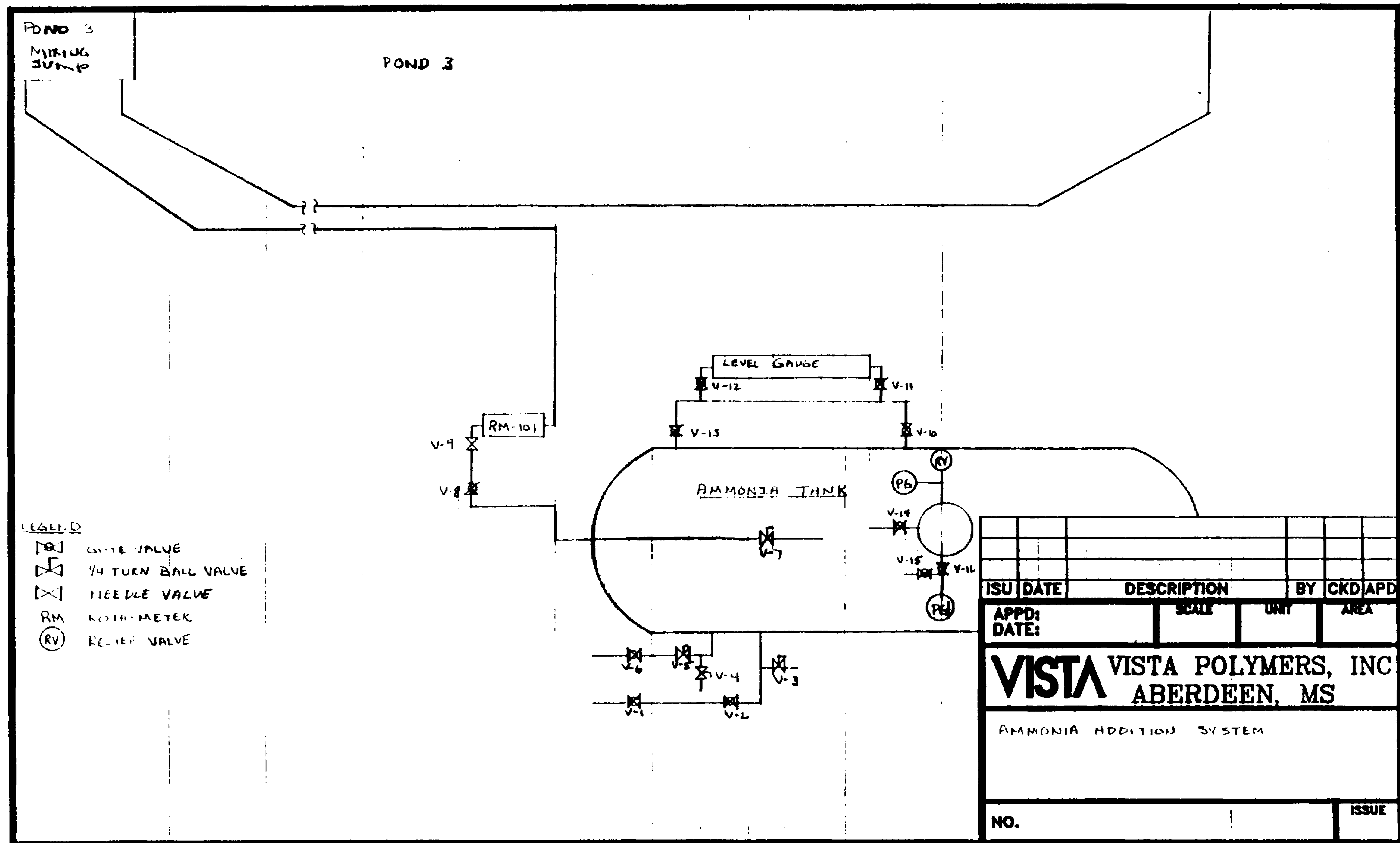
UTILITY OPERATOR SIGNATURE

UTILITY SUPERVISOR

TRUCK DRIVER SIGNATURE

DATE

ISSUED 9-29-86 MHW



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BREATHING AIR COMPRESSOR - OUTFALL

[Responsible: Process Engineering]

The BAC out fall must be checked twice a month. The following must be checked and recorded.

1. Flow - This is measured in inches. The attached strapping table is used to convert to gallons per minute.
2. Temperature - maximum limit is 32.2 degrees C (90 degrees F). Use portable pH/Temperature probe located at the boiler house for testing.
 - a. The temperature reading is taken at the fence line where the BAC outfall enters James Creek.
 - b. If above maximum limit partially open potable water valve (a small stream).
3. pH - Use the portable pH/Temperature probe located at the boiler house for testing. Limits are:
 - a. Maximum limit 9.0 standard pH units.
 - b. Minimum limit 6.0 standard units.
 - c. If pH is outside of limits contact:
Utilities Supervisor (3575)
Environmental coordinator (3637)

The results from the above testing will be reported to the state at the end of each month (NPDES report).

SAC 004
FLOW CONVERSION
STRAPPING TABLE
#####

INCHES
#####

GPM
#####

1	2.28
1 1/4	3.97
1 1/2	6.27
1 3/4	9.22
2	12.87
2 1/4	17.28
2 1/2	22.49
2 3/4	28.54
3	35.47
3 1/4	43.33
3 1/2	52.15
3 3/4	61.96
4	72.81

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BIOASSAY [Responsible: Process Engineering]

1. The week before the Bioassay sampling is needed, TIA Environmental will send the Environmental Coordinator:
 - a. 3 coolers.
 - b. A 1 gallon container for each sample required.
 - c. 3 chain of custody records.
 - d. 1 tag per sample required.
2. On Sunday, Tuesday, and Thursday (at Pond 6 outfall):
 - a. Rinse out sample jug.
 - b. Turn sampler control to forward (to prime pump).
 - c. Turn sample control to auto.
 - d. Leave for 24 hours.
3. On Monday, Wednesday, Friday:
 - a. Take applicable cooler (1,2, or 3) to pond 6 (turn sampler off).
 - b. Fill all gallon containers in cooler.
 - c. Fill out one tag per container and attach to container.
 - d. Fill out chain of custody form, place in cooler.
 - e. Pack cooler with ice (3 bags required).
 - f. Ship Airborne or Federal Express.

WASTE WATER TREATMENT SYSTEM
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BIODISC OPERATION [Responsible: Utility Technician]

SHAFT WEIGHTS

Check and record the biodisc shaft weights Monday, Wednesday, and Friday.

1. Check the biodisc shaft weights by:
 - a. Connect the hand hydraulic pump to the load cell fitting at the shaft being weighed.
 - b. Shut the relief valve on the hand hydraulic pump.
 - c. Apply pressure with slow steady strokes of the hand pump until the pressure remains constant. Record the constant pressure reading.
 - d. Open the relief valve on the hand hydraulic pump and disconnect the pump from the load cell fitting.
2. Normal operating range 700 psig to 1400 psig.

SHAFT WEIGHTS TOO HIGH - AIR STRIPPING

If one or more of the biodisc shaft weights is greater than 1400 psig use the following procedure to air strip the biodisc:

- a. Open the 6-inch discharge valve on the spare air blower (the blower is not running at the time).
- b. Close the inlet butterfly valve on the spare air blower.
- c. Turn on the spare air blower and open the inlet butterfly valve three notches.
- d. Two hours later open the inlet butterfly valve even further until the biodisc shafts are turning 1.6 to 1.8 rpm. Do not turn the biodisc shafts faster than 1.8 rpm.
- e. Air strip for 24 hours and then shut off one of the air blowers.

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BIODISC OPERATION (Continued)

- f. Reset the shaft speeds to make sure the

SHAFT WEIGHTS TOO HIGH - AIR STRIPPING (Continued)

weights have dropped below 1000 psig.

SHAFT WEIGHTS TOO HIGH - CAUSTIC STRIPPING

If air stripping does not succeed in reducing the biodisc shaft weights, caustic strip the biodisc using the following procedure:

- a. Shut off the biodisc feed pumps.
- b. Carefully add drummed caustic soda to the biodisc sump until the pH is greater than 11.
- c. Spin the biodisc at 1.2 to 1.6 rpm in the high pH water until the shaft weights are below 1000 psig.
- d. Turn on one of the biodisc feed pumps.
- e. Monitor the pH in Pond 4 closely, and manually add acid to Pond 4 if necessary.

SHAFT WEIGHTS TOO LOW

Notify the Utilities Supervisor (3575) and the Environmental Coordinator (3637) immediately.

AIR FLOW AND SHAFT SPEED

Check and record the rpm of the biodisc shafts once each shift and adjust speeds as required.

When reading the shaft be sure:

1. To wait at least 15 seconds after shaft selector switch is changed.
2. The shaft speeds are between 1.2 and 1.6 rpm.

Shaft speeds are changed by adjusting the position of the butterfly valve on the suction line of the air blowers.

- a. If shaft turns too slow:

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BIODISC OPERATION (Continued)

AIR FLOW AND SHAFT SPEED (Continued)

1. Increase the air flow rate by opening the blower inlet butterfly valve one notch. Check the speeds again. Open the valve more if necessary.
 2. Check to make sure that the blower piping does not leak. The underwater piping in the biodisc can be checked by opening the shaft cover doors and observing the pattern of rising air bubbles in the disc sump.
 3. Check the air filters on the suction of the blowers to make sure that they are not plugged.
- b. If shaft turns too fast:
1. Decrease the air flow rate by closing the blower inlet butterfly valve one notch. Check the speeds again. Close the valve more if necessary.
3. Check and record the air blower discharge pressure, motor amperage and the biodisc feed pump discharge pressure each day.

ABNORMAL GROWTH ON BIODISC

There is abnormal growth, the biodisc should be air stripped (see shaft weights too high - air stripping) if:

1. A biodisc shaft becomes lopsided and turns irregularly (shaft speed varies 0.2 rpm or more during a single revolution).
2. The biodisc develops a whitish color.
3. COD removal across the biodisc is consistently below 60%.

POWER FAILURE

1. If an air blower shuts off:
 - a. Turn on spare as soon as possible.

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BIODISC OPERATION (Continued)

POWER FAILURE (Continued)

- b. Report to Utilities Superintendent (3575) and Environmental Coordinator (3637).
 - c. Write work order to get the blower fixed.
- 2. In the event that both air blowers are out of service for more than 6 hours:
 - a. Empty the water from the biodisc. The portable trash pump, stored in the shed at the API, must be used to pump the water from the biodisc sump into pond 4.
 - b. The biodisc sump must be empty 12 hours after power is lost, otherwise permanent damage will result to the biodisc shafts.

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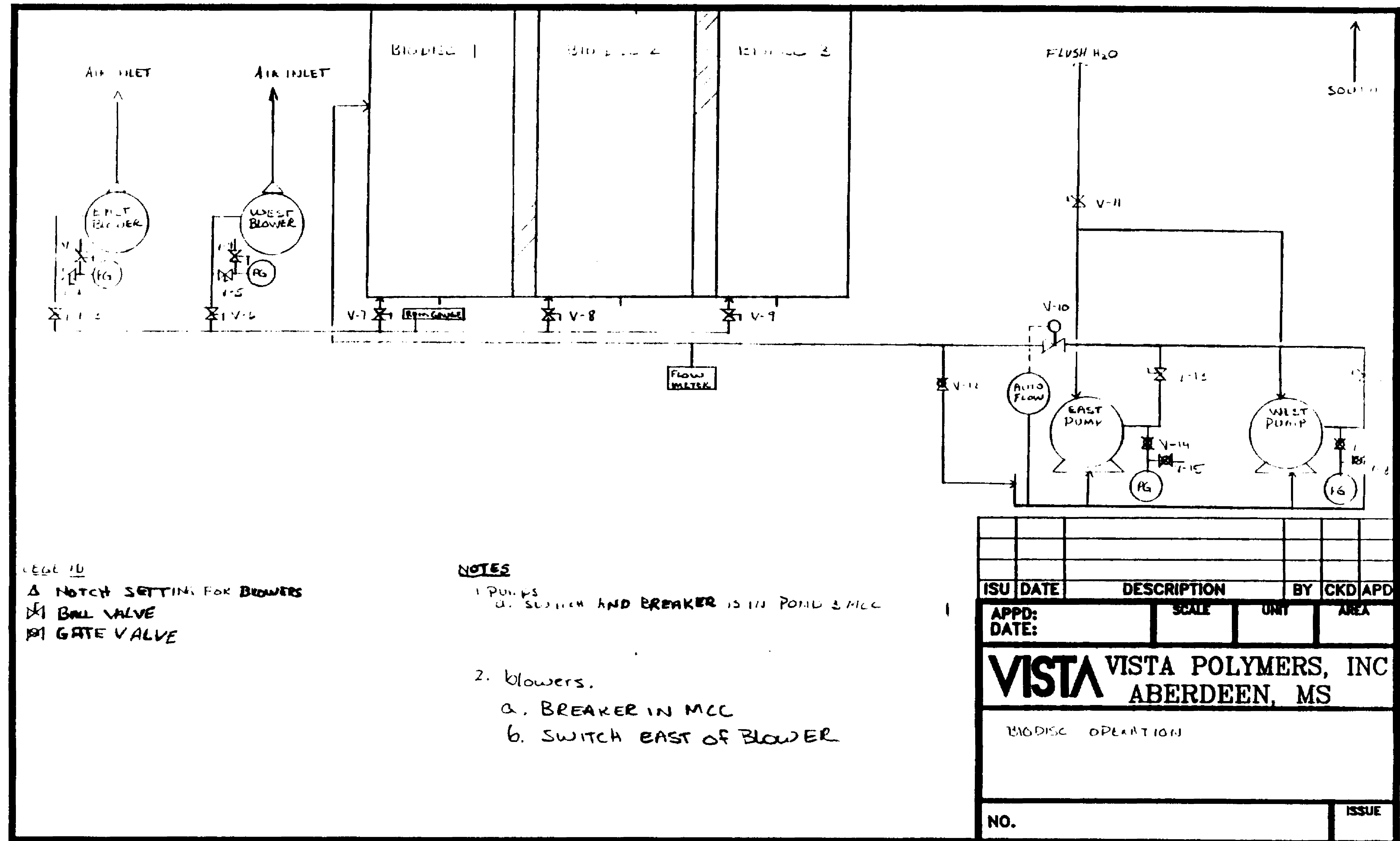
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BIODISC PROCESS DESCRIPTION

The water from pond three gravity flows into the biodisc pump out sump. The biodisc feed pump transfers the wastewater from the pump out sump to the biodisc.

The biodiscs are covered with a thin film of microorganisms, called biomass, which remove BOD and COD from the water. In the biodisc the wastewater is brought into contact with the rotating biological surfaces. As the surface rotates, wetted biomass passes through the atmosphere in order to aerate the microorganisms. This transfer of oxygen is necessary to maintain an aerobic process.

Water flowing through the biodisc has a theoretical residence time of one hour.



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CHEMICAL OXYGEN DEMAND (COD) - TESTING

[Responsible: Utilities Technician]

COD testing is done every Monday, Wednesday, and Friday.

60 ML samples are taken from:

1. Pond 3 inlet
2. Biodisc inlet
3. Biodisc outlet
4. Pond 4 outlet
5. Pond 5 outlet
6. Pond 6 outlet

Samples are taken to the G. C. Lab for analysis. The date, sample location, and what the sample is being tested for MUST be logged in the "SPECIAL SAMPLE" log book.

Two sets of bottles will be kept to minimize the time involved. One set of bottles will be picked up from the lab as the other set is brought in with fresh samples.

If the COD test results CONSISTENTLY show less than 60% reduction across the biodisc, strip the biodisc (see biodisc operation section - shaft weights to high of this manual).

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CHEMICAL OXYGEN DEMAND (COD) - PROCESS DESCRIPTION

The term COD means Chemical Oxygen Demand, which is similar to BOD. COD is measured in wastewater in order to quickly estimate BOD, since the COD test takes 2 hours and the BOD test takes 5 days. The COD at the Aberdeen Plant is typically 2.5 times greater than the BOD.

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DISSOLVED OXYGEN [Responsible: Utility Technician]

The Dissolved Oxygen content will be tested every Wednesday. The content must be greater than 6.0 PPM. The following procedure will be used for this test:

NOTE: The Dissolved Oxygen meter is stored in the boiler house.

1. Calibrate using the instructions on the back of the meter.
2. Place the probe through the fence into James Creek. (There is an open space in the fence at the bottom of the stairs made for this purpose).
3. Allow sufficient time for the probe to stabilize.
4. Read Dissolved Oxygen concentration on the appropriate range (0-10 or 0-20).
5. Record Temperature with probe by turning to "TEMP".

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FLOATING SOLIDS [Responsible: Utility Technician]

The NPDES permit from the state of Mississippi does not allow floating solids to be discharged into James Creek.

The solids removal system is as follows:

1. Floating solids accumulate on Pond 3.
2. Booms in place to collect the solids in the corner of the pond.
3. The solids are skimmed from the pond, dewatered and transferred to a dumpster.
4. These non-hazardous solids are disposed of as hazardous to avoid future liabilities.

Floating Solids in ponds 4, 5, or 6:

1. Notify the Utilities Supervisor (3575) and the Environmental Coordinator (3637).
2. Get booms from the MCC next to Pond 3 (top shelf).
3. Tie booms so solids flow into them.
4. Skim solids, dewater, and place in dumpster.
5. Dispose of with solids from Pond 3.
6. Replace booms in MCC from the storeroom.

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FOAM ON PONDS [Responsible: Utility Technician]

The NPDES permit does not allow foam to be discharged into James Creek.

If foam is noticed on the ponds:

1. Notify the Utilities Supervisor (3575) and the Environmental Coordinator (3637).
2. Bring a drum of FOAMTROL from the boiler house to the weir at Pond 6 going into James Creek.
3. Get a compressor from the Utilities Supervisor.
4. Bring the drum stand and nozzle from the boiler house.
5. Screw the nozzle and valve on the drum.
6. Place the drum on the drum stand.
7. Plug the compressor into the electrical hookup north of the Pond 6 weir going into James Creek. Place the compressor hose in the top of the drum for agitation. Turn the compressor on and agitate until milky.
8. Open the valve a little bit to dribble in the foamtrol.
9. Do the normal COD and BOD testing, but, watch the numbers carefully. If they increase sharply cut down the flow of foamtrol.
10. The Utilities Supervisor will order another drum of foamtrol when a drum is brought to the Ponds.

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NPDES PERMIT LIMITS

A 24 hour composite sample will be used once a week to analyze the following:

<u>TEST</u>	<u>PERMIT LIMITS (lbs/day)</u>	
	<u>DAILY AVERAGE</u>	<u>DAILY MAXIMUM</u>
BOD	295	786
COD	1026	2736
TSS	491	1396
NH3	12.3	24.5

A grab sample will be used once a week to analyze the following:

<u>TEST</u>	<u>PERMIT LIMITS</u>
pH	minimum = 6.0 standard units maximum = 9.0 standard units
DO	minimum = 6.0 PPM
TEMPERATURE	maximum = 32.2 degrees C (90 F)

The flow will be recorded continuously and reported once a week, but there is no permit limit.

A 24 hour composite sample will be used once a month to analyze the following:

<u>TEST</u>	<u>PERMIT LIMITS</u>	
	<u>DAILY AVERAGE</u>	<u>DAILY MAXIMUM</u>
LEAD	13 PPB	34 PPB
CHLORINE	NO LIMIT	0.5 PPM
HARDNESS	NO LIMIT	NO LIMIT

There shall be none of the following discharged from the pond 6 outfall:

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NPDES PERMIT LIMITS

1. Foam
2. Floating solids
3. Sheens of any kind

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ODOR AT THE PONDS [Responsible: Utility Technician]

In case of bad odor at the ponds:

1. Contact the Utilities Supervisor (3575) and the Environmental Coordinator (3637).
2. Turn the aerators off in the pond that has odor problems.
3. When the cause is determined the Utilities Supervisor or the Environmental Coordinator will give corrective instructions if needed.

NOTE: Most cases of odor at the ponds will be caused by the monoester in the T-460 treatment tank not being fully reacted.

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OIL SHEENS [Responsible: Utility Technician]

Oil that is discharged to the process sewers will collect on ponds 1 and 3. If the oil is left on the Ponds, it will slowly dissolve and result in an increased BOD loading to the ponds. If oil is discovered:

1. Notify the Utilities Supervisor (3575) and the Environmental Coordinator (3637).
2. A boom from the Pond 3 MCC will be placed over the outfall of the pond the oil is in.
3. The oil should be skimmed off promptly and placed in drums.
4. The skimmed oil should be dumped into the waste oil sump on the east side of the API Separator.
5. Replace used booms with new booms from the storeroom.

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pH CONTROL [Responsible: Utility Technician]

pH CHECKS

1. Calibrate the portable pH meter once daily using the pH buffer solutions of pH 7 and 10.
2. The Utility Technician will check the pH once each shift using the hand held pH meter in the following locations:
 1. Pond 3 inlet
 2. Biodisc inlet (6 to 9)
 3. Biodisc outlet (6 to 9)
 4. Pond 4 outlet (6.5 to 9)
 5. Pond 5 outlet (7 to 8)
 6. Pond 6 outlet (7 to 8)

If pH is high:

1. Notify the Utilities Supervisor (3575) and the Environmental Coordinator (3637).
2. If acid line is clogged blow out line by fully opening valve for a couple of minutes.
3. If needed add acid from the day tank to Pond 4 manually.

If pH is low:

1. Notify the Utilities Supervisor (3575) and the Environmental Coordinator (3637).
 2. Add soda ash (located at the MCC at Pond 3) to the inlet of the pond with low pH.
3. Check the calibration of the Pond 3 stationary pH probes once each shift by comparing the pH readings indicated by the portable and stationary pH meters.

If the stationary pH meter reading differs from the portable pH reading by 1 pH unit or more, clean the stationary pH probe.

WASTE WATER TREATMENT SYSTEM
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pH CONTROL (Continued)

pH CHECKS (Continued)

If cleaning the probe does not make the reading within 1 unit of each other, write a workorder to get the stationary probes calibrated.

4. Check the sulfuric acid day tank level at least once each shift, and top off the day tank as needed. Record the quantity of sulfuric acid used each shift.
5. The sulfuric acid tank should be refilled whenever the level falls to 24 inches. Check the larger sulfuric acid tank level at least once each week.
6. Chart paper in the pH recorder should be replaced every 30 days.

SULFURIC ACID UNLOADING PROCEDURES

Industrial strength sulfuric acid is one of the most dangerous of acids to handle. For this reason it must be handled with extreme caution and with awareness of the danger to anyone who may come in contact with it.

The Utility Technician is responsible for making sure that the sulfuric acid tank has the capacity to hold the acid load. The yard operator is responsible for:

- a. Watching the driver to insure safe operation.
- b. Opening and closing the fill line valve on the large acid tank.
- c. Providing proper and safety equipment to the driver when necessary.

The following rules apply, in general, to sulfuric acid unloading:

- a. Protective clothing must be worn during initial transfer by both operating personnel and the truck driver.
 1. Face shield
 2. Safety Glasses

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pH CONTROL (Continued)

SULFURIC ACID UNLOADING PROCEDURES (Continued)

3. Rubber gloves
4. Slicker suit
- b. Unloading of sulfuric acid will be done during daylight hours.
- c. The driver and operator must remain with the trailer at all times.
- d. All tools and equipment are to be kept in safe operating conditions.
- e. All defective in valves or safety equipment should be reported to the Utilities Superintendent.

The step-by-step unloading procedure is as follows:

1. Weigh-in trailer and fill out weigh ticket, the driver paperwork must verify contents and quantity of gallons contained.
2. Obtain a "sulfuric acid unloading form" from clipboard in office and notify Utilities Superintendent. The top portion of third form is filled out by the utility operator, signed, dated, and returned for checklist.
3. Instruct the truck driver of the required safety items and location for unloading.
4. Insure driver has all necessary safety equipment and that trailer has a working pop-off valve.
5. After the trailer is properly spotted, both the truck driver and operator must put on all safety equipment.
6. The operator will complete the checklist item on the "sulfuric acid unloading form" and sign it. Be sure that the truck driver signs it also.
7. The yard operator will inspect all hoses

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pH CONTROL (Continued)

SULFURIC ACID UNLOADING PROCEDURES (Continued)

and fittings to be sure they are safe and designed for sulfuric acid. The hoses should be cross-linked polyethylene, hypalon rubber, or teflon-lined and should have no holes or patches. The fittings should be made of stainless steel or black iron and should be free of nicks or dents. Gaskets are to be teflon or hard rubber.

8. Instruct the driver to connect hose from plant unloading line to his trailer.
9. Open the air supply valve and regulate the pressure to 30 psig.
10. When trailer gauge reaches 10 psig, open the bulk tank unloading valve. Be sure to wear protective gear at this point.
11. Instruct the driver to open his unloading valve.
12. The in line relief valve is set to relieve at 30 psig which prevents over pressuring of the trailer.
13. When the trailer empties, allow sufficient time for the acid to empty out of the unloading line.
14. Any leaks or drips that develop during unloading should be repaired. If a leak cannot be repaired, every effort should be made to contain it.
15. Insure trailer pressure gauge reads "0" before closing off air supply valves and disconnecting from trailer.
16. Close all unloading valves including one on the storage tank.
17. Bleed down trailer before disconnecting product lines. Wear protective gear to disconnect hoses.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

pH CONTROL (Continued)

SULFURIC ACID UNLOADING PROCEDURES (Continued)

18. Provide water from water hose for driver to wash up hoses.
19. All washdown should be contained in acid dike.
20. Instruct the driver to return to scales for re-weighing and paperwork.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

pH CONTROL PROCESS DESCRIPTION

The pH Control system maintains the pH of the waste water in Pond 3 between 6.5 and 10.0 pH units. Concentrated sulfuric acid is used to neutralize water with high pH and soda ash is used to neutralize water with low pH.

The pH is controlled by monitoring the incoming waste water with a pH probe located in the Pond 3 mixing sump. A second pH probe is located on the discharge of Pond 3 and is used to monitor the Pond 3 exit pH for alarm conditions (alarm low = 7 alarm high = 10).

NOTES: a. High pH usually comes from tank T-460.
 b. Low pH usually comes from the
 incinerators.

A

SULFURIC ACID UNLOADING FORM

BULK STORAGE TANK _____ INCHES

PERMISSION TO UNLOAD _____

BOILER HOUSE PERSONNEL _____

DATE _____

The above items must be checked and form filled out by boiler house personnel.

CHECKLIST FOR YARD OPERATORS

AIR HOSES INSPECTED	YES _____	NO _____
MATERIAL UNLOADING LINE	YES _____	NO _____
HOSE FITTINGS	YES _____	NO _____
HOSE GASKETS	YES _____	NO _____
SAFETY CLOTHING WORN	YES _____	NO _____
SAFETY BOOTS	YES _____	NO _____
SAFETY RUBBER GLOVES	YES _____	NO _____
FACE SHIELD	YES _____	NO _____

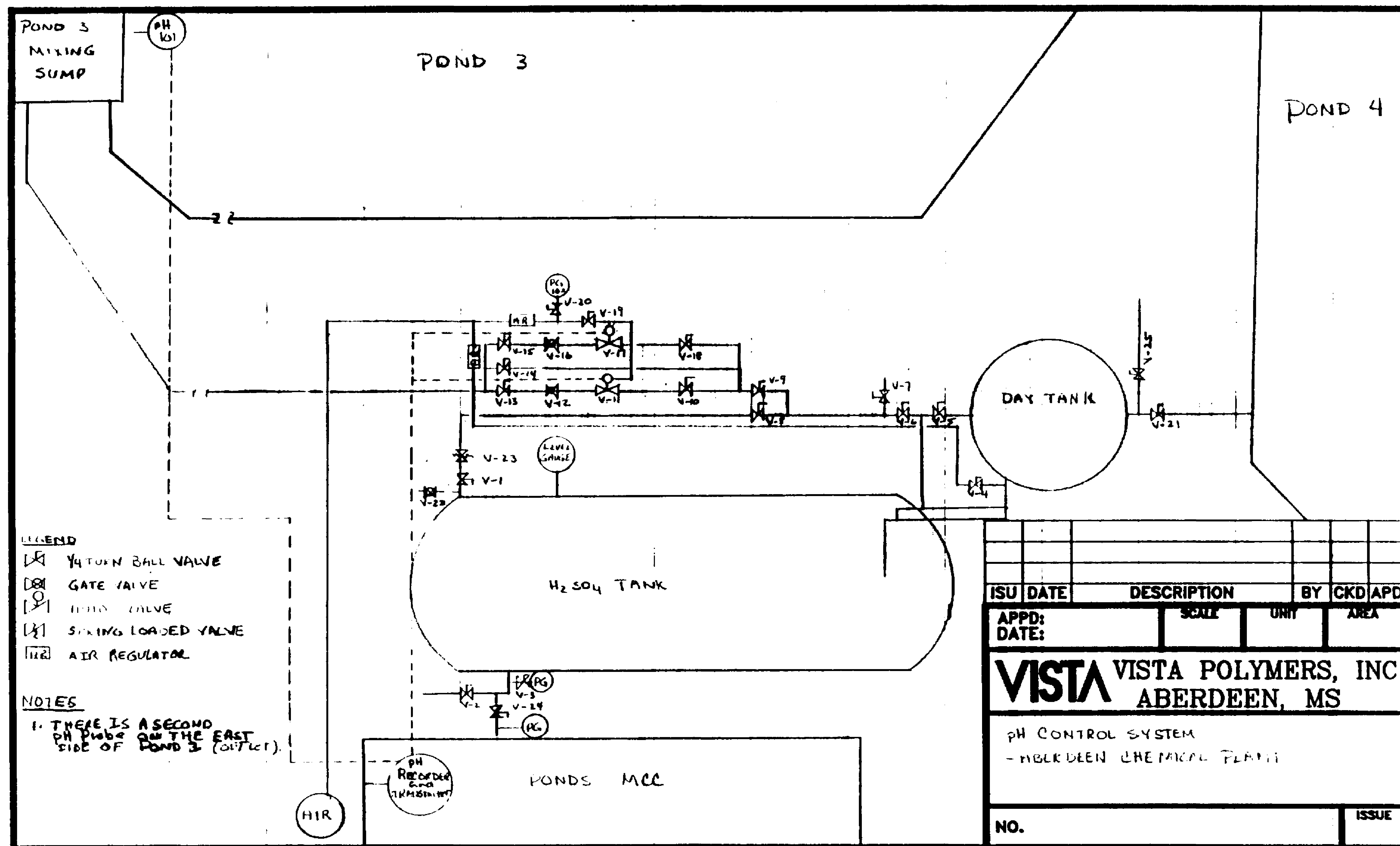
Any spill of one (1) gallon or more must be reported to Utilities Supervisor.

Yard Operator's Signature

Truck Driver's Signature

Date

This form must accompany paperwork up-front for proper filing.



WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

PHOSPHATE [Responsible: Utility Technician]

Check and record the phosphate concentration on Monday, Wednesday, and Friday at the outlet of Pond 4.

The following procedure is used to check the phosphate concentration:

1. Fill the sample cup to the 25 ML mark.
2. Add 3 drops of A-8500 Activator Solution.
3. Snap the tip of the Chemet Ampoule in the sample.
4. Mix the contents of the Chemet ampoule.
5. After two minutes compare with color standard (results in parts per million [PPM]).

Replace Chemet Ampoules and Activator Solution at the storeroom.

Fertilizer which contains Phosphate is added to the ponds during cold weather (winter months). If the residual phosphate reading at Pond 4 is greater than 0.4 PPM reduce the amount of phosphate being added.

If algae begins to grow in Ponds 5 or 6 discontinue the addition of phosphate.

The fertilizer is purchased in 20 pound bags from the local Coop. It is stored in the MCC by Pond 3.

The phosphate feed rate is set according to the residual in Pond 4. A typical feed rate is 3/4 of a 20 lbs bag per day.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

PHOSPHATE PROCESS DESCRIPTION

Phosphate is added to the mixing sump at the Pond 3 inlet during cold weather to fertilize the water prior to biological treatment. Phosphate helps the microorganisms in Pond 3, the biodiscs and in Ponds 4 and 5.

Fertilizer that is 46 percent phosphate is stored in the MCC by Pond 3. It is manually added to the ponds.

The phosphate feed rate is set according to the residual in Pond 4. A typical feed rate is 3/4 of a 20 lbs bag per day.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 1 [Responsible: Process Engineering]

Water from the vinyl operations area gravity flows to two parallel concrete settling basins (Pond 1) at an average flow of 925 gpm. At the inlet of Pond 1 is a small diversion box with isolation valves that can divert waste water to either the east or the west basin. The discharge from each basin joins together into a common line and gravity flows to Pond 3.

The primary purpose of Pond 1 is to collect PVC resin by gravity settling. While one basin is being filled with resin, the other basin is typically blocked in and being dredged. The two basins are alternately filled and dredged as needed. The dredged resin is reclaimed by the plant and sold as low grade product.

Pond 1 inlet must be tested for VCM once a month. The procedure for this testing is as follows:

1. Acquire a 60 ML sample bottle from the lab.
2. Draw a sample in the bucket (kept in utilities truck).
3. Fill sample bottle and screw lid on while under the water. This insures there is no air in the sample bottle.
4. Take to G. C. Lab for analysis:
 - a. Label sample.
 - b. Log in the date, sample location, and what the sample is being tested for in the "Special Sample Log Book".
 - c. Place sample in refrigerator.

Resonance time is 4 1/2 hours.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 3

Water from Pond 1 gravity flows into a concrete mixing sump at the inlet of Pond 3. Wastewater from the boiler house, compound and plasticizer areas bypass Pond 1 and flow directly to the concrete mixing sump.

pH equalization occurs in this pond through addition of sulfuric acid or soda ash.

Ammonia is added continuously in order to fertilize the water prior to biological treatment.

Phosphate is added to fertilize the water in the winter.

Residence time is about 2 hours.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 4

Water gravity flows from the biodisc sump to Pond 4, where it is further treated for BOD removal. Pond 4 is a highly mixed and aerated lagoon.

There are eight small aerators located around the periphery on the pond which mix and aerate the water in order to supply oxygen for microbial growth. Flocks of microorganisms are kept in suspension by swirling water flow around the periphery of the pond, which also helps to increase residence time in the pond.

Residence time is about 16 hours.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 5

Water gravity flows from Pond 4 to Pond 5 for final treatment before discharge to James Creek, from Pond 6.

Pond 5 is a large, partially mixed, and aerated lagoon that primarily biodegrades biological solids that carry over from Pond 4. There are two large surface aerators on Pond 5 that aerate portions of the pond.

A small amount of BOD removal occurs in the aerated zone of the pond and dead biological material is digested by anaerobic processes on the bottom of the pond.

Resonance time:

- a. 1 1/2 days to see effects at outfall.
- b. 4 days to totally clear Pond 5.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 6

Water gravity flows from Pond 5 to Pond 6, and is then discharged into James Creek. Minor amounts of suspended solids that carryover from Pond 5 are settled out.

The discharge from Pond 6 gravity flows to James Creek over a series of steps in a cascade formation, which aerates the effluent in order to increase the dissolved oxygen content of the discharge.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 6 EFFLUENT SAMPLING [Responsible: Process Engineering]

The Pond 6 Effluent Sampling is used to show the effluent is in specification with our NPDES permit limits from the state of Mississippi.

Tuesday mornings:

1. Turn the sampler to forward to prime the pump.
2. Turn the sampler to auto.
3. Record Flow and Totalizer reading.

Wednesday morning:

1. Retrieve sample (turn sampler off)
2. Record Flow and Totalizer readings
3. Check and record:

- a. pH (limit between 6 and 9)

Use the Portable pH/Temperature meter stored in the boiler house. Calibrate using standard 7 and 10 solutions. These solutions are obtained in the storeroom.

- b. Temperature (maximum limit = 32.2 C)

Use the Portable pH/Temperature meter stored in the boiler house.

- c. Dissolved Oxygen (minimum limit = 6.0)

The Dissolved Oxygen meter is stored in the boiler house. To test for Dissolved Oxygen:

1. Calibrate using the instructions on the back of the meter.
2. Place the probe through the fence into James Creek (there is an open space in the fence at the bottom of the stairs made for this purpose).
3. Allow sufficient time for the probe

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

POND 6 EFFLUENT SAMPLING (Continued)

to stabilize.

4. Read Dissolved Oxygen on the appropriate range (0-10 or 0-20).
5. Record Temperature with the probe by turning to "TEMP".

Sample is sent to Envirolab:

1. Fill out chain of custody record (located in Coop Office).
2. Label samples
3. Take to front desk
4. Log in

The weekly sample is tested for:

<u>TEST</u>	<u>DAILY AVG LIMIT</u>	<u>DAILY MAX LIMIT</u>
TBOD	295 lb/day	786 lb/day
SBOD	NO LIMIT	NO LIMIT
COD	1026 lb/day	2736 lb/day
TSS	491 lb/day	1396 lb/day
NH3	12.3 lb/day	24.5 lb/day

The first Wednesday of each month a second sample is sent to Envirolabs to test the following:

<u>TEST</u>	<u>DAILY AVG LIMIT</u>	<u>DAILY MAX LIMIT</u>
LEAD	13 PPB	34 PPB
CHLORINE	NO LIMIT	0.5 PPM
HARDNESS	NO LIMIT	NO LIMIT

The tests are completed by Tuesday of the week following the sampling. Call Envirolab (323-7744) for the results. The results from these tests are published in the Weekly Waste Water Report and recorded in the log book.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

QUARTERLY SAMPLE [Responsible: Process Engineering]

Samples for base neutrals and volatile organics in the outfall to James Creek are taken quarterly and sent to M.S.U. lab for analysis.

The base neutrals sample is a 24 hour composite. Set the sampler by:

1. Turn to Forward to prime the pump.
2. Turn to Auto.

The base neutrals must be sent in a acid cleaned (get from lab) quart jar. Aluminum foil must be placed under the cap to seal the bottle.

The volatile organics sample is a grab sample taken in a green capped 4 oz. glass jar (get from lab). Seal the bottle with electrical tape (get from storeroom).

Refrigerate the samples until delivery (Vista is responsible for delivering sample).

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

SHUTDOWN PROCEDURES

POND 1

1. Close the inlet isolation valve on the basin in operation.

AMMONIA ADDITION

1. Close valve V-7 on top of the ammonia tank.

pH CONTROL SYSTEM

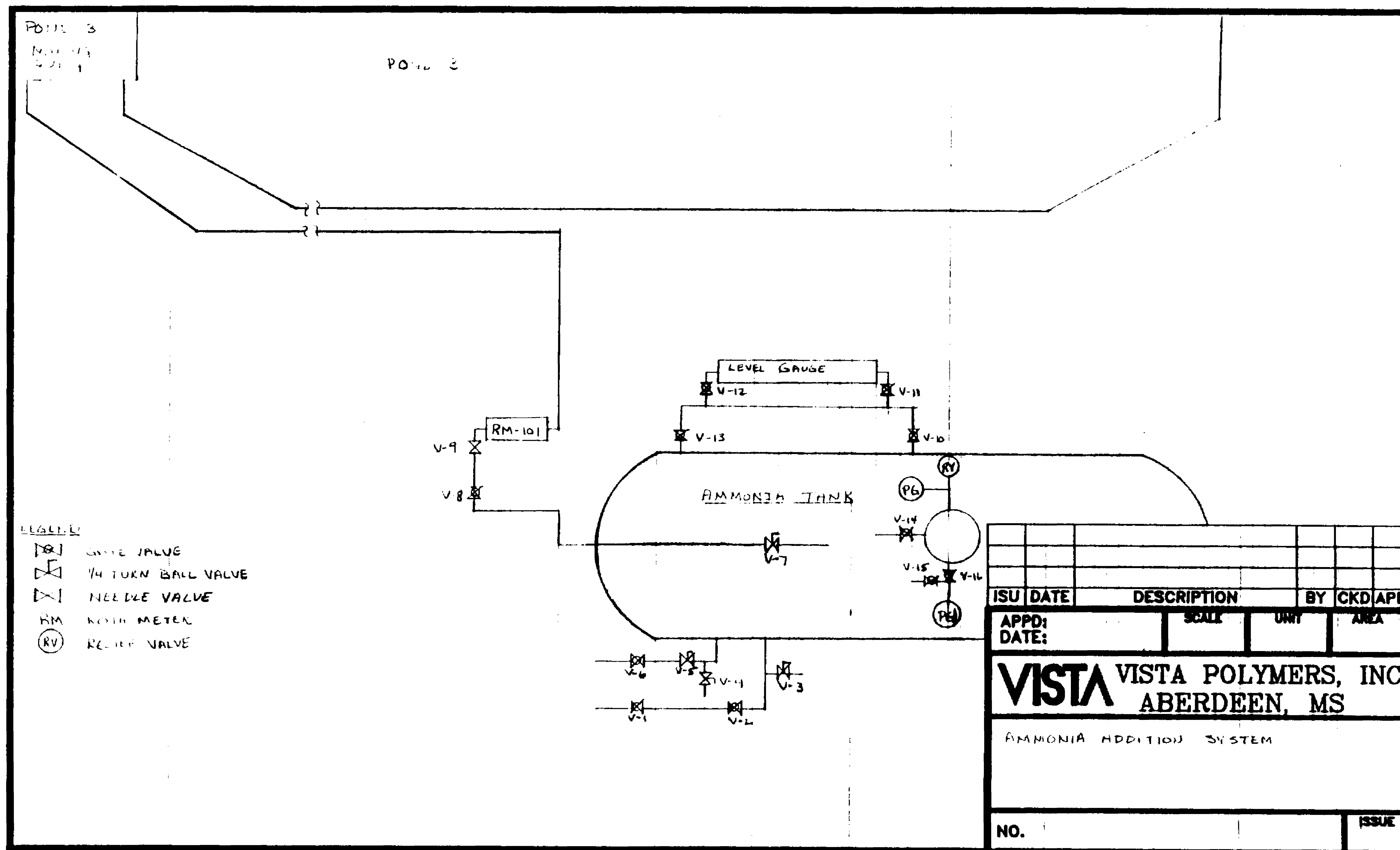
1. Close valves V-1, V-23, V-5, and V-6.
2. Open the sulfuric acid line bleeders and drain the acid from lines. Connect an air hose to the bleeder and carefully blow the remaining acid out of the lines. Connect a water hose to the bleeder and flush the lines into Pond 3 inlet mixing sump.
3. Turn power off to:
 - a. Auto valves V-11 and V-17
 - b. The pH recorders and alarms.
4. Close valves V-8, V-9, V-10, V-18, V-13, V-14, and V-15.

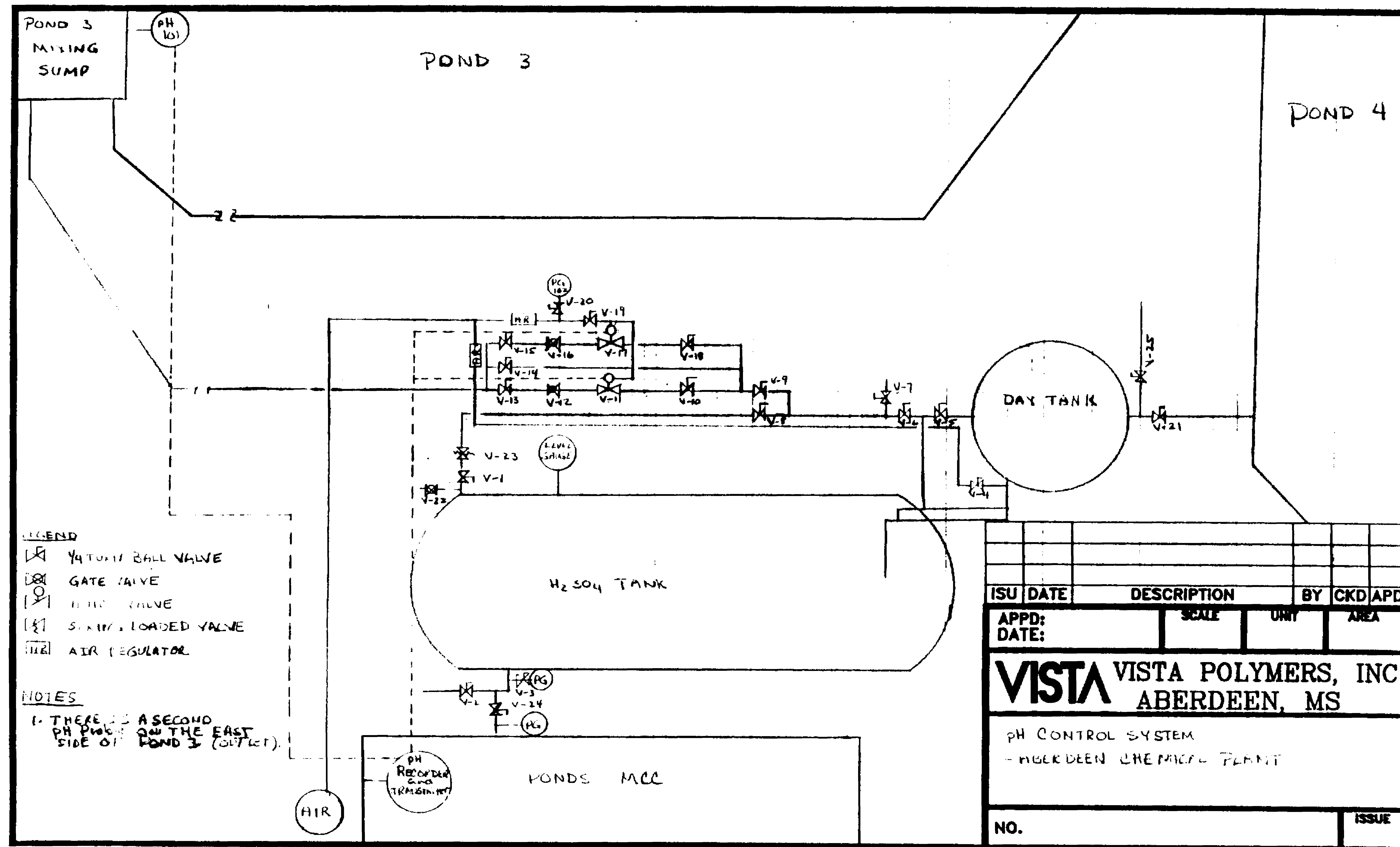
BIODISC

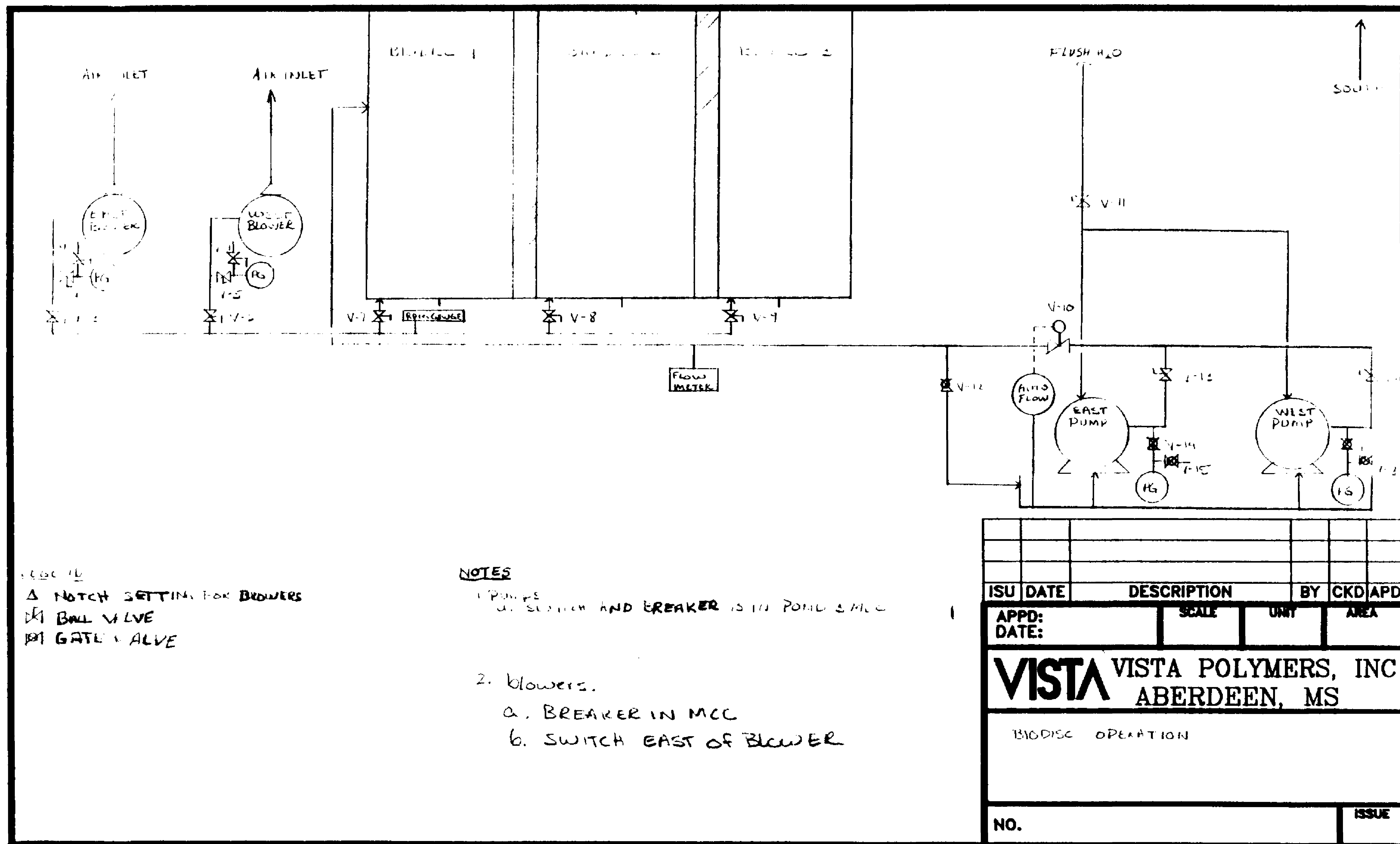
1. Shut off east and west pumps.
2. Shut off air to auto flow level gauge.
3. Shut off east and west blowers.
4. Pump out the biodisc sump to Pond 3 using the portable trash pump. The sump must be empty within 12 hours of shutdown (see biodisc operation section of this manual).

PONDS 3, 4, 5, AND 6

1. Turn off the aerators on Ponds 3, 4, and 5 in the Pond 3 MCC.







WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STARTUP PROCEDURES

POND 1

1. Remove the outlet isolation baffle on the basin to be operated.
2. Open the inlet isolation valve on the basin to be operated.
3. Make sure that the Pond 1 bypass sewer is blocked out. There is a manway east of Pond 1 that has a board in it for this purpose.

AMMONIA ADDITION (See Ammonia Addition System diagram)

1. Start the mixer in the Pond 3 mixing sump.
2. Fill the ammonia tank with anhydrous ammonia (see Ammonia - Ammonia Unloading section of this manual).
3. Open valve V-8.
4. Open the needle valve V-9 and adjust the flow through the flow meter to 8%.

pH CONTROL SYSTEM

1. Put strip chart paper in the pH recorders.
2. Turn on the power to the pH controllers and the recorders.
3. Write a work order to get the pH probes calibrated. The operating procedures for calibration are as follows:
 - a. Immerse the pH probe in a jar filled with pH 7 buffer solution.
 - b. Adjust with calibration knob on the controller until the indicator reads a pH of 7.
 - c. Rinse the probe with water.
 - d. Immerse the pH probe in a jar filled with pH 10 buffer solution.

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STARTUP PROCEDURES (Continued)

pH CONTROL SYSTEM (Continued)

- e. Adjust the span knob on the controller until the indicator reads a pH of 10.
 - f. Rinse the probe with water and repeat steps a through e.
 - g. Calibrate the other probe the using the same procedure.
4. Write a work order to set the channel 1 (Pond 3 outlet) alarm and setpoints using the following procedure:
- a. Set the channel 1 test/run switch on test and record the pH reading.
 - b. Turn the high pH alarm and high pH setpoint knobs fully clockwise, and the low pH alarm and low pH setpoint knobs fully counter clockwise. Turn the deadband knobs fully counter clockwise.
 - c. Turn the calibration knob until the pH indicator reads 4.0. Turn the low pH setpoint knob until the low pH setpoint LED glows.
 - d. Turn the calibration knob until the pH indicator reads 5.0. Turn the low pH alarm knob until the low pH alarm LED glows.
 - e. Turn the calibration knob until the pH indicator reads 10.0. Turn the high pH alarm knob until the high pH alarm LED glows.
 - f. Return the calibration to the pH reading recorder in a step a, and switch the test/run switch to run.
5. Write a work order to set the channel 2 (Pond 3 inlet) setpoints as follows:
- a. Set the channel 2 test/run switch to test and record the pH reading.
 - b. Turn the high and low pH setpoint knobs and

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STARTUP PROCEDURES (Continued)

pH CONTROL SYSTEM (Continued)

the deadband knobs fully clockwise.

- c. Turn the calibration knob until the pH indicator reads 9.0. Turn the low pH setpoint knob until the low pH setpoint LED glows.
 - d. Turn the calibration knob until the pH indicator reads 7.0. Turn the deadband knob adjacent to the low pH setpoint knob until the low pH setpoint LED turns off.
 - e. Turn the calibration knob until the pH indicator reads 10.0. Turn the setpoint knob until the high pH setpoint LED glows.
 - f. Turn the calibration knob until the pH indicator reads 8.0. Turn the deadband knob adjacent to the high pH setpoint knob until the high pH setpoint LED turns off.
 - g. Return the calibration to the pH reading recorded in step a, and switch the test/run switch to run.
6. Fill the sulfuric acid day using the procedures outlined in the pH control - Sulfuric acid unloading section of this manual.
7. Fill the sulfuric acid day tank by:
- a. Close valve V-9 (see pH control system diagram).
 - b. Make sure valve V-7 is closed.
 - c. Open valves V-5, V-6, V-8, V-23, and V-1.
 - d. After day tank is filled make sure to close valves V-8, V-23, and V-1.
8. To start operation of the acid system:
- a. Close valve V-8.
 - b. Open valves V-5, V-6, V-9, and V-18 to allow

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STARTUP PROCEDURES (Continued)

pH CONTROL SYSTEM (Continued)

acid flow from the day tank to the auto valve in the small line.

- c. Adjust valve V-16 to the desired flow rate.
- d. Open valve V-15 to allow acid to flow from the auto valve in the small line to the Pond 3 mixing sump.
- e. Turn the auto valve power on in the MCC.
- f. The big acid line stays blocked off except for cases of emergency.

POND 3

- 1. Turn on the aerators in Pond 3 in the MCC next to Pond 3.

BIODISC

- 1. Inspect the biodisc air diffusers to make sure they are intact. Remove any trash from the biodisc sump.
- 2. Close the pressure gauge drain valves on the air blowers and the biodisc feed pumps.
- 3. Start air flow to the auto flow level gauge next to the east pump (see Biodisc Operation diagram).
- 4. Turn on the flush water to the pumps.
- 5. Open valves V-13 and V-16 (8 inch discharge valves).
- 6. Turn on east pump (in the MCC) and set the pump in automatic. Fill the biodisc sump with water.
- 7. Set the biodisc sump and effluent weirs such that the water level in the sump is approximately 1 foot below the shafts.
- 8. Set the auto flow level controller such that the level in the biodisc feed sump is 6 inches above the low level float switch setpoint. Check out

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STARTUP PROCEDURES (Continued)

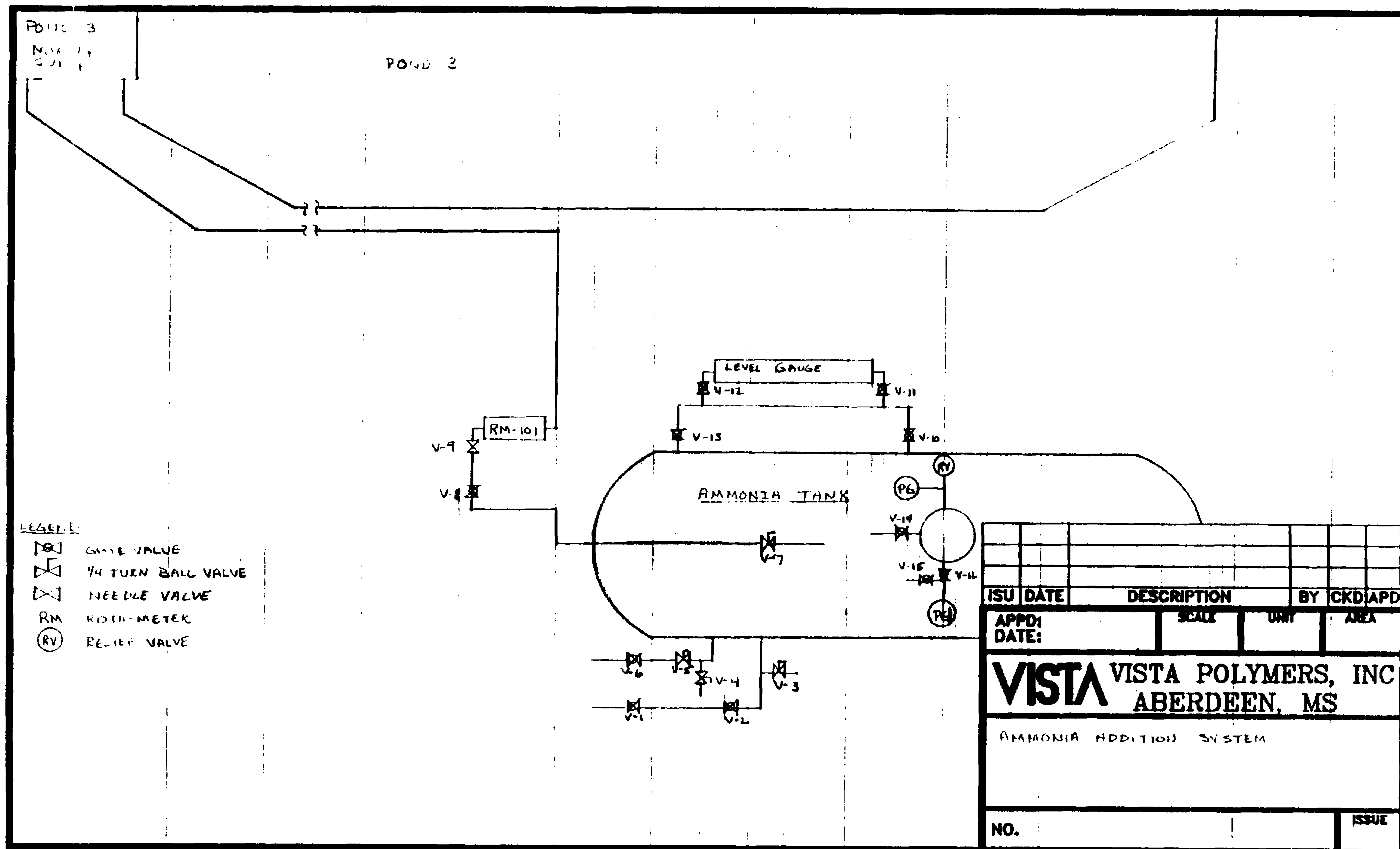
BIODISC (Continued)

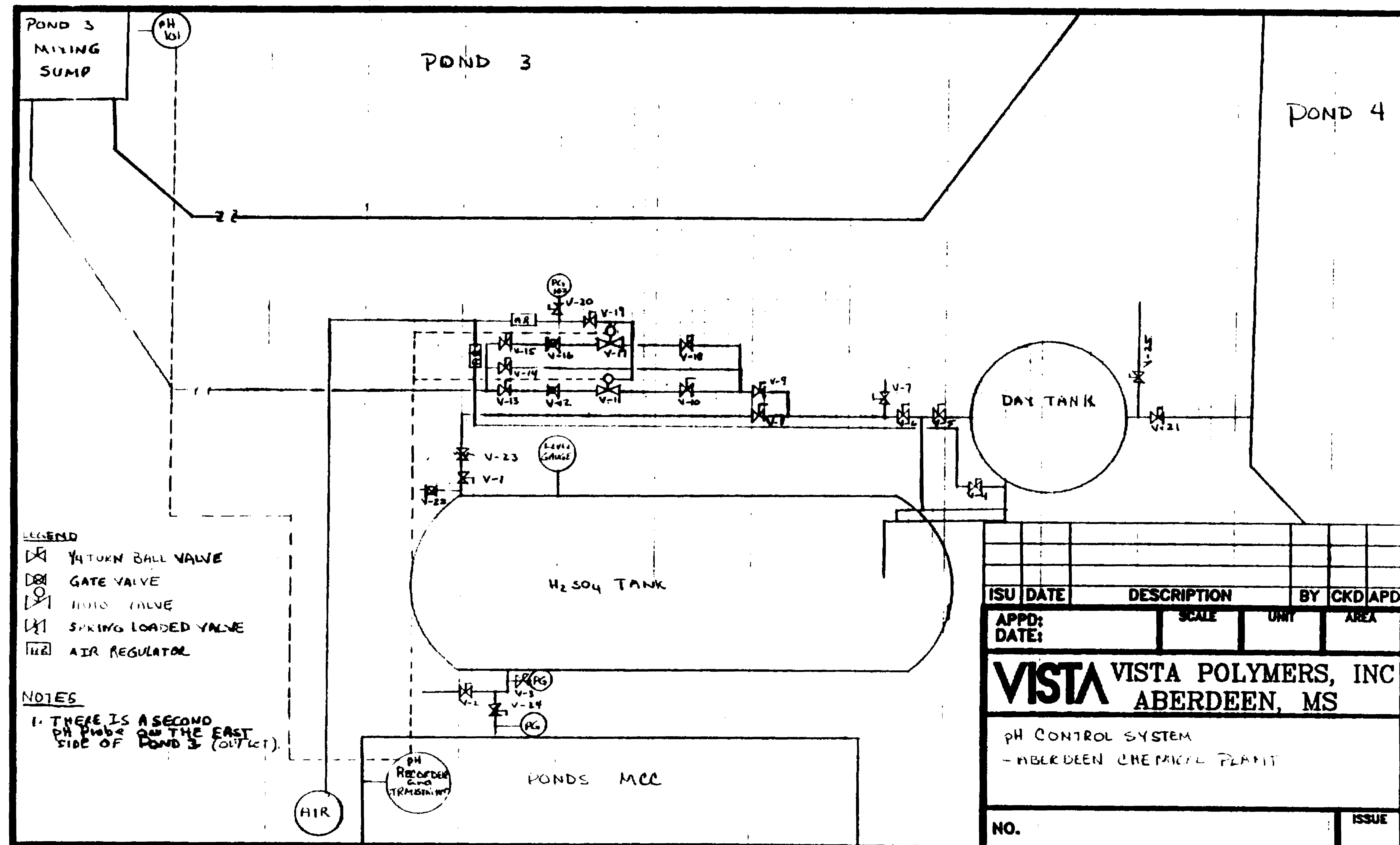
the low level switch by pushing down the float and watching to see if the biodisc feed pumps shutoff.

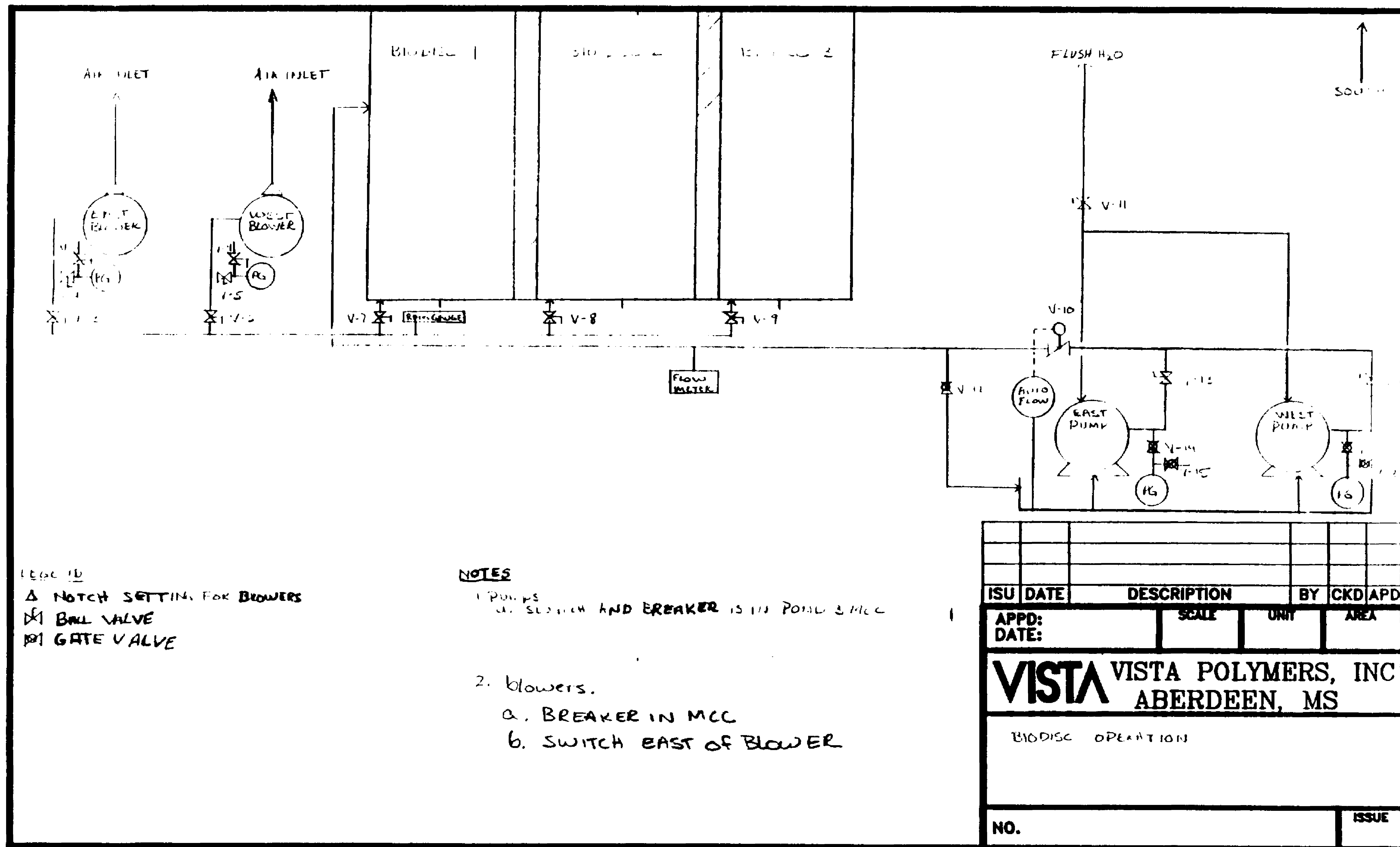
9. Turn off the east pump and turn on the west pump in automatic. Check the low level switch for this pump.
10. Grease the biodisc bearings.
11. Open the V-3 (the six inch valve on the east airblower).
12. Fully open valves V-7, V-8 and V-9.
13. Close the butterfly valve on the suction of the east air blower and turn on blower. When the blowers get up to speed, open the suction valve partially in order to put a load on the blower.
14. Check the blower piping for leaks.
15. Set the shaft speeds at 1.0 rpm by adjusting the suction valves on the east blower. Adjust the low shaft speed alarm setpoint screw at each shaft so that there is a low shaft speed alarm condition when the shaft speed falls below 1.0 rpm.
16. Set the shaft speeds at 1.2 - 1.4 rpm by further opening the suction valve on the east airblower.

PONDS 4, 5, AND 6

1. Turn on the seven small aerators in Pond 4
2. Turn on the two large aerators in Pond 5.
3. Make sure that the isolation valve between Ponds 5 and 6 is open, and the Pond 6 bypass valve is shut.







WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STORM WATER PITS [Responsible: Process Engineering]

Sampling of the storm water pits outfall will be done biweekly (one pit each week).

Tuesday morning:

1. Set up sampler at the appropriate pit (the one not sampled the week before).
2. Turn to auto.
3. Press:
 - a. Delay first sample
 - b. Manual Advance
4. Wait 24 hours

Wednesday morning:

1. Retrieve sample (turn off sampler)
2. Check and record:
 - a. pH (limits between 6 and 9)

Use the Portable pH/Temperature meter stored in the boiler house. Calibrate using standard 7 and 10 solutions. These solutions are obtained in the storeroom.
 - b. Temperature (maximum limit = 32.2 C)

Use the Portable pH/Temperature meter stored in the boiler house.
 - c. Flow (in inches, convert to gpm with attached strapping table)

Send the sample to Envirolabs to be tested for TSS.
Limits:

Daily Average limit = 30 PPM

Daily Maximum limit = 45 PPM

The pit is dredged when filled with settled solids.
When the pit is full notify the Utilities Supervisor

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STORM WATER PITS [Responsible: Process Engineering]

Sampling of the storm water pits outfall will be done biweekly (one pit each week).

Tuesday morning:

1. Set up sampler at the appropriate pit (the one not sampled the week before).
2. Turn to auto.
3. Press:
 - a. Delay first sample
 - b. Manual Advance
4. Wait 24 hours

Wednesday morning:

1. Retrieve sample (turn off sampler)
2. Check and record:
 - a. pH (limits between 6 and 9)

Use the Portable pH/Temperature meter stored in the boiler house. Calibrate using standard 7 and 10 solutions. These solutions are obtained in the storeroom.
 - b. Temperature (maximum limit = 32.2 C)

Use the Portable pH/Temperature meter stored in the boiler house.
 - c. Flow (in inches, convert to gpm with attached strapping table)

Send the sample to Envirolabs to be tested for TSS.
Limits:

Daily Average limit = 30 PPM

Daily Maximum limit = 45 PPM

The pit is dredged when filled with settled solids. When the pit is full notify the Utilities Supervisor (3575)

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

STORM WATER PITS (Continued)

and the Environmental Coordinator (3637).

Check biweekly for solids, oil sheen, or foam floating on top of the pits. Place a boom over the outfall of the pit and notify the Utilities Supervisor and the Environmental Coordinator for such an occurrence.

The first Wednesday of each month both Pit 1 and 2 must be tested for Chlorine. The following procedure is used:

1. Retrieve the Chlorine Kit from the boiler house.
2. Rinse the square mixing bottle with the water to be tested.
3. Fill the square bottle to the 25 ML mark with the sample.
4. Use the clippers to open one TOTAL CHLORINE REAGENT POWDER PILLOW. Add the contents of the pillow to the mixing bottle. Swirl to mix. Allow the sample to stand for 3 minutes.
5. Fill one viewing tube to within 1/16 inch of the top with prepared sample.
6. place the lengthwise viewing adapter in the color comparator.
7. Fill the other viewing tube with an untreated water sample. Insert this tube into the comparator opening.
8. Hold the comparator up to a light source. Rotate the disc to obtain a color match.
9. Read the Chlorine concentration from the scale window. Divide the value by 5 to obtain PPM Total Chlorine.

PIT 1 003
FLOW CONVERSION
STRAPPING TABLE
#####

INCHES
#####

GPM
#####

1	2.47
1 1/4	4.32
1 1/2	6.81
1 3/4	10.01
2	13.98
2 1/4	18.77
2 1/2	24.43
2 3/4	31
3	38.53
3 1/4	47.07
3 1/2	56.65
3 3/4	67.31
4	79.1
4 1/4	92.04
4 3/4	121.55
5	138.18
5 1/4	156.84
5 1/2	175
5 3/4	196
6	217.38
6 1/4	241.38
6 1/2	266.25

FIT 002
 FLOW CONVERSION
 STRAPPING TABLE
 #####

A

INCHES
 #####

GPM
 #####

3/4	1.12
1	2.28
1 1/4	3.95
1 1/2	6.2
1 3/4	9.07
2	12.62
2 1/4	16.88
2 1/2	21.89
2 3/4	27.7
3	34.35
3 1/4	41.86

GPM= 2.277 X HIGHT^^2.47
 (HIGHT IN INCHES)

WASTE WATER TREATMENT SYSTEM
ABERDEEN CHEMICAL PLANT

UNUSUAL OCCURRENCES [Responsible: Utility Technician]

In the event of any unusual occurrences at the ponds or the pits notify:

1. Utilities Supervisor (3575)
2. Environmental Coordinator (3637)

SUNDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM
POND 3 IN		
BIO IN		
BIO OUT		
POND 4 OUT		
POND 5 OUT		
POND 6 OUT		

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE -POND 3		
# OF AERATORS ON LINE -POND 4		
# OF AERATORS ON LINE -POND 5		

TECHNICIAN: _____

MONDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM	NH3	PO4	COD
POND 3 IN					
BIO IN					
BIO OUT					
POND 4 OUT					
POND 5 OUT					
POND 6 OUT					

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE - POND 3		
# OF AERATORS ON LINE - POND 4		
# OF AERATORS ON LINE - POND 5		

SHAFT WEIGHTS
BIODISC 1
BIODISC 2
BIODISC 3

TECHNICIAN: _____

TUESDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM
POND 3 IN		
BIO IN		
BIO OUT		
POND 4 OUT		
POND 5 OUT		
POND 6 OUT		

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE - POND 3		
# OF AERATORS ON LINE - POND 4		
# OF AERATORS ON LINE - POND 5		

TECHNICIAN: _____

WEDNESDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM	NH3	PO4	COD
POND 3 IN					
BIO IN					
BIO OUT					
POND 4 OUT					
POND 5 OUT					
POND 6 OUT					

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE - POND 3		
# OF AERATORS ON LINE - POND 4		
# OF AERATORS ON LINE - POND 5		

SHAFT WEIGHTS	
BIODISC 1	
BIODISC 2	
BIODISC 3	

POND 6 EFFLUENT	
pH (BETWEEN 6 AND 9)	
DISSOLVED OXYGEN (6 MIN)	
TEMPERATURE (90 MAX)	
FLOW (GPM)	

TECHNICIAN: _____

THURSDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM
POND 3 IN		
BIO IN		
BIO OUT		
POND 4 OUT		
POND 5 OUT		
POND 6 OUT		

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE - POND 3		
# OF AERATORS ON LINE - POND 4		
# OF AERATORS ON LINE - POND 5		

TECHNICIAN: _____

FRIDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM	NH3	PO4	COD
POND 3 IN					
BIO IN					
BIO OUT					
POND 4 OUT					
POND 5 OUT					
POND 6 OUT					

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE - POND 3		
# OF AERATORS ON LINE - POND 4		
# OF AERATORS ON LINE - POND 5		

SHAFT WEIGHTS	
BIODISC 1	
BIODISC 2	
BIODISC 3	

TECHNICIAN: _____

SATURDAY DATE: _____

PROBE pH	AM	PM
POND 3 IN		
POND 3 OUT		

GRAB pH	AM	PM
POND 3 IN		
BIO IN		
BIO OUT		
POND 4 OUT		
POND 5 OUT		
POND 6 OUT		

PONDS CHECKS	AM	PM
CLEAN EAST pH PROBE (YES/NO)		
CLEAN WEST pH PROBE (YES/NO)		
CALIBRATE E. PROBE (YES/NO)		
CALIBRATE W. PROBE (YES/NO)		
NH3 TANK LEVEL		
NH3 FEED SETTING		
PO4 FEED SETTING		
ACID TANK LEVEL		
ACID FEED REQUIRED (GPD)		
BIODISC PUMP PRESSURE (PSIG)		
BIODISC PUMP - EAST/WEST		
BIODISC # 1 (RPM)		
BIODISC # 2 (RPM)		
BIODISC # 3 (RPM)		
EAST BIODISC PUMP (ON/OFF)		
WEST BIODISC PUMP (ON/OFF)		
EAST DISC BLOWER (ON/OFF)		
WEST DISC BLOWER (ON/OFF)		
BLOWER PRESSURE (PSIG)		
BLOWER - EAST/WEST		
BLOWER SET (# OF NOTCHES)		
BLOWER AMPERES (AMPS)		
# OF AERATORS ON LINE - POND 3		
# OF AERATORS ON LINE - POND 4		
# OF AERATORS ON LINE - POND 5		

TECHNICIAN: _____