

MOREAU (CAPUTO) SITE

MAINTENANCE AND MONITORING PROGRAM

DECEMBER 1985

Moreau (Caputo) Site
Maintenance and Monitoring Program

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MOREAU (CAPUTO) SITE

I. Introduction

The Moreau (Caputo) Site was reported to have been used during the ten year period of 1958 to 1968 as a waste disposal site for approximately 450 tons of industrial waste. This waste was reported to have included scrap liquids, polychlorinated biphenyls (PCBs), scrap oils, sludge, solvents and miscellaneous scrap.

Most of the liquids were discharged into an evaporative lagoon, 60 feet long by 30 feet wide by 3 feet deep. Although some of the volatile constituents evaporated into the atmosphere a significant quantity infiltrated into the soil. In addition some of the waste material was initially stored adjacent to the evaporative lagoon in approximately 50-100 drums. These drums were subsequently relocated and buried in another part of the site.

Remedial action was initiated in mid-1982 when the relocated drums were removed and transferred to a secure landfill. In addition, approximately 170 cubic yards of soil contaminated from leaking drums was also transferred to this secure landfill.

Subsequent study and soil testing at the site indicated that PCBs appeared to be contained within a maximum radius of 200 feet from the evaporative lagoon. However trichloroethylene (TCE), a solvent that had been discharged as part of the waste material, was found in the soil approximately 300 feet beyond the evaporative lagoon. The solvent has also been detected in the groundwater downgradient from the site.

In an effort to prevent significant migration of contamination beyond the site, it was concluded that the most feasible remedial action would be to contain the soil area that was found to be contaminated. A slurry cut-off wall was constructed to form a containment barrier. The wall is approximately 1600 feet long and is a minimum of 30 inches wide. The wall is constructed of soil and bentonite and extends approximately 100 feet deep from the surface into the underlying silty clay material. In this manner the cut-off wall isolates the contamination from the surroundings. A graded 3-1/2 foot thick clay cap was also applied to minimize infiltration of precipitation. The clay cap is covered with 1-1/2 foot thick sand and topsoil layer which is the base for a grass cover.

The following sections detail the monitoring program which is to be followed in order to insure that the remedial action continues to be effective.

II. Monitoring Program

A. Physical Observation

1. Security

The Moreau (Caputo) Site is enclosed by a six foot high chain link security fence. A double gate is provided in the fence line for site entrance at the end of the access road that leads from Ft. Edward Road. A road gate and associated fencing are also installed in this access road near Ft. Edward Road to restrict the movement of any unauthorized vehicles.

Locks are provided on both gates and at sensitive areas such as standpipes above relief, observation and monitoring wells and the two pan lysimeters.

An inspection is to be made at least once per month at the site and all security items indicated on the log sheet are to be checked. These items include:

- a. Road gate lock.
- b. Chain security fence gate lock.
- c. Security fence.

(Note: Check the fence by walking the inside perimeter of the enclosure.)

- d. Locks on the standpipes for each of the monitoring wells, observation wells, pan lysimeters and the relief well.

2. Embankment and Cap Integrity

The integrity of the completed clay cap and the embankment area must be maintained in order to insure that precipitation infiltration is controlled. The cover grass must also be maintained since it not only is a soil anchor but it also promotes evaporation and transpiration. The surface is graded to provide a gradual run-off from the site. If cracks develop, the effectiveness of the infiltration barrier will be reduced. Further, the erosion potential will increase and possibly result in rapid degradation of the cap effectiveness.

Accordingly the cap and embankment areas are to be checked at least monthly. The toe of embankment is also to be checked for any evidence of soil or slide accumulation. In the event that fissures greater than 2 inches in width or 4 inches in depth are noted, record the location of the defects on a copy of the plot plan that is included in this manual.

The defects are to be repaired promptly in order to prevent any accelerated erosion. The cap is particularly vulnerable during the early stages before the grass cover is developed and accordingly an inspection should be made following heavy rainstorms.

The grass cover is to be mowed periodically to promote satisfactory growth. The grass is to be cut as necessary to maintain a height of 4 to 12 inches. Bare surface areas are to be reseeded, if necessary.

B. Measurements

1. Groundwater Table

The groundwater table at the site outside the cap area is approximately 30 feet below the surface. Measurements of the groundwater table are important not only to determine the direction of groundwater movement but also to assess the effect of the slurry cut-off wall and the cap on water accumulation within the wall.

Accordingly measurements of the groundwater table are to be performed at least once per month at the observation wells and the relief well by the procedure described in Appendix A. Record the data on the log sheet.

Notify the General Electric representative responsible for the monitoring operation in the event that the groundwater table as measured at the relief well increases by six inches above the base line value. This base value is the groundwater table measured at the time that the site is certified by DEC.

GE and DEC will closely monitor the groundwater elevation inside the slurry wall. The decision to use the relief well to lower the inside groundwater will be made jointly by DEC and GE, and will be based upon operating data and not upon any predetermined groundwater elevation differential. At least one year of data collection will be deemed necessary before use of the relief well is even contemplated. If with the approval of GE and DEC it is deemed necessary to lower the groundwater table, use the procedure in Appendix C.

2. Pan Lysimeter

Two pan lysimeters are installed below the cap. The purpose of each lysimeter is to measure the precipitation that penetrates through the cap. The quantity of liquid which enters the pan is to be measured quarterly in accordance with the procedure in Appendix D and the results recorded on the log sheet.

Check the effectiveness of the site clay cap by comparing the lysimeter data with the amount of precipitation deposited on the site as measured at the Glens Falls Weather Station.

C. Samples

1. Monitoring Wells

Samples of groundwater are to be collected from monitoring wells located upgradient of and downgradient from the site. Some of the wells are nested in order to provide samples from shallow, intermediate and deep segments of the aquifer outside of the slurry cut-off wall. These samples are to be obtained annually and analyzed for purgeable halocarbons by EPA Method 601 and for PCB. The sampling procedure to be used is described in Appendix B.

Note: It is anticipated that downgradient samples will initially indicate the presence of contamination. However the concentration should decrease with time.

As a rule of thumb, it is good practice to sample the upgradient wells first in order to minimize the risk of cross contamination.

2. Air

Air samples are to be taken annually above the cap in accordance with the procedure in Appendix E. The samples collected are to be analyzed for PCB at four locations on the cap. The sampling is to be performed annually during the summer period.

III. Frequency of Inspections

A. Physical Observations

<u>Item</u>	<u>Frequency</u>
1. Security	Monthly
2. Embankment and Cap Integrity	Monthly and after heavy rainstorm (>0.25 in./hr. for a duration exceeding 3 hours)

B. Measurements

<u>Item</u>	<u>Frequency</u>
1. Groundwater Table	Monthly
2. Pan Lysimeter	Quarterly

C. Samples

<u>Item</u>	<u>Frequency</u>
1. Groundwater	Annually
2. Air	Annually

IV.

Moreau (Caputo) Site

Log Sheet

Date

A. Physical Observations

(Record N/A if not performed.)

		Satisfactory	
		Yes	No*
1.	Security		
a.	Road Gate Access Lock		
b.	Chain Security Fence Lock		
c.	Security Fence		
d.	Relief Well Lock		
e.	Monitoring Well Locks		
f.	Observation Well Locks		
g.	Pan Lysimeter Locks		
2.	Embankment and Cap Integrity		
a.	Embankment Appearance		
b.	Cap Appearance		
c.	Grass Cover		

*Comments (If not satisfactory, explain why.)

B. Measurements

(Record N/A if not performed.)

1. Groundwater Table

<u>Observation Well No.</u>	<u>Depth (ft.)</u>
OW-1	
OW-2	
OW-3	
OW-4	
OW-5	
Relief Well RW #1	

2. Pan Lysimeter

<u>Location</u>	<u>Volume (gal.)</u>
N.E.	
S.W.	

C. Groundwater Supply

<u>Monitoring Well No.</u>	<u>Date of Sampling</u>
DGC 8 S,I&D	
DGC 11 S,I&D	
DGC 15 S,I&D	
DGC 21 S,I&D	
Other	

D. Air Sampling

Date of Sampling

E. General Remarks

V.

Monitoring Report Format

Once each quarter, the monitoring data are to be evaluated and the results transmitted for information to DEC Region 5, Warrensburg, N. Y. A copy of this report is also to be sent to DEC, 50 Wolf Road, Division of Solid Waste, Albany, N. Y. The format of the report is to be in accordance with the following outline.

Moreau (Caputo) Site

Monitoring Report

Quarterly Period _____

1. Groundwater Elevation

<u>Observation Well No.</u>	<u>Date of Measure</u>	<u>Depth from Top Casing</u>	<u>Calc'd GWT (AMSL)</u>
OW-1			
OW-2			
OW-3			
OW-4			
OW-5			
Relief Well (RW #1)			

2. Sample Analysis

Date _____

<u>Groundwater Well No.</u>	<u>TCE</u>	<u>Concentration PCB</u>	<u>Other</u>
DGC 8 S,I&D			
DGC 11 S,I&D			
DGC 15 S,I&D			
DGC 21 S,I&D			
Other			

3. Pan Lysimeter

Period of Collection _____

Volume (ml)

N. East
S. West

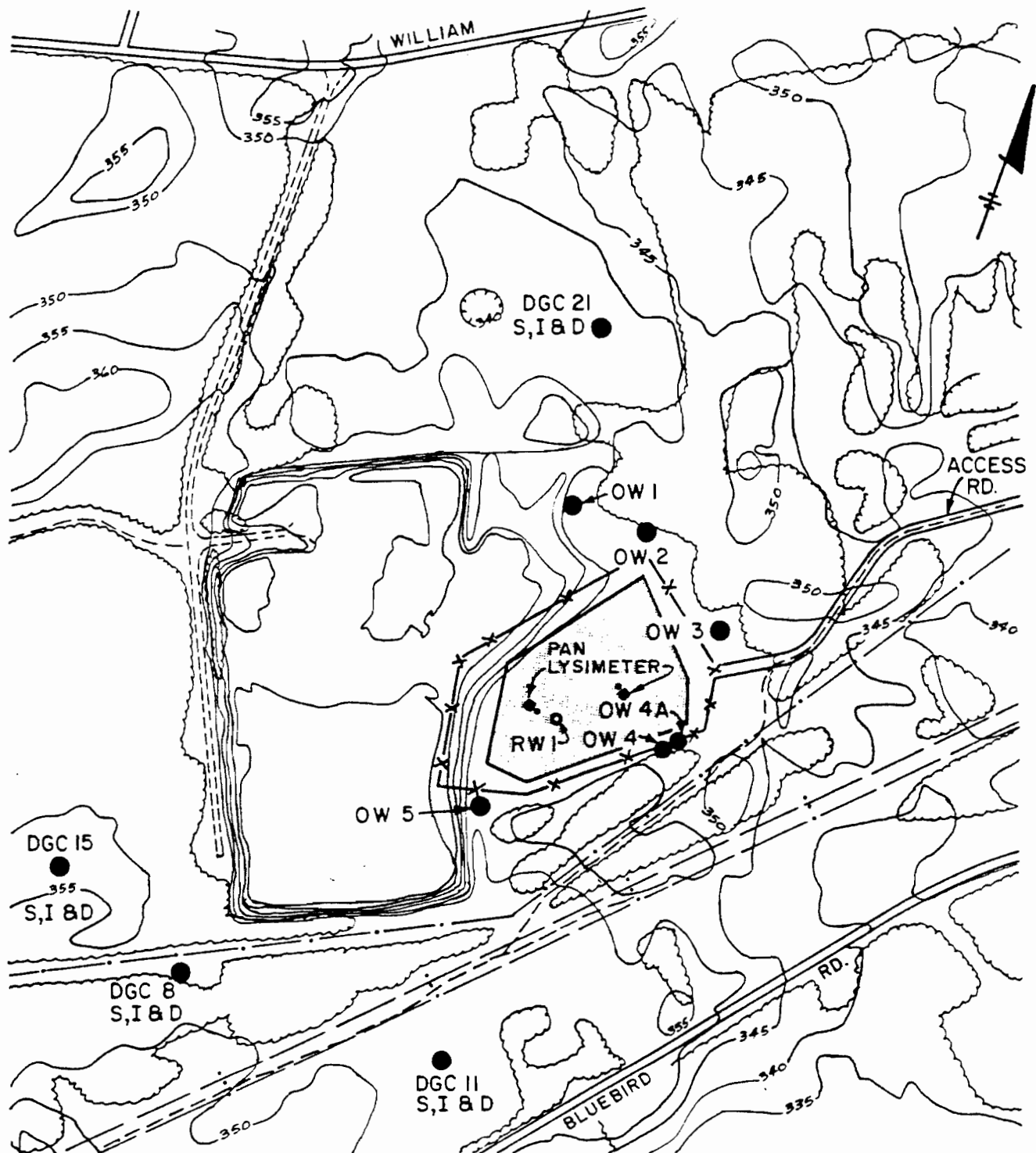
4. Precipitation (inches)
 at Glens Falls Airport
 (Same period as for pan
 lysimeter collection)

Infiltration as % of Precipitation _____

5. Air Sampling

PCB Concentration at four
 locations ($\mu\text{g}/\text{m}^3$)

6. Site Security and General Conditions



MOREAU SITE
MONITORING LOCATIONS

NOTE:

THIS FIGURE WAS ADAPTED FROM
INFORMATION SUPPLIED TO O'BRIEN
& GERE BY THE GENERAL ELECTRIC
COMPANY.

LEGEND

- DGC 21-MONITORING WELL
- RELIEF WELL
- LIMITS OF CAPPED AREA
- x- SECURITY FENCE

Appendix AGroundwater Table MeasurementEquipment

Thomas Keck Water Marker.

Procedure

The procedure for measuring the groundwater table is by measuring the depth of the water in a monitoring well or piezometer from the top of the well standpipe. The elevation of each well standpipe has been established and therefore the elevation of the groundwater table can be readily determined by subtracting the depth from the top of the standpipe elevation. The procedure for the measurement follows (see Note):

1. Unlock the cap of the monitoring well, piezometer, or relief well standpipe.
2. Lower the probe of the water marker into the well until the indicator light indicates contact with the water.
3. Record on the log sheet the depth as indicated by the graduated scale on the probe line.
4. Repeat the measurement by raising the probe and lowering again until the indicator light goes on. The two measurements should agree within 0.1 foot. If not, check using a standard tape measure.
5. Wipe clean the probe with hexane and acetone.
6. Lock the standpipe cover.
7. Calculate the elevation of the groundwater table by subtracting the depth from the elevation of the top of the standpipe.

Note: To reduce the possibility of cross-contamination, even though these wells are not intended to be used for analytical purposes, start with OW-1 and go sequentially through OW-5, then do RW-1 last. After RW-1, clean the equipment with hexane and acetone.

Appendix B
Groundwater Sampling

Instrumentation

Sampling Pump
Bailer (Discrete)
Graduated Container

SamplingA. Procedure

A discrete bailer can be used to purge and collect a groundwater sample from the monitoring wells at the Moreau (Caputo) Site. As a substitute for the bailer, samples can be obtained using a submerged pump or a positive pressure displacement pump. For the pump operation the following procedure is to be used:

1. Each well to be sampled is to be purged by an equivalent of at least three well volumes of liquid. The volume of the liquid is calculated from the groundwater table measurements and the depth of the well. Based on the as-built drawings, the well depth of each well as measured from the top of the standpipe is:

<u>Well No.</u>	<u>Top of Standpipe Elevation (ft.)</u>	<u>Depth of Well from Top of Standpipe (ft.)</u>
8 S	351.16	48
8 I	351.33	78
8 D	351.29	109
11 S	352.85	48
11 I	352.50	83
11 D	352.94	96
15 S	354.91	46
15 I	354.78	76
15 D	354.87	116
21 S	341.51	38
21 I	341.57	73
21 D	341.60	105

2. The height (H) of the groundwater in the well is calculated by subtracting the groundwater depth from the well depth (both measured from the top of the standpipe).
3. The volume in gallons (V) is equal to the product of the groundwater height (H) and the well constant (C). For a 2 inch diameter well $C = 0.16$ gallons per foot. Therefore $V = CH = (0.16) (H)$.
4. Slit the center of the plastic sheet, slide down over the standpipe and spread on the ground.
5. Unplug the monitoring well and insert the pump into the well. Position the pump at a depth such that the inlet is approximately one to two feet from the well base. (Note - Wear protective gloves to prevent sample contamination.)
6. Pump out into the graduated container a volume of water equal to at least three times the well volume as calculated in step 3. above. If the well is installed in a clay stratum it is possible that the recharge rate may be relatively slow compared to the pumping rate. Evidence of this factor will be indicated by air discharged from the pump. If so, stop the pump and permit the water to charge into the well. Continue as necessary until at least three volumes are measured. The purged water is to be collected in a drum for subsequent disposal at an approved site.
7. Raise the pump inlet to an elevation which is approximately at the midpoint of the groundwater height in the well.
8. If the discharge water is clean and free of air, pump sufficient sample to fill the sample bottles. If air is present in the pump discharge, remove the pump and use a bailer to collect the sample.
9. Cap the bottles and prepare to submit the bottles to an analytical laboratory as directed by General Electric.
10. Secure the well, i.e. replug the well and lock the casing cover.
11. Record sampling data on the log sheet.
12. Decontaminate the pump and lines in accordance with procedures in Appendix F.
13. Dispose of the plastic sheet as directed by General Electric.

If the bailer is to be used, obtain the sample as follows:

1. Use a clean bailer and a new lanyard for each sample. Lower the bailer to the base of the well, draw up the water and discharge into the graduated container. (Note: Use the clean plastic cloth around the well standpipe as a protective cover for the wet lanyard.)

2. Repeat until an equivalent of at least three well volumes is purged. If the recharge rate is low, it may be necessary to delay sampling until the well recharges sufficiently to provide a three volume purge.
3. Lower the bailer to approximately midpoint of the groundwater column in the well and then withdraw the bailer after it is filled.
4. Repeat as necessary to fill the sample bottles.
5. Secure the well, record the data on the log sheet and transfer the samples to the laboratory as above.
6. Decontaminate the bailer in accordance with procedures in Appendix F.
7. Dispose of the plastic sheet as directed by General Electric.

Appendix CLeachate Removal from the Site

In the event that it becomes necessary to remove leachate from inside the slurry wall, the six inch relief well (RW #1) is to be utilized. Since the leachate is contaminated, precautions are necessary during this operation. A qualified contractor is to be used for pumping out the leachate into a tanker truck which is permitted to transport hazardous waste. Appropriate protective apparel such as goggles, rubber gloves, coveralls and rubber boots are required during this operation. Respirators may also be required if deemed necessary.

Note: It is estimated that a level change of one inch is equivalent to approximately 25,000 gallons within the slurry cut-off wall assuming an area of 3.6 acres and a porosity of 25%.

The pumped leachate can be transported to an authorized treatment facility. As an alternative, the liquid can be treated on site with Region 5 approval. The treated liquid would be disposed of outside the perimeter of the slurry cut-off wall. The selection of the process must be approved by General Electric and the New York State Department of Environmental Conservation.

Upon completion of the pumping operation, remove the pump and all equipment that had been in contact with the untreated liquid in accordance with the procedures in Appendix F. Lock the well cap.

Appendix DPan Lysimeter MeasurementEquipment

ISCO Peristaltic or equivalent pump.

Two lengths of plastic tubing, one having a 1/4 inch X 6 inch long pipe.

Graduate 500 ml.

Procedure

The volume of liquid collected in the 5 foot X 5 foot pan lysimeter is a measure of the precipitation that has penetrated the site clay cap. Pump the liquid from the pan into the graduate for measurement.

1. Unlock the cap of the pan lysimeter standpipe.
2. Lower the tubing with the pipe end into the standpipe to the pan lysimeter.
3. Pump out the liquid contents in the pan into the graduate.
4. Discontinue pumping when air bubbles appear.
5. Remove tubing from the standpipe and lock the cap.
6. Dispose of lysimeter liquid outside the site fence.

Appendix EAir SamplingInstrumentation

- 4 - DuPont Battery-operated Sampling Pumps
- 4 - Florisil Sample Tubes
- 4 - Sampling Stands
- 1 - Climatronics Weather Station
- 1 - Compass

Procedure

1. Set up the Climatronics Weather Station approximately at the center of the site. At an elevation of 6-8 feet, align in an east-west direction the instrument arm containing the wind direction and speed measuring elements. Locate the wind speed element on this arm in the easterly direction. The temperature and relative humidity sensing elements are to be positioned on another arm that faces the southerly direction. Check that the instrument battery is charged and then start the chart recorder. Inscribe the time of start, the date and the initials of the data taker. Record the required data on this appendix log sheet.
2. Position the four sampling stations at the periphery of the site at least 10 feet from the fence line. Although not essential it is suggested for convenience that the stands be located at the four points of the compass i.e. north, south, east and west. These locations will provide continuity for air samples that will be taken at different periods, irrespective of wind direction.
3. Check the air pumping capacity of each pump using the secondary pump calibrating meter or the primary soap bubble unit. The flow rate through the pump should be approximately 0.20 ± 0.02 liters per minute. Adjust the rate if necessary in accordance with the pump technical manual.
4. Attach a pump to each sampling station and prepare a florisil sample tube for connection. Cut the tips of the florisil tube and connect it to the pump so that air direction through the tube is as indicated on the tube. The elevation of the tube should be 4-5 feet above the ground.
5. Start each sampling pump and record the time. By sound check that each pump is running.
6. Record on the log sheet the initial weather conditions, i.e. wind direction, wind speed, temperature and relative humidity.

7. Continue sampling for a period of 6-8 hours.
8. Stop each pump, recording the time. Also record the pump interval elapsed time indicated at the pump control panel.
9. Remove each sample tube, carefully capping both ends.
10. Store the four tubes and the blank in an envelope for transmittal to the analytical laboratory for PCB analysis.
11. Record on the log sheet the final weather conditions; also pencil on the recorder chart the final time. Remove chart paper for the record.
12. Check and record the pump flow rate at the end of the run.
13. Compute the volume of air which has passed through the sampling tube by multiplying the average flow rate (beginning and end) times the elapsed time. The PCB concentration in air is then calculated from the quantity of PCB adsorbed in the florasil tube divided by the air volume.
14. Disconnect and store the sampling equipment.

Note: Entrained water reduces the effectiveness of the florasil.
Therefore discontinue sampling in the event of precipitation.

Appendix FDecontamination Procedures

It is essential that in sampling operations the equipment used is adequately cleaned in order to prevent cross-contamination of samples or wells. The following is the procedure to be followed:

A. Decontaminating Solutions

1. Trisodium Phosphate Solution.
(0.5% concentration in tap water)
2. Tap water.
3. Distilled or deionized water.

B. Equipment

- (4) Five gallon buckets.
- (1) Fifty-five gallon drum.
- Plastic sheet (approximately 4'X4').

C. Procedure

1. Line up on a plastic sheet the 4 five gallon buckets.
2. Insert the pump and tubing or bailer into the first bucket.
3. Rinse the outside surface of the equipment with approximately 3-4 gallons of the trisodium phosphate (TSP) solution.
4. Pump out the solution into a 55 gallon drum. If the equipment is a bailer lift the bailer out of the bucket capturing some of the TSP solution. Shake the bailer and then pour contents into a 55 gallon drum. Repeat 3-4 times.
5. Drain excessive liquid and transfer equipment to the next bucket.
6. Rinse the outside surface as in step 3. above, using tap water.
7. Clean internals as in steps 4. and 5. above, using the tap water.
8. Repeat rinsing and cleaning operations in another bucket using tap water.
9. Repeat the final rinse and cleaning operations with the distilled or deionized water in the fourth bucket.
10. Wrap pump and tubing or the bailer in a clean plastic sheet.

Note: The TSP solution and water used as decontaminating agents are to be disposed of as directed by General Electric.