ADDENDUM I

WASTEWATER MANAGEMENT AND REMEDIAL INVESTIGATIONS

USCI DIVISION OF C.R. BARD FACILITY
Glens Falls, New York

JUNE 1986

TAMS CONSULTANTS, Inc.

ADDENDUM I

WASTEWATER MANAGEMENT
AND REMEDIAL INVESTIGATIONS

USCI DIVISION OF C.R. BARD
GLENS FALLS, NEW YORK

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ADDENDUM I

WASTEWATER MANAGEMENT AND REMEDIAL INVESTIGATIONS

1. INTRODUCTION

A report entitled, "Wastewater Management and Remedial Investigations at the USCI Division of C.R. Bard Facility, Glens Falls, New York", was prepared and submitted by TAMS Consultants, Inc. in April 1986. Additional sampling was conducted on May 13, 1986 by ERCO, under the supervision of TAMS. The samples were analyzed by ERCO and received by TAMS on June 10, 1986. The sources sampled were seven leaching pits and tanks, and one underground storage tank. This addendum presents the sampling and analytical data and field observations from the effort, as well as short and long-range investigative, waste management, and remedial plans at the Glens Falls facility.

This addendum consists of four major sections:

- Description of the sampling program and locations;
- Summary and interpretation of analytical results;
- Proposed cleanup activities based on the results of this sampling and analysis; and
- Long-range plans for investigation and remediation at the facility.

2. SAMPLING PROGRAM AND LOCATIONS

2.1 Summary and Rationale

Sanitary wastewater as well as certain process and other wastewaters have been discharged to a number of different leaching pits throughout the site. As a result of a "cease discharge" order from the New York State Department of Environmental Conservation (NYSDEC) issued in November 1985 and TAMS' recommendations, contact process wastewater is no longer discharged. In order to prevent possible future problems (such as groundwater contamination) and to begin decommissioning of the leaching system, a number of these leaching pits were sampled. These pits included those that were either no longer in use or could be decommissioned without significant disruptions to the facility or its operations. The goal of the analytical program was to characterize the contents of these pits for the purpose of removal and disposal, followed by final closure of these pits.

In addition to the seven leaching pits, one underground tank was sampled and analyzed in order to obtain data necessary for disposal of its contents and removal of the tank.

2.2 Sampling Locations

The technical scope of work developed for the sampling of an underground storage tank and leaching systems provides for a determination of the appropriate hazardous or non-hazardous classification of the wastewater and sludges.

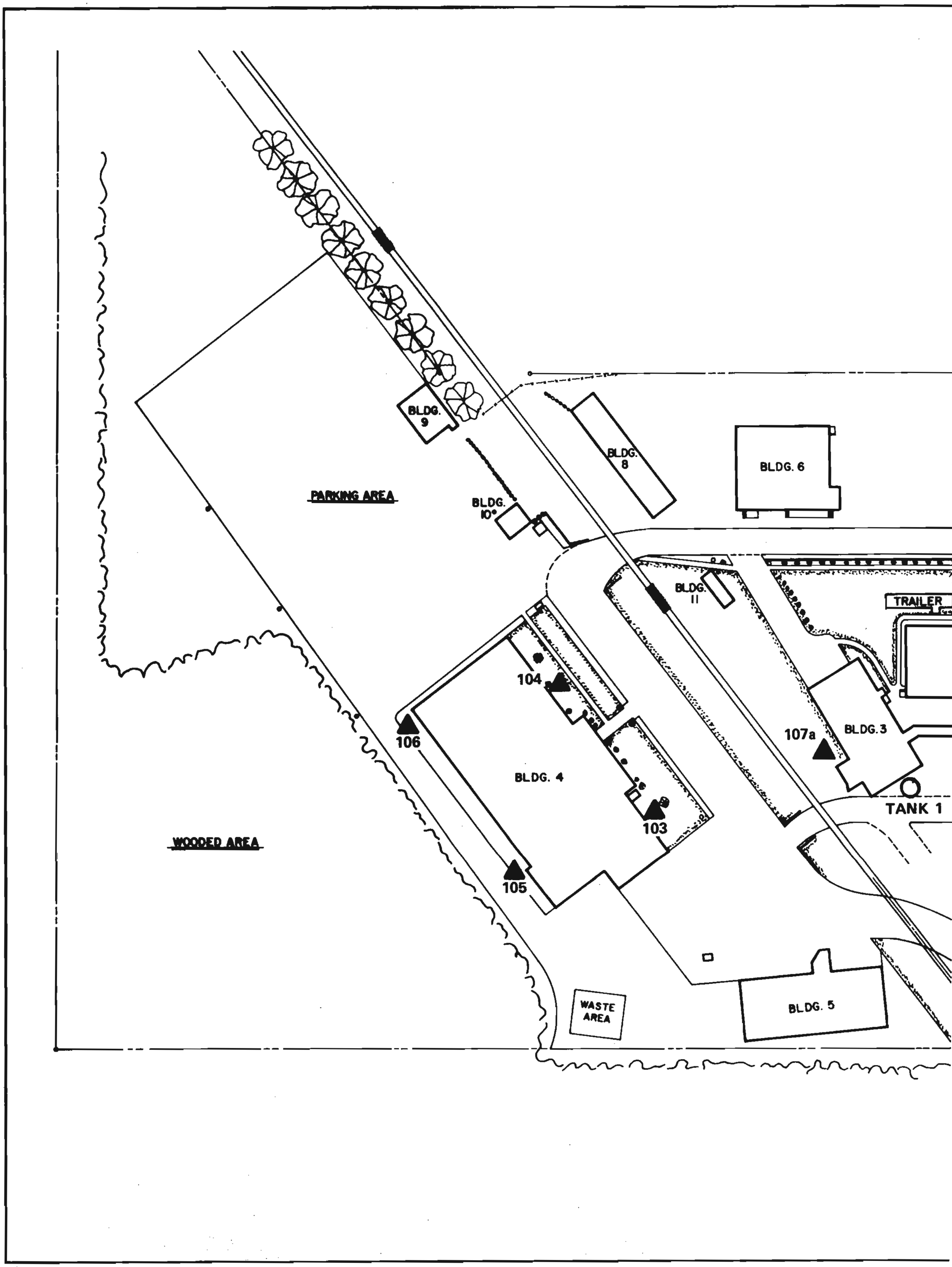
USCI facility engineering staff provided the sampling team with access to the sampling locations and removed surface soil or debris to allow access to the sampling locations. A total of eight systems were sampled. Locations are shown on Figure 1 and described as follows:

Station 101 - This is a square cinder block pit, approximately 3.75 ft by 3.75 ft located at the southeast corner of Building 7. The eastern side of this pit is just a few feet inside the limits of the USCI property line. Prior to 1967, this pit had been used for the disposal of waste oil from vehicle maintenance, and the sample taken had the appearance of a thick, brown, oil/water emulsion.

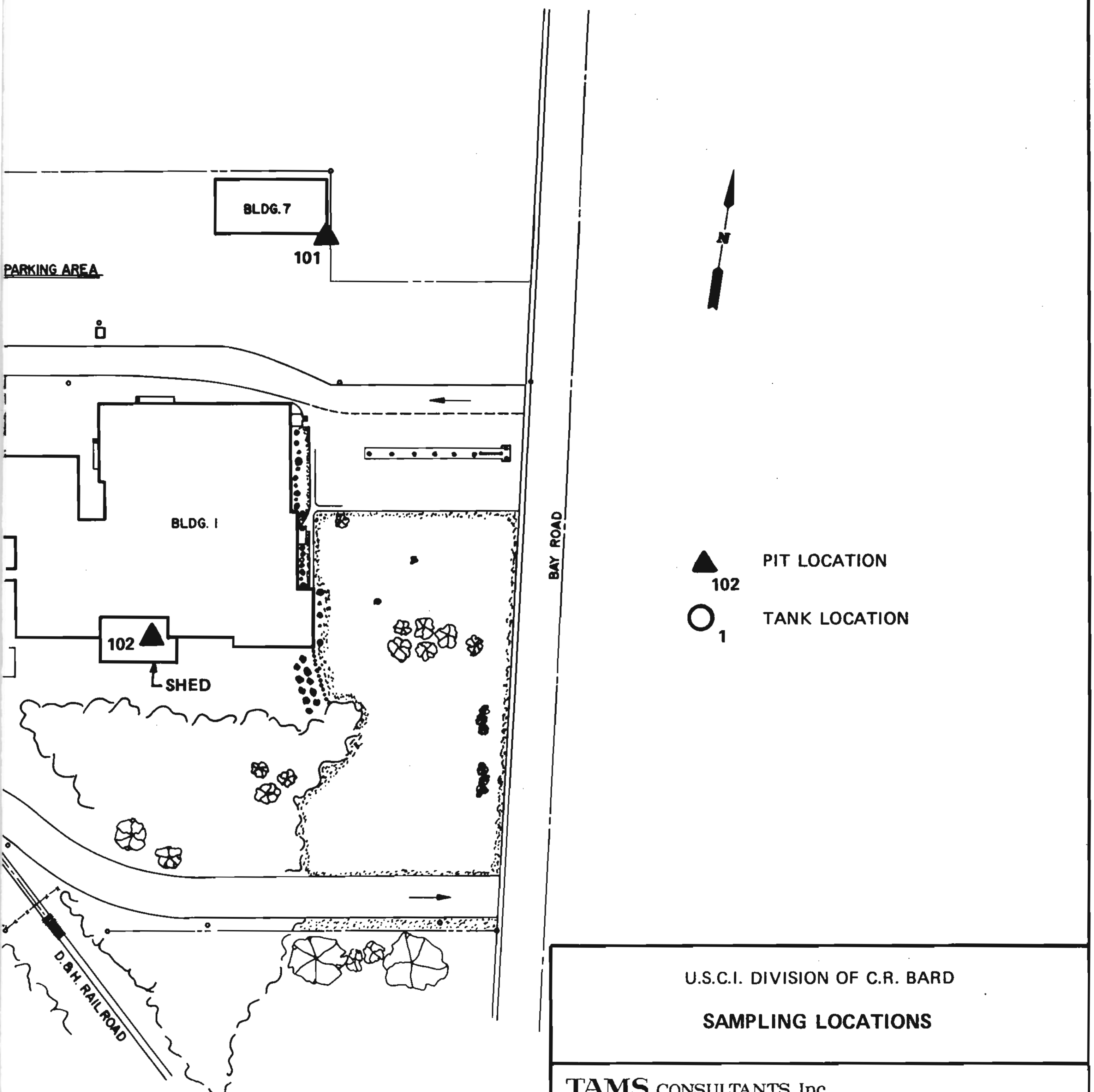
Station 102 - This is a rectangular cinder block pit, approximately 2 ft by 3 ft, located inside the shed housing the air emission collection and control system. One wall of this pit is a common wall with the foundation of Building 1. The pit contained approximately 2 ft of water (which was not sampled) and a thin layer of sludge (which was sampled). The thickness of the sludge layer could not be determined; however, it is estimated to be 3 inches. This pit had been tied into one sink in Building 1. Plant personnel reported that this pit was not in use, and that the water in the pit was groundwater; however, this could not be confirmed.

Station 103 - This is a cylindrical concrete leach tank, that is 4 ft in diameter, about 4 ft deep (open at the bottom), and near the southeast corner of Building 4. According to plant personnel, this tank was installed approximately two to three years ago and has a layer of gravel on the bottom. This tank received wastewater only from Building 4. A two-inch diameter PVC pipe enters this tank from the direction of Building 4. The depth to soil was about 2.5 ft from the top of the tank. Only a very small amount of free liquid was present. The sample, which was an 8-inch long core, had the appearance of soft, moist soil. Groundwater partially filled the hole left by the sample core after its removal.

Station 104 - This leach tank is similar in history and construction to tank **103**, located near the northern corner of Building 4. The only differences between **104** and **103** were that there was no visible PVC piping entering **104**, no free or standing water was present, and the sample had the appearance of brown and gray soil.



BLDG. 9
BLDG. 8
BLDG. 6
PARKING AREA
BLDG. 10
BLDG. 11
TRAILER
104
106
BLDG. 4
103
105
107a
BLDG. 3
TANK 1
WOODED AREA
WASTE AREA
BLDG. 5



U.S.C.I. DIVISION OF C.R. BARD

SAMPLING LOCATIONS

TAMS CONSULTANTS, Inc.

SCALE: 1" = 100'	FIGURE
DATE: JUNE 1986	1

Station 105 - This is a rectangular, cinder block pit near the air conditioning unit behind Building 4. It's inside dimensions are approximately 4'-9" by 3'-3". The top of the pit is about 0.5 ft above grade. One long wall of the pit is in common with Building 4. Wastewaters including glycer in had reportedly been disposed in the pit. No free liquid was present in this pit, and the sampler penetrated less than 6 inches. The sample had the appearance of stiff dirt, containing much debris, including insulation, electrical tape, and gravel.

Station 106 - This is a rectangular, cinder block pit, that is approximately 2'-9" by 3'-8". The cap for this pit also forms the landing for an exit near the northwest corner of Building 4, and one long wall of this pit is shared with Building 4. The top of this pit is slightly (less than one foot) above grade. This pit may have received liquid wastes from labs in Building 4. Some free water was present in this pit about 2'-7" below the top of the pit. The sampler penetrated about 6 inches, and the "sludge" sampled had the appearance of wet soil with rotting leaves.

Station 107a - This is rectangular cinder block pit behind the Building 3 laboratory. The pit is approximately 4 ft by 3 ft. The pit is buried 1 to 2 ft below grade and contains an inoperative pump. Historically, sanitary and other wastes from Building 1 and lab wastes from Building 3 were collected in this pit, and then pumped to the old leachfield. Certain laboratory wastewaters were disposed in this pit until November, 1985. Since then, only water from lab sinks (employee hand-washing, etc.) are discharged here. Other lab waste is collected in a drum and disposed off-site. This pit contained water about 9 inches below the top of the pit, and this water layer, which was not sampled, was 2'-7" thick. The sludge layer was about 3 to 4 inches thick and sampled with a scoop.

The sample had the appearance and consistency of wet mud.

Tank 1 - This is an underground tank that is located slightly south of Building 3. According to plant personnel, this tank is cylindrical and in a vertical orientation with an estimated diameter of 4 ft. Field observations during sampling indicated that the tank is about 4.5 ft to 5 ft high and the top of the tank is 1.0 to 1.5 ft below grade. Sampling access was obtained through a vent/fill pipe extending 2'-3" above the paved surface. The tank is assumed to be constructed of 1/4 inch carbon steel, and have a capacity of 400 to 500 gallons (based on the assumed dimensions). This tank reportedly, formerly received wastes from the floor drain in the solvent mixing room in Building 3. However, plant personnel state that this drain had been plugged (filled with concrete). The tank was sampled with a 5 ft Teflon bailer with a Teflon check valve. Sample recovery in the bailer was 4'-5". The sample had the appearance of clear liquid with rust particles in the bottom. The sample discolored (turned yellow) after about 15 minutes of exposure to direct sunlight. Field tests indicated that the sample was aqueous and one continuous phase.

3. SUMMARY AND INTERPRETATION OF ANALYTICAL RESULTS

3.1 Analyses Performed

The seven tank and pit samples (101 through 107a) were analyzed by ERCO for the following parameters:

- Total Volatile Organics Scan (EPA Methods 601/602 without individual peak quantification)
- Corrosivity by pH (40 CFR 261.22)
- Reactivity (40 CFR 261.23)
- Ignitibility (40 CFR 261.21, Flash Point by Pensky-Martin closed cup)
- Specific Gravity
- Total Solids (EPA-600/4-79-020, March 1983, Method 160.3)
- EP Toxic Metals (40 CFR 261.24 and SW-846 Method 1310, or 1330 where applicable)
- Other Priority Pollutant Metals (SW 846, 7000 series)

Tank 1 was analyzed for the same parameters excluding total volatile organics scan. Instead, a full priority pollutant analysis was substitued for the scan. In addition, Tank 1 was also analyzed for Total Phenolics (EPA-600/4-79-020, March 1983, Method 420.2), Chlorine, Sulfur (ASTM D-1552), and BTU content. The complete ERCO analytical report is presented in the Appendix, and a summary is included in Table 1.

3.2 Summary and Interpretation

None of the samples tested were found to be corrosive, reactive, and only one sample (101) exceeded the allowable levels of EP Toxic Metals. All the samples had flash points of substantially less than 140°F. However, only three of the samples can reasonably be considered liquid. These Samples are 101 (an oil-water emulsion, 37% solids),

TABLE 1
SUMMARY OF ANALYTICAL DATA ON SAMPLES COLLECTED 5/13/86

SAMPLE I.D.	PHASE ANALYZED	TOTAL VOLATILE ORGANICS (ppm)	CORROSIVITY (40 CFR 261)	REACTIVITY (40 CFR 261)	SPECIFIC GRAVITY	FLASH POINT (deg. F)	SOLIDS (%)	METALS (1) Ep Toxic metals (mg/l)	METALS (1) other p.p. metals (mg/l)
101	LIQUID (OIL/WATER EMULSION)	160.	NC	NR	0.98	80	37	Pb: 47(2,3) Cr: 1.5(2)	Cu: 1.7 Ni: 0.09 Zn: 41.
102	SLUDGE (LIQUID NOT SAMPLED)	8.	NC	NR	1.17	90	30	Pb: 0.06	Ni: 0.14 Zn: 6.0
103	SOLID (SEMI-SOLID)	0.02	NC	NR	1.81	78	73	ND	Cu: 0.021 Zn: 0.092
104	SOLID (SEMI-SOLID)	0.06	NC	NR	1.94	76	75	ND	Cu: 0.076 Ni: 0.051 Zn: 0.80
105	SOLID	0.15	NC	NR	1.37	87	73	ND	Cu: 0.011 Zn: 1.1
106	SOLID SLUDGE (FREE LIQUID NOT SAMPLED)	1,100.	NC	NR	1.48	82	59	ND Sb: 0.005	Cu: 0.005 Ni: 0.027 Zn: 1.3
107a	SLUDGE (LIQUID NOT SAMPLED)	0.02	NC	NR	1.68	94	69	ND	Cu: 0.007 Ni: 0.01 Zn: 7.2
TANK 1 (4)	LIQUID	(5)	NC	NR	0.99	75	0.16	Pb: 0.042	ND

NC: Not Corrosive.
ND: Not Dectected. For detections limits, see full data report (Appendix).
NR: Not Reactive (40 CFR 261.23, definitions 1,2,4 and 5).

NOTES
(1) Metals not listed were not detected
(2) Modified EP Toxicity test performed due to high oil content of sample.
(3) Pb exceeds allowable limit.
(4) Additional analyses performed on Tank 1: Pesticides/PCBs: ND; Acid compounds: ND; Base/neutrals: bis(2-ethylhexyl)phthalate: 0.36 ppm, others ND; Total Phenolics: 0.3 ppm; chlorine: 0.007% (wt/wt); sulfur 0.06% (wt/wt); sample not combustible.
(5) 199 ppm was the sum of concentrations of 2 of 35 priority pollutant volatile organics above detection limits (4-methyl-2-pentanone: 180 ppm, toluene: 19 ppm; others ND).

102 (a thin aqueous sludge, 30% solids), and Tank 1 (aqueous, 0.16% solids). These three samples are therefore considered hazardous based on the ignitibility (sample 101 is also hazardous based on the characteristic of EP Toxicity). The high concentration of unidentified volatile organics (1100 ppm) in the sample from 106, coupled with the low flash point, suggests that a characterization of this sample as hazardous based on ignitibility is appropriate.

The samples from leaching tanks 103, 104, 105, and 107 were also solids (69% to 75% solids by analysis). Therefore, categorization of these samples as hazardous with regard to ignitibility based on flash point is not appropriate [as per 40 CFR 261.21 (a)(2)].

In addition, since volatile organic concentrations in these four samples were low (ranging from 0.02 ppm to 0.15 ppm), the data suggests that there is little evidence for listing these materials as hazardous based on hazardous constituents. A final determination of non-hazardous may require analysis for oxidizer 49 CFR 173.151. However, the small quantities involved (the total contents of these four pits is only three cubic yards [Table 2]) dictate that these materials will in all likelihood be bulked for disposal with the solid contents of tanks 101, 102 and 106. Removal and disposal of the tanks, pits and contents will be discussed further in the following sections of this addendum.

4. PROPOSED SHORT-TERM CLEANUP ACTIVITIES

4.1 Actions to Date

Upon receipt of the analytical data from ERCO on June 10, 1986, TAMS contacted three private hazardous waste contractors to obtain quotes and proposals for the complete removal and disposal of the eight pits and tanks. The USCI Glens Falls site was identified only as a confidential light industrial facility located about 50 miles north of Albany. All analytical data obtained from the May 13, 1986 sampling (Table 1) was submitted to the contractors, as well as TAMS' estimates of the quantities involved (Table 2). In all cases, decommissioning of the tanks and pits is to involve removal of the entire contents (liquid, sludge and solid) down to the bottom of the tank or pit; removal and disposal of the tank or walls of the pit (except those pit walls from 102, 105, and 106 that are integral to buildings will not be removed); and sampling prior to filling with clean sand. Data relevant to the removal and disposal of the tanks and pits and their contents are summarized in Table 2.

4.2 Verification of Contamination Removal

4.2.1 Tanks/Pits 101-107a

Sampling to verify removal of contamination will consist of a set of four or five "split spoon" soil samples from each excavation. For all tanks/pits, one vertical two-foot split spoon sample will be taken from the center of the excavated area to evaluate potential vertical migration of contaminants. In addition, horizontal split spoon samples will be taken to assess the possibility of radial contaminant migration. The horizontal split spoon samples will be taken between 0.5 and 1.0 ft above the bottom of the excavation. For the square and rectangular pits, one horizontal split spoon sample will be taken from each of the sides excavated; and for the cylindrical tanks (103 and 104) four horizontal samples will be taken at evenly spaced (approximately 90°) intervals around the circumference of the excavation.

TABLE 2
TANK AND PIT REMOVAL AND DISPOSAL PARAMETERS

TANK/PIT ID	CONTENTS					TANK/PIT WALLS		TYPE OF CONSTRUCTION
	LIQUID (gallons)	SLUDGE (cu ft)	SLUDGE (lbs)	ADDITIONAL (cu ft)	EXCAV'N (lbs)	IN-PLACE VOL. (cu ft)	WEIGHT (lbs)	
101	210	0	0	14	1,350	50	3,100	CINDER BLOCK
102	52	1.5	110	4	380	19	1,160	CINDER BLOCK
103	0	0	0	19	2,120	21	4,100	CEMENT
104	0	0	0	19	2,280	21	4,100	CEMENT
105	0	0	0	31	2,650	37	2,320	CINDER BLOCK
106	TRACE	0	0	14	1,300	32	2,000	CINDER BLOCK
107	232	3.5	370	12	1,150	44	2,770	CINDER BLOCK
TANK 1	415	0	0	0	0	2	900	1/4" STEEL
TOTAL	909	5	480	113	11,230	226	20,450	

4.2.2 Tank 1

After removal of its contents, Tank 1 will be leak-tested. If the tank is determined to be sound (i.e., not leaking), the tank will be removed and only one vertical split spoon sample will be taken from the excavation before it is filled. If the integrity of the tank is suspect, then the excavation will be inspected visually for signs of contamination and also checked with an organic vapor monitor (such as the Photovac Detector). Any apparently contaminated soil will also be removed and disposed, and the excavation will be sampled in the same manner as that described for Tanks 103 and 104 (4.2.1, above).

4.2.3 Sample Analysis

The 0.0 to 1.0 ft intervals of the horizontal split spoons from each excavation will be composited (one composite each for samples 101-107a, and an additional composite from Tank 1 if necessary under the criteria outlined in 4.2.2, above). The 0.0 to 1.0 ft horizontal composite, as well as the 0.0 to 1.0 ft interval from each of the eight vertical split spoon samples, will be analyzed for RCRA hazardous characteristics (40 CFR 261.21-261.24) and volatile (purgeable) organics (EPA Method 624). Certain samples may be subjected to further analysis. Possible candidates for GC/MS semi-volatiles or a full priority pollutant analysis includes pits 105 and 106, and from Tank 1 if it was found to be leaking.

The balance of the samples (i.e., the 1.0 to 2.0 ft interval of the split spoons) will be archived pending the results of the 0.0 to 1.0 ft interval samples. Should significant contamination be found in the 0.0 to 1.0 ft interval samples, then the next interval (1.0 to 2.0 ft) from that excavation will be analyzed. This process will be repeated until analysis shows no significant contamination. The criteria for the determination of "No significant contamination" will include, as an a minimum, a determination that the sample is non-hazardous based on the RCRA characteristics of reactivity, corrosivity, ignitibility, and EP Toxicity (metals). Other criteria will be established to ensure that organic contaminants are less than certain predetermined limits; however, these limits have not yet been established.

Should any of the samples show significant contamination, excavation or removal of the contaminated material would be conducted as part of a long-range (permanent) cleanup program, as outlined below.

5. LONG-RANGE INVESTIGATIVE AND REMEDIAL PROGRAM

5.1 Goals

The goals of the long-range investigative and remedial program include:

- o Removal and appropriate disposal of contaminated soil and other materials;
- o Establishment of appropriate housekeeping and waste management procedures to prevent future contamination of air, soil, and water;
- o Prevention or remediation of groundwater contamination (as necessary); and
- o Establishment of a groundwater monitoring program.

5.2 Removal and Disposal of Contaminated Soil

In addition to the eight locations sampled, there are approximately 25-30 other operating and out-of-service underground units associated with the sites septic/leaching systems. These also include leachfields and pump stations. Most of these locations have currently been identified by plant personnel. Although no process wastewater has been discharged to septic/leaching pits or leachfields since NYSDEC's "cease discharge" order in November 1985, process wastewater was discharged to some of these prior to November 1985. Therefore, it is necessary to identify, sample, and analyze these locations in order to define the existence, extent, and nature of contamination.

To conduct this work in an efficient manner without excessively disrupting plant operations, it is proposed to do this work at the time the facility is hooked up to the town sewer system (estimated to be in the summer of 1987). All the septic pits would be taken out of service at that time. There is no apparent need to conduct this work any sooner, since preliminary sampling and analysis (February 1986) did not reveal any evidence that contamination at the site was causing significant groundwater contamination. The work plan (including sampling and analysis) for this operation would be very similar to that for the removal of the eight tanks and pits sampled on May 13, 1986. The excavation work would be performed by a qualified waste contractor, who may or may not be the same contractor as for the removal of eight tanks and pits discussed in this Addendum.

5.3 Housekeeping and Waste Management Procedures

To a large extent, the facility has taken the necessary steps for appropriate management of process wastes. These include:

- Terminating discharge of process wastewater to onsite septic systems;
- Recycling process water to minimize the amount of waste generated;
- Collecting (drumming) hazardous wastes for offsite disposal by a qualified contractor;

- Not allowing accumulation of wastes longer than the 90-day period allowed under RCRA; and
- Preparing a long-range plan for removal of contamination at the site.

In addition, several other steps are planned for the management of site wastes. Most significant among these are:

- Eliminating all discharges to onsite septic systems after hookup to the town sewer line (estimated for completion in the summer of 1987).
- Constructing an appropriate facility for the storage of drummed hazardous wastes prior to disposal; and
- Continuing employee education and housekeeping practices to ensure that hazardous wastes are segregated from discharges to the town sewer system.

5.4 Prevention/Remediation of Groundwater Contamination

The removal of contaminated soils and other materials from the site, as well as termination of onsite disposal of any nature after hookup to the town sewer, should prevent the introduction of any additional contamination to the aquifer.

Currently available sampling data indicate that no gross contamination of the aquifer is being caused by discharges at the site (Table 8 and Appendix C, Wastewater Management and Remedial Investigations, April 1986). Therefore, no remedial action with regard to groundwater is currently planned. However, a groundwater monitoring program should be instituted, (the proposed program is outlined in the following section). If contamination is found, a remedial program must be designed based on the source, nature, extent, and degree of hazard presented by the contamination.

5.5 Groundwater Monitoring

On February 4, 1986, four shallow wells were installed by Parratt/Wolff under the supervison of TAMS in locations shown on Figure 2. These wells ranged in depth from about 13 to 25 ft below grade. At the time of installation, the groundwater table was between about 4 ft and 7 ft below grade; more recent observations (May 13, 1986) indicated the water table was between 4.0 and 4.6 feet below grade in all four wells. Seasonal Groundwater contours estimated from the February and May, 1986 observations are shown on Figure 2.

The aquifer underlying the USCI-Glens Falls site may be perched on a clay aquiclude; however, this cannot be confirmed by current data. Only one well (No. 4) intersects an aquiclude, so the continuity of this layer, or its effectiveness as an aquiclude, cannot be established. Therefore, additional borings and wells are necessary for an effective groundwater monitoring program.

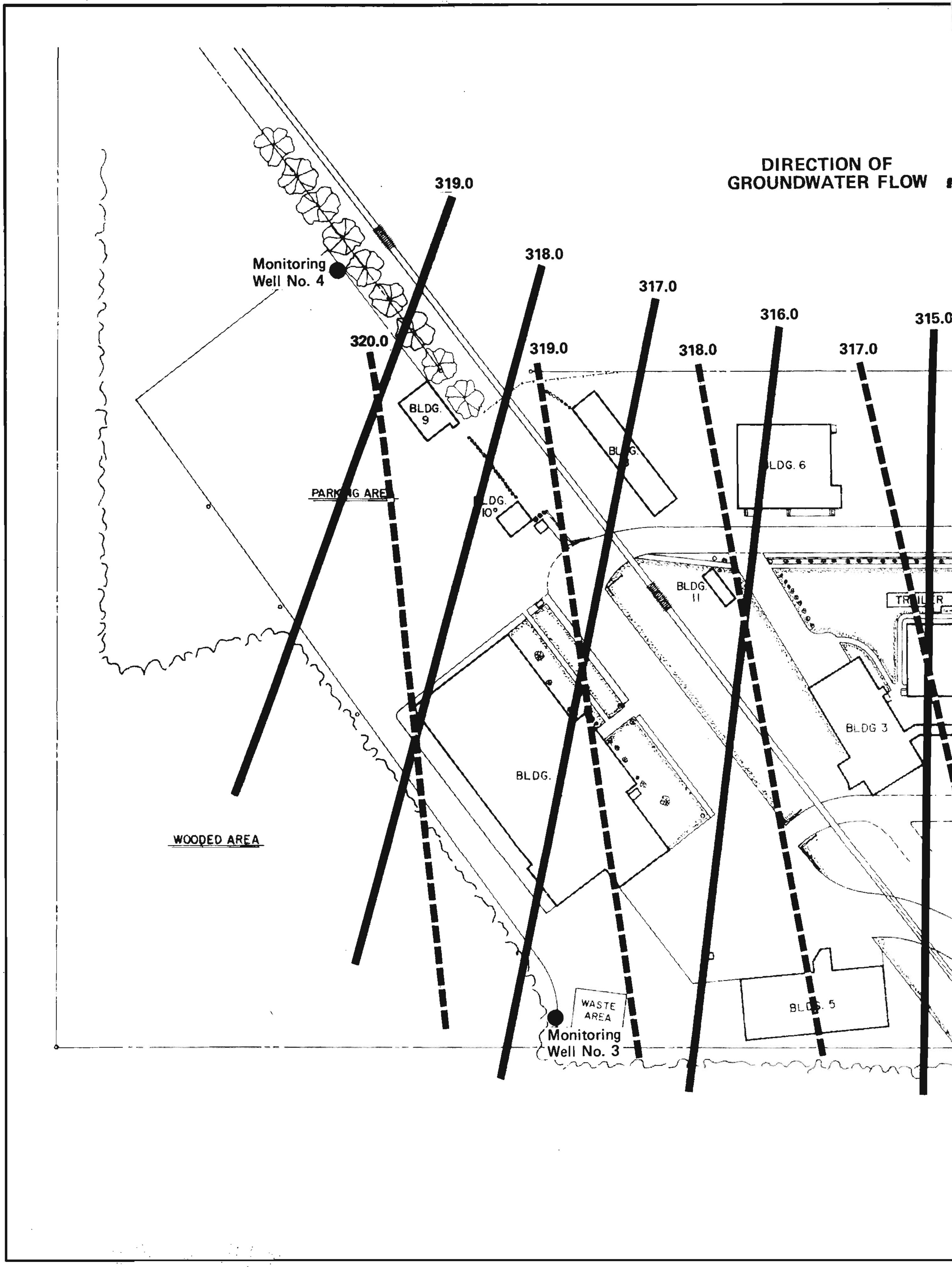
Several fairly shallow (50 ft maximum) test borings should be made at locations scattered about the site to determine if the Lake Clay is continuous underneath the site, and if it appears thick enough to form an effective aquiclude. If so, then several down-gradient wells to the depth of the aquiclude will be installed. Since the general groundwater flow direction is east (see Figure 2), several wells in the area of currently existing Wells No. 1 and No. 2 and in front of Building 1 should be sufficient to establish if contaminated groundwater is migrating offsite. As an added precaution in case the aquifer is leaky, a deep well may also be installed. One well to the depth of the aquiclude at the western edge of the site (near or a bit southwest of Well No. 4) should be adequate to assess the background contaminant concentration.

If the test borings indicate that the Lake Clay is not continuous or is not an effective aquiclude, deeper wells will be necessary. In that case, clusters of wells screened at different depths will be necessary to fully monitor potential groundwater contamination. Each cluster should have one well screened at a shallow depth, at or near the elevation of the groundwater table. The wells placed at the groundwater table depth will serve two purposes. They will be a means to retrieve samples from the surface of the groundwater table for analysis of contamination, and they will also be a means to measure water levels so that local groundwater gradients can be more accurately defined. The proposed locations of the deep cluster wells would not be different than those for shallow wells; however, depending on the depth required, the number of locations might be reduced.

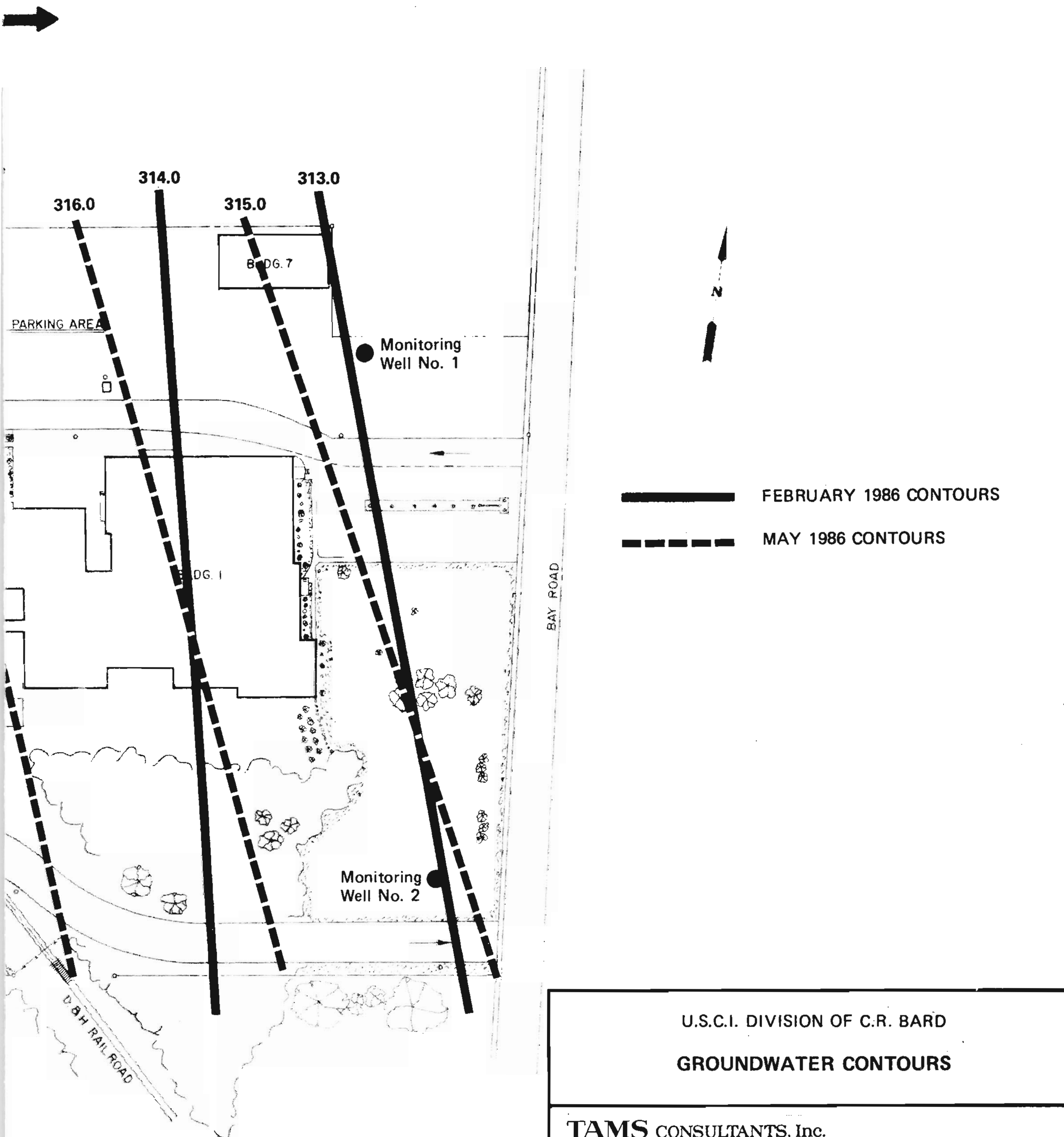
6. SUMMARY AND CONCLUSIONS

Past waste disposal practices at the facility have resulted in some soil contamination as well as the associated potential for groundwater contamination. As a result of a "cease discharge" order from NYSDEC, USCI was ordered to terminate the disposal of process wastes into onsite septic facilities, and hired TAMS to assist in the development of a program to mitigate environmental problems.

Since November 1985 many steps have been taken to prevent further contamination from occurring. These steps include: reduction in waste volume by recycling process water; terminating the discharge of process wastes to onsite septic systems; and segregating and collecting hazardous wastes for offsite disposal. In addition, four



DIRECTION OF
GROUNDWATER FLOW
319.0
318.0
317.0
316.0
315.0
320.0
319.0
318.0
317.0
Monitoring
Well No. 4
BLDG.
9
PARKING AREA
BLDG.
10
BLDG. 6
BLDG.
11
TRAILER
BLDG 3
BLDG.
WOODED AREA
WASTE
AREA
Monitoring
Well No. 3
BLDG. 5



U.S.C.I. DIVISION OF C.R. BARD

GROUNDWATER CONTOURS

TAMS CONSULTANTS, Inc.

SCALE: 1" = 100'	FIGURE	2
DATE: JUNE 1986		

shallow monitoring wells have been constructed and one round of sampling undertaken, and several soil, sludge, and septic pits have been sampled and analyzed.

Along with the work already completed, several other projects are scheduled for the immediate future. For example, hazardous waste contractors are being contacted for removal and disposal of eight tanks and pits sampled in May 1986; and USCI with TAMS' assistance is designing a new structure for storage of drummed hazardous waste prior to disposal.

Despite the work that has already been accomplished and is scheduled, more remains to be done. In addition to the eight tanks and pits scheduled for removal, there are approximately 25-30 additional potential sources of contamination that need to be identified, sampled, and analyzed, and any contamination found should be removed and disposed. In addition, allegations of the existence of onsite dumping of hazardous substances have been made. This charge needs to be laid to rest.

Another item of major concern that needs to be addressed is the potential for groundwater contamination. Although the actions both planned and already undertaken should prevent any further contamination, a groundwater monitoring program should be instituted to verify that conditions and operations at the site are not causing groundwater contamination. In order to achieve this, additional hydrogeological data needs to be obtained in order to accurately characterize the aquifer underlying the site, deeper monitoring wells need to be constructed, and a regular program of sampling and analysis of these wells should be instituted.

APPENDIX

ANALYTICAL DATA PACKAGE FROM SAMPLES

COLLECTED 5/13/86

ERCO
205 Alewife Brook Parkway, Cambridge, Massachusetts 02138 (617) 661-3111 Telex 650-256-7697 (MCI)

A DIVISION OF
ENSECO
INCORPORATED

June 9, 1986

Mr. Michael Tumulty, PE
TAMS Consulting Inc.
655 Third Avenue
New York, NY 10017

Dear Mr. Tumulty:

Enclosed are the results of the eight samples collected on May 13, 1986.

For the samples collected for reactivity and corrosivity the following points should be noted:

1. Reactivity -- Water compatibility tests were performed on the samples collected and no violent change or reaction, including the formation of explosive mixtures, or formation of toxic gases was observed. In addition, analysis for reactive cyanide and sulfide showed less than 10 ppm for all the samples tested. The samples were not tested for explosivity, however, the waste is not known to be an explosive waste as defined by 49 CFR 173.53 or 173.88.

2. Corrosivity -- A conservative approach was taken toward the solid waste samples collected. They were mixed with water and the pH was then taken of the leachate liquid. In all cases, the pH was found to be between 6.0 and 8.0.

Should you have any questions concerning this work, please do not hesitate to contact me.

I look forward to working with you again on future projects.

Sincerely,

Ian Phillips
Project Manager

IP:mk
Encl.

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FIELD OBSERVATIONS

Sampling of the USCI division of C.R. Bard facility in Glens Falls, NY took place on tuesday May 13, 1986. Seven leaching tanks (Tanks 101 through 107A) and one solvent mixing room drainage tank (Tank 1) were sampled. The leaching tanks were sampled in the following order: 104, 103, 107A, 106, 105, 107A, 102, and 101. Tank 107A was sampled on two occasions to insure that an adequate sample for all of the analyses was taken.

Tank 104: The sample was a very moist sludge with the consistency of a very wet clay. The viscosity is considered medium and the physical state of semi-solid. The sample was weakly acidic (pH 6).

Tank 103: The sample's appearance was similar to Tank 104, however, appeared to contain a larger amount of water because after the core was removed the hole filled with water. The viscosity is considered medium and the physical state semi-solid. The sample was weakly acidic (pH6).

Tank 107A: The viscosity was considered high and the physical state was semi-solid. The sample had a pH of approximately 5.

Tank 106: The tank contained a black sludge and there was some puddling of water within the tank. The viscosity was considered to be medium and the physical state was a semi-solid. The sample had a pH of approximately 8.

Tank 105: The tank appeared not to contain any sludge at all, only dirt and debris (including insulation material and leaves) which wash in with rain fall. The sample appeared to be ordinary soil with some grey streaks supposedly due to the process which dumped into the tank. The sample was only 1-3 inches deep. The viscosity was considered high and the physical state was solid. The approximate pH was 7.

Tank 102: The viscosity was considered medium and the physical state was semi-solid. The approximate pH was 6.

Tank 101: The tank contained an emulsified oil and water mixture but no apparent sludge. The viscosity was considered low in relation to the other samples taken at the site and the physical state was considered semi-solid (though very close to a liquid). The approximate pH was 6-7.

Tank 1, Liquid Sample: The liquid was examined for two phases (organic and aqueous) both within the tube and after pouring the contents of the tube into a graduated cylinder and erlymeyer flask. The liquid within the erlymeyer was also mixed with an equal portion of DI water to determine whether the sample was organic or aqueous. It was aqueous.Viscosity was low and the physical state was a liquid. The pH was approximately 6.

The pH of each sample was estimated using pH paper. The pH was taken by touching the paper to the solid material thus allowing moisture from the sample to pass onto the paper.

Viscosity was judged on the following basis:

1) High--could not be poured or would not significantly flow if placed on a gradient.
2) Medium--could be poured slighty or contained a pourable component.
3) Low--sample was readily poured.

RESULTS OF TOTAL ANALYSIS (mg/l)

Sample ID: Tank #1
ERCO ID: 61457-08

EP-Toxicity Metals

As	<0.002
Cd	<0.004
Cr	<0.005
Pb	0.042
Hg	<0.0001
Se	<0.004
Ag	<0.003

Additional Priority Pollutant Metals

Sb	<0.002
Be	<0.001
Cu	<0.003
Ni	<0.01
Tl	<0.002
Zn	<0.050

RESULTS OF OILY EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Tank #101
ERCO ID: 61457-07

EP-Toxicity Metals

As	<0.015	
Cd	<0.05	
Cr	1.5	
Pb	47	✓ 5.0 ppm
Hg	<0.007	
Se	<0.03	
Ag	<0.015	

Additional Priority Pollutant Metals

Sb	<0.015
Be	<0.004
Cu	1.7
Ni	0.09
Tl	<0.03
Zn	41

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Tank #102
ERCO ID: 61457-06

EP-Toxicity Metals

As	<0.05
Cd	<0.004
Cr	<0.005
Pb	0.060
Hg	<0.001
Se	<0.01
Ag	<0.003

Additional Priority Pollutant Metals

Sb	<0.004
Be	<0.001
Cu	<0.003
Ni	0.14
Tl	<0.004
Zn	6.0

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Tank #103
ERCO ID: 61457-02

EP-Toxicity Metals

As	<0.05
Cd	<0.004
Cr	<0.005
Pb	<0.02
Hg	<0.001
Se	<0.01
Ag	<0.003

Additional Priority Pollutant Metals

Sb	<0.004
Be	<0.001
Cu	0.021
Ni	<0.01
Tl	<0.004
Zn	0.092

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Tank #104
ERCO ID: 61457-01

EP-Toxicity Metals

As	<0.05
Cd	<0.004
Cr	<0.005
Pb	<0.02
Hg	<0.001
Se	<0.01
Ag	<0.003

Additional Priority
Pollutant Metals

Sb	<0.004
Be	<0.001
Cu	0.076
Ni	0.051
Tl	<0.004
Zn	0.80

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Tank #105
ERCO ID: 61457-05

EP-Toxicity Metals

As	<0.05
Cd	<0.004
Cr	<0.005
Pb	<0.02
Hg	<0.001
Se	<0.01
Ag	<0.003

Additional Priority
Pollutant Metals

Sb	<0.004
Be	<0.001
Cu	0.011
Ni	<0.01
Tl	<0.004
Zn	1.1

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/l)

Sample ID: Tank #106
ERCO ID: 61457-04

EP-Toxicity Metals

As	<0.05
Cd	<0.004
Cr	<0.005
Pb	<0.02
Hg	<0.001
Se	<0.01
Ag	<0.003

Additional Priority Pollutant Metals

Sb	0.005
Be	<0.001
Cu	0.005
Ni	.027
Tl	<0.004
Zn	1.3

RESULTS OF EP-TOXICITY LEACHATE ANALYSIS (mg/1)

Sample ID: Tank #107A
ERCO ID: 61457-03

EP-Toxicity Metals

As	<0.05
Cd	<0.004
Cr	<0.006
Pb	<0.02
Hg	<0.001
Se	<0.01
Ag	<0.003

Additional Priority Pollutant Metals

Sb	<0.004
Be	<0.001
Cu	0.007
Ni	0.01
Tl	<0.004
Zn	7.2

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: Tams
SAMPLE RECEIVED: 05/14/86
ANALYSIS COMPLETED: 06/02/86
RESULTS IN: ng/g (ppb)

TOTAL VOLATILE ORGANICS ANALYSIS

- Data Report -

ERCO ID	Client ID	Reporting Limit	Result
30418	Tank #104	3.4	58
30419	Tank #103	3.4	21
30420	Tank #107A	3.5	15
30421	Tank #106	19,000	1,100,000
30422	Tank #105	3.5	150
30423	Tank #102	3.6	8,000
30424	Tank #101	3,900	160,000

Reported by: WC
Checked by: NS

ERCO/ A DIVISION OF ENSECO INCORPORATED

CORROSIVITY AND REACTIVITY

CLIENT: Tams

SAMPLE RECEIVED: 05/14/86

- Data Report -

ERCO ID	Client ID	Corrosivity	Reactivity
30418	Tank #104	NC	NR
30419	Tank #103	NC	NR
30420	Tank #107A	NC	NR
30421	Tank #106	NC	NR
30422	Tank #105	NC	NR
30423	Tank #102	NC	NR
30424	Tank #101	NC	NR
30425	Tank #1	NC	NR

NC = Not corrosive by definition (40CFR 261.22).

NR = Not reactive by definitions 1, 2, 4, 5 (40CFR 261.23).

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: Tams

SAMPLE RECEIVED: 05/14/86

ANALYSIS COMPLETED: 06/04/86

RESULTS IN: as indicated

REPORTED BY: RW/PC/FM

CHECKED BY: PR

INORGANIC ANALYSIS

- Data Report -

ERCO ID	Client ID	Specific Gravity	Ignitability (F°)	Solids, Total (%)
30418	Tank 104	1.94	76	74.7
30419	Tank 103	1.81	78	72.8
30420	Tank 107A	1.68	94	68.8
30421	Tank 106	1.48	82	58.7
30422	Tank 105	1.37	87	73.4
30423	Tank 102	1.17	90	30.4
30424	Tank 101	0.977	80	36.7

If customer has any questions regarding analysis, refer to sample in question by its ERCO ID#.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: Tams

SAMPLE RECEIVED: 05/14/86

ANALYSIS COMPLETED: 06/04/86

RESULTS IN: mg/1 (ppm)*

REPORTED BY: PC/FM

CHECKED BY: RW

INORGANIC ANALYSIS

- Data Report -

ERCO ID	Client ID	Phenolics, Total	Specific Gravity	Ignitability (°F)	Solids, Total (%)
30425	Tank 1	0.299	0.991	75	0.16

If customer has any questions regarding analysis, refer to sample in question by its ERCO ID#.

*Unless otherwise indicated.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: TAMS
SAMPLE RECEIVED: 05/14/86
ANALYSIS COMPLETED: 06/06/86
RESULTS IN: As noted below
REPORTED BY:
CHECKED BY:

- Data Report -

ERCO ID	Client ID	Cl by Weight (%)	S by Weight (%)	BTU/lbs
30425	Tank #1	0.007%	<0.06%	Sample would not burn.

ERCO/ A DIVISION OF ENSECO INCORPORATED

SAMPLE RECEIVED: 05/14/86
ANALYSIS COMPLETED: 05/30/86
RESULTS IN: µg/l (ppb)
REPORTED BY: PN
CHECKED BY: EK

- Data Report -

Compound	Client ID: Tank #1 ERCO ID: 30425
89P Aldrin	ND
90P Dieldrin	ND
91P Chlordane	ND
92P 4,4'-DDT	ND
93P 4,4'-DDE	ND
94P 4,4'-DDD	ND
95P alpha-Endosulfan	ND
96P beta-Endosulfan	ND
97P Endosulfan sulfate	ND
98P Endrin	ND
99P Endrin aldehyde	ND
100P Heptachlor	ND
101P Heptachlor epoxide	ND
102P alpha-BHC	ND
103P beta-BHC	ND
104P gamma-BHC	ND
105P delta-BHC	ND
106P PCB-1242	ND
107P PCB-1254	ND
108P PCB-1221	ND
109P PCB-1232	ND
110P PCB-1248	ND
111P PCB-1260	ND
112P PCB-1016	ND
113P Toxaphene	ND

ND = Not detected at or above reporting limit.

Detection Limit = 0.2 ppb.

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT: Tams
CLIENT ID: Tank #1
ERCO ID: 30425
SAMPLE RECEIVED: 05/14/86
ANALYSIS COMPLETED: 05/24/86
RESULTS IN: µg/l (ppb)

SUMMARY OF ORGANIC
PRIORITY POLLUTANT ANALYSIS
VOLATILE ORGANIC
COMPOUNDS

- Data Report -

Compound	Result	Compound	Result
Chloromethane	<2,500	1,2-Dichloropropane	<1,000
Bromomethane	<2,500	trans-1,3-Dichloropropene	<1,000
Vinyl chloride	<2,500	Trichloroethene	<1,000
Chloroethane	<2,500	Dibromochloromethane	<1,000
Methylene chloride	<2,500	1,1,2-Trichloroethane	<1,000
Acetone	<25,000	Benzene	<1,000
Carbon disulfide	<1,000	cis-1,3-Dichloropropene	<1,000
1,1-Dichloroethene	<1,000	2-Chloroethylvinylether	<1,000
1,1-Dichloroethane	<1,000	Bromoform	<1,000
trans-1,2-Dichloroethene	<1,000	4-Methyl-2-pentanone --------	180,000
Chloroform	<1,000	2-Hexanone	<5,000
1,2-Dichloroethane	<1,000	Tetrachloroethene	<1,000
2-Butanone	<5,000	1,1,2,2-Tetrachloroethane	<1,000
1,1,1-Trichloroethane	<1,000	Toluene ---------------------	19,000
Carbon tetrachloride	<1,000	Chlorobenzene	<1,000
Vinyl acetate	<1,000	Ethylbenzene	<1,000
Bromodichloromethane	<1,000	Styrene	<1,000
		Total xylenes	<1,000

Reported by: WC
Checked by: NS

ERCO/ A DIVISION OF ENSECO INCORPORATED

CLIENT:	Tams
CLIENT ID:	Tank #1
ERCO ID:	30425
SAMPLE RECEIVED:	05/14/86
ANALYSIS COMPLETED:	06/02/86
RESULTS IN:	µg/l

SUMMARY OF ORGANIC PRIORITY POLLUTANT ANALYSIS

- Data Report -

ACID COMPOUNDS		BASE/NEUTRAL COMPOUNDS	
21A 2,4,6-Trichlorophenol	ND	41B 4-Bromophenyl phenyl ether	ND
22A p-Chloro-m-cresol	ND	42B Bis(2-chloroisopropyl)ether	ND
24A 2-Chlorophenol	ND	43B Bis(2-chloroethoxy)methane	ND
31A 2,4-Dichlorophenol	ND	52B Hexachlorobutadiene	ND
34A 2,4-Dimethylphenol	ND	53B Hexachlorocyclopentadiene	ND
57A 2-Nitrophenol	ND	54B Isophorone	ND
58A 4-Nitrophenol	ND	55B Naphthalene	ND
59A 2,4-Dinitrophenol	ND	56B Nitrobenzene	ND
60A 4,6-Dinitro-o-cresol	ND	61B n-Nitrosodimethylamine	NA
64A Pentachlorophenol	ND	62B n-Nitrosodiphenylamine[a]	ND
65A Phenol	ND	63B n-Nitrosodi-n-propylamine	ND
		66B Bis(2-ethylhexyl)phthalate ------	360
BASE/NEUTRAL COMPOUNDS		67B Butyl benzyl phthalate	ND
		68B Di-n-butyl phthalate	ND
1B Acenaphthene	ND	69B Di-n-octyl phthalate	ND
5B Benzidine	ND	70B Diethyl phthalate	ND
8B 1,2,4-Trichlorobenzene	ND	71B Dimethyl phthalate	ND
9B Hexachlorobenzene	ND	72B Benzo(a)anthracene	ND
12B Hexachloroethane	ND	73B Benzo(a)pyrene	ND
18B Bis(2-chloroethyl)ether	ND	74B Benzo(b)fluoranthene	ND
20B 2-Chloronaphthalene	ND	75B Benzo(k)fluoranthene	ND
25B 1,2-Dichlorobenzene	ND	76B Chrysene	ND
26B 1,3-Dichlorobenzene	ND	77B Acenaphthylene	ND
27B 1,4-Dichlorobenzene	ND	78B Anthracene	ND
28B 3,3-Dichlorobenzidine	ND	79B Benzo(ghi)perylene	ND
35B 2,4-Dinitrotoluene	ND	80B Fluorene	ND
36B 2,6-Dinitrotoluene	ND	81B Phenanthrene	ND
37B 1,2-Diphenylhydrazine	ND	82B Dibenzo(a,h)anthracene	ND
39B Fluoranthene	ND	83B Indeno(1,2,3-cd)pyrene	ND
40B 4-Chlorophenyl phenyl ether	ND	84B Pyrene	ND

ND = None detected above the average reporting limit of 100 ppb for acids and 60 ppb for B/N.

Reported by: LC
Checked by: AT

NA = Not analyzed due to method limitations.

[a]Analyzed as diphenylamine.

ERCO/ A DIVISION OF **ENSECO** INCORPORATED

CLIENT: Tams
CLIENT ID: Trip Blank
ERCO ID: 30426
SAMPLE RECEIVED: 05/14/86
ANALYSIS COMPLETED: 05/24/86
RESULTS IN: μg/l (ppb)

SUMMARY OF ORGANIC PRIORITY POLLUTANT ANALYSIS VOLATILE ORGANIC COMPOUNDS

- Data Report -

Compound	Result	Compound	Result
Chloromethane	<5	1,2-Dichloropropane	<2
Bromomethane	<5	trans-1,3-Dichloropropene	<2
Vinyl chloride	<5	Trichloroethene	<2
Chloroethane	<5	Dibromochloromethane	<2
Methylene chloride	<5	1,1,2-Trichloroethane	<2
Acetone	<50	Benzene	<2
Carbon disulfide	<2	cis-1,3-Dichloropropene	<2
1,1-Dichloroethene	<2	2-Chloroethylvinylether	<2
1,1-Dichloroethane	<2	Bromoform	<2
trans-1,2-Dichloroethene	<2	4-Methyl-2-pentanone	<10
Chloroform	<2	2-Hexanone	<10
1,2-Dichloroethane	<2	Tetrachloroethene	<2
2-Butanone	<10	1,1,2,2-Tetrachloroethane	<2
1,1,1-Trichloroethane	<2	Toluene	<2
Carbon tetrachloride	<2	Chlorobenzene	<2
Vinyl acetate	<2	Ethylbenzene	<2
Bromodichloromethane	<2	Styrene	<2
		Total xylenes	<2

Reported by: WC
Checked by: NS