INVESTIGATION OF SUBSURFACE OIL NEAR THE PLANT BOILER ROOM

ALLIED/AMPHENOL-BENDIX
CONNECTOR OPERATIONS
SIDNEY, NEW YORK

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The ERM Group

TABLE OF CONTENTS

SECTION 1

INTRODUCTION

Environmental Resources Management, Inc. (ERM) has been retained by the Allied/Amphenol-Bendix Connector Operations, Sidney, New York, to conduct an assessment of the potential impact of subsurface oil, found near a former waste oil tank, on the surrounding ground water system. This tank was installed some time in the late 1960s and held No. 6 oil and possibly No. 2 oil in later years. This oil was used as boiler fuel in the adjacent boiler room. In 1981, the tank was converted to use as a waste oil storage tank, from which the waste was periodically pumped for transport to a disposal facility.

The tank was taken out of service in 1983 and was being removed permanently on 27 November 1984 when oil was discovered in the surrounding subsurface sediments. Inspection of the tank revealed no apparent leaks, indicating that minor spillages during tank filling over time may have been the source of the subsurface oil.

1.1 Objectives

The objectives of this study were to:

- Determine whether or not free-floating oil is present on the shallow ground water table.
- Define the potential for and extent of migration of any associated dissolved organic compounds.
- Make recommendations for further action, if necessary.

This study has provided substantial data and subsurface geological and hydrogeological definition, the results of which indicate the need for limited additional data collection to meet the study objectives.

1.2 Background Data

Since the tank has not been used for a year, and the oil discharge may have occurred over the years, it was necessary to investigate downgradient ground water conditions to determine if any free-floating oil or dissolved fraction concentrations are migrating. In designing this hydrogeological investigation, ERM assumed that the shallow aquifer properties in this area are similar to those encountered in the study of the West Well area. At the West Well area, the ground water table was approximately fifteen feet below the land surface and occurred in deposits of glacial alluvium. Shallow flow gradients in the area of the subsurface tank were assumed to be similar to the flow directions at the West Well, which were north to northwestward. Also, the ground water flow velocity in the tank area is expected to be on the order of 25 to 30 feet per year, as determined for the shallow flow system at the West Well.

Oil was detected in the subsurface during the removal of the underground storage tank and oil and ground water samples were collected by Allied/Amphenol personnel on 29 November. These were submitted to Friend Laboratory, Inc. for analysis. The results indicated that no PCB was present in the oil or ground water, but that up to 1,600 ppb of the benzene-toluene-xylene (BTX) series was present. The BTX compounds represent the principal soluble constituents of oil in ground water. The only other volatile compound detected was 2 ppb of Trans 1, 2-Dichlorethene. Using this preliminary information, ERM developed a program with efforts concentrated on defining any potential migration of the oil and BTX compounds at the site. Since these compounds are lighter than water, no significant downward migration is expected; therefore, the emphasis is on lateral migration.

SECTION 2

FIELD INVESTIGATION

2.1 Tank Removal and Sump Installation

On 27 November, Allied/Amphenol personnel removed the tank, along with 400 to 500 cubic yards of fill and soil material, discovering the subsurface oil in the process. Figure 2-1 shows the configuration of the open pit and locations of the piles of removed soil. Clean near-surface soils and oil-contaminated soils were segregated into separate piles and composite samples were collected by Allied personnel for analyses for PCB. Additional soil samples were collected from the bottom of the pit and also analyzed for PCB. These samples were designated Core Samples 1 through 4, and their locations are shown in Figure 2-1.

In order to protect the boiler room foundation and to prevent rainwater and runoff collecting in the open pit, it was necessary to backfill as soon as possible. To monitor and sample the ground water in the tank area, two one-foot diameter sumps were installed on 28 November. The locations are shown on Figure 2-1. These were constructed of twenty-foot long corrugated steel pipe sections, slotted along the bottom ten feet and closed on the bottom with a steel plate welded in place.

A construction shovel was used to dig a sump opening below the water table. Unfortunately, running sand was encountered and the sumps could not be set a full five feet in the ground water as desired. Each sump was set into place, pushed one to two feet into the sand bottom, and the sump pit backfilled with washed gravel for the full ten-foot slotted pipes section. Clean silt and gravel fill was used to backfill the remainder of the open pit.

2.2 Well Installation

In January 1985, five 25-foot deep wells were installed in the area for the purpose of assessing potential oil and BTX migration associated with the site. Their locations are shown in Figure 2-2. For the drilling of these wells, the hollow stem auger method was used, with split-spoon samples collected continuously for the first ten feet and at five-foot intervals thereafter. Each well was constructed of two-inch I.D. Schedule 40 PVC well riser above the water table and .010-inch machine-slotted screen

Figure 2-1
Soil Sampling Location Map

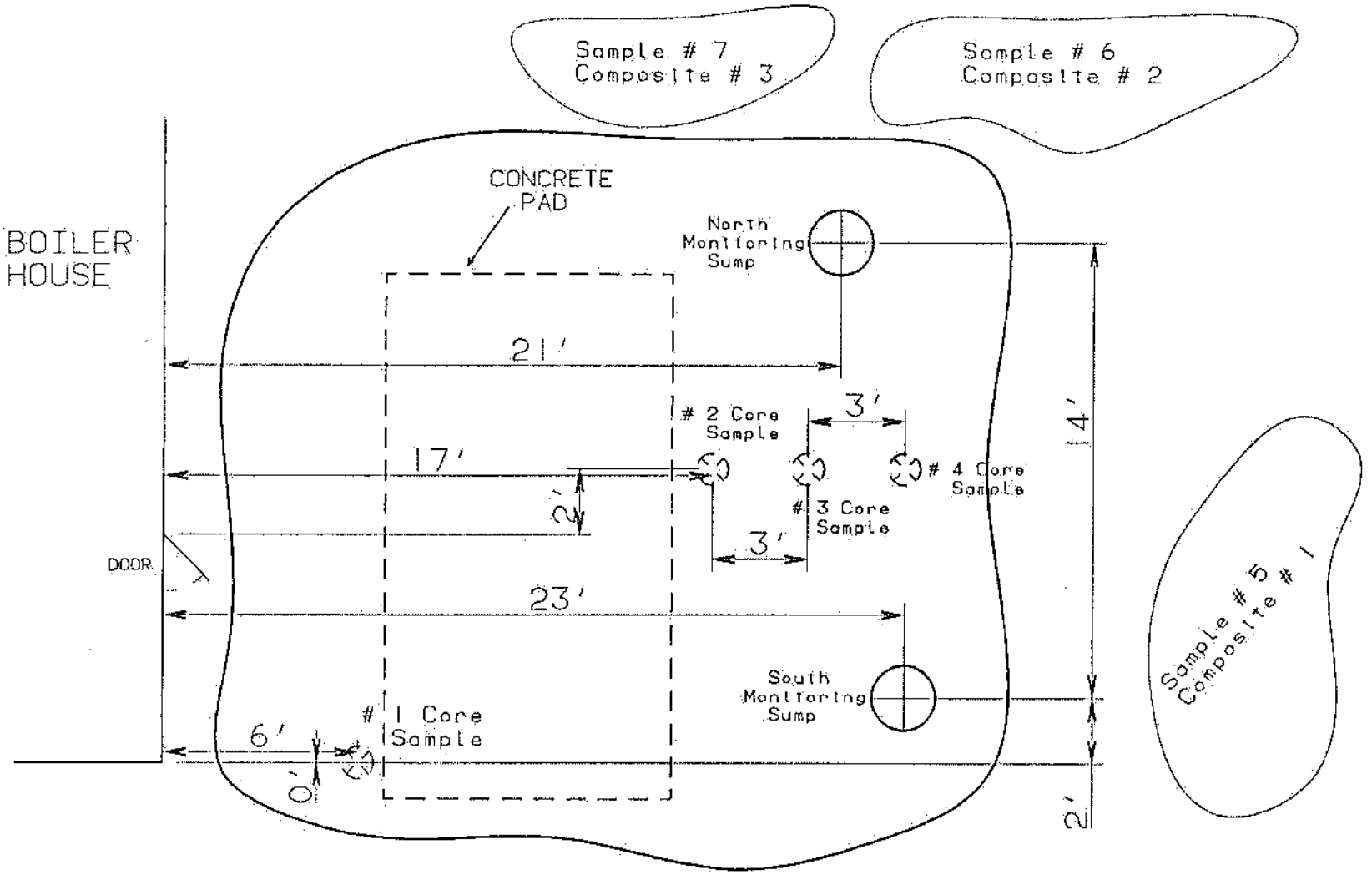
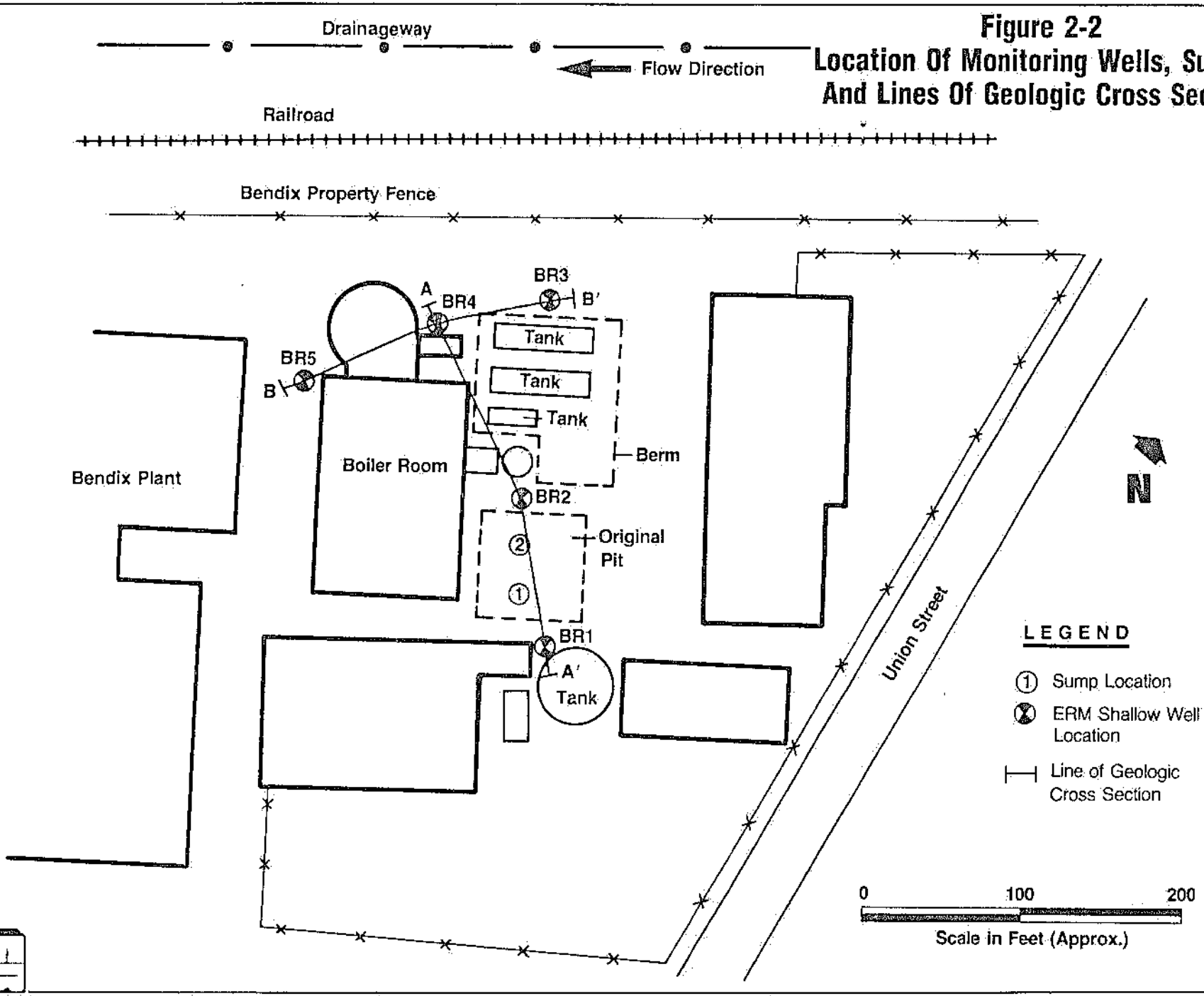


Figure 2-2
Location Of Monitoring Wells, Sumps, And Lines Of Geologic Cross Section



installed fifteen feet into the water table. All joints were threaded and flush. The screened interval was sand packed to one foot above atop the screen. A one-foot thick bentonite plug was installed atop the sand pack, and the annulus was filled with cement grout to isolate the screened interval of the well from surface runoff.

The wells were developed using a combination of bailing and water flushing with drill rig. Wells No. BR-1 through BR-4 were finished with six-inch I.D. steel risers with locking caps. Well No. BR-5 was finished with a steel curb box flush to the pavement. Table 2-1 shows the depths of the wells, and Attachment A shows the the geologic log and construction details for each well. Well elevations were surveyed at the top of the PVC risers to the nearest hundredth of a foot using the U.S.G.S. mean sea level datum.

2.3 Ground Water Level Measurements, Free Product Determination, and Ground Water Sampling

After the newly installed wells had been allowed to reach static equilibrium, water levels in the wells and sumps were measured in January and again in March. All water level elevations are shown in Table 2-1. The presence or absence of free-floating product in the wells and sumps was determined using a bottom filling clear bailer. Using this method, the clear bailer is slowly lowered into the well and returned to the surface where the presence of a free oil layer or sheen can be observed and measured atop the column of water in the bailer.

For sampling, the wells were purged of three casing volumes using a PVC bailer. Due to the larger volume of water in the sumps, the sumps were not purged before sampling. After the water levels recovered, a dedicated PVC bailer was used to collect a ground water sample from each well. The samples were collected in laboratory-supplied forty-milliliter glass vials with Teflon-lined septa, for BTX analysis. For quality control purposes, the samples were split, with one set of samples submitted to Friend Laboratory, Inc., Waverly, New York, and another set submitted to Lancaster Laboratories, Lancaster, Pennsylvania.

TABLE 2-1

WELL DEPTHS AND WATER LEVEL ELEVATIONS

Well No.	Depth (feet)	Elevation of Monitoring Point (feet)	Ground Water Elevation January 28	Ground Water Elevation March 27
BR-1	25.0	987.17	971.67	972.41
BR-2	25.0	987.92	971.48	971.77
BR-3	25.0	986.96	971.45	971.77
BR-04	25.0	986.54	971.47	971.63
BR-5	25.0	984.46	971.55	971.58
Sump 1	19.0	985.89	971.60	971.70
Sump 2	19.0	986.47	971.56	971.68

SECTION 3

RESULTS

3.1 Geologic Deposits

The exposed sediments in the open pit consisted of several lithologies. In the upper four feet of sediments, a red-brown silt and a coarse gravel fill material was identified. This disturbed zone was underlain by the previously existing natural sediment profile. The initial seven feet of sediments consisted of soft gray clayey silt with red mottling and organic plant residue. This silt was observed to be fractured, and large chunks caved in periodically with breakage along the fracture planes. The lower two feet of this unit appeared to be oil stained. This silt unit may act as a natural barrier to the migration of the free oil because it is of low permability and has a high surface area for the retention of the petroleum product. Below the silt unit was approximately three feet of gray-black oil-stained, rounded, poorly sorted gravel. A black, oil-stained running medium sand was present under the gravel unit. The ground water table was encountered within this sand, approximately fifteen feet below the land surface.

The results of the drilling program revealed that the sediments observed in the open pit occur fairly uniformly in the subsurface surrounding the boiler room. Southeast-northwest (A-A') and west-east (B-B') cross sections across the site are shown in Figures 3-1 and 3-2. The gray clayey silt layer was encountered in all five borings and showed uniform thickness of approximately ten feet. As shown in cross section B-B', this silt layer was more sandy at the base of the unit in Borings BR-3, BR-4, and BR-5. Boring BR-5 also contained a loose brown sand and gravel unit at the top of the silt unit.

The loose sand and gravel unit below the silt varies in thickness from ten feet in BR-2 at the pit, to four feet in Borings BR-4 and BR-1. The last unit pentetrated during drilling was the well sorted gray-red running fine sand unit. This stratified sequence of silts, sands, and gravels represents glacially-derived alluvial material, deposited by glacial melt waters.

Figure 3-1
Hydrogeologic Cross Section A-A'

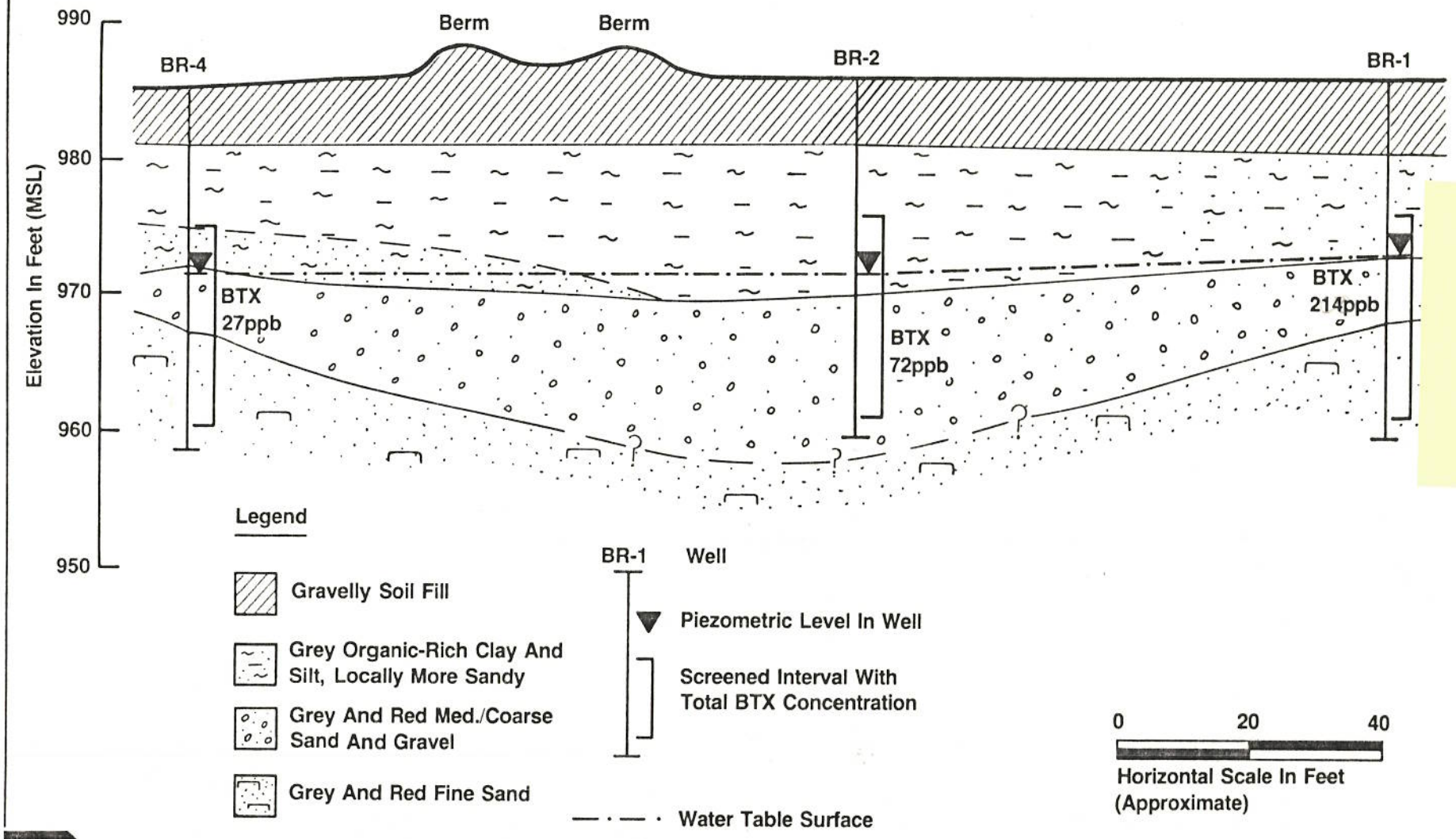
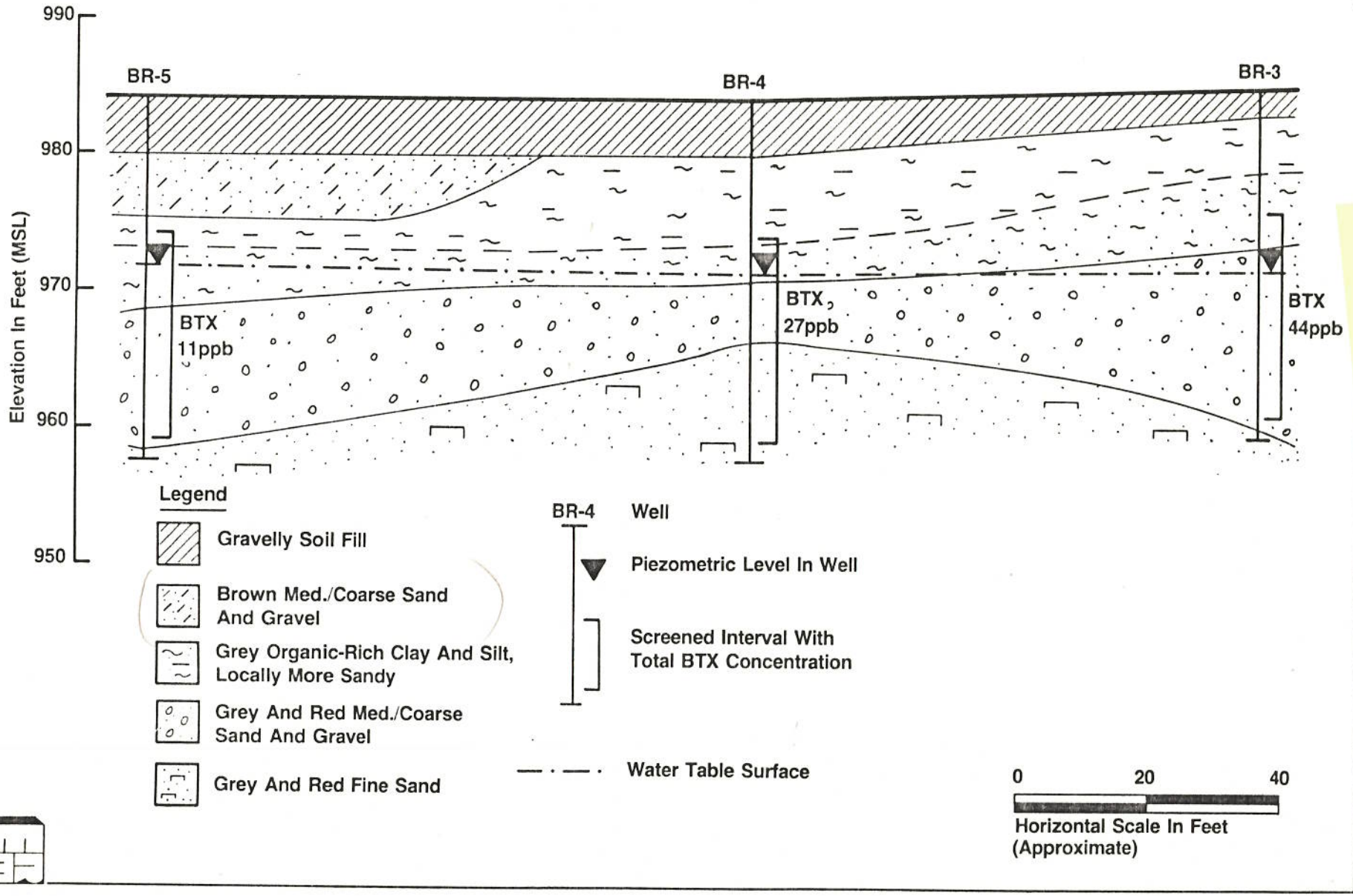


Figure 3-2
Hydrogeologic Cross Section B-B'

Samples 1/28/85



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3.2 Hydrogeology

Ground water flow underlying boiler room occurs in the permeable sand and gravel and the well sorted fine sand unit. At the initiation of this study it was expected that this flow system would follow the regional northwestward flow direction, toward the Susquehanna River as found at the West Well area. However, the January 1985 ground water table configuration, shown in Figure 3-3, indicates that flow was northward.

The ground water table contours measured in March 1985 are shown in Figure 3-4 (the ground water elevations in the sumps appear to be anomalous, probably due to excessive silt accumulation, and were not used for the construction of this map). This water table map indicates that the flow pattern had shifted to the northwestward direction with a northwest-trending swale apparent in the contours. Water table elevations during this March monitoring event were slightly higher than those from January, suggesting that the flow gradients may be controlled by variations in the amounts of seasonal recharge. Also, it should be noted that the flow gradient at the site is very low, with an elevation change of only .10 feet over the horizontal distance of 100 feet. This slight gradient may be influenced by the heterogeneous sequence of layered impermeable silts and permeable sands and gravel found at the site, thus resulting in geologic control on flow directions.

3.3 Ground Water Quality

During the two monitoring events in January and March, no free-floating product was observed in the monitoring wells or sumps. Hence, the dissolved product in the form of BTX compounds is the only ground water concern in this area. The results of the BTX analyses from the motoring wells and sumps are shown in Table 3-1. The ground water quality data obtained from the two laboratories show close agreement, except for the difference in the BTX values from Sump 1 where results from Friend Laboratories showed 3,259 ppb while Lancaster Laboratories reported 556 ppb. The difference between the laboratories may be due to analytical error; however, it is more likely the difference is due to sampling heterogenities. The BTX compounds are lighter than water and will float atop the bailers used to collect the sample. Consequently, the first bottle filled with the sample may contain the higher concentration of BTX compounds.

The results of the ground water quality analyses indicate that the highest concentration of BTX is present in Sump 1. This result is considerably greater than the BTX concentrations

Figure 3-3
Shallow Ground Water Table Map
January 28, 1985

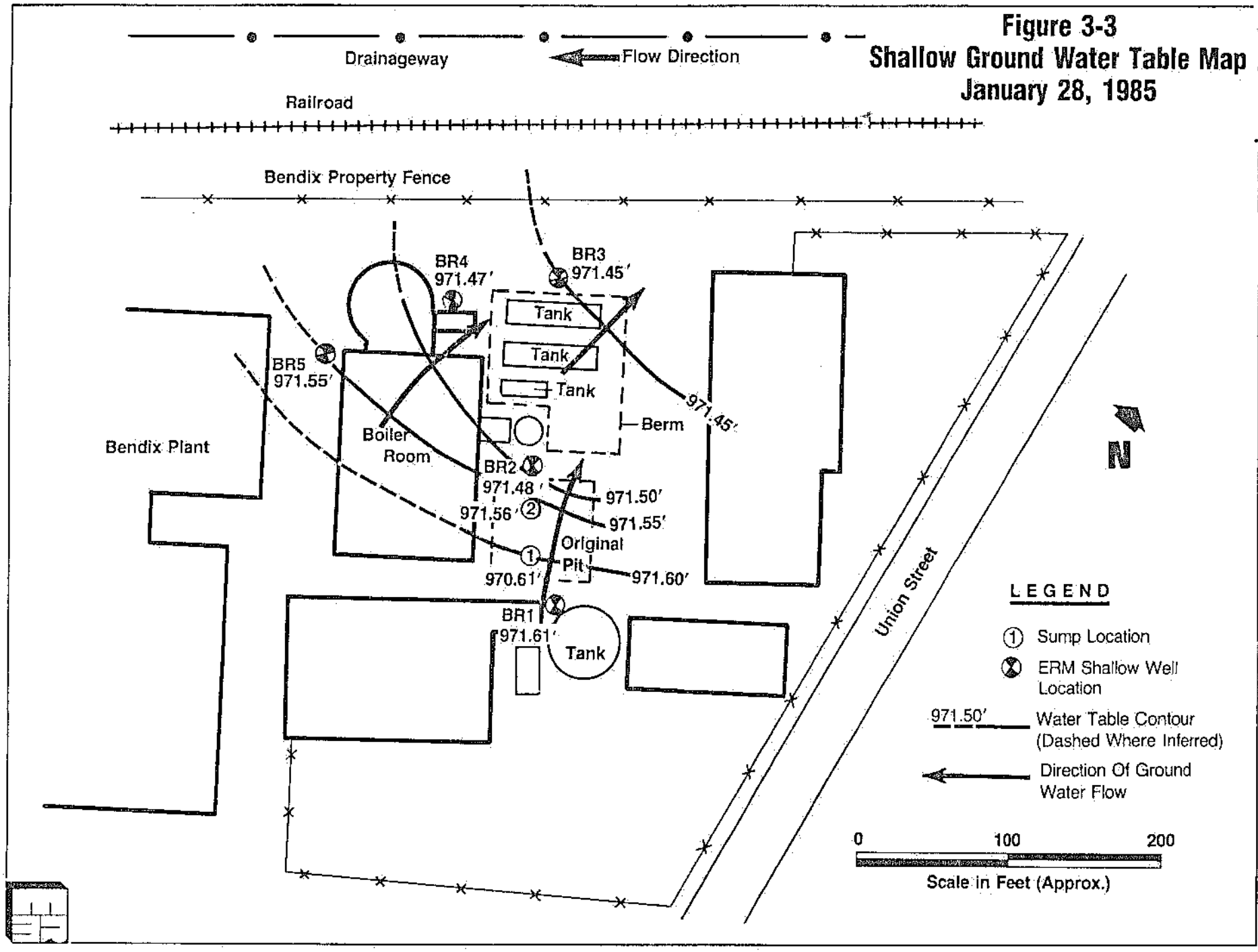

Figure 3-4
Shallow Ground Water Table Map
March 27, 1985

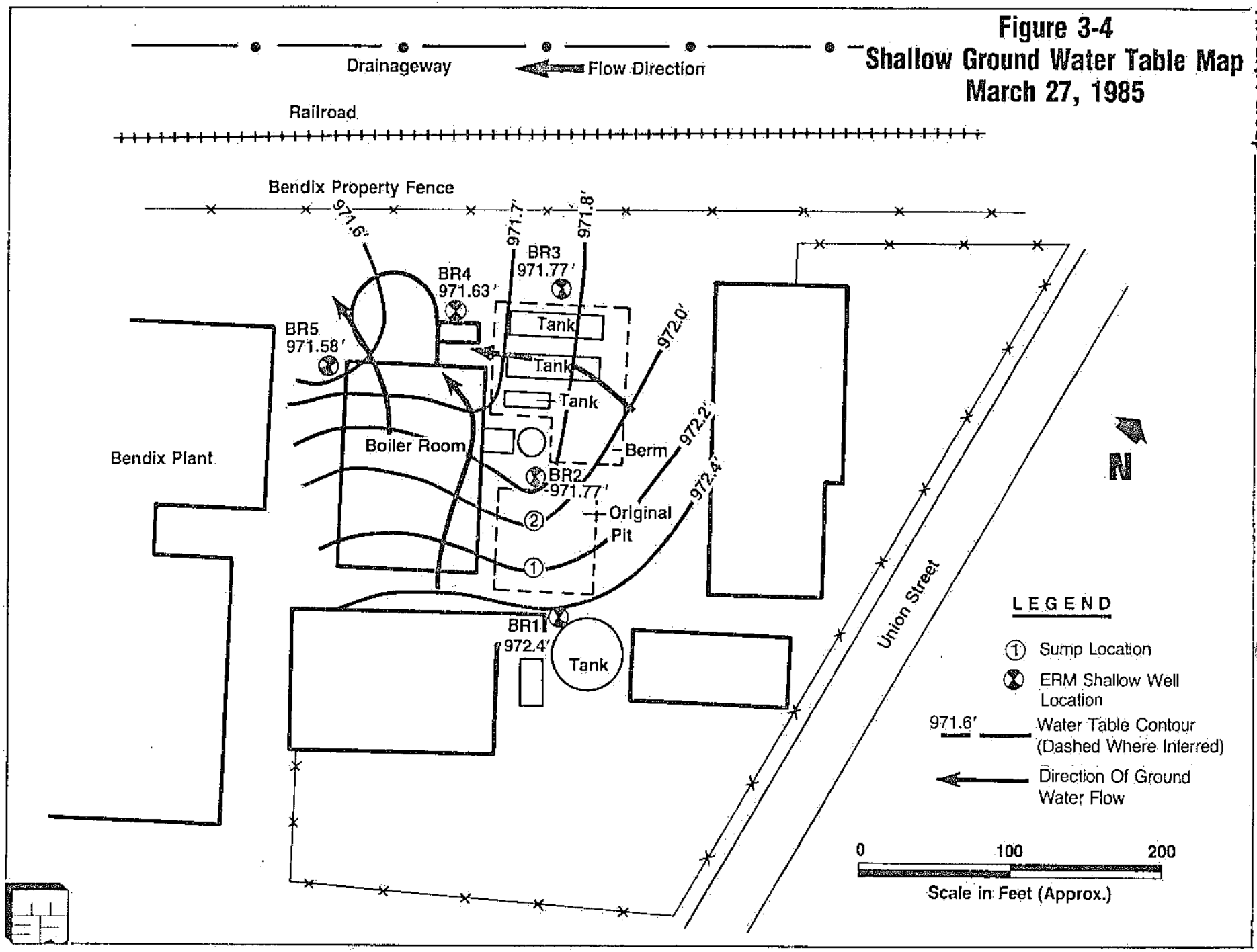

TABLE 3-1

GROUND WATER QUALITY RESULTS -
BTX ANALYSIS, JANUARY 28 AND 29, 1985
(All results in ppb. Blank or ND = none detected)

Organic Compound	Well BR-1		Well BR-2		Well BR-3		Well BR-4		Well BR-5		Sump 1			Sump 2		
	Friend	Lane	Friend	Lane	Friend	Lane	Friend	Lane	Friend	Lane	Friend 11/84	Friend 1/85	Lane 1/85	Friend 11/84	Friend 1/85	Lane 1/85
Benzene	150	143	37	72		39	23	26	28	11	370	140	298	18		2
Toluene	21	18					15				510	69	94	4		
Para-Xylene	16	12				1	8		3		220	740	84	2		1
Meta-Xylene	11	12					12				290	310	15	1		1
Ortho-Xylene	33	15	6	—	4	4	22	1	1	—	200	2,000	65	2	9	—
Total BTX	231	200	43	72	4	44	80	27	32	11	1,590	3,259	556	27	9	4
PCBs											ND			ND		

8/27/85 VOC 7 365 117 291 172 4 2

— correlations between VOCs ⇒ BTX concentrations.

detected in Sump 2, suggesting that most of the oil was accumulated in the Sump 1 area. No detectable levels of PCB were found in the ground water in the sumps. The ground water quality data from the monitoring wells shows total concentrations of BTX compounds ranging from just over 200 ppb in Well BR-1 to 11 ppb in Well BR-5. The presence of BTX in upgradient Well BR-1 is likely related to its proximity to the Sump 1 area, and to the very low ground water gradients which may allow limited dispersal around the area. Also, this well is located in a former subsurface gasoline storage area. Although the tank was removed and showed no leakage, minor spillages could have contributed to the BTX concentrations detected.

3.4 Soil Quality

The objective of the soil samples collected by Allied personnel from the pit and from the excavated soil piles was to determine if the soils contained PCBs possibly associated with waste oils. The results of the analyses are shown in Table 3-2. PCB was only detected in the trace concentrations of .3 ppm in Core sample 4 at the base of the pit. There was no detectable concentration of PCB in any of the composites samples from the excavated soil; hence, under prior approval from the regional New York DEC office, this soil was transported to the Delaware County landfill and disposed of as a non-hazardous waste.

TABLE 3-2

SOIL ANALYSIS RESULTS - PCB
(All results in ppm. ND = none detected)

Sample No.	PCB Concentration
Core No. 1	ND
Core No. 2	ND
Core No. 3	ND
Core No. 4	0.3
Composite No. 1	ND
Composite No. 2	ND
Composite No. 3	ND

SECTION 4

DISCUSSION OF RESULTS

The absence of free-floating petroleum product in the sumps and monitoring wells indicates that there is no free oil migrating on the water table at the site. The integrity of the storage tank appeared to be intact, suggesting that the observed product accumulation in the pit sediments was possibly due to spillage during tank filling operations rather than leakage in the subsurface storage tank.

The clayey silt, sand and gravel, and fine sand units above the water table in the area of the storage tank were all observed to be discolored by oil. However, the impermeable nature of the silt unit likely provides a high oil retention capacity, arresting the migration of free oil. Oil retention capacity is a function of permeability of the unit and increases with decreasing permeability. If the volume of oil spilled is low, as it appeared to be at this site, the threshold of saturation of the oil in the silt unit will not be met, and oil cannot flow to the water table. The free oil observed in the excavated pit was likely released in the surrounding sediments during tank removal, rather than having existed as free-floating product on the water table.

With no detectable free oil on the ground water table, the primary ground water quality concern at this site is dissolved petroleum products in the form of the BTX compounds. The presence of these compounds in the ground water indicate that the oil in the overlying sediments comes in contact with ground water as the water table rises and falls seasonally. As expected, the concentrations are greatest in the area of the former storage tank and decrease outward.

The ultimate extent of BTX plume migration is likely limited by the following factors:

- dilution by the large volumes of water available in the loose sands and gravels in the shallow system;
- gentle ground water gradients, producing a low flow velocity of approximately thirty feet per year (as determined at the West Well); and

- little vertical migration of contaminants due to the lighter-than-water nature of the BTX compounds.

Lastly, it should be noted that the major source for the dissolved oil constituents was the oil-saturated sediments surrounding the subsurface storage tank. Since these soils have been removed from the area, the major source of contamination has been abated.

SECTION 5

CONCLUSIONS

1. Ground water at the site occurs in unconfined conditions in the unconsolidated layered glacial alluvium deposits.

2. The direction of ground water flow at the site appears to be influenced by the variable amounts of seasonal recharge, the interlayered sequence of permeable and impermeable sediments, and the gentle ground water flow gradients.

3. The sediments underlying and surrounding the former storage tank apparently attenuated oil migration; therefore, there is no free-floating oil on the ground water table.

4. The primary ground water quality concern at this site is the dissolved BTX compounds, which have migrated northward through the shallow ground water flow system.

5. The horizontal extent of the plume is limited due to dilution, slow ground water flow velocity, and a limited source of oil.

6. The lighter-than-water nature of the BTX compounds prevents significant vertical migration of the petroleum products into the deeper aquifer system.

VOC-Sinkers

SECTION 6

RECOMMENDATIONS

As a result of the hydrogeologic investigation at the boiler room area, ERM recommends that additional monitoring be conducted to verify the ground water flow conditions and the extent of BTX contamination at the site. ERM recommends:

1. Monthly monitoring from May through September of ground water elevations to determine the effect of seasonal recharge conditions on the direction of ground water flow.

2. Monthly sampling and BTX analysis from May through September to better establish the probable plume configuration and to determine the extent to which the soil removal has begun to abate the solution and migration of contaminants.

3. Issuance of an addendum report to clarify conditions and recommend further action, if necessary.

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ATTACHMENT A

Well Construction and Boring Logs

A

Environmental Resources Management

Drilling Log

Project Bendix-Sidney Owner

Location Boiler Room W.O. Number 3010510

Well Number BR-1 Total Depth 25.0' Diameter 2"

Surface Elevation Water Level: Initial 24-hrs.

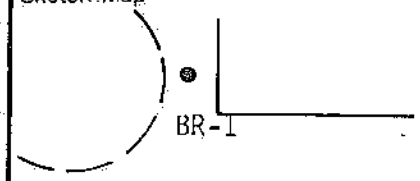
Screen: Dia. 2" Length 15.0' Slot Size .01''

Casing: Dia. 2" Length 17.0' Type PVC Schedule 40

Drilling Company Porratt Wolff, Inc Drilling Method Hollow stem auger

Driller Butch Stevens Log By Bob Keating Date Drilled 1-24-85

Sketch Map



Notes

Grout mix 1-1 cement - san

Screen packed with No.3 sand.

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0				Finished with 2.0' of 6" I.D. steel riser with locking cap.
2			0-2'	Brown pea gravel and soil FILL, loose, dry, no odors.
4			2-4'	Same as above.
6			4-6'	Black organic - rich silty CLAY, with plant debris, soft, moist no odors.
8			6-8'	Grey SILT, little f. sand, trace clay, soft but dense, dry, no odors.
10			8-10'	(1') Dark brown organic - rich silty CLAY, soft but dense, moist, no odors.
			10-11.5'	(1') Grey SILT, little f. sand, little clay, soft but dense, moist, no odors.
				Grey clayey SILT, trace f. sand, soft buta dry, moist, no odors.
15			15-16.5'	(1') Same as above.
				(1') Green silty f. SAND and f/m subrounded GRAVEL, poorly sorted, dense, dry, no odors.
				-saturated conditions
20			20-21.5'	Red grey f. SAND, little silt, soft,saturated, no odors.
25			25-26.5'	Red grey f. SAND, little silt, trace clay, soft, saturated, no odors.

Environmental Resources Management

Drilling Log

Project Bendix-Sidney Owner

Location Boiler Room W.O. Number 3010510

Well Number BR-2 Total Depth 25.0' Diameter 2"

Surface Elevation Water Level: Initial 24-hrs.

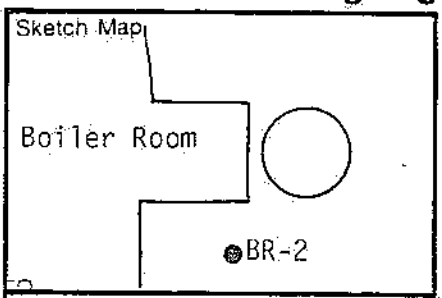
Screen: Dia. 2" Length 15.0' Slot Size .01"

Casing: Dia. 2" Length 17.0' Type PVC Schedule

Drilling Company Porratt Wolff, Inc Drilling Method Hollow stem auger

Driller Butch Stevens Log By Bob Keating Date Drilled 1-24-85

Sketch Map



Notes

Grout 1-1 cement - sand, screen sand packed with No. sand.

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0				Finished with 20' of 6" I.D. steel riser with locking cap.
			0-2'	Black soil FILL, soft, dry, no odors.
2			2-4'	Orange and red subangular gravel and soil FILL, soft, dry, no odors.
4			4-6'	(1') Same as above, loose, saturated, no odors.
6				(1') Grey clayey SILT, soft but dense, moist, no odors.
			6-8'	Grey SILT, little f. sand, little clay, moist, soft, slight odor.
8			8-10'	Grey, with orange mottling, clayey SILT, little f. sand, moist, soft, no odors.
10			10-11.5'	Same as above.
15			15-16.5'	(1') Grey CLAY, little silt, soft, moist, no odors. (.5') Grey and red f. sandy subrounded to rounded GRAVEL, loose, saturated, slight odor.
20			20-21.5'	Green and red f/m/c SAND and f/m rounded GRAVEL, loose, saturated, slight odor.
25				Same as above, slight odor.

Environmental Resources Management

Drilling Log

Project: Bendix-Sidney Owner:

Location: Boiler Room W.O. Number: 3010510

Well Number: BR-3 Total Depth: 25.0' Diameter: 2"

Surface Elevation: Water Level: Initial: 24-hrs.:

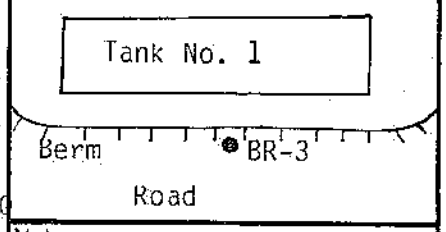
Screen: Dia. 2" Length 15.0' Slot Size .01"

Casing: Dia. 2" Length 12.0' Type PVC Schedule 40

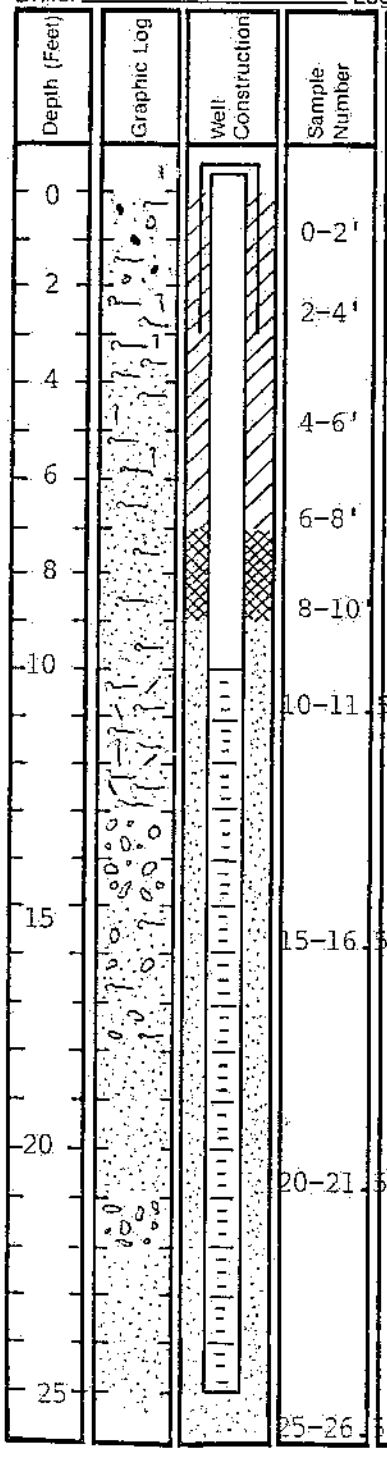
Drilling Company: Porratt Wolff, Inc. Drilling Method: Hollow Stem Auger

Driller: Butch Stevens Log By: Bob Keating Date Drilled: 1-23-85

Sketch Map



Notes
Grout mix 1-1 cement sand.
Screen packed with No. 3 san



Sample Number	Description/Soil Classification (Color, Texture, Structures)
	Finished with 2.0' of 6" I.D. steel riser with locking cap.
0-2'	Red brown silty soil and gravel FILL, dense, dry, no odors.
2-4'	(1.5') Green and tan SILT, little clay, dense, dry, no odors.
	(.5') Black organic-rich SILT, little f. sand, dense, dry, no odo
4-6'	Grey with tan mottling silty f. sand, trace clay, soft but dense, moist, no odors.
6-8'	Grey with tan mottling f. SAND, little silt, soft but dense, moist, no odors.
8-10'	Grey f. SAND, little silt, soft but dense, moist, no odors.
10-11.5'	Grey f. sandy SILT, little clay, wood debris, soft but dense moist, no odors.
	---Gravel
15-16.5'	Grey blue f/m sandy f/m rounded GRAVEL, little silt, loose, moist to saturated, no odors.
	---Sand
20-21.5'	(1') Blue-grey m/SAND, well sorted, loose, saturated, no odors
	(1') Blue-grey f/m rounded GRAVEL, well sorted, loose, saturated no odors (gravel lens).
	(1') Blue-grey m/SAND, loose, saturated, no odors.
25-26.5')	(.5) Red-grey SILT to f. SAND, soft, saturated, no odors.

Environmental Resources Management

Drilling Log

Project Bendix-Sidney Owner

Location Boiler Room W.O. Number 3010510

Well Number BR-4 Total Depth 25.0' Diameter 2"

Surface Elevation Water Level: Initial 24-hrs.

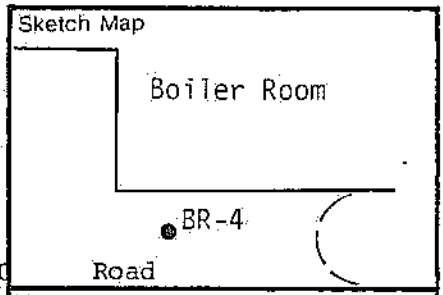
Screen: Dia. 2" Length 15.0' Slot Size .01"

Casing: Dia. 2" Length 12.0' Type PVC Schedule 40

Drilling Company Porratt Wolff, Inc Drilling Method Hollow Stem Auger

Driller Butch Stevens Log By Bob Keating Date Drilled 1-23-84

Sketch Map



Notes
Grout mix 1-1 Cement sand, Screen packed with No. 3 sand

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0			0-2'	Finished with 2.0' of 6" I.D. Steel riser with locking cap Red-brown silty and gravelly FILL, dense, dry, no odors
2			2-4'	Same as above.
4			4-6'	(1') Black organic-rich SILT, wood debris, soft, dry, possible odor. (1') Grey SILT, little f/m sand, little clay, soft but dense, moist, no odors.
6			6-8'	Grey f. sandy SILT, little clay, soft but dense, moist, no odors.
8			8-10'	Same as above with thin layer of organic-rich black clay, no odors.
10			10-11.5'	Grey f. SAND, little silt, trace clay, soft but dense, saturated, no odors.
				-- Gravel
15			15-16.5'	Grey and red f/m sandy f/m rounded GRAVEL, loose, saturated, no odors.
				---M/Sand
				---M/Sand
20			20-21.5'	Red-grey f. SAND, little silt, soft, saturated, no odors.
25			25-26.5'	Red-grey, molted f. SAND, little silt, saturated, no odors

Environmental Resources Management

Drilling Log

Project Bendix-Sidney Owner

Location Boiler Room W.O. Number 3010510

Well Number BR-5 Total Depth 25.0 Diameter 2"

Surface Elevation Water Level: Initial 24-hrs.

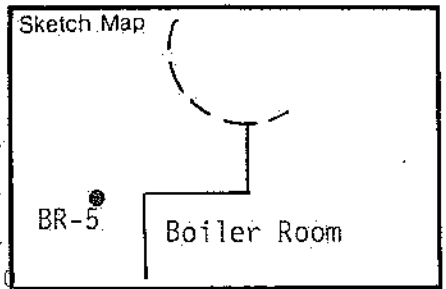
Screen: Dia. 2" Length 15.0' Slot Size .01"

Casing: Dia. 2" Length 10.0' Type PVC Schedule 40

Drilling Company Porratt Wolff, Inc Drilling Method Hollow Stem Auger

Driller Butch Stevens Log By Bob Keating Date Drilled 1-24-85

Sketch Map



Notes
Grout mix 1-1 cement sand, Screen sand packed with 4.3 sand

Depth (Feet)	Graphic Log	Well Construction	Sample Number	Description/Soil Classification (Color, Texture, Structures)
0				Finished with steel gate box flush to grade.
			0-2'	Red soil and gravel FILL, dense, dry, no odors.
2			2-4'	Same as above.
4			4-6'	Brown m/c SAND and f/m rounded GRAVEL, loose, moist, no odors.
6			6-8'	No recovery.
8			8-10'	(1') Same as above, loose, saturated, no odors.
10			10-11.5'	(1') Grey silty CLAY, little f. sand, damp, soft but dense, no odors. (1') Same as above. (.5') Gray f/m SAND, little silt, wood debris, soft, damp, no odors.
				- Saturated conditions
15			15-16.5'	(.5') Same as above, soft, saturated, no odors. (1') Red and Green f/m/c SAND and f/m subrounded GRAVEL, little silt, loose, saturated, no odors.
20			20-21.5'	Green and Red f/m/c SAND and f/m rounded GRAVEL, little sand, loose, saturated, no odors.
25				(.5) Green m/c SAND, loose, saturated, no odors.
			25-26.5'	(1') Red grey f. SAND, little silt, soft, saturated, no odo