CAPSULE

ENVIRONMENTAL ENGINEERING INC.

TORRINGTON INVESTIGATION REPORT

CAPSULE
ENVIRONMENTAL ENGINEERING INC.

January 9, 1992

Ms. Pam Meyer
Urban Enterprise Association
1200 County - City Boulevard
South Bend, IN 46601

Dear Ms. Meyer:

Enclosed is a copy of the Torrington Investigation Report that Butch Longino, of the Torrington Company, requested we send to you.

Sincerely,

CAPSULE ENVIRONMENTAL ENGINEERING, INC.

Bruce Bohnen

Bruce A. Bohnen
Research Chemist

BAB:mmf
Enclosure

124-01

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TORRINGTON

INVESTIGATION

REPORT

PREPARED FOR:

THE TORRINGTON COMPANY
59 FIELD STREET
TORRINGTON, CONNECTICUT 06790

PREPARED BY:

CAPSULE ENVIRONMENTAL ENGINEERING, INC.
1970 OAKCREST AVENUE, SUITE 215
ST. PAUL, MINNESOTA 55113

DATED:

DECEMBER 11, 1991

TABLE OF CONTENTS

INTRODUCTION

At the request of The Torrington Company, Inc. (Torrington), Capsule Environmental Engineering, Inc. (Capsule) has conducted an investigation to assess soils in pond area #4 and to define the groundwater condition at the northern perimeter of the former Torrington Bantum Bearing manufacturing facility (site) in South Bend, Indiana.

BACKGROUND

SITE DESCRIPTION

The site is located at 3702 West Sample Street in South Bend, Indiana, in St. Joseph County (Figure 1). The site covers approximately 16 acres, including the parking area north of Sample Street (Figure 2). The surrounding area consists of mixed industrial, commercial, and residential properties. The site includes the main building, the foundry, and five former storm water ponds. Four of the five former ponds have been filled to grade. Pond #1 is the only pond that remains at the site which retains water during periods of heavy precipitation.

SITE HISTORY

The site was used as a ball bearing manufacturing facility from 1928 through 1983, when Torrington discontinued all industrial activities. Site use prior to 1928 is not well documented. In 1984 an environmental investigation was initiated by Torrington to evaluate property conditions. Under contract to Torrington, Environmental Systems Inc. (ESI) sampled sediments and water in the ponds and in two production wells on site. Results of this investigation showed that no dissolved metals or polychlorinated biphenyls (PCBs) were present in the pond sediments. However, several volatile organic compounds (VOCs), including 1,1,1-trichloroethane (TCA), were detected in pond #4. No VOCs or PCBs were identified above detection limits in the production wells (ESI, 1984).

These initial results prompted the Indiana State Board of Health to request further site investigation. Torrington retained Canonie Engineers, Inc. (Canonie) to evaluate soil and groundwater conditions at the site. In 1984 Canonie installed monitoring wells (W-1, W-2, W-3, W-4, W-5, S-3, W-7, and W-8) to access groundwater quality. Canonie identified mineral spirits, TCA, and 1,1-dichloroethane (DCA) in soils near the southwest corner of the main building; determined the presence of mineral spirits (light hydrocarbons) in pond #5 sediments; detected VOCs below the method detection limit in ponds #1-4; and detected TCA,

DCA, and 1,2-dichloroethene (DCE) in monitoring wells located downgradient of the tank area.

In late 1985, Harza Environmental Services, Inc. (HARZA) conducted an environmental assessment to verify previous sampling activities and analytical results at the site and to identify other potential source areas. HARZA confirmed the presence of compounds identified in previous studies.

In 1990 and 1991, Urban Enterprise Association (UEA) contracted with Best Environmental Services and Technology Inc. (BEST) to perform an additional groundwater and soil investigation. BEST installed additional monitoring wells (W-9, W-10A/B, W-11A/B, W-12, and W-13) to further access groundwater quality at the site. BEST determined that TCA and its associated degradation products were present in groundwater monitoring wells located near the north boundary of the main plant site and south of Sample Street (W-10 and W-11).

GEOLOGY

The regional geology in the South Bend area consists of thick fluvioglacial deposits composed of sand and gravel with clay to sandy-clay layers that vary in extent and thickness. Some areas of glacial lacustrine silts and clays also are present but tend to be deposited randomly throughout the sand and gravel. The glacial deposits range from 80 to 200 feet in thickness. The glacial deposits are atop a blue-black Devonian or Mississippian shale. The age of the shale is dependent upon the amount of erosion which has taken place prior to glacial deposition (Klaer and Stallman, 1948).

The site geology is typical of the regional geology in the South Bend area. A thick deposit of sand and gravel comprises the first 58 to 60 feet of sediment. The gravel content tends to increase with depth. Beneath the sand and gravel is a hard, tight clay layer with interspersed boulders and cobble. Based upon production well logs from the site (Appendix A), the clay layer is 20 to 30 feet thick and rests atop additional sand and gravel deposits, similar to those above the clay layer. The predominantly clay layer occurs in all deep borings taken at the site, including the most recent borings taken north of Sample Street. Although the clay layer is continuous beneath the site, area well logs indicate the layer pinches out to the east of the site toward the Oliver Park municipal well field (Figure 1) (Canonie 1984).

HYDROGEOLOGY

Large quantities of glacial outwash were deposited in the old St. Joseph-Kankakee bedrock river valley during the Wisconsin Age or approximately 10,000 years ago. Regionally, groundwater flows

through the glacial deposits toward the present-day St. Joseph River. Construction of the South Bend Dam in 1948 has altered this regional groundwater flow regime. Since 1948 the St. Joseph River upstream of the dam recharges groundwater from baseflow, while the groundwater recharges the river downstream of the dam. The large amount of permeable sand and gravel deposits and consistent recharge from precipitation to the groundwater have created a highly transmissive aquifer capable of producing large quantities of groundwater. Transmissivities of 100,000 to 500,000 gallons/day/foot have been observed in the South Bend area (Klaer and Stallman, 1948).

Based upon monitoring well and production well logs and grain size analysis testing conducted by Best in 1991, the site is underlain by a sand and gravel aquifer with a high transmissivity. The previously discussed clay layer locally acts as a confining unit dividing the aquifer into upper and lower units. The upper aquifer averages 60 feet in thickness, the clay layer ranges from approximately 20 to 30 feet in thickness, and the lower aquifer is approximately 90 feet in thickness. Shale bedrock is encountered at approximately 180 feet below grade and does not yield any substantial amount of groundwater. All monitoring wells installed to date at the site are screened in the upper aquifer (Appendix A).

Based upon potentiometric surface maps of the site, the groundwater flow in the upper aquifer is north to northeast (Figure 2). This flow is toward the direction of the Allied Bendix facility, which is undergoing groundwater remediation with recovery wells approximately one mile northeast of the site. Although specifics of the Allied Bendix recovery well system are not available, the area aquifer's high transmissivity allows the formation of large capture zones for water wells. Therefore, the Allied Bendix groundwater recovery system could potentially influence groundwater flow direction and gradient within its radius of influence (Best 1991).

Hydraulic conductivity at the site has been estimated to be 361 feet/day with a groundwater flow rate of 0.25 feet/day at a gradient of 0.0007 foot/feet (BEST, 1991). This high groundwater flow rate is conducive to relatively rapid transport and increased dilution and dispersion of contaminants.

PURPOSE AND SCOPE

The purpose of Capsule's investigation was to focus on two areas: 1) the former pond #4 area and 2) to define the groundwater condition at the north perimeter of the facility. Previous investigations conducted in the pond #4 area indicated that contaminants were present in the surficial sediments and/or "sludge." Therefore, deeper soil borings would need to be taken

and samples analyzed for VOCs, metals, and total petroleum hydrocarbons (TPH). In addition, groundwater samples taken from monitoring wells W-10 and W-11 indicated that TCA and associated degradation products were present at the northern perimeter of the main plant. This necessitated the installation of monitoring wells further downgradient or north of the main plant site (Figure 2).

It should be noted that the purpose and scope of Capsule's investigation does not include the evaluation of work previously conducted on the site. However, data from previously prepared reports was used to support interpretations and conclusions and are properly referenced when utilized.

FIELD METHODS

DRILLING

During the week of September 9, 1991, Capsule provided oversight and direction to Layne Northern Company for installing monitoring wells and conducting soil borings. Four monitoring wells (two, two-well nests) were installed, and one continuously sampled 60-foot boring was taken in the parking lot north of Sample Street. The original workplan called for only one two-well nest, but field screening results indicated a second nest would be necessary. One continuously sampled 10-foot boring was taken in the former pond #4 area (Figure 2).

The monitoring wells were installed at depths and locations based upon information from previously installed upgradient monitoring wells and field screening results during drilling (Appendix A). Split-spoon samplers were used to take soil samples in 2-foot increments. Sampling intervals were generally every 5 feet, with the exception of borings C-1 and PD4-1 which were sampled continuously. Each sample was screened using an HNu photoionization meter, calibrated daily to a 100 ppm benzene standard, for headspace readings. The headspace readings have been included on the soil boring logs (Appendix A). Head space readings could not be obtained during mud rotary drilling. Due to formation instability, the bore hole collapsed when mud circulation was ceased and prevented taking soil samples with a split-spoon sampler.

Monitoring wells W-14B, W-15A, and W-15B were installed through hollow-stem augers, while W-14A was installed via mud-rotary techniques. All cuttings and drilling fluids were containerized in 55-gallon drums. Two attempts were made to install W-14A through hollow-stem auger methods; however, a large cobble and boulder zone was encountered at approximately 40 to 50 feet. The coarseness of the material caused the augers to "walk" or move away from the rig, rather than drill through the zone. This

created a trenching effect with the augers and led to an unstable substrate that could not support the weight of the drilling rig.

Monitoring well W-14A was installed to a depth of 59 feet with a screened interval from 59 to 49 feet. Control of the hole was lost during circulation of water to remove the mudpack. This resulted in formation collapse 21 feet above the screen or 37 feet below the ground surface. This is a common problem with mud rotary drilling in highly transmissive aquifers, but should not affect the usefulness of the well for monitoring purposes. A 2-foot bentonite seal was placed above the natural filterpack, and the remaining annulus was grouted to the surface with neat cement (Appendix A).

Monitoring well W-14B was installed with hollow stem augers to a depth of 41 feet. The well was screened from 41 to 31 feet with filter pack extended to 29 feet. A two foot thick bentonite seal was placed above the filter pack. The remaining annulus was grouted to grade with neat cement.

The bore hole for monitoring well W-15A was extended to a depth of 61 feet with headspace readings taken at 5-foot intervals. Headspace readings indicated the highest concentrations of VOCs were in the upper 20 feet of the aquifer directly downgradient from the main source area. This boring was not intended to be a monitoring well; however, field screening using headspace readings indicated that VOCs may be present. Therefore, the formation was allowed to collapse from 61 to 31 feet as the augers were withdrawn, and the screen was placed from 31 to 21 feet. Monitoring well W-15B was screened from 18 to 8 feet. This allowed the screened intervals to be placed to intercept contaminants as indicated by headspace readings and maximize coverage in the upper to middle part of the aquifer. Both wells were filterpacked 2 feet above their respective screens, a 2-foot bentonite seal was installed and the remaining annulus grouted to grade with neat cement.

All newly installed wells were developed through pumping by Layne Northern. Details are provided in Appendix A.

Boring PD4-1 was placed in pond #4 near the outlet of the remaining concrete weir (Figure 2). Continuous split-spoon samples were collected to 10 feet.

SOIL SAMPLING

Soil samples were selected for laboratory analysis based upon headspace readings taken at the time of split-spoon sampling. Each split-spoon sampler was decontaminated with a trisodium phosphate water wash and a triple rinse between sampling intervals. Soils sampled in the parking lot area were analyzed

for VOCs (Appendix B). The soil sample taken in pond #4 area was analyzed for VOCs, TPH, metals, and cyanide. Each soil sample was collected and tightly packed in a 4-ounce capacity glass jar provided by Aspen Research Corporation of New Brighton, Minnesota, (Aspen). All samples were handled with new latex gloves to ensure sample integrity. Each sample jar was labeled and placed in a ziplock bag and stored in the field inside an ice cooler. All samples were shipped on ice within 24 hours of collection to Aspen for analysis.

GROUNDWATER SAMPLING

On September 23, 1991, Canonie performed groundwater sampling on the newly installed monitoring wells W-14A, W-14B, W-15A, and W-15B. Details of the field sampling methods employed by Canonie are included in Appendix C. All samples were shipped to Aspen via Federal Express within 24 hours of collection.

QUALITY ASSURANCE/QUALITY CONTROL

Field rinseate blanks were taken during drilling and groundwater sampling activities and analyzed for VOCs (Appendix B). Aspen also prepared trip blanks and shipped the blanks with the sampling jars and vials to the site prior to drilling activities. The trip blanks remained with the samples throughout field activities and were returned with collected samples to Aspen for analysis. Two field blanks were taken during drilling activities: one of rinseate generated from the split-spoon samplers to verify decontamination techniques and one of rinseate from the jars used for headspace readings. A field blank also was taken during groundwater sampling activities from bailer rinseate to ensure that decontamination procedures were valid. Decontamination procedures were found to be adequate to ensure sample integrity since no VOCs were detected in the field or trip blanks.

DISPOSAL OF CUTTINGS

All cuttings and drilling muds were containerized until laboratory results were received. Since limited cuttings were generated from the pond #4 boring (PD4-1) and the water table was not breached, cuttings were returned to the bore hole.

Laboratory results indicated that no VOCs were present in the soils sampled; therefore, Canonie was contracted to thin-spread the soils in the pond #2 area (Appendix D). Drilling muds cannot be thin spread for aesthetic reasons; therefore, the drums containing mud will be disposed of with the drums that remain on site from the BEST borings. These drums will be disposed as an

Indiana "Type A Special Waste" by Waste Management of North America (WMNA) at their Prairie View Disposal Facility near Wyatt, Indiana.

FIELD OBSERVATIONS AND ANALYTICAL RESULTS

Black stained soil with a strong petroleum odor was identified in pond #4 boring PD4-1. The stained soils were observed to a depth of 5.2 feet, and a gray medium-to-fine sand was identified to a depth of 10 feet where the boring was terminated. Analytical results detected metals and total petroleum hydrocarbons in the soil sample taken from 2 to 4 feet in pond #4. Table 1 provides a summary of soil results for pond #4.

None of the boring locations in the parking area (W-14A, W-14B, C-1, W-15A, and W-15B) showed visible signs of contamination or emitted any obvious odors. A base grade of mixed aggregate and sand was encountered from 0.5 feet to 2 feet below the parking lot asphalt; however, soil samples taken at depths greater than 2 feet were identified as naturally occurring sand and gravel deposits typical of the site and the South Bend area.

Based upon analytical results from the soil samples collected during drilling activities, no VOCs were present above practical quantitation limits (PQLs) in borings W-14A, W-14B, W-15A, W-15B, and C-1 (Appendix B).

Results from the groundwater sample taken from W-14A show that TCA, TCE, DCA, and DCE were present north of Sample Street in the lower part of the upper aquifer. Degradation products (DCA and DCE) were in higher concentrations than TCA and TCE. Groundwater samples taken from monitoring wells W-14B, W-15A, and W-15B showed no VOCs present above PQLs. Groundwater analytical results are summarized in Table 2.

OBSERVATIONS AND CONCLUSIONS

Based upon the analytical results collected and the field observations made during this investigation, the following observations and conclusions can be made:

- Pond #4 sediments contain an elevated level of metals, cyanide, and total petroleum hydrocarbons. Concentrations of VOCs do not exist above the PQLs. Visual contamination is present from 0 to 5.2 feet. This contradicts the previous soil analysis conducted on pond #4 sediments in which no metals were identified in high concentrations, but DCE was detected (Best 1991).

- The analytical results from soil boring samples taken at the northern perimeter parking lot (W-14A, W-14B, C-1, W-15A and W-15B) did not detect VOCs.

- Groundwater contaminants previously detected in upgradient monitoring wells (S-3, W-7, W-8, W-10A/B, W-11A/B, W-12, and W-13) are not present in monitoring wells W-15A and W-15B, which are screened in the upper and middle part of the upper aquifer (Figure 2). Although field results from headspace readings indicated VOCs may have been present in the upper and middle parts of the upper aquifer, laboratory results indicated no VOCs above the PQLs. Based upon the results from W-14A/B contaminants could be present in the lower part of the upper aquifer in the location of monitoring well W-15A/B.

- TCA, DCA, TCE, and DCE were detected in monitoring well W-14A (59 feet in depth) but not in the shallower W-14B (42 feet in depth). All four compounds were present at concentrations which exceed the maximum contaminant limits (MCL) for drinking water established by the U.S. Environmental Protection Agency (EPA) (Table 2). The detection of the contaminants in the deeper well but not in the shallower well does not follow the trend of contaminant migration in the on-site wells. Historically, the shallower on-site wells have exhibited greater contaminant levels than the deeper wells.

- Figure 3 is a cross section of the DCE concentration in wells downgradient from the source area, S-3. DCE was chosen because it is the most prevalent compound found at the site. Based upon the cross section, the plume is sinking as it migrates downgradient from the source area, S-3. This is typical behavior for DCE and the other VOCs associated with the site, as their specific gravities are greater than water and they tend to sink. Note: Laboratory results from the February 1991 BEST report were used for wells W-10A/B, W-7, W-8, W-13, and S-3. Results from the Capsule sampling event in September were used for W-14A/B.

- The groundwater gradient at the northern part of the site is steepening. The gradient is 0.0009 foot/feet from W-9 to W-10A, but increases substantially from W-10A to W-14A to 0.007 foot/feet. The increase in gradient is also exhibited on Figure 2 as the contour lines increase in frequency from W-10A to W-14A when compared to the frequency of contour lines between W-9 to W-10A. One explanation for this behavior is a man made influence due to the remediation activities occurring at the Allied Bendix facility north of the site.

- The low concentration of VOCs in monitoring well W-13 is anomalously low. Historically, W-13 is the monitoring well nearest the S-3 source area, yet it consistently shows lower VOC concentrations or non-detect in both the laboratory and field results. On the other hand, wells further downgradient from W-13 show higher concentrations (BEST, 1991). Three possible explanations exist for the anomalous results: 1) the contaminants have not migrated to the screen depth or have migrated beneath the screen depth of W-13, 2) W-13 is not located downgradient along the major axis of the plume, and 3) another source exists downgradient from W-13 that is contributing to contamination of W-10A/B and other monitoring wells. It should be noted that, although W-7/W-8 are shown in the cross section, the position of the wells is oblique to the axis of the plume. Based upon groundwater flow direction, the W-13 monitoring well should be in the middle area of the plume. The cross section presented in Figure 3 shows that W-13 is screened at virtually the same elevation as S-3 and W-10A. Therefore, the first and second explanations are unlikely. The third explanation of another source between W-13 and W-10 is likely.

REFERENCES

Best Environmental, Inc., "Environmental Assessment, Torrington Site," October 1990.

Best Environmental, Inc., "Subsurface Environmental Assessment And Remediation Action Plan," April 1991.

Canonie Engineers, "Environmental Assessment, The Torrington Bantum Bearing Company, South Bend, Indiana," October 1984.

ESI (Environmental Systems, Inc.), "Analysis Report, Pond And Well Water, The Torrington Company, South Bend, Indiana," January 1984.

Harza Environmental Services, Inc., "Environmental Assessment, The Torrington Company, South Bend, Indiana Plant," June 1986.

Klaer, F. H., Jr. and Stallman, R.W., "Ground-Water Resources of St. Joseph County, Indiana," Division of Water Resources, Indiana Department of Conservation, Bulletin No. 3, 1948.

Appendix A

Well Logs

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/15/91 LOGGER: S. Price BORING#: PD4-1
DRILLING METHOD: HSA WATER LEVEL: N/A TIME: 08:00

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
	Topsoil to 1.2 ft	2/6/4/5	50	0	08:10
	Dark brown fine sand to 2 ft				
	Black fine sand - Hydrocarbon odor	2/2/3/5	100	0	08:16
	Black silty fine sand to 5.2 ft. - Hydrocarbon odor	5/6/9/12	100	*	08:20
5					
	Gray fine sand to 6 ft.	4/6/8/11	100	*	08:24
	Same to 7 ft.				
	Medium gray medium sand with trace gravel	11/12/9/8	100	*	08:27
	Same				
10					
15	End of boring @ 10 ft.				
	* HNu malfunctioned - could not continue sampling.				
20					
25					
30					
35					
40					
45					
50					
55					
60					
65					

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/13/91 LOGGER: S. Price BORING#: W-15A
DRILLING METHOD: HSA WATER LEVEL: 13.20 TOC TIME: 14:30

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
5	Light brown medium to fine sand	4/8/9/13	100	31	14:30
10	Same Wet	12/13/9/12	100	2.0	14:36
	Same grading to a coarse sand and gravel	9/16/26/22	100	1	14:48
15	Same	4/15/11/31	100	1	15:12
20	Same	2/9/12/20	100	1	16:05
25	Medium brown fine to medium sand	9/16/26/23	100	31	16:30
30	Medium brown coarse sand grading to a gravel with sand organic muck from 31.8-32 ft.	3/10/27/21	100	2	16:45
35	Coarse gravel with sand	8/20/12/11	100	0.1	16:58
	Center plug bound, delayed drilling 2 hours				9/14/91
40	Same with small cobbles	15/26/34/34	100	0	9:45
45	Light brown fine to medium sand trace large cobbles (drove rock)	26/238/100	50	0	10:45
50	Same to 50.9 ft. Gravel with silty clayey sand to 51.5 ft Medium gray medium to coarse sand	64/31/41/20	100	0	11:02
55	Same	29/33/23/42	100	1	11:45
60	Medium brown coarse sand and gravel	38/84/43/45	100	0.1	12:06
	Hard silty clay 61.9 ft. End of boring @ 62 ft.	200/2.5 in	10	0	12:22
65	Installed well @ 32 ft.				

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/14/91 LOGGER: S. Price BORING#: W-15B
DRILLING METHOD: HSA WATER LEVEL: 12.66 TOC TIME: 18:15

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
5	Fine to medium sand grading to a coarse sand and gravel	11/14/16/17	100	0.5	18:35
10	Same	6/12/15/17	100	5	18:39
15	Same	17/23/19/31	100	7	18:59
20	Terminated boring @ 18 ft. - installed well with screened interval				
25					
30					
35					
40					
45					
50					
55					
60					
65					

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/12/91 LOGGER: S. Price BORING#: C-1
DRILLING METHOD: HSA WATER LEVEL: N/A TIME: 14:00

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
	Asphalt to 3 inches	9/8/7/4	20	8	14:22
	Gravel aggregate base 3 inches to 1.5 ft.				
	Light brown fine to medium sand (fill)	6/4/2/4	100	15	15:00
	Medium brown silty clay 4-4.6 ft.	5/3/4/6	50	12	15:06
5	Tan fine sand to 7.2 ft.				
		5/12/19/11	100	4	15:15
	Medium to coarse sand and gravel to 9.8 ft.	5/12/7/13	100	9	15:20
10	Light brown well sorted medium sand	3/8/12/19	100	2	15:30
	Wet				
	Medium brown medium sand and gravel	5/11/15/21	100	5	15:35
	Same	10/12/17/7	100	1	15:38
15					
	Same	12/13/13/8	100	0.5	15:45
	Same	16/10/16/23	100	0.4	15:51
20	Same with increasing gravel content and size to 1.5-2 inches	10/12/23/29	100	0.1	15:58
	Same with less gravel	10/21/17/8	100	0.1	16:05
	Light grey fine sand with trace gravel	13/19/18/22	100	0.5	16:12
25					
	Same	11/29/39/38	100	1	16:33
	Same	13/20/22/17	100	0.4	16:42
30	Same to 31.5 ft.	18/10/11/11	50	0.2	16:47
	Large gravel with sand				
	Same	13/10/10/12	40	0.1	16:55
	Same to 34.6 ft.	22/26/21/23	100	0	17:00
35	Silty clayey gravel.				
	Silty gravel	18/22/21/26	100	0	17:10
	Same	12/26/40/23	100	0	17:18
40	Same	26/22/26/25	100	0	17:25
	Same	18/26/22/24	100	0	17:47
	Same	22/26/18/27	100	0	17:54
45					
	Same grading to a light brown medium sand with trace gravel	12/24/31/32	100	0.1	18:05
	Light brown well sorted fine sand	20/27/27/32	100	0	18:12
50	Same	29/43/38/50	100	0.1	18:28
	Same	39/50/33/36	100	0.1	18:41
	Same grading to a medium to coarse sand and gravel	52/63/32/32	100	0	18:50
55					
	Medium brown gravel with sand	40/45/22/32	100	0	18:58
	Same	40/40/37/25	100	0	19:15
60	Same to 61.2 ft.	43/56/28/76	100	0	08:05
	Tight silty clay with trace gravel, dry	300/3'	10	0	08:35
	End of boring @ 62.4				
65					

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/10/91-9/11/91 LOGGER: S. Price BORING#: W14B
DRILLING METHOD: HSA WATER LEVEL: 13.75 TOC TIME: 17:30

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
5	Medium brown, fine to medium sand	9/10/4/6	100	0	17:54
10	Same with trace large gravel Wet	18/20/10/11	100	1.0	18:08
15	Medium grey, medium to coarse sand	15/14/6/7	100	0.7	18:19
20	Same	5/9/13/8	100	2.0	18:38
25	Grey brown, coarse sand and gravel	18/35/37/18	100	1.0	18:58
30	Same	26/18/11/11	100	3.0	19:20
35	Same to 36.5 ft. Grey brown coarse gravel with sand	29/17/15/15	100	5	07:49
40	Same to 40.5 ft. Grey silty clayey gravel	21/22/33/19	100	5.2	08:15
45	End of boring @ 42 ft.				
50					
55					
60					
65					

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/11/91 LOGGER: S. Price BORING#: W14A(2)
DRILLING METHOD: HSA WATER LEVEL: N/A TIME: 15:15

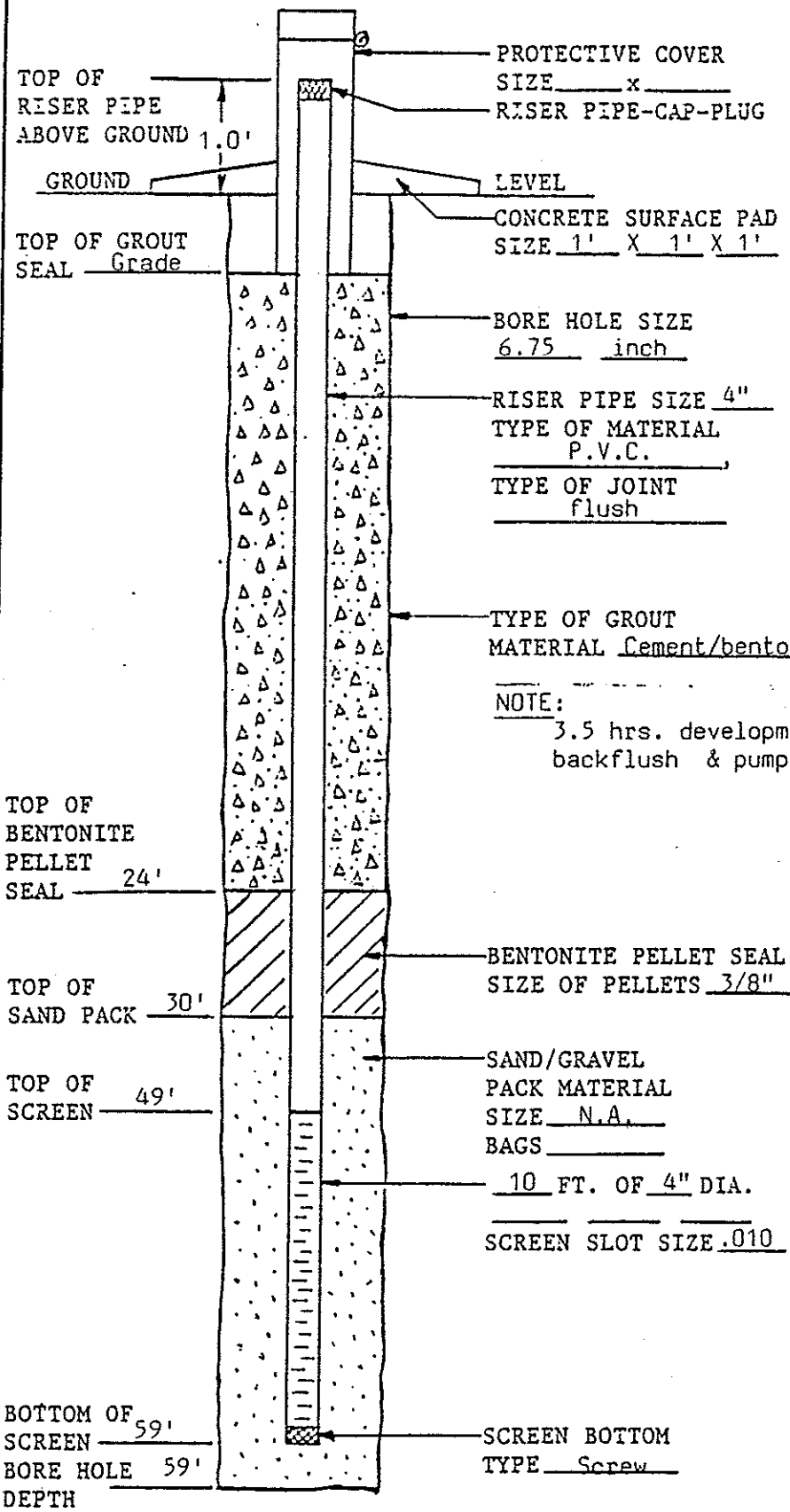
DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
	Second attempt to install well via HSA. Moved 7 ft. north of original W14A.				
10	Medium brown, fine to medium sand with trace organics Wet	12/16/15/16	100	2.0	15:35
40	Sudden darkening of auger cuttings. Auger began walking at 40 ft. Experienced 2 ft. of lateral movement. Decided to install well with mud rotary methods. Abandoned hole with tremied neat cement. End of boring @ 40 ft.			0	16:50

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/9/91-9/10/91 LOGGER: S. Price BORING#: W14A(1)
DRILLING METHOD: HSA WATER LEVEL: N/A TIME: 16:30

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
	Asphalt 0-3 inches	2/6/6/5	100	6.5	16:3810
	Dark to light brown, medium sand (fill)	4/4/2/4	100	3.0	16:52
	Same				
	Organic Muck 4.5-5.0 ft				
5	Medium brown, medium fine sand	12/12/11/8	100	0.5	17:00
	Same	8/16/8/34	100	4.0	17:10
	Same with trace organics				
10	Moist	7/20/30/27	100	6.0	17:22
	Changed sampling interval from continuous to 5 foot intervals to facilitate well installations				
15	Medium grey, medium to coarse sand with plagioclase gravel	4/6/14/32	100	0	09:40
	Wet				
20	Same with 3 inch cobbles	4/14/23/19	100	0.5	09:55
25	Same	16/25/29/20	100	0	10:15
30	Angular coarse gravel with sand	22/25/36/32	100	0.3	10:40
	Problems with augers walking				
35					
40					
45					
50	Augers started walking, caused rig to begin cavitating				
	Terminated drilling due to unsafe conditions				
	Abandoned hole with tremied neat cement				
	End of boring @ 50 ft.				
55					
60					
65					

PROJECT: Torrington, South Bend DRILLER: Layne-Northern PAGE: 1 OF: 1
DATE: 9/14/91 LOGGER: S. Price BORING#: W14A(3)
DRILLING METHOD: MUD ROTARY WATER LEVEL: 14.3 TOC TIME: 09:40

DEPTH (FEET)	DESCRIPTION	N VALUES	% REC	HNU	TIME
	Third attempt at installing well 14A. Well installed via mud rotary. Unable to split spoon due to formation instability, therefore well logged from cuttings.				
10	Sand and gravel				
60	Hard clay @ 60.2 ft.				
	End of boring @ 60.9 ft.				
65	Installed well @ 59 ft.				



JOB NO. 54-4169
LOCATION Torrington, Co
South Bend, IN
COUNTY St. Joseph
TOWNSHIP Portage
SECTION 16 T ____ R ____

PIPE TALLY-

	FEET	INCHES
BOTTOM		
TOTAL		

MATERIALS USED

FEET OF SCREEN 10'
FEET OF RISER PIPE 60'
BAGS OF SAND N.A.
PAILS OF PELLETS 2
BAGS OF CEMENT 6
BAGS OF ENVIROPLUG N.A.
BAGS OF BENTONITE 1
BAGS OF READY MIX N.A.
NO. OF SPLIT SPOON SAMPLES N.A.
NO. OF SHELBY SPOONS N.A.

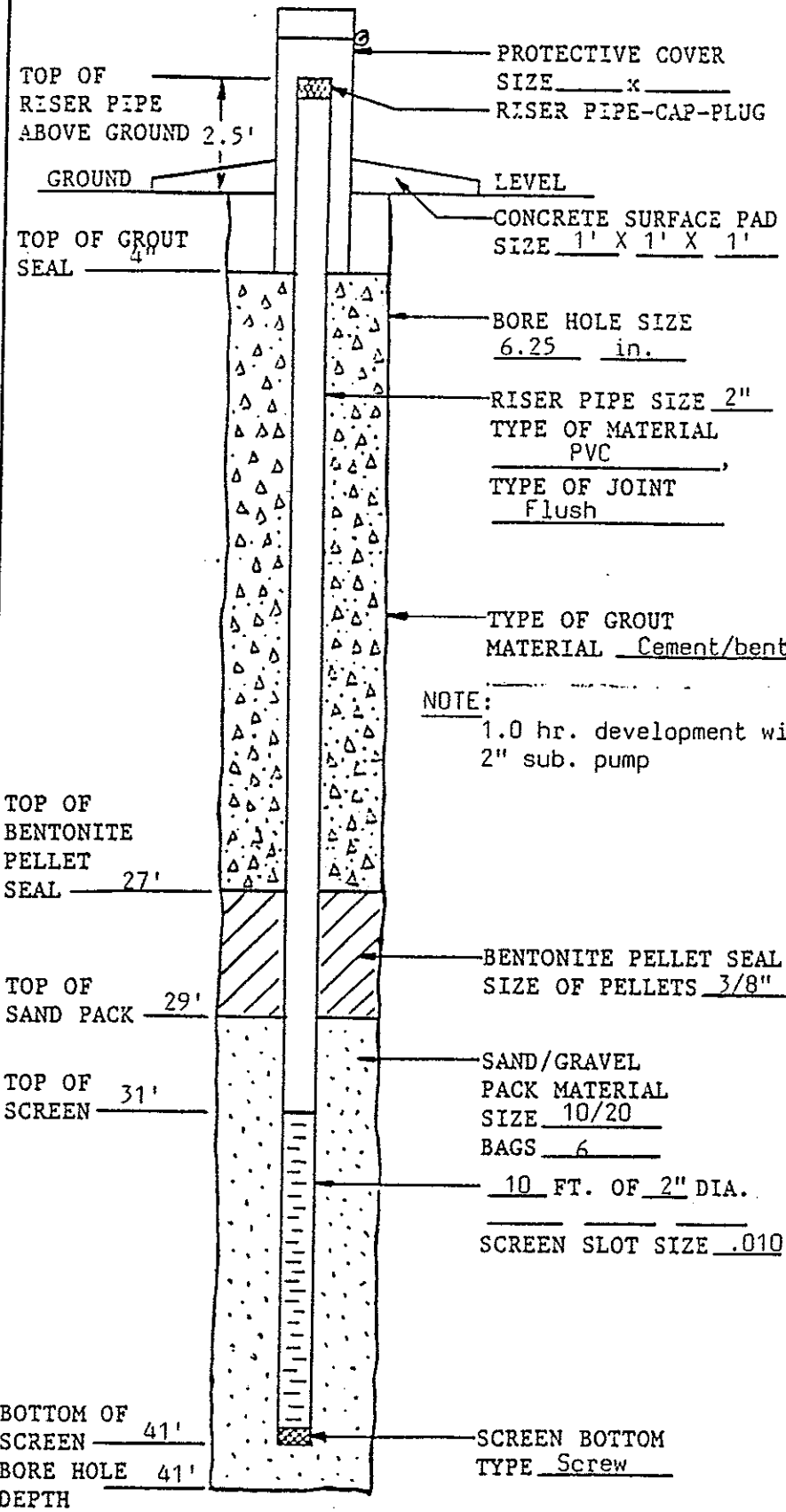
DATE COMPLETED 9/15/91
STATIC WATER LEVEL ____

DRILLER B. McLeish

MONITORING WELL NO. W-14A FOR: Torrington Co./Capsule Enviro. Engrg.

LAYNE-NORTHERN CO., INC.
INDIANAPOLIS • MISHAWAKA, IND. • LANSING

DRAWING NUMBER



PROTECTIVE COVER SIZE ____ x ____

RISER PIPE-CAP-PLUG

CONCRETE SURFACE PAD SIZE 1' X 1' X 1'

BORE HOLE SIZE 6.25 in.

RISER PIPE SIZE 2"
TYPE OF MATERIAL PVC
TYPE OF JOINT Flush

TYPE OF GROUT MATERIAL Cement/bentonite

NOTE:
1.0 hr. development with 2" sub. pump

BENTONITE PELLET SEAL
SIZE OF PELLETS 3/8"

SAND/GRAVEL PACK MATERIAL
SIZE 10/20
BAGS 6

10 FT. OF 2" DIA.
SCREEN SLOT SIZE .010"

SCREEN BOTTOM TYPE Screw

JOB NO. 54-4169
LOCATION Torrington Co.
South Bend, IN

COUNTY St. Joseph
TOWNSHIP Portage
SECTION 16 T ____ R ____

PIPE TALLY-

	FEET	INCHES
BOTTOM		
TOTAL		

MATERIALS USED

FEET OF SCREEN 10'
FEET OF RISER PIPE 40'
BAGS OF SAND 6
PAILS OF PELLETS 1
BAGS OF CEMENT 6
BAGS OF ENVIROPLUG N.A.
BAGS OF BENTONITE 1
BAGS OF READY MIX N.A.
NO. OF SPLIT SPOON SAMPLES 6
NO. OF SHELBY SPOONS N.A.

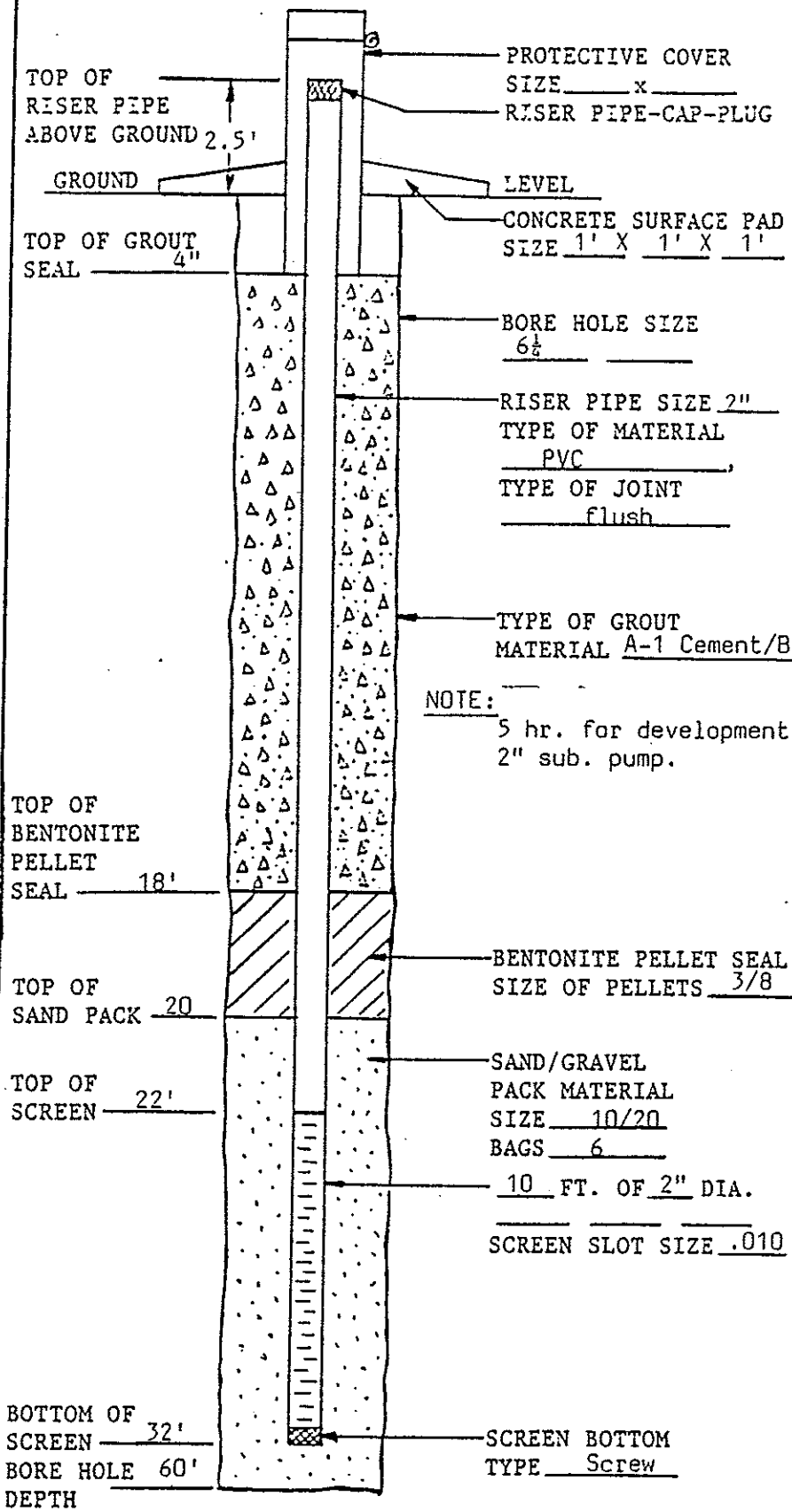
DATE COMPLETED 9/11/91
STATIC WATER LEVEL ____

DRILLER J. Marsh

MONITORING WELL NO. W-14B FOR: Torrington Co./Capsule Enviro. Engrg.

LAYNE-NORTHERN CO., INC.
INDIANAPOLIS • MISHAWAKA, IND. • LANSING

DRAWING NUMBER



JOB NO. 54-4169
LOCATION
Torrington Co.
South Bend, IN

COUNTY St. Joseph
TOWNSHIP Portage
SECTION 16 T ____ R ____

PIPE TALLY-

	FEET	INCHES
BOTTOM		
TOTAL		

MATERIALS USED

FEET OF SCREEN 10'
FEET OF RISER PIPE 30'
BAGS OF SAND 6
PAILS OF PELLETS 1
BAGS OF CEMENT 6
BAGS OF ENVIROPLUG N.A.
BAGS OF BENTONITE 1
BAGS OF READY MIX N.A.
NO. OF SPLIT SPOON SAMPLES 12
NO. OF SHELBY SPOONS N.A.

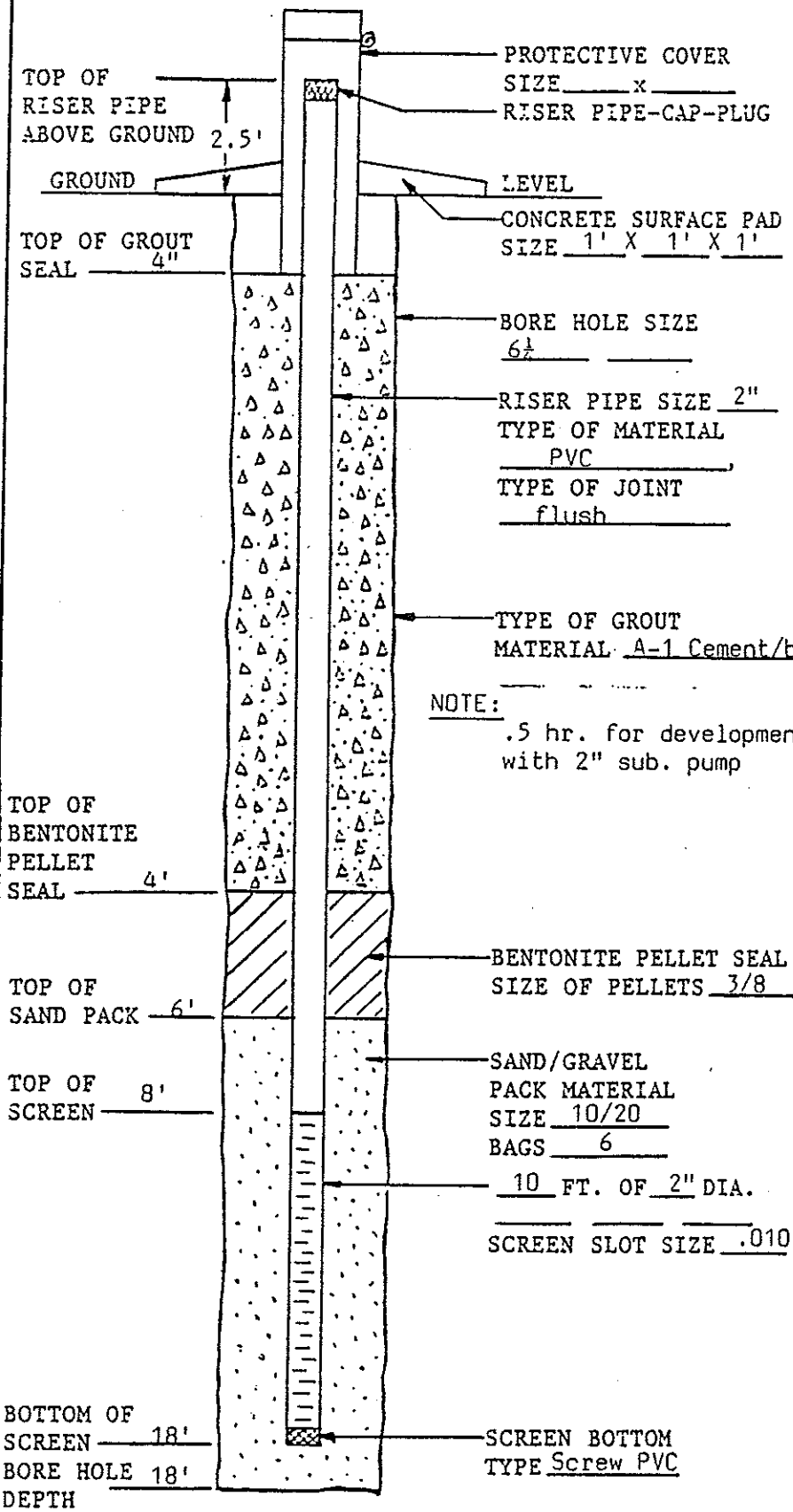
DATE COMPLETED 9/14/91
STATIC WATER LEVEL ____

DRILLER J. Marsh

MONITORING WELL NO. W-15A FOR: Torrington Co./Capsule Enviro. Engrg.

LAYNE-NORTHERN CO., INC.
INDIANAPOLIS • MISHAWAKA, IND. • LANSING

DRAWING NUMBER



JOB NO. 54-4169
LOCATION
Torrington Co.
South Bend, IN

COUNTY St. Joseph
TOWNSHIP Portage
SECTION 16 T ____ R ____

PIPE TALLY-

	FEET	INCHES
BOTTOM		
TOTAL		

MATERIALS USED

FEET OF SCREEN 10
FEET OF RISER PIPE 10
BAGS OF SAND 6
PAILS OF PELLETS 1
BAGS OF CEMENT 6
BAGS OF ENVIROPLUG N.A.
BAGS OF BENTONITE 1
BAGS OF READY MIX N.A.
NO. OF SPLIT SPOON SAMPLES 2
NO. OF SHELBY SPOONS N.A.

DATE COMPLETED 9/15/91
STATIC WATER LEVEL ____

DRILLER J. Marsh

MONITORING WELL NO. W-15B FOR: Torrington Co./Capsule Enviro. Engrg.

LAYNE-NORTHERN CO., INC.
INDIANAPOLIS • MISHAWAKA, IND. • LANSING

DRAWING NUMBER

Layne

LAYNE NORTHERN COMPANY

LANSING, MICHIGAN

FIELD RECORD OF EXPLORATION

CONTRACTED WITH Capsule BORING NO. C-1

PROJECT NAME Torrington Company JOB NO. 54-4169

LOCATION South Bend, Indiana

BORING METHOD Auger HAMMER WT. 140 lbs. HAMMER DROP 30" HOLE DIA 6¼

SURFACE ELEV _____ CORE DIA _____ CASING DIA _____ DATE _____

DEPTH from / to	LOG VISUAL CLASSIFICATION
0.0	Geologist from Capsule on site, lithology taken by Susan Price.
	0-60' drilled & continous sampled, 30 samples taken.

SAMPLES						
sample number	TYPE	DEPTH (feet) from	DEPTH (feet) to	penetration data BLOWS/6" DROP HAMMER	RECOV (inch)	cond

W.L. WHILE DRILLING:
W.L. AT COMPLETION:

DRILLER James B. Marsh

INSPECTOR _____

Layne

LAYNE NORTHERN COMPANY

LANSING, MICHIGAN

FIELD RECORD OF EXPLORATION

CONTRACTED WITH Capsule BORING NO. PD-4-1

PROJECT NAME Torrington Company JOB NO. 54-4169

LOCATION South Bend, indiana

BORING METHOD Auger HAMMER WT. 140 lbs. HAMMER DROP 30" HOLE DIA 6¼

SURFACE ELEV _____ CORE DIA _____ CASING DIA _____ DATE _____

DEPTH from / to	LOG VISUAL CLASSIFICATION
0.0	Geologist from Capsule on site, lithology taken by Susan Price.
	0'-10' drilled & continous sampled, 5 samples taken.

SAMPLES						
sample number	TYPE	DEPTH (feet) from	DEPTH (feet) to	penetration data BLOWS/6" DROP HAMMER	RECOV (inch)	cond

W.L. WHILE DRILLING:

W.L. AT COMPLETION:

DRILLER James.B. Marsh

INSPECTOR _____

Layne

LAYNE NORTHERN COMPANY

LANSING, MICHIGAN

FIELD RECORD OF EXPLORATION

CONTRACTED WITH Capsule BORING NO. W-14A

PROJECT NAME Torrington Co. JOB NO. 54-4169

LOCATION South Bend, Indiana

BORING METHOD Auger HAMMER WT. _____ HAMMER DROP _____ HOLE DIA 8¼

SURFACE ELEV _____ CORE DIA _____ CASING DIA _____ DATE _____

DEPTH from / to	LOG VISUAL CLASSIFICATION
0.0	Geologist from Capsule on site, lithology taken by Susan Price
	0-50 ft. 10 samples were taken

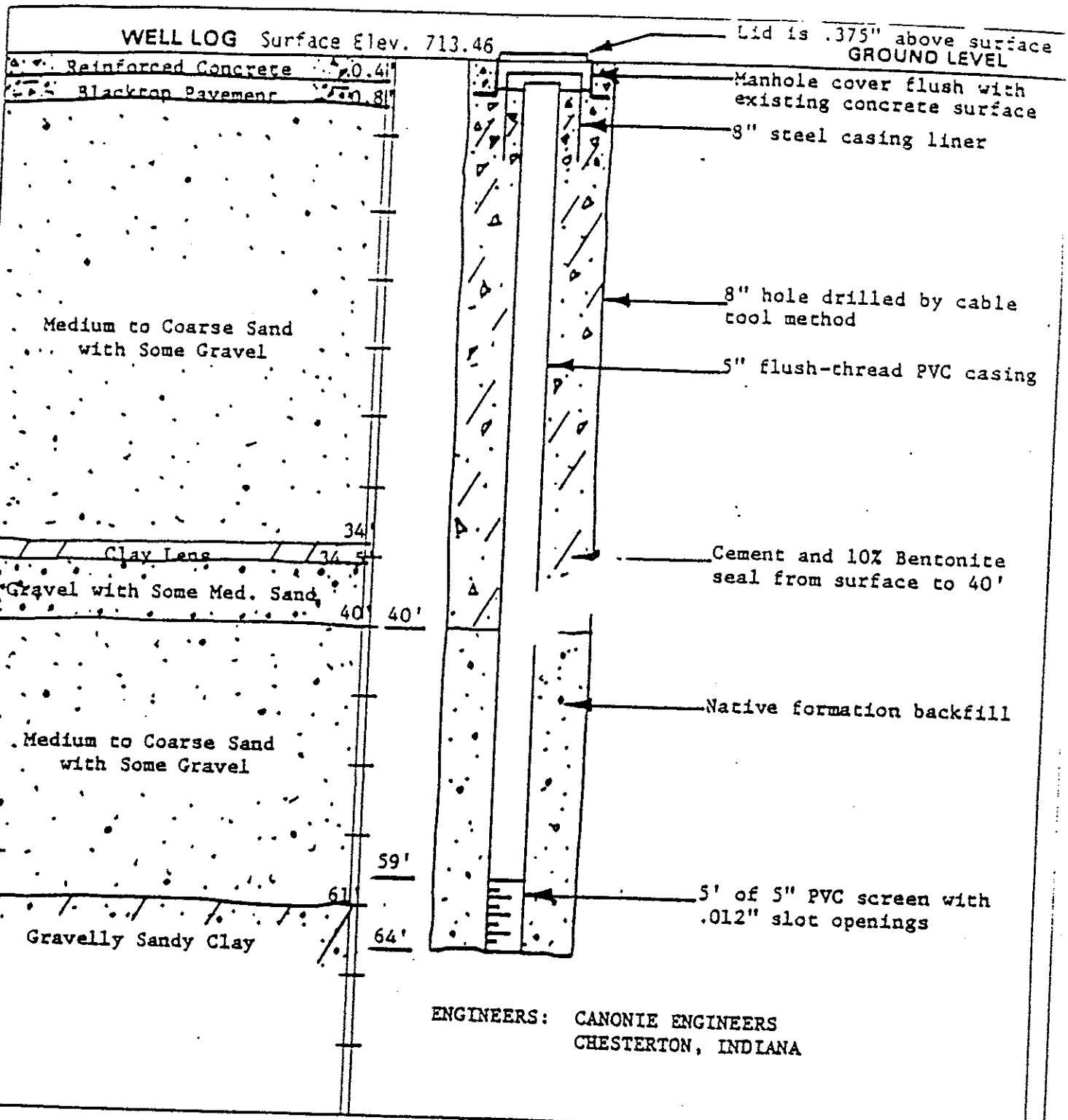
SAMPLES							
sample number	TYPE	DEPTH (feet) from	DEPTH (feet) to	penetration data BLOWS/6" DROP HAMMER	penetration data RECOV (inch)	penetration data cond	

W.L. WHILE DRILLING:

W.L. AT COMPLETION:

DRILLER James B. Marsh

INSPECTOR _____



City South Bend State Indiana

Location Approximately 50' East of Water Supply Well #4

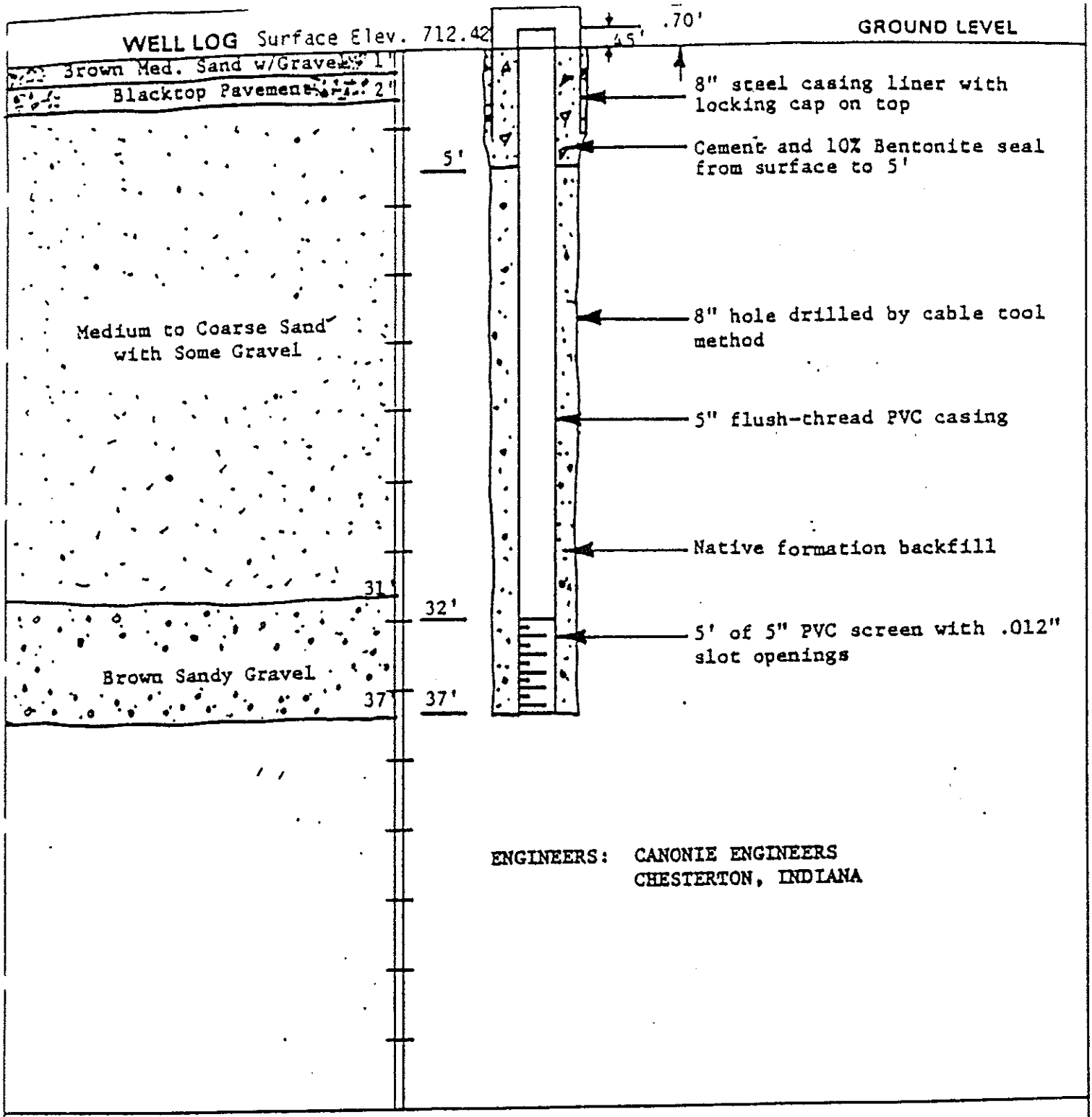
County St. Joseph Twp. Portage Section SE¼NW¼NE¼ of 16

Test Capacity _____ GPM. Static Water Level _____ ft. Pumping Level _____ ft.
Specific Capacity _____ GPM/Ft. D.D.
Date Drilled August 7, 1984
Driller John Blatz
Job No. 4704

Well No. W-1
TORRINGTON COMPANY
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.
Granger, Indiana

WELL LOG Surface Elev. 712.42



ENGINEERS: CANONIE ENGINEERS
CHESTERTON, INDIANA

City South Bend State Indiana

Location Off NW Corner of Pond #1

County St. Joseph Twp. Portage Section SE¼NW¼NE¼ of 16

Test Capacity _____ GPM. Static Water Level _____ ft. Pumping Level _____ ft.

Specific Capacity _____ GPM/Ft. D.D.

Date Drilled August 1, 1984

Driller John Blatz

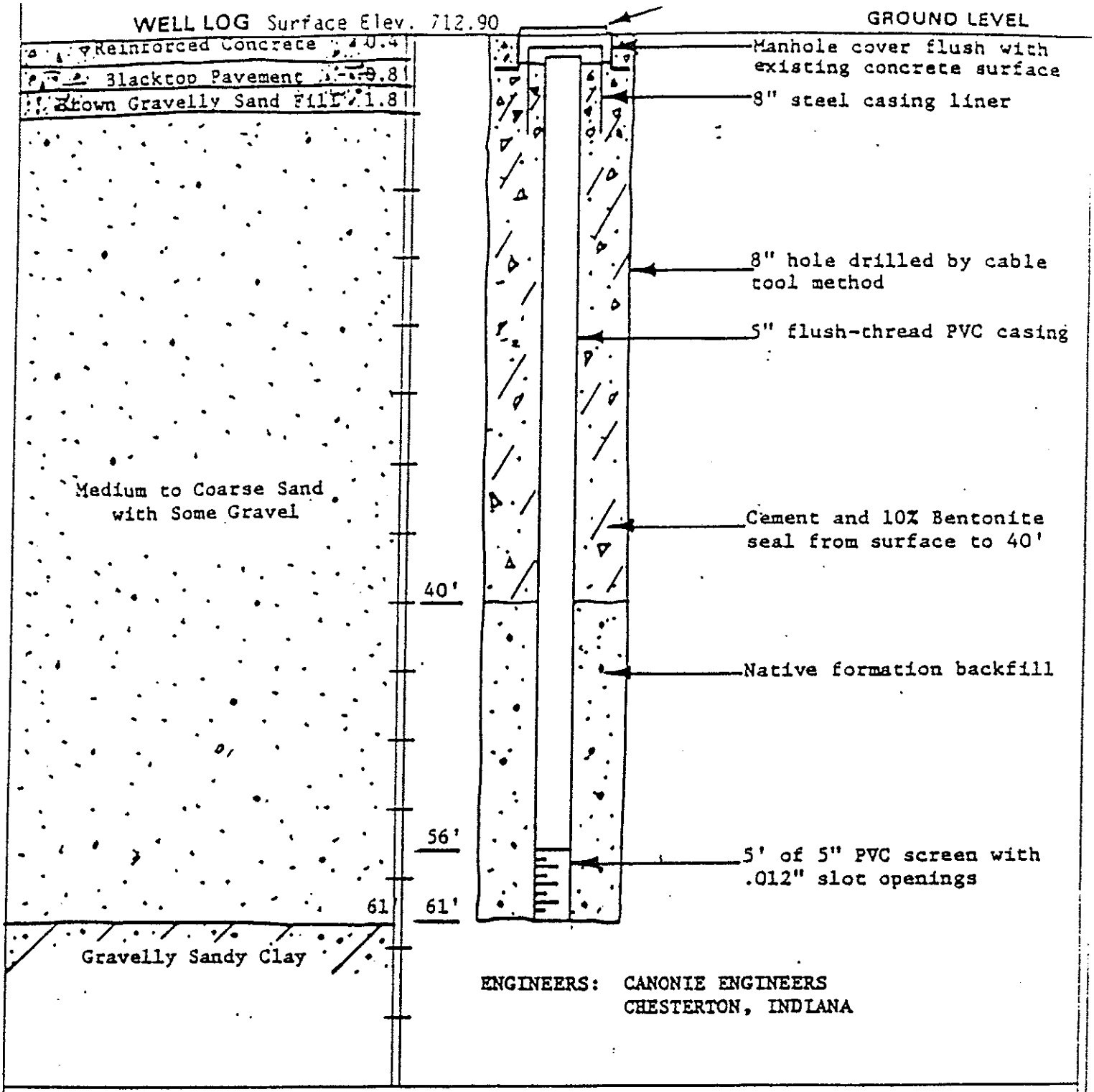
Job No. 4704

Well No W-2

TORRINGTON COMPANY
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.
Granger, Indiana

WELL LOG Surface Elev. 712.90



ENGINEERS: CANONIE ENGINEERS
CHESTERTON, INDIANA

City South Bend State Indiana

Location Approximately 15' East of NE Corner of Maintenance Shed "B"

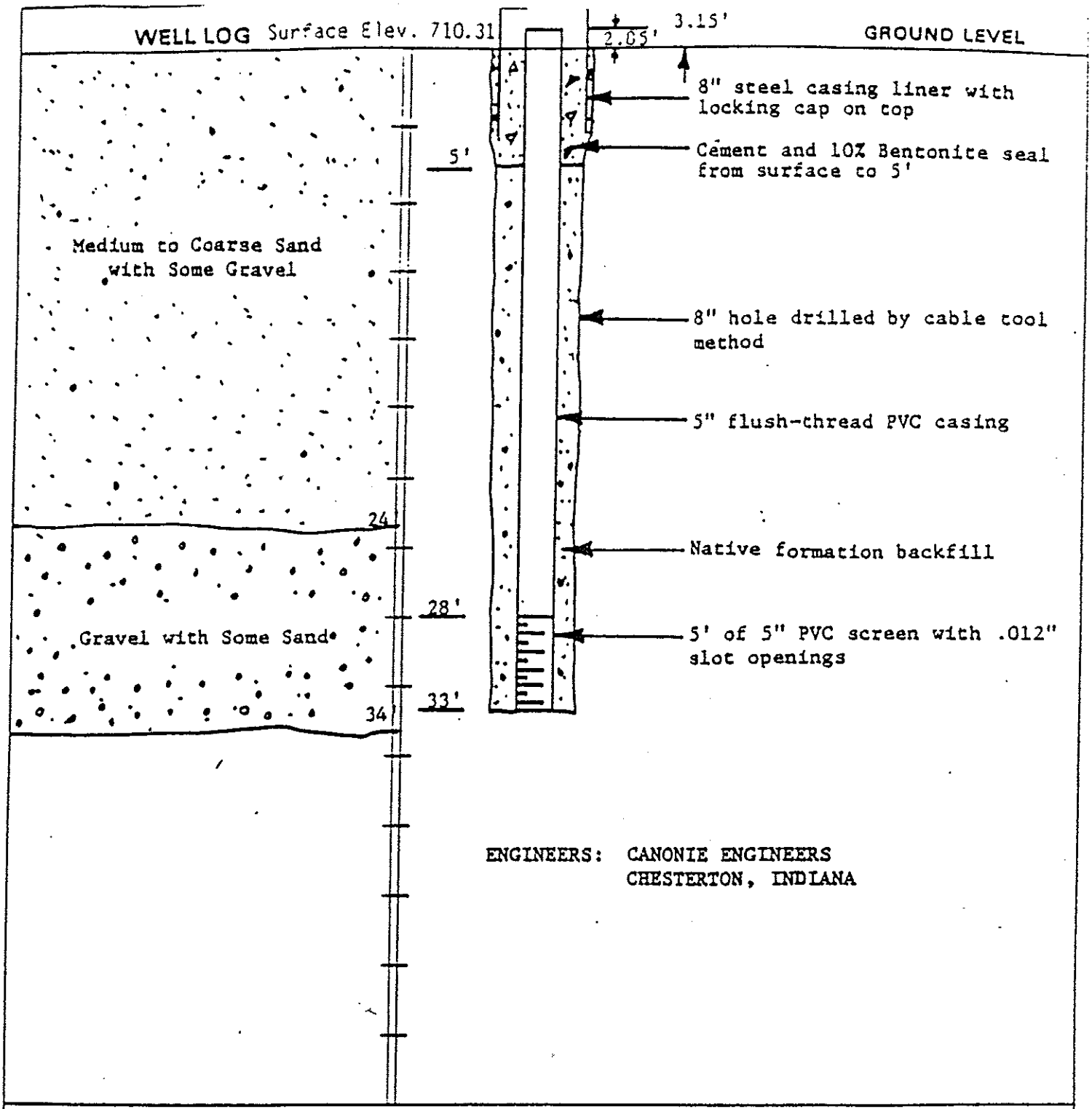
County St. Joseph Twp. Portage Section SE¼NW¼NE¼ of 16

Test Capacity _____ GPM. Static Water Level _____ ft. Pumping Level _____ ft.
Specific Capacity _____ GPM/Ft. D.D.
Date Drilled August 10, 1984
Driller John Blatz
Job No. 4704

Well No. W-3
TORRINGTON COMPANY
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.
Granger, Indiana

WELL LOG Surface Elev. 710.31



ENGINEERS: CANONIE ENGINEERS
CHESTERTON, INDIANA

City South Bend State Indiana

Location Along East Edge of Mound Containing Buried Oil Tanks Just North of Pond #4

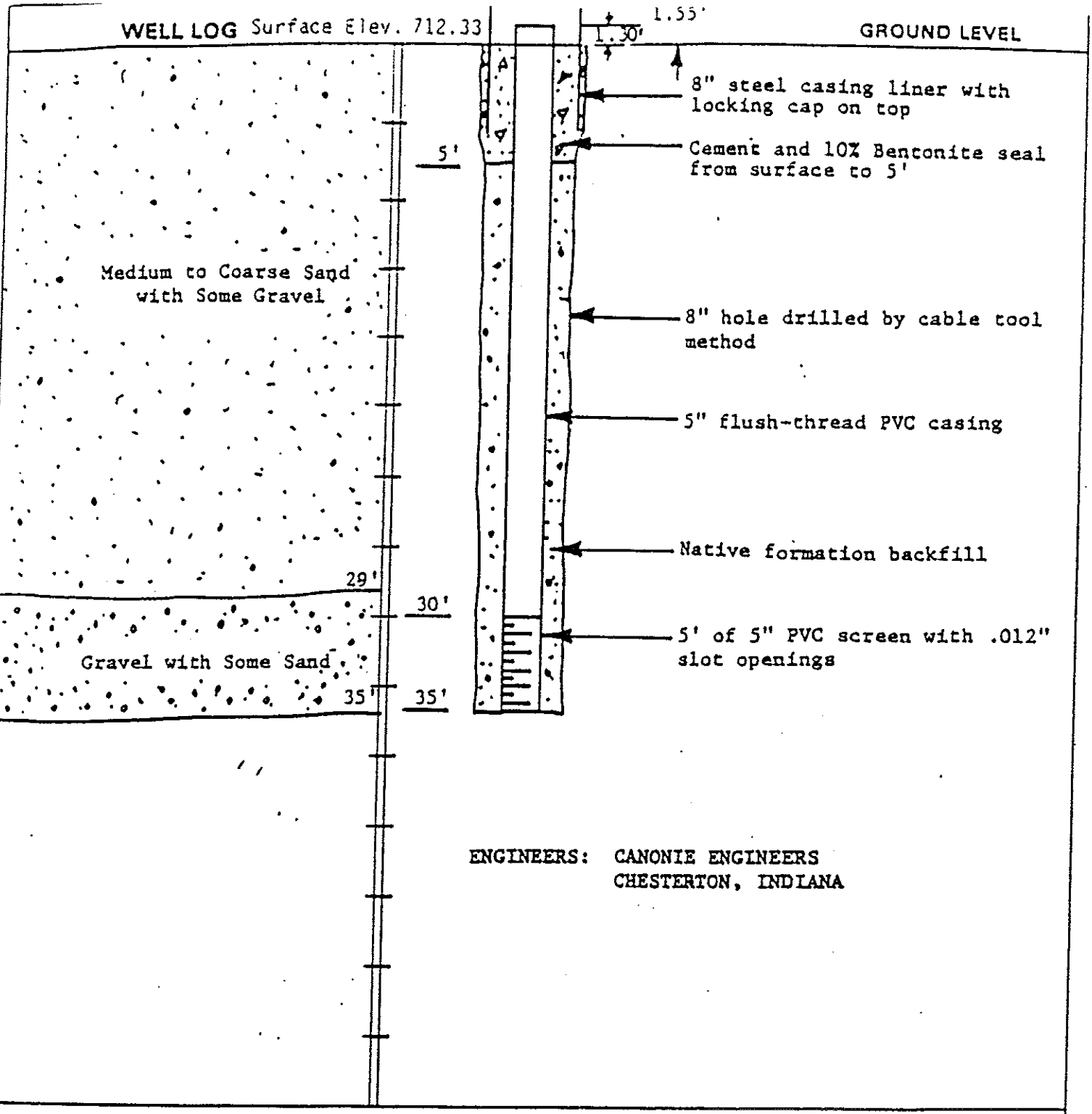
County St. Joseph Twp. Portage Section SE¼NW¼NE¼ of 16

Test Capacity _____ GPM. Static Water Level _____ ft. Pumping Level _____ ft.
Specific Capacity _____ GPM/Ft. D.D.
Date Drilled July 30, 1984
Driller John Blatz
Job No. 4704

Well No W-4
TORRINGTON COMPANY
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.
Granger, Indiana

WELL LOG Surface Elev. 712.33



ENGINEERS: CANONIE ENGINEERS
CHESTERTON, INDIANA

City South Bend State Indiana

Location On North Side of Line Between Pond #4 and Pond #3

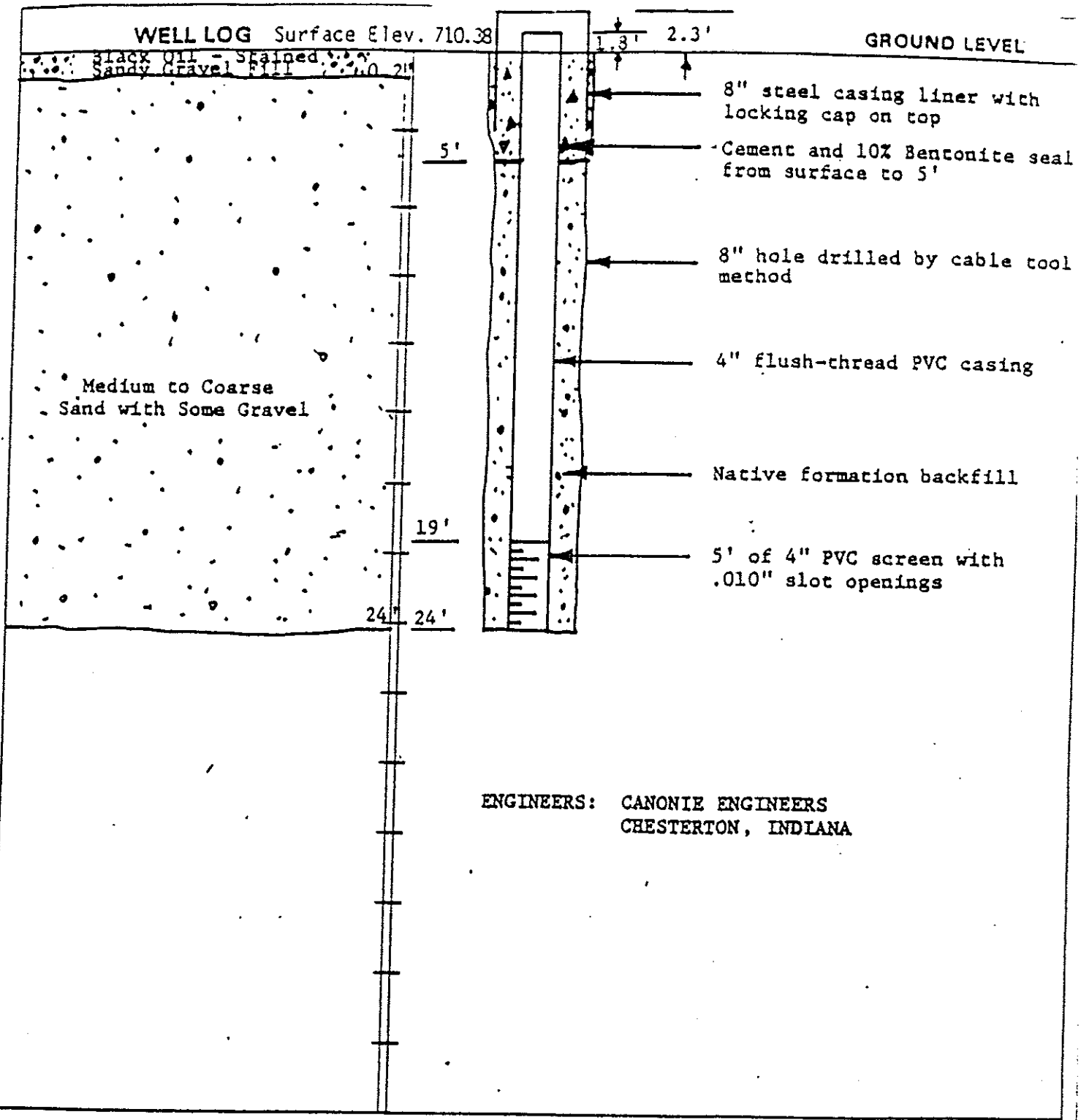
County St. Joseph Twp. Portage Section SE¼NW¼NE¼ of 16

Test Capacity _____ GPM. Static Water Level _____ ft. Pumping Level _____ ft.
Specific Capacity _____ GPM/Ft. D.D.
Date Drilled July 31, 1984
Driller John Blatz
Job No. 4704

Well No. W-5
TORRINGTON COMPANY
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.
Granger, Indiana

WELL LOG Surface Elev. 710.38



ENGINEERS: CANONIE ENGINEERS
CHESTERTON, INDIANA

City South Bend State Indiana

Location Next to above ground quench oil tanks on west side of plant

County St. Joseph Twp. Portage Section SE¼NW¼NE¼ of 16

Test Capacity _____ GPM. Static Water Level _____ ft. Pumping Level _____ ft.
Specific Capacity _____ GPM/Ft. D.D.
Date Drilled August 13, 1984
Driller John Blatz
Job No. 4704

Well No S-3

TORRINGTON COMPANY
SOUTH BEND, INDIANA

PEERLESS-MIDWEST, INC.
Granger, Indiana

Canonie

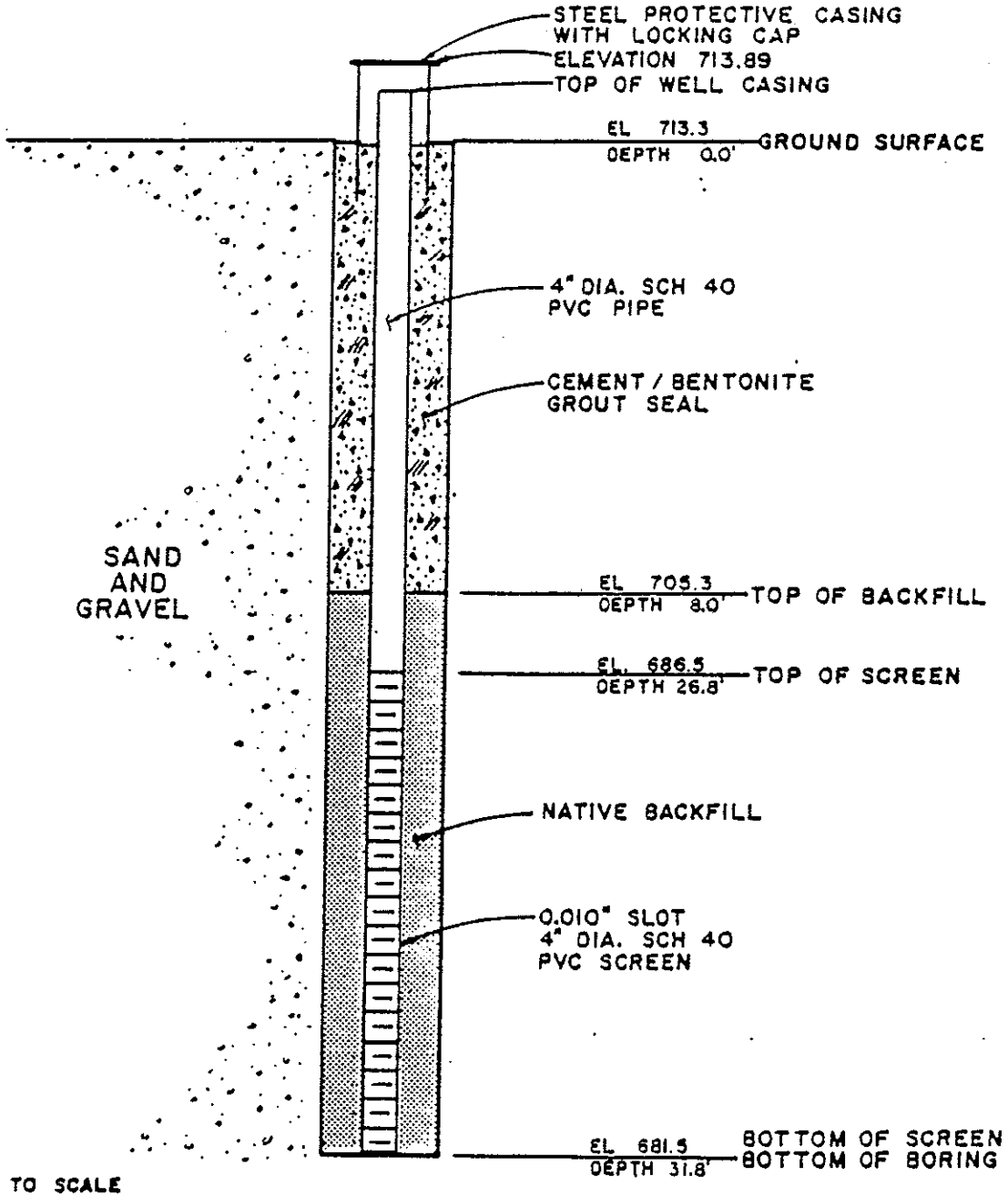
Observation Well Details

PROJECT No. 83-182

WELL No. W-7

PROJECT NAME BARNES AND THORNBURG

BORING LOCATION N 4550.88 E 5855.74* DATE 10-18-84 BY KMB



NOTE:
NOT DRAWN TO SCALE
* PLANT COORDINATES

Canonie

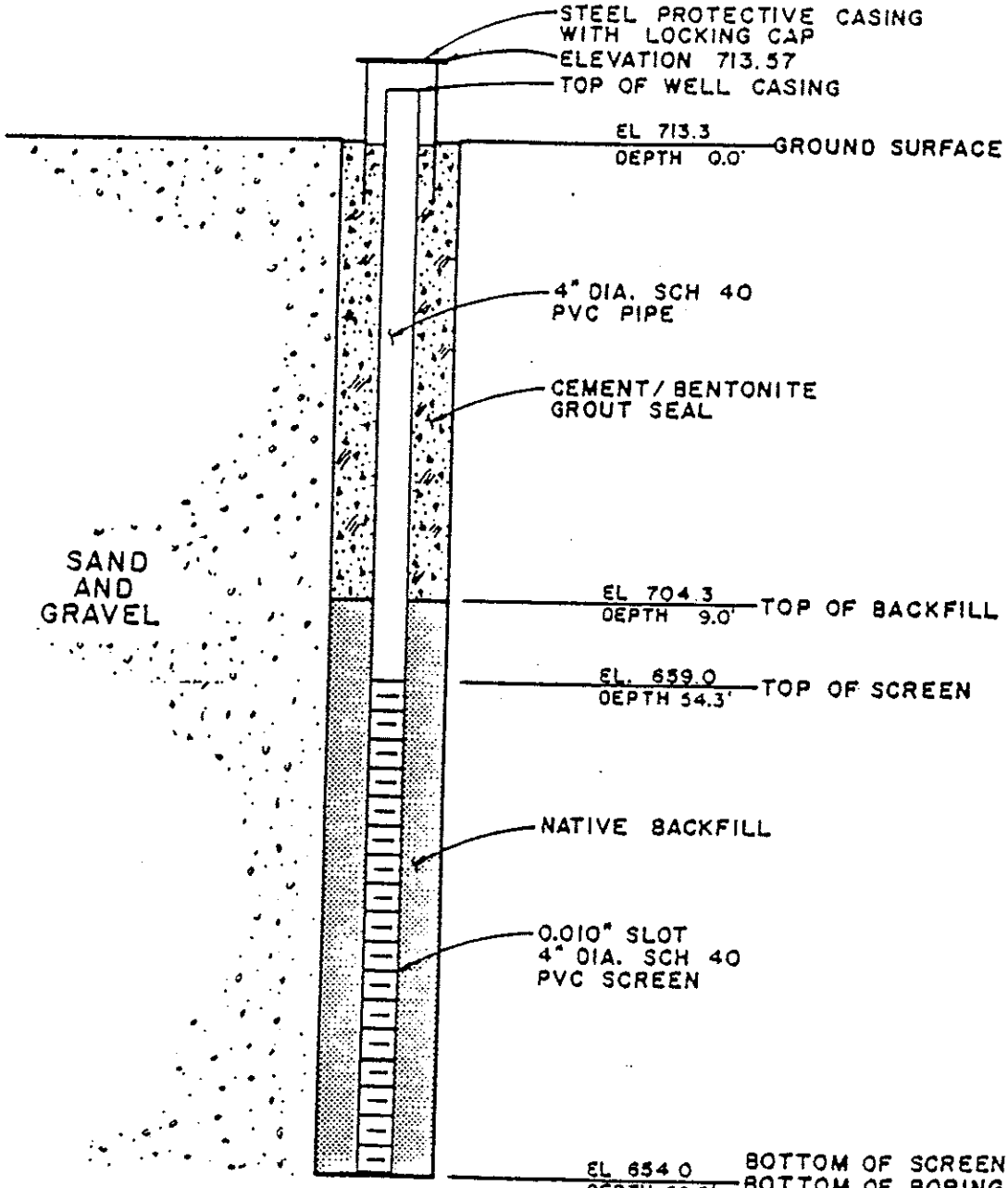
Observation Well Details

PROJECT No. 83-182

WELL No. W-8

PROJECT NAME BARNES AND THORNBURG

BORING LOCATION N 4542.42 E 5855.85* DATE 10-23-84 BY KMB



NOTE:
NOT DRAWN TO SCALE
* PLANT COORDINATES

BORING LOG

BORING NO. W-9

SHT 1 OF 1

D/A JOB NO. 900-13 PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W DATE START 1-31-91 FINISH 2-1-91

WEATHER HAZY, 15° F TOP OF CASING ELEVATION 714.86 FT. MSL

GROUND ELEVATION 712.52 FT. MSL TOTAL DEPTH 58.5 FT.

DRILLED BY BEST ENVIRONMENTAL LOGGED BY MJS - DAILY & ASSOCIATES

CASING I.D. 3 3/8"

SPLIT SPOON SIZE 2" I.D.

TYPE HOLLOW STEM AUGER

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586	AS BUILT MONITORING WELL DETAIL	SOIL & ROCK DESCRIPTION / COMMENTS
				WELL PROTECTOR; CEMENT GROUT	
				BENTONITE/ PC DRY MIX	dark brown SILTY CLAY, organic
				7.2' 705.32	2.5' 710.02
				9.2' 703.32	
10		W1		BENTONITE SEAL	light brown SAND, fine to medium w/some small pebbles
	1				sample 1 is an auger cutting, collected w/ 30' of auger in the ground
20		W2			
				NATIVE SAND BACKFILL	GRAVEL @ 25.0' 687.52
		W3 @ 30'			NOTE: UNABLE TO CONDUCT SPLIT SPOON SAMPLING BECAUSE OF SOIL HEAVING. GROUND-WATER SAMPLES TAKEN @ 10' INTERVALS.
40	2	W4		2" PVC CASING	sample 2 is an auger cutting, collected w/55' of auger in the ground
				44.56' 667.96	
50		W5		2" PVC 0.010" SCREEN	
				54.56' 657.96	
	3				GRAVEL @ 55.0'
60					split spoon driven 56.5'-58.5', gray SANDY CLAY w/pebbles
					END OF BORING 58.5' 654.02

SOILS 58.5 FEET

BEDROCK NONE

TOTAL DEPTH 58.5 FEET

COMMENTS UPGRADENT/BACKGROUND MONITORING WELL

SEEPAGE WATER ENCOUNTERED, DEPTH 11.5 ELEV. 701.02

WATER LEVEL AT COMPLETION 7.64' ELEV. 704.88

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BL-3

BORING LOG

BORING NO. W-10A

SHT 1 OF 2

D/A JOB NO. 900-13 | PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W | DATE START 1-30-91 FINISH 1-30-91

WEATHER OVERCAST, 20° F | TOP OF CASING ELEVATION 714.74 FT. MSL

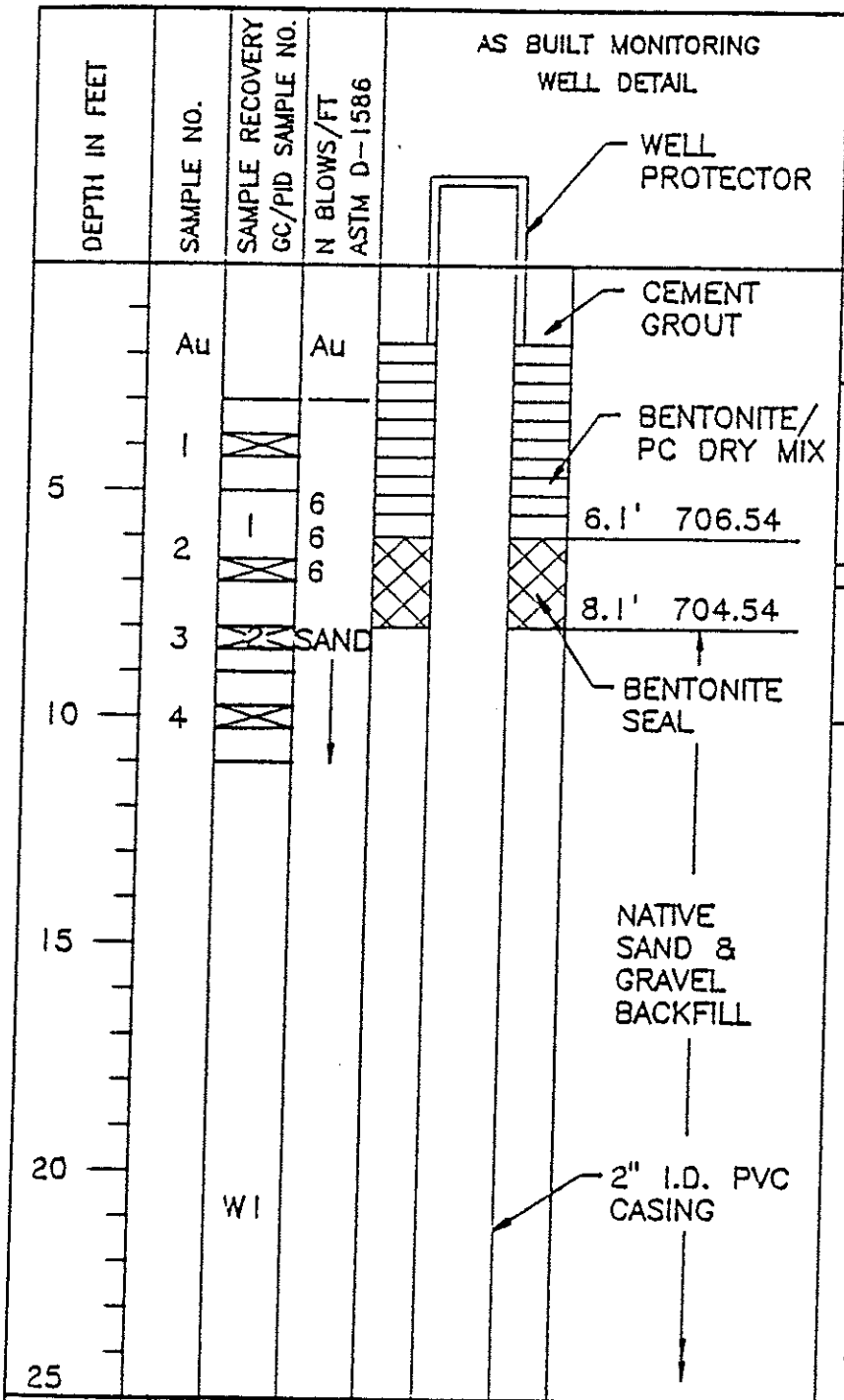
GROUND ELEVATION 712.64 FT. MSL | TOTAL DEPTH 60.0 FEET

DRILLED BY BEST ENVIRONMENTAL | LOGGED BY MJS - DAILY & ASSOCIATES

CASING I.D. 3 3/8"

SPLIT SPOON SIZE 2" I.D.

TYPE HOLLOW STEM AUGER



SOIL & ROCK DESCRIPTION / COMMENTS

black SILTY CLAY, organic
2.5' 710.14

light brown SAND, fine to medium, moist
3" CLAYEY SILT @ 4.0'
6.1' 706.54
6.5' 706.14

light brown SAND, fine, moist
7.0' 705.64

light brown SAND, fine to coarse w/some gravel
8.1' 704.54
10.0' 702.64

light brown SAND, fine

NOTE: SAND HEAVE IN AUGER 4 1/2', UNABLE TO WASH OUT OF AUGER. DECISION MADE TO AUGER DOWN THROUGH SAND STOPPING AT EVERY 10' TO SAMPLE GROUNDWATER WITH THE WATERA PUMP TO BE DEDICATED TO WELL.

GRAVEL @ 22.0' 690.64

DRILLER TO REPORT CHANGES IN AUGER BEHAVIOR, WILL DRIVE SPLIT SPOON WHEN CLAY IS ENCOUNTERED.

SOILS 60.0 FEET

BEDROCK NONE

TOTAL DEPTH 60.0 FEET

COMMENTS FIRST NEW WELL INSTALLED AT THE SITE

SEEPAGE WATER ENCOUNTERED, DEPTH 8.0' ELEV. 704.64

WATER LEVEL AT COMPLETION 8.74' ELEV. 704.00

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BL-3

BORING LOG

BORING NO. W-10A

SHT 2 OF 2

D/A JOB NO. 900-13 PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W DATE START 1-31-91 FINISH 1-31-91

WEATHER LIGHT SNOW TO MOSTLY SUNNY, 20°F TOP OF CASING ELEVATION 714.74 FT. MSL

GROUND ELEVATION 712.64 FT. MSL TOTAL DEPTH 60.0 FEET

DRILLED BY BEST ENVIRONMENTAL LOGGED BY MJS - DAILY & ASSOCIATES

CASING I.D. 3 3/8"

SPLIT SPOON SIZE 2" I.D.

TYPE HOLLOW STEM AUGER

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586	AS BUILT MONITORING WELL DETAIL (CONTINUED)	SOIL & ROCK DESCRIPTION / COMMENTS
				2" I.D. PVC CASING	brown SAND, fine to coarse w/gravel
30		W2		NATIVE SAND & GRAVEL BACKFILL	
		W3	@ 40'		NOTE:
				48.51' 664.13	1. AUGER CUTTING SAMPLE TAKEN @ 50' FOR GRAIN SIZE ANALYSIS #5 (FINE TO COARSE BROWN SAND W/GRAVEL).
50	5	W4		2" I.D. PVC 0.010" SLOT SCREEN	2. HIT CLAY @ 57.5', 8' OF SAND & GRAVEL HEAVED INSIDE AUGER, COULD NOT WASH OUT, AUGERED DOWN TO 60', ENCOUNTERED LARGE GRAVEL (BOULDERS).
55					
				58.51' 654.13	
60					60.0' 652.64 END OF BORING

SOILS 60.0 FEET

BEDROCK NONE

TOTAL DEPTH 60.0 FEET

COMMENTS

SEEPAGE WATER ENCOUNTERED, DEPTH 8.0' ELEV. 704.64

WATER LEVEL AT COMPLETION 8.74' ELEV. 704.00

WATER LEVEL ELEV. DATE/TIME

WATER LEVEL ELEV. DATE/TIME

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BORING LOG

BORING NO. W-10B

SHT 1 OF 1

D/A JOB NO. 900-13 PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W DATE START 2-4-91 FINISH 2-4-91

WEATHER CLEAR, 50° F TOP OF CASING ELEVATION 714.80 FT. MSL

GROUND ELEVATION 712.68 FT. MSL TOTAL DEPTH 29.0 FEET

DRILLED BY BEST ENVIRONMENTAL LOGGED BY PB - BEST ENVIRONMENTAL

CASING I.D. 3 3/8"

SPLIT SPOON SIZE 2" I.D.

TYPE HOLLOW STEM AUGER

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586	AS BUILT MONITORING WELL DETAIL	SOIL & ROCK DESCRIPTION / COMMENTS
				4"x5' WELL PROTECTOR LOCKABLE	
				CEMENT GROUT	
				BENTONITE/ PC DRY MIX	dark brown SILTY CLAY, organic
				5.8' 706.88	2.5' 710.18
				7.8' 704.88	
10				BENTONITE SEAL NATIVE SAND BACKFILL	light brown SAND, fine to medium w/gravel
				18.13' 694.55	
20				2" PVC CASING	GRAVEL @ 22.0' 690.68
				2" PVC 0.010" SCREEN	
				28.13' 684.55	29.0' 683.68
30					END OF BORING
40					

SOILS 29.0 FEET

BEDROCK NONE

TOTAL DEPTH 29.0 FEET

COMMENTS GROUNDWATER SAMPLING CONDUCTED DURING CONSTRUCTION OF W-10A

SEEPAGE WATER ENCOUNTERED, DEPTH 8.0' ELEV. 704.68

WATER LEVEL AT COMPLETION 8.68' ELEV. 704.00

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BORING LOG

BORING NO. W-11A
SHT 1 OF 1

O/A JOB NO. 900-13
PROJECT UEA / TORRINGTON
LOCATION SOUTH BEND, IN / MW-W
DATE START 2-1-91 FINISH 2-1-91
WEATHER PARTLY CLOUDY, 35° F
TOP OF CASING ELEVATION 714.79 FT. MSL
GROUND ELEVATION 712.24 FT. MSL
TOTAL DEPTH 56.5 FEET
DRILLED BY BEST ENVIRONMENTAL
LOGGED BY MS / PB

CASING I.D. 3 3/8"
SPLIT SPOON SIZE 2" I.D.
TYPE HOLLOW STEM AUGER

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586	AS BUILT MONITORING WELL DETAIL	SOIL & ROCK DESCRIPTION / COMMENTS
				4"x5' WELL PROTECTOR LOCKABLE	0.5' SILTY CLAY & gravel
				CEMENT GROUT	2.5' dark brown SILTY CLAY, organic
				BENTONITE/ PC DRY MIX	light brown SAND, fine
				6.5' 705.74	
				8.2' 704.04	
10		W1		BENTONITE SEAL	changes to brown SAND, fine to coarse w/gravel
				NATIVE SAND BACKFILL	
20		W2			
					GRAVEL @ 22.0' 690.24
		W3 @ 30'		2" PVC CASING	
40		W4			
				45.1' 667.14	
				2" PVC 0.010" SCREEN	GRAVEL @ 47.0' 665.24
50		W5			
				55.1' 657.14	gray SILTY CLAY @ 55.5' 656.74
					56.5' 655.74
					END OF BORING

SOILS 56.5 FEET
BEDROCK NONE
TOTAL DEPTH 56.5 FEET
COMMENTS

SEEPAGE WATER ENCOUNTERED, DEPTH 10.0' ELEV. 702.24
WATER LEVEL AT COMPLETION 8.29' ELEV. 703.95
WATER LEVEL ELEV. DATE/TIME
WATER LEVEL ELEV. DATE/TIME
ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BL-3

BORING LOG

BORING NO. W-11B

SHT 1 OF 1

O/A JOB NO. 900-13 PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W DATE START 2-4-91 FINISH 2-4-91

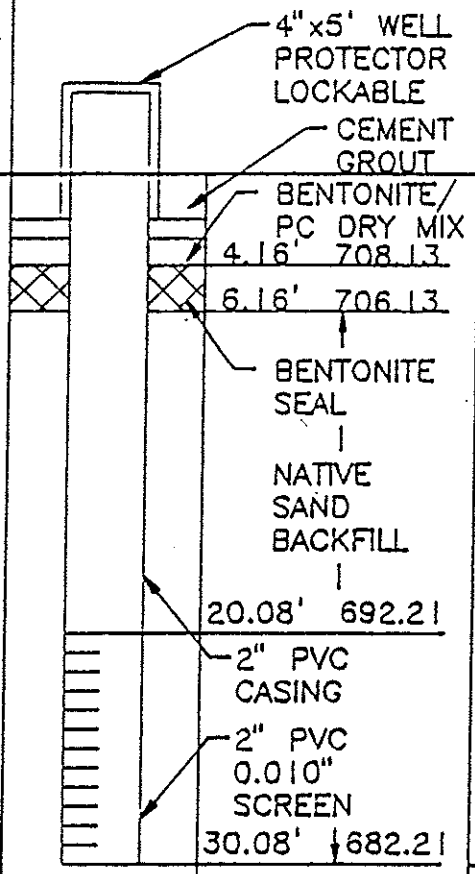
WEATHER CLOUDY, 45° F TOP OF CASING ELEVATION 714.79 FT. MSL

GROUND ELEVATION 712.29 FT. MSL TOTAL DEPTH 30.08 FEET

DRILLED BY BEST ENVIRONMENTAL LOGGED BY PB

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586

AS BUILT MONITORING WELL DETAIL



CASING I.D. 3 3/8"

SPLIT SPOON SIZE 2" I.D.

TYPE HOLLOW STEM AUGER

SOIL & ROCK DESCRIPTION / COMMENTS

GRAVEL, dark brown SILTY CLAY, organic 2.5' 709.79

light brown SAND, fine to medium

changes to brown SAND, fine to medium w/gravel

GRAVEL @ 22.0' 690.29

30.08 682.21

END OF BORING

SOILS 30.08 FEET

BEDROCK NONE

TOTAL DEPTH 30.08 FEET

COMMENTS GROUNDWATER SAMPLING CONDUCTED DURING CONSTRUCTION OF W-11A

SEEPAGE WATER ENCOUNTERED, DEPTH 10.0' ELEV. 702.29

WATER LEVEL AT COMPLETION 8.33' ELEV. 703.96

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BORING LOG

BORING NO. W-12

SHT 1 OF 1

D/A JOB NO. 900-13 PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W DATE START 2-5-91 FINISH 2-5-91

WEATHER CLOUDY, 40° F TOP OF CASING ELEVATION 712.92 FT. MSL

GROUND ELEVATION 713.05 FT. MSL TOTAL DEPTH 29.81 FEET

DRILLED BY BEST ENVIRONMENTAL LOGGED BY PB

CASING I.D. 3 3/8"

SHELBY TUBE SIZE

TYPE HOLLOW STEM AUGER

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586	AS BUILT MONITORING WELL DETAIL	SOIL & ROCK DESCRIPTION / COMMENTS
				8"x1' FLUSH MOUNT BOLT DOWN COVER (SEAL)	
				CEMENT GROUT	
				BENTONITE/ PC DRY MIX	driveway, CONCRETE
				5.0' 708.05	cinders w/fine-coarse brn. SAND
				7.0' 710.05	brown SANDY SILTY CLAY
					gray SILTY CLAY, some coarse sand
10		W1		BENTONITE SEAL	changes to brown SAND, fine to medium
				NATIVE SAND BACKFILL	
20		W2		19.81' 694.21	
				2" PVC CASING	
				2" PVC 0.010" SCREEN	GRAVEL @ 24.0' 689.05
30		W3		29.81' 683.24	29.81' 683.24
					END OF BORING
40					

SOILS 29.81 FEET

BEDROCK NONE

TOTAL DEPTH 29.81 FEET

COMMENTS

SEEPAGE WATER ENCOUNTERED, DEPTH 11.0' ELEV. 702.05

WATER LEVEL AT COMPLETION 8.71' ELEV. 704.34

WATER LEVEL ELEV. DATE/TIME

WATER LEVEL ELEV. DATE/TIME

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

BORING LOG

BORING NO. W-13

SHT 1 OF 1

O/A JOB NO. 900-13

PROJECT UEA / TORRINGTON

LOCATION SOUTH BEND, IN / MW-W

DATE START 2-6-91 FINISH 2-6-91

WEATHER CLOUDY, 40° F

TOP OF CASING ELEVATION 714.01 FT. MSL

GROUND ELEVATION 714.22 FT. MSL

TOTAL DEPTH 57.0 FEET

DRILLED BY BEST ENVIRONMENTAL

LOGGED BY PB

CASING I.D. 3 3/8"

SPLIT SPOON SIZE 2" I.D.

TYPE HOLLOW STEM AUGER

DEPTH IN FEET	SAMPLE NO.	SAMPLE RECOVERY GC/PID SAMPLE NO.	N BLOWS/FT ASTM D-1586	AS BUILT MONITORING WELL DETAIL	SOIL & ROCK DESCRIPTION / COMMENTS
				8"x1' FLUSH MOUNT BOLT DOWN COVER (SEAL)	
				CEMENT GROUT	
				BENTONITE/ PC DRY MIX	1.0' 713.22 floor, CONCRETE
				6.83' 707.39	light brown FILL SAND
				8.83' 705.39	
10		W1			10.0' 704.22
				BENTONITE SEAL	
				NATIVE SAND BACKFILL	brown SAND, fine to medium w/some gravel
20		W2		2" PVC CASING	GRAVEL @ 22.0' 692.22
				25.29' 688.93	
				2" PVC 0.010" SCREEN	
30		W3		35.29' 678.93	
		W4 @ 40'			
50	(53') W-13 SOIL	W5			AUGER CUTTINGS SAMPLE @ 53.0'
					CLAY @ 57.0' NO SAMPLE POSSIBLE
60					END OF BORING 657.22

SOILS 57.0 FEET

BEDROCK NONE

TOTAL DEPTH 57.0 FEET

COMMENTS

SEEPAGE WATER ENCOUNTERED, DEPTH 11.0' ELEV. 703.22

WATER LEVEL AT COMPLETION 9.83' ELEV. 704.39

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

WATER LEVEL ____ ELEV. ____ DATE/TIME ____

ELEVATION MEASURING POINT GROUND SURFACE

DAILY & ASSOCIATES ENGINEERS INC. CHAMPAIGN & PEORIA, ILLINOIS

APPENDIX C

Job No. M11C27

Pipe extends ___ feet above ground level.

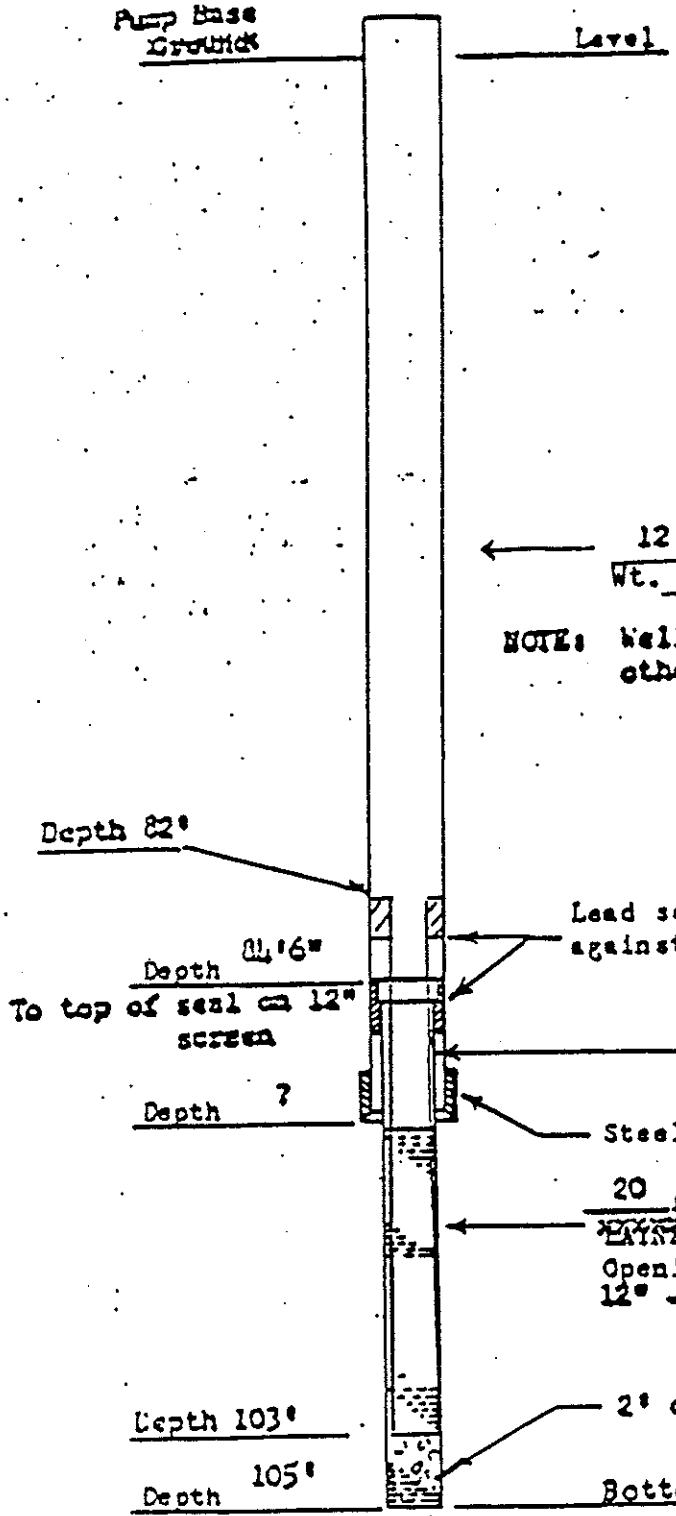
Location from Street or Road

Inside new bldg.

County St. Joseph

Township Portage

Section



Pipe Tally	Welded Threaded
Bottom	
Top	
Total	

Static Level ___

Pumped 328 GPM

at 45' pumping level

after 1 hours

Driller Schoon

Date Finished June 10, 1954

Not drawn to scale
All depths measured from Ground Level

LAYNE TUBULAR WELL No. 3
For
TORRINGTON COMPANY
SOUTH BEND, IND.

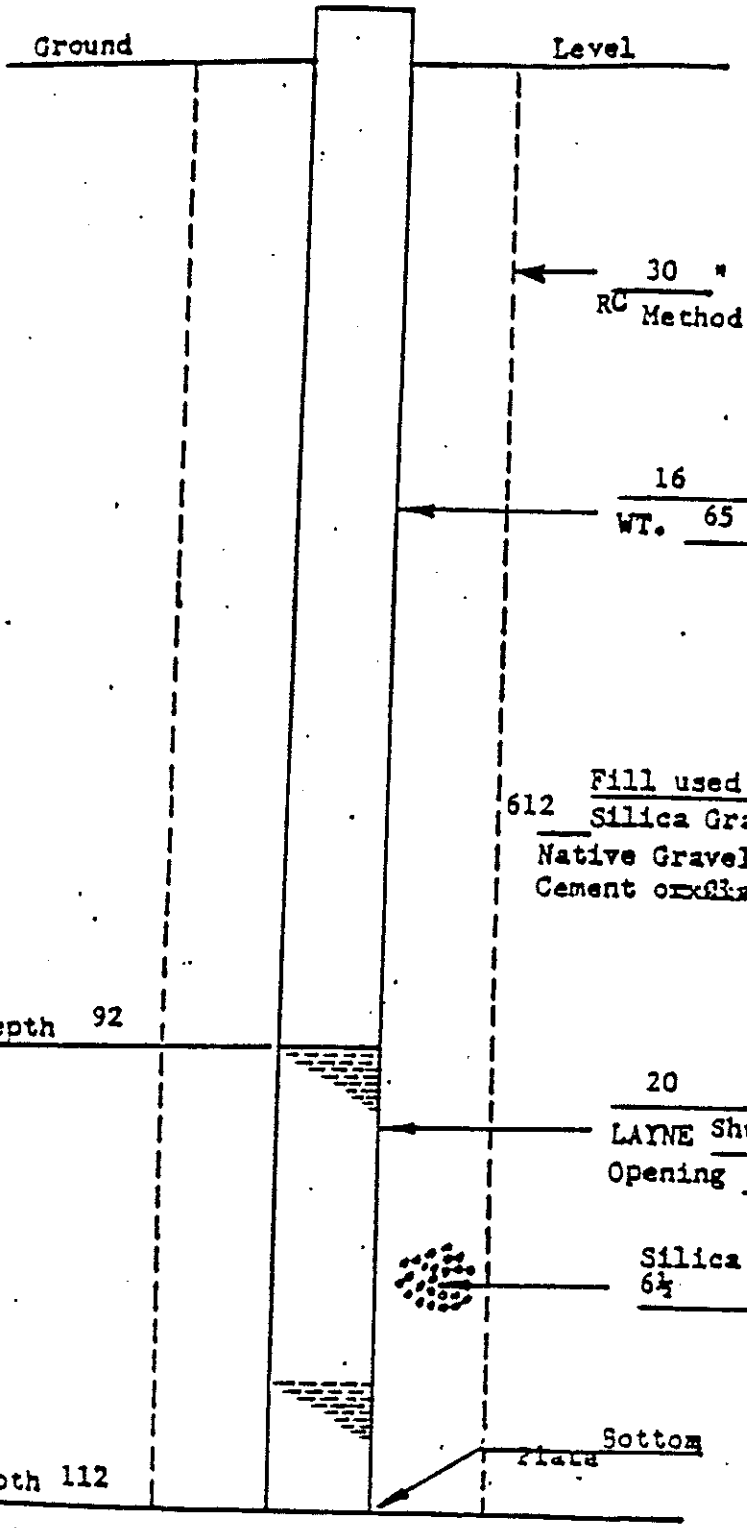
LAYNE NORTHERN CO. INC.
MISHAWAKA, INDIANA

DRAWN BY	DRAWING NO.
APPROVED BY	
DATE	

Pipe extends 1 feet above ground level

Job No. [illegible]

Location:
7 ft. East of Foundry
7 Ft. South of old pump house



Pipe Tally	Welded ~~Threaded~~
Bottom	18'7"
	22' 8"
	21'3"
	19' 3"
	11' 3"
	93'

St. Joseph Co
Portage Twp.

Static Level 13'
Pumped 1034 GPM
at 50 pumping level

Driller George Petz
Date Finished 4/5/65

Not drawn to scale
All depths measured from Ground Level

LAYNE GRAVEL WALL WELL NO. 4
for
TORRINGTON COMPANY
SOUTH BEND, Indiana

LAYNE NORTHERN CO. INC.
MISHAWAKA, INDIANA

DRAWN BY
APPROVED BY
DATE

DRAWING NO.

LAYNE-NORTHERN COMPANY
Incorporated

MISHAWAKA, INDIANA

☐ TEST

☒ PERMANENT

Job No. M11,388

WELL LOG No. 4 CITY South Bend County St. Joseph

Owner Torrington Company Township Portage

Section

State Indiana

Location

From Land Description ft. East and ft. North of SW Corner of Section.

From Street or Road On east side of bldg. approx. 15' SE of abandoned #3 well

FORMATION FOUND — DESCRIBE FULLY	FROM NATURAL GROUND LEVEL			
	Depth to Top of Stratum	Depth to Bottom of Stratum	Thickness of Stratum	Static Water Level
Sandy & gravely fill	0	7	7	
Sand	7	11	24	
Sand & gravel with boulders	11	57	46	
Sandy gravely clay	57	62	5	
Clay	62	78	16	
Dirty Sand & gravel & black silt	78	92	14	
Sand & gravel clean	92	112	20	13'
Stopped in clean sand and gravel				

30 inch diameter hole drilled by ☐ Cable Tool ☒ Rotary ☐ Jetting

Pipe left in hole 93' of 16" pipe

Date Started 3/18/65 Finished 4/5/65 George Petz

INDIANA-MICHIGAN WATER DEVELOPMENT CO.

1912 So. Main St.
SOUTH BEND 23, INDIANA
Phone 3-8231

Log. 943

Well log for Torrington Company, South Bend, Indiana
Sold thru Sollitt Constr. Co.

Location of well North East Corner of New Building
2W. " Old "

Well #3

Date completed 4-17-51

Size or diameter 12"

Finished depth. Surface to bottom of screen 100'

SCREEN

Diameter 12

Length (Exclusive of fittings) 18'

Make and type Johnson Everdur

Opening or slot size 30 Slot

Fittings Standard

Formations encountered

	Grain Analysis
0-17 Dry Sand	
17-19 Hard Pan	80/97
19-33 Coarse gravel	70/65
33-37 Coarse gravel	66/46
37-41 Gravel with Clay balls	64/39
41-44 Clay	60/33
44-56 Fine Sand	58/28
56-75 Clay & Hard Pan	50/23
75-80 Sand & Gravel- Some Clay balls	36/10
80-97 Sand & Gravel	28/16
97-100 Fine Sand (Still in it)	12/12

75'-80' Same as 80'-97' but very dirty.

Total depth penetrated

Static or normal water level ~~from base of structure~~ 13' 15'

PUMPING TEST No test made

Drawdown 35 ft. at 325 GPM.

Tested 8/30 by Roy with Permanent Pump - W.O. 329

Permanent well information, as installed

Appendix B

Analytical Results

ARC
Aspen Research Corporation
Turning Questions into Answers

October 1, 1991

Mr. Bruce Bohnen
Capsule Environmental Engineering, Inc.
1970 Oakcrest Ave.
St. Paul, MN 55113

Reference: Capsule Project—Torrington So. Bend
ARC Project No. 2878, Sampling date—September 10-13, 1991

Dear Mr. Bohnen:

Please find attached results of the requested analysis on the above referenced project.

The analysis was carried out according to EPA Method 8240 from Test Methods for Evaluating Solid Waste, SW846, November 1986, Third Edition. The Minnesota Department of Health 465D compound analyte list was reported.

Thank You for choosing Aspen Research Corporation. We look forward to providing you with continued analytical support and service. As always, we welcome your comments regarding the quality of service you have received. If you have any questions, please feel free to give us a call.

Regards,

Ruth M. Lewis
ASPEN RESEARCH CORPORATION

436 West County Road D
New Brighton, MN 55112-3522

Phone (612) 631-9234
FAX (612) 631-9270

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 10-13, 1991
ARC Project ID: 2878

Sample ID:	C1 2'-4'	W15A 30'-32'	C1 60'-61'	C1 34'-36'	W14B 10'-12'	C1 0'-2'	W14A 2/L	
Analysis Date:	9-20-91	9-20-91	9-20-91	9-20-91	9-20-91	9-20-91	9-20-91	
ARC ID:	11961	11971	11964	11962	11955	11958	11957	PQL
Analyte	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
Dichlorodiflouromethane	ND	ND	ND	ND	ND	ND	ND	1400
Chloromethane	ND	ND	ND	ND	ND	ND	ND	1400
Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	1400
Bromomethane	ND	ND	ND	ND	ND	ND	ND	1400
Chloroethane	ND	ND	ND	ND	ND	ND	ND	1400
Dichloroflouromethane	ND	ND	ND	ND	ND	ND	ND	1400
Trichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	1400
Ethyl Ether	ND	ND	ND	ND	ND	ND	ND	14000
1,1,2-Trichlorotrifluoroethane	ND	ND	ND	ND	ND	ND	ND	1400
Acetone	ND	ND	ND	ND	ND	ND	ND	14000
1,1-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	700
Allyl Chloride	ND	ND	ND	ND	ND	ND	ND	1400
Methylene Chloride	ND	ND	ND	ND	ND	ND	ND	700
Methyl Tertiary Butyl Ether	ND	ND	ND	ND	ND	ND	ND	700
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	700
Methyl Ethyl Ketone	ND	ND	ND	ND	ND	ND	ND	14000
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	700
2,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	700
cis-1,2-Dichloroethene	ND	ND	ND	ND	ND	ND	ND	700
Chloroform	ND	ND	ND	ND	ND	ND	ND	700
Bromochloromethane	ND	ND	ND	ND	ND	ND	ND	700
Tetrahydrofuran	ND	ND	ND	ND	ND	ND	ND	14000
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	700
1,1-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	700
Carbon Tetrachloride	ND	ND	ND	ND	ND	ND	ND	700
1,2-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	700
Benzene	ND	ND	ND	ND	ND	ND	ND	700
Trichloroethene	ND	ND	ND	ND	ND	ND	ND	700
1,2-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	700
Bromodichloromethane	ND	ND	ND	ND	ND	ND	ND	700
Dibromomethane	ND	ND	ND	ND	ND	ND	ND	700
Methyl Isobutyl Ketone	ND	ND	ND	ND	ND	ND	ND	7000
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	700
Toluene	ND	ND	ND	ND	ND	ND	ND	700
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	ND	ND	700
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	ND	ND	700
1,3-Dichloropropane	ND	ND	ND	ND	ND	ND	ND	700
Tetrachloroethene	ND	ND	ND	ND	ND	ND	ND	700
Dibromochloromethane	ND	ND	ND	ND	ND	ND	ND	700
1,2-Dibromoethane	ND	ND	ND	ND	ND	ND	ND	700
Chlorobenzene	ND	ND	ND	ND	ND	ND	ND	700
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	700
Ethylbenzene	ND	ND	ND	ND	ND	ND	ND	700
m,p&o-xylenes	ND	ND	ND	ND	ND	ND	ND	700
Styrene	ND	ND	ND	ND	ND	ND	ND	700
Isopropylbenzene	ND	ND	ND	ND	ND	ND	ND	700
Bromoform	ND	ND	ND	ND	ND	ND	ND	700
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	ND	700
1,2,3-Trichloropropane	ND	ND	ND	ND	ND	ND	ND	700
n-Propyl benzene	ND	ND	ND	ND	ND	ND	ND	700

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 10-13, 1991
ARC Project ID: 2878

Sample ID:	C1 2'-4'	W15A 30'-32'	C1 60'-61'	C1 34'-36'	W14B 10'-12'	C1 0'-2'	W14A 2/L	
Analysis Date:	9-20-91	9-20-91	9-20-91	9-20-91	9-20-91	9-20-91	9-20-91	
ARC ID:	11961	11971	11964	11962	11955	11958	11957	PQL
Analyte	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)	(ug/Kg)
Bromobenzene	ND	ND	ND	ND	ND	ND	ND	700
1,3,5-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	700
2-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	700
4-Chlorotoluene	ND	ND	ND	ND	ND	ND	ND	700
tert-Butyl benzene	ND	ND	ND	ND	ND	ND	ND	700
1,2,4-Trimethylbenzene	ND	ND	ND	ND	ND	ND	ND	700
sec-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	700
p-Isopropyltoluene	ND	ND	ND	ND	ND	ND	ND	700
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	700
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	700
n-Butylbenzene	ND	ND	ND	ND	ND	ND	ND	700
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	700
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	ND	ND	ND	700
1,2,4-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	700
Hexachlorobutadiene	ND	ND	ND	ND	ND	ND	ND	700
Naphthalene	ND	ND	ND	ND	ND	ND	ND	700
1,2,3-Trichlorobenzene	ND	ND	ND	ND	ND	ND	ND	700
Filespec	>A3331	>A3332	>A3335	>A3336	>A3337	>A3338	>A3339	

Key:

ND = Not Detected
PQL = Practical Quantitation Limit (the MDL times a matrix specific multiplier)

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 10-13, 1991
ARC Project ID: 2878

Sample ID:	Trip Blank	Rinsate	Soil Blank	Lab Blank	PQL
Analysis Date:	9-19-91	9-19-91			
ARC ID:	11966	11968			
Analyte	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Dichlorodiflouromethane	ND	ND	ND	ND	10
Chloromethane	ND	ND	ND	ND	10
Vinyl Chloride	ND	ND	ND	ND	10
Bromomethane	ND	ND	ND	ND	10
Chloroethane	ND	ND	ND	ND	10
Dichloroflouromethane	ND	ND	ND	ND	10
Trichlorofluoromethane	ND	ND	ND	ND	10
Ethyl Ether	ND	ND	ND	ND	100
1,1,2-Trichlorotrifluoroethane	ND	ND	ND	ND	10
Acetone	ND	ND	ND	ND	100
1,1-Dichloroethene	ND	ND	ND	ND	5
Allyl Chloride	ND	ND	ND	ND	10
Methylene Chloride	ND	ND	ND	ND	5
Methyl Tertiary Butyl Ether	ND	ND	ND	ND	5
trans-1,2-Dichloroethene	ND	ND	ND	ND	5
Methyl Ethyl Ketone	ND	ND	ND	ND	100
1,1-Dichloroethane	ND	ND	ND	ND	5
2,2-Dichloropropane	ND	ND	ND	ND	5
cis-1,2-Dichloroethene	ND	ND	ND	ND	5
Chloroform	ND	ND	ND	ND	5
Bromochloromethane	ND	ND	ND	ND	5
Tetrahydrofuran	ND	ND	ND	ND	100
1,1,1-Trichloroethane	ND	ND	ND	ND	5
1,1-Dichloropropene	ND	ND	ND	ND	5
Carbon Tetrachloride	ND	ND	ND	ND	5
1,2-Dichloroethane	ND	ND	ND	ND	5
Benzene	ND	ND	ND	ND	5
Trichloroethene	ND	ND	ND	ND	5
1,2-Dichloropropane	ND	ND	ND	ND	5
Bromodichloromethane	ND	ND	ND	ND	5
Dibromomethane	ND	ND	ND	ND	5
Methyl Isobutyl Ketone	ND	ND	ND	ND	50
cis-1,3-Dichloropropene	ND	ND	ND	ND	5
Toluene	ND	ND	ND	ND	5
trans-1,3-Dichloropropene	ND	ND	ND	ND	5
1,1,2-Trichloroethane	ND	ND	ND	ND	5
1,3-Dichloropropane	ND	ND	ND	ND	5
Tetrachloroethene	ND	ND	ND	ND	5
Dibromochloromethane	ND	ND	ND	ND	5
1,2-Dibromoethane	ND	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	ND	5
1,1,1,2-Tetrachloroethane	ND	ND	ND	ND	5
Ethylbenzene	ND	ND	ND	ND	5
m,p&o-xylenes	ND	ND	ND	ND	5
Styrene	ND	ND	ND	ND	5
Isopropylbenzene	ND	ND	ND	ND	5
Bromoform	ND	ND	ND	ND	5
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	5
1,2,3-Trichloropropane	ND	ND	ND	ND	5
n-Propyl benzene	ND	ND	ND	ND	5

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 10-13, 1991
ARC Project ID: 2878

Sample ID:	Trip Blank	Rinsate	Soil Blank	Lab Blank	PQL
Analysis Date:	9-19-91	9-19-91			
ARC ID:	11966	11968			
Analyte	(ug/L)	(ug/L)	(ug/L)	(ug/L)	(ug/L)
Bromobenzene	ND	ND	ND	ND	5
1,3,5-Trimethylbenzene	ND	ND	ND	ND	5
2-Chlorotoluene	ND	ND	ND	ND	5
4-Chlorotoluene	ND	ND	ND	ND	5
tert-Butyl benzene	ND	ND	ND	ND	5
1,2,4-Trimethylbenzene	ND	ND	ND	ND	5
sec-Butylbenzene	ND	ND	ND	ND	5
p-Isopropyltoluene	ND	ND	ND	ND	5
1,3-Dichlorobenzene	ND	ND	ND	ND	5
1,4-Dichlorobenzene	ND	ND	ND	ND	5
n-Butylbenzene	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	5
1,2-Dibromo-3-Chloropropane	ND	ND	ND	ND	5
1,2,4-Trichlorobenzene	ND	ND	ND	ND	5
Hexachlorobutadiene	ND	ND	ND	ND	5
Naphthalene	ND	ND	ND	ND	5
1,2,3-Trichlorobenzene	ND	ND	ND	ND	5
Filespec	>A3324	>A3326	>A3323	>A3333	

Key:

ND = Not Detected
PQL = Practical Quantitation Limit (the MDL times a matrix specific multiplier)

ARC
Aspen Research Corporation

436 West County Road D
New Brighton, MN 55112-3522

Phone (612) 631-9234
FAX (612) 631-9270

CHAIN OF CUSTODY RECORD

PN 2878

№ 2435

COMPANY: Capsil	PROJECT TITLE:
ADDRESS:	PROJECT NUMBER: PN# 72880 P.O.# C2571
CITY, STATE, ZIP:	CONTACT: Susan Price PHONE: ( )

ITEM	SAMPLE NUMBER	SAMPLE DESCRIPTION	TYPE / PRESERVATIVE (SEE BELOW) WATER	SOIL	GRAB	COMP	PRES	DATE / TIME COLLECTED	BY	# OF BOTTLES	ANALYSIS (SEE BELOW)	ARC NUMBER (LEAVE BLANK)
1.		Trip Blank VOA	J					9-6-91	TJJ	3		
2.		Rinsate 1 Liter	J					9-6-91	TJJ	1		
3.												
4.												
5.												
6.												
7.												
8.												
9.												
10.												

SAMPLING / RECEIPT COMMENTS	BY

PRESERVATIVE	
FILTERED:	F
CHILLED:	C
ACID:	A
BASE:	B
NONE:	N

ANALYSIS

BTX, TPH
BTEX, TPH
EPA 8270 / 625
EPA 3820
EPA 8010 / 601
EPA 8020 / 602
EPA 8040 / 604
EPA 8060 / 606
EPA 8080 / 608
EPA 8100 / 610
EPA 8120 / 612
EPA 8140 / 614
EPA 8150 / 615
EPA 8240 / 624
EPA 1310
EPA 3020
OTHER: PLEASE SUMMARIZE ABOVE

TRANS #	ITEMS	RELINQUISHED BY NAME / COMPANY	ACCEPTED BY NAME / COMPANY	DATE	TIME	MODE OF TRANSPORTATION
1.	1-2	Tim Jones/Capsil		9-6-91	5:00	Fed Express
2.		FED EXP	Sig Fed	9/10/91	5:00	Fed Exp
3.						
4.						
5.						

WHITE - SAMPLES CANARY - ORIGINATOR PINK - FILE

ARC
Aspen Research Corporation
436 West County Road D
New Brighton, MN 55112-3522
Phone (612) 631-9234
FAX (612) 631-9270

CHAIN OF CUSTODY RECORD

No 2430

DN 2878

COMPANY: CAPSOLE	PROJECT TITLE: TORRINGTON, SO. BEND
ADDRESS:	PROJECT NUMBER: JN# 72550 A.F. # C2571
CITY, STATE, ZIP	CONTACT: Bruce Bohmen PHONE: (612) 638 2644

	SAMPLE I.D.	SOURCE	TYPE / PRESERVATIVE					DATE / TIME COLLECTED	BY	# OF CONTAINERS	ANALYSIS REQUIRED BELOW	LAB NUMBER (LAB USE ONLY)
1.	W14B 10-12	SOIL		X	X			9/10/91 6:04pm	SGP	2	See	595 RMK Bruce 400
2.	W14A 2/C	@ 35' SOIL CUTTINGS		X		X		9/11/91 5:26pm	SGP	2		
3.	C1 0-2	SOIL		X	X			9/12/91 2:22pm	SGP	2		
4.	C1 2-4	SOIL		X	X			9/12/91 3:00pm	SGP	2		
5.	C1 34-36	SOIL		X	X			9/12/91 5:00pm	SGP	2		
6.	C1 60-61	SOIL		X	X			9/13/91 8:05am	SGP	2		
7.	Trip Blank	VOA	X					9/6/91	TJO	2		
8.	Rinsate	Split spoon	X		X			9/13/91	TJO	2		594-RMK
9.	W15A 30-32	SOIL		X	X			9/13/91 4:45	SGP	2		
10.												

REMARKS	BY
ITEMS #3 and 4 2nd jar ½ full, low sample recovery w/ split spoon	SGP

PRESERVATIVE CODE
FILTERED: F
CHILLED: C
ACID: A
BASE: B
NONE: N

ANALYSIS CODE
BTX, TPH
BTEX, TPH
EPA 8270 / 625
EPA 3820
EPA 8010 / 601
EPA 8020 / 602
EPA 8040 / 604
EPA 8060 / 606
EPA 8080 / 608
EPA 8100 / 610
EPA 8120 / 612
EPA 8140 / 614
EPA 8150 / 615
EPA 8240 / 624
EPA 1310
EPA 3020
OTHER: PLEASE SUMMARIZE ABOVE

ITEM	QTY	RELINQUISHED BY / AFFILIATION	RECEIVED BY / AFFILIATION	DATE	TIME	MODE OF TRANSPORTATION
1.	1-6	SG Price/Capsole	FED Exp	9/13/91	5:00	FED EXP
2.						
3.						
4.						
5.						

WHITE - SAMPLES CANARY - ORIGINATOR PINK - FILE

ARC
Aspen Research Corporation
Turning Questions into Answers

September 20, 1991

Mr. Bruce Bohnen
Capsule Environmental
1970 Oakcrest Avenue, Suite 215
St. Paul, MN. 55113

REFERENCE: ARC Project No.: 2883
Project Title: Torrington S. Bend
Sample No.: 11976-11986
Capsule PO#: C2571
Capsule PN#: 72880

Dear Mr. Bohnen:

We have completed the requested analysis on the above referenced project. Enclosed you will find a summary of the results obtained. The samples analyzed are identified on the following pages.

The samples below were analyzed as described in Test Methods for Evaluating Solid Wastes, SW-846, 3rd Edition:

Parameter	Test Method
Cadmium	ICP (EPA Method 6010)
Chromium	ICP (EPA Method 6010)
Copper	ICP (EPA Method 6010)
Lead	ICP (EPA Method 6010)
Nickel	ICP (EPA Method 6010)
Arsenic	ICP (EPA Method 6010)
Selenium	ICP (EPA Method 6010)
Mercury	CVAA (EPA Method 7470)
Cyanide	EPA Method 9010
MDoH Method 465D	EPA Method 8240

Thank you for selecting Aspen Research Corporation. We look forward to providing you with continued analytical support and service. As always, we welcome your comments regarding the quality of service you have received. If you have any questions or comments, or if we can be of further service please do not hesitate to call.

Regards,

ASPEN RESEARCH CORPORATION

Jerry D. Olson

Jerry D Olson
Chemist

436 West County Road D
New Brighton, MN 55112-3522

Phone (612) 631-9234
FAX (612) 631-9270

Results of Analysis for
Metals

Project ID: Capsule
Project Title: Torrington S. Bend
Capsule Project #: 72880
Capsule PO#: C 2571
Sampling Date: September 15, 1991
Received Date: September 16, 1991
ARC Project ID: 2883

	ARC Number	11976	
	Sample ID	Pond 4 Soil 2-4'	PQL
		mg/Kg	mg/Kg
Arsenic		14	0.78
Cadmium		7.1	0.12
Chromium		56	0.24
Copper		1000	0.52
Lead		220	1.7
Mercury		0.64	0.03
Nickel		49	0.44
Selenium		BPQL	4

Key:
PQL = Practical Quantitation Limit
BPQL = Below Practical Quantitation Limit
As, Cd, Cr, Cu, Pb, Ni, and Se are analyzed by ICP (EPA Method 6010)
Hg was analyzed by CVAA (EPA Method 7470)

Results of Analysis for
Cyanide
(EPA Method 9010)

Project ID: Capsule
Project Title: Torrington S. Bend
Capsule Project #: 72880
Capsule PO#: C 2571
Sampling Date: September 15, 1991
Received Date: September 16, 1991
ARC Project ID: 2883

ARC Number	11976		
Sample ID	Pond 4 Soil 2-4'	Blank	PQL
	mg/Kg	mg/Kg	mg/Kg
Cyanide	0.78	BPQL	0.1

Key:
PQL = Practical Quantitation Limit
BPQL = Below Practical Quantitation Limit

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 15, 1991
ARC Project ID: 2883

Sample ID:	PD 4-1 2'-4'	
Analysis Date:	9-16-91	
ARC ID:	11977	PQL
Analyte	(ug/Kg)	(ug/Kg)
Dichlorodifluoromethane	ND	1400
Chloromethane	ND	1400
Vinyl Chloride	ND	1400
Bromomethane	ND	1400
Chloroethane	ND	1400
Dichlorofluoromethane	ND	1400
Trichlorofluoromethane	ND	1400
Ethyl Ether	ND	14000
1,1,2-Trichlorotrifluoroethane	ND	1400
Acetone	ND	14000
1,1-Dichloroethene	ND	700
Allyl Chloride	ND	1400
Methylene Chloride	ND	700
Methyl Tertiary Butyl Ether	ND	700
trans-1,2-Dichloroethene	ND	700
Methyl Ethyl Ketone	ND	14000
1,1-Dichloroethane	ND	700
2,2-Dichloropropane	ND	700
cis-1,2-Dichloroethene	ND	700
Chloroform	ND	700
Bromochloromethane	ND	700
Tetrahydrofuran	ND	14000
1,1,1-Trichloroethane	ND	700
1,1-Dichloropropene	ND	700
Carbon Tetrachloride	ND	700
1,2-Dichloroethane	ND	700
Benzene	ND	700
Trichloroethene	ND	700
1,2-Dichloropropane	ND	700
Bromodichloromethane	ND	700
Dibromomethane	ND	700
Methyl Isobutyl Ketone	ND	7000
cis-1,3-Dichloropropene	ND	700
Toluene	ND	700
trans-1,3-Dichloropropene	ND	700
1,1,2-Trichloroethane	ND	700
1,3-Dichloropropane	ND	700
Tetrachloroethene	ND	700
Dibromochloromethane	ND	700
1,2-Dibromoethane	ND	700
Chlorobenzene	ND	700
1,1,1,2-Tetrachloroethane	ND	700
Ethylbenzene	ND	700
m,p&o-xylenes	ND	700
Styrene	ND	700
Isopropylbenzene	ND	700
Bromoform	ND	700
1,1,2,2-Tetrachloroethane	ND	700
1,2,3-Trichloropropane	ND	700
n-Propyl benzene	ND	700

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 15, 1991
ARC Project ID: 2883

Sample ID:	PD 4-1 2'-4'	
Analysis Date:	9-16-91	
ARC ID:	11977	PQL
Analyte	(ug/Kg)	(ug/Kg)
Bromobenzene	ND	700
1,3,5-Trimethylbenzene	ND	700
2-Chlorotoluene	ND	700
4-Chlorotoluene	ND	700
tert-Butyl benzene	ND	700
1,2,4-Trimethylbenzene	ND	700
sec-Butylbenzene	ND	700
p-Isopropyltoluene	ND	700
1,3-Dichlorobenzene	ND	700
1,4-Dichlorobenzene	ND	700
n-Butylbenzene	ND	700
1,2-Dichlorobenzene	ND	700
1,2-Dibromo-3-Chloropropane	ND	700
1,2,4-Trichlorobenzene	ND	700
Hexachlorobutadiene	ND	700
Naphthalene	ND	700
1,2,3-Trichlorobenzene	ND	700
Filespec	>A3313	

Key:

ND = Not Detected
PQL = Practical Quantitation Limit (the MDL times a matrix specific multiplier)

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 15, 1991
ARC Project ID: 2883

Sample ID:	Lab Blank	PQL
Analyte	(ug/L)	(ug/L)
Dichlorodifluoromethane	ND	10
Chloromethane	ND	10
Vinyl Chloride	ND	10
Bromomethane	ND	10
Chloroethane	ND	10
Dichlorofluoromethane	ND	10
Trichlorofluoromethane	ND	10
Ethyl Ether	ND	100
1,1,2-Trichlorotrifluoroethane	ND	10
Acetone	ND	100
1,1-Dichloroethene	ND	5
Allyl Chloride	ND	10
Methylene Chloride	ND	5
Methyl Tertiary Butyl Ether	ND	5
trans-1,2-Dichloroethene	ND	5
Methyl Ethyl Ketone	ND	100
1,1-Dichloroethane	ND	5
2,2-Dichloropropane	ND	5
cis-1,2-Dichloroethene	ND	5
Chloroform	ND	5
Bromochloromethane	ND	5
Tetrahydrofuran	ND	100
1,1,1-Trichloroethane	ND	5
1,1-Dichloropropene	ND	5
Carbon Tetrachloride	ND	5
1,2-Dichloroethane	ND	5
Benzene	ND	5
Trichloroethene	ND	5
1,2-Dichloropropane	ND	5
Bromodichloromethane	ND	5
Dibromomethane	ND	5
Methyl Isobutyl Ketone	ND	50
cis-1,3-Dichloropropene	ND	5
Toluene	ND	5
trans-1,3-Dichloropropene	ND	5
1,1,2-Trichloroethane	ND	5
1,3-Dichloropropane	ND	5
Tetrachloroethene	ND	5
Dibromochloromethane	ND	5
1,2-Dibromoethane	ND	5
Chlorobenzene	ND	5
1,1,1,2-Tetrachloroethane	ND	5
Ethylbenzene	ND	5
m,p&o-xylenes	ND	5
Styrene	ND	5
Isopropylbenzene	ND	5
Bromoform	ND	5
1,1,2,2-Tetrachloroethane	ND	5
1,2,3-Trichloropropane	ND	5
n-Propyl benzene	ND	5

Analytical Results for MDoH Method 465 (Rev. D) Compound List
by EPA Method 8240

Capsule Project ID: Torrington So. Bend
Sampling Date: September 15, 1991
ARC Project ID: 2883

Sample ID:	Lab Blank	PQL
Analyte	(ug/L)	(ug/L)
Bromobenzene	ND	5
1,3,5-Trimethylbenzene	ND	5
2-Chlorotoluene	ND	5
4-Chlorotoluene	ND	5
tert-Butyl benzene	ND	5
1,2,4-Trimethylbenzene	ND	5
sec-Butylbenzene	ND	5
p-Isopropyltoluene	ND	5
1,3-Dichlorobenzene	ND	5
1,4-Dichlorobenzene	ND	5
n-Butylbenzene	ND	5
1,2-Dichlorobenzene	ND	5
1,2-Dibromo-3-Chloropropane	ND	5
1,2,4-Trichlorobenzene	ND	5
Hexachlorobutadiene	ND	5
Naphthalene	ND	5
1,2,3-Trichlorobenzene	ND	5
Filespec	>A3307	

Key:

ND = Not Detected
PQL = Practical Quantitation Limit (the MDL times a matrix specific mulitiplier)

ARC
Aspen Research Corporation
Turning Questions into Answers

October 1, 1991

Mr. Bruce Bohnen
Capsule Environmental Engineering
1970 Oakcrest Ave.
St. Paul, MN 55113

Reference: Capsule Project: Torrington Facility
ARC Project No. 3050
Sampling date: September 23, 1991

Dear Mr. Bohnen:

Please find attached results of the requested analysis on the above referenced project.

The analysis for volatile organics were carried out according to EPA Method 8240 from Test Methods for Evaluating Solid Waste, SW846, November 1986, Third Edition.

Thank You for choosing Aspen Research Corporation. We look forward to providing you with continued analytical support and service. As always, we welcome your comments regarding the quality of service you have received. If you have any questions, please feel free to give us a call.

Regards,

Ruth M. Lewis
ASPEN RESEARCH CORPORATION

436 West County Road D
New Brighton, MN 55112-3522

Phone (612) 631-9234
FAX (612) 631-9270

Analysis of Volatile Organics by EPA Method 8240
SW-846 3rd Edition

Capsule Project ID: Torrington Facility
Sampling Date: September 23, 1991
ARC Project ID: 3050

Sample ID:	W 14A	W 14B	W15A	W15B	Lab Blank	PQL
ARC Number:	13217	13220	13210	13213		
Analyte	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Chloromethane	ND	ND	ND	ND	ND	10
Vinyl chloride	ND	ND	ND	ND	ND	10
Bromomethane	ND	ND	ND	ND	ND	10
Chloroethane	ND	ND	ND	ND	ND	10
Trichlorofluoromethane	ND	ND	ND	ND	ND	10
Acetone	ND	ND	ND	ND	ND	100
1,1-Dichloroethene	38	ND	ND	ND	ND	5
Methylene chloride	ND	ND	ND	ND	5.7	5
Carbon disulfide	ND	ND	ND	ND	ND	5
Acrylonitrile	ND	ND	ND	ND	ND	5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	5
1,1-Dichloroethane	45	ND	ND	ND	ND	5
Chloroform	ND	ND	ND	ND	ND	5
1,2-Dichloroethane	ND	ND	ND	ND	ND	5
2-Butanone	ND	ND	ND	ND	ND	100
Vinyl acetate	ND	ND	ND	ND	ND	50
1,1,1-Trichloroethane	31	ND	ND	ND	ND	5
Carbon tetrachloride	ND	ND	ND	ND	ND	5
Benzene	ND	ND	ND	ND	ND	5
Trichloroethene	5.4	ND	ND	ND	ND	5
1,2-Dichloropropane	ND	ND	ND	ND	ND	5
Bromodichloromethane	ND	ND	ND	ND	ND	5
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	10
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	5
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	5
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	5
Tetrachloroethene	ND	ND	ND	ND	ND	5
Dibromochloromethane	ND	ND	ND	ND	ND	5
Bromoform	ND	ND	ND	ND	ND	5
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	50
2-Hexanone	ND	ND	ND	ND	ND	50
Toluene	ND	ND	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	ND	ND	5
Ethyl benzene	ND	ND	ND	ND	ND	5
m,p-Xylenes	ND	ND	ND	ND	ND	5
o-Xylene	ND	ND	ND	ND	ND	5
Styrene	ND	ND	ND	ND	ND	5
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	5
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	5
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	5
Filespec	>A3361	>A3362	>A3363	>A3364	>A3352	

Key:
ND = Not Detected
PQL = Practical Quantitation Limit

Analysis of Volatile Organics by EPA Method 8240
SW-846 3rd Edition

Capsule Project ID: Torrington Facility
Sampling Date: September 23, 1991
ARC Project ID: 3050

Sample ID:	Trip Blank	Trip Blank	Equip Blank	Field Blank	Lab Blank	PQL
ARC Number:	13206	13207	13227	13204		
Analyte	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Chloromethane	ND	ND	ND	ND	ND	10
Vinyl chloride	ND	ND	ND	ND	ND	10
Bromomethane	ND	ND	ND	ND	ND	10
Chloroethane	ND	ND	ND	ND	ND	10
Trichlorofluoromethane	ND	ND	ND	ND	ND	10
Acetone	ND	ND	ND	ND	ND	100
1,1-Dichloroethene	ND	ND	ND	ND	ND	5
Methylene chloride	ND	ND	ND	ND	5.7	5
Carbon disulfide	ND	ND	ND	ND	ND	5
Acrylonitrile	ND	ND	ND	ND	ND	5
trans-1,2-Dichloroethene	ND	ND	ND	ND	ND	5
1,1-Dichloroethane	ND	ND	ND	ND	ND	5
Chloroform	ND	ND	ND	ND	ND	5
1,2-Dichloroethane	ND	ND	ND	ND	ND	5
2-Butanone	ND	ND	ND	ND	ND	100
Vinyl acetate	ND	ND	ND	ND	ND	50
1,1,1-Trichloroethane	ND	ND	ND	ND	ND	5
Carbon tetrachloride	ND	ND	ND	ND	ND	5
Benzene	ND	ND	ND	ND	ND	5
Trichloroethene	ND	ND	ND	ND	ND	5
1,2-Dichloropropane	ND	ND	ND	ND	ND	5
Bromodichloromethane	ND	ND	ND	ND	ND	5
2-Chloroethyl vinyl ether	ND	ND	ND	ND	ND	10
cis-1,3-Dichloropropene	ND	ND	ND	ND	ND	5
trans-1,3-Dichloropropene	ND	ND	ND	ND	ND	5
1,1,2-Trichloroethane	ND	ND	ND	ND	ND	5
Tetrachloroethene	ND	ND	ND	ND	ND	5
Dibromochloromethane	ND	ND	ND	ND	ND	5
Bromoform	ND	ND	ND	ND	ND	5
4-Methyl-2-pentanone	ND	ND	ND	ND	ND	50
2-Hexanone	ND	ND	ND	ND	ND	50
Toluene	ND	ND	ND	ND	ND	5
Chlorobenzene	ND	ND	ND	ND	ND	5
Ethyl benzene	ND	ND	ND	ND	ND	5
m,p-Xylenes	ND	ND	ND	ND	ND	5
o-Xylene	ND	ND	ND	ND	ND	5
Styrene	ND	ND	ND	ND	ND	5
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	5
1,3-Dichlorobenzene	ND	ND	ND	ND	ND	5
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	5
1,2-Dichlorobenzene	ND	ND	ND	ND	ND	5
Filespec	>A3354	>A3355	>A3356	>A3357	>A3352	

Key:
ND = Not Detected
PQL = Practical Quantitation Limit

ARC
Aspen Research Corporation

PN 3050

CHAIN OF CUSTODY RECORD

№ 2463

per Bruce Conner 9-24-91

PO# C2571 PN 7268C

436 West County Road D
New Brighton, MN 55112-3522
Phone (612) 631-9234
FAX (612) 631-9270

COMPANY	PROJECT TITLE
Canonie	TORRINGTON FACILITY
ADDRESS: 800 CANONIE DRIVE	PROJECT NUMBER: 91-450-01
CITY, STATE, ZIP: PORTER, IN 46304	CONTACT: Paul Lamberti PHONE: (219) 926-8651

ITEM	SAMPLE NUMBER	SAMPLE DESCRIPTION	TYPE / PRESERVATIVE (SEE BELOW) WATER	SOIL	GRAB	COMP	PRES	DATE / TIME COLLECTED	BY	# OF BOTTLES	ANALYSIS (SEE BELOW)	ARC NUMBER (LEAVE BLANK)
1.		Field Blank	✓					9-17-91	TJS	2	EPA 8240/624	328 KM
2.		Trip Blank	✓					9-17-91	TJS	1		
3.		TRIP BLANK	✓					9-6-91	TJV	1		
4.	W-15A	GROUND WATER	✓					9-23-91 10:30AM		4		
5.	W-15B	"						9-23-91 10:00AM		4		
6.	W-14A	"						9-23-91 1:00 PM		4		
7.	W-14B	"						9-23-91 4:00PM		4		
8.		EQUIPMENT BLANK	✓					9-23-91 4:15PM		4		
9.												
10.												

SAMPLING / RECEIPT COMMENTS	BY
SAMPLES TO BE ANALYZED	
FOR VOLATILE ORGANICS	
(VOAs) BY EPA 8240/624.	

PRESERVATIVE	
FILTERED:	F
CHILLED:	C
ACID:	A
BASE:	B
NONE:	N

ANALYSIS
BTX, TPH
BTEX, TPH
EPA 8270 / 625
EPA 3820
EPA 8010 / 601
EPA 8020 / 602
EPA 8040 / 604
EPA 8060 / 606
EPA 8080 / 608
EPA 8100 / 610
EPA 8120 / 612
EPA 8140 / 614
EPA 8150 / 615
EPA 8240 / 624
EPA 1310
EPA 3020
OTHER: PLEASE SUMMARIZE ABOVE

TRANS #	ITEMS	RELINQUISHED BY NAME / COMPANY	ACCEPTED BY NAME / COMPANY	DATE	TIME	MODE OF TRANSPORTATION
1.	1-1	Tim J Conner/Arc	"	9-17-91	4:30	Fed. Express
2.			CANONIE	9-18-91	11:00AM	"
3.	3-8	CANONIE		9-23-91	6:00 PM	Fed. Express
4.			Beth Braunschweig 9/24/91			
5.						

WHITE - SAMPLES CANARY - ORIGINATOR PINK - FILE

ARC
Aspen Research Corporation
Turning Questions into Answers

October 2, 1991

Bruce Bohnen
Capsule Environmental
1970 Oakcrest Avenue
St. Paul, MN 55359

Reference: Project: Torrington S. Bend
ARC Project #: 2883
Date Sampled: September 15, 1991

Dear Mr. Bohnen:

The enclosed TPH results were not included in the letter sent to you on September 20, 1991. Please add these results to that file.

The determination of TPH was accomplished by extraction with carbon disulfide and analysis by on column injection with high resolution gas chromatography using flame ionization detection.

Thank you for using Aspen Research Corporation. We look forward to providing you with continued analytical service and support. As always, if you have questions or comments, or we can be of further assistance, please don't hesitate to call.

Respectfully,

Robert Miller
Associate Chemist
ASPEN RESEARCH CORPORATION

436 West County Road D
New Brighton, MN 55112-3522

Phone (612) 631-9234
FAX (612) 631-9270

Analysis of Total Petroleum Hydrocarbons

Capsule Project ID: Torrington So. Bend
ARC Project ID: 2883
Sampling Date: September 15, 1991
Analysis Date: September 17, 1991

Sample ID	ARC#	TPH (mg/kg)	File Spec. A0000014.-	Product ID
PD4-1 2'-4'	11976	39000***	39	High Molecular Weight Hydrocarbon Material
Method Blank		BPQL	40	**See Below

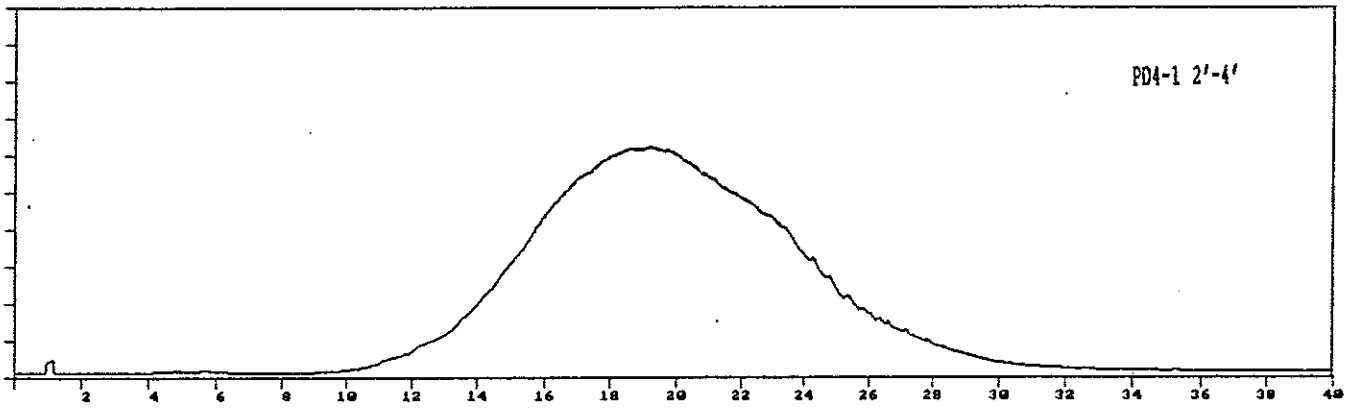
PQL Fuel #6 20 mg/kg

ND = Not Detected
PQL = Practical Quantitation Limit
BPQL = Below Practical Quanitation Limit (the compound was detected at a concentration above the MDL but below the PQL)

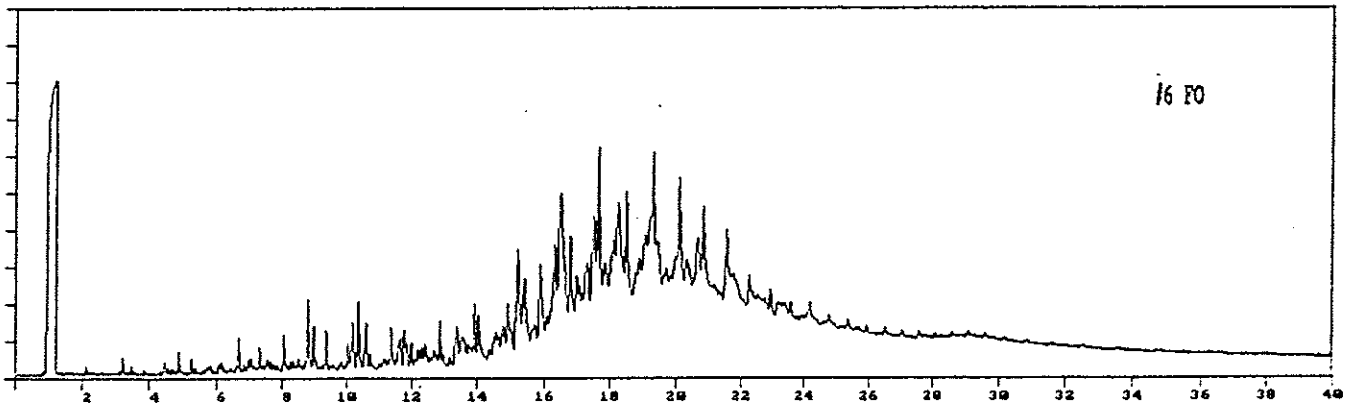
**Solvent blank and sample contained solvent residual which were subtracted out before quantitation

***The sample was more similar in nature to a refined oil than a fuel oil. However, since product was not availible the sample was quantitated against the fuel #6 calibration due to similar elution times. Due to the high level of product in the sample results are outside the calibration range for fuel #6.

File=D:\cp\df\A0000014.40R from 0.00 to 40.00 min. Low Y = -7.50508 mv High Y = 638.88898 mv Span = 646.39404m



File=D:\cp\df\A0000014.48R from 0.00 to 40.00 min. Low Y = 0.33804 mv High Y = 28.41284 mv Span = 28.07480m



Appendix C

Monitoring Well Sampling

CanonieEnvironmental

Canonie Environmental Services Corp.
800 Canonie Drive
Porter, Indiana 46304
Phone: 219-926-8651
Fax: 219-926-7169

September 26, 1991

91-450-01

Mr. Bruce Bohnen
Capsule Environmental
1970 Oak Crest Avenue
Suite 215
St. Paul, MN 55113

Letter Report
Ground Water Sampling
Former Torrington Facility
South Bend, Indiana

Dear Mr. Bohnen:

This letter report, prepared by Canonie Environmental Services Corp. (Canonie), details the field activities associated with ground water sampling at the former Torrington Facility in South Bend, Indiana.

Canonie collected ground water samples from four newly installed ground water monitoring wells (W-14A, W-14B, W-15A, and W-15B) on September 23, 1991. Samples were submitted to Aspen Research Corporation (ARC) for volatile organics analysis (VOA). A discussion of the field sampling procedures is presented below.

Ground Water Sampling

Prior to sampling, all four wells were purged of at least three volumes or until pH, temperature, and specific conductance were stabilized. The volume of water standing in the well (one well volume) was calculated by using the following equation:

$$V=\Pi x(\frac{D}{2})^2 xH$$

Where: V = Volume of water in the well (one well volume)(ft^3)
D = Inside diameter of well (ft)
H = Height of water column in the well (ft) = Depth to bottom of the well minus depth to the water table

Monitoring Wells W-15A, W-15B, and W-14A, which are two-inch-diameter wells, were purged with a high-density polyethelene (HDPE) bailer, while Well W-14B, which is a four-inch-diameter well, was purged with a submersible pump. The purge water from the wells were discharged directly to the ground surface at least 15 feet from the well locations. Ground water samples from the four monitoring wells were recovered for VOA with a dedicated HDPE disposable bailer. A copy of the field sample data logs for each well is attached with to this report. Throughout the sampling activities, a flame-ionizing organic vapor analyzer (OVA) was used to monitor any organics in the breathing zone.

In addition to well samples, an equipment blank was collected at each well by rinsing the dedicated bailers and the submersible pump with distilled water purchased locally. All samples, including equipment and trip blanks, were placed in a cooler, packed in ice, and shipped via Federal Express to ARC for VOAs (U.S. Environmental Protection Agency 8240/624) analysis. A copy of the completed chain-of-custody form and the Federal Express shipping bill are attached with the report.

Canonie appreciates the opportunity to provide professional services to Capsule Environmental. If you have any questions concerning this report or if you need additional information, please call me.

Very truly yours,

Paul W. Lambert

Paul W. Lambert, CPG
Project Manager

PWL/tl

Attachments

Canonie Environmental

FIELD SAMPLE DATA

PROJECT No. 91-450-01

FIELD ENGINEER RS / DGB

PAGE 1 OF 1

PROJECT NAME Former Torrington Facility DATE 9/23/91

FIELD DATA:

WELL SAMPLED W-14B (4" Dia Well)

Depth of well from TOP OF CASING ELEVATION 61.04 Ft

DEPTH TO GROUND WATER FROM T.O.C., FT. 13.75 Ft.

GROUND WATER ELEVATION _____

PURGE DATE 9/23/91

PURGE METHOD Submersible pump

START PURGE 2-15 PM ELAPSED TIME 1.5 HRS. VOLUME PURGED 66 gallons
(SEE WELL DEVELOPMENT LOG FOR PURGING DETAILS)

SAMPLER TYPE Fultz pump : 1. (SUBMERSIBLE PUMP) 2. BLADDER PUMP 3. BAILER
4. OTHER(SPECIFY) _____

SAMPLER MATERIAL _____ : 1. STAINLESS STEEL 2. TEFLON 3. PVC
4. OTHER(SPECIFY) _____

TUBING MATERIAL _____ : 1. TEFLON 2. POLYETHYLENE 3. TYGON 4. SILICON
5. OTHER(SPECIFY) _____

SAMPLE APPEARANCE Clear.

SAMPLE pH 7.0 TEMPERATURE 63° F SPECIFIC CONDUCTANCE 1600

Sample time - 4:00 PM

COMMENTS:

		pH	temp	Sp. Cond.
WEATHER:	Sunny, cool @ 65° F			
OTHER:	Measurements after 25 gallons	7.0	62° F	1700
"	" 50 "	6.5	62° F	1600
"	" 66 "	7.0	63° F	1600

88-3

Canonie Environmental

FIELD SAMPLE DATA

PROJECT No. 91-450-01

FIELD ENGINEER RS/DGB

PAGE 1 OF 1

PROJECT NAME Former Torrington Facility DATE 9/23/91

FIELD DATA:

WELL SAMPLED W-15A (2" Dia well)

Depth of well from TOP OF CASING ~~ELEVATION~~ 35.00 Ft.

DEPTH TO GROUND WATER FROM T.O.C., FT. 13.20 Ft.

GROUND WATER ELEVATION _____

PURGE DATE 9/23/91

PURGE METHOD Bailing

START PURGE 9.50 AM ELAPSED TIME 0.58 HRS. VOLUME PURGED 11 gallons
(~~SEE WELL DEVELOPMENT LOG FOR PURGING DETAILS~~)

SAMPLER TYPE _____ : 1. SUBMERSIBLE PUMP 2. BLADDER PUMP (3. BAILER)
4. OTHER(SPECIFY) _____

SAMPLER MATERIAL _____ : 1. STAINLESS STEEL 2. TEFLON 3. PVC
(4. OTHER(SPECIFY)) HDPE

TUBING MATERIAL _____ : 1. TEFLON 2. POLYETHYLENE 3. TYGON 4. SILICON
5. OTHER(SPECIFY) _____

SAMPLE APPEARANCE Muddy

After 5 gallons pH - 7.0 Temperature - 62° F Specific Conductance 1800

SAMPLE pH 7.0 TEMPERATURE 63° F SPECIFIC CONDUCTANCE 1800

Sample time - 10.30 AM

COMMENTS:

WEATHER: Sunny, Cool @ 60°F

OTHER: _____

88-3

Canonie Environmental

FIELD SAMPLE DATA

PROJECT No. 91-450-01

FIELD ENGINEER RS/DGB

PAGE 1 OF 1

PROJECT NAME Former Torrington Facility DATE 9/23/91

FIELD DATA:

WELL SAMPLED W-14A (2" Dia well)

Depth of well from TOP OF CASING ~~ELEVATION~~ 43.36 FT.

DEPTH TO GROUND WATER FROM T.O.C., FT. 14.30 FT.

GROUND WATER ELEVATION _____

PURGE DATE 9/23/91

PURGE METHOD Bailing

START PURGE 11:00 AM ELAPSED TIME 1-83 HRS. VOLUME PURGED 35 gallons
(~~SEE WELL DEVELOPMENT LOG FOR PURGING DETAILS~~)

SAMPLER TYPE _____ : 1. SUBMERSIBLE PUMP 2. BLADDER PUMP (3. BAILER)
4. OTHER(SPECIFY) _____

SAMPLER MATERIAL _____ : 1. ~~STAINLESS STEEL~~ 2. TEFLON 3. PVC
(4. OTHER(SPECIFY)) HDPE

TUBING MATERIAL _____ : 1. TEFLON 2. POLYETHYLENE 3. TYGON 4. SILICON
5. OTHER(SPECIFY) _____

SAMPLE APPEARANCE Slightly Muddy to clear. Temperature-64°F Specific Conductance - 1900
After 30 gallons - 7-0
SAMPLE pH 7-0 TEMPERATURE - 65°F SPECIFIC CONDUCTANCE - 1900
Sample time - 1-00 pm

COMMENTS:

WEATHER: Sunny, Cool @ 65°F

OTHER: _____

88-3

Canonie Environmental

FIELD SAMPLE DATA

PROJECT No. 91-450-01

FIELD ENGINEER RS/DGB

PAGE 1 OF 1

PROJECT NAME Former Torrington Facility DATE 9/23/91

FIELD DATA:

WELL SAMPLED W-15B (2" Dia Well)

Depth of well from TOP OF CASING ~~ELEVATION~~ 19.88'

DEPTH TO GROUND WATER FROM T.O.C., FT. 12.60 Ft.

GROUND WATER ELEVATION _____

PURGE DATE 9/23/91

PURGE METHOD Bailing

START PURGE 9:30 AM ELAPSED TIME 0.25 HRS. VOLUME PURGED 5 gallons
(~~SEE WELL DEVELOPMENT LOG FOR PURGING DETAILS~~)

SAMPLER TYPE _____ : 1. SUBMERSIBLE PUMP 2. BLADDER PUMP (3. BAILER)
4. OTHER(SPECIFY) _____

SAMPLER MATERIAL _____ : 1. STAINLESS STEEL 2. TEFLON 3. PVC
4. (OTHER(SPECIFY)) HDPE

TUBING MATERIAL _____ : 1. TEFLON 2. POLYETHYLENE 3. TYGON 4. SILICON
5. OTHER(SPECIFY) _____

SAMPLE APPEARANCE Muddy

SAMPLE pH 7.1 TEMPERATURE 64°F SPECIFIC CONDUCTANCE 2200

Sample time - 10:00 AM

COMMENTS:

WEATHER: Sunny, Cool, @ 60° F

OTHER: _____

88-3

ARC
Aspen Research Corporation
4936 West County Road D
New Brighton, MN 55112-3522
Phone (612) 631-9234
FAX (612) 631-9270

CHAIN OF CUSTODY RECORD

PN 3050

№ 2463

per Bruce Conner 9-24-91

PC# C2571 PN 72680

COMPANY: CANONIE	PROJECT TITLE: TORRINGTON FACILITY
ADDRESS: 800 CANONIE DRIVE	PROJECT NUMBER: 91-450-01
CITY, STATE, ZIP: PORTER, IN 46304	CONTACT: Paul Lambert PHONE: (219) 926-5651

ITEM	SAMPLE NUMBER	SAMPLE DESCRIPTION	TYPE / PRESERVATIVE (SEE BELOW) WATER	SOIL	GRAB	COMP	PRES	DATE / TIME COLLECTED	BY	# OF BOTTLES	ANALYSIS (SEE BELOW)	ARC NUMBER (LEAVE BLANK)
1.		Field Blank	✓					9-17-91	TJS	2	EPA 8240/624	328 KML
2.		Trip Blank	✓					9-17-91	TJS	1		
3.		TRIP BLANK	✓					9-6-91	TJV	1		
4.	W-15A	GROUND WATER	✓					9-23-91 10:30AM		4		
5.	W-15B							9-23-91 10:00AM		4		
6.	W-14A							9-23-91 1:00 PM		4		
7.	W-14B							9-23-91 4:00PM		4		
8.		EQUIPMENT BLANK	✓					9-23-91 4:15PM		4		
9.												
10.												

SAMPLING / RECEIPT COMMENTS	BY
SAMPLES TO BE ANALYZED	
FOR VOLATILE ORGANICS	
(VOAs) BY EPA 8240/624.	

PRESERVATIVE	
FILTERED:	F
CHILLED:	C
ACID:	A
BASE:	B
NONE:	N

ANALYSIS
BTX, TPH
BTEX, TPH
EPA 8270 / 625
EPA 3820
EPA 8010 / 601
EPA 8020 / 602
EPA 8040 / 604
EPA 8060 / 606
EPA 8080 / 608
EPA 8100 / 610
EPA 8120 / 612
EPA 8140 / 614
EPA 8150 / 615
EPA 8240 / 624
EPA 1310
EPA 3020
OTHER: PLEASE SUMMARIZE ABOVE

TRANS #	ITEMS	RELINQUISHED BY NAME / COMPANY	ACCEPTED BY NAME / COMPANY	DATE	TIME	MODE OF TRANSPORTATION
1.	1-2	Tim O'Connor/ASP	"	9-17-91	4:30	Fed. Express
2.			Ray CANONIE	9-18-91	11:00AM	11
3.	3-8	Ray CANONIE		9-23-91	6:00 PM	Fed. Express
4.			Beth Braunschweig 9-24-91			
5.						

WHITE - SAMPLES CANARY - ORIGINATOR PINK - FILE

Appendix D

Disposal of Cuttings

CanonieEnvironmental

Canonie Environmental Services Corp.
800 Canonie Drive
Porter, Indiana 46304
Phone: 219-926-8651
Fax: 219-926-7169

October 18, 1991

91-450-03

Mr. Bruce Bohnen
Capsule Environmental
1970 Oakcrest Avenue
Suite 215
St. Paul, MN 55113

Letter Report
On-site Dispersion of Drummed Auger Cuttings
Former Torrington Facility
South Bend, Indiana

Dear Mr. Bohnen:

This letter report, prepared by Canonie Environmental Services Corp. (Canonie), details the field activities associated with on-site disposal of drummed auger cuttings temporarily stored in the parking area at the former Torrington Facility in South Bend, Indiana. Canonie personnel accessed and spread the contents of 20 drums on-site.

In addition to auger cuttings, several drums also contained latex and nitrile gloves as well as paper and other debris. These gloves and miscellaneous debris were gathered and placed in a 55-gallon drum for temporary storage. This material will be disposed in conjunction with the off-site disposal of 11 drums containing drilling muds. Canonie is currently arranging the transport and disposal of the drilling muds at Prarieview Landfill. Canonie is forwarding a cost proposal to arrange for disposal of the 11 drums under separate cover.

Photographs were taken prior to and following completion of field activities. A complete set of project photographs is enclosed.

The 20 empty 55-gallon drums were transported for recycling to Convenience Recycling Inc., LaPorte, Indiana.

Canonie appreciates the opportunity to continue providing professional services to Capsule Environmental. If you have any questions concerning this report or if you need additional information, please call me.

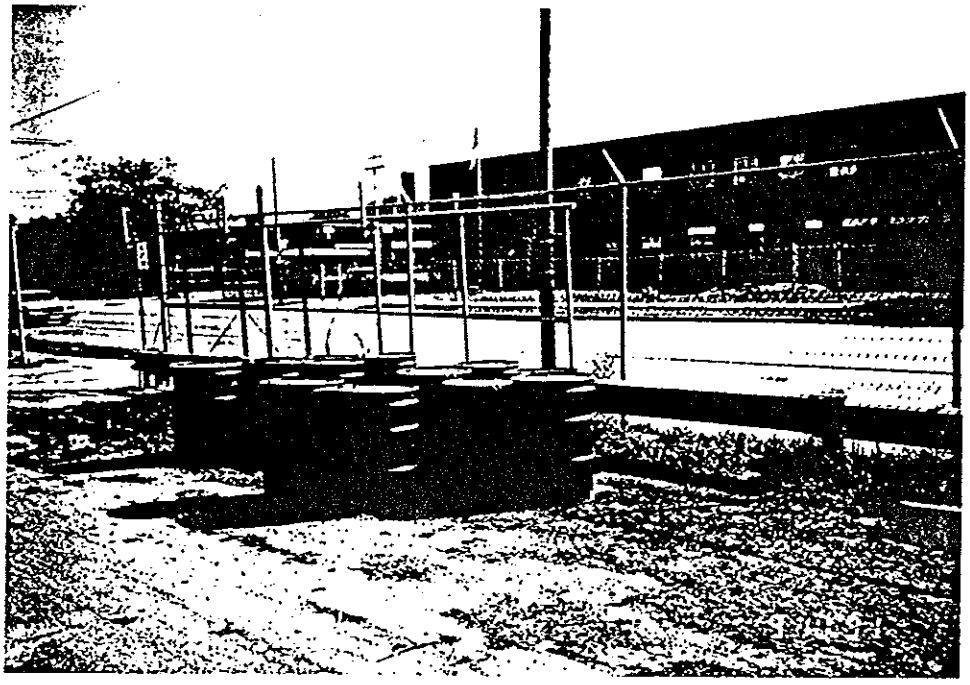
Very truly yours,

Daniel D. Bradfield for

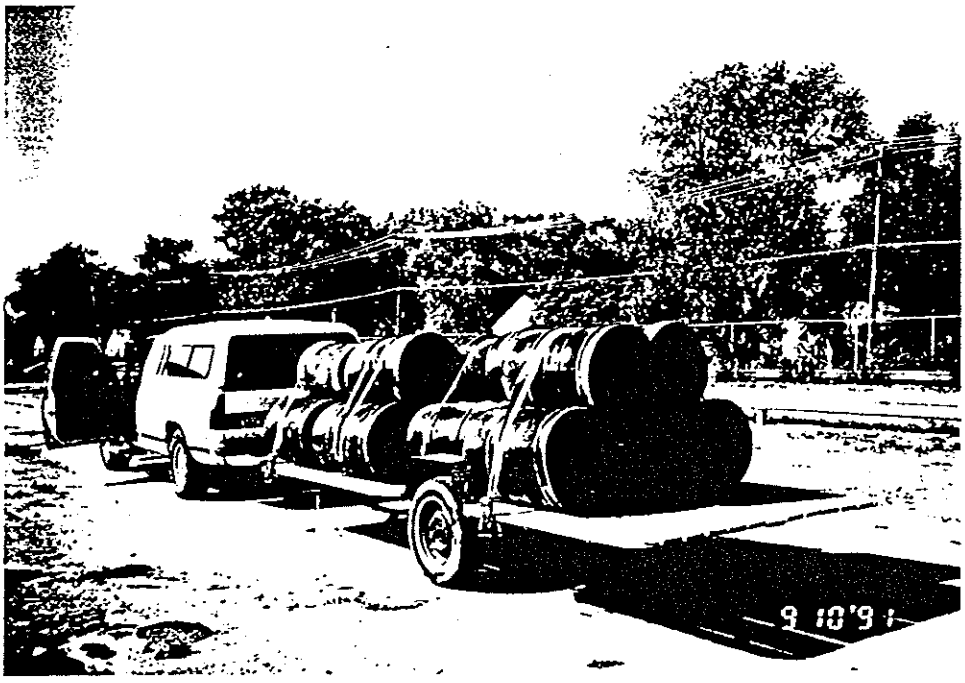
Paul W. Lambert, CPG
Project Manager

PWL/aw

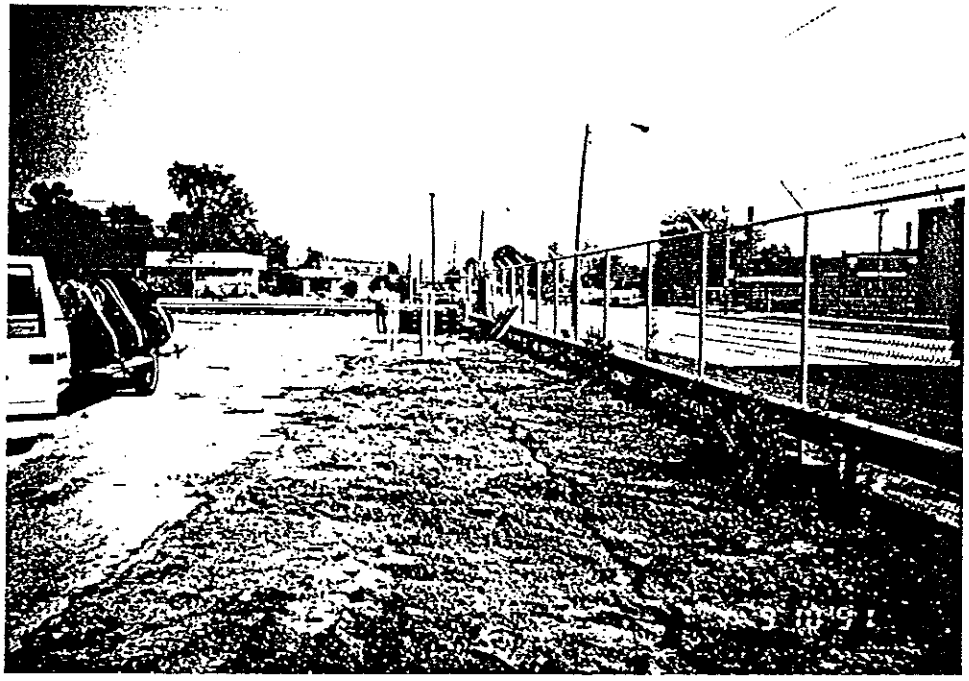
Enclosure



Remaining 55-gallon drums (12).



Empty drums loaded for off-site disposal.



Drummed cutting disposal area.

Table 1

Soil Boring Analytical Results

Table 1
South Bend
Sampling

Description of Field Samples	Analysis
Soil Borings:	
C1 2–4'	8240 Organics in soil, 465D compound list
C1 60–61'	
C1 34–36'	
C1 0–2'	
W15A 30–32'	
W14B 10–12'	
W14A 2/L	
PD4–1	
PD4–1	TPH, Recra metals,cyanide
Monitoring Wells:	
W14A	8240 Organics in water
W14B	
W15A	
W15B	
QA/QC Samples:	
Equipment rinsates	8240 Organics in water
Trip blanks	
Field blank	

TABLE 1

SUMMARY OF ANALYTICAL DATA TORRINGTON, SOUTH BEND

Sampling Location	Pond 4 Soil 2-4'	PQL
Metals (mg/Kg)		
Arsenic	14	0.78
Cadmium	7.1	0.12
Chromium	56	0.24
Copper	1,000	0.52
Lead	220	1.7
Mercury	0.64	0.03
Nickel	49	0.49
Selenium	BPQL	4.0
Cyanide	0.78	0.1
TPH (ppm)	39,000	50

TPH - Total Petroleum Hydrocarbons

Table 2

Groundwater Analytical Results

TABLE 2

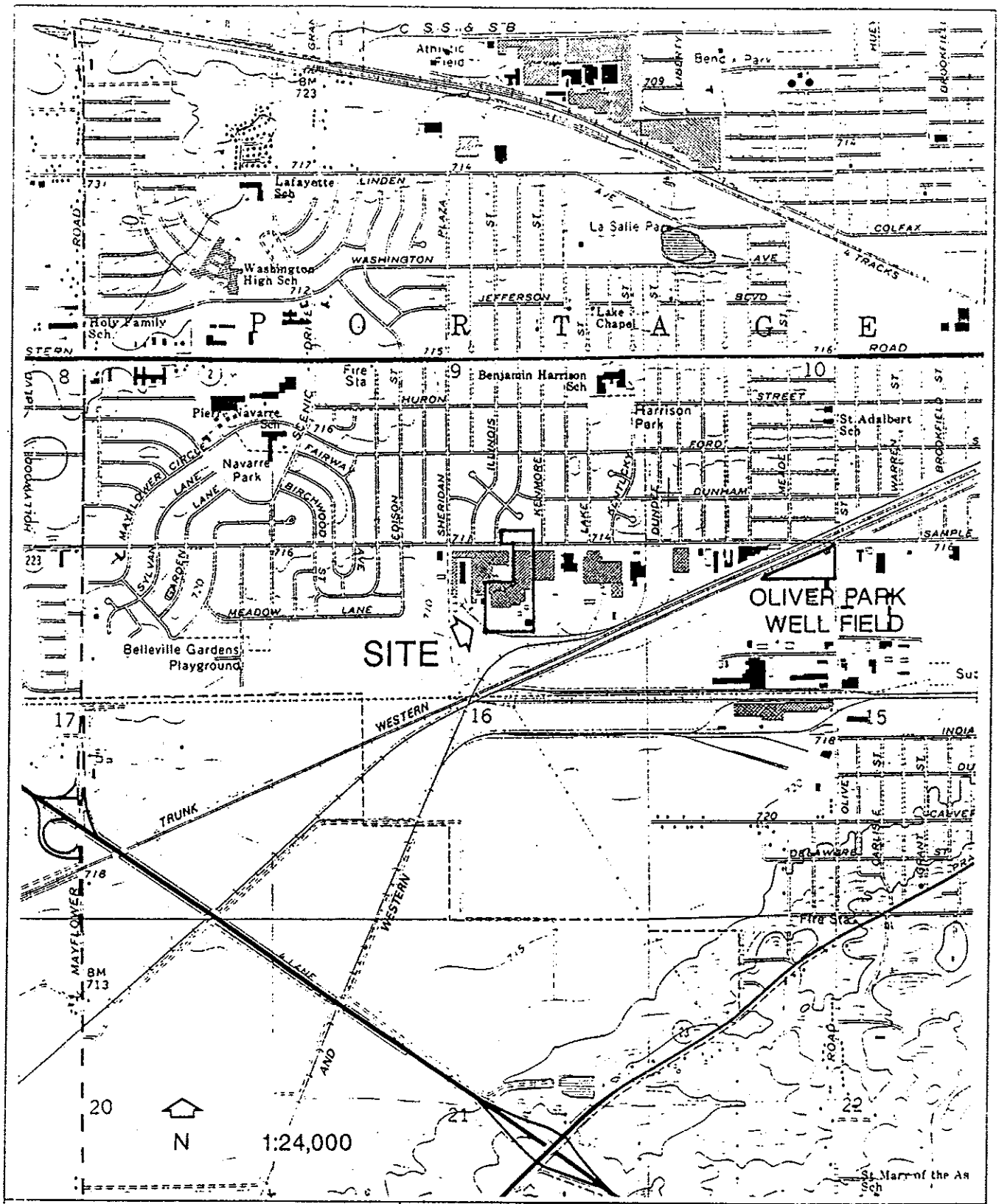
SUMMARY OF ANALYTICAL DATA TORRINGTON, SOUTH BEND

Sampling Location	W-14A	PQL	MCL
Organics (ug/L)			
1,1-Dichloroethene	38	5.0	7.0
1,1-Dichloroethane	45	5.0	---
1,1,1-Trichloroethane	31	5.0	200.0
Trichloroethene	5.4	5.0	5.0

PQL - Practical Quantitation Limit
MCL - Maximum Contaminant Limit

Figure 1

Site Map Locations



CAPSULE
ENVIRONMENTAL ENGINEERING INC.

THE TORRINGTON COMPANY
SOUTH BEND, INDIANA FACILITY

SITE LOCATION MAP FIGURE 1

Figure 2

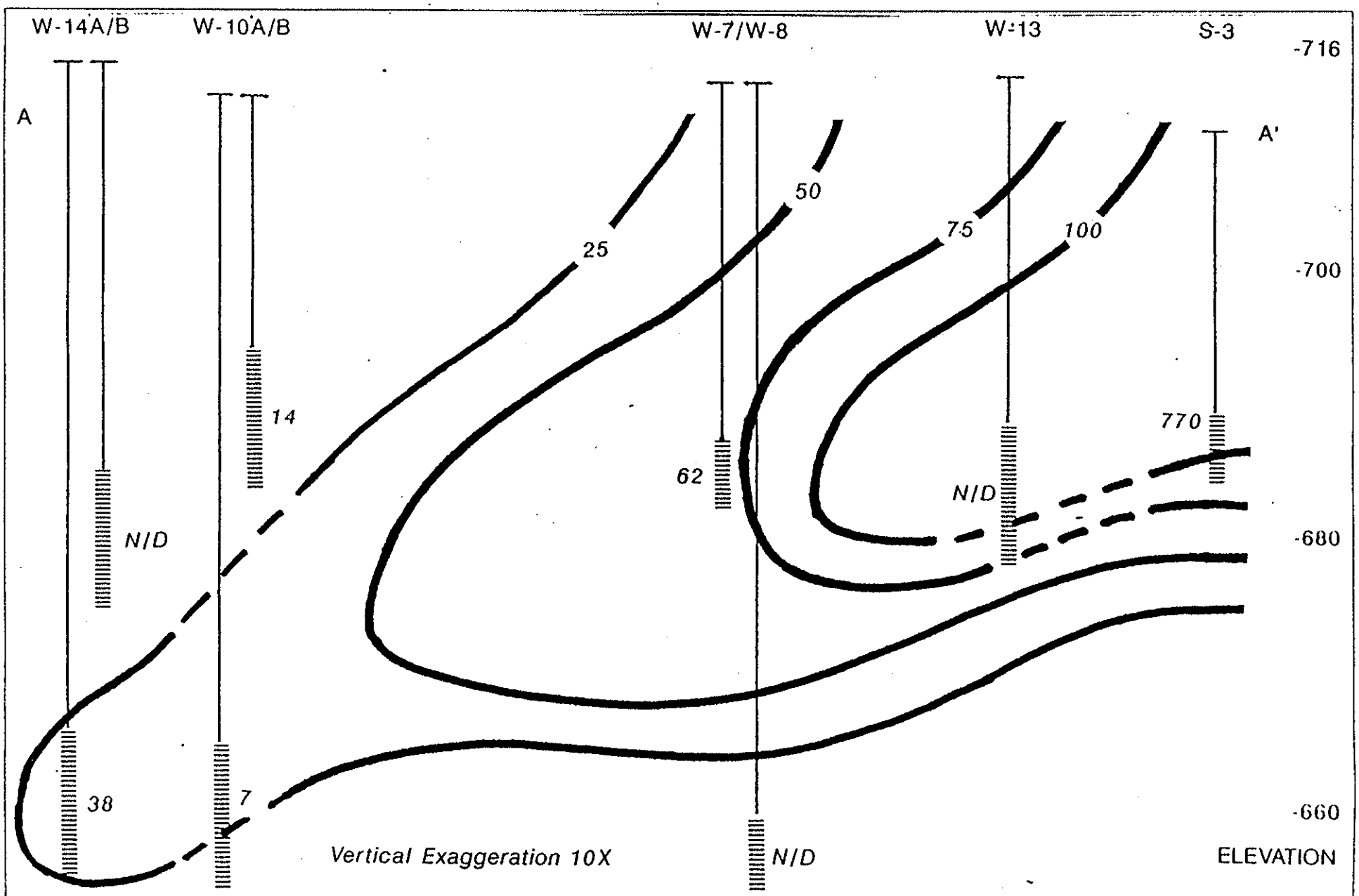
ALTA/ACSM Land Title Survey and Groundwater Flow Map

Figure 2

Missing

Figure 3

Cross Section of DCE Plume



CAPSULE
ENVIRONMENTAL ENGINEERING INC.

THE TORRINGTON COMPANY, SOUTH BEND, INDIANA FACILITY

PLUME CROSS-SECTION OF CIS 1,2 DCE ppb FIGURE 3