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TEXFI INDUSTRIES
PHASE III GROUNDWATER ASSESSMENT

3136-9-1000 JANUARY 15, 1988

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TEXFI INDUSTRIES

Phase III Groundwater Assessment

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TEXFI INDUSTRIES

Phase III Groundwater Assessment

1. Introduction

This report summarizes the findings of Phase III of the Groundwater Assessment Investigation for the plant site formerly owned by Texfi Industries in New Bern, North Carolina. This investigation was initiated under the authorization of Mr. John E. Tate, representative for Texfi Industries, in accordance with the Chas. T. Main, Inc. (MAIN) proposal to Mr. Tate dated September 24, 1987.

A. Site Background

In August 1986 Amital Spinning Company contracted Law Engineering Testing Company (LETCo) to perform an environmental audit and preliminary groundwater assessment at the former Texfi facility. The results of this study were presented in Preliminary Groundwater Assessment Former Texfi Plant Site, New Bern, North Carolina dated November 14, 1986. As a result of this assessment, MAIN was contracted to provide additional horizontal and vertical contamination delineation. The results of MAIN's investigation were submitted in two reports on March 17 and July 30, 1987. These reports were entitled Texfi Industries Preliminary Groundwater Assessment, and Texfi Industries Phase II Groundwater Assessment. In a letter dated September 1, 1987, the North Carolina Department of Natural Resources and Community Development, Division of Environmental Management, responded to these reports by submitting comments and recommendations to continue the investigation.

B. Project Scope

The Scope of this project entailed installing two groundwater monitoring wells at the facility. One of the wells was installed to sample the watertable aquifer, the other well screened the Castle Haynes Aquifer. Groundwater samples were collected from the two new wells and eight existing wells. Samples were analyzed for volatile organic compounds in accordance with EPA Method 624.

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2. Drilling Program

A. Well Installation Procedures

Two additional groundwater monitoring wells (wells MW-11 and MW-12) were installed in locations to assist in delineating the horizontal extent of contamination (see drawing R-1). These wells were constructed and permitted in accordance with North Carolina Administrative Code Title 15, Subchapter 2C, Well Construction Standards Criteria and Standards Applicable to Water Supply and Certain Other Type Wells. Each well was constructed of 2-inch diameter Schedule 40 PVC casing with 10-foot manufactured screens. The screen interval was packed with a clean coarse sand and sealed with bentonite. The remaining annulus was backfilled with lean grout and finished with a concrete collar and locking steel cap. Well completion records for these wells are included in Appendix A.

B. Well Locations

Well MW-11 was installed at the north corner of the manufacturing building. This well was drilled to a depth of 20.5-feet below grade and screened 10 feet into the watertable aquifer in the surficial sediments. Well MW-12 was installed approximately 265 feet south of the facility and was drilled to a depth of 40-feet. The ten foot screen was installed in the Yorktown and Castle Hayne Formations, to determine water quality.

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3. Hydrogeology

A. Site Geology

The geology underlying the site has been described in previous reports as consisting of three major stratigraphic units. Detailed descriptions are included in the Phase I report entitled Texfi Industries Preliminary Groundwater Assessment dated March 17, 1987.

The following is a brief description of each unit. Geologic cross-sections have been revised to include well MW-12. Cross-sections are shown on Dwgs. R-2 and R-3. The oldest geologic unit encountered at the study area is the Castle Hayne Formation which is dated as Eocene in age, or approximately 22 million years old. This formation is described as a biomicrite (fossil limestone) composed almost entirely of pelecypod molds. The Castle Hayne Formation was encountered on site at depths ranging from 37 feet below grade in well MW-12 to 40-feet in well MW-9A.

The Yorktown Formation lies unconformably over the Castle Hayne on this site. The Yorktown Formation is considered to be Miocene in age, or approximately 12 million years old. This formation has been described as a semi-consolidated unit consisting of fragmented shell debris and quartz sand. This unit ranges in thickness across the site from 9.5-feet in well MW-6 to 14 feet in well MW-9A.

Overlying the Yorktown Formation on site is a unit referred to as post-miocene sediments. Sediments from Pliocene, Pleistocene and Holocene are included in this unit. These sediments consist primarily of interbedded clays and sands.

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B. Site Hydrology

Groundwater elevations measured on October 26, 1987 are presented in Table 1. The elevations were utilized in developing the site potentiometric map (drawing R-1) for both the watertable aquifer and the Castle Hayne Aquifer.

As discussed in the Phase II report, the groundwater flow directions for each aquifer are shown on Drawing R-1. The watertable aquifer appears to mound in the vicinity of wells MW-3A and 2A. This mound allows the groundwater to flow off the site in a southeastern, southern and western directions with an average horizontal hydraulic gradient of approximately 0.012 ft/ft.

The groundwater direction in the Castle Hayne Aquifer underlying this site appears to be in a southern direction with a horizontal hydraulic gradient of approximately 0.008 ft/ft.

A detailed discussion of the aquifer characteristics for these two aquifers was presented in the Phase II Groundwater Assessment report dated July 30, 1987.

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TABLE - 1
TEXFI INDUSTRIES
WELL AND GROUNDWATER DATA

WELL #	TOC ELEV.	SWL (10-27-87)	T/S ELEV.	B/S ELEV.
1	29.26	18.85	19.70	9.70
1A	29.65	12.53	19.10	9.10
2	28.46	18.69	19.80	9.80
2A	29.28	17.50	19.10	9.10
3	29.62	19.84	20.70	10.70
3A	30.06	20.43	19.80	9.80
4	28.21	12.82	18.50	8.50
4A	29.81	16.07	19.60	9.60
5	31.81	21.67	22.30	12.30
6	29.95	10.89	-1.86	-10.86
7	29.17	17.09	16.61	7.86
8	29.88	12.91	16.67	7.92
9	29.61	14.80	16.37	7.62
9A	29.53	10.48	-1.72	-10.80
10	29.05	11.71	12.35	3.27
10A	29.86	10.89	-2.56	-11.64
11	30.24	13.26	17.11	8.11
12	29.50	10.42	-0.66	-9.66
PW	28.40	6.99	-	-

TOC: Top of casing
SWL: Static water level
T/S: Top of screen
B/S: Bottom of screen

4. Groundwater Sampling Program

A. Sampling Procedure

On October 28, 1987, MAIN collected groundwater samples from wells 2A, 3A, 4A, 4, 6, 8, 9, 9A, 11 and 12 to be analyzed for volatile organic compounds, pH, temperature and specific conductance. Samples were collected utilizing procedures consistent with accepted EPA protocols. The sampling procedures utilized included:

1. Measurement of water levels in all wells.

2. Evacuation of three well volumes or until dry.

3. Collection of groundwater samples within 24 hours of purging.

Purging of the watertable wells was accomplished by bailing with teflon bailers. Wells screened in the Yorktown/Castle Hayne Formations were evacuated using a Brainard-Killman 1.7 hand-pump. The pump and bailers were decontaminated between wells. All field measurements and parameters are included on the field data sheets in Appendix C.

B. Analytical Results

Groundwater samples collected from 10 wells were transported to the laboratory for analysis by EPA Method 624 as published in the Federal Register, Volume 29, No. 209, October 26, 1984. Laboratory data sheets are included in Appendix C.

A total of 13 volatile organic compounds were detected in monitoring wells at the site. Some compounds are degradation products of 1,1,1 trichloroethane (1,1,1-TCA), which was one of the original contaminants detected. Table 2 summarizes the analytical results for all wells sampled during the Phase III investigation.

Well MW-4A located in the area of a known 1,1,1-TCA spill, tested positively for all 13 compounds. Concentrations for individual compounds ranged as high as 120,000 ug/l for 1,1-dichloroethane (1,1-DCA). The total volatile organic concentration in MW-4A is 212,582 ug/l.

Well MW-9, which is also located in a suspected spill area, tested positively for 10 volatile organic compounds. The highest concentration recorded is 32,000 ug/l for 1,1,1-TCA. Analytical results for Wells MW-3A, MW-4A, MW-8, MW-9 and MW-9A were generally consistent with results obtained in previous sampling events. One notable difference between this sampling event and previous events was observed in samples collected from MW-6. 1,1-DCA was not detected in MW-6 during the latest event. This well is screened in the Castle Hayne Formation.

Two new monitoring wells were installed prior to the latest sampling event. Well MW-11, located near the north corner of the plant building, is screened into the watertable aquifer. 1,1-DCA was detected in this well at 360 ug/l which may indicate a possible spill or overfilling of a former above ground 1,1,1-TCA storage tank located approximately 130 feet west of MW-11. Well MW-12 was installed approximately 265 feet south of the plant building and screened in the Castle Hayne Formation. Trace concentrations of methylene chloride were detected in this well. No other compounds were detected.

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TABLE - 2
TEXFI INDUSTRIES
ANALYTICAL RESULTS

PARAMETER	WELL (ug/l)									
	2A	3A	4	4A	6	8	9	9A	11	12
1. Vinyl Chloride				38						
2. Chloroethane		40		110			10	11		
3. Methylene Chloride (Dichloromethane)	15	11	11	62	16	15	12	13	12J	11
4. 1,1 - Dichloroethylene		10		1200		37	1100		15J	
5. 1,1 - Dichloroethane	7J	230		120,000		290	8300	200	360	
6. Chloroform (Trichloromethane)				23			17			
7. 1,2 - Dichloroethane				460			20			
8. 1,1,1 Trichloroethane				90,000			32,000			
9. Trichloroethylene				620			11			
10. 1,1,2 - Trichloroethane				22			31			
11. Tetrachloroethylene				19						
12. 1,1,2,2 Tetrachloroethane				20						
13. Toluene				8J			18			

J = Estimated Concentration; values between the detection limit and one-half of that limit.

As stated previously, many compounds detected in wells at this site are degradation products of a few volatile organic compounds. According to published data (Smith & Dragun, 1984) the following are assumed to be the source compounds at this site:

1,2-Dichloroethane
Tetrachloroethylene
1,1,2,2-Tetrachloroethane
1,1,1-Trichloroethane
Trichloroethylene (possible)
Toluene

Microbial degradation of many of the source compounds occurs as a result of reductive dechlorination which is the replacement of chlorine by hydrogen under anaerobic conditions (Smith & Dragun, 1984). Under these conditions 1,1,1-TCA reduces to 1,1 dichloroethane, chloroethane and vinyl chloride. Tetrachloroethylene reduces to trichloroethylene and ultimately to vinyl chloride. Table 3 shows the identified source compounds, the reaction pathways and associated degradation products.

TABLE 3

REACTION PATHWAYS, PRODUCTS, AND REFERENCES FOR DETECTED VOLATILE CHLORINATED ORGANIC COMPOUNDS AT AMITAL SPINNING PLANT, NEW BERN, NORTH CAROLINA

SOURCE COMPOUNDS	REACTION PATHWAYS	DEGRADATION PRODUCT	REFERENCES
1,1,1-TCA	MICROBIAL DEGRADATION	1,1-DCA CHLOROETHANE VINYL CHLORIDE	BOUWER (1983), PARSONS et al. (1982,1983)
TETRACHLOROETHYLENE	MICROBIAL DEGRADATION	TRICHLOROETHYLENE	BOUWER(1983), BOUWER AND McCARTY (1983a), McCARTY (1984), PARSONS et al. (1982,1983,1984)
CHLOROFORM	MICROBIAL DEGRADATION	METHYLENE CHLORIDE	SMITH AND DRAGUN (1984)
1,2-DICHLOROETHANE	UNKNOWN	CHLOROETHANE	SMITH AND DRAGUN (1984)
1,1,2,2-TETRACHLOROETHANE	MICROBIAL DEGRADATION	1,1,2-TRICHLOROETHANE	BOUWER AND McCARTY (1983b), McCARTY (1984)
1,1,1-TCA	UNKNOWN	CHLOROFORM	

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Figures 1, 2, 3, 4 and 5 are flow diagrams for selected monitoring wells detailing the chronology of degradation of compounds detected in each well. The diagrams are taken from Smith and Dragun, 1984. The history of use of the identified source compounds at the plant site is incomplete. 1,1,1-TCA was widely used on Texfi to service machinery. The remaining compounds are commonly used as degreasing agents and paint solvents.

Methylene chloride was detected in each well with concentrations ranging from 11 ug/l to 16 ug/l. Well MW-4A is the exception with a concentration of 62 ug/l. It should be noted that this compound was detected in the samples from wells MW-6, MW-9A and MW-12 which are all screened in the Castle Hayne Formation. With the exception of MW-4, it appears that the occurance of methylene chloride is probably a laboratory artifact associated with this sampling event. This conclusion is based on the following observations:

a. Previous analyses detected methylene chloride only in well 2.

b. Concentrations are very close to the detection limit.

c. Concentrations are unusually consistent across the site.

d. Concentrations in the Castle Hayne Aquifer are similar to concentrations within the watertable aquifer. In addition, the spatial distribution within the lower aquifer implies no attenuation with distance from possible sources.

One possible explanation for detection of methylene chloride may be that the sample containers may have been contaminated prior to arrival on to the site. Another possibility may

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TEXFI INDUSTRIES
WELL 3A

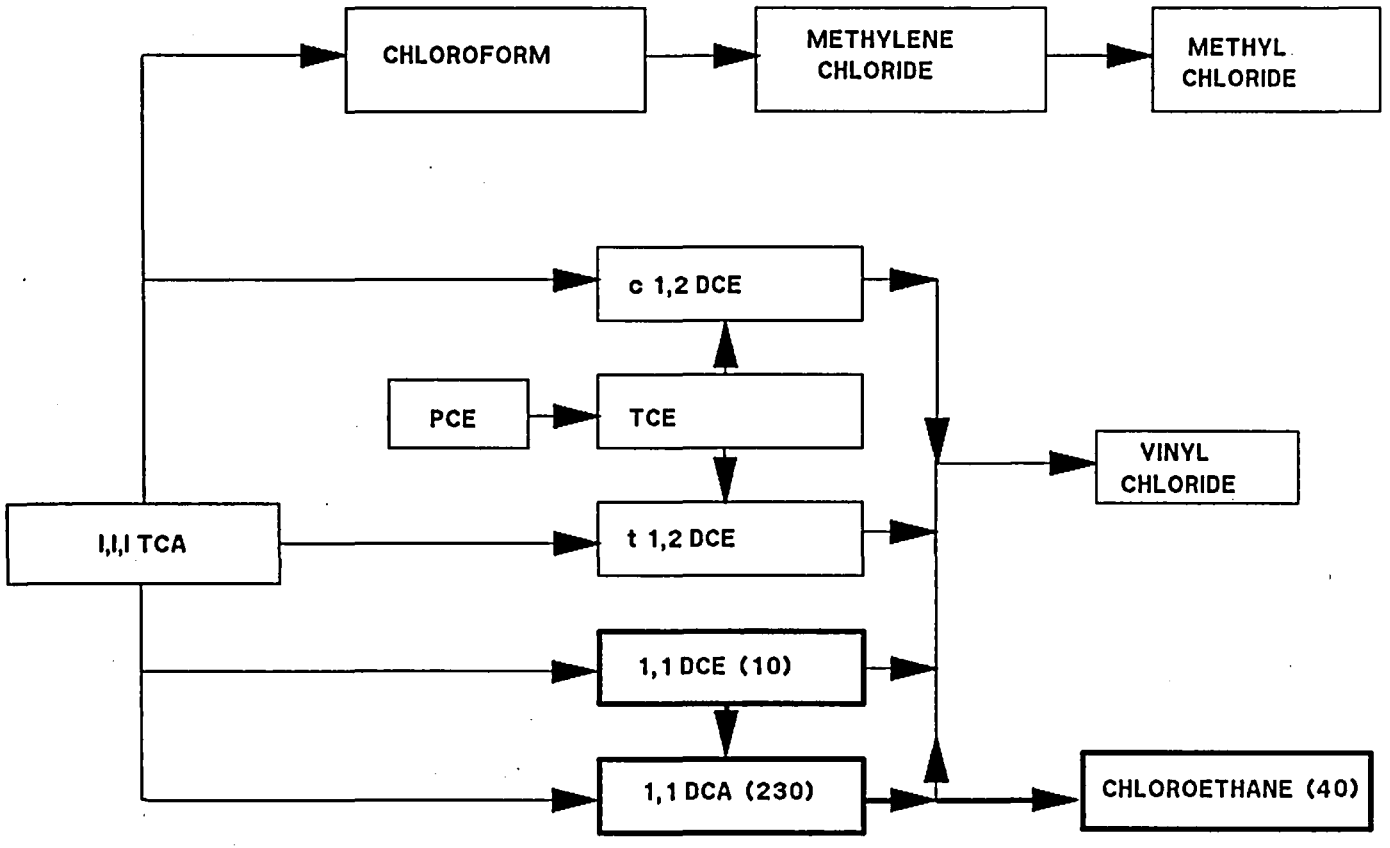

FIGURE 1 Transformation Pathways For Various Volatile Priority Pollutants In Soil-Groundwater Systems From Smith and Dragun, 1984. The Volatile Compounds Detected During The October 28, 1987 Sampling Are Are Shown In Parentheses In ug/l.

TEXFI INDUSTRIES
WELL 4A

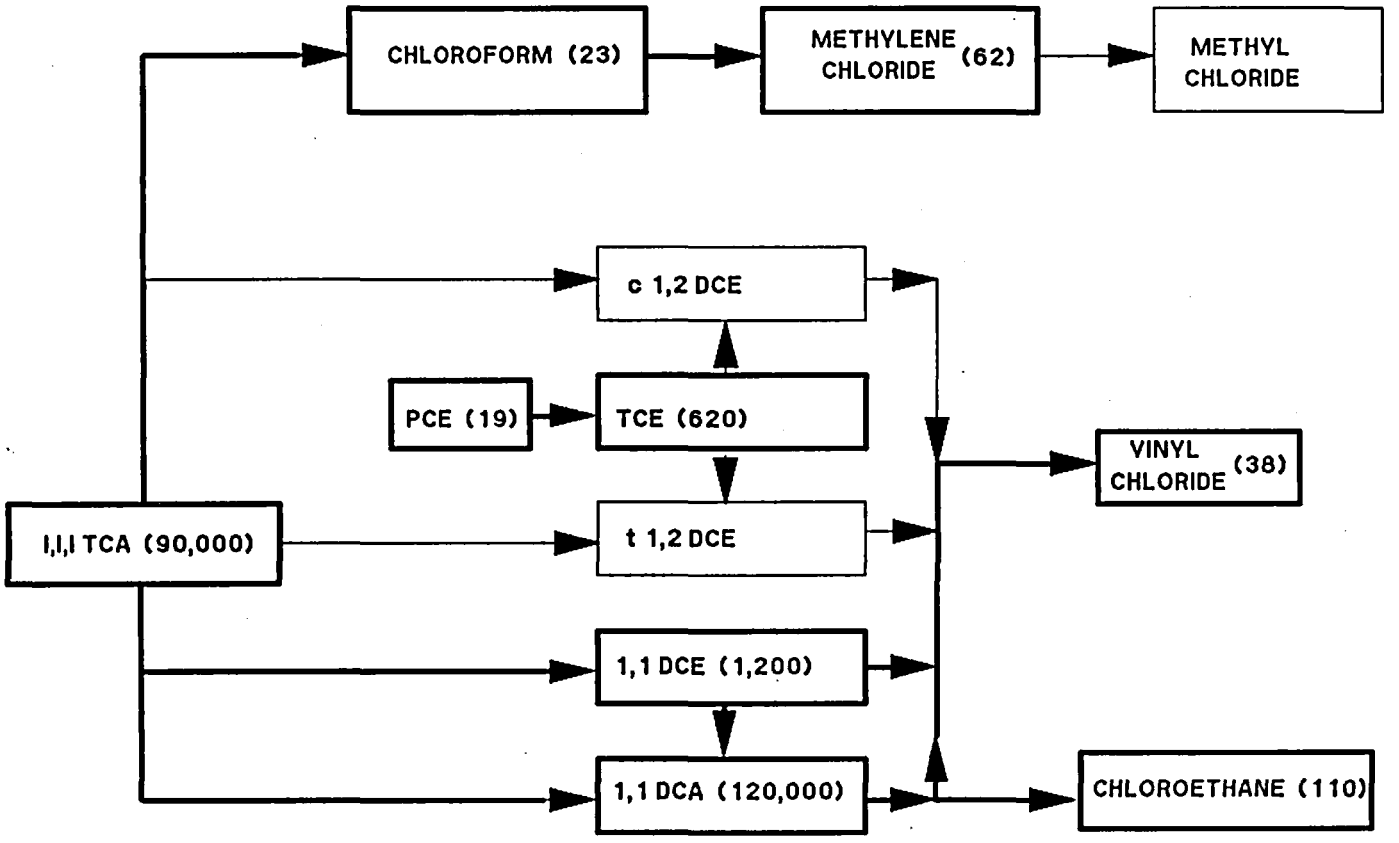

FIGURE 2 Transformation Pathways For Various Volatile Priority Pollutants In Soil-Groundwater Systems From Smith and Dragun, 1984. The Volatile Compounds Detected During The October 28, 1987 Sampling Are Are Shown In Parentheses In ug/l.

TEXFI INDUSTRIES
WELL 8

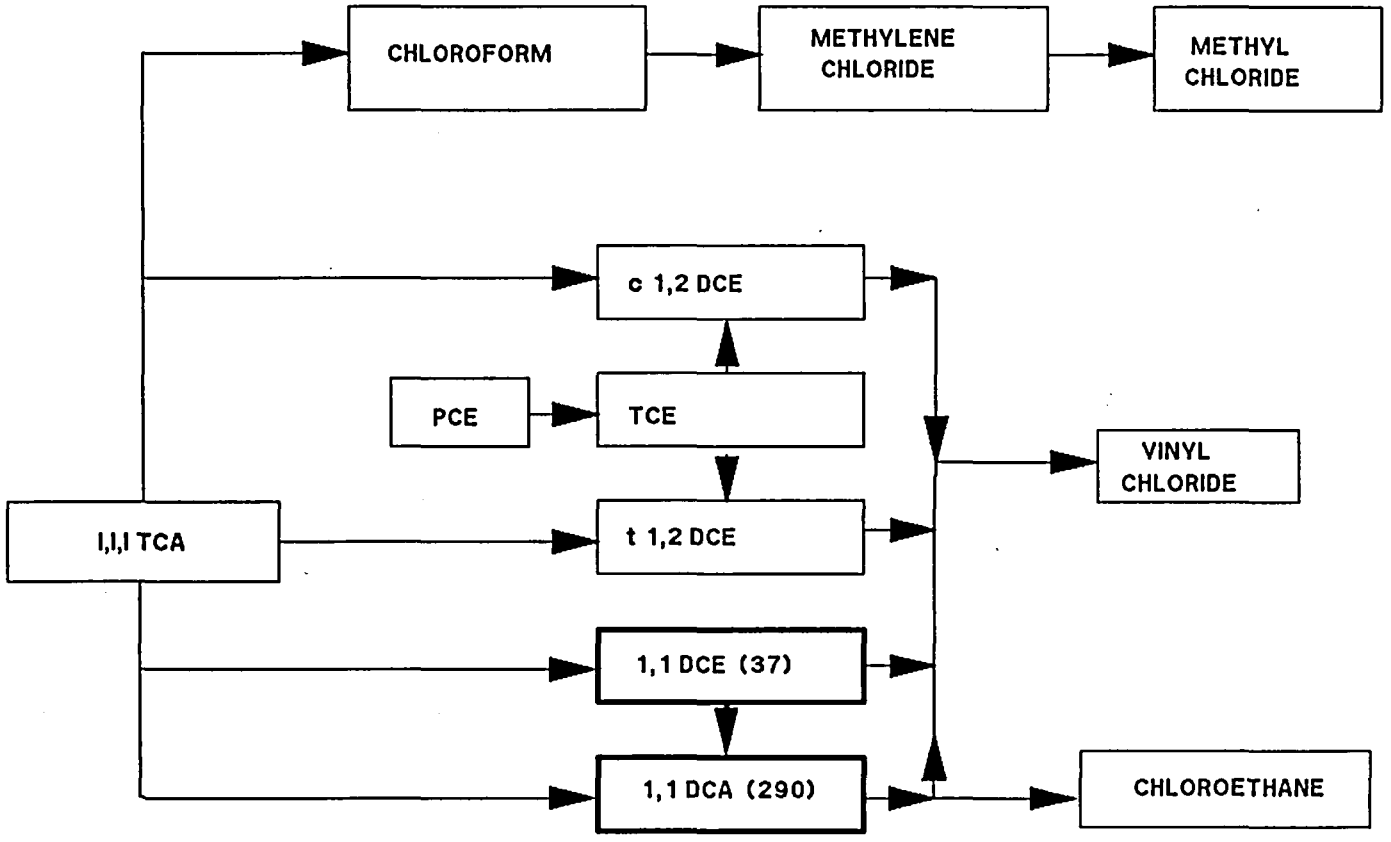

FIGURE 3 Transformation Pathways For Various Volatile Priority Pollutants In Soil-Groundwater Systems From Smith and Dragun, 1984. The Volatile Compounds Detected During The October 28, 1987 Sampling Are Are Shown In Parentheses In ug/l.

TEXFI INDUSTRIES
WELL 9

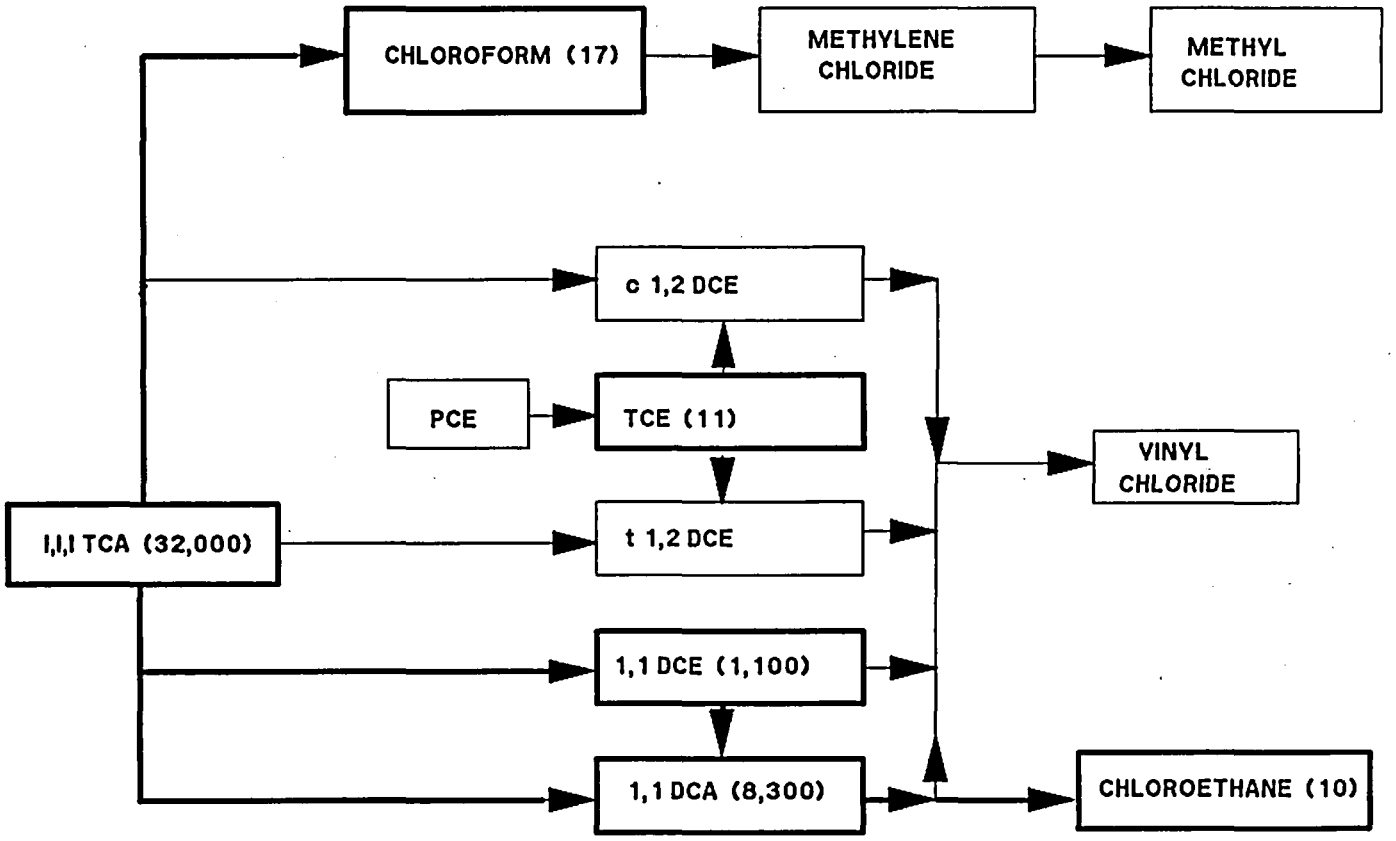

FIGURE 4 Transformation Pathways For Various Volatile Priority Pollutants In Soil-Groundwater Systems From Smith and Dragun, 1984. The Volatile Compounds Detected During The October 28, 1987 Sampling Are Are Shown In Parentheses In ug/l.

TEXFI INDUSTRIES
WELL 11

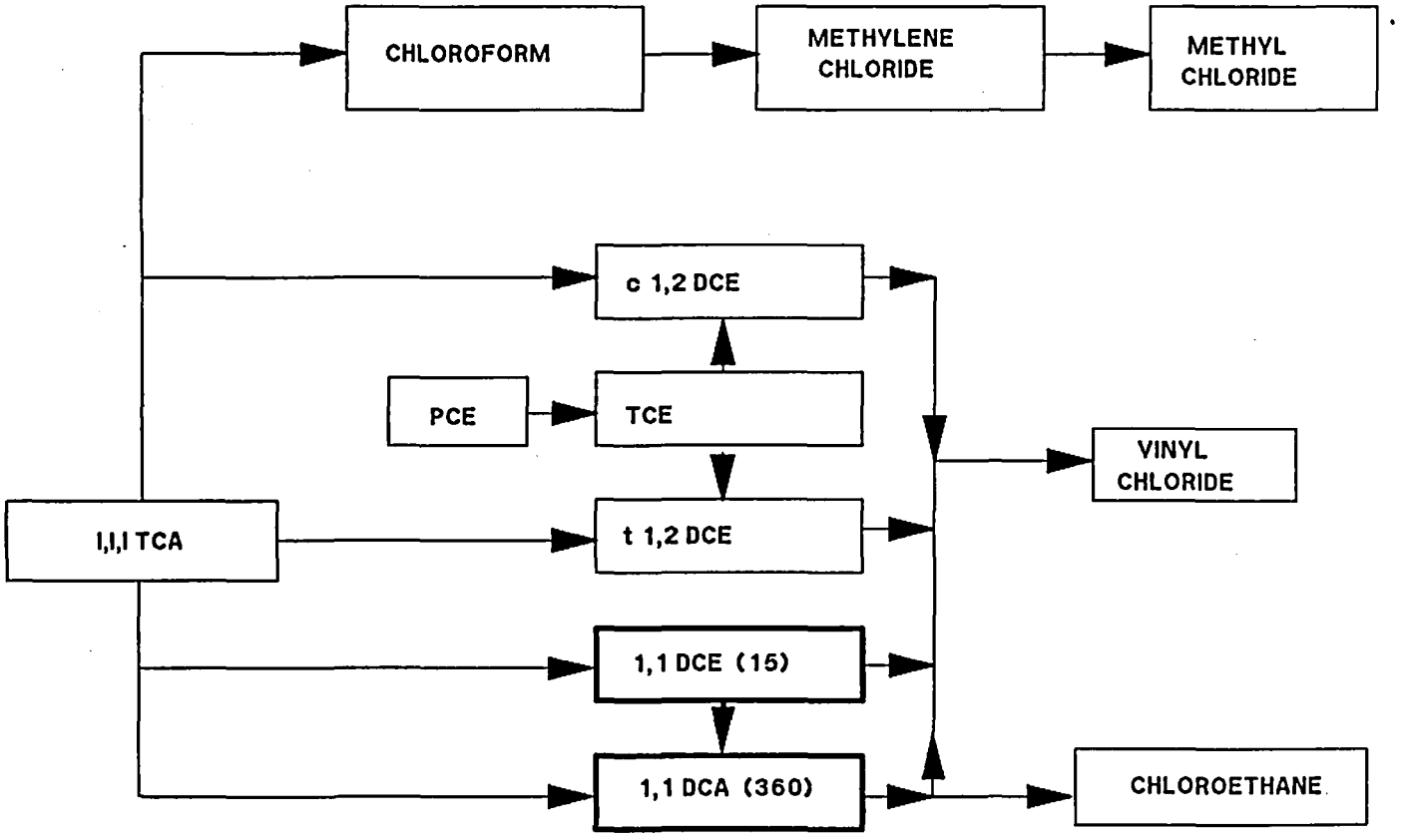

FIGURE 5 Transformation Pathways For Various Volatile Priority Pollutants In Soil-Groundwater Systems From Smith and Dragun, 1984. The Volatile Compounds Detected During The October 28, 1987 Sampling Are Are Shown In Parentheses In ug/l.

be that traces of methylene chloride may have been present in laboratory instruments at the time of analysis.

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5. Conclusions

Much is still unknown about the history of this site which would aid in removing contamination from the groundwater. Testing still points to the probability that a number of releases have occurred. Some locations are known and others are suspect. The spill from the 1,1,1-TCA tank at well MW-4A appears to have moved horizontally within the upper aquifer about 400 feet eastward, under the plant building toward well MW-8. In addition, leakage of contamination into the Castle Hayne from this spill has occurred and is migrating southward. This plume has migrated horizontally about 300 to 400 feet. This is based on velocity calculations using aquifer characteristics obtained from literature on the Castle Hayne Formation and an assumed travel time of approximately 10 years as stated in previous reports. The vertical migration of this plume cannot be determined due to the lack of vertical hydraulic conductivity data in the Castle Hayne Formation at this site. See Dwg. R-1 for locations of suspected and known spill locations.

A second release is assumed to have occured in the area around wells 9 and 9A. The age of this spill is unknown but, it is assumed to be substantially younger than the spill at well 4A. This assumption is based on an evaluation of degradation products from 1,1,1-TCA which were detected in well 9. The degradation of 1,1,1-TCA to 1,1-DCA appears more complete at well 4A than at well 9.

The horizontal extent of contamination within the upper aquifer is unknown, but is known to be less than 500 feet from the spill location since no contamination has been detected in well 10. Contamination has been detected within the Castle Hayne Formation at well 9A. Migration towards the south is known to be less than 290 feet since well MW-12 tested clean. The vertical extent of this plume is unknown for the reasons stated above.

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A release may have occurred at either the former 1,1,1-TCA tank located at the north corner of the plant or at the door leading from the plant at that same location. This is evidenced by monitoring results at well MW-11 showing 360 ug/l of 1,1-DCA. The size and extent of this plume is known since only one well exists in this area. It would appear from the relatively low concentration of 1,1-DCA in well MW-11 that the downgradient edge of the plume in the upper aquifer may be very near the perimeter drainage ditch. The extent of contamination within the Castle Hayne Formation cannot be determined at this time due to the fact that any plume from this location would be moving directly under the plant building.

A fourth release is suspected in the area around the stormwater drop inlet near well MW-3A. Neither the horizontal nor vertical extent of this plume in the upper aquifer or Castle Hayne Formation are known. It is also unknown as to whether well MW-3A is located upgradient or downgradient of the plume. Well MW-4 is located approximately 450 feet downgradient of the suspected release location and has not detected a plume from this area. The Castle Hayne Formation is not presently being monitored downgradient of this location.

In summary, the data collected from the site to date indicate that as many as four individual releases have occurred and have resulted in a least four contamination plumes. The depth of contamination cannot be quantified at this time. Hydraulic calculations indicate that the horizontal extent of contamination, at least near the ground surface, is confined to the property and is well within the limits of a "perimeter of compliance" if developed in accordance with the North Carolina Administrative Code T15: 02L.0100, .0200 and .0300. It appears, at this time, that due to the relatively low rates of plume migration, the fact that contamination has not been detected off-site and the fact that no groundwater users are located immediately downgradient of this facility, contamination from

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this site presents no immediate threat to the public health and safety or the environment beyond the proposed perimeter of compliance.

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6. Recommendations For Corrective Action

The general components of a corrective action system for this facility should include a groundwater monitoring system, groundwater recovery system, groundwater treatment system, and an effluent discharge system.

A. Groundwater Monitoring System

The groundwater monitoring system should be a series of four (4) monitoring wells screened 10 feet into the watertable and five (5) deep monitoring wells screened in the Castle Hayne Formation. The locations are shown on Dwg. R1. Three of the shallow wells should be located approximately 80 feet east of the perimeter fence on the east side of the plant. They should be located hydraulically downgradient of spill locations as described in Section 5. Well MW-4 should be used as the fourth shallow well as long as it continues to yield representative groundwater samples.

The five deep monitoring wells should be located on the south side of the plant within the perimeter fence. These wells will monitor the plumes within the Castle Hayne Formation. Well MW-12 should remain in use as one of the five deep wells. The wells should be constructed of schedule 40 PVC casing with manufactured screens and lockable caps. Samples from the perimeter of compliance wells should be analyzed semi-annually for the following:

1,1,1-Trichloroethane
1,1-Dichloroethane
1,1-Dichloroethylene
1,2-Dichloroethane
Trichloroethylene

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Field parameters should include:

Water Levels
pH
Specific Conductance
Temperature

B. Groundwater Treatment System

Alternatives for treatment of contaminated groundwater at this site are being evaluated at this time. The alternatives are being analyzed for technical and economic feasibility. A letter report detailing the development and permitting strategies will be forwarded to the Division of Environmental Management at the completion of this evaluation.

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BIBLIOGRAPHY

Smith, Leverett R., Dragun, James; "Degradation of Volatile Chlorinated Aliphatic Priority Pollutants in Groundwater", Environment International, Vol. 10 pp. 291-198; 1984.

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NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY

Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Froehling & Robertson, Inc.

DRILLER REGISTRATION NUMBER 421

STATE WELL CONSTRUCTION PERMIT NUMBER: 24-0267-WM-0111

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: New Bern

County: Craven

(Road, Community, or Subdivision and Lot No.)

OWNER Amital Spinning Corp.

ADDRESS Stanley Blvd. (Street or Route No.)

New Bern, N.C. 28561
City or Town State Zip Code

3. DATE DRILLED 10-20-87 USE OF WELL monitoring

4. TOTAL DEPTH 20.5 ft CUTTINGS COLLECTED ☒ Yes ☐ No

DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: 16.98 FT. ☐ above ☒ below TOP OF CASING,

TOP OF CASING IS 2.62 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): _____ METHOD OF TEST _____

8. WATER ZONES (depth): _____

9. CHLORINATION: Type _____ Amount _____

CASING:

	Depth From	To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	10.5 Ft.	2 in	SCH40	PVC
		Ft.			
		Ft.			

GROUT:

	Depth From	To	Material	Method
	0	8.5 Ft.	portland	poured
		Ft.		

SCREEN:

	Depth From	To	Diameter	Slot Size	Material
	10.5	20.5 Ft.	2 in.	.01 in.	PVC
		Ft.	in.	in.	
		Ft.	in.	in.	

GRAVEL PACK:

	Depth From	To	Size	Material
	9.5	20.5 Ft.	coarse	sand
		Ft.		

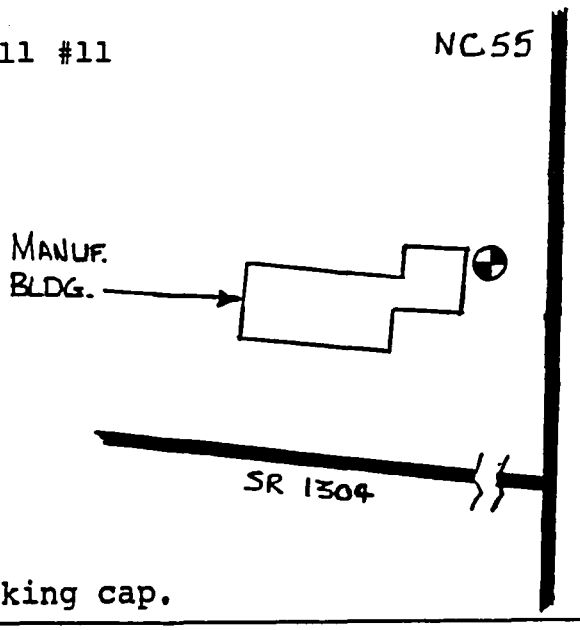
REMARKS: 1' bentonite seal above sand pack, locking cap.

DRILLING LOG	
Depth From To	Formation Description
0 - .5 ft	crusher run coquina
.5 - 20.5	sandy clays and clays

If additional space is needed use back of form.

LOCATION SKETCH

(Show direction and distance from at least two State Roads, or other map reference points)



I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Ray T. Whitaker 11-9-87

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

GW-1 Revised 11/84

NORTH CAROLINA DEPARTMENT OF NATURAL RESOURCES AND COMMUNITY DEVELOPMENT
DIVISION OF ENVIRONMENTAL MANAGEMENT - GROUNDWATER SECTION
P.O. BOX 27687 - RALEIGH, N.C. 27611, PHONE (919) 733-5083

FOR OFFICE USE ONLY
Quad. No. _____ Serial No. _____
Lat. _____ Long. _____ Pc _____
Minor Basin _____
Basin Code _____
Header Ent. _____ GW-1 Ent. _____

WELL CONSTRUCTION RECORD

DRILLING CONTRACTOR Froehling & Robertson, Inc.

DRILLER REGISTRATION NUMBER 421

STATE WELL CONSTRUCTION PERMIT NUMBER: 24-0267-WM-0111

1. WELL LOCATION: (Show sketch of the location below)

Nearest Town: New Bern

County: Craven

(Road, Community, or Subdivision and Lot No.)

2. OWNER Amital Spinning Corp.

ADDRESS Stanley Blvd. (Street or Route No.)

New Bern, NC 28651 (City or Town, State, Zip Code)

3. DATE DRILLED 10-21-87 USE OF WELL monitoring

4. TOTAL DEPTH 39.5 ft CUTTINGS COLLECTED ☒ Yes ☐ No

5. DOES WELL REPLACE EXISTING WELL? ☐ Yes ☒ No

6. STATIC WATER LEVEL: 19.08 FT. ☐ above ☒ below TOP OF CASING,

TOP OF CASING IS 1.22 FT. ABOVE LAND SURFACE.

7. YIELD (gpm): _____ METHOD OF TEST _____

8. WATER ZONES (depth): _____

9. CHLORINATION: Type _____ Amount _____

10. CASING:

	Depth From	Depth To	Diameter	Wall Thickness or Weight/Ft.	Material
	0	30	2 in	SCH40	PVC

11. GROUT:

	Depth From	Depth To	Material	Method
	0	28	Portland	Poured

12. SCREEN:

	Depth From	Depth To	Diameter	Slot Size	Material
	30	40	2 in.	.01 in.	PVC
			in.	in.	
			in.	in.	

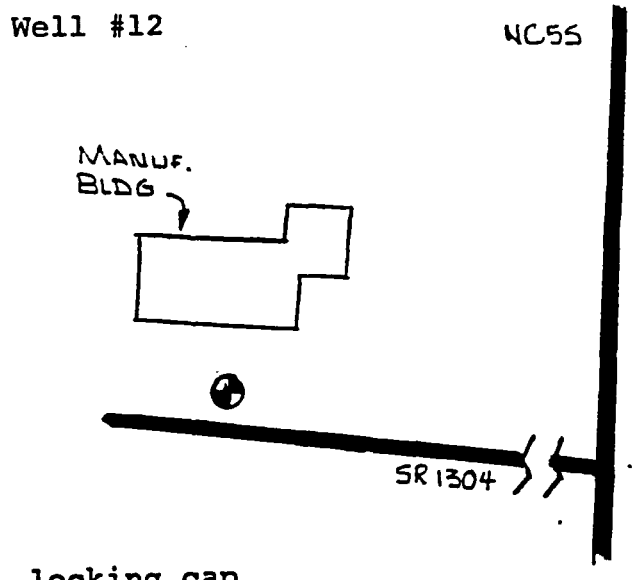
13. GRAVEL PACK:

	Depth From	Depth To	Size	Material
	29	40	coarse	sand

Depth From	Depth To	DRILLING LOG Formation Description
0	2 ft	tan fine sand
2	27 ft	interbedded gray fine sandy clay and clay
27	37 ft	yorktown formation - cemented shell hash
37	39.5 ft	Castle Hayne - fossil limestone

If additional space is needed use back of form.

LOCATION SKETCH
(Show direction and distance from at least two State Roads, or other map reference points)



14. REMARKS: 1' bentonite seal above sand pack, locking cap

I DO HEREBY CERTIFY THAT THIS WELL WAS CONSTRUCTED IN ACCORDANCE WITH 15 NCAC 2C, WELL CONSTRUCTION STANDARDS, AND THAT A COPY OF THIS RECORD HAS BEEN PROVIDED TO THE WELL OWNER.

Ray T. Whitaker 11-9-87

SIGNATURE OF CONTRACTOR OR AGENT DATE

Submit original to Division of Environmental Management and copy to well owner

GW-1 Revised 11/84

TEST BORING RECORD

SITE: TEXFI, NEW BERN
DATE DRILLED: 12-22-87
JOB NUMBER: 3108-0-1222

BORING NO: WELL 11
GROUNDWATER DEPTH: 18.98
DATE MEASURED: 12-27-87

DEPTH (FT.)	UNIFIED CLASSIFICATION	PENETRATION RESISTANCE (BLOWS/FT.) 0 20 40 60 80 100	LITHOLOGY	ELEV.
				27.9
	FIRM TAN AND GRAY SILT-SAND BLN COQUINA (SM)	*		25.6
2.3				
	SOFT DARK BROWN AND GRAY PLASTIC CLAY (CH)	*	STRUCTURELESS	
4.5				23.1
	SOFT GRAY AND BLACK FINE SANDY, SILTY CLAY (CL)	*	WEAK CRUMB STRUCTURE	
		*		
9.5				18.1
	SOFT DARK GRAY SLIGHTLY SILTY ORGANIC CLAY (OL)		NATURAL ORGANIC ODOR FAINT HORIZONTAL BEDDING	
		*		15.6
12.0				
	LOOSE TO VERY LOOSE DARK GRAY CLAYEY FINE SAND (SC)	*	SAND PRIMARILY WELL ROUNDED TO SUB-ROUNDED QUARTZ GRAINS SINGLE GRAIN STRUCTURE, NATURAL ORGANIC ODOR	
		*		
		*		
22.0				5.9
	BORING TERMINATED 22.0 FT.			

REMARKS:

MAIN 1893

TEST BORING RECORD

SITE: TEXFI NEW BERN
DATE DRILLED: 10-21-87
JOB NUMBER: 3126-9-1000

BORING NO: NB-12
GROUNDWATER DEPTH: 15.00
DATE MEASURED: 10-27-87

DEPTH (FT.)	UNIFIED CLASSIFICATION	PENETRATION RESISTANCE (BLOWS/FT.) 0 20 40 60 80 120	LITHOLOGY	ELEV.
				33.3
	LOOSE TAN SILTY FINE SAND (SP)	*	GRASS ROOT FRAGMENTS SINGLE GRAIN STRUCTURE	
3.0				30.3
	FIRM TAN AND GRAY MOTTLED SLIGHTLY SANDY CLAY (CL)	*	ANGULAR BLOCKY STRUCTURE	
7.0		*		26.3
	SOFT DARK GRAY AND ORANGE MOTTLED SLIGHTLY SANDY CLAY (CL)	*	FAINT HORIZONTAL BEDDING	
9.5				23.8
	SOFT DARK GRAY VERY FINE TO COARSE SANDY CLAY (CL)	*	NATURAL ORGANIC ODOR	
12.0				
	VERY LOOSE DARK GRAY ORGANIC CLAYEY FINE TO COARSE SAND (SC)	*	SAND PRIMARILY ROUNDED TO SUB-ROUNDED QUARTZ GRAINS, SINGLE GRAIN STRUCTURE	
14.5				18.8
	SOFT TO FIRM DARK GRAY FINE SANDY ORGANIC CLAY (OL)	*	COARSE SAND GRAINS PRIMARILY SHELL HASH	
19.5		*		
	STIFF TO VERY STIFF DARK GRAY SILTY, FINE SANDY CLAY (OL)	*	INTERBEDDED FINE SAND AND CLAY, LENSES OF MEDIUM SAND SIZE SHELL HASH	
	STIFF DARK GRAY SILTY FINE SAND (SM)	*		
27.0		*		6.3
		*		

REMARKS:

MAIN 1893

"GS" BORING RECORD

SITE: TEXFI, NEW BERN
DATE DRILLED: 10-21-87
JOB NUMBER: 3138-9-1000

BORING NO: WELL 12
GROUNDWATER DEPTH: 19.08
DATE MEASURED: 10-27-87

DEPTH (FT.)	UNIFIED CLASSIFICATION	PENETRATION RESISTANCE (BLOWS/FT.) 0 20 40 60 80 100	LITHOLOGY	ELEV.
	FIRM LIGHT GRAY FINE TO COARSE SHELL SAND (SW)	*	YORKTOWN FORMATION SINGLE GRAIN STRUCTURE, OCCASIONALLY CEMENTED CLASTS	
		*		
37.0	ROCK SAMPLED AS POORLY GRADED GRAVEL (GP)	*	CASTLE HAYNES FORMATION FOSSILIFERIOUS LIMESTONE	9.7
		50/5" *		
39.5	BORING TERMINATED 39.5 FT.			11.2

REMARKS:

MAIN 1893

CHAS. T. MAIN, INC.

MAIN

TWO FAIRVIEW PLAZA, 5950 FAIRVIEW RD., P.O.BOX 240236, CHARLOTTE, N.C. 28224, TEL 704/554-1100

MAIN Sample Number
87-1464
87-1465
87-1466
87-1467
87-1468

Job #: 3136-9-1000

MAIN ANALYTICAL LABORATORY
RESULTS OF ANALYTICAL TESTING

Date: 11/24/87

CLIENT: Southridge Corporation

Address: Texfi
P. O. Box 10904
Greensboro, N.C. 27404

P.O.#:
Attn: Mr. John Tate

Sample No.	Date Taken	Sample Description
87-1464	10/28/87	Well #2A
87-1465	10/28/87	Well #3A
87-1466	10/28/87	Well #4
87-1467	10/28/87	Well #4A
87-1468	10/28/87	Well #6

Date Samples Rec'd.: 10/30/87
Rec'd/Logged By: JL

Shipped By: H. Lyons, R. Harmon
Invoice Date:

By	Parameter	Unit	Concentration				
			87-1464	87-1465	87-1466	87-1467	87-1468
CC	Volatile Organics	------	See Attachments------				
	Method 624						

Remarks:.

MAIN Analytical Lab

MAIN

CHAS. T. MAIN, INC.

TWO FAIRVIEW PLAZA, 5950 FAIRVIEW RD., P.O.BOX 240236, CHARLOTTE, N.C. 28224, TEL 704/554-1100

MAIN Sample Number
87-1469
87-1470
87-1471
87-1472
87-1473

Job #: 3136-9-1000

MAIN ANALYTICAL LABORATORY
RESULTS OF ANALYTICAL TESTING

Date: 11/24/87

CLIENT: Southridge Corporation

Address: Texfi
P. O. Box 10904
Greensboro, N.C. 27404

P.O. #:
Attn: Mr. John Tate

Sample No.	Date Taken	Sample Description
87-1469	10/28/87	Well #8
87-1470	10/28/87	Well #9
87-1471	10/28/87	Well #9A
87-1472	10/28/87	Well #11
87-1473	10/28/87	Well #12

Date Samples Rec'd.: 10/30/87
Rec'd/Logged By: JL

Shipped By: H. Lyons, R. Harmon
Invoice Date: 99 (12)

By	Parameter	Unit	Concentration				
			87-1469	87-1470	87-1471	87-1472	87-1473
CC	Volatile Organic		------See	Attachmen	ts------		
	Method 624						

Remarks:

MAIN Analytical Lab

COMPUCHEM LABORATORIES

- TABLE OF CONTENTS -

Chronicle

Method Reference

Data Summary

- Volatile Organics

Quality Control Summary

Quality Assurance Notices*

Chain of Custody**

*These notices are included where appropriate for data qualification.

**When the original chain of custody is submitted with the sample(s), a copy of it is included with the report.

METHOD REFERENCE

CompuChem® employs Method 624 for the GC/MS analysis of volatile priority pollutant organics in liquid matrices. This method is published in Volume 49, October 26, 1984 Federal Register.

Method Summary

As stated in the October 1984 reference, "An inert gas is bubbled through a 5 ml sample contained in a specially designed purging chamber at ambient temperature. The purgeables are efficiently transferred from the aqueous phase to the vapor phase. The vapor is swept through a sorbent column where the purgeables are trapped. After purging is completed, the sorbent column is heated and backflushed with the inert gas to desorb the purgables onto a gas chromatographic column ... which are then detected with a mass spectrometer."

The referenced methods are no longer appropriate for several of the original priority pollutant compounds. This is due to either the deletion from the toxic pollutant list (40 CFR Part 401) by EPA or the determination by EPA that the referenced methods may not be optimized for certain compounds (EPA-600/4-82-057) originally incorporated by the methods.

Those compounds which have actually been deleted are listed below with the Federal Register deletion reference.

Compound Name	GC/MS Fraction	Federal Register	Date
Dichlorodifluoromethane	Volatile	46FR2264	1/8/81
Trichlorofluoromethane	Volatile	46FR2264	1/8/81
Bis(Chloromethyl)Ether	Volatile	46FR10723	2/4/81

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1464	162164	11/03/87	11/10/87

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1464
COMPUCHEM® SAMPLE NUMBER: 162164

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	BDL	10
5V.	METHYLENE CHLORIDE	15	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	BDL	10
9V.	1,1-DICHLOROETHANE	7 J	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D_4-1,2-Dichloroethane	92	(76-114)
4-Bromofluorobenzene	88	(86-115)
D_8-Toluene	100	(88-110)

BDL=BELOW DETECTION LIMIT
J=Estimated concentration; values are between the detection limit and one-half of that limit.

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1464
COMPUCHEM® SAMPLE NUMBER: 162164

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BF871110C13	OK
Shift Standard	VS871110C13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1465	162165	11/03/87	11/10/87

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1465
COMPUCHEM® SAMPLE NUMBER: 162165

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	40	10
5V.	METHYLENE CHLORIDE	11	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	10	10
9V.	1,1-DICHLOROETHANE	230	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range%
D_4-1,2-Dichloroethane	88	(76-114)
4-Bromofluorobenzene	102	(86-115)
D_8-Toluene	101	(88-110)

BDL= BELOW DETECTION LIMIT

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1465
COMPUCHEM® SAMPLE NUMBER: 162165

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871110A13	OK
Shift Standard	VU871110A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1466	162166	11/03/87	11/09/87

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1466
COMPUCHEM® SAMPLE NUMBER: 162166

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	BDL	10
5V.	METHYLENE CHLORIDE	11	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	BDL	10
9V.	1,1-DICHLOROETHANE	BDL	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D_4-1,2-Dichloroethane	82	(76-114)
4-Bromofluorobenzene	86	(86-115)
D_8-Toluene	91	(88-110)

BDL=BELOW DETECTION LIMIT

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1466
COMPUCHEM® SAMPLE NUMBER: 162166

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BF871109A13	OK
Shift Standard	VU871109A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

LABORATORY NOTICE

CC # 162167

ID # 87-1467

The volatile fraction of this sample was analyzed twice as a Low Level Liquid, once neat and once at a 200:1 dilution. The neat analysis had a number of saturated analytes which required dilution. In addition, BFB failed surrogate recovery criteria, even when calculated using secondary ions. This has been attributed to sample matrix interference. The 200:1 analysis passed all dilution and QC requirements. In order to provide the greatest amount of information, we are reporting both aanlyses with reference to this qualifier.

Sarah A. Hubbard

Sarah A. Hubbard

Senior Volatile Data Specialist

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1467	162167	11/03/87	11/09/87 11/11/87*

*Sample extract re-analyzed at a dilution.

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1467
COMPUCHEM® SAMPLE NUMBER: 162167

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	38	10
4V.	CHLOROETHANE	110	10
5V.	METHYLENE CHLORIDE	62	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	1200† J	2000†
9V.	1,1-DICHLOROETHANE	120000†	2000†
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	23	10
12V.	1,2-DICHLOROETHANE	460	10
13V.	1,1,1-TRICHLOROETHANE	90000†	2000†
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	620	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	22	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	19	10
26V.	1,1,2,2-TETRACHLOROETHANE	20	10
27V.	TOLUENE	8 J	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D_4-1,2-Dichloroethane	105	(76-114)
4-Bromofluorobenzene	*	(86-115)
D_8-Toluene	97	(88-110)

BDL=BELOW DETECTION LIMIT
J=Estimated concentration; values are between the detection limit and one-half of that limit.
†This value was obtained from a 200:1 dilution of the sample extract. All other data, including detection limits, were obtained from the analysis of the undiluted extract.
*See Laboratory Notice

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1467
COMPUCHEM® SAMPLE NUMBER: 162167

VOLATILE (Diluted)

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BK871111C13	OK
Shift Standard	VS871111C13	OK

VOLATILE (Undiluted)

Blank	162425	OK
Sample Spike	161258	OK
BFB*	BF871109A13	OK
Shift Standard	VU871109A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1468	162168	11/03/87	11/10/87

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1468
COMPUCHEM® SAMPLE NUMBER: 162168

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	BDL	10
5V.	METHYLENE CHLORIDE	16	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	BDL	10
9V.	1,1-DICHLOROETHANE	BDL	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range%
D_4-1,2-Dichloroethane	79	(76-114)
4-Bromofluorobenzene	91	(86-115)
D_8-Toluene	97	(88-110)

BDL= BELOW DETECTION LIMIT

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1468
COMPUCHEM® SAMPLE NUMBER: 162168

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871110A13	OK
Shift Standard	VU871110A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1469	162169	11/03/87	11/10/87

8

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1469
COMPUCHEM® SAMPLE NUMBER: 162169

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	BDL	10
5V.	METHYLENE CHLORIDE	15	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	37	10
9V.	1,1-DICHLOROETHANE	290	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D_4-1,2-Dichloroethane	81	(76-114)
4-Bromofluorobenzene	87	(86-115)
D_8-Toluene	94	(88-110)

BDL=BELOW DETECTION LIMIT

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1469
COMPUCHEM® SAMPLE NUMBER: 162169

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871110A13	OK
Shift Standard	VU871110A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1470	162170	11/03/87	11/10/87 11/11/87*

*Analysis repeated at a dilution.

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1470
COMPUCHEM® SAMPLE NUMBER: 162170

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	10	10
5V.	METHYLENE CHLORIDE	12	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	1100†† J	1700††
9V.	1,1-DICHLOROETHANE	8300††	1700††
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	17	10
12V.	1,2-DICHLOROETHANE	20	10
13V.	1,1,1-TRICHLOROETHANE	32000††	1700††
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	11	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	31	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	18	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range%
D_4-1,2-Dichloroethane	82	(76-114)
4-Bromofluorobenzene	94	(86-115)
D_8-Toluene	94	(80-110)

BDL= BELOW DETECTION LIMIT
J=Estimated concentration; values are between the detection limit and one-half of that limit.
††These values were obtained from a 167:1 dilution of the sample. All other values, including detection limits were obtained from an analysis of the undiluted sample.

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1470
COMPUCHEM® SAMPLE NUMBER: 162170

VOLATILE (Undiluted)

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BK871111C13	OK
Shift Standard	VS871111C13	OK

VOLATILE (Diluted)

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871110A13	OK
Shift Standara	VU871110A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1471	162171	11/03/87	11/11/87

9A

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1471
COMPUCHEM® SAMPLE NUMBER: 162171

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	11	10
5V.	METHYLENE CHLORIDE	13	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	BDL	10
9V.	1,1-DICHLOROETHANE	200	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D_4-1,2-Dichloroethane	85	(76-114)
4-Bromofluorobenzene	105	(86-115)
D_8-Toluene	109	(88-110)

BDL=BELOW DETECTION LIMIT

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1471
COMPUCHEM® SAMPLE NUMBER: 162171

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871111A13	OK
Shift Standard	VT871111A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1472	162172	11/03/87	11/11/87

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1472
COMPUCHEM® SAMPLE NUMBER: 162172

		CONCENTRATION (ug/L)	DETECTION† LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	17
2V.	BROMOMETHANE	BDL	17
3V.	VINYL CHLORIDE	BDL	17
4V.	CHLOROETHANE	BDL	17
5V.	METHYLENE CHLORIDE	12 J	17
6V.	ACROLEIN	BDL	170
7V.	ACRYLONITRILE	BDL	170
8V.	1,1-DICHLOROETHYLENE	15 J	17
9V.	1,1-DICHLOROETHANE	360	17
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	17
11V.	CHLOROFORM	BDL	17
12V.	1,2-DICHLOROETHANE	BDL	17
13V.	1,1,1-TRICHLOROETHANE	BDL	17
14V.	CARBON TETRACHLORIDE	BDL	17
15V.	BROMODICHLOROMETHANE	BDL	17
16V.	1,2-DICHLOROPROPANE	BDL	17
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	17
18V.	TRICHLOROETHYLENE	BDL	17
19V.	DIBROMOCHLOROMETHANE	BDL	17
20V.	1,1,2-TRICHLOROETHANE	BDL	17
21V.	BENZENE	BDL	17
22V.	CIS-1,3-DICHLOROPROPENE	BDL	17
23V.	2-CHLOROETHYL VINYL ETHER	BDL	17
24V.	BROMOFORM	BDL	17
25V.	TETRACHLOROETHYLENE	BDL	17
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	17
27V.	TOLUENE	BDL	17
28V.	CHLOROBENZENE	BDL	17
29V.	ETHYLBENZENE	BDL	17

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range%
D_4-1,2-Dichloroethane	77	(76-114)
4-Bromofluorobenzene	114	(86-115)
D_8-Toluene	110	(80-110)

BDL= BELOW DETECTION LIMIT
J=Estimated concentration; values are between the detection limit and one-half of that limit.
†Sample analyzed using a 1.67:1 dilution, thus the higher than normal detection limits.

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1472
COMPUCHEM® SAMPLE NUMBER: 162172

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871111A13	OK
Shift Standard	VT871111A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

COMPUCHEM LABORATORIES

ANALYTICAL REPORT OF DATA
SUBMITTED TO:

Ms. Linda Mitchell
Charles T. Main, Inc.
P.O. Box 240236
Charlotte, NC 28210

CHRONICLE

ITEM NO.	SAMPLE IDENTIFIER	COMPUCHEM® NUMBER	DATE SAMPLE RECEIVED	DATE VOLATILE FRACTION ANALYZED
1.	87-1473	162173	11/03/87	11/11/87

COMPOUND LIST - VOLATILE ORGANICS

SAMPLE IDENTIFIER: 87-1473
COMPUCHEM® SAMPLE NUMBER: 162173

		CONCENTRATION (ug/L)	DETECTION LIMIT (ug/L)
1V.	CHLOROMETHANE	BDL	10
2V.	BROMOMETHANE	BDL	10
3V.	VINYL CHLORIDE	BDL	10
4V.	CHLOROETHANE	BDL	10
5V.	METHYLENE CHLORIDE	11	10
6V.	ACROLEIN	BDL	100
7V.	ACRYLONITRILE	BDL	100
8V.	1,1-DICHLOROETHYLENE	BDL	10
9V.	1,1-DICHLOROETHANE	BDL	10
10V.	TRANS-1,2-DICHLOROETHYLENE	BDL	10
11V.	CHLOROFORM	BDL	10
12V.	1,2-DICHLOROETHANE	BDL	10
13V.	1,1,1-TRICHLOROETHANE	BDL	10
14V.	CARBON TETRACHLORIDE	BDL	10
15V.	BROMODICHLOROMETHANE	BDL	10
16V.	1,2-DICHLOROPROPANE	BDL	10
17V.	TRANS-1,3-DICHLOROPROPENE	BDL	10
18V.	TRICHLOROETHYLENE	BDL	10
19V.	DIBROMOCHLOROMETHANE	BDL	10
20V.	1,1,2-TRICHLOROETHANE	BDL	10
21V.	BENZENE	BDL	10
22V.	CIS-1,3-DICHLOROPROPENE	BDL	10
23V.	2-CHLOROETHYL VINYL ETHER	BDL	10
24V.	BROMOFORM	BDL	10
25V.	TETRACHLOROETHYLENE	BDL	10
26V.	1,1,2,2-TETRACHLOROETHANE	BDL	10
27V.	TOLUENE	BDL	10
28V.	CHLOROBENZENE	BDL	10
29V.	ETHYLBENZENE	BDL	10

Surrogate Recoveries - Introduced at the instrument, volatile surrogate standards are deuterated and/or select compounds that analytically mimic the response of certain analytes. Known concentrations of these surrogates are added to the sample and a percent recovery is calculated. This recovery acts as a barometer of method efficiency for the individual sample.

	% Recovery	Control Range %
D_4-1,2-Dichloroethane	81	(76-114)
4-Bromofluorobenzene	102	(86-115)
D_8-Toluene	110	(88-110)

BDL=BELOW DETECTION LIMIT

QUALITY CONTROL SUMMARY

SAMPLE IDENTIFIER: 87-1473
COMPUCHEM® SAMPLE NUMBER: 162173

VOLATILE

	NUMBER	ACCEPTANCE CRITERIA
Blank	162425	OK
Sample Spike	161258	OK
BFB*	BG871111A13	OK
Shift Standard	VT871111A13	OK

*The tuning calibration compound, Bromofluorobenzene, is used for the volatile instruments.

FIELD LOG FORM

1/2

GROUNDWATER MONITORING

ANALYTICAL LABORATORY

CLIENT: TEXFI

JOB NUMBER: 3136-8-1000

Address: NEW BERN

Quarter:

Sampling Periods:

Attention:

SAMPLE COLLECTION PROCEDURE:

WELL EVACUATION:

Well #	Description	Date	Time	Water Level Prior to Evacuation	Remarks
6		2-17-87	AM	19.10 SWL/TOC	100 BAILS - 2" BAILER
7		"	AM	12.31	BAILED DRY (CLEAN)
8		"	AM	18.69	BAILED DRY (CLEAN)
9		"	AM	15.19	BAILED DRY (CLEAN)
3A	NOT DEVELOPED LETCO WELL	2-18-87	AM	7.89	BAILED DRY (DIRTY)

WELL SAMPLING - FIELD ANALYSIS:

Well #	Date	Time	Water Level	pH (units)	Temp. (C°)	Conductivity (mmhos)	MAIN #
6	2-18-87	AM	N/A	6.93	15.5	580	W-6
7	"	AM	N/A	6.39	15.3	805	W-7
8	"	AM	N/A	6.56	15.2	1000	W-8
9	"	AM	N/A	5.33	15.2	850	W-9
3A	"	AM	N/A	5.96	14.0	1150	W-3A

NOTES:

Name of Sampler (print) HWL / RCA

Name of Sampler (sign)

Date 2-18-87

MAIN

FIELD LOG FORM

2/2

GROUNDWATER MONITORING

ANALYTICAL LABORATORY

CLIENT: TEXEL

JOB NUMBER: 31360-8-1000

Address: NEW BERAL

Quarter:

Sampling Periods:

Attention:

SAMPLE COLLECTION PROCEDURE:

WELL EVACUATION:

Well #	Description	Date	Time	Water Level Prior to Evacuation	Remarks
4A	NOT DEVELODDED LETCO WELL	2-18-87	AM	14.96 SWL/TOC	BAILED DRY (CLEAN)

WELL SAMPLING - FIELD ANALYSIS:

Well #	Date	Time	Water Level	pH (units)	Temp. (C°)	Conductivity (mmhos)	MAIN #
4A	2-18-87	AM	N/A	4.95	15.2	3600	W-4A

NOTES:

Name of Sampler (print) HWL / RCA

Name of Sampler (sign)

Date 2-18-87

MAIN

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 2A

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 29.28 Feet

(B)Depth of Well From Top of Casing: 18.5 Feet

(C)Depth to Water: (10.82) 11.78 Feet

(D)Elevation of Water Level: (A) - (C) = 17.50 Feet

(E)Number of Feet of Water: (B) - (C) = 6.72 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* 1.1 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry _____ 3-5 Volumes ✓

(J)Time: 10-28-87 AM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 6.31 Temp 19.3 Specific Conductance 490

(D)Type of Containers: VOA vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 3A

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 30.06 Feet

(B)Depth of Well From Top of Casing: 18.5 Feet

(C)Depth to Water: (8.67) 9.63 Feet

(D)Elevation of Water Level: (A) - (C) = 20.43 Feet

(E)Number of Feet of Water: (B) - (C) = 8.87 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* 1.5 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry ✓ 3-5 Volumes _____

(J)Time: 10-28-87 AM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 5.61 Temp 19.7 Specific Conductance 900

(D)Type of Containers: VOA Vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 4A

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 29.81 Feet

(B)Depth of Well From Top of Casing: 18.5 Feet

(C)Depth to Water: (12.78) 13.74 Feet

(D)Elevation of Water Level: (A) - (C) = 16.07 Feet

(E)Number of Feet of Water: (B) - (C) = 4.76 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* .78 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry ✓ 3-5 Volumes _____

(J)Time: 10-28-87 AM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 3.49 Temp 18.9 Specific Conductance 4000

(D)Type of Containers: VOA vials

(E)Preservative: ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLA, HWL Well# 4

Date 10-23-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 28.21 Feet

(B)Depth of Well From Top of Casing: 18 Feet

(C)Depth to Water: (14.43) 15.39 Feet

(D)Elevation of Water Level: (A) - (C) = 12.82 Feet

(E)Number of Feet of Water: (B) - (C) = 2.61 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* .21 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry ✓ 3-5 Volumes _____

(J)Time: 10-28-87 AM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 6.53 Temp 18.6 Specific Conductance 810

(D)Type of Containers: VOA vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLA, HWL Well# 6

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 29.95 Feet

(B)Depth of Well From Top of Casing: 41.48 Feet

(C)Depth to Water: (18.10) 19.06 Feet

(D)Elevation of Water Level: (A) - (C) = 10.89 Feet

(E)Number of Feet of Water: (B) - (C) = 30.59 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* 2.5 Gallons

(H)Purged by Pump ✓ Bailer

(I)Purged to Dry 3-5 Volumes ✓

(J)Time: 10-28-87 AM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 6.85 Temp 17.5 Specific Conductance 740

(D)Type of Containers: VOA vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 8

Date 10-28-87

Weather Conditions: Cloudy, Cool

(A)Elevation of Top of Casing: 29.88 Feet

(B)Depth of Well From Top of Casing: 22.88 Feet

(C)Depth to Water: (16.01) 16.97 Feet

(D)Elevation of Water Level: (A) - (C) = 12.91 Feet

(E)Number of Feet of Water: (B) - (C) = 5.91 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* .96 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry ✓ 3-5 Volumes _____

(J)Time: 10-28-87

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 4.77 Temp 17.6 Specific Conductance 1500

(D)Type of Containers: VOA Vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 9

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 29.61 Feet

(B)Depth of Well From Top of Casing: 21.0 Feet

(C)Depth to Water: (13.85) 14.81 Feet

(D)Elevation of Water Level: (A) - (C) = 14.80 Feet

(E)Number of Feet of Water: (B) - (C) = 6.19 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* 1.01 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry ✓ 3-5 Volumes _____

(J)Time: 10-28-87 P.M

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 3.92 Temp 20.0 Specific Conductance 1450

(D)Type of Containers: VOA vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 9A

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 29.53 Feet

(B)Depth of Well From Top of Casing: 40.0 Feet

(C)Depth to Water: (18.09) 19.05 Feet

(D)Elevation of Water Level: (A) - (C) = 10.48 Feet

(E)Number of Feet of Water: (B) - (C) = 20.95 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* 3.42 Gallons

(H)Purged by Pump ✓ Bailer

(I)Purged to Dry 3-5 Volumes ✓

(J)Time: 10-28-87 PM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87

(C)Measurements: pH 6.64 Temp 18.7 Specific Conductance 925

(D)Type of Containers: VOA vials

(E)Preservative: ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 11

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 30.24 Feet

(B)Depth of Well From Top of Casing: 23.03 Feet

(C)Depth to Water: (16.02) 16.98 Feet

(D)Elevation of Water Level: (A) - (C) = 13.26 Feet

(E)Number of Feet of Water: (B) - (C) = 6.05 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* .99 Gallons

(H)Purged by Pump _____ Bailer ✓

(I)Purged to Dry ✓ 3-5 Volumes _____

(J)Time: 10-28-87 AM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 6.20 Temp 16.9 Specific Conductance 1300

(D)Type of Containers: VOA Vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408

WATER LEVEL MEASUREMENT AND PURGING PROCEDURE

Personnel: RLH, HWL Well# 12

Date 10-28-87

Weather Conditions: Cloudy, cool

(A)Elevation of Top of Casing: 29.50 Feet

(B)Depth of Well From Top of Casing: 40.06 Feet

(C)Depth to Water: (18.12) 19.08 Feet

(D)Elevation of Water Level: (A) - (C) = 10.42 Feet

(E)Number of Feet of Water: (B) - (C) = 20.98 Feet

(F)Diameter of Well: 2 Inches

(G)Volume of Standing Water:* 3.42 Gallons

(H)Purged by Pump ✓ Bailer

(I)Purged to Dry 3-5 Volumes ✓

(J)Time: PM

GROUNDWATER SAMPLING PROCEDURE

(A)Type of Sampling Equipment Used Bailer

(B)Time/Date of Last Calibration of Field Equipment 10-28-87 AM

(C)Measurements: pH 6.61 Temp 18.6 Specific Conductance 940

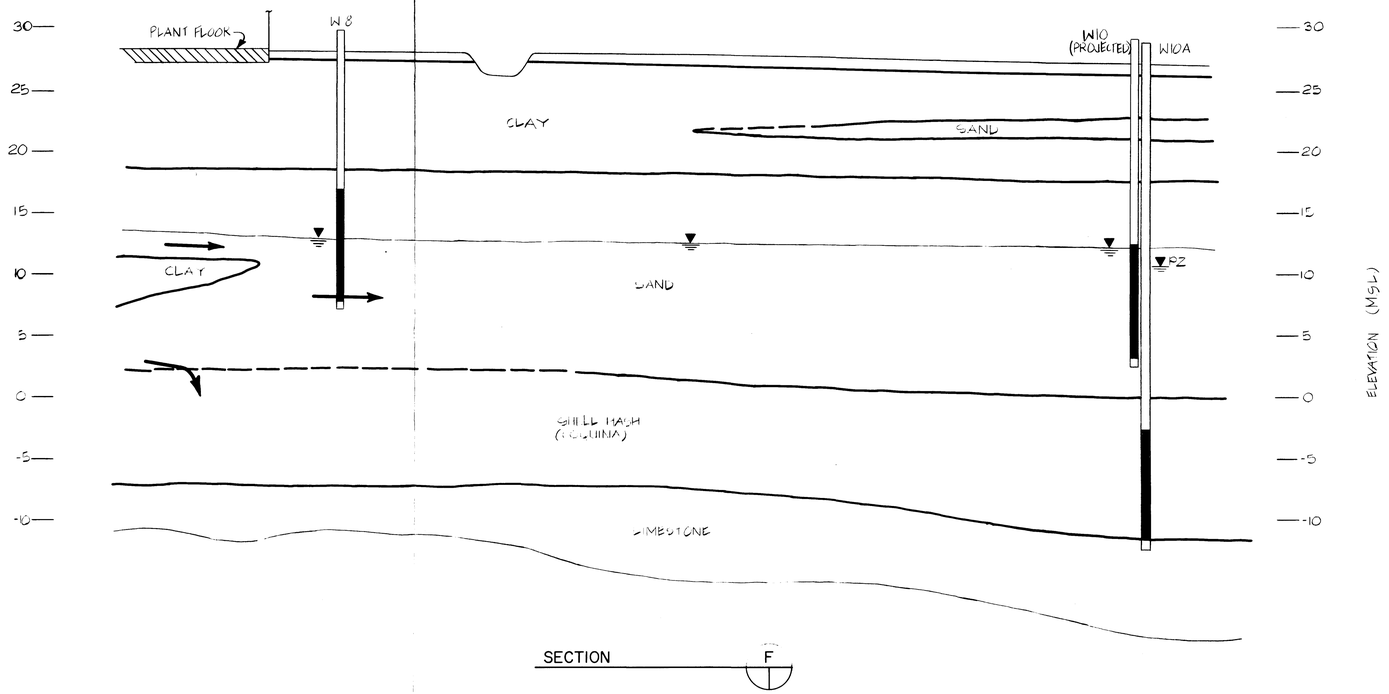
(D)Type of Containers: VOA Vials

(E)Preservative: Ice

(F)Time: PM

Comments:

(E) x (F) x (F) x 0.0408



NOTES

1. REFER TO LEGEND ON R2 FOR COMPLETE SOIL DESCRIPTIONS

LEGEND

→ ESTIMATED CONTAMINANT FLOW PATH.

NOTE:
THE LINES DESIGNATING THE INTERFACES BETWEEN SEDIMENTARY UNITS ON THE GEOLOGICAL SECTIONS ARE DETERMINED BY INTERPOLATION AND ARE THEREFORE APPROXIMATIONS. THE TRANSITIONS MAY BE SHARP OR GRADUAL. ONLY AT THE BORING LOCATIONS SHOULD PROFILES BE CONSIDERED REASONABLY ACCURATE AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOG.

NO	DATE	DESCRIPTION
0	7/30/87	ISSUED FOR REPORT

DRAWN BY: K. HOWELL
CHECKED BY: [illegible]
DESIGN SUPV.
RESP. ENGR.
SUPV.. DISC ENGR.
CH. DISC. ENGR.
PROJECT ENG. MGR.
PROJECT MGR.: Robert L. Martin
IN CHARGE

DRAWN | CHECKED | DES. SUPV. | RESP. ENGR. | SUP. DISC. ENG. | CH. DISC. ENG. | PR. ENG. MGR. | MF

MAIN 1893

CHAS. T. MAIN, INC., Engineers
A Company of The C. T. Main Corporation
Boston • New York • Charlotte • Portland

CLIENT/PROJECT TITLE
TEXFI INDUSTRIES
NEWBERN, NORTH CAROLINA
GROUNDWATER ASSESSMENT

DEPT. INDUSTRIAL | NO. 30

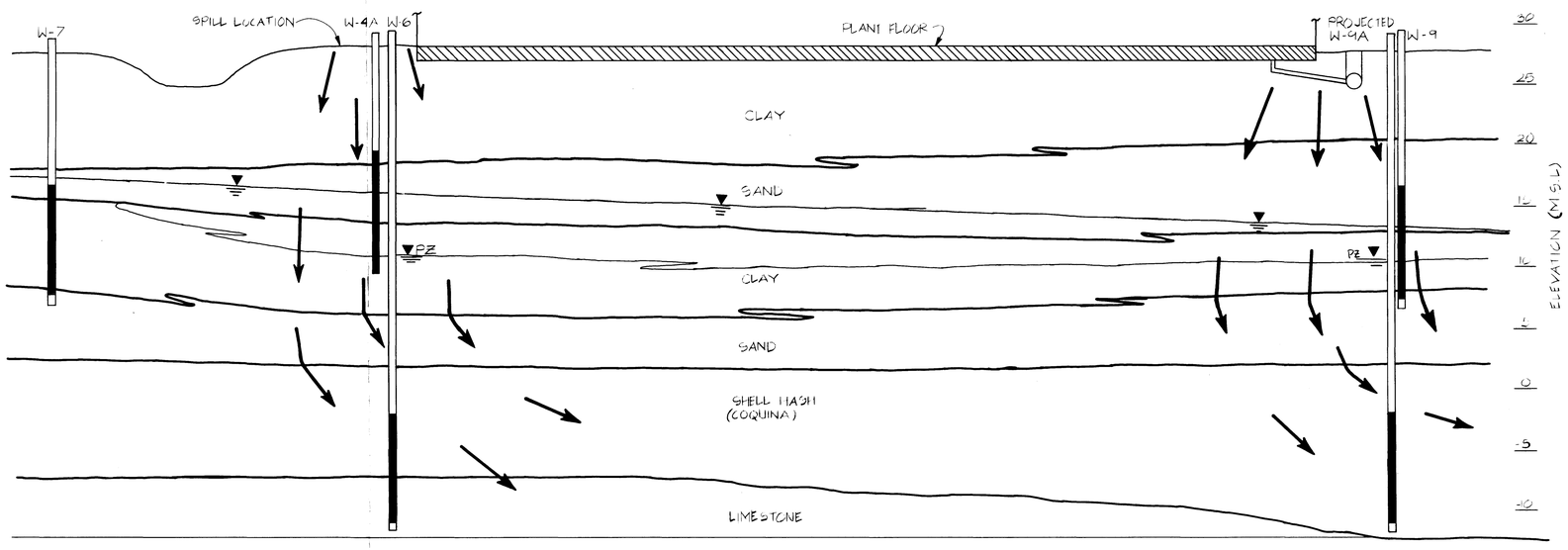
DRAWING DESCRIPTION
ESTIMATED CONTAMINANT FLOW PATHS

SCALE 1:5 VERT. 1:20 HORZ.

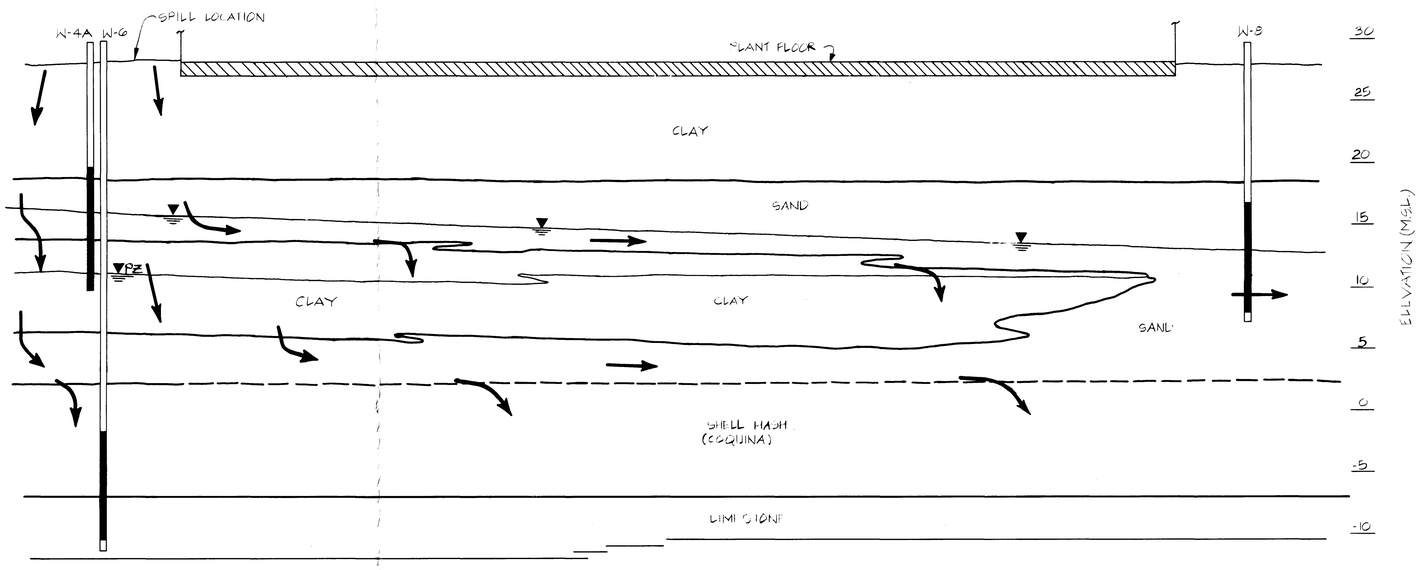
MAIN'S DWG NO. 3136-8-1000-R5 | REV. 0

ARCH HVAC I & C ELECT MECH CIVIL STRUC

The Earthquake



SECTION D



SECTION E

NOTES

1. REFER TO LEGEND ON R2 FOR COMPLETE SOIL DESCRIPTIONS.

LEGEND

→ ESTIMATED CONTAMINANT FLOW PATH.

NOTE:
THE LINES DESIGNATING THE INTERFACES BETWEEN SEDIMENTARY UNITS ON THE GEOLOGICAL SECTIONS ARE DETERMINED BY INTERPOLATION AND ARE THEREFORE APPROXIMATIONS. THE TRANSITIONS MAY BE SHARP OR GRADUAL. ONLY AT THE BORING LOCATIONS SHOULD PROFILES BE CONSIDERED REASONABLY ACCURATE AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOG.

NO	DATE	DESCRIPTION
0	7/30/87	ISSUED FOR REPORT

DRAWN BY K. HOWELL | CHECKED BY | DESIGN SUPV. | RESP. ENGR. | SUPV., DISC ENGR. | CH. DISC. ENGR. | PROJECT ENG. MGR. | PROJECT MGR. Robert L. Martin | IN CHARGE

DRAWN | CHECKED | DES. SUPV. | RESP. ENGR. | SUP. DISC. ENG. | CH. DISC. ENG. | PR. ENG. MGR. | MF

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CLIENT/PROJECT TITLE
TEXFI INDUSTRIES
NEW BERN, NORTH CAROLINA
GROUNDWATER ASSESSMENT

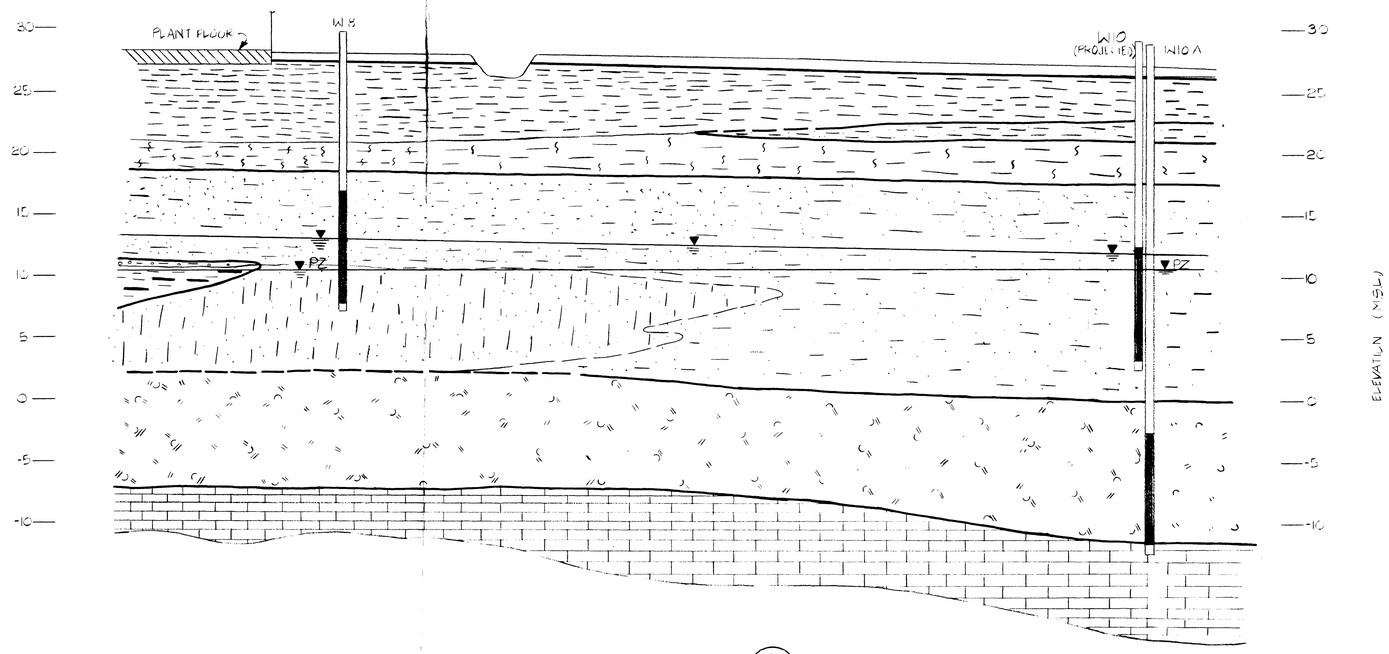
DEPT. INDUSTRIAL | NO. 30

DRAWING DESCRIPTION
ESTIMATED CONTAMINANT FLOW PATHS

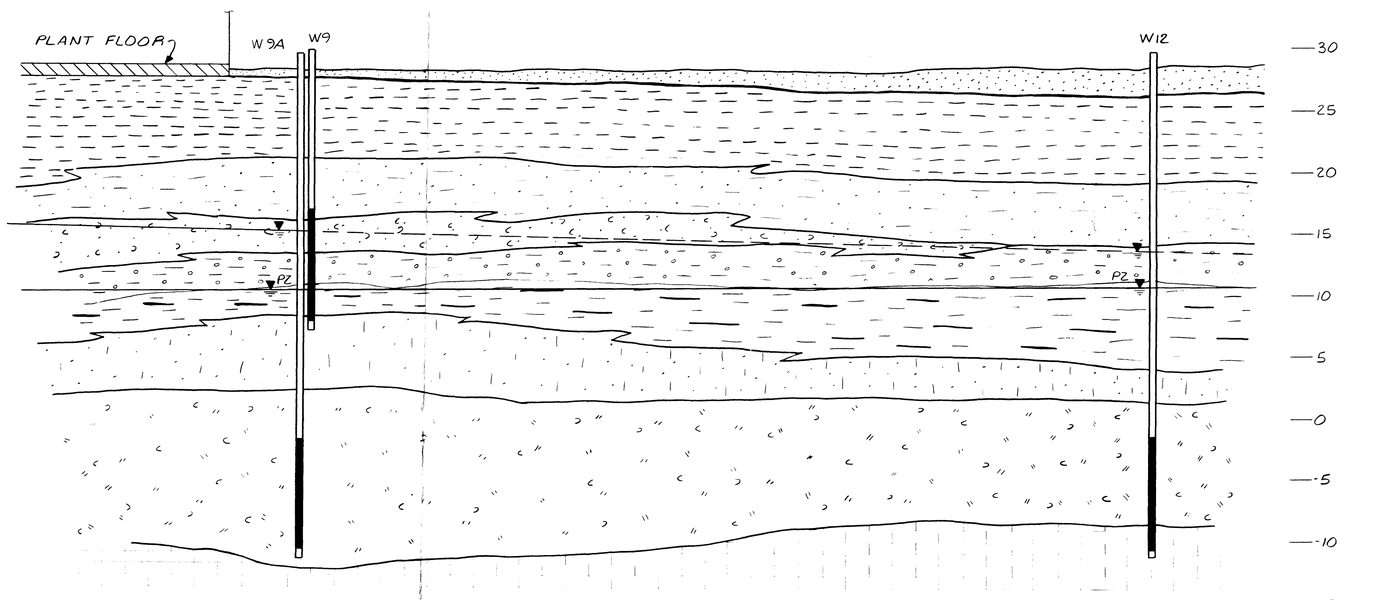
SCALE 1:5 VERT. 1:20 HORZ.

MAIN'S DWG NO. 3136-8-1000-R4 | REV. 1

ARCH HVAC I&C ELECT MECH CIVIL STRUC



SECTION C



SECTION D

NOTES

1. REFER TO LEGEND ON R2.

NOTE:
THE LINES DESIGNATING THE INTERFACES BETWEEN SEDIMENTARY UNITS ON THE GEOLOGICAL SECTIONS ARE DETERMINED BY INTERPOLATION AND ARE THEREFORE APPROXIMATIONS. THE TRANSITIONS MAY BE SHARP OR GRADUAL. ONLY AT THE BORING LOCATIONS SHOULD PROFILES BE CONSIDERED REASONABLY ACCURATE AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOG.

NO	DATE	DESCRIPTION
1	11/29/80	REVISED WATER TABLE & ADDED SECT. D
0	7/30/79	ISSUED FOR REPORT

DRAWN BY K. HOWELL | CHECKED BY | DESIGN SUPV. | RESP. ENGR. | SUPV., DISC ENGR. | CH. DISC. ENGR. | PROJECT ENG. MGR. | PROJECT MGR. IN CHARGE Robert L. Martin

DRAWN | CHECKED | DES. SUPV. | RESP. ENGR. | SUP. DISC. ENG. | CH. DISC. ENG. | PR. ENG. MGR. | MF

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CLIENT/PROJECT TITLE
TEXFI INDUSTRIES
NEWBERN, NORTH CAROLINA
GROUNDWATER ASSESSMENT

DEPT. INDUSTRIAL | NO. 30

DRAWING DESCRIPTION
GEOLOGIC CROSS SECTION
SHEET 2 OF 2

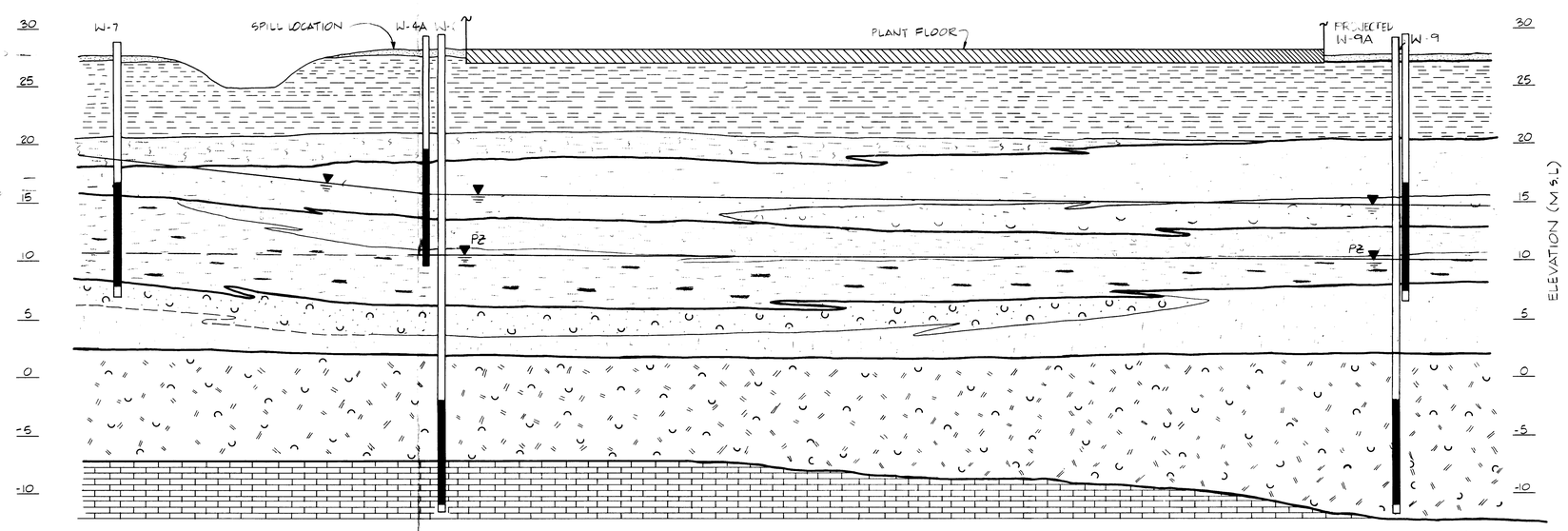
SCALE 1:5 VERT. 1:20 HORZ.

MAIN'S DWG NO. 3136-8-1000-R3 | REV. 1

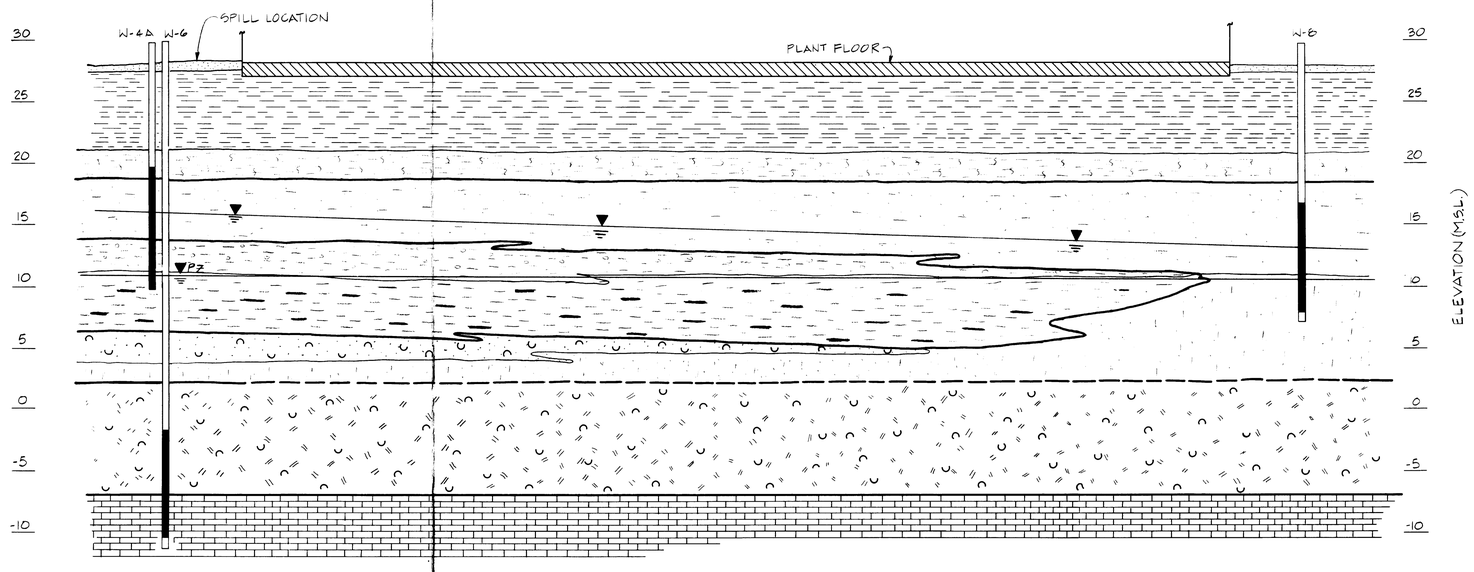
ARCH HVAC I & C ELECT MECH CIVIL STRUC

The Drafboard

DUNCAN PARNELL, INC. - CHARLOTTE 1081



SECTION A



SECTION B

NOTES

LEGEND

- SURFICIAL SAND, 'A' HORIZON (SP, SM, SC)
- FINE SANDY, SILTY CLAY B & B/C HORIZON (CL)
- SILTY CLAY; ZONES OF ORGANICS & PLANT ROOT MATERIAL (OL)
- ORGANIC CLAYEY MEDIUM TO COARSE SAND (SC)
- UNCONSOLIDATED POST-MIOCENE SEDIMENTS: ORGANIC SILTY CLAY WITH APPARENT RIP CLASTS OF SILTY CLAY MATERIAL (OL)
- ORGANIC, FINE SANDY CLAY WITH SILT; UNIT CONTAINS FINE SAND LAMINAE (OL)
- FINE TO COARSE QUARTZ SAND WITH MARINE SHELL FRAGMENTS (SW)
- ORGANIC SILTY FINE SAND (SM)
- YORKTOWN FM (MIOCENE): SHELL HASH, SAND COMPOSED OF FINE TO COARSE SHELL FRAGMENTS CEMENTED WITH CALCIUM CARBONATE (SW)
- CASTLE HAYNE FORMATION (EOCENE): BIOMICRITE, SANDY PELECYPOD-MOLD LIMESTONE
- WATERTABLE SURFACE
- PZ PIEZOMETRIC SURFACE
- WELL SCREEN INTERVAL
- INFERRED CONTACT

NOTE:
THE LINES DESIGNATING THE INTERFACES BETWEEN SEDIMENTARY UNITS ON THE GEOLOGICAL SECTIONS ARE DETERMINED BY INTERPOLATION AND ARE THEREFORE APPROXIMATIONS. THE TRANSITIONS MAY BE SHARP OR GRADUAL. ONLY AT THE BORING LOCATIONS SHOULD PROFILES BE CONSIDERED REASONABLY ACCURATE AND THEN ONLY TO THE DEGREE IMPLIED BY THE NOTES ON THE BORING LOG.

NO	DATE	DESCRIPTION
2	11/2	REVISED WATERTABLE
1	7/30/87	ADDED NEW WELLS & REVISED CONTACT LOCATIONS
0	2/11/87	ISSUED FOR REVIEW

DRAWN BY: J. R. Vincent
CHECKED BY: [illegible]
DESIGN SUPV.
RESP. ENGR.
SUPV. DISC. ENGR.
CH. DISC. ENGR.
PROJECT ENG. MGR.
PROJECT MGR. IN CHARGE: Robert L. Martin

DRAWN / CHECKED / DES SUPV / RESP ENGR / SUP DISC ENG / CH DISC ENG / PR ENG MGR / MF

MAIN
CHAS. T. MAIN, INC.
BOSTON • NEW YORK • CHARLOTTE • DENVER • PORTLAND

CLIENT/PROJECT TITLE
TEXFI INDUSTRIES
NEW BERN, NORTH CAROLINA
GROUNDWATER ASSESSMENT

DEPT. INDUSTRIAL — NO. 30

DRAWING DESCRIPTION
GEOLOGIC CROSS SECTIONS
SHEET 1 OF 2

SCALE 1:5 VERT. 1:20 HORZ.

MAIN'S DWG. NO. 3136-8-1000-R2 — REV. 2

ARCH HVAC I & C ELECT MECH CIVIL STRUC