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Volume 2

Geohydrologic Investigations
Niagara Plant
Niagara Falls, New York

Woodward-Clyde Consultants

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GEOHYDROLOGIC INVESTIGATIONS
NIAGARA PLANT
NIAGARA FALLS, NEW YORK
VOLUME II

Prepared for:

E. I. DUPONT DE NEMOURS & CO., INC.

Niagara Falls, New York

JAN 10 1984

Prepared by:

WOODWARD-CLYDE CONSULTANTS

Plymouth Meeting, Pennsylvania

well logs in w/c 3-57, Dupont SS 12C
Soil logs in Dupont 127-137

APPENDIX

A

APPENDIX A

Woodward-Clyde Consultants performed detailed logging of the rock cores obtained from the monitoring well installations. A total of 52 monitoring wells were installed at the 21 well cluster localities. Well cluster locations are designated on the logs numerically 1 to 21 and well types are designated alphabetically corresponding to the principal fracture (or monitor) zone encountered.

The available NX cores obtained from individual well installations were logged by WCC personnel and these logs are presented on pages A-3 to A-57. Information shown on the rock logs includes core run intervals and recoveries, RQD (Rock Quality Designation), lithologic descriptions, fracture locations and pertinent remarks.

Logs provided by DuPont are also included and are presented on pages A-58 to A-126. These logs were prepared by several Conoco personnel present at the time of monitoring well installations. Information pertaining to events or conditions occurring during borehole advancement are recorded in addition to rock descriptions and well construction details.

Twenty-one soil borings were drilled, one at each of the 21 well cluster localities. Logs of these borings are presented on pages A-127 to A-137. All test borings were advanced utilizing standard sampling and rotary drilling methods. Bedrock was either penetrated by rotary percussion or diamond coring techniques. A-type wells consist

of 4.5 inch steel casing having a 20 slot screen. All other well types consist 4.5 to 6.5 inch steel casing having a variable open-hole section. In all installations the steel casing is grouted inplace.

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 3362336-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Sabol

BORING NUMBER 1-3
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 1/15/85 FINISH 1/25/85

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
12									TOP OF BEDROCK			
13									SOME SOIL			
14								14'	GRAY DOLOMITIC LIMESTONE WITH STYLOLITE ↓			
15	Run 1 13.7-19.0		2.3 / 5.3	43%	5.3 / 5.3	100%			13.9 0° FRACTURE ALONG STYLOLITE 13.7-14.2 minor VUG occurrence 14.2 0° JOINT 14.3 0° JOINT 14.3-14.8 VUG (5mm) SURFACE, WEATHERED 14.5 TWO PARALLEL 0° JOINTS 14.6 0° JOINT	1 5 0		
16									15.7-16.4 VUG (1-10mm) SURFACE WEATHERED 16.0 15° FRACTURE ALONG STYLOLITE 16.1 0° FRACTURE ALONG STYLOLITE 16.6-17.1 VUG (1-10mm) SURFACE WEATHERED	5		
17									16.6 0° JOINT 16.8 0° JOINT 16.9 10° JOINT 17.0 0° JOINT 17.6-17.8 VUG (.1-1mm) SURFACE	5 6		
18									17.5 0° JOINT, GYPSUM COAT 17.6 TWO 0° FRACTURES ALONG STYLOLITES 17.8 0° FRACTURE ALONG GYPSUM VEIN 18.0 GYPSUM VEIN (0°)	3+		
19	Run 2 19.0-22.0		6.6 / 8.6	77%	8.0 / 8.0	100%			18.1 0° JOINT, GYPSUM COAT 18.25 0° JOINT, " " 18.35 0° JOINT, " " 18.5 5° JOINT, " "	4+ 0		
20									18.55 GYPSUM VEIN (0°), 5° JOINT, GYPSUM COAT 18.9 0° JOINT, GYPSUM COAT 19.0 0° JOINT, " " 20.4-20.5 VUG (1mm) SURFACE	1		
21									19.65 0° FRACTURE ALONG STYLOLITE 19.7 0° FRACTURE ALONG STYLOLITE	1		
22									19.9-20.1 BROKEN ZONE (? > 4 JOINTS)			
									20.3 5° JOINT 20.45-20.5 TWO 0° FRACTURES ALONG STYLOLITES			

GENERAL NOTES:
LOG NOTES TOP OF BEDROCK @ 14'

Total Depth 22'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-3

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 3362336-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Sabol

BORING NUMBER 1-3
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 1/15/85 FINISH 1/25/85

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
25									20.9 0° FRACTURE ALONG STYLOLITE 21.9 0° " " " 22.6-24.1 STYLOLITES AND INCREASING FRACTURING (GYPSUM BLEB) 22.0 0° " " "	1		
26									23.9-24 LARGE IRREGULAR FRACTURE, DEEPLY NOTCHED AND WEATHERED (?0°) 24.5 0° FRACTURE ALONG STYLOLITE (MECH?)	0		
27									END OF BORE 26.7 LARGE IRREGULAR FRACTURE, WEATHERED (?0°) 25.4-26.7 26.85 40° JOINT (?MECH) JAGGED VUG (.1-2mm) SURFACE (GYPSUM BLEB)	1		

GENERAL NOTES:

Total Depth 27.0'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-3

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dipoint Plant NO. 83C2736
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER B-1-C
BORING OFFSET _____
SURFACE ELEVATION 569.7'
DATE START 4/27/83 FINISH 5/4/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
14	Top		0%					41.0'				
15												
16												
17												
18	Run											
19												
20												
21									21.0' - 31.0' - Med. gray to dark gray brown laminated Dolomite. Stylolites common. Vugs vary in size and abundance along length of it. Granular texture fine vugs.			0°
22	Run 1								21.6' - 22.0' - Some horizontal size of vugs (.02")	2		
23									21.85' - 21.85' - Horizontal fractures. Brown coating on fracture (Sulphur?)			
24			8.4'	10'	10'	10'			22.2' - Horizontal Fracture of a white gypsum vein.	0		
25			10'						21.95' - 22.2' - Vertical Fracture			
26			3.4'	34%	1.4'	14%			24.6' - 26.0' - Many Solitude crystals at bits ends between these interval. Rock is more fractured, weathered, also contains a few long, brown vugs from .5" to 6".	1	10°	0°
									25.4' - 25.5' - Some (10°)		0°	
									25.1' - 25.25' - Horizontal fractures, also contains vugs filled with (Sulphur?).	3	10°	

GENERAL NOTES:

Total Depth 42.6'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-1C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dipoint Plant NO. 83C2736
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER B-1-C
BORING OFFSET _____
SURFACE ELEVATION 569.7'
DATE START 4/27/83 FINISH 5/4/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
27									26.0' - [illegible]			
28									28.1' - Fractures at a gypsum [illegible]			
29									28.1' - 29.4' - [illegible]		10°	
30									29.3' - Vein [illegible] Vugs. (10° fracture).			
31									29.4' - 31.0' - [illegible]	1		
32	RUN 2		2.6'		2.7'				29.6', 30.2' - Horizontal Fracture			
33	Box 2		3.0'		3.0'				31.0' - 35.5' - Dolomite [illegible]			0°
34			87%		90%				See [illegible]	0		
35									33.0' - Joint, 30° [illegible]		5°	
36	RUN 3								33.15' - Fracture [illegible]	2		
37			7.6'		2.5'				33.5' - 34.6' - [illegible] Granular texture due to abundant small vugs			
38			4.6'		2.6'				34.0' - 36.0' - very dense [illegible]	0		
39			38%		11%				35.15' - Vein [illegible]		2°	
40									36.0 - [illegible]	1		
41									36.0' - 42.6' - [illegible]			0°
42									42.5' - [illegible]	1	5°	
43											0°	

GENERAL NOTES:

Total Depth 42.6'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-1C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Chlorine Plant NO. 83C2236 | BORING NUMBER B-1-C
DRILLING RIG _____ | BORING OFFSET _____
OPERATOR _____ | SURFACE ELEVATION 569.7'
INSPECTOR Ted Taylor | DATE START 4/27/83 FINISH 5/4/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
40									39.75' = Horizontal Fracture. 40.4'-42.6' = Small pods & veins of white gypsum are occasionally seen.	1	0°	0°
41									40.4' = Horizontal break along a gypsum vein 40.5' = Joint, 10°, coated w/ black residue & some white gypsum.	4	0° 10° 0°	
42									40.6', 40.7' = Horizontal Fracture. 41.4' = Horizontal break along a gypsum seam. 42.0'-42.2' = high angle joint (60°)	1	0°	
43	Total		Very		42	6"				1	60°	
44												

GENERAL NOTES:

Total Depth 42.6'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-1C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Chlorine Plant NO. 83C2236 | BORING NUMBER B-1D
DRILLING RIG _____ | BORING OFFSET _____
OPERATOR _____ | SURFACE ELEVATION 568.2'
INSPECTOR Ted Taylor | DATE START 5/1/83 FINISH 5/9/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
15	Top	of	Rock		15.6'				42.5' - 51.0' Rock gray brown, fine to med Dolomite, Sylvite in veins & as fine grains throughout, Large dark veins of Sylvite not well cemented. Sylvite also present as grains.			
42									42.5' = Mechanical Fracture. 43.75' = Joint 70° (Sylvite). 44.2' = Joint 20° 44.4' = Mech Broken Fractures. 44.4'-44.5' = Sylvite filled fracture (.5") vert 45.05' = Joint, 10° to vert (Sylvite)			
43	RUN 1								44.8' = Large Sylvite grain. 45.2' = Fracture along Sylvite			
44	1 to 1								45.2'-45.35' = Vert Mech Fractures 45.4' and 46.0' = Mech Fracture (Sylvite)			
45			5.5'	7.5'					47.3' = Mechanical Fracture along Sylvite vein. Sylvite present			
46			77%	100%					48.2' = Joint 25°			
47									48.6' = 48.7' = Joint 20°			
48									48.8' = Fracture along Sylvite vein 48.9' = Mech Broken Fractures (Sylvite) 49.5' = Mech Broken Fracture along Sylvite vein			
49									50.1' = Joint 10° to Sylvite vein			
50	Run 2		14.9'	100%					50.55' = Mech Broken Fracture along Sylvite vein 50.65' = Mech Broken Fracture along Sylvite vein 50.8' = Mech Broken Fracture	0		
51										0		

GENERAL NOTES:

Total Depth 24.6'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-1D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Pigment NO. 8262256
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER B-1D
BORING OFFSET _____
SURFACE ELEVATION 568.8'
DATE START 5/4/83 FINISH 5/4/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
52			97%						51.0' - 62.2' - Med gray to gray brown, well laminated & fossilif. Many swirling streaks in this section. Pinhole vugs still common in occasional areas of larger, irregular vugs. No areas are intensely vuggy. Stylolites present.	1	0°	0°
53									52.65' - Horizontal fracture (mechanical?)	0		
54										0		
55									55.4' - Horizontal Fracture (mechanical?)	0		
56									55.5' - 56.4' - Relatively vuggy. Large vugs (.8") w/ many smaller, irregular vugs.	1	0°	
57									57.1' - Horizontal fracture along a stylolite	0	0°	0°
58										1	0°	
59									59.1' - 62.4' - Rather vuggy w/ occ. med. sized vugs (occ. - 1") throughout, not connected. Swirling laminations.	0		
60										0		
61										0		
62										0		
63									62.4' - 66.85 - Dark gray to dark gray brown Dolo. Not as distinctly laminated as above. Pinhole vugs abundant giving a granular texture to the rock. Occ. large fenestral pores.	2	1	
64									62.8' - Large stylolitic pore.			
65									63.25' and 63.5' - Horizontal fracs. along stylolites	0		

GENERAL NOTES:

Total Depth 71.6'
'ROCK' Drilling ____
HOLE NO. B-1D

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Pigment NO. 8262256
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER B-1D
BORING OFFSET _____
SURFACE ELEVATION 568.8'
DATE START 5/4/83 FINISH 5/4/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
66												
67	RUNS								66.85 - 68.1' - Dolo approx. same as above dark gray. Pinhole vugs common, some fenestral pores but not as many stylolites.	0		
68	SEAMS									0		
69									68.1' - 70.1' - Dolo becomes less fossilif, less mottled w/ more seams & swirls. Still some pinhole vugs. Stylolites common. Fractures:	0		
70			7.2' / 8'		8.5' / 8.5'				69.0', 69.2', 69.4', 69.6', 69.8', 69.95'	1		
71			90%		100%				70.1' - 71.6' - Medium dark gray dolo to dark gray brown and somewhat stromatolitic. Stylolites and pinhole vugs abundant, give rock texture in the fenestral pores.			
72												
73												
74												
75	Total	Depth				74.6'						

GENERAL NOTES:

Total Depth 71.6'
'ROCK' Drilling ____
HOLE NO. B-1D

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. [illegible]2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 1-E
BORING OFFSET _____
SURFACE ELEVATION 567.6
DATE START 5/4/83 FINISH 5/12/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
15												
24										1	0°	0°
										1	15°	
										1	0°	
										0		
									78.0'- Fracture along a Sepiolite.			
									78.5'- Horizontal Fracture.	2	0°	
									79.3'- Fracture along a Sepiolite.	1		
									80.1'- Horizontal Fracture.	1	0°	
									80.7'- Horizontal Fracture (Discontinuous).	2	0°	
									81.1'- Horizontal Fracture.	1	0°	
									[illegible] Horizontal Fractures.	[illegible]		
									85.3'- Horizontal Fracture.			0°
									[illegible]	2	15°	
									89.0, 89.1, 89.3'- Horizontal Fractures.	[illegible]	0°	
									89.7'- Horizontal Fracture.	4	0°	
									89.9'- Horizontal Fracture.	1	0°	

GENERAL NOTES:

1) 89.0' [illegible]

Total Depth 89.2
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. [illegible]2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 1-E
BORING OFFSET _____
SURFACE ELEVATION 567.6
DATE START 5/4/83 FINISH 5/12/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
86									86.05'- Fracture along [illegible]			0°
									86.8'- Horizontal Fracture w/ gypsum? [illegible]			
87									87.2'- Horizontal Fracture w/ [illegible]			
									87.55'- Joint, 55°, along a Bleb Seam.			
88									88.2'- Fracture along a Bleb Seam (Sepiolite).			
89	Total	Depth	89.4'									

GENERAL NOTES:

Total Depth 89.2'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 1

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 1-15
BORING OFFSET _____
SURFACE ELEVATION 569.4
DATE START 5/5/83 FINISH 5/18/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
15'	Top		05.2		Rock		15.0'					
90	"		"		"				90.0' - 93.1' - med to dark brown, distinctly and evenly laminated Siltstone, argillites present. Very minute Fractures very 1" to 5". Some Fractures may be mechanical. The Fractures are all horizontal but very irregular in nature, possibly following laminations.	?		1
91	1.5	2.6										
92										3		
93			2.5"		7.1"							
94					7.1"					3		
95			25%		100%							0°
96										1		
97												
98												
99												
100												
101												
102												
103												
104												
105												
106												
107												

Hairline Fractures at :
90.5', 90.9', 90.9', 91.3', 91.4', 92.4', 92.5', 92.7', 93.0', 93.1', 93.3', 93.4', 93.9', 94.0', 94.1', 94.45', 94.6', 94.8', 95.0', 95.2', 95.05', 95.9', 96.0', 96.2', 96.4', 96.8', 96.9'

Total Depth

GENERAL NOTES:

Total Depth 91.0'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 1-G
BORING OFFSET _____
SURFACE ELEVATION 569.6'
DATE START 5/5/83 FINISH 5/13/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
	Top	of	Rock		15.0'							
97									97.0' - 104.25' - med gray to dark gray [illegible], and evenly laminated [illegible]. Wavy face, Argillites present.			
98									97.3' - Horizontal Fractures at an angle to core			
99									98.9' - 99.9' - Thin bed of [illegible] gray Dolo. Horizontal Fractures at [illegible]	1		5"
	Run 7											
100	Run 1								100.5' - Hor. to slight [illegible]			
101			10.3'		12.0'				101.7' - Hor. Fracture along [illegible]			
102			12.3		12.0'							
103			96%		100%				102.1' - Joint, 5° [illegible]	1		
104									102.25' 103.4' [illegible] (Mechanical)			
105									104.15' Joint, 15°			
106									104.25' - 104.9' - [illegible]	2		0"
107									[illegible]			

Total Depth

GENERAL NOTES:

Total Depth 170.0'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-G

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG
OPERATOR
INSPECTOR Ted Taylor

BORING NUMBER 1-G
BORING OFFSET
SURFACE ELEVATION 568.6'
DATE START 5/5/83 FINISH 5/24/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
108									108.0'- Fracture along a stylolite (50°) 108.2'- Horizontal Fracture (mechanical?).	1	50° 0°	
109									109.1' and 109.9' Fractures along stylolites	2		0°
110									110.6'- Horizontal Fracture (mechanical?) 111.0'- 111.25'- Data has dark and green seams, well laminated, and several small gypsum pods.	1	0°	
111	Box 1 Run 2								111.0' and 111.25'- Horizontal fractures associated with gypsum?	2		
112			11.8'	15.2'					111.25'- 117.05'- Data becomes more gray in color, with fine grained banding, fractures (stylolites), seams, and gypsum pods and blebs. Vugs- pin hole to .25" vugs become very common from 112.2' to 115.2'	2	0°	
113			17%	97%					112.2' Horizontal fracture along a stylolite. 112.75'- 113.1'- large gypsum concentration 113.5'- large (.5") vug partially filled w/ gypsum	0 1		0°
114									114.1'- Irregular Fracture. 115.4'- 115.8'- concentration of gypsum. 115.6'- Horizontal Fracture.	1	0°	
116	Box 2 Run 3								116.15'- Horizontal Fracture.	1	0°	
117			9.8'	15.1'					117.05'- Horizontal Fracture along stylolites. 117.05'-132.9' The Data quickly becomes dark gray shale, discretely laminated, and containing very few, if any vugs.	1	0°	
118			64%	98%					117.55' 117.8' Horizontal Fractures. 118.45' Joint, 10° along a thick stylolite. 118.95' 119.25'- Horizontal Fractures.	3	0° 10° 0°	0°
119										1		
120												

GENERAL NOTES:

Total Depth 120.0'
'ROCK' Drilling

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-G

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG
OPERATOR
INSPECTOR Ted Taylor

BORING NUMBER 1-G
BORING OFFSET
SURFACE ELEVATION 568.6'
DATE START 5/5/83 FINISH 5/24/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
120									120.6'- 121.0'- Large, solid gypsum vein 120.8'- Horizontal Fracture (mechanical?)			
121									121.2', 121.4', 122.8', 123.0', 123.15', 123.5'- Irregular fractures with many stylolites	1		0°
122												
123									123.5'-123.75'- Thick solid gypsum seam			
124									124.25', 124.6'- Irregular fractures (mechanical?)			
125	Box 2 Run 3								125.2'-125.3'- Data with gypsum seams 125.4'-132.9'- Data soft dark gray shale, well laminated. Vugs more common. Also yet more slumping block seams, some bent, shaling vugs.	2		
126									125.7' Irregular fracture along a stylolite. 126.0' Irregular fracture parallel to previous fracture. 126.0'-126.5'- contains vugs & small gypsum seams 126.6'- Horizontal fracture along gypsum seam. 126.8'-126.9' large gypsum pod.	2		0°
127									126.95'- Thin gypsum seam (.1").	1		
128									127.4', 127.65', 127.95', 128.1'- Horizontal irregular fractures generally along stylolites. Gypsum seams on 127.65' and 128.1'	4		
129	Run 4								129.1'- large gypsum concentration. 129.1'-129.4'- Vertical fracture. 129.4'- Horizontal fracture. Gypsum seam. 129.6'-129.8'- Pebbles, heart of core. 129.7'- Fracture (5°) along a stylolite.	6		
130												
131									131.05', 131.65', 131.85', 132.2', 132.4', 132.6'- Irregular fractures.	4		0°
132												

GENERAL NOTES:

Total Depth 130.0'
'ROCK' Drilling

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-G

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Tom Taylor

BORING NUMBER 1-G
BORING OFFSET _____
SURFACE ELEVATION 564 ±
DATE START 5/5/83 FINISH 5/12/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
134									132.9' - 142.3' - Dolo borer: light to medium gray, somewhat laminated. Stylolites present. Small and medium sized (.05") vugs throughout. Less fractured.	1	0°	
135									135.3' - Fracture along a stylolite.	2		
136									136.0' - Horizontal Fracture			
137									136.3' - 136.9' - Vertical seam of gypsum (core not broken).			
138									137.6' - Horizontal Fracture, slickensided.	1	0°	0°
139									138.3' - Fracture along stylolite (some of core missing above this)?			
140									138.3' - 137.0' - Vertical seam.	2		
141									138.1' - Horizontal Fracture. (mechanical)?	0		
142									138.5' - Horizontal Fracture. "	1	0°	
143									139.2' - Horizontal Fracture. "	2	0°	
144										0		0°
145									141.0' - Horizontal Fracture along stylolite.	1	0°	
146									(some fractures in Run 10 look mechanical)	0		
147									142.5 - Stylolite.	1		
148									142.7 - 136.0' - med gray, poorly laminated Brownish stylolite parallel. Small and med vugs throughout, becoming large in places			
149									144.75', 143.65', 143.5', 143.35', 142.15' - Horizontal breaks (mechanical)	0		0°
150										0		
151										1		
152										0		

GENERAL NOTES:

1) Flaky (broken rubble) zone in Core Run 11 - 143.5' - 135.5'

Total Depth 150.0'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-G

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Tom Taylor

BORING NUMBER 1-G
BORING OFFSET _____
SURFACE ELEVATION 564 ±
DATE START 5/5/83 FINISH 5/12/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
147									146.5' - 149.1' - Vugs become predominant. Up to 2.5" diameter and larger.	0		
148									146.4' - 147.35' - Horizontal (mechanical)	0		
149									148.0' - Horizontal Fracture along a stylolite. Partial gypsum seam.		0°	
150									148.2' - 148.37' - Horizontal fracture along a stylolite.			0°
151									150.5' - Horizontal fracture along a stylolite. Some gypsum.	1	0°	
152									151.15' - Horizontal Fracture.			
153									153.1' - Horizontal Fracture.	0		1
154									154.0' - Horizontal Fracture.	1		
155									154.6' - Horizontal Fracture along a stylolite.	0	0°	
156	Run 11 for 5		5' 6.3'	6.3' 6.3'					154.8' - 155.2' - Dolo stands as above with black patches - A spotted appearance.			
157									155.8' - Horizontal fracture along a stylolite.	0		
158									156.0' - 163.0' - Dolo quickly changes from the 1" to 2" vugs, to gray/tan, fine to coarse grained. Small vugs (many in place) are gone. Small vugs (many in place) are also present. Stylolites rare. Very minor	0		
159			84%	100%						0		0"
160									159.2' - Vug zone & fracture along a stylolite.	0		
161									159.7' - Horizontal Fracture	2	0"	

GENERAL NOTES:

1) [illegible]

Total Depth 150.0'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-G

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Jed Taylor

BORING NUMBER 1-C
BORING OFFSET _____
SURFACE ELEVATION 564.6'
DATE START 5/13/85 FINISH 5/13/85

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
160									159.4'- Joint, 10°	3	10°	0°
161									161.15'- Horizontal fracture. 161.4'- Irregular break.	0 2	0°	
162									162.2'- Irregular break. 162.3'- Joint, 30° 162.5'- Joint, 10° 162.6'- Joint, 10° 162.9'- Joint, 25°	5	30° 10° 45° 10°	
163	5								163.0'- 170'- Dolostone becomes v. dark gray to black. No streaky laminations as above. No vugs or apparent stylolites. Many fractures, mostly along bedding (mechanical?).	6	5°	0°
164									163.0', 163.1', 163.25', 163.45', 163.7', 163.8', 164.0', 164.25', 164.4'- Joints ranging from ~5-10° angles. This stretch of Dolo is very dense and fine grained. Sometimes just dropping the core makes a fracture.	5 4	5° 0° 0° 0°	
165									164.9', 165.0', 165.2', 165.45', 165.9', 166.1', 166.35', 166.8', 166.9', 167.2', 167.45', 167.85', 168.0', 168.25', 168.6', 169.25', 169.65', 169.7', 169.75'- Horizontal fractures, many may be mechanical.	4	0°	
166			0.9'	8.4'	8.4'	8.4'						
167												0°
168			11%	100%						3	0°	
169										4	0°	
170	Total	Depth	170'									

GENERAL NOTES:

Total Depth 170.0'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 1-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 5

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Jed Taylor

BORING NUMBER 2-C
BORING OFFSET _____
SURFACE ELEVATION 570.1'
DATE START 5/14/85 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
14	Top	of	Rock	14.0'								
15												
16												
17									17.0'- 21.0'- Med gray to dark gray to black, finely laminated dolostone w/ local variations in color. Vugs also vary in sizes, shapes & amounts.		0°	0°
18									17.0'- 18.0'- Large and small vugs ... Some vugs filled w/ black ... and gypsum.			
19	Run 1								17.3', 17.9'- Horizontal fractures ... stylolites 18.65'- Horizontal fracture at ...		0°	
20	Run 1								19.8'- 19.8'- Large, irregular ... vugs (1" long). Have ...			
21									19.2', 19.4', 19.55'- Fractures ...			
22									19.8'- 20.3'- Rock becomes light gray - ... 20.2'- Irregular, 40°			
23			11.6' / 14.0'	14.6' / 14.0'					20.3'- 21.2'- Rock is ... gray ... Vugs abundant. ... 20.4', 21.0', 21.2'- Horizontal fractures.			
24									21.2'- 23.0'- Vugs less abundant. ... filled w/ black ...			
25									23.0'- 26.0'- ... vugs ... fracture.			
26			75%	100%					23.8', 24.4'- ...			

GENERAL NOTES:

Total Depth 45.5'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 2-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 83C2276
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 2-C
BORING OFFSET _____
SURFACE ELEVATION 570.1'
DATE START 1-23-85 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
25									Contains some long, linear vugs from 26.4'-26.7' and from 27.0'-27.2' otherwise vug-free.	4		0°
									26.25', 26.45', 26.5', 26.65', 27.2'- Fractures.			
26									27.9'-28.1'- Another small thinly laminated area as was 26.0'-27.2'. No vugs gypsum stone at 28.1' Fractured at both ends.	2	0°	
									28.4'-28.6'- Fracture along seams.		0°	
27									29.2'-30.2'- Concentration of small vugs. Some up to .1" diameter. Also some bleached areas.	1	0°	
									29.8'- Fracture.			
30									30.8' - Horizontal Fracture	1	0°	
31									31.5'-38.0'- Dark brown to yellow brown to tan mild dolomite. Small vugs concentrated in 2 intervals (31.5'-32.4') & (34.0'-34.85') otherwise vug are rare.	0		
									31.6'- Large (1") gypsum vug.	1	45°	0°
32									32.1'- Joint, 25°.		0°	
									32.85'- Horizontal fracture.	1		
33										0		
34										0		
			11.8		13.7				36.0'- Horizontal Fracture.	2	0°	
35			11.8'		14.0'				36.05'- Horizontal Fracture.			
									37.0' and 37.1'- Irregular fracture along a stylolite and gypsum seam.	4	0°	
36									37.55'- Horizontal fracture along a stylolite.			
			97%		98%				38.0'- Horizontal fracture along gypsum pods. Some gypsum is dissolved to an amber red.	6	0°	
37									42.0'-58.2'- Has concentrated vugs filled w/ gypsum.			
									58.2'-59.2'- Vugs more concentrated vugs, some bleached areas of anhy (coarse) gypsum.			

GENERAL NOTES:
1) Partial loss of circulation at 5'

Total Depth 45.5'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 2-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 83C2276
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 2-C
BORING OFFSET _____
SURFACE ELEVATION 570.1'
DATE START 1-23-85 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
40									39.25'- Irregular fracture along a stylolite and .25" thick gypsum seam. Gypsum stringers at other intervals. (gypsum pod continues to 39.9')	1		0°
41									39.9'-45.5'- Dark grey brown to grey black mineralized dolomite. No hole vugs present and concentrated in certain areas	1	60°	
									40.6'- Fracture along a stylolite.			
42									40.85'- Joint along a stylolite and gypsum pod (30°)	0	10°	
									41.5'-41.7'- several large gypsum pods.	2	10°	
43									42.0'- Joint (10°) along a stylolite.			
									42.6'- Joint (10°) along a gypsum seam.			
44									43.6'-43.7'- Concentration of large, linear vugs (.3" long) "Porky" look-ng.	1		0°
									43.7'- Fracture along vugs.			
45									44.0'-44.1'- Thin concentration of very small vugs.	1		
									44.55'- Irregular fracture at 25° to core axis			
46	Total	Depth	45.5'						45.0', 45.1', 45.45'- Irregular fractures. 45.0'- thin gypsum coat.	3		

GENERAL NOTES:

Total Depth 45.5'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 2-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER B-B
BORING OFFSET _____
SURFACE ELEVATION 569.0'
DATE START 5/23/83 FINISH 5/12/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
11												
12	Trip		25				11.6'					
13												
14	run		Sample									
15									15.0'-17.2' - med gray to olive gray brown somewhat laminated dolomite. Vugs rare and small when present. Stylolites present	0		0°
16									16.05' - Joint, 15° along a gypsum pod.		15°	
17									16.05'-16.5' - High concentration of white gypsum pods (.5" diameter).	1		
18									17.2'-22.8' - med gray to med gray brown, dolomite, thin laminations. Stylolites present. Some minor concentrations of small vugs but generally very few vugs.	0		
19	Start run									0		
20			10.15'		11.0'					0		
21			11.0'		11.0'					0		0°
22			92%		100%					0		
23									22.8'-24.1' - Dolomite becomes a little more dense and has a few vugs. Vugs are small to very small.	1		
24									23.9'-24.05' - Becomes dolo. w/ vugs. (a few = 1")	2		

GENERAL NOTES:

Total Depth 26.1'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER B-B
BORING OFFSET _____
SURFACE ELEVATION 569.0'
DATE START 5/23/83 FINISH 5/12/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
24									23.1' - Joint, 20°			
25									25.0'-25.5' - Many large (.25") vugs in Penny bearing dolomite	2	30°	0°
26									25.5'-25.8' - Becomes a little more dense and has a few vugs.			
27	Total Depth		26.1'						25.8'-26.0' - Vertical fracture			
									26.0'-26.1' - med. gray dolomite. Dense. Vugs absent			
									26.05' - Horizontal break.			

GENERAL NOTES:

Total Depth 26.1'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 8362236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 4-C
BORING OFFSET _____
SURFACE ELEVATION 570.0'
DATE START 5/24/83 FINISH 6/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
13												
14	Top	of										
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												

GENERAL NOTES:

Total Depth 160'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 8362236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 4-C
BORING OFFSET _____
SURFACE ELEVATION 570.0'
DATE START 12/82 FINISH 6/24/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
26												
27	NO	Sample										
28												
29												
30												
31												
32	RUN 1											
33			2.6'		9.5'							
34			8.2'		8.5'							
35			115%		100%							
36												
37												
38												
39												
40												

GENERAL NOTES:

Total Depth 160'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 8322236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 4-C
BORING OFFSET _____
SURFACE ELEVATION 575.0'
DATE START 5/24/83 FINISH 6/2/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
39									39.0'-40.8' - Mod. brittle to grey brown, poorly laminated interbedded vugs 1/2" diam. present but not abundant. Fracture every 3"-4½" stylolites present.	2	5°	
40									Horizontal fractures (along stylolites) 39.25', 39.4', 39.7', 39.9', 40.2', 40.4', 40.5', 40.8'	4	0°	
41									40.8'-42.6' - Interbedded dolomitic limestone. Brown at black ceramic. Vugs not as prevalent but rare. Horizontal fractures at: 41.2', 41.5', 42.0', 42.4', 42.6'	4	0°	
42									42.6'-45.0' - Dolo. limestone and brown to gray brown, and relatively vuggy. Connecting vugs have form an fracture. Some 1/2" to large pockets (1" dia.) with 99% gypsum. Abundant dolo. fossil "peels".	4	0°	
43			2.5' 1.5'	5.2' 1.5'					42.4'- Gypsum seam and horizontal fracture.	1	0°	
44									43.0'- Fracture from vugs.	5	0°	
45			42%	10.0%					43.5' 43.8' 44.2' 44.4' 44.6' 44.95' 45.0'- Horizontal fractures.	3	0°	
46									44.4'-45.0'- Vertical fractures.	1	0°	
47	Total	Depth	?						45.0'-(46.8'); Mod. grey brown, poorly laminated, v.f.g. Abundant vugs, some as large as 1.25" but rare. 45.5' 45.8' 46.0' Fractures.			

Total Depth 46.0'
'ROCK' Drilling _____

GENERAL NOTES:
1) Top 2' soil core.

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 1

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 8322236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Logged by RLE 11/22/83

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11/22/83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
									SOIL DRILLING TO 15.4'			
									* SEE SOIL LOGS *			
16									15.6' - 10° Dip joint - weathered, calcareous	2		
									15.8' - 20° Dip joint, [illegible]			
									16.1' - 30° Dip joint, [illegible]	6		
17									16.3' - 30° Dip joint [illegible]			
									16.5' - 40° 940° opposing joints, [illegible]	2		
									16.6' - 10° Dip joint - Black, [illegible]			
18									16.8' - 10° Dip joint - Black, [illegible]			
	RUN 1								17.3' - Horizontal joint, [illegible]	2		
									17.7' - Irregular joint [illegible]			
19	15.4'		7.9'	12.0'					18.5' - Horizontal joint - [illegible]			
	to		63%	95%					18.9' - 20° Dip joint	2+		
20	28.0'								19.8' - 1" Irregular fracture [illegible]			
									20.0' - Irregular fracture [illegible]			
									20.3' - 5° dip joint [illegible]	4		
21									20.5' - 20° dip joint - Gypsum			
									20.7' - 20° dip joint - Gypsum	5		
									21.1' - Horizontal joint Gypsum			
22									21.4' - horizontal joint - Gypsum			
									21.7' - Irregular joint - Gypsum	3		
									21.9' - horizontal joint Gypsum			
23									21.95' - Irregular joint Gypsum			
									22.1' - horizontal joint Gypsum	2		
24									22.4' - horizontal joint Gypsum			
									23.6' - 20° dip joint Gypsum			
									23.75' Irregular joint	3		
25									24.3' - horizontal joint			
									24.65' - horizontal joint Gypsum			
									24.8' - 20° Dip joint Gypsum	0		
26									26.6' - Irregular joint Gypsum			
									26.6' 26.8', vertical fracture @ 90°±			
									26.8' - 40° Dip joint			

Total Depth _____
'ROCK' Drilling _____

GENERAL NOTES:
Light brown [illegible]

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 11

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83C2236
DRILLING RIG
OPERATOR
INSPECTOR LOGGED BY REB

BORING NUMBER A-J
BORING OFFSET
SURFACE ELEVATION
DATE START FINISH

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
27									27.1 20° dip joint BLACK, CALCAREOUS	5+		
28	Box 1								28.0 - 20° Dip joint - BLACK, CARBONACEOUS	1		
	Box 2								28.2 - 10° irregular joint - BLACK, CARBONACEOUS	8+		
29									28.2 - 28.5 badly fractured " "			
									28.4 10° Dip Joint " "			
									28.4 - 29.1 - 80° joint POLISH	4		
30									28.5 - irregular joint - BLACK, CARBONACEOUS			
									28.9 - 10° Dip joint BLACK, CARBONACEOUS	1		
									29.2 - horizontal joint - GYPSUM			
31									29.3 horizontal joint - BLACK, CARBONACEOUS			
									29.6 - irregular joint " "	1		
									30.0 - irregular joint - GYPSUM			
32	Run 2								30.1 - irregular joint BLACK, CARBONACEOUS	1		
	29.0'		9.9		14.9'				31.2 - irregular joint "			
33									32.4 - horizontal joint - GYPSUM	1		
	TO		66%		99%				33.1 - nearly horizontal joint - GYPSUM			
									33.1 - 33.6 vertical fracture	3		
34	43.0'								34.0 - horizontal joint			
									34.1 - 10° dip joint			
									34.4 10° dip joint	6+		
35									35.0 - 20° dip joint - BLACK, CARBONACEOUS			
									35.4 - irregular fracture - PITTED	3		
									35.45 - irregular fracture - PITTED			
36									35.65 - irregular fracture - BLACK, CARBONACEOUS, PITTED			
									36.3 horizontal joint	1		
37												
38									38.1 - 20° dip joint	0		
									38.4 - irregular joint	2		
39												

GENERAL NOTES:

Total Depth
'ROCK' Drilling
HOLE NO. A-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC I-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 12

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Plant Site NO. 83C2236
DRILLING RIG
OPERATOR
INSPECTOR

BORING NUMBER A-J
BORING OFFSET
SURFACE ELEVATION
DATE START FINISH

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
39									39.7 horizontal joint - BLACK, CARBONACEOUS			
									39.9 - irregular joint	2		
40									40.4 - irregular fracture			
									40.4 - 40.55 - 90° fracture	5+		
									40.55 - horizontal joint -			
									40.75 - irregular joint			
41									40.9 - 40.95 Horizontal joint	4		
									41.1 Horizontal joint			
									41.5 - irregular joint - PITTED			
42									41.6 - 10° dip joint PITTED	5+		
									41.9 - irregular joint PITTED, CARBONACEOUS			
	Box 2								42.1 - 5° dip joint - PITTED			
43	Box 3								42.4 - 42.6 - multiple fractures	5+		
									42.65 - irregular joint			
									42.8 horizontal joint - BLACK, CARBONACEOUS			
44									42.8 - 43.0 badly fractured	6		
									43.0 - 43.2 badly fractured, PITTED			
									43.3 - 45.4 badly fractured - PITTED - CARBONACEOUS			
45	Run 3								45.4 20° dip joint	7+		
									46.0 - horizontal joint			
	43.0'		13.2'		14.5				47.5 - horizontal joint - BLACK, CARBONACEOUS	0		
46	TO		88%		97%				48.0 - horizontal joint - CARBONACEOUS			
									48.75 - 48.85 - badly fractured - CARBONACEOUS	2		
	58.0'								48.85 horizontal joint			
47									49.1 - 49.25 - badly fractured - CARBONACEOUS			
									49.5 20° dip joint - BLACK, CARBONACEOUS	5+		
48									50.0 - irregular fracture			
									50.7 - irregular fracture - BLACK, CARBONACEOUS	4+		
									51.8 - 10° dip joint BLACK, CARBONACEOUS			
49									52.4 20° dip joint - BLACK, CARBONACEOUS	1		
									[illegible]			
50												
51										1		
52												

GENERAL NOTES:

Total Depth
'ROCK' Drilling
HOLE NO. A-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC I-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Plant Site NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
53									54.0 irregular fracture	1		
									54.4 - irregular fracture - BLACK, CARBONACEOUS			
54									54.7 - 10° dip joint - BLACK, CARBONACEOUS	0		
55									55.3 - irregular joint - BLACK, CARBONACEOUS	3		
56										1		
57										0		
									57.0 - 10° dip joint			
									57.5 - irregular fracture	2		
58	Box 3											
	Box 4									0		
59									59.3' - irregular fracture - BLACK, SMOOTH - SHALE			
										1		
60									60.9 - irregular fracture			
									dispersed gypsum - very small xls	1		
61												
										0		
62									62.4 - irregular joint - BLACK, CARBONACEOUS			
										1		
63	Run 4								63.6 - irregular fracture			
										1		
64	58.0'		14.1'		15.0'							
	To									1		
65	73.0'		94%		100%				65.0 - 20° dip joint - BLACK, CARBONACEOUS			

GENERAL NOTES:

Total Depth _____
"ROCK" Drilling _____
HOLE NO. 4-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Plant Site NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
66									65.9 - 66.2 - 3 approx horizontal fractures - BLACK, [illegible]	2		
67									66.7 10° dip joint	3		
68									67.9 - irregular fracture	1		
69									[illegible]			
70												
71									70.9 - 5° dip joint - BLACK, CARBONACEOUS	1		
72									72.0 - 5° dip joint - GYPSUM	1		
									72.4 - 5° dip joint - GYPSUM			
									72.5 - 5° dip joint - BLACK, CARBONACEOUS			
									72.6 5° dip joint - " "			
73	Box 4								72.65 - 5° dip joint " "			
	Box 5								72.9 - 5° dip joint " "			
									73.1 - irregular fracture			
74									73.4 -20° dip joint			
									73.9 - 5° dip joint - GYPSUM			
	Run 5								74.6 - irregular fracture - GYPSUM			
75									74.9 - 73.6 - 80° fracture			
									75.1 - horizontal joint - GYPSUM			
									75.4 - horizontal joint - GYPSUM			
76	73.0'		13.5'		13.8'				75.9 - irregular fracture - GYPSUM			
									77.1 - horizontal joint - BLACK, CARBONACEOUS			
77	To		90%		92%							
78	88.0'								78.0 irregular fracture			

GENERAL NOTES:

Total Depth _____
"ROCK" Drilling _____
HOLE NO. 4-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of 17

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Plant Site NO. 83G2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
91									91.1 - horizontal joint BLACK, CARBONACEOUS	1		
92	Run 5								92.1 - 20° dip joint - BLACK, CARBONACEOUS	1		
93									93.1 - horizontal joint	1		
94	93.0		13.8'		13.8'				93.8 - 20° dip joint BLACK, CARBONACEOUS	2		
95	to		90%		92%				94.3 - irregular fracture " "	1		
96	98.0								95.1 - 5° dip joint - BLACK, CARBONACEOUS	1		
97										0		
98									98.4 - horizontal joint BLACK, CARBONACEOUS	0		
99										1		
100									99.7 - horizontal joint - gypsum	2		
101	Br. 5 Box 6								99.8 - 5° dip joint			
102									GREY DOLOMITE - joint, horizontal, gypsum coated, slightly weathered, medium hard, fine grained			
103	Run 6								101.1 - irregular bedding fracture, smooth, BLACK, SHALE	3		
104									101.2 - irregular fracture, smooth, BLACK, SHALE			
105									101.7 - 5° dip joint - smooth, BLACK, SHALE	1		
106									102.0 irregular fracture SMOOTH, BLACK, SHALE			
107									102.3 - irregular joint fracture	1		
									103.4 - irregular joint fracture SMOOTH, BLACK, SHALE			

GENERAL NOTES:

Total Depth _____
"ROCK" Drilling _____
HOLE NO. 4-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC I-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 7 of 17

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Plant Site NO. 83G2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
92	Run 6								91.7 - horizontal joint - smooth, BLACK, [illegible]	2		
93									92.0 - irregular joint - " " "			
94	98.0		13.0'		14.9'				92.5 - irregular joint - " " "	1		
95	to		87%		94%				93.4 - irregular joint - " " "	2		
96	103.0								93.6 - irregular joint - " " "			
97									93.9 - 5° dip joint - " " "	1		
98									94.5 - irregular fracture - GYPSUM	1		
99									95.0 - 20° dip joint	5		
100									95.2 - horizontal joint			
101									95.4 - horizontal joint - SMOOTH, BLACK, [illegible]	2		
102									95.65 - 95.70 badly fractured - SMOOTH, [illegible]			
103	Box 6 Box 7								95.9 - 20° dip joint - " " "	1		
104									96.1 - 20° dip joint - " " "			
105									96.9 - irregular fracture - GYPSUM + CLAY	2		
106									97.6 - 97.65 2 horizontal fractures - SMOOTH, [illegible]			
107									98.0 - horizontal joint - BLACK, [illegible]	1		
									98.4 - irregular fracture GYPSUM			
									98.6 - irregular fracture - SMOOTH, [illegible]	2		
									99.0 - horizontal joint			
									101.5 - irregular fracture - [illegible]	1		
									102.1 - horizontal fracture			
									102.2 - 102.1 - 45° fracture SLICKENSIDED, [illegible]			
									103.0 SLICKENSIDED MATERIAL ABOUT RUN	3		

GENERAL NOTES:

Total Depth _____
"ROCK" Drilling _____
HOLE NO. 4-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC I-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 8 of 12

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Plant Site NO. 82C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
105									105.1 - 20° FRACTURE	0		
106										1		
107										0		
108										0		
109	Run 7						PLASTER			0		
110	103.0		14.5'	97%	15.0'	100%			109.1 - horizontal fracture	1		
111	118.0									0		
112									112.7 - 10° dip joint	0		
113									113.75 - irregular fracture	1		
114									114.25 irregular fracture	1		
115									115.1 - irregular dip joint	1		
116									115.15 ditto	3		
117									115.3 ditto	0		

GENERAL NOTES:

Total Depth _____
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 9 of _____

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT- PLANT SITE NO. 82C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
118	Box 7								117.1 - irregular fracture	2		
119	Box 8								118.0 - irregular fracture	0		
120										0		
121	Run 8								120.9 - irregular fracture	1		
122	119.0'		13.3'	89%	15.0'	100%			121.5 - irregular fracture (horizontal)	2		
123	133.0'								121.9 horizontal fracture	1		
124									122.9 - irregular fracture	2		
125									123.6 - irregular fracture	0		
126									123.9 - 5° dip joint	4		
127									125.5 - 20° dip joint	0		
128									125.7 - horizontal joint	1		
129									125.1 125.8 bldly fractured	1		
130									126.8 10° dip joint	1		
									127.3 15° dip irregular joint			
									128.0 - 5° dip joint			
									129.3 irregular fracture			

GENERAL NOTES:

Total Depth _____
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

FIELD ROCK DESCRIPTION LOG

Woodward-Clyde Consultants

Sheet 10 of [illegible]

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-PLANT SITE NO. 8332236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
131									130.4 - 20° dip joint - SMOOTH, BLACK, SHALE 130.6 - 10° dip joint " " " 130.9 - Irregular fracture " " "	3		
132									131.5 - 5° dip joint " " " 131.6 - horizontal joint - GYPSUM 131.8 - irregular joint SMOOTH, BLACK, SHALE 132.1 - 5° dip joint " " "	3		
133	Box 8 Box 9								132.4 - 40° dip joint " " " 132.8 - 5° dip joint " " " 133.1 - horizontal joint - GYPSUM 133.3 - 20° dip joint - SMOOTH, BLACK, SHALE 133.5 - horizontal joint " " "	4		
134									134.0 - 20° dip joint " " " 134.3 - 20° dip joint " " " 134.7 - 5° dip joint " " "	2		
135									135.0 - irregular horizontal joint " " " 135.7 - uneven horizontal joint " " " 135.9 - uneven 5° joint " " "	3		
136									136.4 - 10° dip joint " " " 136.8 - horizontal joint " " " 137.0 - Irregular fracture " " "	2		
137	Run 9								137.3 - uneven horizontal fracture " " " 137.6 - uneven horizontal fracture " " " 137.6 - 138.5 - 80° fracture - FILLED FOR [illegible]	5		
138	133.0									0		
139	to								139.7 - 10° dip joint SMOOTH, BLACK, SHALE 140.2 - 140.6 - 80° fracture " " "	1		
140	148.0								140.6 - uneven horizontal fracture " " "	2		
141									141.1 uneven horizontal fracture " " " 141.5 - 10° dip fracture " " "	2		
142									142.9 - 5° dip fracture " " " 142.9 - Horizontal fracture " " "	2		
143												

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

FIELD ROCK DESCRIPTION LOG

Woodward-Clyde Consultants

Sheet 10 of [illegible]

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT- [illegible] NO. [illegible]
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER [illegible]
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
144	Run 9								143.4 - horizontal fracture SMOOTH, [illegible] SHALE 143.7 horizontal fracture " " "	2		
145	133.0'		12.1'	15.0'					144.1 - 10° dip fracture " " " 144.4 - 20° fracture " " "	2		
146	To		91%	100%					145.0 - irregular horizontal fracture " " " 145.5 - horizontal fracture " " "	2		
147	148.0'								146.4 - 10° dip joint " " " 146.7 - horizontal fracture " " " 147.0 - irregular horizontal fracture - [illegible]	3		
148	Box 9 Box 10								147.9 - horizontal fracture - SMOOTH, [illegible] SHALE 148.3 - Irregular fracture - [illegible]	1		
149										3		
150									150.5 - irregular horizontal fracture - PLAIN CALCAREOUS	0		
151	Run 10									1		
152	148.0'								[illegible]			
153	To		141.3'	15.0'								
154	163.0'		95%	100%								
155									155.0 horizontal joint " " "	1		
156												

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 11 of 12

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
157									156.6 - 10° dip joint - BLACK, CARBONACEOUS	1		
158	Run 10								157.6 - 20° dip joint - BLACK, CARBONACEOUS	1		
159	158.0'		14.3'	95%	15.0'	100%			158.4 - horizontal joint - BLACK, CARBONACEOUS 158.8 - 10° dip joint - Gypsum 159.5 10° dip joint SMOOTH, GREY SHALE	2 1		
160	163.3'								161.1 - 10° irregular dip joint SMOOTH, GREY, SHALE	0		
161												
162									162.0 - irregular horizontal joint, SMOOTH, GREY, SHALE	1		
163	Base 10 End								162.9 - 20° dip joint SMOOTH, BLACK, SHALE 163.1 - 20° dip joint " " " 163.3 horizontal fracture " " " 163.4 - horizontal fracture " " " 163.5 irregular fracture " " " 163.7 - 20° dip joint " " "	2 5 0		
164												
165	Run 11								165.2 5° dip joint " " "	1		
166			9.6	96%	10.0	100%			166.6 - 20° dip joint " " "	1		
167	163.3								167.6 - 10° dip joint " " "	1		
168	T.D.											
169	173.0								169.5 - irregular fracture 168.9 - horizontal fracture	2		

STRATA CHANGE DEPTH: 156.6 Light Grey Dolomite; 161.1 Black Fissile Shale

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 12 of _____

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 4-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
170	Run 11								169.5 ° horizontal joint	1		
171	163.0								170.3 - horizontal joint 170.6 - horizontal joint	2		
172	T.D.								171.7 - horizontal joint 172.5 - horizontal joint	1 1		
173	173.0								E.O.B. 173.0'			

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 4-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Depot Niagara Plant NO. 2227236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-B
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 5/20/83 FINISH 5/20/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
16	Top	of	Rock	16'								
17									17.0'-26.0' - med gray, laminated to poorly laminated Dolomite. Stylolites present but not common. Pin hole vugs usually abundant throughout core.			0°
18									17.0'-18.0' - Vugs abundant and Large. Eating away at core.			
19									17.5' - Fracture (mechanical?)			
									18.0' - Fracture from vugs?			
									19.9' - Fracture along a stylolite			
22			2.0'	90°	90°							
			9.0'		9.0'				22.55' - Horizontal Fracture.		0°	
									22.5'-24.5' - Dolo. becomes well laminated, lighter gray, and very vuggy.		10° 50°	0°
			7.0'	100%	10.0'				22.95' - Joint, 20° along stylolite.			
									23.05' - Joint, 30°, along stylolite.			
									23.35, 23.45' - Fractures (from vugs?)			
									23.8', 23.95' - Horizontal Fractures.			
									24.35, 24.6' - Horizontal Fractures			

GENERAL NOTES:

Total Depth 26.0'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Depot Niagara Plant NO. 2227236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-B
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 5/20/83 FINISH 5/20/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
									25.7', 25.9' Horizontal Fractures	2		
26	Total	Depth	26'									
27												

GENERAL NOTES:

Total Depth 26.0'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-CD
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/12/83 FINISH 10/14/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
53			0%		1.0'	10%						
54												
55												
56			61%		95%							
57												
58												
59												
60	Total	Depth			60'							

GENERAL NOTES:

Total Depth 60'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-CD

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-CD
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/12/83 FINISH 10/14/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
54									53.85'-54.0' - Fractures at 45°			
55			61%		95%				54.2', 54.6', 54.8' - Fractures at 45° (low to 45° downward)	7		
56									55.6'-55.7' - Fractures at 45° to horizontal.			
57									56.1' - Irregular fracture			
58									57.3' - Horizontal fractures.	1		
59									58.6' - 58.9' - Irregular fractures			
60	Total	Depth			60'							

GENERAL NOTES:

Total Depth 60'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-CD

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Depart Niagara Plant NO. 83C226
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-F
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/1/83 FINISH 10/2/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
13	Top	of	Rock	13'								
14												
15	0		0		0							
16												
17									17.0'-22.0'- Dark gray brown to greenish brown, fine grained dolomite. Vugs very. Stylolites present.			
18									17.8'- Large gypsum pod. 17.0'-18.3'- Pin hole vugs abundant. Granular texture. Well fractured. Horizontal fractures at: 17.3', 17.45', 17.55', 17.75', 17.85', 17.95', 18.0', 18.2'- All but 18.2' partially cemented w/ gypsum.	3	.0 .0 .0	
19									18.3'-22.4'- Vugs much less common. 19.5', 19.75'- Horizontal fractures. 19.95'- Joint, 20°	2	.0 .0 20°	0°
20	Run 1									3		
21	Run 1		12' 15.0'		15.0' 15.0'					0		
22									22.3'- Horizontal fracture along a seylolite. 22.3'-23.75'- Dolo. lighter in color, more thinly laminated. Many long thin vugs. Some over 1" long.	0		0°
23			75%		100%				22.6'- Joint, 35° 22.8', 23.1', 23.5', 23.75'- Fractures along vugs.	2	35°	
24									23.75'-32.0'- Dolo, fine grained, dolo, many small pin hole vugs, only a few large vugs over 25.6'	3		
25									25.4'-25.7'- large vugs fracturing rock.	0		

GENERAL NOTES:

1) 100% water loss at 15' (2nd run)

Total Depth 96.0'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Depart Niagara Plant NO. _____
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-F
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/1/83 FINISH 10/2/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
26									26.4'- Gypsum Pod. (.6").			
27									27.5'- Fracture along a stylolite.	0		
28										1		
29									29.2'- Fracture along a stylolite.	0		
30									29.9'- Fracture along a stylolite. 30.0' and 30.2'- [illegible]	2		
31									30.9'- Large gypsum pod.	0		
32									32.0'-42.0'- Same dolo as above - [illegible] Vugs not as abundant except [illegible] Stylolites present.	0		
33	Run 2									1		
34	Run 2								34.25', 34.5'- Irregular fracture along vugs.	1		
35									35.1'- Fracture along a stylolite. 35.1'-35.5'- Area of several vugs 1/8" to 1/4" [illegible] fracture and connecting vugs. 35.65', 35.8'- Horizontal fractures. 36.0', 36.1', 36.2'- Also fractures along stylolites.	3		
36			12.4'		12.9'					1		
37			15.0'		15.0'					0		
38			83%		99%					0		

GENERAL NOTES:

1) Water loss at 44.5'
Void at 44.75'

Total Depth 96.0'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Pigeon Point NO. 5XE236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-5
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 4/1/83 FINISH 4/1/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
51										0		0°
52									51.1'-52.0'- Area of rock with several dirty white patches, some small vugs.	0		
53									52.65'- Dirty white gypsum seams.	0		
54									53.6'-53.8'- Several long, thin, deep vugs (.5").	0		
55									54.2'-55.6'- Zone of large deep vugs. 54.4'- Horizontal Fracture. 55.1'-55.6'- Dirty white patches.	4	22°	0°
56									55.6'-57.0'- Some gypsum nodules (Fossil?) vugs absent except from 56.4'-56.6'.	0		
57									57.0'-62.0'- Some dark gray brecciated and mix. 0.1Mlo fossil-bearing rocks. Stylolites present. Vugs in places. Some diffuse blurry reddish ovs. 57.5'- stain (.2') 57.7'- 58.0'- Vugs and 58.05'- Horizontal Fracture 58.4'- Joint, 15° 58.6'- 58.9'- Large (1") Gypsum 59.1'-59.2'- Irregular Fracture 59.4'-59.6'- also several vugs (.2"). 60.2'-	3	15°	
58												
59												
60	Rock		12.5"							2	0°	0°
61			15.0"									
62												
63										1		
64												

GENERAL NOTES:

Total Depth 960'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-5

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Pigeon Point NO. 5XE236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER S-5
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 4/1/83 FINISH 4/1/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
52									51.1'- Joint, 20° [illegible] stylolites. 51.8'- [illegible] Gradual [illegible] at 52.4'. 51.9'-52.0'- large gypsum [illegible] at 51.95'. 52.1'- Horizontal Fracture. 52.4'- Small gypsum pods.	1		
53									53.2'- Zone of Fracture [illegible] seams.	2		
54									54.0'- Fracture.	1		
55										2		
56			83%		100%				55.6'- [illegible] 55.8'- Fracture [illegible] at 56.0'.	1		
57									56.95'- Irregular fracture [illegible]	3		
58									57.8'-58.0'- Small (.05") vugs [illegible]	4		
59												
60									60.1'- Fracture [illegible] at 60.3' (open at ingestion).	5		
61										1		
62									61.8'- Fracture along a [illegible] 62.1'-62.6'- large gypsum [illegible]	1		0°
63												
64												

GENERAL NOTES:

Total Depth 960'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-5

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Alyeska Pipeline NO. 83C7736
DRILLING RIG _____
OPERATOR _____
INSPECTOR Tod Taylor

BORING NUMBER _____
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/1/83 FINISH 10/2/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
65												
66												
67												
68												
69												
70												
71												
72												
73												
74												
75												
76												
77												

GENERAL NOTES:

Total Depth 960'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. [illegible]

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of 7

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Alyeska Pipeline NO. 83C7736
DRILLING RIG _____
OPERATOR _____
INSPECTOR Tod Taylor

BORING NUMBER [illegible]
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/1/83 FINISH [illegible]

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
78												
79												
80												
81												
82			10.4' / 11.0'		11.0' / 11.0'							
83												
84												
85			95%		100%							
86												
87												
88												
89												
90												

GENERAL NOTES:

Total Depth 960'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. [illegible]

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 5-C
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 10/1/83 FINISH 10/7/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
91									[illegible]	1		
92									[illegible]	5	0°	
93									[illegible]		0°	
94			6"/10		9"/10				[illegible]	1		
95									[illegible]			
96									[illegible]	0		0°
97									[illegible]	0		

GENERAL NOTES:

1) Do not [illegible]

Total Depth 96.0'
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 5-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schmitt

BORING NUMBER 7-C
BORING OFFSET _____
SURFACE ELEVATION 569.4'
DATE START 12/[illegible] FINISH 2/7/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
16	TOP OF BEDROCK											
17	NO SAMPLE											
18												
19	RUN 1							LT. GRAY DOLO. WITH [illegible] STYLOLITES	19.2 IRREGULAR FRACT. 19.0-20 LARGE FISSILE VUGS	4+		
20	19.0-		11.3	14.3					19.35 FRACT ALONG STYLOLITE			
21	33.5'		14.5	14.5					19.8-20.0 BROKEN ZONE (2" RECOVERY) VUGGY	0		
22									21.0-21.1 BROKEN ZONE (3 BREAKS)			
23			78%		99%				21.25 0° JOINT (VUGGY) 21.1-21.4 VUG SURFACE + BROWN STAIN	3+		
24									23.4 IRREGULAR FRACT.	0		
25									24.3 0° JOINT 24.1-24.4 VUG SURFACE	1		
26									25.2 0° JOINT			
27									26.1 IRREGULAR FRACT (~15°)	1		
28									26.25 " " 28.2 CYL CLAY (5cm)			
									26.3 0° JOINT	1		
									26.4 IRREGULAR FRACT. 28.3 CYL VEIN (~0°)			
									26.65 " " 29.2 CYL VEIN	6		
									26.65 15° JOINT			
									27.6 10° JOINT 27.0 - 30.3 VUG SURFACE (1-5cm)	1		
									29.65 5° JOINT + VUGS (1-5cm)			
									30.5 FRACT ALONG STYLOLITE			

GENERAL NOTES:

Total Depth 45'
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 7-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Digester Plant NO. 8562236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schuck

BORING NUMBER 7-C
BORING OFFSET _____
SURFACE ELEVATION 560.0'
DATE START 7/27/83 FINISH 7/28/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
29									30.7 IRREGULAR FRACT 31.1 " " 31.8 50° JOINT + GYPSUM COAT 31.85 5° " + " "	0 1	5	
30									32.5 LINEAR VUG (4cm/1.5cm) 33.05 15° JOINT + GYPSUM COAT	2		
31									33.2 IRREGULAR FRACT 32.75 LINEAR VUG (6cm/1.5cm)	3	5	
32											5	
33										0	5	
34	33.5	45.0	10.2 / 11.5	89%	11.3 / 11.5	98%			33.5 15° JOINT 34.1 IRREGULAR FRACT 36.0 " " 36.65 " " (~5°) 37.85 10° JOINT 38.65 0° JOINT 39.45 IRREGULAR FRACT (~0°) 40.8 " " 41.35 " " (~0°) 41.6 " " 41.7 " " 41.85 " " 43.55 " " (~15°) 44.0 " " (~0°) 34.6 - 37.2 VUG SURFACE, CLOSELY WEATHERED (OPEN)	3 1 0 2 1 1 1 1	15 10 0	

BOX/SAMPLE HAS OIL-BASED DRILLING FLUID CLAY

GENERAL NOTES:

Total Depth 45'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 7-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Digester Plant NO. 8562236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schuck

BORING NUMBER 7-C
BORING OFFSET _____
SURFACE ELEVATION 560.0'
DATE START 7/27/83 FINISH 7/28/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
42									44.4 - 44.45 BROKEN ZONE (2 BREAKS) 44.85 IRREGULAR FRACT ALONG GYPSUM ALSO (5cm/1cm) 45.6 GYP. ALSO (1cm)	4 0		
43										1		
44										4+		87
45									END OF CORE			

GENERAL NOTES:

Total Depth 45'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 7-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schorn

BORING NUMBER B-B
BORING OFFSET _____
SURFACE ELEVATION 568.0'
DATE START 5/26/83 FINISH 7/14/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
12	TOP OF BEDROCK											
13	NO SAMPLE											
14	RUN 1 12.0 - 17.0		1.8 / 3.0	60%	3.0 / 3.0	100%		LT GR SOLID WITH VUGS GYPSUM CRYSTALS	14.45 10° JOINT 14.6 IRREGULAR FRACT. 14.9 0° JOINT + GYPSUM 15.05 IRREGULAR FRACT. 15.35 5° JOINT + GYPSUM 15.4 0° JOINT 15.5 0° JOINT 16.0 0° JOINT + GYPSUM 16.1 0° JOINT 16.5 5° JOINT 16.9 5° JOINT + GYPSUM 17.0 0° JOINT + GYPSUM 15.0-15.05 PINHOLE VUGS 16.6, 16.7, 16.85 GYPSUM SEAMS (1mm WIDE)	3 4 4 4		
17	RUN 2 17.0 - 25.6'		6.0 / 8.6		8.6 / 8.6				17.25 0° JOINT 17.6 IRREGULAR FRACT. 17.9 0° JOINT + GYPSUM 18.1 IRREGULAR FRACT. (~0°) 18.7 IRREGULAR FRACT. 20.6 0° JOINT 20.7 0° JOINT 20.8 IRREGULAR FRACT. (~15°) 20.35 " " (~10°) 21.1 0° JOINT 21.4 LARGE IRREGULAR FRACTURE WITH VUGS 21.8 0° JOINT 22.05 FRACT. ALONG CALCITE	2 0 4 3 1 1		-LARGE
24	SAMPLE BOX OGES NOT CLEARLY DELINEATE TOP OF THIS RUN, SOME MAY BE 3RD DEVARIE GRADE FROM THIS RUN.			70%		100%						

GENERAL NOTES:

Total Depth 25.6'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schorn

BORING NUMBER B-B
BORING OFFSET _____
SURFACE ELEVATION 568.0'
DATE START 5/26/83 FINISH 7/14/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
25									23.1 IRREGULAR FRACT (~0°) + VUGS 24.4 " " (~5°) 24.7 " " + VUGS	3 3		
26	RUN 3 25.6' - 28.6'				3.0 / 3.0	100%			24.85 5° JOINT 25.0 10° JOINT 25.1 0° JOINT 25.8 5° JOINT 26.5 0° JOINT + CALCITE 27.7 - 27.9 VUGS (1-10 mm) SURFACE	1 0 0		
27	END OF BORE								28.5 PACKER ENGAGE BARREL ABOVE TO CLEAN (CLEAN) BELOW			

GENERAL NOTES:

Total Depth 28.6'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY REZ 11/17/83

BORING NUMBER S-7
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11-3-83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
									SOIL DRILLING TO 13.0'			
									* SEE SOIL LOGS *			
14							PITED		13.45'- 30° DIP JOINT - OXIDIZED - CARBONACEOUS - SURROUNDING AREA IS HIGHLY PITED	3+		
	RUN 1								13.90 - UNEVEN FRACTURE			
									13.90'- 14.1'- BROKEN - HIGHLY FRACTURED			
15									14.1'- HORIZONTAL JOINT - OXIDIZED - CARBONACEOUS	5		
									14.2'- JOINT - 50°			
									14.4'- JOINT - 80° - OXIDIZED - CARBONACEOUS (SHINY BLACK)			
16									14.7'- JOINT - 30°			
	13.0'								14.85'- JOINT - HORIZONTAL	4		
	to		7.7'	14.7'					15.3'- JOINT - 10° - PITED - OXIDIZED			
17	28.0'		15.0'	15.0'					15.35' JOINT - HORIZONTAL - OXIDIZED - PITED	8		
									15.7'- JOINT - 20° - OXIDIZED			
									15.35'- 15.7' - VERTICAL JOINT - CARBONACEOUS - OXIDIZED			
18									16.0'- JOINT - 30° - OXIDIZED	3		
									15.7'- 16.0'- VERTICAL JOINT			
									16.05'- JOINT - HORIZONTAL - CARBONACEOUS			
									16.18'- 16.01'- VERTICAL JOINT			
19									16.3'- HORIZONTAL JOINT - GREEN STAINING	1		
									16.45'- 16.3' VERTICAL JOINT			
									16.55'- HORIZONTAL JOINT			
									16.3'- 16.51'- VERTICAL JOINT			
	Box 1								16.8'- HORIZONTAL JOINT - OXIDIZED - PITED	4		
20									17.0'- JOINT - 20° - GYPSUM + BROWN STAINING			
									17.1'- HORIZONTAL JOINT - GYPSUM ON FACE			
									17.2'- HORIZONTAL JOINT - CARBONACEOUS - GYPSUM			
21									18.9'- JOINT - 10° - GYPSUM	3		
									19.0'- JOINT - 20° - GYPSUM			
									19.4'- JOINT - 10° - GYPSUM			
	RUN 1								19.45'- JOINT - HORIZONTAL - GYPSUM	4		
22									19.7'- JOINT - 30°			
							PITED		20.2'- JOINT - 10°			
									20.3'- HORIZONTAL JOINT - GYPSUM	3		
									21.2'- 21.3'- GYPSUM ON 1/2 OF FACE			
23									21.3'- JOINT - 10°			
									21.35'- JOINT - HORIZONTAL - LITTLE BIT OF GYPSUM	2		
									21.35 - 21.5'- 2 HORIZ. + 1 VERT. FRACTURE			
24									21.5'- JOINT - 20° - CARBONACEOUS - BLACK			
									22.1'- UNEVEN JOINT - CARBONACEOUS - OXIDIZED - PITED FROM 21.6'- 22.8'			
									22.2'- JOINT 40°			
									22.5'- HORIZONTAL - UNEVEN JOINT - GYPSUM			
									23.4'- JOINT - 20° - CARBONACEOUS			
									23.7'- JOINT - HORIZONTAL - CARBONACEOUS			

STRATA CHANGE DEPTH: 11.8' DARK GREY DOLOMITE; 21.1' GREY DOLOMITE

DESCRIPTION GREY - DARK DOLOMITE - fine grained, horizontal bedding, frequent carbonaceous joints or partings, occasional pitted areas, numerous small (1/8") gypsum inclusions

GENERAL NOTES:

WHITE STRIATIONS - probably gypsum - JOINTS CONTINUITY ROUGH AND UNEVEN
PITED AREAS MOST LIKELY THE RESULT OF DISSOLVED GYPSUM

Total Depth 162.5
"ROCK" Drilling 156.5

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-7

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY REZ 11/17/83

BORING NUMBER S-7
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11-3-83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
									GREY - DARK GREY DOLOMITE - fine grained, white striations (gypsum), frequent carbonaceous joints or partings, occ. pitted areas, numerous gypsum inclusions	0		
25	RUN 1						PITED		25.1'- UNEVEN JOINT - GYPSUM - PITED			
									PITED FROM 24.7' - 25.3'	5		
	13.0'		7.7'	14.7'					25.4'- JOINT 20° - GYPSUM			
	to		15.0'	15.0'					25.6'- JOINT - 20° - CARBONACEOUS			
26	28.0'								25.7'- JOINT - 10°	2		
									25.7'- 26.1'- NUMEROUS HAIRLINE FRACTURES @ 10-20°			
									26.2'- JOINT - 10° - GYPSUM			
	Box 1								26.8'- JOINT - 20° - GYPSUM (26.75'- 26.8')	1		
27									27.8 - UNEVEN JOINT - GYPSUM (GYPSUM 27.8'- 28.5')			
									GREY DOLOMITE			
	Box 2								GYPSUM			
28									28.3'- 10° JOINT - HIGHLY CARBONACEOUS - BLACK	1		
	RUN 2								29.0'- HORIZONTAL JOINT			
29									29.4'- 30.6'- PITED w/ ALOT OF GYPSUM INTERMIXED THROUGHOUT DOLOMITE	2		
	28.0'								30.0- 31.5' PITED			
30	to											
	43.0'		13.7'	15.0'			PITED		31.45'- 20° JOINT - CARBONACEOUS (thin)	1		
31			15.0'	15.0'								
									32.5'- 10° JOINT - CARBONACEOUS - (thin)	1		
32				100%								
									33.75'- HORIZONTAL JOINT	1		
33									Thin gypsum layer (1/16" thick) at 33.7' + 32.2' (30°)			
									34.55'- 20° JOINT - SLIGHTLY CARBONACEOUS	1		
34												
	RUN 2								35.35'- 20° JOINT - CARBONACEOUS	1		
35									Gypsum blob at 36.0' (1" x 1")			
									36.2'- 10° JOINT - CARBONACEOUS	1		
36	Box 2											
									37.0' HORIZONTAL JOINT			
37									Gypsum vug at joint (1/4" x 3/4" x 1/4" thick)			

GENERAL NOTES:

Total Depth 162.5
"ROCK" Drilling 156.5

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. S-7

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 13

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY PEZ 11/17/83

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11-3-83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
38									38.0'- HORIZONTAL JOINT	1		
	RUN 2								38.45'- 30° JOINT - SLIGHTLY CARBONACEOUS	2		
39									39.1'- 10° JOINT			
									39.4'- 20° JOINT - SLIGHTLY CARBONACEOUS	4		
40	28.0'		13.7'		15.0'				39.4'- 39.6' VERTICAL JOINT			
	to		15.0		15.0				39.85'- HORIZONTAL JOINT			
41	43.0'								40.4'- 30° JOINT - HIGHLY CARBONACEOUS	1		
					100%				... occasional vugs and hairline to ¼" thick veins of gypsum randomly scattered throughout			
42										0		
43	Box 2 Box 3									0		
44									GREY-DARK GREY DOLOMITE - fine grained, thin bedded, frequent carbonaceous partings, occ. pitted areas, numerous small irregular shaped gypsum inclusions, white gypsum stringers or laminae	0		
	RUN 3							GREY - DARK GREY DOLOMITE		0		
45										0		
46	43.0'		14.1		15.0'				46.0'- HORIZONTAL JOINT BLACK-CARBONACEOUS	2		
	to		15.0		15.0'				46.6'- 20° JOINT			
47	58.0'				100%				47.0'- 20° JOINT - HIGHLY CARBONACEOUS - BLACK	1		
48										0		
							PITTED, POROUS	LIGHT GREY DOLOMITE	LIGHT GREY DOLOMITE - fine grained, [illegible]			
49												
50									47.8'- 10° JOINT	1		

GENERAL NOTES:

Total Depth 50'
'ROCK' Drilling 46.5'

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 4

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY PEZ 11/17/83

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
51									50.3'- HORIZONTAL JOINT	2		
									50.4'- 30° JOINT - BLACK, CARBONACEOUS			
52	RUN 3								52.35'- 40° JOINT - GYPSUM	1		
53	43.0'		14.1'		15.0'				54.1'- HORIZONTAL JOINT	1		
	to		15.0'		15.0'				54.3'- UNEVEN JOINT - BLACK - HIGHLY CARBONACEOUS	0		
54	58.0'											
					100%				55.15'- 30° JOINT -	2		
55												
56									56.05'- 20° JOINT - BLACK, HIGHLY CARBONACEOUS	1		
57										1		
58	Box 3								57.85'- 30° JOINT - CARBONACEOUS - BLACK	1		
	Box 4							LIGHT GREY DOLOMITE				
	RUN 4								GREY DOLOMITE - Light [illegible]			
59									[illegible]			
60	58.0'		14.35		15.0'				60.25'- VERTICAL JOINT - CARBONACEOUS	1		
	to		15.0		15.0'							
61	73.0'											
					100%				61.7'- 10° JOINT - BLACK, CARBONACEOUS	1		
62												
63										6		

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of ___

GROUND WATER OBSERVATION
At ___ Ft. at Completion
At ___ Ft. after ___ hrs.
At ___ Ft. after ___ hrs.
At ___ Ft. after ___ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG ___
OPERATOR ___
INSPECTOR ___
LOGGED BY REZ 11/17/83

BORING NUMBER B-J
BORING OFFSET ___
SURFACE ELEVATION ___
DATE START ___ FINISH ___

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
64									GREY DOLOMITE - light and dark sections, occ irregular crystal lines, black laminae, some gypsum crystal formations, occ sparry calcite veinlets	0		
65										0		
66	Run 4									0		
67	58.0'		11.25'		15.0'					0		
	to		15.0'		15.0'							
68	73.0'					100%			68.75' - 30° JOINT - BLACK - partially calcareous	1		
69									69.5' - 30° JOINT	4		
								Shaly	69.5'-69.7' - Broken - horiz + vert. fractures - CC - boundaries			
70									69.7' - 10° JOINT			
									69.5' - Horiz JOINT			
71							Pitted		70.0' - 10° JOINT - CALCAREOUS	2		
									70.55' - 50° JOINT	1		
72									72.2' - 30° JOINT	1		
73	Box 4											
	Box 5									0		
74	Run 5								74.75 - 30° JOINT - BLACK, CALCAREOUS	1		
	73.0'		14.0		15.0							
75	to		15.0'		15.0'					0		
	88.0											
76												

GENERAL NOTES:

Total Depth ___
"ROCK" Drilling ___
HOLE NO. B-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC I-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of ___

GROUND WATER OBSERVATION
At ___ Ft. at Completion
At ___ Ft. after ___ hrs.
At ___ Ft. after ___ hrs.
At ___ Ft. after ___ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG ___
OPERATOR ___
INSPECTOR ___
LOGGED BY REZ 11/17/83

BORING NUMBER B-J
BORING OFFSET ___
SURFACE ELEVATION ___
DATE START ___ FINISH ___

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
77									GREY DOLOMITE - [illegible]	0		
78										0		
79										0		
80	Run 5									2		
	73.0'		14.2'		15.0'				79.15' - HORIZONTAL JOINT - BLACK, CALCAREOUS			
81	to		15.0'		15.0'				79.3' - Horiz, + 40° JOINT - BLACK, CALCAREOUS	2		
	88.0'					100%			80.0' - 81.6 - 85° JOINT			
82									81.6' - UNEVEN JOINT - N10° - [illegible]	3		
									82.6' - 82.2' - 80° JOINT			
83									81.1' - Horizontal joint 1/16" DEEP INTERSECTS 35° JOINT - SOME Bottom of Gypsum Lab	0		
									81.2' - HORIZONTAL JOINT - SLIGHTLY UNEVEN 1"x1" [illegible]	1		
84												
85									84.55' - 10° JOINT - BLACK, CALCAREOUS	3		
									84.65' - 10° JOINT - BLACK, CALCAREOUS			
86									84.15' - UNEVEN JOINT - SLIGHTLY [illegible]	2		
									85.55' - 40° JOINT - BLACK, CALCAREOUS			
87									85.75' - 10° JOINT, BLACK, CALCAREOUS	3		
									86.05' 30° JOINT			
88	Box 5								86.3' - 40° JOINT - SMOOTH, GREY, CALCAREOUS	1		
	Box 6								86.6' - UNEVEN JOINT - SMOOTH, GREY, CALCAREOUS - Shaley			
89	Run 6		13.3		15.0'				87.3' - 30° JOINT - SMOOTH GREY, CALCAREOUS			
	88.0'		15.0		15.0'				88.3' - 30° JOINT - SMOOTH, GREY, [illegible]	1		
	to					100%						
	103.0'								89.1' - [illegible]			

GENERAL NOTES:

Total Depth ___
"ROCK" Drilling ___
HOLE NO. B-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC I-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 7 of 13

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY RLE 11/17/83

BORING NUMBER B-5
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
90									SOFT DOLOMITE - 6" [illegible]	1		
91									90.7'- 20° JOINT - GRAY, SMOOTH, NON-CALCAREOUS - CLAYSTONE	1		
92	RUN 6								11.4'- UNEVEN JOINT 91.5' UNEVEN JOINT 91.6'- 92.6' BROKEN FRACTURED 91.6' HORIZONTAL JOINT 91.65 HORIZONTAL JOINT 91.8'- 40° JOINT 91.95 45° JOINT - Gyp [illegible]	7		
93									92.35'- 10° JOINT - SMOOTH, GRAY, CALCAREOUS 92.6'- 10° JOINT, SMOOTH, GRAY, NON-CALCAREOUS CLAYSTONE [illegible] 92.6-92.7'- Gypsum	3		
94		88.0' to 103.0'							92.7'- UNEVEN JOINT Gypsum	2		
95			13.3' / 15.0'		15.0' / 15.0'				93.45'- 20° JOINT, SMOOTH, GREY, NON-CALCAREOUS CLAYSTONE [illegible]	5		
96									93.7'- 30° JOINT (WAVY), SMOOTH, GRAY, NON-CALCAREOUS CLAYSTONE PARALLEL BANDING CLAYSTONE 1/8" BEDS	1		
97					100%				94.0'- 30° JOINT 94.4'- 30° JOINT 94.5'- 30° JOINT - SMOOTH, GREY, CLAYSTONE - [illegible]	2		
98	RUN 6								94.5'-94.65'- BROKEN, HIGHLY FRACTURED (NO CONTINUITY) 94.65'- 30° JOINT - Gypsum Beds 95.5'- 45° JOINT - BLACK, CARBONACEOUS	1		
99									96.45'- 30° JOINT, BLACK, CARBONACEOUS - NON CALCAREOUS 96.8': UNEVEN JOINT, BLACK [illegible]	0		
100	RUN 6								97.05' 30° JOINT - BLACK - SMOOTH 97.8'- Gypsum Bed (1/2" x 3/4") PITTED	0		
101									PEY DOLOMITE - Oct. Gypsum blebs 1/4" [illegible]	1		
102									100.8'- 70° JOINT	0		

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____
HOLE NO. B-5

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 8 of _____

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY RLE 11-17-83

BORING NUMBER B-5
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
103	RUN 6		13.3 / 15.0		15.0 / 15.0				103.65'- 10° JOINT - GRAY, CALCAREOUS	0		
104	Box 6 Box 7								103.70 - UNEVEN JOINT, BLACK SHALE 104.8'-105.5' - WHITE SILTSTONE NON-[illegible]	2		
105	RUN 7								104.55' HORIZONTAL JOINT 105.0' - SILTSTONE 30° B- 1/2" KI"	1		
106									105.5' ICE [illegible] NON COAL MEASURES	1		
107		103.0' to 118.0'	14.8' / 15.0'		15.0' / 15.0'				105.9' UNEVEN JOINT - GRAY CALCAREOUS SILTSTONE - SMOOTH 106.3' - 30° JOINT - DK. GRAY - NON [illegible] OF SHALE 106.9' - SILTSTONE BED - 3/4" X 1"	1		
108									107.75' - 107.85' - WHITE, SILTSTONE A 107.85' - 45° JOINT	1		
109					100%				109.25' - 10° JOINT, SMOOTH GRAY [illegible]	0		
110									110.85' - HORIZONTAL JOINT - P [illegible]	1		
111									111.6' HORIZONTAL JOINT - FRESH SURFACE	0		
112									112.4' 6° JOINT - PITTED SURFACE PITTED SURFACE AT 112.3' TO 113.6'	1		
113									113.4' 70° JOINT PITTED	1		
114	RUN 7									0		
115									115.15' SMOOTH JOINT [illegible]			

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____
HOLE NO. B-5

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 9 of 12

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY REZ 11/17/83

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
116	RUN 7									1		
	103.0'		14.8'		15.0'				116.8' - ~60° UNEVEN JOINT GRY, SMOOTH, SHALE			
117	to		13.0'		15.0'				117.3' - UNEVEN (~3in) JOINT - GREY, SMOOTH, SHALE	1		
	118.0'								117.6' - HORIZONTAL JOINT			
118	RUN 8								118.0' - 30° JOINT - GRY/SHALE	2		
									118.55' - HORIZONTAL JOINT, SMOOTH, SHALE			
119									119.4' BLACK, SMOOTH, SHALE 30° JOINT	2		
120									120.15' UNEVEN JOINT - GRY SHALE	1		
	118.0'											
121	to		14.2'		14.8'				121.25' - 30° JOINT - SHALE - GRY	2		
	133.0'		15.0'		15.0'				121.6' - UNEVEN JOINT - GRY SHALE			
122									122.4' - 70° JOINT - GREY - UNEVEN	2		
									122.9' 70° JOINT - 45° JOINT (OTHER END)			
123			91.6%		99 %				123.4' - UNEVEN JOINT - SMOOTH, GREY	3		
									123.55' - 45° JOINT, SMOOTH GREY			
124									123.4' - 123.55' - BROWN, FRACTURED			
125									125.1' - 10° JOINT	0		
126									126.45' - UNEVEN JOINT - GREY, SMOOTH	1		
	RUN 8											
127									126.8' - 127.5' SHALE	1		
									127.1' UNEVEN JOINT			
128									127.5' - UNEVEN JOINT	1		

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 10 of 12

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY REZ 11/17/83

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
129	RUN 8								128.3' - UNEVEN JOINT	1		
	118.0'		14.2'		14.8'				129.15' - 10° JOINT - BLACK, SMOOTH, SHALE			
130	to		15.0'		15.0				130.5' - UNEVEN JOINT - GYPSUM	1		
	133.0'				99 %				131.35' - ~10° UNEVEN JOINT			
131									132.95' - 30° JOINT	1		
132												
133	Box 8								133.5' - UNEVEN JOINT	1		
	Box 9								133.1' - ~10° UNEVEN JOINT - GRY	2		
134									134.5' - 30° JOINT			
	RUN 9									1		
135									135.45' - 20° JOINT			
	133.0'		14.15		15.0'				135.65' - 30° JOINT GRY, SMOOTH, SHALE	2		
136	to		15.0'		15.0'				136.3' HORIZONTAL JOINT GREY, SMOOTH, SHALE			
	148.0'									1		
137									137.5' HORIZONTAL UNEVEN JOINT			
138									138.5' 30° JOINT SHALE	1		
139												
140									140.0' 30° JOINT SHALE	3		
									140.3' 30° JOINT GRY - SMOOTH, SHALE			
141									141.0' 10° JOINT -	2		

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 11 of 13

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83-2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
Logged By REZ 11-21-83

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11-3-83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
142									141.4' UNEVEN HORIZ. JOINT	2	20°	
	RUN 9								142.3' 20° JOINT - GREY, SMOOTH, SHALE	2	10°	
143									142.7' 10° JOINT			
	138.0'		14.15'		15.0'				143.1' 10° JOINT			
144	to		15.0'		15.0'				143.65' UNEVEN HORIZONTAL JOINT - GYPSUM	3		
	148.0'								143.85' 20° JOINT - GREY SMOOTH - SHALE		20°	
145									144.3' 20° JOINT - GREY - SMOOTH - SHALE, GYPSUM	1	20°	
									144.5' 20° JOINT			
146									GREY SHALY DOLOMITE - moderately hard fine shale seams and gypsum laminae, grey shaley appearance of joints & parts	1		
									146.3' 10° JOINT - GREY SHALE	2	10°	
147									146.5' 10° JOINT		10°	
									147.0' 10° JOINT - GYPSUM, BLACK, SHALE	2	20°	
148	Box 9								147.6' 20° JOINT - GYPSUM			
	RUN 10								148.4' 10° JOINT - GREY, SHALE & GYPSUM	1	10°	
149									149.2' 10° JOINT - GREY, SMOOTH, SHALE	2	40°	
									149.3' 10° JOINT - GREY, SMOOTH, SHALE, SILICEOUS			
150	148.0'		13.4'		14.1'				150.15' 10° JOINT - GYPSUM	3	10°	
	to		15.0'		15.0'				150.3' 20° JOINT - GYPSUM, SHALE, GREY, SOFT		10°	
151	160.0'								150.7' 10° JOINT - GREY, SMOOTH, SHALE		0°	
					99.3%				151.0' HORIZONTAL JOINT - GREY, SMOOTH, SHALE	2		
152									151.6' 20° JOINT - GREY, SMOOTH, SHALE		20°	
									152.0' 10° UNEVEN JOINT - GREY, SMOOTH, SHALE		10°	
153									152.4' 10° JOINT - BLACK, SMOOTH, SHALE	2		
									LIGHT GREY DOLOMITE - thin bedded, moderately hard, fine grained, (fair to poor joint control)			
154									153.7' 10° JOINT - GREY, SMOOTH, SHALE	1	15°	
									154.1' HORIZONTAL JOINT - GREY, SMOOTH, SHALE		0°	

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____
HOLE NO. B-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 12 of 13

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83-2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
(Logged By REZ 11-21-83)

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11-3-83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
155									155.0' 10° JOINT - GREY, SMOOTH, SHALE	1	15°	
									155.3' 20° JOINT, GREY, SMOOTH, SHALE			
156									155.7' 10° JOINT - GREY, SMOOTH, SHALE + GYPSUM	3		
	RUN 10								156.2' HORIZONTAL JOINT - GREY, SMOOTH, SHALE			
157									DARK GREY DOLOMITIC SHALE - moderately indurated, laminated, with shale & gypsum	1		
	198.0'		14.15'		14.1'							
158	to		15.0'		15.0'				158.1' 10° JOINT - SHALE	0		
	163.0'								158.4' 20° JOINT - SHALE, GYPSUM			
159					94.3%					1		
									159.9' HORIZONTAL JOINT - GREY, SMOOTH, SHALE			
160									160.3' 10° JOINT - SMOOTH, GREY, SHALE	2		
161									161.1' HORIZONTAL JOINT - GYPSUM, BLACK, SHALE	1		
162										1		
163	Box 10								163.15' VUGGY ZONE (1")	0		
	Box 11								163.2' 10° JOINT - SHALE			
164									DARK GREY DOLOMITIC SHALE	1		
	RUN 11		8.04'		8.24				164.4' UNEVEN JOINT - SHALE			
165	163.0'											
	to								165.4' 10° JOINT - GYPSUM, SHALE	2		
166	170.5'								165.8' 10° JOINT			
167									BLACK SHALE (FISSILE)	1		

GENERAL NOTES:

Total Depth _____
'ROCK' Drilling _____
HOLE NO. B-J

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 13 of 13

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY R.E.Z 11-21-83

BORING NUMBER B-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 11-3-83 FINISH 11-8-83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
168	Run 11							BLACK SHALE	168.1' HORIZONTAL JOINT	1	0°	
	168.5'		8.0'		8.0'				168.3' HORIZONTAL JOINT		0°	
169	170.5'								168.65' 10° JOINT	4	10°	
									169.0' - 169.2' VERT. TO 10° JOINTS		90° 10°	
170									169.6' HORIZONTAL JOINT	1	0°	
									170.2' 10° JOINT	1	10°	
									END OF BORING 170.5'			

GENERAL NOTES:

Total Depth 170.5'
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. B-J

WCC 1-15

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB [illegible] NO. [illegible]
DRILLING RIG _____
OPERATOR _____
INSPECTOR [illegible]

BORING NUMBER [illegible]
BORING OFFSET _____
SURFACE ELEVATION [illegible]
DATE START [illegible] FINISH [illegible]

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
7	Top of Rock					7.6'						
8												
9	No Sample											
10												
11												
12												
13	Run 1											
14	[illegible]		7.2'	8.8'								
15			9.5'	9.5'								
16												
17			77%	95%								

GENERAL NOTES:

[illegible]

Total Depth 24.8'
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-C

A-36

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-C
BORING OFFSET _____
SURFACE ELEVATION 567.1'
DATE START 5/26/83 FINISH 5/26/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
20									19.4'-23.5' Dolo gets very [illegible] vugs connecting. Slightly wavy fractured. Some gypsum crystals and pockets. Med gray brown color.	0		0°
21									20.0', 20.5', 20.9' - Horizontal breaks. 20.9' is wavy & thick (.4') gypsum stained parting.	3	0°	
	Run 2								21.0' - Horizontal fracture & wavy & stylolitic.	1	0°	
22									22.1' - Horizontal fracture wavy & stylolitic.		0°	
									22.6' - Horizontal fracture along & stylolitic.	2	0°	
									22.8' - Vug 5" long (.4") vugs close together.			
									23.2' - Fracture along a stylolite.	1	0°	
24			7.5' / 9.0'		9.0' / 9.0'				23.5'-24.0' - Distinctly grey Dolo mod small (1") whitish patches. Connecting vugs present.			
									24.0'-25.5' - Brown to light grey brown Dolo (gradual color change). Small vugs at few isolated ones.	1	0°	
									24.95' - Horizontal fracture along & stylolite.		0°	
									25.1', 25.10' - Horizontal fractures		0°	
25									25.6' - Large fracture along vugs	2		
									25.6'-28.1' - Med gray to grey brown, Poorly laminated Dolo. Small pinhole vugs and minor recrystal. Very granular texture to Dolo.	1	0°	0
26			8.3' / 10.0'	83%	10.0' / 10.0'	100%			26.3' - Horizontal fracture.			
									27.1'-28.8' - Dolo gets very "wormy" right before a stylolite. Vugs up to 1/2" long. Many Gypsum crystals.			
	Total Run		Depth				28.8'					

GENERAL NOTES:

1) 100% core loss at 27.5'-27.7'

Total Depth 28.8'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet ____ of 4

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 85C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 9-D
BORING OFFSET _____
SURFACE ELEVATION [illegible]
DATE START 9/[illegible]/83 FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
					7.0'							
19												
									19.5'-24.5' - Med gray / brown / grey / brown to tan Dolo. Stylolitic in places. Vugs not connect, except at 24.0' [illegible] fractured, every [illegible]	11		
20												
	Run 1											
21										11		
			0' / 5.0'		3.7' / 5.0'							
22												
				0%		74%						
23												
24												
									24.5'-29.5' - Dolo gray [illegible] Below many long, [illegible] vugs [illegible]			
25												
26									26.0' - Broken from vugs			
	Run 2											
			2.4' / 5.0'		5.0' / 5.0'				26.9' - To 27.5', vug			
27												
									27.5'-29.0' - Dolo [illegible] med [illegible] vugs [illegible] Has med brown [illegible]			
28												
				56%		100%						
29									29.0' - Vugs present but [illegible]			

GENERAL NOTES:

1) [illegible]

Total Depth 70'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 4

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Plant NO. [illegible]
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10 - D
BORING OFFSET _____
SURFACE ELEVATION 562.1'
DATE START 9/ /83 FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
50					41							
51									50.0'-54' - Dark gray to dark gray brown laminated dolomite. Almost vertical orientation of core in center of primary looking vug core areas where shown others.	1		0°
52									52.0'-59.3' - Larger connecting vugs throughout. Some filled w/ a dirty yellow-gray comb gypsum	1		
53									58.65'-59.2' - Fractures due to vugs.			
54	1		12.6'		15.1'				59.3'-60.9' - Vugs less common but still large vugs.	1		
55			1.0'		16'				60.9'-61.8' - Vugs, broken due to connecting vugs			
56									61.8'-62.05' - Joint along solution, 15°	4	0 / 15° / 15° / 15°	0°
57									61.8'-64.3' - Abundant small to med size vugs (.1-5") connected vugs, many 5 mm of gypsum combs. Not as common as 50.0'-54.0' but still present.	1		
58									62.55', 63.0', 63.4', 63.95', 64.5' - Fractures due to connecting vugs.			
59									63.6' large vug w/ terminated gypsum crystals.	3		
60			79%		94%				64.3'-66.0' - Data is similar to former and less vuggy below this point. V. dark brown, blackish. Linear & pinhole vugs present. V. few large vugs.	1		
61									66.1'-66.3' - Horizontal fractures.	0		
62										2		
63										0		
64										0		
65									64.0'-67.7' - Top [illegible]	0		
66									[illegible] Vuggy. Large vugs (2-3") [illegible]	0		
67									50.95' - Horizontal fracture			

GENERAL NOTES:

Total Depth 0
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 4

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB D. Plant NO. [illegible]
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10 - D
BORING OFFSET _____
SURFACE ELEVATION 562.1'
DATE START 9/ /83 FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
50									50.95' - Horizontal Fracture			
51									51.1'-54.0' - Dark gray to dark gray brown laminated dolomite. Almost vertical orientation of core in center of primary looking vug core areas where shown others. Slightly lighter [illegible] much fewer large vugs, [illegible] and less vugs [illegible]	1		
52									54.0'-66.9' - Most gray brown [illegible] heavily mineralized [illegible] abundant [illegible] (.1" and less) [illegible] these are larger and become [illegible] from 59.0' to 66.9'. [illegible] dolomite is very [illegible] dirty gypsum [illegible] 1/8" long and deep [illegible] .05 +/- .1" diameter.	0		
53										0		
54										0		
55									55.9' - core broken [illegible]	1		
56										0		
57										0		
58										0		
59										0		
60			12.9'		15'					0		
61			1.0'		16'					0		
62			81%		94%					0		
63									63.4' - Horizontal fracture	1	0°	
64												
65												
66												
67												

GENERAL NOTES:

Total Depth 10'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 4

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Depue Niagara Plant NO. 8362236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-D
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START 9/1/82 FINISH 9/29/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
64										0		0°
65										0		
66									65.5'- Horizontal Fracture 65.7'- Horizontal Fracture 66.2'- Horizontal Fracture	2	0° 0°	
67									66.55'- Horizontal Fracture 66.9'- 67.65'- Dark gray brown lp Dolomitized well laminated w/ black shale stringers (broken) 67.65'. Very few vugs. Small when present. 67.3± Joint, 10°	2	0° 10°	
68									67.65'- 70.0'- Dark gray brown lp blocky primarily laminated Dolomite. Vugs absent. 67.8', 67.9', 68.1', 68.3', 68.55', 68.6', 69.65' Horizontal Fractures.	3 5 0	0° 0° 0°	0°
69												
70												
71												

GENERAL NOTES:

5) Fractures 60°

Total Depth 70'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Depue Niagara Plant NO. 8362236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-E
BORING OFFSET _____
SURFACE ELEVATION 561.1'
DATE START _____ FINISH 9/22/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
7	Top	of	Rock		7'							
9	1)		C		A				9.5'-28'- Hard to dark gray brown laminated Dolomite. Small pin-hole vugs throughout. Larger, deep vugs			
10									9.5'-9.8'- Vertical Fracture 9.9'- Joint 10° 10.15'- Joint 20°			
11	Rems not marked								10.4'- Fracture Few vugs, Large cylindrical vugs 11.65'- Fracture with offset (broken) Some Rock vugs on surface.			
12	9.5' to 28'								11.8'- Vertical Fracture 12.0'-12.2'- Large, deep vugs with fracture	1		
13			9.4'		1H 8'				12.0'- vug with fracture 12.2'-12.6'- Vertical Fracture 13.0'- Horizontal Fracture 13.8'- Horizontal Fracture.			
14	Total		12.4'		18.5'				14.05'- Horizontal Fracture with vugs	1		
15									14.9'-15.4'- Large vugs abundant.			
16			45%		80%				16.15', 16.45', 16.7', 16.95', 17.1'- Horizontal Fractures; Entire			
17									17.1'-19.6'- Small vugs throughout			0
18												
19										6		

GENERAL NOTES:

1) Loss of water at 12'(?)

Total Depth 105'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2276
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-E
BORING OFFSET _____
SURFACE ELEVATION 567.1'
DATE START _____ FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
20									20.3'- Horizontal fracture (mechanical?)	5	0°	0°
									20.8'- Horizontal fracture.	3	—	
21									20.9'- Joint, 10°		10°	
									21.95'- Horizontal fracture.	1	0°	
										0		
									23.5'-29.0'- Dolo laminae shear plane? w/ more black, thin laminations. Some long, linear vugs.	0		0°
26										1		
										0		
30										1		
										0		
										1		

GENERAL NOTES:

Total Depth 105'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2276
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-E
BORING OFFSET _____
SURFACE ELEVATION 567.1'
DATE START _____ FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
33			80%	100%					32 of 32 ½ = Hor. fracture			
34									33.5'-35.6'- Large, deep vugs bleached (gypsum) areas. Vugs absorbent and dull			
									34.0'-34.5'- Horizontal fracture, few vugs.			
35									35.4'- Irregular fracture, few vugs.			
									35.6'-37.2'- Many long, open & vug			
36									36.0'- Fo 50°			
37									37.2'-42.8'- Many vugs, few open, some deep vugs			
38									38.5'- Tight			
39									39.55'-39.7'- Many vugs, bleached, few open vugs			
40									40.0'-40.1' 50° 116° Fract			
41									40.6'-41.2'- Many vugs, few open			
42									42.2'-42.5'			
43												
44												
45												

GENERAL NOTES:

Total Depth 105'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 83222.06
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-E
BORING OFFSET _____
SURFACE ELEVATION 567.1'
DATE START _____ FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
46									46.1'-50.5' Dolo, gray-brown, vuggy, many large vugs but not as long as before (5-6"), most vugs parallel to bedding, some fractures at high angle to bedding	0		0°
47										0		
48										0		
49									49.5' Joint, 90°			
50			91%		96%				49.55'-49.75' Fossils	4	20°	0°
51									50.5'-56.3' Dolo, tan, less vuggy than above, vugs abundant, some large (1-2") vugs	0		
52									51.0' Joint, 60°	1	60°	
53										0		
54										0		
55										0		
56										0		
57									56.3'-57.1' Dolo, gray-brown, vuggy, vugs 1-2" long	0		

GENERAL NOTES:

Total Depth 105'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet ____ of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Niagara Plant NO. 83222.06
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER _____
BORING OFFSET _____
SURFACE ELEVATION 567.1'
DATE START _____ FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
59												
60												
61												
62	Run 5											
63	80 x 4		13.6'		15.0							
64			15.0'		15.0				64.6'-65.5' Dolo, brown-gray, vuggy, vugs 1-2" long, some fossils			
65									65.0' Joint, 90°			
66									65.5'-66.5' Dolo, gray-brown, vuggy, vugs 1-2" long, some fossils			
67			91%		100%				66.5'-68.1' Dolo, gray-brown, vuggy, vugs 1-2" long, some fossils			
68									68.1'-69.4' Dolo, gray-brown, vuggy, vugs 1-2" long, some fossils			
69												
70												
71												

GENERAL NOTES:

Total Depth 105'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 8502236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-F
BORING OFFSET _____
SURFACE ELEVATION 560.1'
DATE START _____ FINISH 7/29/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
77										0		
78									78.05'- Thin (.2') gypsum seam.	0		0°
79										0		
80									80.5'- 80.9'- Several calcite gypsum veins (.1' to .2' thick). Vugs with crystals of calcite.	0		
81			9.1'	11.4'						0		0°
82			11.4'						82.6'- Horizontal fracture on gypsum/calcite.	1		
83									83.45'- Horizontal fracture - Partial gypsum coat.	2	0°	
84			8.5'	100%					83.9'- Joint, 30°.		30°	
85									84.2'- Fracture along a calcite.	5	10°	
86									84.9'- Joint, 10° 85.5'- Horizontal fracture. 85.85'- Horizontal fracture along a calcite. 86.9'- Joint, 20°		0° 20°	
87									87.5'- 87.7'- Open joint with gypsum coat. Vertical fractures at 87.5°.			
88									87.7'- 87.9'- Fractured zone. Horizontal fractures at 87.8°, 87.9°.			
89									87.9'- 88.4'- Fractured zone. Horizontal fractures at 88.0°, 88.2°, 88.4°.			
90									88.4'- 89.1'- Fractured zone. Horizontal fractures at 88.5°, 88.8°, 89.1°.			
91									89.1'- 89.4'- Fractured zone. Horizontal fractures at 89.2°, 89.3°.			
92									89.4'- 89.7'- Fractured zone. Horizontal fractures at 89.5°, 89.6°, 89.7°.			
93									89.7'- 90.2'- Fractured zone. Horizontal fractures at 89.8°, 89.9°, 90.0°, 90.2°.			
94									90.2'- 90.5'- Fractured zone. Horizontal fractures at 90.3°, 90.4°, 90.5°.			
95									90.5'- 91.3'- Fractured zone. Horizontal fractures at 90.6°, 90.8°, 91.0°, 91.2°, 91.3° (gypsum coat).			
96									91.3'- 91.5'- Fractured zone. Horizontal fractures at 91.4°, 91.5°.			
97									91.5'- 92.0'- Fractured zone. Horizontal fractures at 91.6°, 91.7°, 91.8°, 91.9°, 92.0°.			
98									92.0'- 92.3'- Fractured zone. Horizontal fractures at 92.1°, 92.2°, 92.3°.			
99									92.3'- 92.6'- Fractured zone. Horizontal fractures at 92.4°, 92.5°, 92.6°.			
100									92.6'- 93.0'- Fractured zone. Horizontal fractures at 92.7°, 92.8°, 92.9°, 93.0°.			
101									93.0'- 93.3'- Fractured zone. Horizontal fractures at 93.1°, 93.2°, 93.3°.			
102									93.3'- 93.7'- Fractured zone. Horizontal fractures at 93.4°, 93.5°, 93.6°, 93.7°.			
103									93.7'- 94.0'- Fractured zone. Horizontal fractures at 93.8°, 93.9°, 94.0°.			
104									94.0'- 94.3'- Fractured zone. Horizontal fractures at 94.1°, 94.2°, 94.3°.			
105									94.3'- 94.6'- Fractured zone. Horizontal fractures at 94.4°, 94.5°, 94.6°.			
									94.6'- 95.0'- Fractured zone. Horizontal fractures at 94.7°, 94.8°, 94.9°, 95.0°.			
									95.0'- 95.2'- Fractured zone. Horizontal fractures at 95.1°, 95.2°.			
									95.2'- 95.5'- Fractured zone. Horizontal fractures at 95.3°, 95.4°, 95.5°.			
									95.5'- 95.8'- Fractured zone. Horizontal fractures at 95.6°, 95.7°, 95.8°.			
									95.8'- 96.2'- Fractured zone. Horizontal fractures at 95.9°, 96.0°, 96.1°, 96.2°.			
									96.2'- 96.5'- Fractured zone. Horizontal fractures at 96.3°, 96.4°, 96.5°.			
									96.5'- 96.8'- Fractured zone. Horizontal fractures at 96.6°, 96.7°, 96.8°.			
									96.8'- 97.2'- Fractured zone. Horizontal fractures at 96.9°, 97.0°, 97.1°, 97.2°.			
									97.2'- 97.5'- Fractured zone. Horizontal fractures at 97.3°, 97.4°, 97.5°.			
									97.5'- 97.8'- Fractured zone. Horizontal fractures at 97.6°, 97.7°, 97.8°.			
									97.8'- 98.2'- Fractured zone. Horizontal fractures at 97.9°, 98.0°, 98.1°, 98.2°.			
									98.2'- 98.5'- Fractured zone. Horizontal fractures at 98.3°, 98.4°, 98.5°.			
									98.5'- 98.8'- Fractured zone. Horizontal fractures at 98.6°, 98.7°, 98.8°.			
									98.8'- 99.2'- Fractured zone. Horizontal fractures at 98.9°, 99.0°, 99.1°, 99.2°.			
									99.2'- 99.5'- Fractured zone. Horizontal fractures at 99.3°, 99.4°, 99.5°.			
									99.5'- 99.8'- Fractured zone. Horizontal fractures at 99.6°, 99.7°, 99.8°.			
									99.8'- 100.2'- Fractured zone. Horizontal fractures at 99.9°, 100.0°, 100.1°, 100.2°.			
									100.2'- 100.5'- Fractured zone. Horizontal fractures at 100.3°, 100.4°, 100.5°.			
									100.5'- 100.8'- Fractured zone. Horizontal fractures at 100.6°, 100.7°, 100.8°.			
									100.8'- 101.2'- Fractured zone. Horizontal fractures at 100.9°, 101.0°, 101.1°, 101.2°.			
									101.2'- 101.5'- Fractured zone. Horizontal fractures at 101.3°, 101.4°, 101.5°.			
									101.5'- 101.8'- Fractured zone. Horizontal fractures at 101.6°, 101.7°, 101.8°.			
									101.8'- 102.2'- Fractured zone. Horizontal fractures at 101.9°, 102.0°, 102.1°, 102.2°.			
									102.2'- 102.5'- Fractured zone. Horizontal fractures at 102.3°, 102.4°, 102.5°.			
									102.5'- 102.8'- Fractured zone. Horizontal fractures at 102.6°, 102.7°, 102.8°.			
									102.8'- 103.2'- Fractured zone. Horizontal fractures at 102.9°, 103.0°, 103.1°, 103.2°.			
									103.2'- 103.5'- Fractured zone. Horizontal fractures at 103.3°, 103.4°, 103.5°.			
									103.5'- 103.8'- Fractured zone. Horizontal fractures at 103.6°, 103.7°, 103.8°.			
									103.8'- 104.2'- Fractured zone. Horizontal fractures at 103.9°, 104.0°, 104.1°, 104.2°.			
									104.2'- 104.5'- Fractured zone. Horizontal fractures at 104.3°, 104.4°, 104.5°.			
									104.5'- 104.8'- Fractured zone. Horizontal fractures at 104.6°, 104.7°, 104.8°.			
									104.8'- 105.0'- Fractured zone. Horizontal fractures at 104.9°, 105.0°.			

GENERAL NOTES:

1) Vertical fractures in gypsum veins.

Total Depth 105'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 7 of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 8502236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-F
BORING OFFSET _____
SURFACE ELEVATION 560.1'
DATE START _____ FINISH 7/29/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
85									84.0'- 95.1'- Dark gray [illegible]			
86									[illegible]			
87									Horizontal Fractures at: 84.9°, 85.4°, 85.6°, 86.1°, 86.4°, 86.6°, 87.2°, 87.5°, 87.8°, 88.0°, 88.4°, 88.6°, 88.8°, 89.1°, 89.4°, 89.6°, 90.2°, 90.4°, 91.3° (gypsum coat); 91.6°, 91.8°, 92.0°, 92.3°.			
88												
89			2.9'	14.9'								
90			16.0'	16.0'								
91												
92			49%	93%					92.4'- Joint, 10°			
93									93.0'- Broken along a vertical (.1') [illegible] (Gypsum)?			
94									93.7' and 93.9'- Is gypsum vein part. (.5' thick).			
95									95.1'- 105'- Like between [illegible]			
96									[illegible]			
97									[illegible]			
98									[illegible]			
99									[illegible]			
100									[illegible]			
101									[illegible]			
102									[illegible]			
103									[illegible]			
104									[illegible]			
105									[illegible]			

GENERAL NOTES:

Total Depth 105'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 8 of 8

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 10-E
BORING OFFSET _____
SURFACE ELEVATION 567.1'
DATE START _____ FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
98									97.4' - Irregular fracture along a black seam (slickens). Also has gypsum.	1	0°	0°
									97.6' - Gypsum pod.			
									98.1' - Horizontal fracture.	2		
99									98.7' - Fracture along a seam/vein.			
									(Total core length)	0?		
100									100.3' - Irregular fracture (mechanical?).			
									100.35' - Large, irregular fracture. Along a thick black seam. Also rocks broken	2		
101									101' - 105' - Dolo. gets vuggy. Small vugs abundant.	0		
102			4.7'	5C'					102.2' - Horizontal fracture (mechanical?)	1		
103			0'	0'						0		
104			94%	100%						0		
105												
106												

GENERAL NOTES:

1) Lost circulation at 101' (very broken).

Total Depth 105'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 10-E

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 12-B
BORING OFFSET _____
SURFACE ELEVATION 568.1'
DATE START 5/26/83 FINISH 7/15/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
11	Top		5'		Rec.	10'						
12												
13												
14												
15									14.3' Joint, 55°			
									14.6' Joint (mechanical?)			
									15.5' Joint 55°			
16									16.2' Horizontal fracture			
									16.3' Fracture along a seam/vein			
									16.4' - 16.5' Vuggy zone			
17									17.0' - 20.5' Mod. fract. to very fract. Vuggy zone.			
									Vugs - mod. abundant.			
									17.6' - Horizontal fracture			
18	Rock											
19			9.6'	17.0'								
			13.0'	13.0'								
20												
21			94%	100%					20.5' - 20.6' Int. fract. (mech.)			
22												
23												

GENERAL NOTES:

Total Depth 27.0'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 12-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Diguard Plant NO. 8X6223.6
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 12 - C
BORING OFFSET _____
SURFACE ELEVATION 564.0'
DATE START 5/26/82 FINISH 5/28/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
24									23.15'- Joint, 15°. 23.45'- Fracture along vugs. 23.85', 23.8'- Jointed (vuggy?) fractures. 24.1'- Jointed fracture along series of small vugs.	5	15°	0°
25									24.8'- Fracture, along a seam/vug.	3		
26									24.8'- 27.0'- Porosity as at 13.0'-20.5' with more & larger vugs. Poorly formed, small vugs abundant throughout fracture.	1		
27									24.9'- Joint, 15° 25.0'- Horizontal Fracture. 26.2'- Jointed fracture along seam/vug.	1		0°
28	Top of Rock						27.0'					

GENERAL NOTES:

Total Depth 27.0'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 12 - C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 5

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Diguard Plant NO. 8X6223.6
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 14 - C
BORING OFFSET _____
SURFACE ELEVATION 564.0'
DATE START 10/1/82 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
9	Top of Rock				9.0'							
10	"	"	"		"							
11									11.0'- 25.0'- med grn. Severely weathered. Porous to vugs abundant and more evident in seams. Stylolites present. Entirely fractured.	5		
12	Runs 1 & 2								11.0'- 11.5'- Breccia zone. 11.5'- Joint, 15° 11.6', 11.8'- Fractures. 11.7' Joint, 50°			
13									12.15', Fracture. 12.15'- 12.2'- Several large (.5") vugs. 12.45', 12.5', 12.7'- Fractures. Along stylolites.			
14	Rock 1 11'0 to 25'		2.3' 14.0'		8.6' 14.0'				12.7'- 13.7'- Small vugs throughout. "Sponge" looking. A breccia refer to Photo. 12.9'- 13.2'- Pebbles. 13.2'- 13.5'- Vertical Fracture. 13.7', 14.4'- Fractures along stylolites.	5		
15												
16										3		
17			24%		61%				16.15', 16.9', 17.1', 17.4'- Horizontal Fractures.			
18									18.3'- Horizontal Fracture along a stylolite.	2		
19									18.9'- Horizontal Fracture along a stylolite. 19.2'- Joint, 15°, along a stylolite. 19.7'- Fracture in .3' a stylolite.		15°	0°
20									19.6'- 19.6'- relatively vuggy.	1		

GENERAL NOTES:

1) 19.6' [illegible] relatively vuggy.

Total Depth 70.0'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 14 - C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 5

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83122.26
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 14-c
BORING OFFSET _____
SURFACE ELEVATION 568.9'
DATE START 6/1/83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
21												
22												
23												
24												
25									25.0'- 40.0'- Dark gray to gray brown, laminated to partly laminated Dolomite. Vugs concentrated in areas. Pin hole vugs abundant throughout. Granular texture.			
26									25.7'- Rim of linear (.3") long vugs.	0		0°
27									26.7'- 27.6'- Linear vugs concentrated. Some .4" long.	0		
28									27.35'- Joint, 15°		15°	
29	1								27.96'- Horizontal Fracture.	2	0°	
30	3.0'		13.9'	14.2'					27.75'- 28.4'- Large vugs (.2" diam.) concentrated. Gypsum combs and pods present. Somewhat "spongy".	0		
31			15.0'	15.0'					28.3'- Large Gypsum pod.	0		
32			93%	98%					30.35'- Irregular Fracture along a stylolite.	2	—	
33									30.95'- Horizontal Fracture.	2	0°	
									31.3', 31.7'- Horizontal Fractures at a gypsum root.	4	0°	
									32.1'- Joint, 20°, along a stylolite. Some gypsum.		0°	
									32.9'- Fracture - Broken off piece	3	20°	
											—	

GENERAL NOTES:

Total Depth 70'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 14-c

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 5

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83122.26
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____

BORING NUMBER 14-c
BORING OFFSET _____
SURFACE ELEVATION 568.9'
DATE START 6/1/83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
34									33.5'- Irregular fracture.	1	—	
35									33.8'- 34.8'- Slightly vuggier than before. A few large (.1") vugs.			
36									34.25'- Fracture along a stylolite. Some vugs.	1		0°
37									35.0'- Horizontal Fracture.		0°	
38									35.65'- Joint, 10°	1	10°	
39									35.85'- 36.1'- Moderately vuggy. Abundant small vugs. Some gypsum combs.			
40									36.1'- Horizontal Fracture.	1	0°	
41									36.85'- 37.9'- Vertical Fractures.		90°	
42									37.2'- Horizontal Fracture. Partial open.	3	0°	
43									37.9'- Horizontal Fracture.			
44									38.5'- Gypsum pod, (.6")	2		
45									39.4'- 40'- Vuggy, resistive, [illegible]			
46									40.0'- 53'- Dark gray to [illegible] Puberty Dolomite. Abundant vugs. Vugs vary from pinpoint to .1". Pin hole vugs abundant throughout.	0		0
									40.1'- 42.5'- Pin hole vugs abundant. Granular texture. Some small gypsum veins.			
									42.25'- Irregular fracture along a stylolite. Gypsum present.	0		
	3.0'		11.4	13.6'					42.25', 42.8'- Horizontal Fractures.	2	—	
			13.0'	10'					42.5-42.5'- Vertical fracture/vug.		0°	
									42.9'-44.8'- Horizontal Fractures at a Stylolite. Broken piece [illegible]		0°	
			85%	100%					44.5'-45.2'- Pin hole vugs, [illegible]	1	—	
									45.6'- Large (.2") gypsum pod.	0		

GENERAL NOTES:

Total Depth 70'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 14-c

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 5

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 14-C
BORING OFFSET _____
SURFACE ELEVATION 568.9'
DATE START 10/1/83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
47									47.35'- 47.7'- Lighter colored, many small dirty gypsum patches. Sharp boundry between beds dips at 2 stylolites.	0		5°
48									47.7'- Fracture at a stylolite.	1		
									48.5'- Horizontal fracture. Along several small gypsum pods.	1		
49									48.5'- 49.9', 50.25'- Horizontal fractures along stylolites.	2		
50										1		
51									51.2'- Horizontal Fracture.	1	0°	0°
52										0		
53									53.0'- 61.4'- Some Rock - Dark gray to gray brown, w/ scattering inclusions. Vugs rare. Some small, thin vuggy fractures. All fractures and joints are along stylolites.	1		
54									53.3'- Horizontal Fracture.	3	30°	
									54.35', 54.5'- Joints, 20°			
55									54.65'- Horizontal Fracture.			
									55.2'- Joint, 50°	1	50°	
56	Run 4		12.1'	14.5'					55.7'- 56.0'- Large gypsum pod.		25°	
	5.5 min		11.0'	17.0'					56.05'- Joint, 25°	1		0°
57									57.05'- Horizontal Fracture	1		
58			78%	97%					58.5'- Horizontal fracture.	0		
59									59.25'- Horizontal fracture.	1		

GENERAL NOTES:

Total Depth 70'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 14-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of 5

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 14-C
BORING OFFSET _____
SURFACE ELEVATION 568.9'
DATE START 10/1/83 FINISH _____

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
									59.3'- Thin gypsum seam.			
60									59.5'- Horizontal Fracture.	2		5°
									60.1'- Horizontal Fracture.			
									60.25'- Joint, 10°	2		
61									61.4' - 70.0'- Dole Limestone, dark gray brown, fine grained. A very sparsly argillaceous dole matrix with discrete fossil fragments. Pinhole vugs abundant throughout.	1		
62									62.3'- Joint (along stylolites or seam), 10°	1		
									62.35'- Horizontal Fracture.			
63										0		
64												
65										0		
66									66.6'- Joint, 20°			
									66.7'- Horizontal Fracture	2	45°	
67												
68									[illegible]			
69												
70									Total Depth			
71												

GENERAL NOTES:

Total Depth 70
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 14-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 85C2276
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schary

BORING NUMBER 15-C
BORING OFFSET _____
SURFACE ELEVATION 568.5'
DATE START 7/25/83 FINISH 8/1/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
6	TOP OF BEDROCK											
7												
8												
9	RUN 1							LT GRAY DOLO + GYPSUM + STYLOLITE	9.15 TWO IRREGULAR FRACTS (~5°)	6		
10	9.0 - 13.5'		8.7 / 13.5		12.2 / 13.5				9.3 IRREGULAR FRACT (~15°)	3		
11									9.5 " " (~5°)			
									9.55 5° JOINT			
									9.8 IRREGULAR FRACT (~5°)	4+		
12			RECOVERED .2' OF RUN 2						10.2 " " (~5°)			
									10.35 " " (~5°)	6+		
									10.4 " " (~5°)			
13									11.25-11.3 BROKEN ZONE (2 BREAKS)	3		
14			61%		90%				11.75 5° JOINT			
									11.9 IRREGULAR FRACT (~20°) (SOME WEATHERING)	3		
15									12.3 IRREGULAR FRACT. (SOME WEATHERING, VUGS) 12.3 - 13.6 PINHOLE VUGS			
16									11.4 IRREGULAR FRACT. (VUGS ON JOINT + CORE SURFACE)	0		
									12.6 IRREGULAR FRACT (0°) (VUGS ON JOINT + CORE)	2		
17									12.7-12.8 BROKEN ZONE (2 BREAKS) VERY WEATHERED	3		
18									12.95 IRREGULAR FRACT (~10°) (VUGS ON JOINT + CORE)			

GENERAL NOTES:

Total Depth 31'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 85C2276
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 15-C
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 7/27/83 FINISH 8/1/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
19									13.25 5° JOINT (VUGS ON CORE + JOINT)	0		
									13.85 5° JOINT 17.3 - 20.0 PIN-HOLE VUGS CONCENTRATED	2		
20									13.9 IRREGULAR FRACT (~5°)			
									14.1 " " (~10°)	2		
									9.5 0° JOINT + GYPSUM			10
21									14.6 IRREGULAR FRACT (~5°)	1		
									16.6 " " (~0°) + GYPSUM			
22									16.8 " "			
									17.5 5° JOINT	1		
	RUN 2								17.65 0° JOINT 19.1 - 19.6			
23	22.5 - 24.7		2.2 / 2.2		2.2 / 2.2				17.7 IRREGULAR FRACT (~5°) MAINLY FRACT			
									19.35 " "	2		
24			100%		100%				19.6 " "			
									20.1 " " + GYPSUM/CALCITE	1		
									20.5 " " ON LARGE GYPSUM			
25	NO SAMPLE, DRILLED TO CLEAN OUT HOLE (CORE BLOCKAGE)								VUGS 21.35 GYP 6-7.5			
									21.6 10° JOINT (7cm)	NO SAMPLE		
26									22.9 IRREGULAR FRACT (~0°)			
	RUN 3								23.3 " "	1		
27	26.7 - 31.0'		3.6 / 4.3		3.8 / 4.3				23.9 " "	4		
									24.35 " "			
28									26.7 IRREGULAR FRACT VUGS ON 1/2 CORE 26.7 - 27.4 VUG (1-20mm) WEATHERED	2		5
									27.15 IRREGULAR FRACT 27.1 GYPSUM FILLED (3cm)			
29			81%		93%				27.25 " "	1		
									27.3 " "			
30									27.8 " "			
									28.2 " (~0°) + GYPSUM 28.0 - 28.6 VUG (1-1mm)	0		
31	END OF CORE								28.65 5° JOINT			
									29.55 IRREGULAR FRACT			

GENERAL NOTES:

Total Depth 31'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 1

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2736-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schoen

BORING NUMBER 15-CD
BORING OFFSET _____
SURFACE ELEVATION 564.2'
DATE START 10/1/83 FINISH 10/2/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
35	RUN 1 35'-47'		4.0 / 7.0	57%	6.3 / 7.0	90%		DK GRAY DOLO WITH BANDING	START SAMPLE @ 35.7	0		
									36.1 5° JOINT		5	
36									36.25 IRREGULAR FRACT (~20°)	3		
									36.85 5° JOINT		5	
37									37.05 IRREGULAR FRACT	4	10	
									37.3 10° JOINT		0	
38									37.55 0° JOINT		0	
									37.7 0° JOINT	4	0	
									38.0 0° JOINT		5	
39									38.2 IRREGULAR FRACT + VUGS (mm)	1	5	
									38.45 5° JOINT			
40									38.7 IRREGULAR FRACT (~5°)	2	0	
									39.5 5° JOINT		5	
41									40.1 IRREGULAR FRACT (~10°)	2		
									40.5 0° JOINT ON GYPSUM BLEB			
42	RUN 2 42'-47'		2.5 / 5.0	50%	5.0 / 5.0	100%			41.0 IRREGULAR FRACTURE	1		
									41.35 5° JOINT			
43									42.4 FRACT. ALONG STYLOLITE	3	5	
									43.2 IRREGULAR FRACT		5	
									43.3 5° JOINT		5	
44									43.75 IRREGULAR FRACT.	4	5	
									44.0 5° JOINT		10	
45									44.1 TWO 5° JOINTS	4	0	
									44.3 5° JOINT			
46									45.0 IRREGULAR FRACT	2		
									45.1 10° JOINT + GYPSUM			
47									45.4 IRREGULAR FRACT (~5°)			
									45.5 0° JOINT			

FEW PINHOLE VUG CONCENTRATIONS IN RUN 2

45.5 IRREGULAR FRACT.

46.4 IRREGULAR FRACT + GYPSUM

GENERAL NOTES:

Total Depth 47'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-CD

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2736
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schoen

BORING NUMBER 15-D
BORING OFFSET _____
SURFACE ELEVATION 564.2'
DATE START 10/3/83 FINISH 10/4/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
	TOP											
51	RUN 1 51'-65'		11.2 / 14.0	80%	13.6 / 14.0	97%		DARK GRAY DOLO. WITH DARK BANDING AND VUGS	51.4 IRREGULAR FRACT (~0°)	5+	0	
									51.5 0° JOINT + GYPSUM			
52									51.75 IRREGULAR FRACT (~0°)	2+		
									51.85 " " "		0	
53									51.95-52.15: BROKEN ZONE (~2 FRACTURES) Some GYPSUM CEMENT (BLEB)	3	5	
									52.8 0° JOINT			
54									53.3 5° JOINT + GYPSUM	2	5	
									53.6 IRREGULAR FRACT. (~10°) 52.4-52.6 VUG (~2cm) ZONE			
55									53.8 FRACT ALONG STYLOLITE	3		
									54.35 5° JOINT 54.5 GYP BLEB (3cm)			
56									54.8 5° JOINT	1		
									55.1 IRREGULAR FRACT (~10°) (STYLOLITE)			
57									55.4 " FRACT ALONG STYLOLITE	2		
									55.9 " " " "			
58									56.35 " " " "	2	0	
									57.1 " " " "			
59									57.7 " " " "	2	5	
									58.1 0° JOINT			
60									58.6 FRACT ALONG STYLOLITE 58.7 GYP BLEB (~1cm)	1		
									59.05 5° JOINT			
61									59.8 5° JOINT 60.3-64.0 VUG (~1cm) ZONE	1	5	
									60.2 FRACT ALONG STYLOLITE			
62									60.9, 61.2 TWO FRACTS (mech)	2	5	
									61.9 5° JOINT		5	
63									62.9 5° JOINT			

GENERAL NOTES:

Total Depth 72'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 85627.36
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schaick

BORING NUMBER 15-D
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 10/12/83 FINISH 10/14/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
64									62.8 IRREGULAR FRACT + VUG ON SURFACE (1cm)	2	0	
									63.25 0° JOINT			
									63.75 IRREGULAR FRACTURE	1		
65									64.2 " " (~15°)		0	
	RUN 2								65.25 0° JOINT	1		
66	65'-	73'	6.0 / 8.0		7.7 / 8.0				66.5 IRREGULAR FRACTURE ALONG GYPSUM BLEB	1		
67									67.4 FRACT. ALONG STYLOLITE			
				75%		96%			67.85 IRREGULAR FRACT.	2		
68									69.2 " " 69.2 - 70.2 VUG SURFACE (1-3mm)			
69									69.55 0° JOINT	0		
									70.5 10° JOINT	2	0	
70									71.05 5° JOINT		10	
								BLACK VERY FINE GRAIN (MAFIC)	71.65 IRREGULAR FRACT.	1	5	
71									71.9 " "	3		
									72.0 0° JOINT			
72									72.25 10° JOINT		10	
									72.5 IRREGULAR FRACT (~0°)	4		
73		END OF BORE							72.55 " " (~50°)			

GENERAL NOTES: LOG NOTES LOST OF WATER AT 68'

Total Depth 73'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-D

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 85627.36-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schaick

BORING NUMBER 15-F
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 9/27/83 FINISH 9/29/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
31												
	RUN 1		11.7 / 12.8		12.8? / 12.5			LT. GRAY DOLO. WITH DARK HORIZON. SEAMS AND FINE-MED GRAIN	32.6 0° JOINT GYPSUM COAT 31.0 - 43.5 RUBBLE VUGS AT SURFACE			
32	31.0 -	43.5'							34.35 0° JOINT	0		
									34.5 0° FRACTURE ALONG STYLOLITE			
33									34.6 0° FRACTURE ALONG STYLOLITE	1	0	
									34.9 5° JOINT (MECH?)			
34									35.7 0° JOINT 36.0 GYPSUM SEAM	0		
				91%		100%			36.4 10° JOINT, GYPSUM MIN. 37.8 - 38.35 VUGS (1-3mm) ON SURFACE			
35									37.25 5° JOINT	4	0	
									37.8 0° JOINT GYPSUM COAT			
									38.35 0° " " "			
36									39.1 0° JOINT, " "	1	0	
									39.8 0° JOINT			
37									40.7 0° JOINT	1	10	
									41.4 0° JOINT			
38									43.1 0° FRACTURE ALONG STYLOLITE	2	5	
											0	
39										1	0	
											10	
40										2	0	
											0	
41										0	0	
											0	
42										1	0	
											0	
43										0	0	

GENERAL NOTES:

Total Depth 105'
'ROCK' Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2236-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schuck

BORING NUMBER 15-F
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 9/21/83 FINISH 10/7/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
44												
	RUN 2											
	43.5' -											
45	58.0		12.0 / 14.5		14.5 / 14.5							
									43.5 50° JOINT 43.9 GYP. BLEB (2 cm)	3	5 / 30	
									43.6 30° JOINT 44.6-44.8 LARGE GYPSUM BLEB (6 cm)	2	0	
									44.3 0° JOINT + Gypsum Bleb		15	
									44.8 15° JOINT		30 / 0	
									45.2 20° JOINT	2		
									45.3 0° JOINT			
									47.2 0° JOINT + GYPSUM 47.4-47.6 Gypsum VEIN			
									47.55 0° JOINT + GYPSUM	0		
			85%		100%				48.45 0° JOINT + XTL FILLED VUG		0	
									48.25 5° FRACTURE ALONG JTV/DOLITE	2	0	
									50.15 0° " " "			
									50.2-50.8 >80° FRACTURE 52.0-53.5 - VERY FINE GRAIN, FEWER PINHOLE VUGS	1	0	
									51.6 5° JOINT		5	
									52.6 0° FRACTURE ALONG JTV/DOLITE	1		
									53.0 0° " " "		0	
									52.5-53.65 >80° FRACTURE	2	>80	
									53.65 0° JOINT		5	
									55.9 0° JOINT	1		
									53.0 0° JOINT		0	
									53.7 - 55.7 CONTORTED BEDDING	1	0 / >80	
										3	0	
54												
55										0		
56										1	0	

GENERAL NOTES:
[illegible] EXCEPT AS NOTED ABOVE

Total Depth 105'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. [illegible]

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2236-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schuck

BORING NUMBER 15-F
BORING OFFSET _____
SURFACE ELEVATION [illegible]
DATE START 9/[illegible] FINISH [illegible]

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
57												
58												
	RUN 3								58.35 0° JOINT			
	58.0-		9.8 / 10.5		10.5 / 10.5				57.75 0° JOINT 59.8 - 60.6 VERY FINE GRAIN, NO PINHOLE VUGS	0		
59	68.5								59.05 0° JOINT			
									60.7 20° JOINT	3		
									61.15 5° JOINT 63.2 - 64.9 VUG (1-1mm) SURFACE			
60									61.85 5° JOINT	1		
			93%		100%				62.95 15° JOINT			
61									63.45 0° JOINT			
									63.95 0° JOINT	2		
62									65.0 0° JOINT 66.4 - 68.0 VERY FINE GRAIN, EARTH GRAY (MICA?), NO PINHOLE VUGS			
									66.3 0° JOINT	1		
63									67.0 0° JOINT			
									67.3 0° JOINT	2		
64									67.4 0° JOINT			
									67.5 0° JOINT	0		
65									67.6 0° JOINT			
									67.75 0° JOINT	1		
									63.1 10° JOINT			
66									63.5 5° JOINT			
										1		
67												
68										6		
	RUN 4								69.0 0° JOINT			
69	68.5-83.5		13.2 / 15.0		15.0 / 15.0					2		

GENERAL NOTES:

Total Depth 105'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. [illegible]

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 4 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont NIAGARA PLANT NO. 3362336-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schock

BORING NUMBER 15-F
BORING OFFSET _____
SURFACE ELEVATION 564.2'
DATE START 7/27/83 FINISH 7/28/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
70									70.7 0° JOINT, BROWN OXIDE STAIN (mica)	1		
									70.9 10° JOINT			
71									72-76 PINHOLE VUGS	2	0	
									76.0 0° JOINT		10	
72									77.15 0° JOINT	0		
									77.5-77.7 TWO GYPSUM SEAMS (1-2 cm)			
73									78.9 5° JOINT	0		
			58%	10%					80.45 5° JOINT			
74									80.8 15° JOINT	0		
									81.7 5° JOINT			
75									82.0 5° JOINT	0		
									83.1-83.2 TWO 0° JOINTS (1 mm)			
76										1	0	
77										0		
78										1		
79										1	5	
80										0		
81										2	5	
82										1	15	
											5	

GENERAL NOTES:

Total Depth 105'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 5 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DuPont NIAGARA PLANT NO. 3362336-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schock

BORING NUMBER 15-F
BORING OFFSET _____
SURFACE ELEVATION 564.2'
DATE START 7/27/83 FINISH 7/28/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
83										1		
	RUN 5								84.1 TWO 0° JOINTS			
84	83.5 -		11.0	73%	12.5	83%			84.5 0° JOINT NO CORE ON CORE SURFACE THROUGHOUT RUN	2		
	98.5		13.5		15.0				84.8 5° JOINT			
85									85.2 0° JOINT	4		
									85.5 0° JOINT			
86									86.4 0° JOINT	2		
									87.0 0° JOINT			
87			81%	90%					87.95 5° JOINT	1		
									88.25 0° JOINT			
88									88.6 0° JOINT	2		
									89.2 0° JOINT 89.55 GYPSUM SEAM			
89									89.4 5° JOINT 90.1 " "	2		
									89.6 15° JOINT, GYPSUM COAT			
90									90.25 0° JOINT 91.6 GYPSUM SEAM	3		
									90.75 5° JOINT 91.9-92.3 GYPSUM SEAM			
91									91.2 5° JOINT	2		
									91.45 0° JOINT + GYPSUM COAT 92.2 CORE CUTTING GYPSUM SEAM			
92									91.9 0° JOINT + GYPSUM COAT	3		
									92.5 5° JOINT + GYPSUM COAT			
93									93.0 0° JOINT + GYPSUM COAT	1		
									93.5 0° JOINT			
94									93.95 15° JOINT (CONCHOIDAL)	3		
									94.3 15° JOINT (CONCHOIDAL)			
95										2		

GENERAL NOTES: 106.2' BOREHOLE [illegible]

Total Depth 105'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 6 of 6

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 3202236-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schock

BORING NUMBER 15-F
BORING OFFSET _____
SURFACE ELEVATION 568.2'
DATE START 9/22/83 FINISH 10/7/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
96									94.8 40° JOINT (IRREGULAR), VUGGY JUNDARE	0		
97									94.0 - END: SAMPLE IS DISTINCTLY LIGHTER IN COLOR, DARK BANDING CEASES	0		
98	END OF SAMPLE											
	END OF BORE											
									NOTE: DISCREPANCY OF ~ .5 - 1 FOOT BETWEEN ORIGINAL LOG AND SAMPLE BOX WRITTEN INTERVALS AFTER RUN 3, SUGGEST POSSIBLE ERROR OF 1' AFTER 63' IN THIS LOG.			

GENERAL NOTES:

Total Depth 104'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-F

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT-NIAGARA PLANT NO. 3202236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY LBZ 11/22/83

BORING NUMBER 15-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH 11-2-83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
									* SEE LOG FOR OTHER NO 15 WELLS.			
154									Rollerrocked to 154.5'			
155	Box 1								155.0' - 25° JOINT BLACK, [illegible]			
156									155.4' - 20° JOINT BLACK [illegible]			
157	RUN 1								155.7' - HORIZONTAL JOINT, BLACK, [illegible]			
158	154.5'		11.4'		15.0'				156.[illegible] 20° JOINT [illegible]			
159	to		15.0'		15.0'				[illegible]			
160	169.5'				100%				157.33' - HORIZ JOINT [illegible]			
161									157.75' - HORIZ JOINT - SOME [illegible]			
162									[illegible]			
163									158.[illegible] 20° [illegible]			
164									159.1' HORIZ JOINT [illegible]			
									159.51' - 20° JOINT [illegible]			
									160.[illegible] - 15° JOINT [illegible]			
									[illegible]			
									[illegible]			
									[illegible]			
									162.73' 15° JOINT			
									163.2' HORIZ JOINT			
									[illegible]			
									[illegible]			

GENERAL NOTES:

Total Depth 169.5'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15-J

FIELD ROCK DESCRIPTION LOG

Woodward-Clyde Consultants

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT - NIAGARA PLANT NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR _____
LOGGED BY REZ 11/22/83

BORING NUMBER 15-J
BORING OFFSET _____
SURFACE ELEVATION _____
DATE START _____ FINISH 11-10-83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
165	165'								BLACK SHALE			
166	15½'		—		15.0'							
167	16½'		15.0'		15.0'							
168												
169												
170									END OF HOLE 169.5'			

154.5 - 161.7 - GREY SHALY DOLOMITE - 11.1 thick, grey, thin bedded, fine grained, numerous shale [illegible] along clay, occ. gypsum [illegible], smooth joints

161.7 - 169.5 BLACK SHALE - [illegible] bedded, 2½ to 4 dark grey, calcareous

GENERAL NOTES:

Total Depth 4.5'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 15 J

WCC 1-15

FIELD ROCK DESCRIPTION LOG

Woodward-Clyde Consultants

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 16-J
BORING OFFSET _____
SURFACE ELEVATION 581.5'
DATE START 12/5/83 FINISH 12/9/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
11	Top	of	Rock	11.5'								
12												
13	NO											
14												
15									14.5' - 17.0' - med grey [illegible] laminated [illegible]			
16												
17									17.0' - 18.1' - [illegible]			
18												
19			4.4'		10'							
20			10'		10'							
21												
22			44%		100%							
23												

GENERAL NOTES:

Total Depth 16.5'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 16-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB Dupont Niagara Plant NO. 83C2256
DRILLING RIG _____
OPERATOR _____
INSPECTOR Ted Taylor

BORING NUMBER 16-B
BORING OFFSET _____
SURFACE ELEVATION 569.3'
DATE START 5/15/83 FINISH 5/19/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
24									24.1'-25.3' Med to light gray, well laminated [illegible] 24.1' is a sharp contact at a [illegible] Few med sized vugs (.15"), [illegible]	0		0°
25									24.3' - Fracture along a [illegible]	3	0°	
	RUN 1								24.6' - Joint, 50°		50°	
	10.2								24.8' - Horizontal Fracture	2		
									25.2' - Joint, 30°		0°	
									25.3 - 36.3' - Med gray to [illegible] laminated dolomite. Many small vugs [illegible]	2	0°	
									25.5' - Joint, 30° Large vugs nearby		30°	
									25.65' - Large Vug [illegible] (15"x.5")	3	0°	
									26.4' - Horizontal Fracture			
									26.9' - Horizontal Fracture along stylolite Gypsum cont. Same at 27.1' and 27.25' except no gypsum.	1	10°	
									27.6' - Horizontal Fracture			
									27.8' - Large gypsum filled vug.	1		
									28.1' - Horizontal Fracture along stylolite and connecting vugs			
									28.1' - Joint, 10°	0		
									28.6' - 30.6' Band of small vugs common.		0°	
									31.1' - Horizontal Fracture.	4	30°	
									31.5' - Joint, 30°		0°	
									31.5' - 33.0' - Vugs, [illegible] and [illegible] common. Beginning to [illegible]	2		
									31.5' - 32.0' - Vertical Fracture.			
									31.7' 32.0' - Horizontal Fractures.			
									32.2', 32.4' - Fracture due to connecting vugs.	3	10°	
									33.15' 33.45' - V large, [illegible] Vugs. Gypsum [illegible]		0°	
									33.45' - Piece of [illegible] (Drill)		10°	
									33.6' - Joint, 10°	3	0°	
									33.9' - Horizontal Fracture			
									34.3' - Joint, 10° Gypsum cont			
									34.5' - 34.7' - Buggy, Brecciated & [illegible]			
									34.8' - Gray [illegible]	0		
36	Total	Depth							36.1' - Horizontal Fracture [illegible]	1	0°	

GENERAL NOTES:

Total Depth 36.3'
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 16-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 83C2256
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Sedlock

BORING NUMBER 17-B
BORING OFFSET _____
SURFACE ELEVATION 568.4'
DATE START 7/26/83 FINISH 7/27/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
21	TOP OF BEDROCK											
22	NO SAMPLE											
23												
24												
25	RUN 1							Lt Gray Dolo. with Fossil, Gypsum Fractures	24.9 5° JOINT + GYPSUM 25.2 2 cm VUG	1	5°	
	24.5-								25.0 5° JOINT		5°	
	35.3'	10.2		10.8					25.4 GYPSUM BLEB + IRREGULAR FRACT. 25.3 GYP. BLEB (3cm)	2		
26		10.8		10.8					25.9 2cm VUG			
									26.4 IRREGULAR FRACT	1		
27									27.3 IRREGULAR FRACT (~10°)			
									30.6 0° JOINT	1		
28				94%		100%			30.8 5° JOINT 29.15 3cm VUG			
									31.7 IRREGULAR FRACT (~10°)	0		
29									31.9 5° JOINT			
									32.0 5° JOINT	0		
30									32.6 5° JOINT + INTERSECTION WITH VERTICAL VUG (5cm)			
									33.35 10° JOINT	2	0	
31											5°	
									33.6 - 35.3 VUG SURFACE (1.5cm)	2		
32											5°	
									PINHOLE AND LINEAR VUGS WITHIN [illegible] LOCAL [illegible] IN RUN (SEMPLE LOG)	2	5°	
33												

GENERAL NOTES:

Total Depth 71.8'
"ROCK" Drilling _____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 17-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 82-2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schuck

BORING NUMBER 17-B
BORING OFFSET _____
SURFACE ELEVATION 584.4'
DATE START 7/26/83 FINISH 7/27/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
34										1	10	
35										0		
36	RUN 2 35.3'-45.5'		9.7 / 10.2		10.2 / 10.2				36.15 5° JOINT 39.4 5° FRACT ALONG STYLOLITE 40.2 10° FRACT ALONG STYLOLITE 40.45 0° JOINT 42.2 0° FRACT ALONG STYLOLITE 43.1 15° JOINT 44.8 IRREGULAR FRACTURE 45.1 10° JOINT 35.5 3cm GYP. BLEB 38.3-38.4 CROSS CUTTING GYPSUM VEIN PINHOLE VUGS (CONTINUOUS ... FOR ... FEET, PENETRATING THROUGH ... FRACTURE VUGS)	0	5	
37										0		
38			95%		100%					1	5	
39										0		
40										2	10 / 0	
41										0		
42										1	0	
43										1	15	
44										1		
45										2	10 / 10	
46	RUN 3 45.5-51.8'		5.4 / 6.3		6.1 / 6.3				45.5 10° JOINT 46.0 5° JOINT 46.2 RADIAL VUG ZONE 46.8 " END OF VUG ZONE		5	

GENERAL NOTES:

Total Depth 51.8'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 17-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 3 of 3

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 82-2236
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schuck

BORING NUMBER 17-B
BORING OFFSET _____
SURFACE ELEVATION 584.4'
DATE START 7/27/83 FINISH 7/28/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
47									47.3-47.8 BROKEN ZONE (0°-10° FRACTURES) 4" BREAK 47.0 0° JOINT 47.35 IRREGULAR FRACT (~10°) 47.9 GYP. VEIN 48.8 JOINT	1		
48										6	0	0°
49			86%		98%					3+	0	
50									48.5-48.6 BROKEN ZONE (LARGE FRACTURE) 50.45 5° JOINT 48.6 - END OF RUN: VUGGY ZONE (1-2cm)	0		
51										1	5	
52	END OF BORE									0		

GENERAL NOTES: 100% RECOVERY AT WATER AT 47.6'

Total Depth 51.8'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 17-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 84[illegible]36
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schewe

BORING NUMBER 18-C
BORING OFFSET _____
SURFACE ELEVATION 567.6'
DATE START 5/27/83 FINISH 7/22/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
13	TOP OF [illegible]											
14	NO [illegible]											
15												
16	RUN 1											
17	16.0 - 21.3'		3.8 / 5.3		5.3 / 5.3			LT GRAY [illegible]	18.35 IRREGULAR FRACTURE	0		
18									18.5 - 18.8 BROKEN ZONE; FRACTURES 0°-10°, 4+ BREAKS	0		
19			72%		100%				18.5 - 19.0 VUG (1cm - 10cm) SURFACE	5+	0° 5 10	
20									19.1 5° JOINT			
21									19.4 10° JOINT	4		
22	RUN 2								19.6 IRREGULAR JOINT (~5°10°), SURFACE OF ZONE IS VUGGY AROUND JOINT			
23	21.3' - 35.9'		12.5 / 14.6		14.1 / 14.6				19.75 IRREGULAR JOINT (~0°), VUGGY ZONE SURFACE AROUND JOINT	1		
24									20.3 IRREGULAR FRACTURE (~0°) (MECH?)		10	
25									21.1 10° JOINT	4	15 5 0	
26									21.2 - 22.6 : VUG (1-4cm) SURFACE, WEATHERED		5	
27									21.3 15° JOINT	6+	82 10 5	
28			66%		97%				21.75 5° JOINT (VUGGY JOINT)			
29									21.9 0° JOINT	2	5	
30									22.0 5° JOINT		0	
31									22.0 - 22.4 BROKEN ZONE, 0°-10°, 4+ BREAKS	1		
32									22.65 30° JOINT		5	
33									23.0 5° JOINT		5	

GENERAL NOTES: LOG MADE FROM CORE AT WATER AT 18.5

Total Depth 35.9'
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 18-C

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. [illegible]
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schewe

BORING NUMBER 18-C
BORING OFFSET _____
SURFACE ELEVATION [illegible]
DATE START 5/27/83 FINISH 7/22/83

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
26									23.6 5° JOINT	4	0	
27									24.0 0° JOINT + GYPSUM			
28									25.0 5° JOINT	1		
29									25.1 5° JOINT			
30									25.55 IRREGULAR FRACT (~10°) + GYPSUM	0		
31									25.65 - 27.0 VUG (1-10 cm) [illegible]			
32									26.9 IRREGULAR FRACT (~5°)	1		
33									27.4 - 28.1 SMALL VUG SURFACE			
34									28.8 IRREGULAR FRACT (~5°)	0		
35									28.5 - 31.8 : SINGLE VUG SURFACE			
36	END OF BORE								32.3 IRREGULAR FRACT (~5°)	0		
									28.8 - 29.4 CRYSTAL VEIN			
									33.05 5° JOINT	0		
									33.15 5° JOINT			
									33.3 5° JOINT	0		
									33.8 IRREGULAR FRACT ON GYPSUM SEAM			
									34.7 BROKEN ZONE (SMALL PIECES), 2+ BREAKS	1		
									35.5 10° JOINT	4		
										2+		
										1	10	

GENERAL NOTES: LOG NOTES [illegible]

Total Depth [illegible]
"ROCK" Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. [illegible]

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 1 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 3C23336-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schock

BORING NUMBER 19-B
BORING OFFSET _____
SURFACE ELEVATION 569.8'
DATE START 5/25/82 FINISH 7/22/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
10					10.5'							
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												

			9.2	92%				LT. GRAY DOLOMITE 2 STYLOLITES	14.4 0° JOINT 14.5 5° JOINT, BLACK STAIN 14.65 5° JOINT 14.7 0° JOINT 14.8 5° JOINT, GYPSUM COAT 15.1 5° JOINT GYPSUM COAT 15.3 5° JOINT 15.4 0° JOINT 15.7 5° JOINT 16.4 5° JOINT 17.1 20° FRACTURE ALONG STYLOLITE 17.2 20° JOINT (? MECH) 19.9 0° FRACTURE ALONG STYLOLITE 20.05 0° JOINT 20.25 0° JOINT 20.5 0° FRACTURE ALONG STYLOLITE 21.0 0° JOINT, GYPSUM COAT	14.4 - 14.7 VUG (1-1mm) SURFACE, WEATHERED, ENDOGZONE 20.1 - 20.3 VUG (5-10mm) SURFACE, WEATHERED. 20.8 - 21.0 STYLOLITE CONCENTRATION 20.8 GYPSUM FILLED	5 4 1 2 0 1 3 1	0 5 5 5 5 5 20 0 0 0 0	20

GENERAL NOTES: VUG WATER LOSS AT WATER AT 20.15'

Total Depth 23.4'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 19-B

Woodward-Clyde Consultants

FIELD ROCK DESCRIPTION LOG

Sheet 2 of 2

GROUND WATER OBSERVATION
At _____ Ft. at Completion
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.
At _____ Ft. after _____ hrs.

JOB DUPONT NIAGARA PLANT NO. 3C23336-2
DRILLING RIG _____
OPERATOR _____
INSPECTOR Dave Schock

BORING NUMBER 19-B
BORING OFFSET _____
SURFACE ELEVATION 569.8'
DATE START 5/25/82 FINISH 7/22/82

DEPTH	CORE RUN From	CORE RUN To	RQD Inch	RQD %	RECOVERY Inch	RECOVERY %	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTURES No./Ft.	FRACTURES DIP	BED DIP
13									23.4 0° JOINT, GYPSUM COAT 22.0 - 23.4 VUG (1-3mm) SURFACE	0 1		
	END OF BORE											

GENERAL NOTES:

Total Depth 23.4'
'ROCK' Drilling ____

Proportions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%

HOLE NO. 19-B

CONOCO

Attachment 1

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #1-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Bruno Lagattuta WEATHER CLEAR

DATE STARTED 5/5/83 COMPLETED 5/17/83 TECHNICIAN MIKE FREY

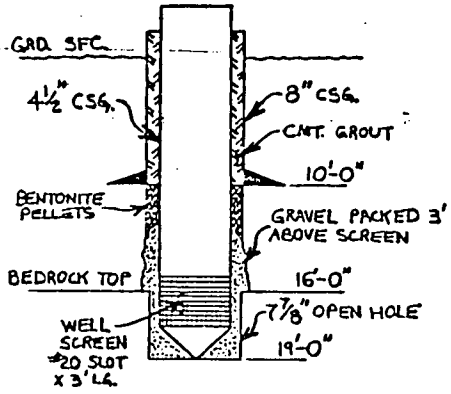
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

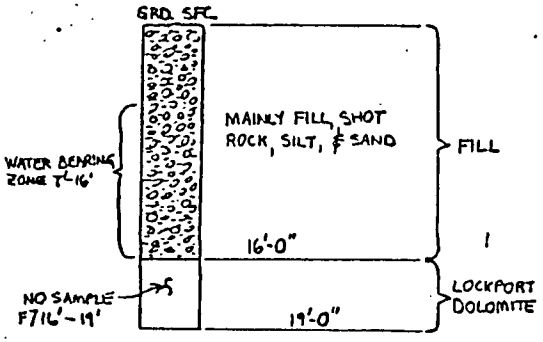
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– LRG. BLDR'S. & ROCKS & GEN. RIF RAFF (FILL) NO SAMPLES DUE TO ROCKS & BLDR'S.
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BEDROCK (CSG. NOT CMT. GROUTED)
10'									– DRILL 7 7/8" O.D. HOLE 3' INTO BEDROCK TO 19'-0"
15'									– BEDROCK HIT @ DEPTH OF 16'-0"
								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 19'-0"
20'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 10'
									– 8" CSG. PULLED UP TO 10'-0" & CMT GROUTED TO SFC.
									– DEVELOPMENT YIELDED 1 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS DIRTY AT FIRST, THEN CLEARED BUT SMELLED BAD (RIVER WATER SMELL)

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. B:
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. B:

WELL #1-A



GEOLOGY OF #1-A



CONOCO

WELL # 1-B

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #1-B

PROJECT DUPONT EXPLORATORY WELL'S

CLIENT DUPONT

ELEVATION _____ INSPECTOR Doug Loffman WEATHER COLD & SNOW

DATE STARTED 4/19/93 COMPLETED 4/25/93 TECHNICIAN DON SWEATING

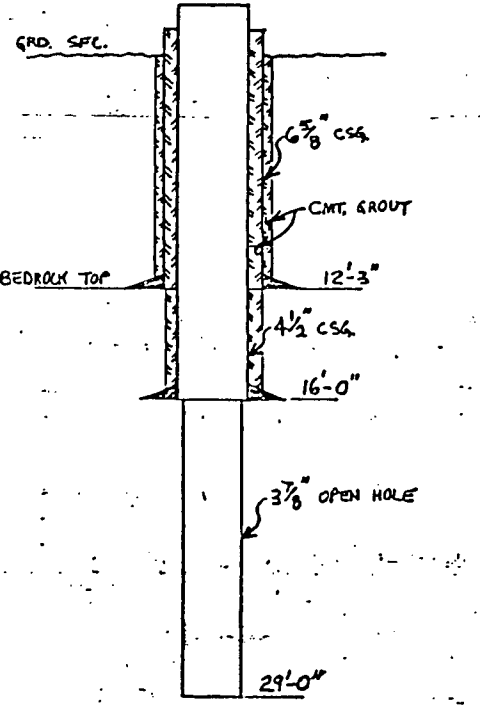
GROUND WATER – CASING IN – AT COMPLETION / TIME

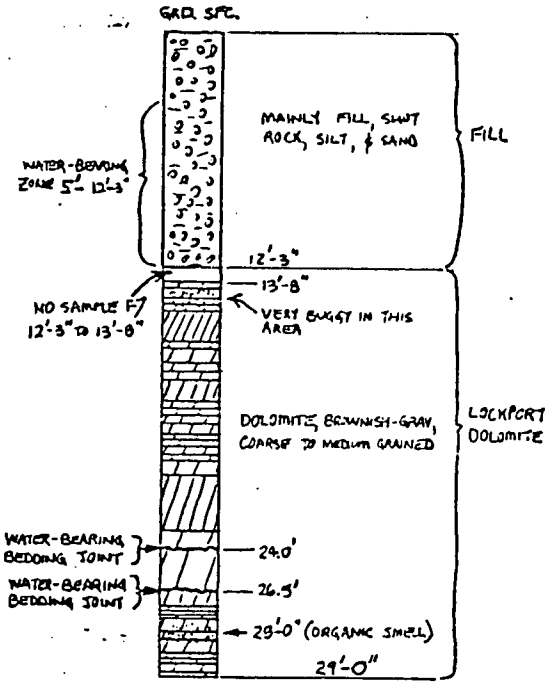
BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– LRG. BLDR'S. & ROCKS & GEN. RIF RAFF (FILL) NO SAMPLES DUE TO ROCKS & BLDR'S.
									– TOP SURFACE FULL OF WATER-WASHED OUT SOIL AROUND BLDR'S WHILE DRILLING
10'									– 6 5/8" O.D. CSG. SET TO 12'-3" (NO CMT. GROUT)
									– BEDROCK HIT @ DEPTH OF 12'-3"
15'								RUN #1 13'-8" TO 19'-0" REC. 5'-3"	– DRILLED F/ 12'-3" TO 13'-8" W/ 5 7/8" ROLLER ROCK BIT
									– CORED SAMPLE F/ 13'-8" TO 19'-0" SAMPLE BROWNISH-GRAY DOLOMITE W/ BEDDING FRACTURES
20'									– REAMED F/ 13'-8" TO 16'-0" W/ 5 7/8" BIT
								RUN #2 19'-0" TO 27'-0" REC. 8'-0"	– 4 1/2" O.D. CSG. SET TO 16'-0"
25'									– CORED SAMPLE F/ 19'-0" TO 27'-0" SAMPLE BROWNISH-GRAY DOLOMITE W/ WATER BEARING FRACTURES @ 24.0' & 26.5' (LOST CIRC. TO 24' FRAC.)
									– REAMED F/ 16'-0" TO 29'-0" W/ 3 7/8" BIT
30'									– DEVELOPMENT YIELDED 10 GAL./MIN FROM 24'-0" WATER-BEARING FRAC., 2-PHASE ORGANIC WAS PRESENT AT FIRST, THEN CLEARED UP, BUT STILL HAD ORGANIC ODOR

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FT. FALL
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FT. FALL

GEOLOGY OF # 1-B





CONOCO

PROJECT NO. _____ PAGE 1 OF _____ BORING NO. WELL #1-C

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dawn Loeffelholz WEATHER COLD & RAINY

DATE STARTED 4/27/93 COMPLETED 5/4/93 TECHNICIAN DON SWEATING

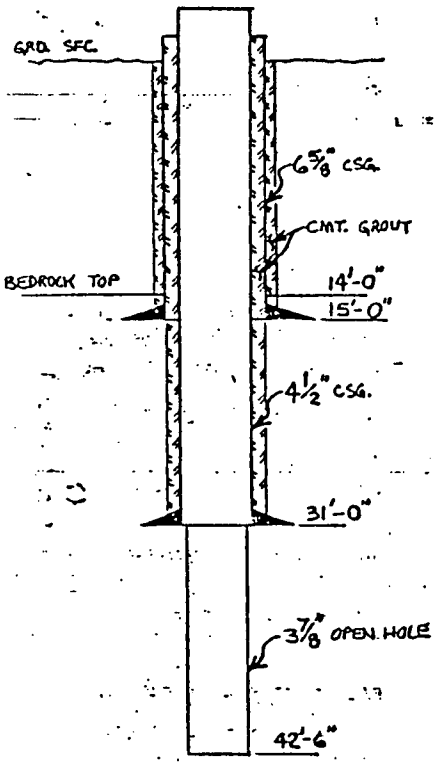
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – WELLPOINT AT

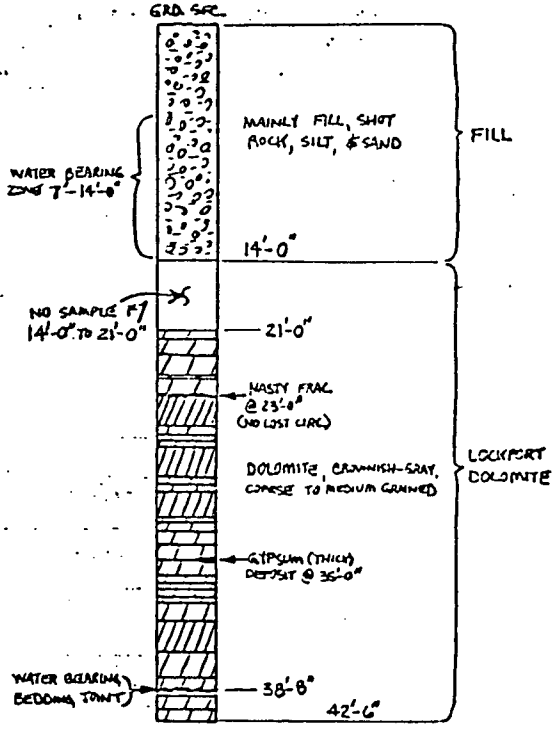
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
					– BLDR'S. & ROCKS & GEN. RIF RAFF (FILL) NO SAMPLES DUE TO ROCKS & BLDR'S.
					– DRILL 7⅞" O.D. HOLE 1' INTO BEDROCK TO 15'-0"
					– 6⅝" O.D. CSG. CMT. GROUTED @ 15'-0"
10'					– BEDROCK HIT @ DEPTH OF 14'-0"
					– DRILLED F/ 14'-0" TO 21'-0" W/ 5⅞" BIT
				CIRC. SAMPLE F/ 17' WASHOUT	– HIT VOID @ 17'-10' & LOST CIRC. PUMPED CMT. PLUG ACROSS ZONE OF VOID (CIRC. SAMPLE F/ 17' ZONE SHOWED SAND & SILT)
20'					
				RUN #1 21'-0" TO 31'-0" REC. 9'-11½"	– CORED SAMPLE F/ 21'-0" TO 31'-0" SAMPLE BROWNISH-GRAY DOLOMITE W/ BEDDING FRACTURES
30'					– REAMED F/ 21'-0" TO 31'-0" W/ 5⅞" BIT
				RUN #2 31'-0" TO 34'-0"	– CORED SAMPLE F/ 31'-0" TO 34'-0" (TRYING TO FIND WATER-BEARING FRAC. – NO LUCK) SAMPLE BROWNISH-GRAY DOLOMITE
				RUN #3 34'-0" TO 42'-6" REC. 8'-3"	– 4½" O.D. CSG. SET TO 31'-0"
40'					– CORED SAMPLE F/ 34'-0" TO 42'-6" SAMPLE BROWNISH-GRAY DOLOMITE W/ WATER BEARING FRACTURE @ 38'-8" (LOST CIRC. TO 39'-3" FRAC.)
50'					– REAMED F/ 31'-0" TO 42'-6" W/ 3⅞" BIT
					– DEVELOPMENT YIELDED 1 QT./MIN. FROM 38'-8" WATER-BEARING FRAC., WATER WAS CLEAR, BUT SMELLED LIKE RIVER WATER

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. F
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. F

WELL #1-C



GEOLOGY OF #1-C



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #1-D

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Louis Loffhouse WEATHER COLD

DATE STARTED 5-4-83 COMPLETED 5-9-83 TECHNICIAN JOE KEMP

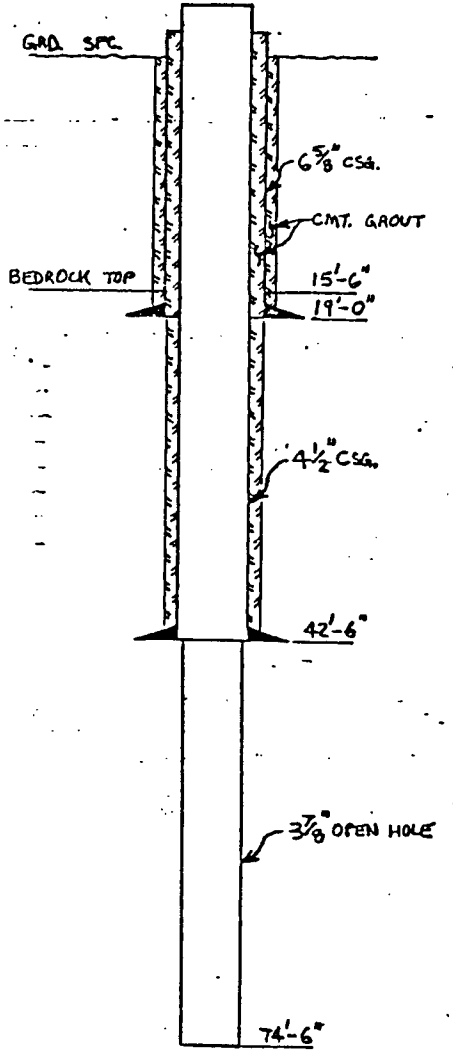
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

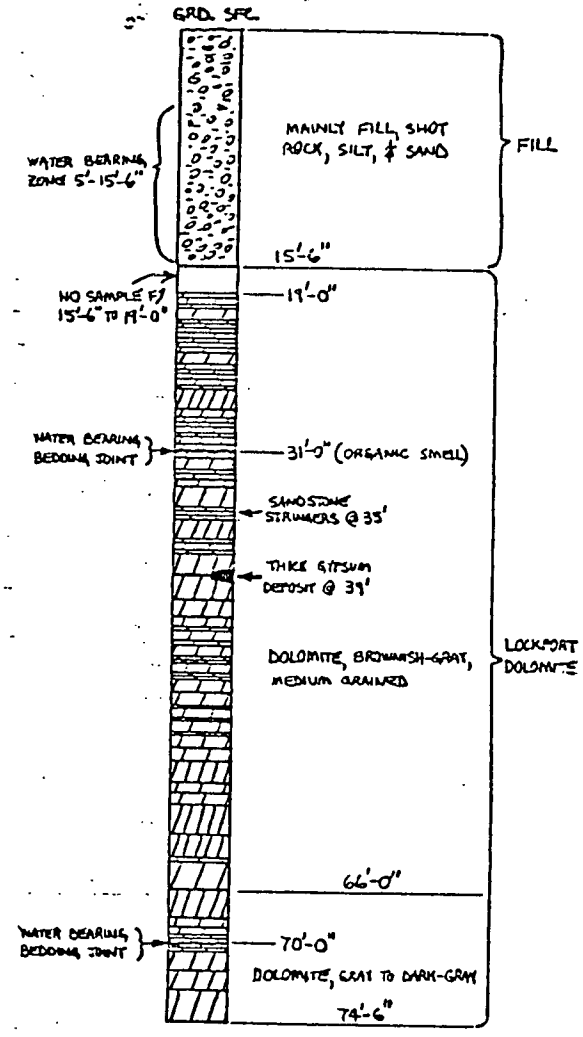
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
15'									– BLDR'S. & ROCKS & GEN. RIP RAPP (FILL) – NO SAMPLES – DRILL 7⅞" O.D. HOLE 3'-6" INTO BEDROCK TO 19'-0" – 6⅝" O.D. CSG. CMT. GROUTED @ 19'-0" – BEDROCK HIT @ DEPTH OF 15'-6"
30'								RUNS #1-3 19'-0" TO 42'-6"	– CORED F/19'-0" TO 42'-6" CORE SHOWED BROWNISH-GRAY DOLOMITE W/ WATER BEARING FRAC. @ 31'-0" (HEAVY ORGANIC SMELL ENCOUNTERED @ 31' FRAC) – REAMED F/19'-0" TO 42'-6" W/ 5⅞" BIT – 4½" O.D. CSG. SET TO 42'-6"
45'								RUN #4 42'-6" TO 51'-0" REC. 8'-4"	– CORED SAMPLE F/42'-6" TO 74'-6" SAMPLE BROWNISH-GRAY DOLOMITE DOWN TO 66' GRAY TO DARK-GRAY DOLOMITE BELOW 66' W/ WATER BEARING FRAC. (LOW VOLUME) @ 70'-0" (LOST CIRC. SLOWLY TO 70' FRAC)
60'								RUN #5 51'-0" TO 66'-0" REC. 15'-0"	– REAMED F/42'-6" TO 74'-6" W/ 3⅞" BIT
75'								RUN #6 66'-0" TO 74'-6" REC. 8'-5"	– DEVELOPMENT YIELDED 1 GAL/MIN FROM 70'-0" WATER-BEARING FRAC., WATER WAS BLACKISH IN COLOR W/ HEAVY SMELL OF SULFUR

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. BY
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. BY

WELL #1-D



GEOLOGY OF #1-D



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #1-E

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dennis Lofthouse WEATHER WARM & SUNNY

DATE STARTED 5/4/83 COMPLETED 5/13/83 TECHNICIAN DON SWEATING

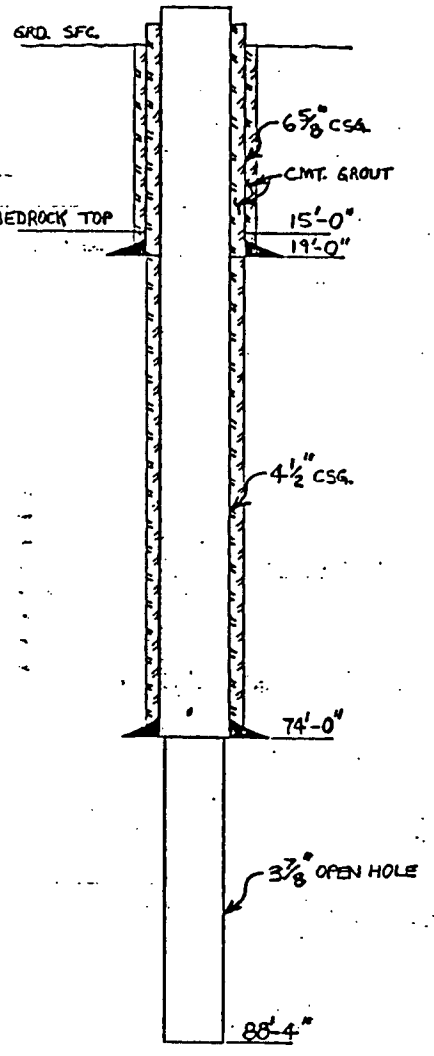
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

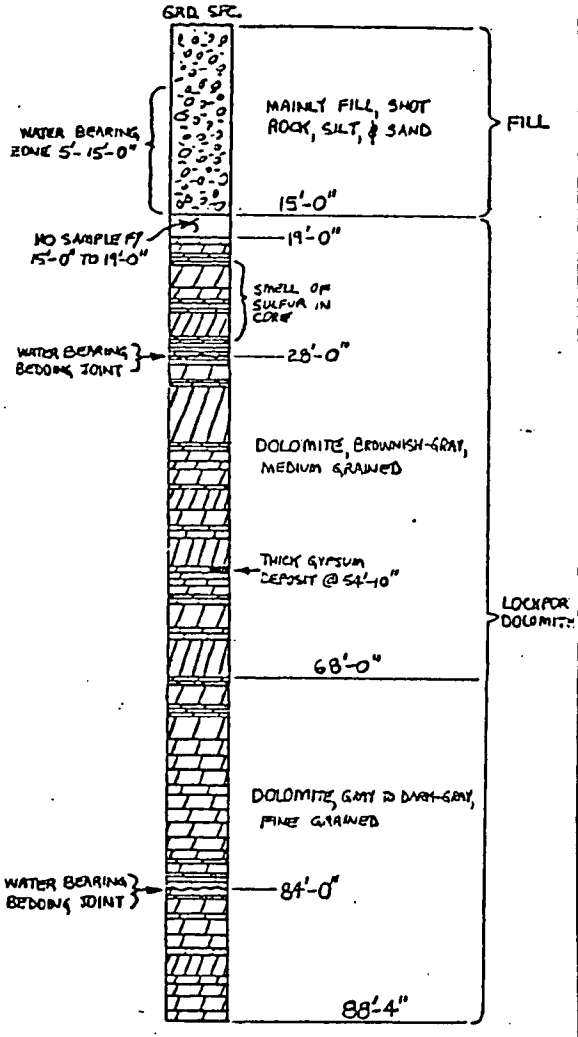
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
15'					– ELDRS. & ROCKS & GEN. RIF RAFF (FILL) – NO SAMPLES – DRILL 7⅞" O.D. HOLE 4'-0" INTO BEDROCK TO 19'-0" – 6⅝" O.D. CSG. CMT. GROUTED @ 19'-0" – BEDROCK HIT @ DEPTH OF 15'-0"
30'				RUNS #1-4 19'-0" TO 74'-0"	– CORED F/ 19'-0" TO 74'-0" CORE SHOWED BROWNISH-GRAY DOLOMITE DOWN TO AROUND 68', GRAY TO DARK-GRAY DOLOMITE BELOW 68' W/ WATER BEARING FRAC. @ 28'-0" – REAMED F/ 19'-0" TO 74'-0" W/ 5⅞" BIT – 4½" O.D. CSG. SET TO 74'-0"
45'					
60'					– CORED SAMPLE F/ 74'-0" TO 88'-4" SAMPLE GRAY TO DARK-GRAY DOLOMITE W/ WATER BEARING FRAC. (LOW VOLUME) @ 84'-0" (LOST CIRC. SLOWLY TO 70' FRAC.) – REAMED F/ 74'-0" TO 88'-4" W/ 3⅞" BIT
75'					– DEVELOPMENT YIELDED LESS THAN 1 PT./MIN. FROM 84'-0" WATER-BEARING FRAC., WATER WAS BLACKISH IN COLOR W/ SULFUR SMELL
90'				RUN #5 74'-0" TO 88'-4" REC. 14'-2"	

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. F
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. F

WELL #1-E



GEOLOGY OF #1-E



A-62

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #1-F

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Bruce Lofthouse WEATHER WARM

DATE STARTED 5/5/93 COMPLETED 5/10/93 TECHNICIAN JOE KEMP

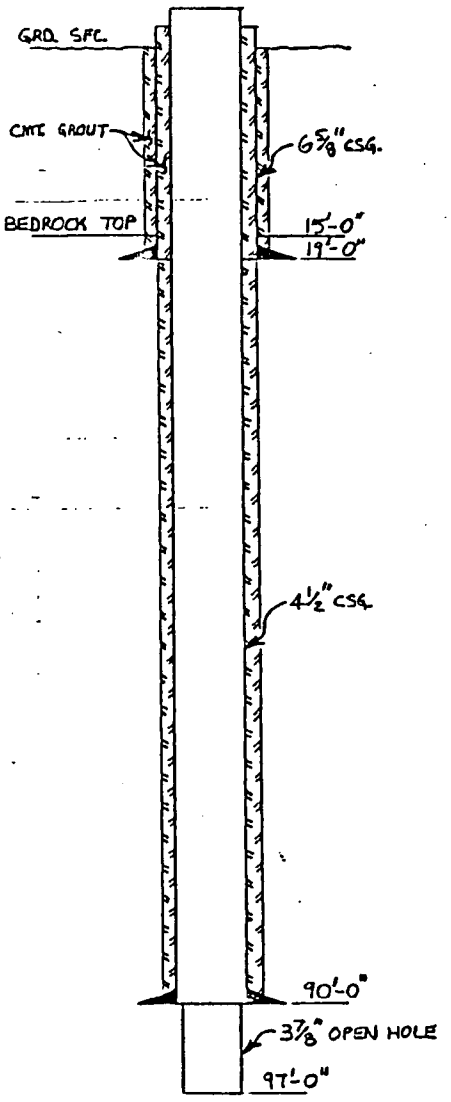
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

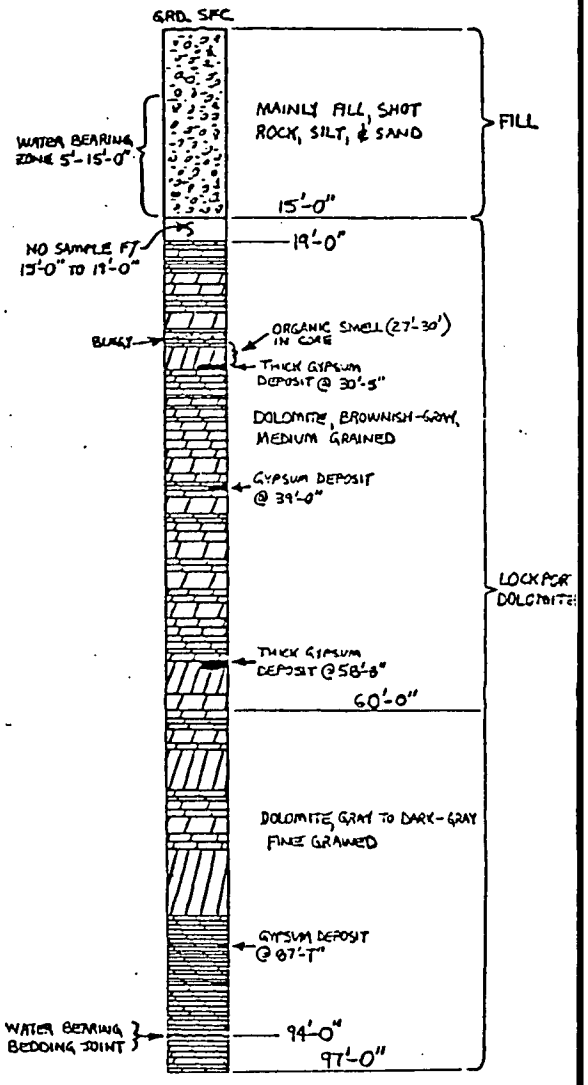
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– BLDRS. & ROCKS & GEN. RIF RAFF (FILL) – NO SAMPLES
									– DRILL 7⅞" O.D. HOLE 4'-0" INTO BEDROCK TO 19'-0"
									– 6⅝" O.D. CSG. CMT. GROUTED @ 19'-0"
									– BEDROCK HIT @ DEPTH OF 15'-0"
20'									– CORED F/19'-0" TO 90'-0" CORE SHOWED BROWNISH-GRAY DOLOMITE DOWN TO AROUND 60', GRAY TO DARK-GRAY DOLOMITE BELOW 60' (HEAVY ORGANIC SMELL ENCOUNTERED F/27'-30')
40'								RUNS #1-5 19'-0" TO 90'-0"	– REAMED F/19'-0" TO 90'-0" W/ 5⅞" BIT
60'									– 4½" O.D. CSG. SET TO 90'-0"
80'									– CORED SAMPLE F/90'-0" TO 97'-0" SAMPLE GRAY TO DARK-GRAY DOLOMITE W/ WATER BEARING FRAC. @ 94'-0" (LOST CIRC. TO 94' FRAC.)
								RUN #6 90'-0" TO 97'-0"	– REAMED F/90'-0" TO 97'-0" W/ 3⅞" BIT
100'								REC 6'-11"	– DEVELOPMENT YIELDED MORE THAN OUR PUMPS COULD PUMP (>20 GAL/MIN) FROM 94'-0" WATER-BEARING FRAC., WATER WAS VERY CLEAN W/ NO NOTICIBLE SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FALL _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FALL _____

WELL #1-F



GEOLOGY OF #1-F



CONOCO

PROJECT NO. _____ PAGE 1 OF 2 BORING NO. WELL #1-G

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dennis Coffman WEATHER RAINY

DATE STARTED 5/5/83 COMPLETED 5/24/83 TECHNICIAN JOE KEMP

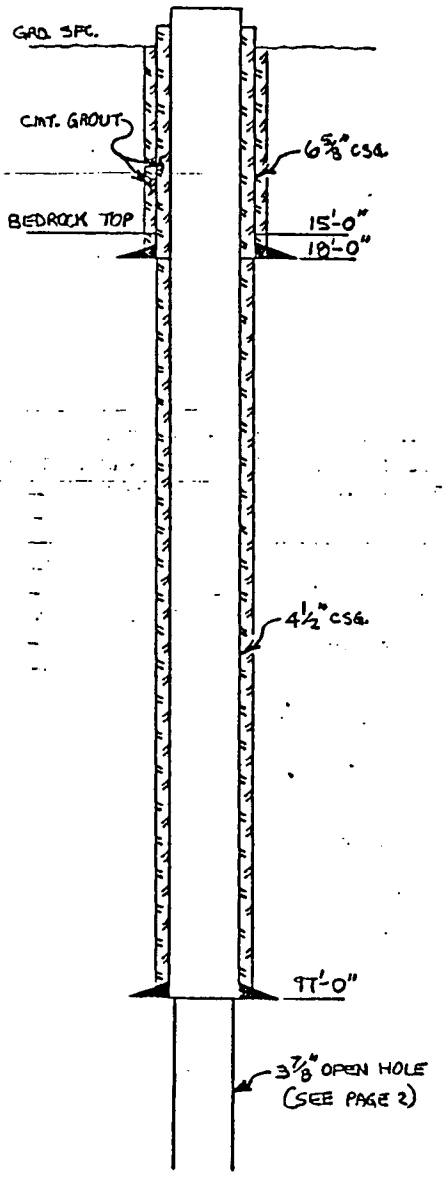
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

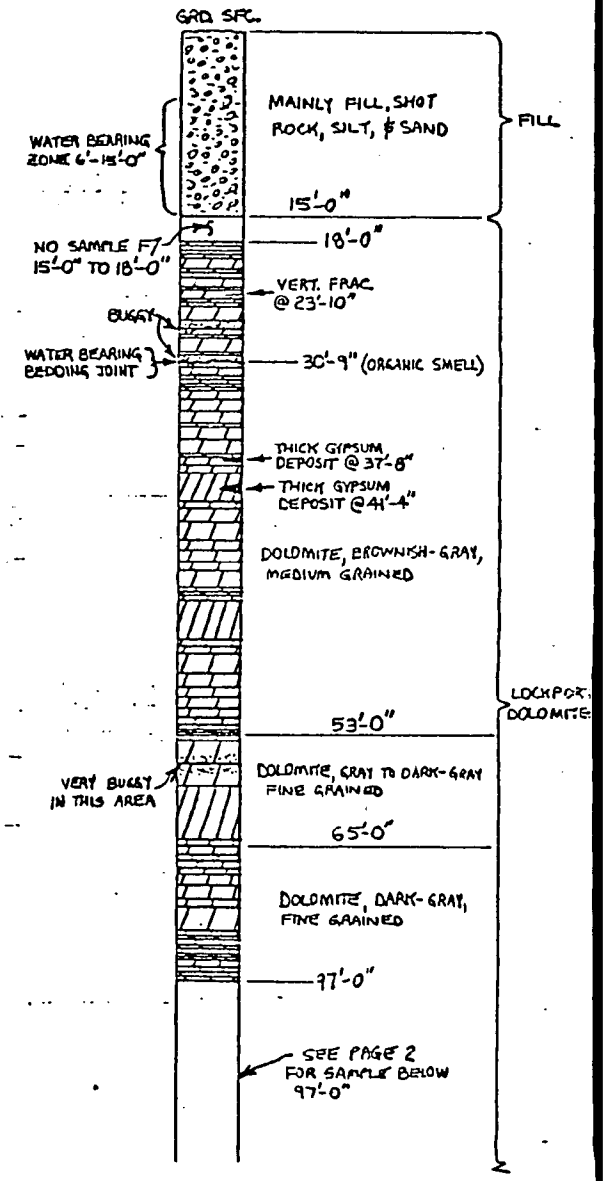
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– BLDRS. & ROCKS & GEN. RIF RAFF (FILL) – NO SAMPLES
									– DRILL 7⅞" O.D. HOLE 3'-0" INTO BEDROCK TO 18'-0"
									– 6⅝" O.D. CSG. CMT. GROUTED @ 18'-0"
									– BEDROCK HIT @ DEPTH OF 15'-0"
20'									– CORED F/ 18'-0" TO 97'-0" CORE SHOWED BROWNISH-GRAY DOLOMITE DOWN TO AROUND 50', GRAY TO DARK-GRAY DOLOMITE BELOW 50' W/ WATER BEARING FRAC. @ 30'-9" (HEAVY ORGANIC SMELL ENCOUNTERED @ 30'-9" FRAC.)
40'									
								RUNS #1-6 18'-0" TO 97'-0"	– REAMED F/ 18'-0" TO 97'-0" W/ 5⅞" BIT
									– 4½" O.D. CSG. SET TO 97'-0"
60'									
									– CORED SAMPLE F/ 97'-0" TO 170'-0" SAMPLE DARK-GRAY DOLOMITE DOWN TO 100'-0"; LIGHT-GRAY LIMESTONE & DOLOMITE F/ 100'-140'; LIGHT-GRAY DOLOMITE W/ LIMESTONE & SHALE PARTINGS F/ 140'-163'-8"; DARK-GRAY SHALE BELOW 163'-8"
80'									
100'								RUN #7 97'-0" TO 109'-0" REC. 11'-10½"	
								RUN #8 109'-0" TO 124'-6" REC. 15'-2"	
120'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FT. B:
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FT. B:

WELL #1-G



GEOLOGY OF #1-G



CONOCO

PROJECT NO. _____ PAGE 2 OF 2 BORING NO. WELL #1-G

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Bruce Lockwood WEATHER _____

DATE STARTED 5/5/03 COMPLETED 5/24/03 TECHNICIAN JOE KEMP

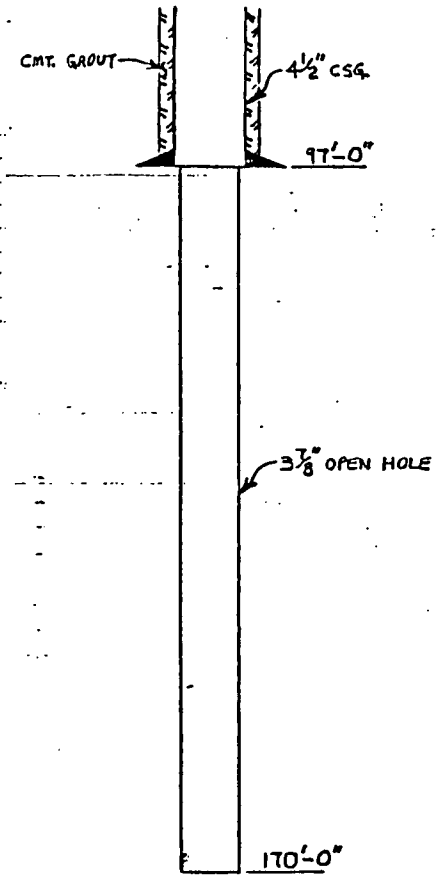
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

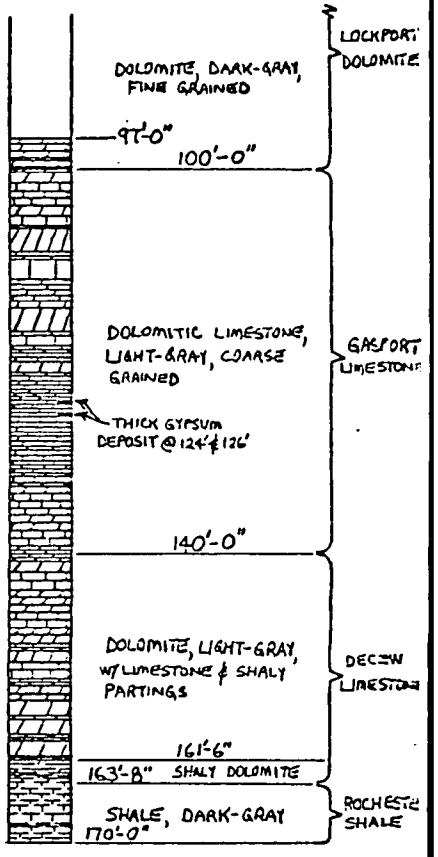
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
								RUN #8	
								RUN #9 124'-6" TO 140'-0" REC. 15'-1"	– REAMED F/97'-0" TO 170'-0" W/ 3 7/8" BIT
140'								RUN #10 140'-0" TO 155'-3" REC. 15'-1½"	– DEVELOPMENT YIELDED NO WATER FLOW AT ALL (DRY HOLE) AT FIRST. AFTER 3 WEEKS A SLOW LEAK IN THE CSG. (TESTS SHOWED A HOLE @ 13'-0") FILLED TO' OF THE OPEN HOLE. SAMPLE HAD ORGANIC SMELL W/ HEAVY SULPER SMELL AS WELL & WAS GREENISH-BLACKISH IN COLOR
160'								RUN #11 155'-3" TO 161'-6"	
								RUN #12 161'-6" TO 170'-0" REC. 8'-5½"	
180'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. BL
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. BL

WELL #1-G



GEOLOGY OF #1-G



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL # 1-J

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 3/2/83 COMPLETED 3/3/83 TECHNICIAN _____

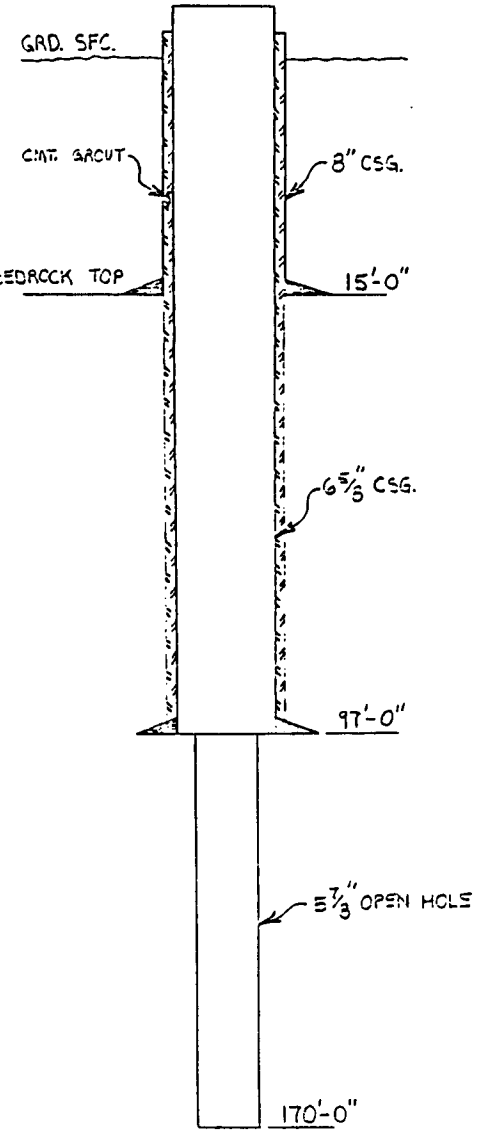
GROUND WATER BELOW SURFACE – CASING IN – AT COMPLETION / TIME

– CASING OUT – –WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– BLDRS. & ROCKS & GEN. FILL – NO SAMPLES
									– DRILL 10" O.D. HOLE TO BEDROCK @ 15'-0"
									– 8" I.D. CSG. SET AGAINST BDR. (NO CMT. GROUT)
20'									– BEDROCK HIT @ DEPTH OF 15'-0"
									– DRILLED 7 7/8" O.D. HOLE F/ 15'-0" TO 97'-0"
									– 6 5/8" O.D. CSG. SET TO 97'-0"
40'									– DRILLED 5 7/8" O.D. HOLE F/ 97'-0" TO 170'-0"
									– DEVELOPMENT YIELDED 2 GAL./MIN. FROM 125'-0" WATER-BEARING FRAC., WATER WAS GREEN IN COLOR & HAD HEAVY SULFUR SMELL
60'									
30'									
100'									
v 170'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

WELL # 1-J



GEOLOGY OF #1-J
(SEE #1-3)

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #2-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dennis Hoffman WEATHER _____

DATE STARTED 5/23/93 COMPLETED 5/24/93 TECHNICIAN MIKE FREY

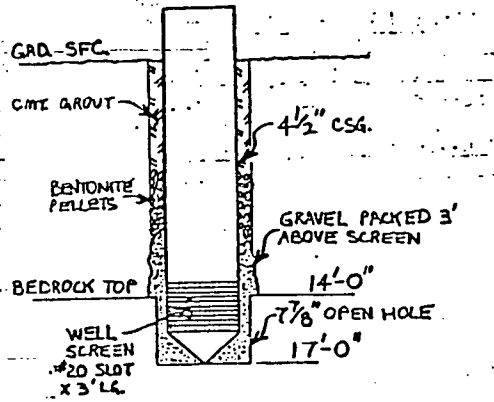
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

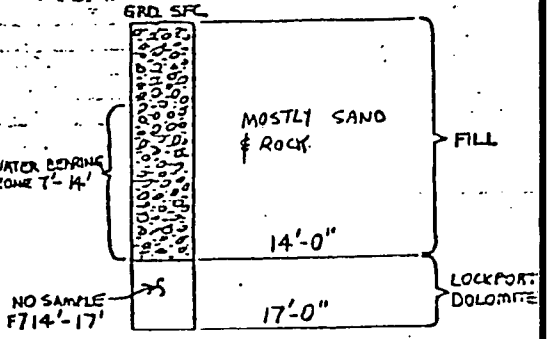
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND & ROCK AND GEN. RIF-RAFF (FILL)
10'									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
									– DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 17'-0"
15'									– BDR. HIT @ DEPTH OF 14'-0"
								NO SAMPLE	– 4 1/2" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 17'-0"
20'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 8'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT GROUTED TO SFC.
									– DEVELOPMENT YIELDED 10 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR & HAD SLIGHT RIVER WATER SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. ID
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. ID

WELL #2-A



GEOLOGY OF #2-A



DATE BEGUN 9-29-83 | LOG OF TEST BORING | HOLE NUMBER 2-C
DATE COMPLETED 10-2-83 | DUPONT | SHEET ___ OF ___
RIG NUMBER ___ | TOTAL DEPTH 45'
PROJECT NUMBER ___ HOLE DIA. ___ | LOGGER Jaime Hunter
PROJECT NAME ___
LOCATION Plant Site 10
METHOD USED ___
FIELD PARTY ___
WEATHER ___

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:
TRAFFIC. DITCH.

VEGETATION:

7 7/8" hole for 6 5/8" casing

Top bed rock 14'

6 5/8" Casing set at 17' - Cemented to surface

5 5/8" hole for 4 1/2" O.D. Casing

4 1/2" O.D. Casing set at 31' - Cemented to surf

Fracture at 38' - Lost 60% circ.

Open hole - 3 7/8"

Total depth - 45' GLM

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 3

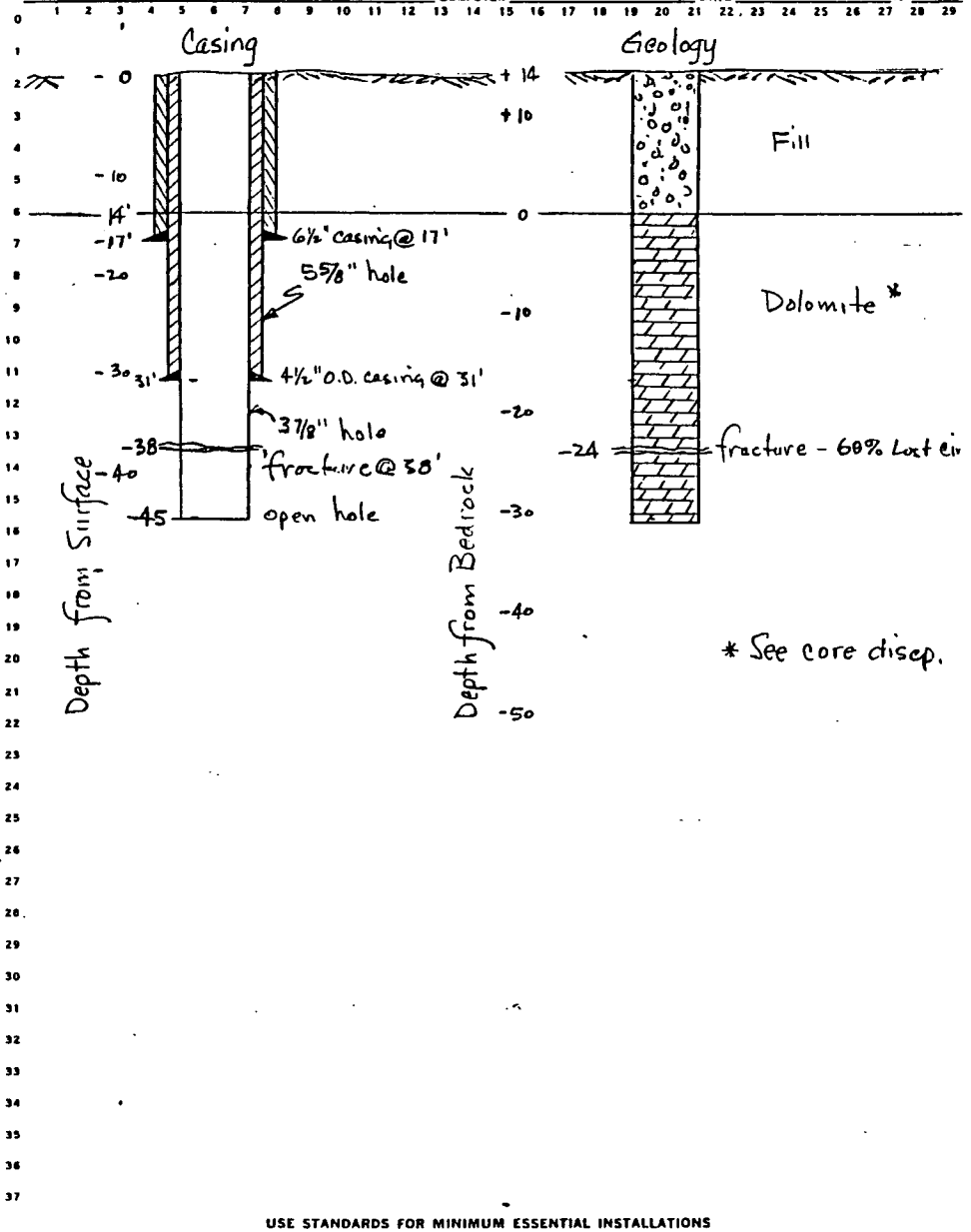
G-46-A REV. 1-78

ENGINEERING DUPONT COMPUTATION SHEET SHEET NO. ___

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO. ___

SUBJECT Well No. 2-C WORKS Plant Site

COMPUTER H.E. Hunter DATE ___ 19 ___



USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

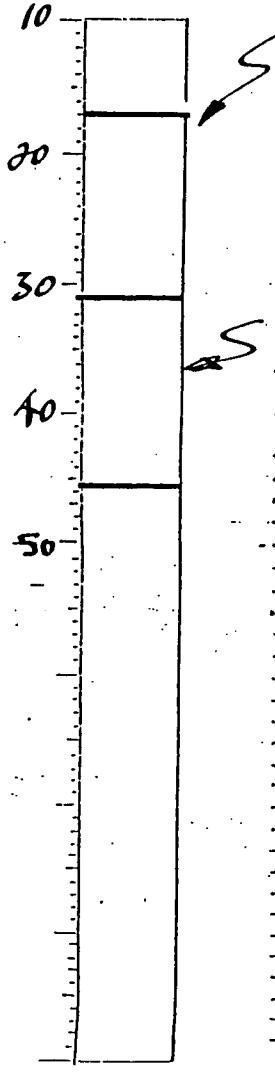
A-68

CORE DATA SHEET Page ____

Well No. 2-C Plant

Sample No. ____

Columnar Section



Core Description

Core 19'-51'

17'-19' dolomite, grey to dk grey, scatt. argillaceous porosity

19.0-19.5 dolomite, vuggular, poss. fracture plane,

19.5-31 dolomite, grey to light grey very dense, dry, no visible porosity

Core 31.5'-45.5' Recovered 14'

31.5'-32.5' dolomite, grey, dense, dry

32.5-34.5 " dark grey, some vug por

34.5-38 dolomite, grey, large gyp filled vugs (2"), dense

38-39 dolomite grey-brn, porosity, poss wet,

39-40 dolomite grey dense, gyp lam

40-41 dolomite, dk grey, dense

41-45.6 dolomite, grey with dark grey lams, gyp filled vugs, hard dense

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #3-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Louis Lofflin WEATHER _____

DATE STARTED 5/24/83 COMPLETED 5/25/83 TECHNICIAN MIKE FREY

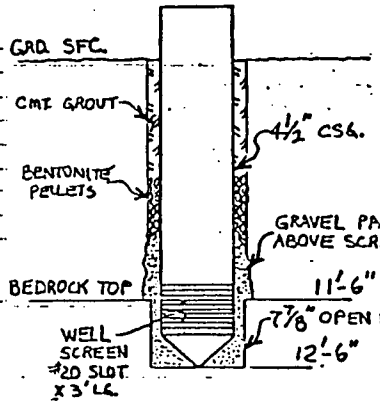
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

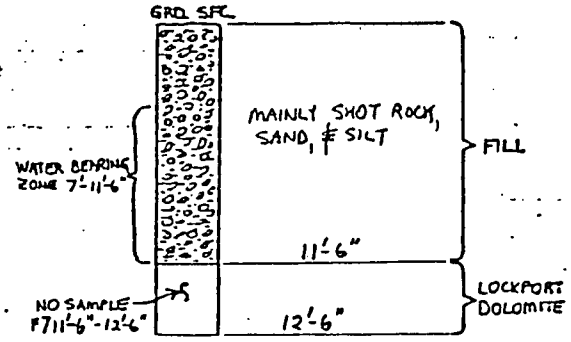
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SHOT ROCK, SAND, & SILT FILL
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
5'									– DRILL 7⅞" O.D. HOLE 1' INTO BDR. TO 12'-6"
10'									– BDR. HIT @ DEPTH OF 11'-6"
								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG #20 SLOT WELL SCREEN SET TO 12'-6"
15'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 4'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT SHOWED SCREEN TO BE CLOGGED UP W/ FINE SILT OF WHICH 1½' WAS CLEANED OUT, NO YIELD ESTIMATE (< 1 FT./MIN. FLOW), WATER WAS VERY MUDDY & HAD TYP. RIVER WATER SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FALL
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FALL

WELL #3-A



GEOLOGY OF #3-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #3-B

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dave Lockhart WEATHER _____

DATE STARTED 5/23/83 COMPLETED 7/12/83 TECHNICIAN STEVE DYER

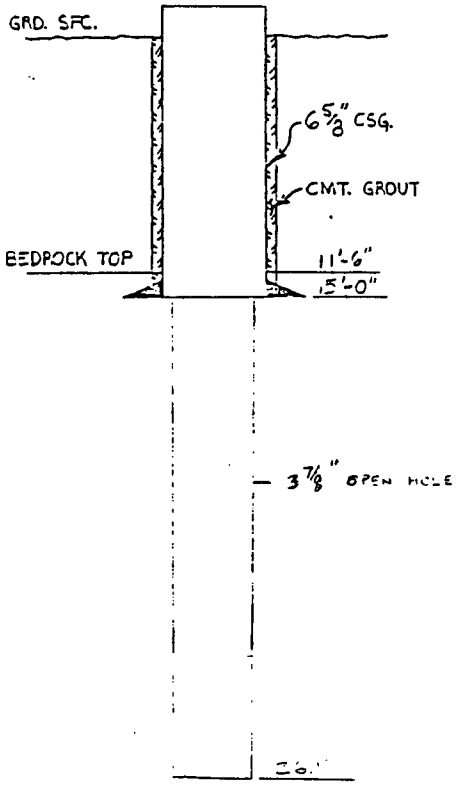
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT _____

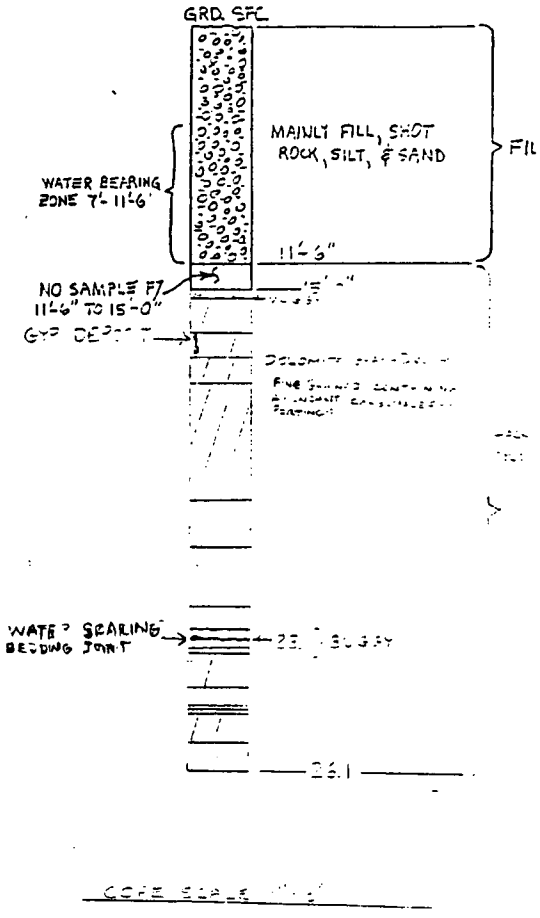
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SHOT ROCK, SAND, & SILT FILL
									– DRILL 7⅞" O.D. HOLE 3'-6" INTO BEDROCK TO 15'-0"
									– 6⅝" O.D. CSG. CMT. GROUTED @ 15'-0"
10'									– BEDROCK HIT @ DEPTH OF 11'-6"
								NO SAMPLE	
								RUN #1 15.0 TO 23.4 REC. 8.3 LOST RETURNS CORE JAMMED	– CORED F/15.0' TO 23.4' – SAMPLE: GRAY TO DARK GRAY, FINE GRAINED DOLOM… – CORE BARREL BLOCKED … IN WATER BEARING FRACTURE WAS CUT @ 23.1' (LOST …
20'								RUN #2 23.4' TO 26.1 REC. 2.65	– CORED 3' F/23.1' TO 26.1' DOLOMITE, DARK-GRAY, CONTAINING … – REAMED 0/15' TO 26.1' W/ 3⅞" BIT
30'									– DEVELOPMENT YIELDED 12 GPM W/ 2' DRAWDO… AFTER 30 MIN. 2-PHASE ORGANIC WAS PRESENT, WATER CLEARED AS PUMPING CONTINUED. SPD ORGANIC ODOR PRE…

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. B

WELL #3-B



GEOLOGY OF #3-B



CORE SCALE …

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #4-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dennis Lofthouse WEATHER _____

DATE STARTED 5/24/83 COMPLETED 5/26/83 TECHNICIAN MIKE FREY

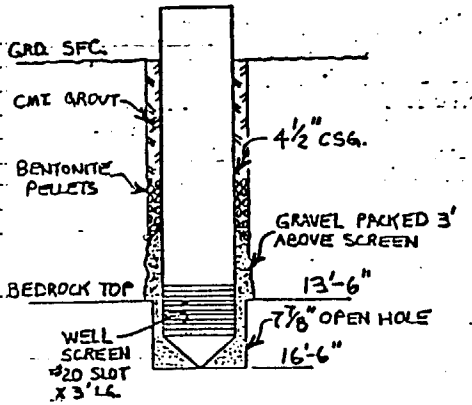
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

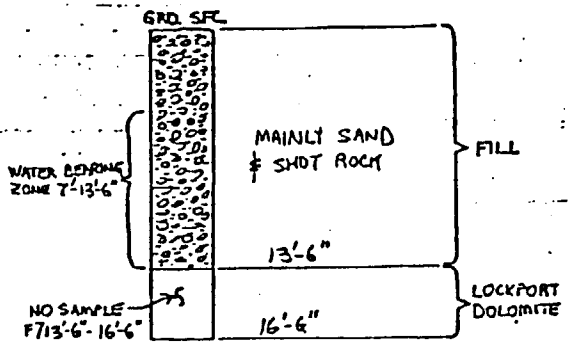
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" / 6"/12" / 12"/18" / 18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'						– SHOT ROCK & SAND (FILL)
						– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
0'						– DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 16'-6"
						– BDR. HIT @ DEPTH OF 13'-6"
5'					NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 16'-6"
20'						– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 8'-0"
						– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
						– DEVELOPMENT YIELDED 26 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR & HAD NO SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. D
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. F

WELL #4-A



GEOLOGY OF #4-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #4-C

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Simms Leffingwell WEATHER _____

DATE STARTED 5/24/83 COMPLETED 6/29/83 TECHNICIAN ED POOCH

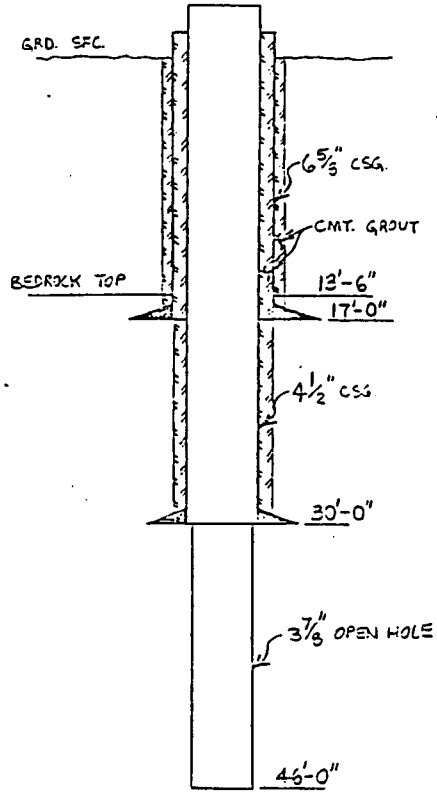
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

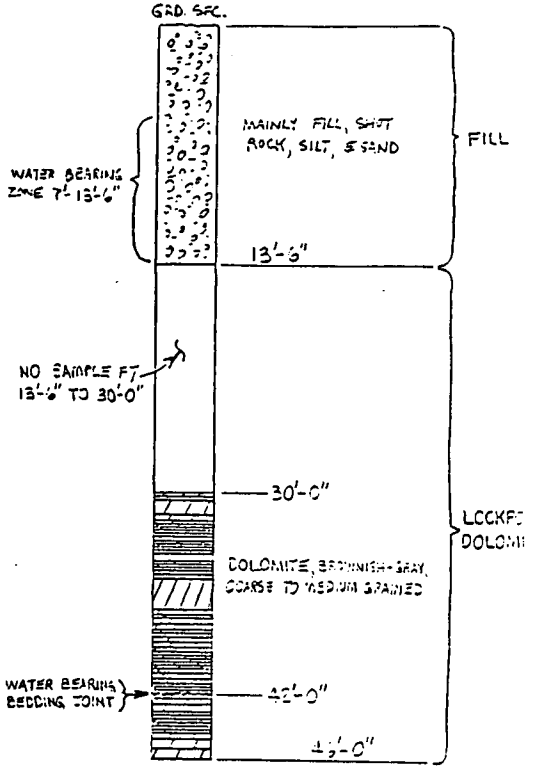
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
10'									– SHOT ROCK & SAND (FILL) – DRILL 7⅞" O.D. HOLE 3'-6" INTO BEDROCK TO 17'-0" – 6⅝" O.D. CSG. CMT. GROUTED @ 17'-0" – BEDROCK HIT @ DEPTH OF 13'-6"
20'								NO SAMPLE	– DRILLED F/ 17'-0" TO 30'-0" W/ 5⅞" BIT – HIT VERY SLOW ZONE OF LOST CIRC. F/ 24'-27' – 4½" O.D. CSG. SET TO 30'-0"
30'									– CORED SAMPLE F/ 30'-0" TO 46'-0" SAMPLE BROWNISH-GRAY DOLOMITE W/ WATER BEARING FRACTURE @ 42'-0" (LOST CIRC. TO 42'-0" FRAC.)
								RUN #1 30'-0" TO 38'-6" REC. 8'-3"	
40'								RUN #2 38'-6" TO 46'-0" REC. 7'-5"	– REAMED F/ 30'-0" TO 46'-0" W/ 3⅞" BIT
50'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA.

WELL #4-C



GEOLOGY OF #4-C



DATE BEGUN 10-31-83 LOG OF TEST BORING HOLE NUMBER A-J

DATE COMPLETED ____ DUPONT SHEET ____ OF ____

RIG NUMBER ____ TOTAL DEPTH ____

PROJECT NUMBER ____ HOLE DIA. ____ LOGGER Hammond Hunt

PROJECT NAME ____

LOCATION Plant Site 4

METHOD USED ____

FIELD PARTY ____

WEATHER ____

GROUND WATER LEVEL			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION: SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC ____ DITCH ____

VEGETATION:

Fill 0-13.5' - Top bedrock @ 13.5'

13.5 — 6½

Fracture at 16.5', lost 100% circ

16.5

Cored 13.5' to 173'

Reamed core hole to 6⅛" (6" nominal)

73

Fracture at ± 73' - increase in fluid produced when reaming core hole with air circulation

3⅞" open hole below 4½" casing

4½" O.D. Casing set at 150'
Cemented to surface

150 — 4½"

Total Depth @ 173'

173

Top Rochester Shale @ 168'

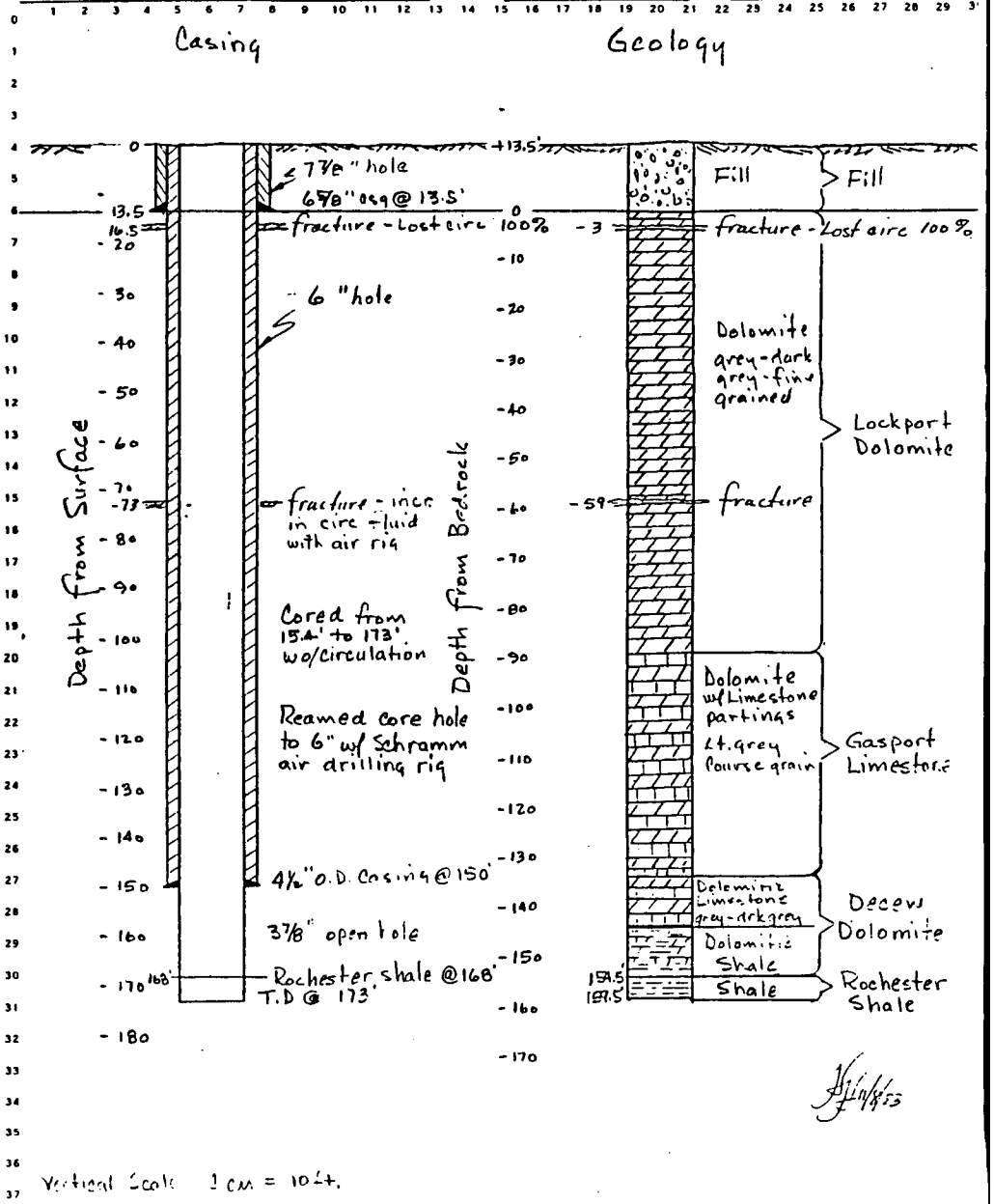
UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1⅜" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB HAMMER 2'0

G-16-A REV. 1-78 ENGINEERING DUPONT COMPUTATION SHEET SHEET NO ____

TITLE OF PROJ OR STUDY DuPont Exploratory Drilling PROJ OR STUDY NO ____

SUBJECT Well No. A-J WORKS Plant Site

COMPUTER H.E. Hunter DATE 11- - 19 83



Vertical Scale 1 cm = 10 ft.

A-74

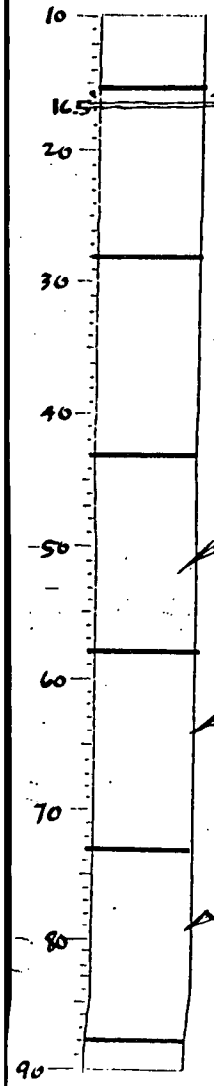
CORE DATA SHEET

Page 1 of 3

Well No. A-J

Sample No. Plant Site 4

Columnar Section



Core Description

Core 15.4 - 28 Recovered 12.6' Dolomite
15.4 - 16.5 dense grey wf laminations of dk grey, hard, dry no por
16.5 lost 100% circulation
16.5 - 20.5 dark grey - dk grey broken @ 20.
20.5 - 28 grey, dense hard dry, vugs @ 2

No circulation between 16.5' - 173'

Core 28 - 43 Recovered 15' dolomite
28 - 29.5 broken, vert fractures, grey, dense
29.5 - 35 grey, dense, dry, no por.
35 - 36 brkn, irregular.
36 - 43 dense, scatter irregular porosity vugs, large vugs filled w/ gyp

Core 43 - 58 Recovered 15' dolomite
43 - 46 dark grey, dense, hard, porous
46 - 56 grey, scattered vugs & gyp
56 - 58 grey wf 2" bands of dk grey dense

Core 58 - 73 Recovered 15' dolomite
58 - 54 dark grey dense
54 - 68 grey wf widely spaced bands of dk grey, dense hard dry
68 - 70 porous, wet-wet
90 - 73 grey - dk grey dense dry hard

Core 73 - 88 Recovered 14' dolomite
73 - 74 grey - dark grey dense
74 - 76 " " " " wf gyp
76 - 88 grey & dark grey, dense

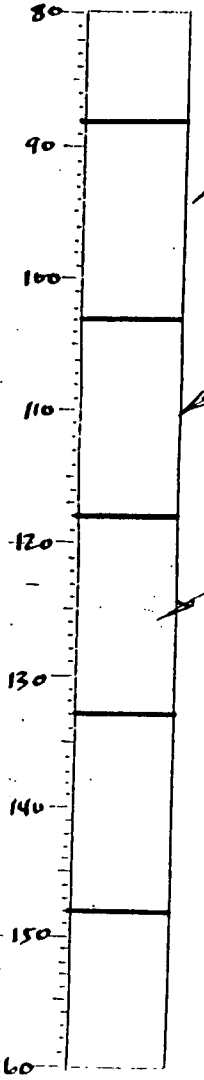
CORE DATA SHEET

Page 2 of 3

Well No. A-J

Sample No. Plant Site 4

Columnar Section



Core Description

Core 88 - 103' Recovered 15' dolomite
88 - 103 grey dense, no vis porosity, hard gyp at scattered intervals

Core 103 - 118 Recovered 15'
103 - 115 coarse grain, dk grey, poss. top Gasport limestone.
115 - 118 light grey with dark grey lam.
Possible top of Gasport Fm 103

Core 118 - 133 Recovered 15' Dolomitic limestone dense hard, light grey wf dk grey laminations, no vis. porosity

Core 133 - 148 Recovered 15' same as above

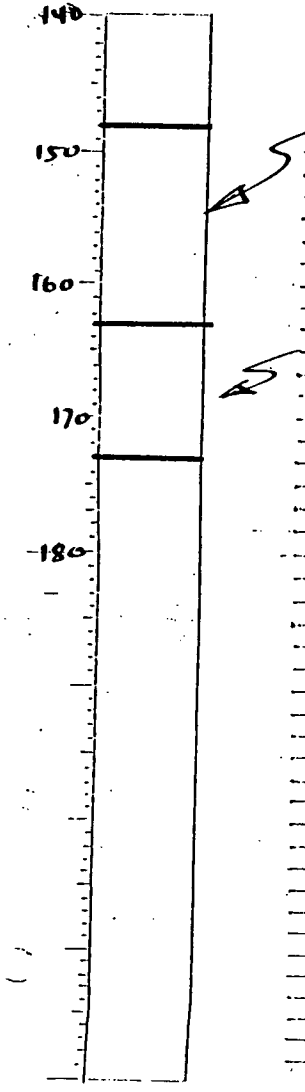
A-75

CORE DATA SHEET

Well No. 4-J

Sample No. Plant Site 4

Columnar Section



Core Description

Possible Top of Decew Limestone 148'

Core 148-163 Recovered 15' dolomitic limestone
148-156 grey - w/ dk grey lens., vuggular porosity (mineral vugs) med. grain
156-158 grey - dk gr, calcite gr. w/ vuggy, shaly, shale
158-163 fine grain grey w/ dk gr lens, blocky, hard, dry, shaley dolomitic shale

Probable base of Decew limestone at 158'

Core 163-173' Recovered 10'
163-168' dolomitic shale, fine grain dense dry
168-173 shale, dk grey

Top Reynales Shale @ 168'

Total Depth 173'

JV 11/3/83

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #5-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loftbourrow WEATHER _____

DATE STARTED 5/24/93 COMPLETED 5/26/93 TECHNICIAN MIKE FREY

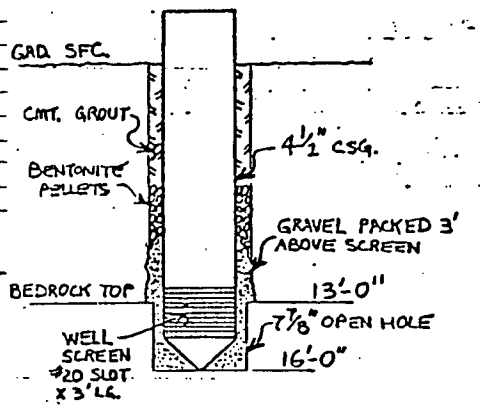
GROUND WATER – CASING IN – AT COMPLETION 1 TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

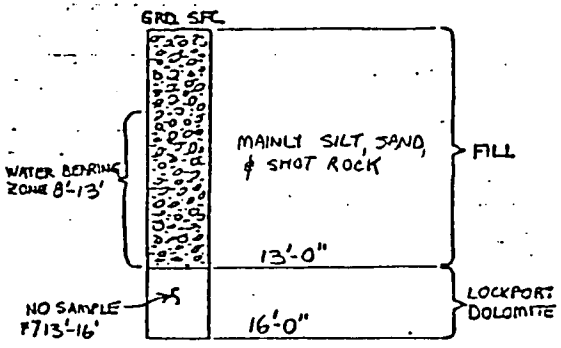
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SHOT ROCK, SILT & SAND (FILL)
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
									– DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 16'-0"
									– BDR. HIT @ DEPTH OF 13'-0"
								NO SAMPLE	– 4 1/2" O.D CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 16'-0"
									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 7'-0"
									– 8" CSG PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED 1 1/2 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR W/ NO SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. BL
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. BL

WELL #5-A



GEOLOGY OF #5-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #5-B

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dave Lotterman WEATHER _____

DATE STARTED 5/2±/83 COMPLETED 6/3?/83 TECHNICIAN STEVE DIER

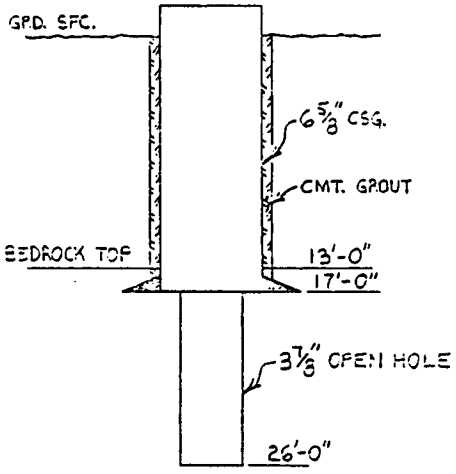
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT _____

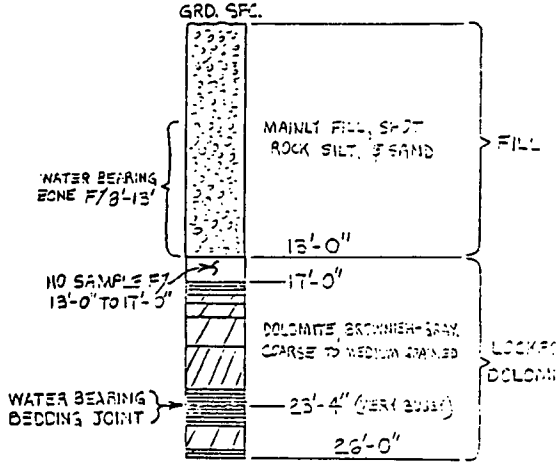
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
0'									– SHOT ROCK, SILT & SAND (FILL) – DRILL 7⅞" O.D. HOLE 4'-0" INTO BEDROCK TO 17'-0" – 6⅝" O.D. CSG. CMT. GROUTED @ 17'-0" – BEDROCK HIT @ DEPTH OF 13'-0".
0'								NO SAMPLE RUN #1 17'-0" TO 26'-0" REC. 8'-11"	– CORED SAMPLE F/ 17'-0" TO 26'-0" SAMPLE BROWNISH-GRAY DOLOMITE W/ WATER BEARING FRACTURE @ 23'-4" (LOST CIRC. TO 23'-4" FRAC.) – REAMED F/ 17'-0" TO 26'-0" W/ 3⅞" BIT
30'									– DEVELOPMENT YIELDED 3 GPM W/ 3.5 FOOT DRAWDOWN AFTER 10 MIN. WATER WAS CLOUDY AND WOULD NOT CLEAR UP. A SLIGHT ODOR WAS NOTED.

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. B

WELL #5-B



GEOLOGY OF #5-B



LOG OF TEST BORING

DUPONT

DATE BEGUN 9-29-83
DATE COMPLETED 10-2-83
RIG NUMBER
PROJECT NUMBER HOLE DIA.
PROJECT NAME
LOCATION Plant Site 5
METHOD USED
FIELD PARTY
WEATHER

HOLE NUMBER 5-CD
SHEET OF
TOTAL DEPTH
LOGGER Jimmy Hunter

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-13'

7⅞" hole 0-13'

6⅝" Casing @ 17' - cemented to surface

5⅝" hole 17'-42'

4½" O.D. casing @ 42' - cemented in place

Fracture at 44' - 100% lost circ.

Total depth 50' - 3⅞" open hole.

13'
17'
42'
44'
50'

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30"

C-68-A REV. 1-78

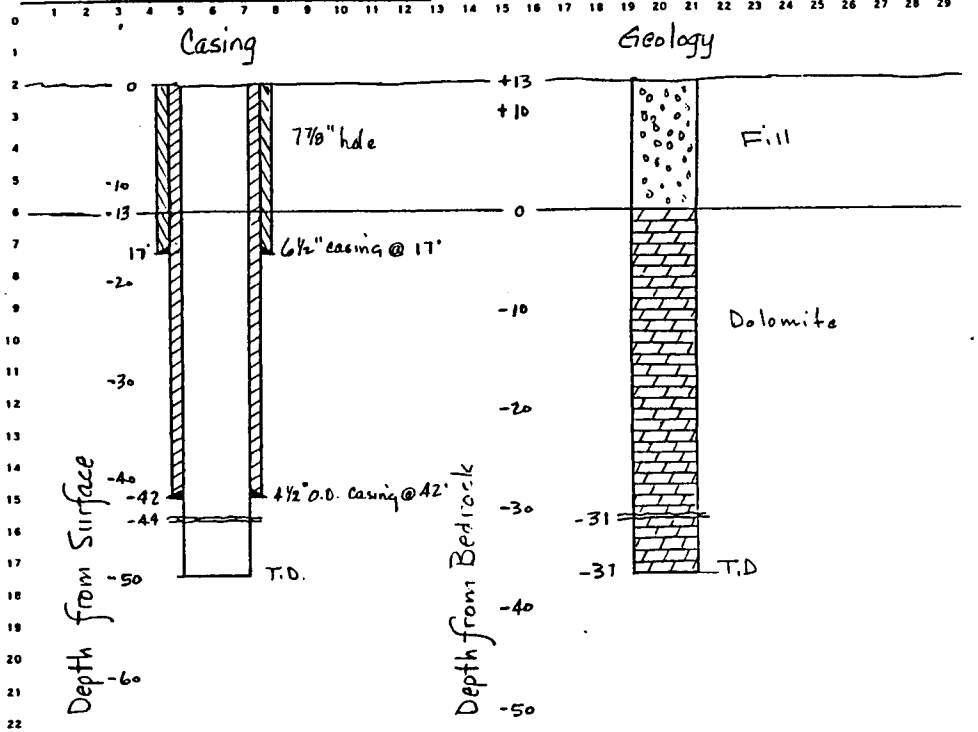
ENGINEERING DUPONT COMPUTATION SHEET

SHEET NO

TITLE OF PROJ OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO.

SUBJECT Well No. 5 CD WORKS Plant Site

COMPUTER H.E. Hunter DATE 19



USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

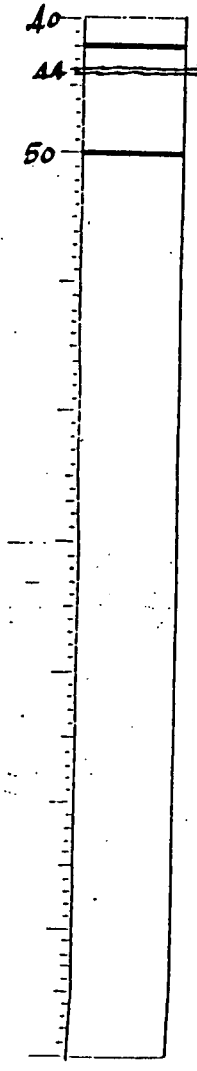
A-79

CORE DATA SHEET Page ____

Well No. 5-CD

Sample No. Plant Site

Columnar Section



Core Description

Core 42'-50' - Recovered 8'

42'-44' dolomite, dark grey w/ closely spaced grey laminations, dense, w/ irregular porosity ca 2%.

44' 1" void, lost fire. Completely

44'-50' dolomite, dark gr, w/ closely spaced grey laminations, large gyp nodules, some small vuggy porosity, prob. wet.

4½" Casing set at 42'

DATE BEGUN 10-7-83 | LOG OF TEST BORING | HOLE NUMBER 5-D

DATE COMPLETED 10-11-83 | SHEET ___ OF ___

RIG NUMBER ___ | TOTAL DEPTH ___

PROJECT NUMBER ___ HOLE DIA. ___ | LOGGER Jassell Hunter

PROJECT NAME ___

LOCATION Plant Site 5

METHOD USED ___

FIELD PARTY ___

WEATHER ___

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION: SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-13'

6½" Casing set at 17'- cement to surface

Drilled 5⅞" hole with air rig

No Cores 17'-50'

Core 50'-60' - see separate sheet

4½" O.D. Casing set at 50' - Cmt. to surface

Fracture @ 55' - lost 100% circ.

Total Depth 60' - 3⅞" open hole 50'-60'

13'
17'
50'
55'
60'

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30 IN

C

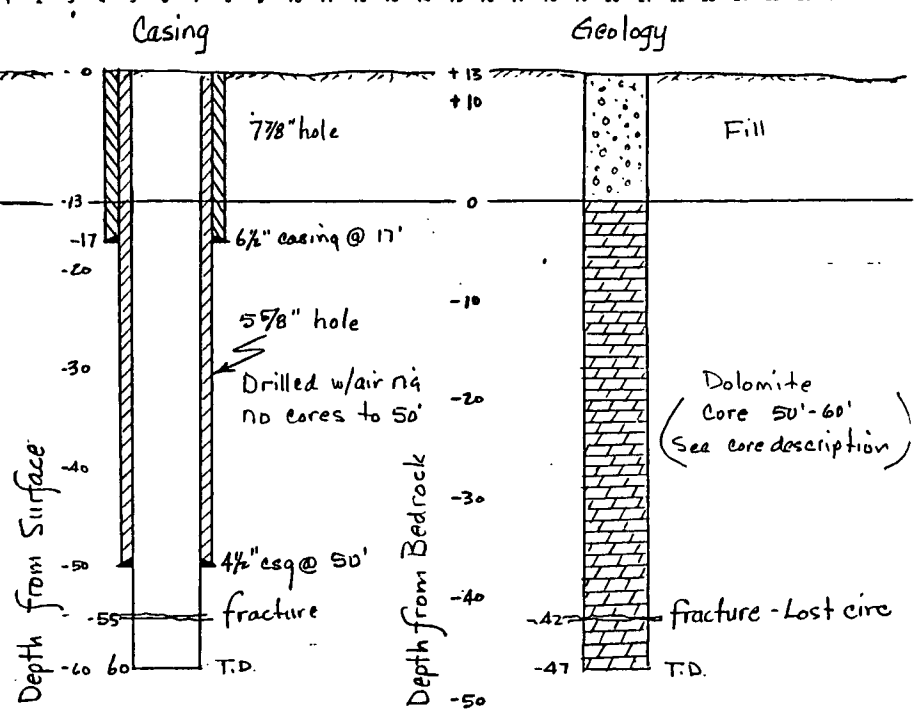
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E-48-A REV. 1-79 | ENGINEERING DUPONT COMPUTATION SHEET | SHEET NO ___

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program | PROJ. OR STUDY NO ___

SUBJECT Well No. 5-D | WORKS Plant Site

COMPUTER H.E. Hunter | DATE ___ 19 ___



USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

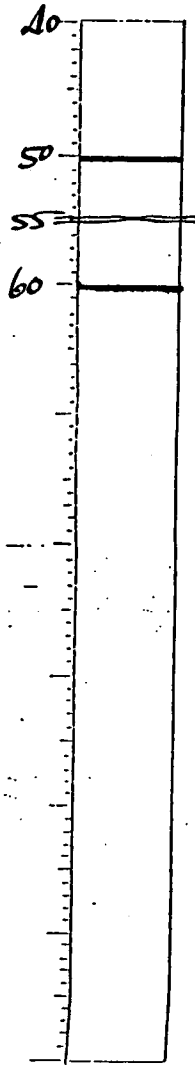
A-81

CORE DATA SHEET Page ___

Well No. 5-D

Sample No. Plant Site

Columnar Section



Core Description

Casing (4 ft) set at 50'

Core 50'-60' Recovered 10'

50'-55' dolomite, dark grey w/ closely spaced grey (gypsum?) laminae. Large 1" gypsum nodule at 51.5'

55' fracture, lost 100% to core.

55-60' dolomite, dark grey w/ closely spaced brown anhydrite laminae, dense, hard, dry.

LOG OF TEST BORING

DUPONT

DATE BEGUN 10-1-83
DATE COMPLETED 10-2-83
RIG NUMBER
PROJECT NUMBER HOLE DIA.
PROJECT NAME
LOCATION Plant Site 5
METHOD USED
FIELD PARTY
WEATHER

HOLE NUMBER 5-F
SHEET OF
TOTAL DEPTH
LOGGER Jassiel Hunter

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER, BLOW COUNT, LOCATION SAMPLED, RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-13'

6½" Casing set at 17' - Cemented to surface
Cored from 17' to 88'
Reamed Core hole to 5⅞" diameter

Dolomite 13'-96'
Cored from 88-96'
Reamed Core Hole to 3⅞" open hole.

4½" Casing set at 88' - Cemented to surface*
Fracture at 95'
Total Depth 96'

* Casing hydrostatically tested for tight before drilling cement plug of 4½" casing set at 88'. - No Leaks!

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB HAMMER

E-46-A REV. 1-79

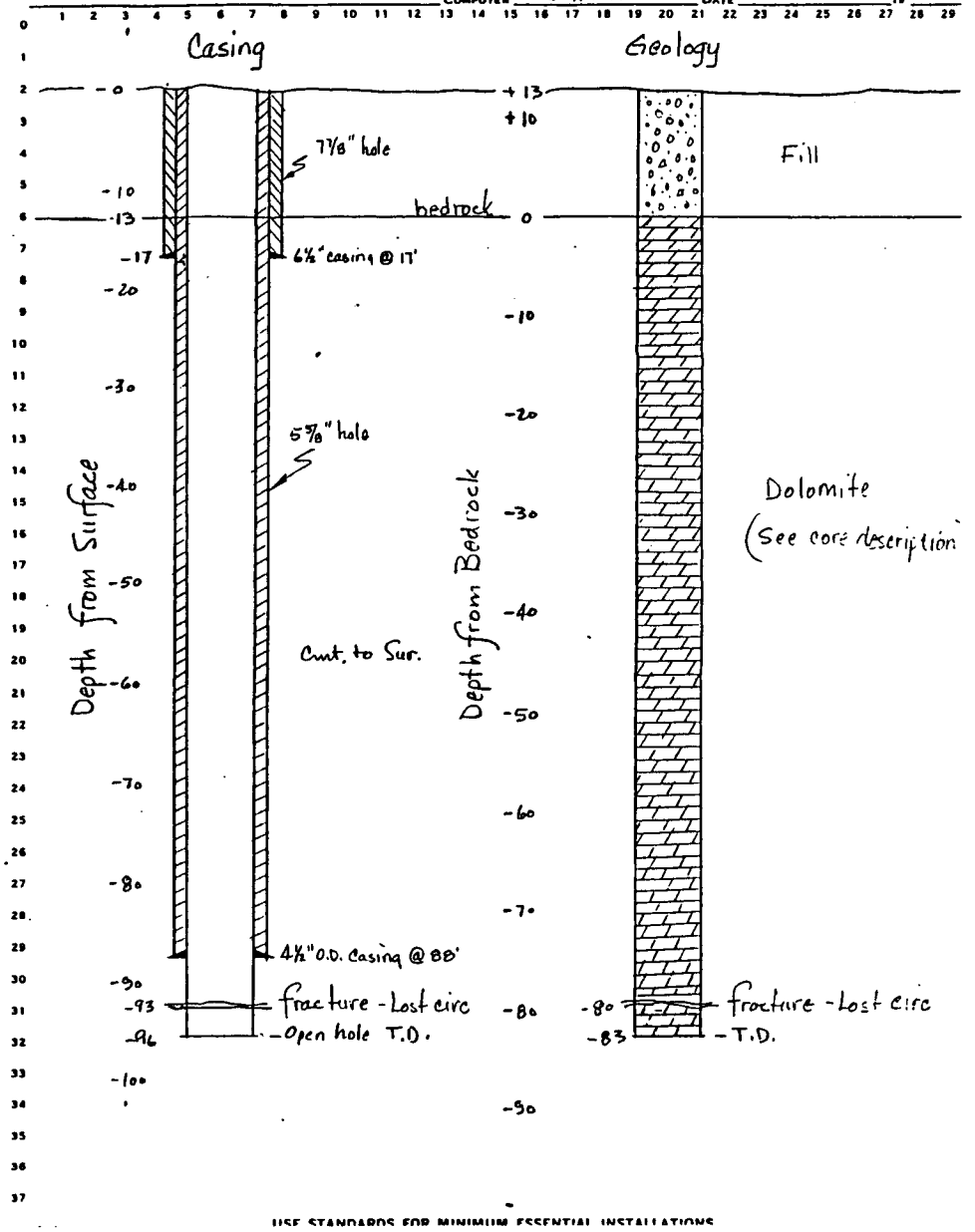
ENGINEERING DUPONT COMPUTATION SHEET

SHEET NO.

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO.

SUBJECT Well No. 5-F WORKS Plant Site

COMPUTER H.E. Hunter DATE 19



USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

CORE DATA SHEET

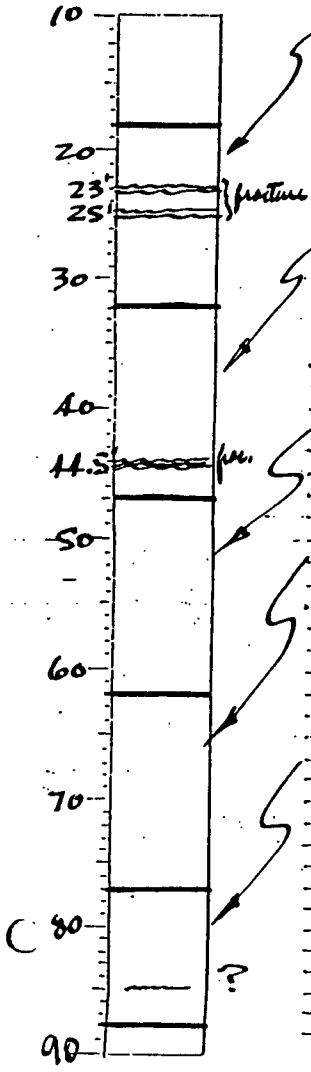
Page ____

Well No. 5-F

Sample No. Plant Site

Columnar Section

Core Description



Core 17-32 as follows:
17-23 dolomite grey w/dk grey lams, dens
23-24 dolomite, grey/dk grey, large grey
pore space, plane, void 2" wh
drilling, lost circ.
24-25 dolomite grey-dk grey-dense,
25-25 fracture, ½" void
25-32 dolomite, lt grey-tan, porous, lo
large open voids, some filled w/g

Core 32-47 as follows:
32-44 dolomite, grey-dk grey laminated,
dense, sound occasional pores
44-45 fracture & void - 2" void at 44'6" a
3" void at 44'9"
45-47 dolomite, grey-dk grey laminated &
occasional voids

Core 47-62 as follows:
47-55 dolomite, dk grey w/grey lams, des
55 1" thick gypsum/dolomite
55-62 dolomite, grey-dk grey, dense, fr
62 1" thick gypsum

Core 62-77 as follows:
62-63 dolomite, grey-dk grey, dense, d
63-69 dolomite, dk grey-tan, moderate por, ve
abd. small vugs
69-69.5 vertical fracturing vugs
69.5-77 dolomite, grey, dense, dk grey, lam
gyp. filled vugs

Core 77-88' as follows:
77-84' dolomite, grey-dk grey laminate
dense, dry
84-88 dolomite, grey, min. laminatio
dense, poor fracture at 8

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #6-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Brian J. Loftus WEATHER _____

DATE STARTED 5/24/93 COMPLETED 5/26/93 TECHNICIAN MIKE FREY

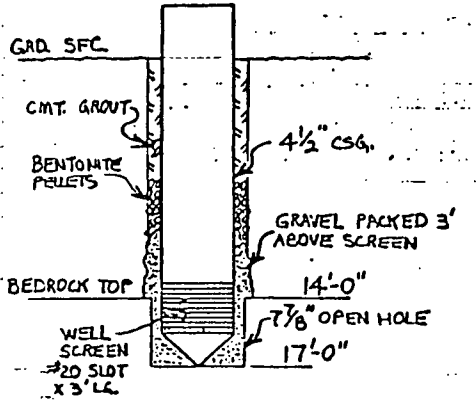
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ WELLPOINT AT _____

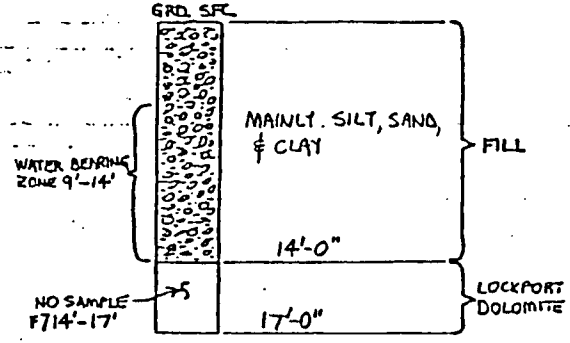
DEPTH BELOW FACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SILT, SAND, & CLAY w/ SOME SHOT ROCK (FILL)
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT GROUTED)
									– DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 17'-0"
									– BDR. HIT @ DEPTH OF 14'-0"
								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 17'-0"
									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 8'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED 10 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS SLIGHTLY DIRTY & HAD NO SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FALL _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FALL _____

WELL #6-A



GEOLOGY OF #6-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #7-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Brian Laufman WEATHER _____

DATE STARTED 5/26/93 COMPLETED 5/31/93 TECHNICIAN MIKE FREY

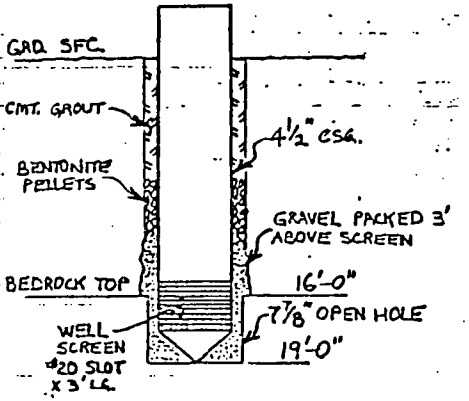
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

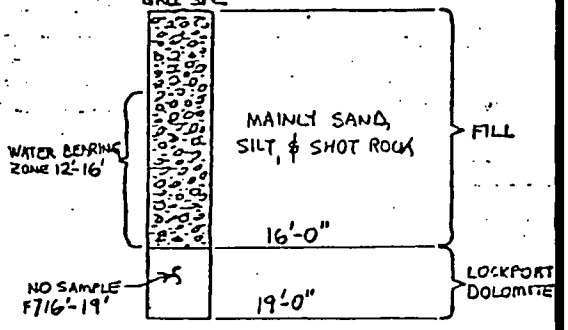
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SILT, SAND, & SHOT ROCK (FILL)
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
10'									– DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 19'-0"
15'									– BDR. HIT @ DEPTH OF 16'-0"
20'								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 19'-0"
									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 10'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED LESS THAN 1 PT./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR W/ HYDROCARBON SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA.

WELL #7-A



GEOLOGY OF #7-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #7-C

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dennis Hoffman WEATHER _____

DATE STARTED 5/25/83 COMPLETED 7/7/83 TECHNICIAN STEVE DYER

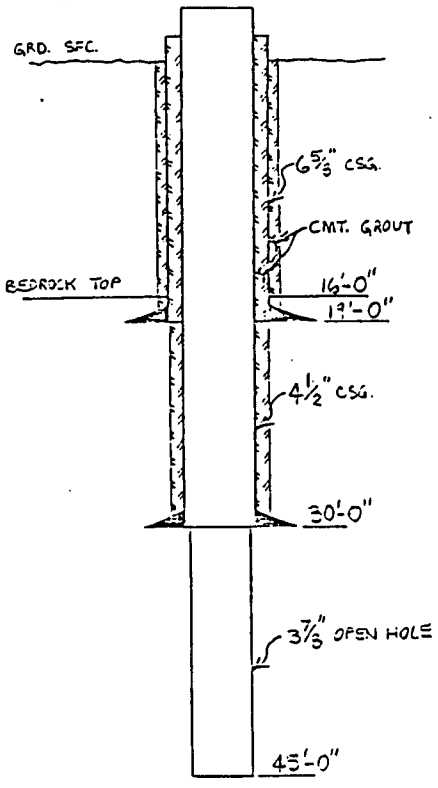
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

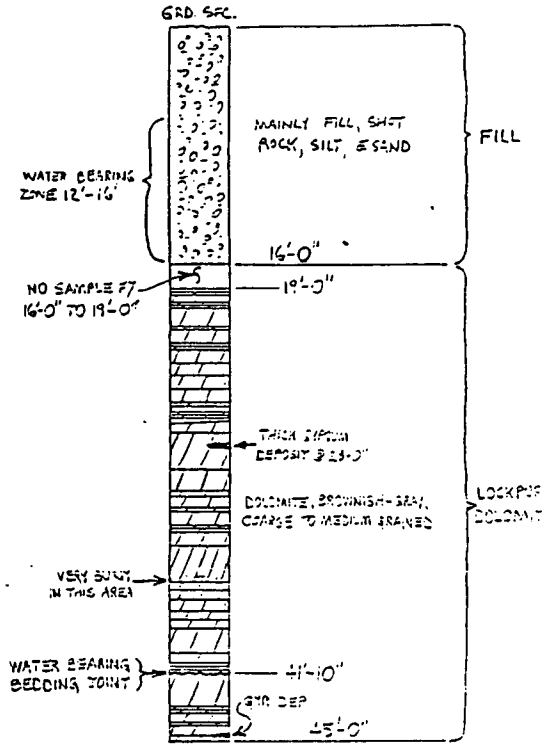
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
10'									– SILT, SAND, & SHOT ROCK (FILL) – DRILL 7⅞" O.D. HOLE 3'-0" INTO BEDROCK TO 19'-0" – 6⅝" O.D. CSG. CMT. GROUTED @ 19'-0" – BEDROCK HIT @ DEPTH OF 16'-0"
20'								NO SAMPLE	– CORED SAMPLE F/ 19'-0" TO 45'-0" SAMPLE BROWNISH-GRAY DOLOMITE W/ WATER BEARING FRACTURE @ 41'-10" (LOST CIRC. TO 41'-10" FRAC.)
30'								RUN #1 19'-0" TO 33'-6" REC. 14'-3"	– 6⅝" O.D. CSG. KNOCKED LOOSE DURING CORING – REAMED F/ 19'-0" TO 30'-0" W/ 5⅞" BIT – 4½" O.D. CSG. SET TO 30'-0"
40'								RUN #2 33'-6" TO 45'-0" REC. 11'-6"	– REAMED F/ 30'-0" TO 45'-0" W/ 3⅞" BIT – DEVELOPMENT YIELDED 0.625 GPM ON TWO SEPERATE TEST OF 2 HR. DURAT. DRAWDOWN OF TEST #1 : 6.5', TEST #2 : 1.0 THE WELL DOES RECOVER VERY QUICKLY. WATER IS CLEAR W/ NO ODOR.
50'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. E
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. E

WELL #7-C



GEOLOGY OF #7-C



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #8-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Coffman WEATHER _____

DATE STARTED 5/26/83 COMPLETED 5/31/83 TECHNICIAN MIKE FREY

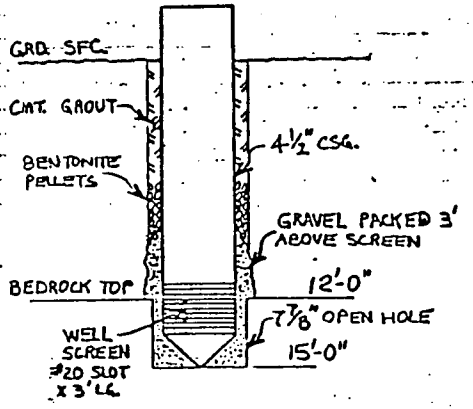
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

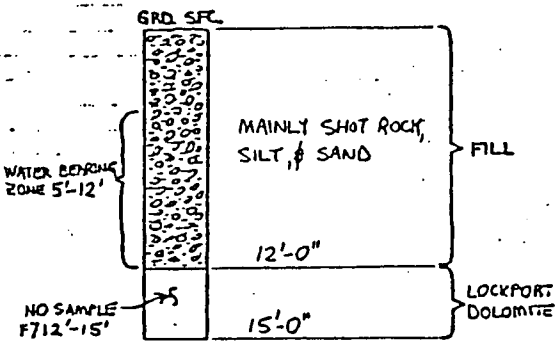
DEPTH BELOW RFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SHOT ROCK, SILT, & SAND (FILL)
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
									– DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 15'-0"
0'									– BDR. HIT @ DEPTH OF 12'-0"
								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 15'-0"
15'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 6'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT GROUTED TO SFC.
									– DEVELOPMENT YIELDED 1 GAL./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR & HAD STRONG HYDROCARBON SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. P.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. P.

WELL #8-A



GEOLOGY OF #8-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #3-8

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/21/83 COMPLETED 7/14/83 TECHNICIAN STEVE DYER

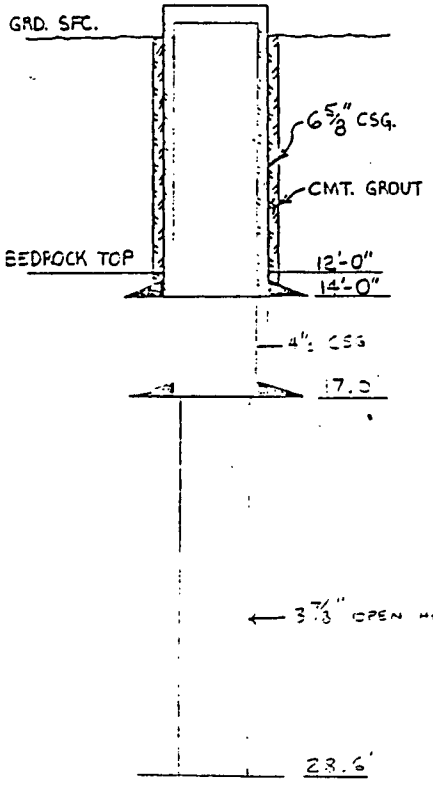
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

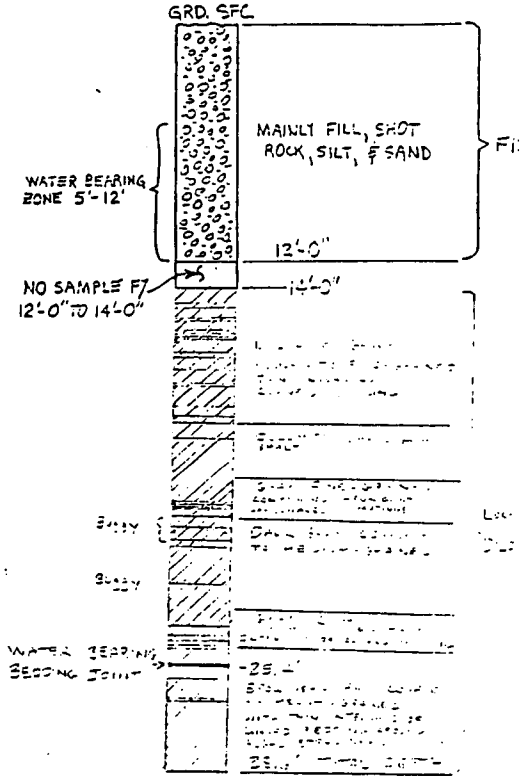
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
0'									– SHOT ROCK, SILT, & SAND (FILL)
									– DRILL 7⅞" O.D. HOLE 2'-0" INTO BEDROCK TO 14'-0"
									– 6⅝" O.D. CSG. CMT. GROUTED @ 14'-0"
									– BEDROCK HIT @ DEPTH OF 12'-0"
								NO SAMPLE	– CORED SAMPLE F/14.0' TO 17.0'
0'								RUN #1 12.0'-17.0' REC. 2.3'	– DOLOMITE 14.0' TO 17.0' GRAY MEDIUM [illegible] 17.0' TO 17.2' DARK GRAY, SHALY 17.2' TO 21.0' GRAY, FINELY GRAINED 21.0' TO 23.75' DARK GRAY [illegible] MEDIUM 23.75 TO 24.9' GRAY CONCRETE TO MEDIUM 24.9 TO 28.6' BROWN-GRAY W WATER BEARING FRACTURE @ 25.4'
								RUN #2 17.0'-28.4' REC. 3.4	
0'								RUN #3 25.4'-28.6' REC. 3.2'	
									– 6⅝" O.D. CSG. KNOCKED LOOSE DURING CORING
									– REAMED F/14.0' TO 17.0' W/5⅞" BIT
									– SET 4½" O.D. CSG. @ 17.0' PRESSURE GROUT
									– CORED SAMPLE F/17.0' TO 28.6'
									– REAMED F/17.0' TO 28.6' W/3⅞" BIT
									– DEVELOPMENT YIELDED 5 GPM W/ONE FOOT DRAWDOWN OVER 30 MIN. WATER HAS STRONG ORGANIC ODOR AND BROWNISH COLOR, AS PUMPING CONTINUED ODOR AND COLOR WORE [illegible]

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. B

WELL #8-8



GEOLOGY OF #8-8



LOG OF TEST BORING

DUPONT

DATE BEGUN 11-3-83
DATE COMPLETED
RIG NUMBER
PROJECT NUMBER HOLE DIA.
PROJECT NAME
LOCATION Plant Site 8
METHOD USED
FIELD PARTY
WEATHER

HOLE NUMBER 8-J
SHEET OF
TOTAL DEPTH 170.5'
LOGGER H. E. Hunter

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-12' Top of Bedrock at 13'

6⅞" Casing set at 12' - on 2nd attempt
first hole abandoned because of
trash in hole. Junk encountered
on 2nd hole also.

Cored from 13'-170.5'

Reamed core hole to 6" to casing point
Strong odor encountered while reaming
with air 0'-28'. Changed circulation
system to water to wash remains
off bore. No returns to surface.

12'

169.5'

T.D.

3⅞" open hole below casing
Top Rochester Shale @ 165'
Total Depth @ 170.5'

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN WITH A I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB HAMMER 30"

G-66-A REV. 1-76

ENGINEERING DUPONT COMPUTATION SHEET

SHEET NO

TITLE OF PROJ OR STUDY DuPont Exploratory Drilling
PROJ. OR STUDY NO
SUBJECT Well No. 8-J
WORKS Plant Site
COMPUTER H.E. Hunter DATE 19

Casing

Depth from Surface

0 | 12 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 | 160 | 165' | 170 | 170.5 | 180

Rochester Shale @ 165'
T.D. @ 170.5'

Geology

Depth from Bedrock

+12 | 0 | -10 | -20 | -30 | -40 | -50 | -60 | -70 | -80 | -90 | -100 | -110 | -120 | -130 | -140 | -150 | -160 | -170 | -180 | -190

Fill

Dolomite
grey - dark grey - fine grained
Lockport Dolomite

Dolomite w/ Limestone partings lt. grey, w/ dark grey laminations
Gasport Limestone

Dolomitic Limestone grey - dark grey
Dolomitic Shale
Decew Limestone

155'
158.5'
Shale
Rochester Shale

Circulation lost at 12' and never regained. No fractures detected.

Vertical Scale 1 cm = 10 ft.

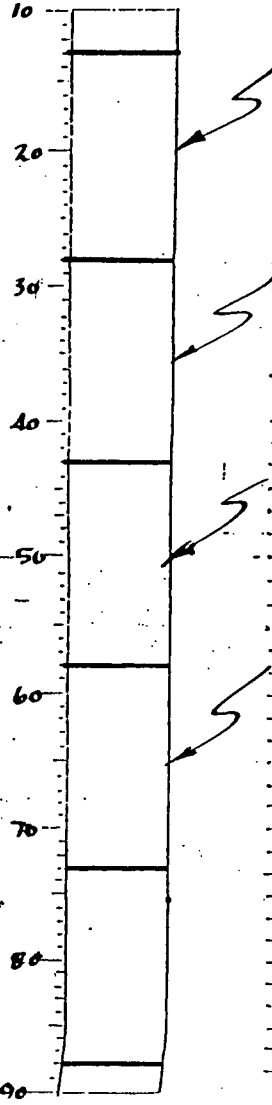
A-90

CORE DATA SHEET

Well No. 8-J

Sample No. Plant Site 8

Columnar Section



Core Description

6½" Casing set at 12'

Core 13'-28' Recovered 15' dolomite
13-17 broken, grey, coarse grain, den
17-20' grey, hard dense, dry, no por
20-22 dark grey, same as above
22-28 grey, hard, dense, dry, no por.
2" side gyp streak at 28'

Core 28-43 Recovered 15' dolomite
28-29.5 dark grey, coarse grain, dense, d
29.5-33 dark grey, irregular porosity, pro
wet, coarse grain
33-37 dark grey, coarse gr. some gyp
laminations, some vugs
37-43 dark grey w/ grey laminations,
occasional gyp and vugs.

Core 43-58 dolomite recovered 15'
43-52 dark grey w/ grey lams. Coarse gr.
occasional gyp and vugs.
52-58 grey-dark grey same as above

Core 58-73' Recovered 15' dolomite
58-62' dark grey, dense, hard, dry, some
gyp nodules
62-68 dark grey, irregular porosity, prob.
wet
68-73 grey-dark grey, dense, gyp deposits

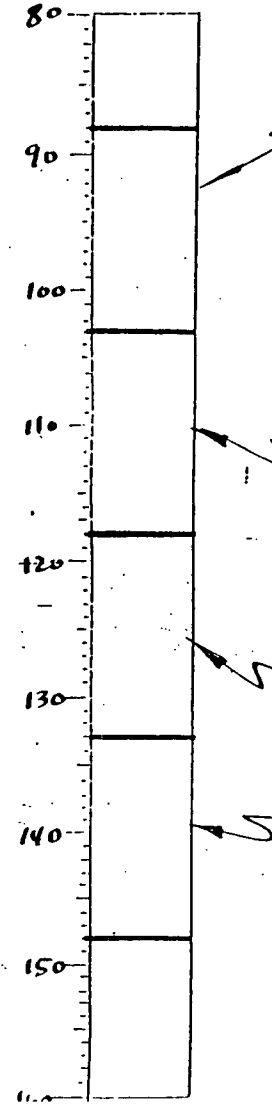
Core 73-88 Recovered 15' dolomite
73-81 dark grey coarse grain, dense dry
81-84 grey-dark grey, dense dry
84-88 grey, dense dry no porosity

CORE DATA SHEET

Well No. 8-J

Sample No. Plant Site 8

Columnar Section



Core Description

Core 88-103 Recovered 15' dolomite & limeston
88-92 grey w/ dark grey laminations,
fractured at 93', dense dry
fine grain
92-95 grey w/ widely spaced dk gr lam.
Large gyp parting at 93'; fract
at 95'
95-99 grey w/ dark grey lam, dense hor
99' Possible top of Gasport Limestone
99-103 dark grey w/ closely spaced
grey laminations, dense, hard
dry, no porosity, no vugs
some gyp nodules

Core 103-118' Recovered 15' of dolomite limest
103-106' dark grey w/ closely spaced grey
laminations, some gyp nod
dense dry. lt grey limestone portion
106-110' mostly grey, dense dry no por.
110-113' grey-dark grey, scattered irregul
porosity, lt grey limestone portio
113-118 grey, dense, hard, dry no por

Core 118-133' Recovered 15' dolomite limestone
118-133' mostly grey w/ irregular dark
grey laminations, slo visible
porosity, dense hard, dry
lt gray is limestone

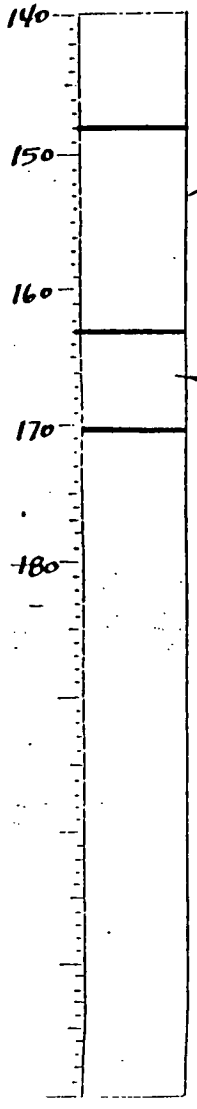
Core 133-148' Recovered 15' dolomite limeston
133-148 light grey w/ scattered grey
irregular laminations, dense
hard, dry, no visible porosity
some gyp laminations
lt grey lt limestone

CORE DATA SHEET

Well No. 8-J

Sample No. Plant Site 8

Columnar Section



Core Description

Possible Top of Reserve Limestone 148'

Core 148-163 Recovered 15' shaley limestone
148-150 light grey w/ shaley laminations
shale is dark grey, fine grain
dense hard dry no porosity
150-152 light grey less shaley, dense, dry
152-156 light grey shaley, coarse grain,
hard, no porosity
156-163 grey-dark grey, shaley limestone
boulders with limey shales
fine grain, no porosity, no
fractures, dry

Core 163-170.5 Recovered 7½' shaley fine shale
163-165 limey shale grading into
shale, dark grey, dense
165' Top of Rechuelle Shale
165-170.5 Shale, dark grey, fine g

Total Depth 170.5'

JJJ 11/9/83

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #9-

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Bruno Lofflomo WEATHER _____

DATE STARTED 5/27/83 COMPLETED 6/1/83 TECHNICIAN MIKE FREY

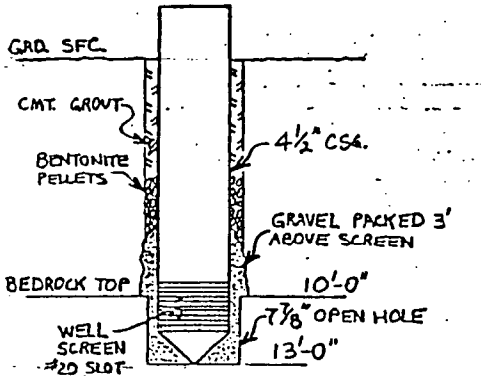
GROUND WATER – CASING IN – AT COMPLETION 1 TIME _____

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

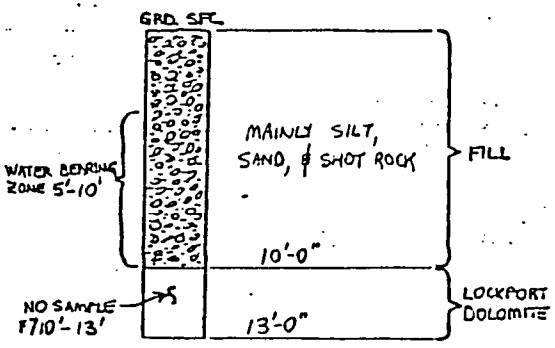
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" / 6"/12" / 12"/18" / 18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
						– SILT, SAND, & SHOT ROCK (FILL)
						– DRILL 10" O.D. HOLE TO BEDROCK & SET TEM 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUT.
5'						– DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 13'-(
						– BDR. HIT @ DEPTH OF 10'-0"
10'					NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 13'-0"
						– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 5'-0"
15'						– 8" CSG. PULLED OUT & ANNULUS OF HO CMT. GROUTED TO SFC.
						– DEVELOPMENT YIELDED 10 GAL./MIN. FROM S WATER-BEARING ZONE, WATER HAD A BLU TINTED COLOR & A STRONG HYDROCARBON SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

WELL #9-A



GEOLOGY OF #9-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #10-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Bruce Loeffelholz WEATHER _____

DATE STARTED 5/26/93 COMPLETED 6/1/93 TECHNICIAN MIKE FREY

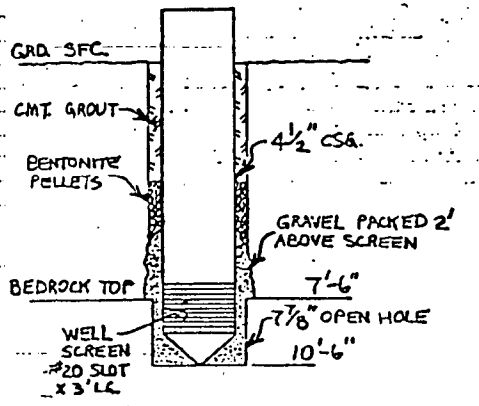
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

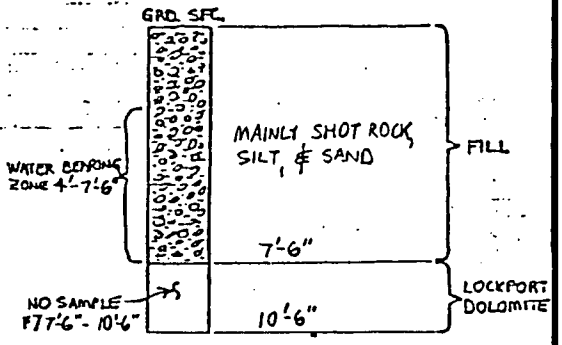
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND, SILT, & SHOT ROCK (FILL) – DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED) – DRILL 7 7/8" O.D. HOLE 5' INTO BDR. TO 10'-6" – BDR. HIT @ DEPTH OF 7'-6"
10'								NO SAMPLE	– 4 1/2" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 10'-6"
15'									– HOLE GRAVEL PACKED TO 2' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 3'-0" – 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC. – DEVELOPMENT YIELDED 15 GAL./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS MURKY & HAD TYP. RIVER WATER SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. B

WELL #10-A



GEOLOGY OF #10-A



A-94

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #10-C

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/26/93 COMPLETED 26 JULY 93 TECHNICIAN _____

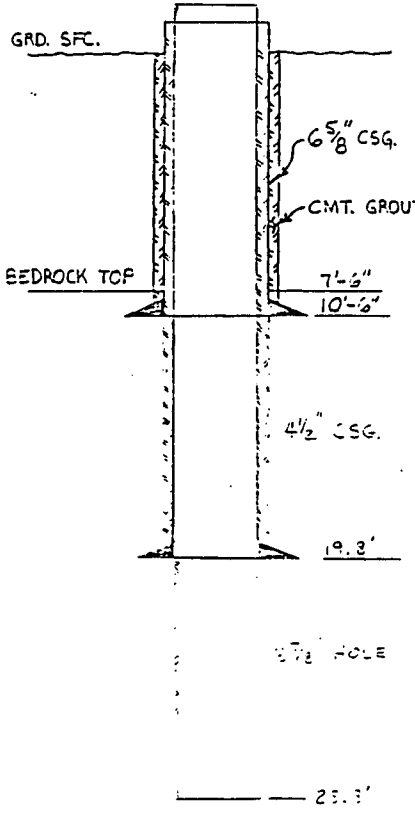
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

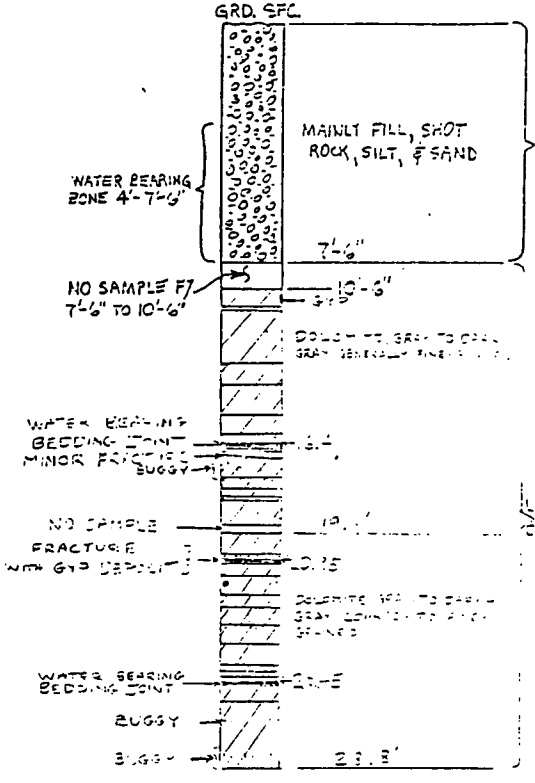
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
10'								NO SAMPLE	– SAND, SILT, & SHOT ROCK (FILL) – DRILL 7⅞" O.D. HOLE 3'-0" INTO BEDROCK TO 10'-6" – 6⅝" O.D. CSG. CMT. GROUTED @ 10'-6" – BEDROCK HIT @ DEPTH OF 7'-6"
0'								RUN #1 10.5' TO 19.8' REC. 8.85'	– CORED SAMPLE F/ 10.5' TO 19.8' SAMPLE GRAY TO DARK-GRAY DOLOMITE, GENERALLY FINE-GRAINED WITH GYP DEPOSITS AND VUGGY PLACES. WATER BEARING FRACTURE @ 16.4'. (LOST CIRC. TO 16.4' FRAC.)
0'								RUN #2 19.8' TO 28.8' REC. 8.8'	– REAMED F/ 10.5' TO 19.8' W/ 5⅞" BIT – 4½" O.D. CSG. SET @ 19.8' – CORED SAMPLE F/ 19.8' TO 28.8' SAMPLE GRAY TO DARK-GRAY DOLOMITE, COARSE- TO FINE-GRAINED, LOCALLY SUGARY IN TEXTURE, SOME CARBONACEOUS PARTINGS A FEW GYP DEPOSITS WITH VUGGY PLACES DISPERSED THROUGHOUT. WATER BEARING FRACTURE @ 25.45' (LOST CIRC. TO 25.45' FRAC.) – REAMED F/ 19.8' TO 28.8' W/ 3" BIT – DEVELOPMENT YIELDED 10 GPM W/ NO DRAWDOWN AFTER 10 MIN. AND 20 GPM W/ 2' DRAWDOWN AFTER 10 MIN. WATER WAS CLEAN W/ NO ODOR
0'									
0'									
0'									
50'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. B:
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. B:

WELL #10-C



GEOLOGY OF #10-C



CORE SCALE 1:5

DATE BEGUN 9- -1983 | LOG OF TEST BORING | HOLE NUMBER 10-D

DATE COMPLETED 9-29-1983 | SHEET ___ OF ___

RIG NUMBER ___ | TOTAL DEPTH 70'

PROJECT NUMBER ___ HOLE DIA. ___ | LOGGER Howell Hunter

PROJECT NAME ___

LOCATION Plant Site 10

METHOD USED ___

FIELD PARTY ___

WEATHER ___

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD	SAMPLING: SAMPLE NUMBER	BLOW COUNT	LOCATION SAMPLED	RECOVERY	DEPTH IN FEET	SOIL GRAPH	MOISTURE	CONSISTENCY	RQD
					0				
					7				6½"
					38				4½"
					66				
					70				

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill - 0'-7'

6½" Casing set at 10' cemented to surface

Roller rock drilled with 5⅞" bit to 38'

4½" Casing set at 38' cemented to surface

Cored from 38'-54' and 54'-70'

Fracture at 66'

Reamed open hole to 3⅜"

Total Depth 70' Grn level

Dolomite 7'-70' (see separate descripti

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30"

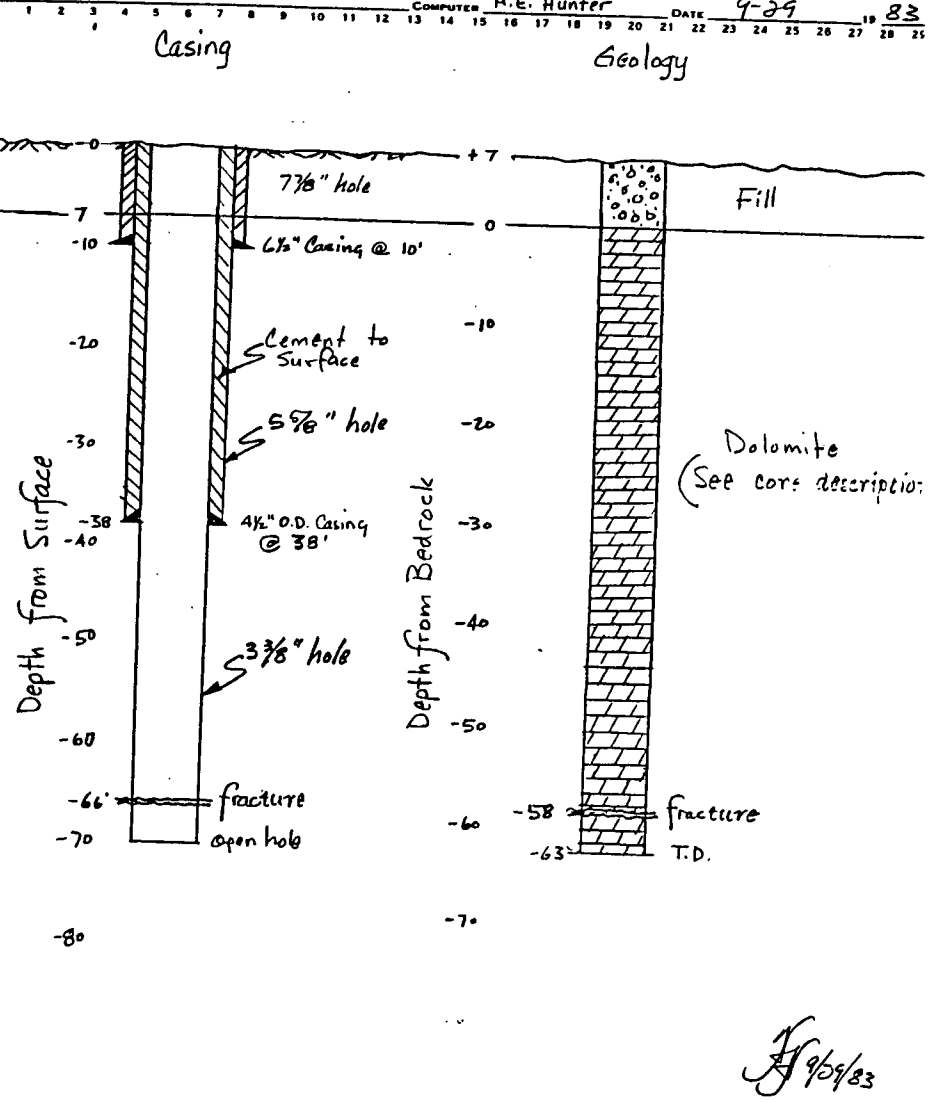
O-48-A REV. 1-70

ENGINEERING DUPONT COMPUTATION SHEET SHEET NO ___

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO. ___

SUBJECT Well No. 10-D WORKS Plant Site

COMPUTED H.E. Hunter DATE 9-29 19 83



9/29/83

USE STANDARD END

A-96

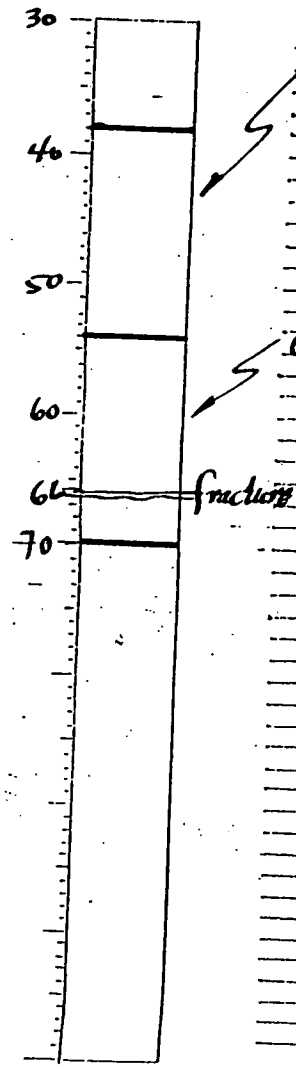
CORE DATA SHEET Page ___

Well No. 10-D "Plant"

Sample No. _____

Columnar Section

Core Description



Core 38'-54' as follows:

38-39.5' dolomite, very irregular, very
39.5-42.5 porous, 30% gypsum, wet
dolomite, dk grey w/ grey
some limiting wet fill.
42.5-44 dolomite, irregular, some
large vugs (1") filled with gyp
Prod. wet.
44-44 dolomite, dense, no vis por
44-52 dolomite, irregular, grey-b
52-54 Prod. wet
Core 54-70 as follows,
54-55 dolomite, dense, grey w/ brn l
55-68 dolomite, grey-brn, fine to coarse
irregular porosity, some vugs
filled with gyp. Prod. wet
68-70 dolomite, dk to lt grey,
no vis por, dry

LOG OF TEST BORING

DUPONT

DATE BEGUN _____ HOLE NUMBER 10 E
DATE COMPLETED 9-29-83 SHEET ____ OF ____
RIG NUMBER _____ TOTAL DEPTH 105'
PROJECT NUMBER _____ HOLE DIA. _____ LOGGER James Hunter
PROJECT NAME _____
LOCATION Plant Site 10
METHOD USED _____
FIELD PARTY _____
WEATHER _____

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD	SAMPLING: SAMPLE NUMBER	SAMPLING: BLOW COUNT	SAMPLING: LOCATION SAMPLED	SAMPLING: RECOVERY	DEPTH IN FEET	SOIL GRAPH	MOISTURE	CONSISTENCY	RQD
Depth									
10				14½"				6¼"	
20									
30									
40									
50									
60									
70									
80								4½"	
90									
100					101				
105					105				

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0'-7'
6½" Casing set at 10.5' cemented to surface
Cored from 10.5'-84'
Reamed core hole to 5⅞"

Set 4½" casing at 84' cemented to surface
Fracture at 101' - lost circulation
Cored from 84-105'
Reamed core hole to 3⅞" to 105'
Total Depth 105' GL

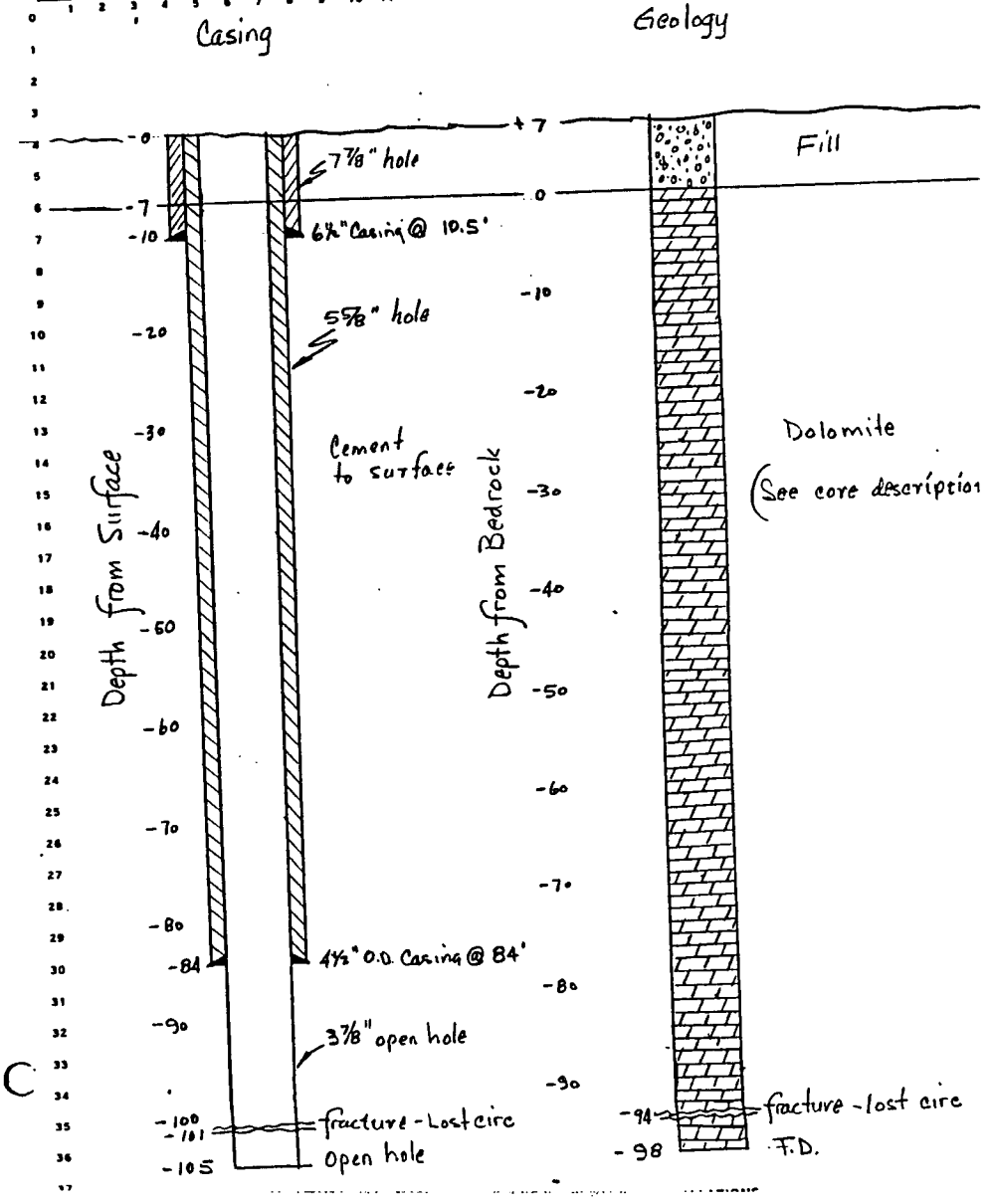
Dolomite 7'-105' (see separate description)

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30" DR

C

E-10-A REV. 1-70 ENGINEERING DUPONT COMPUTATION SHEET SHEET NO ____

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO ____
SUBJECT Well No. 10-F WORKS Plant Site
COMPUTER H.E. Hunter DATE 9-29- ,19 83



C

CORE DATA SHEET

Page _____

Well No. 10-F

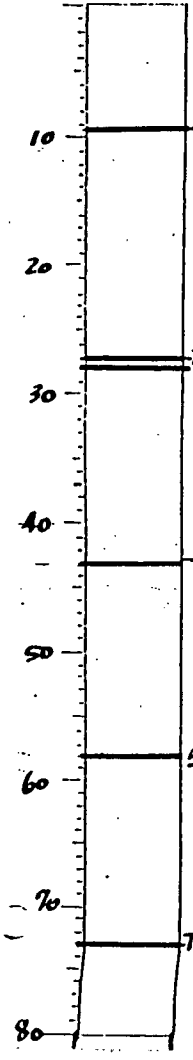
Sample No. _____

Drillers Measurements

Columnar Section

Core Description

9/26/83



Core 9.5-13.5 dolomite, dense, grey to dark gre
some irregular porosity at 12.5-1
13', fractured core at 13.5
secondary gyp deposit in vugs.

13.5-18 dolomite, sucrosic porosity,
water wet

18-23 dolomite, grading to dense, laminat
porosity, fractured at 21'

23-24 dolomite dense grey

24-28 dolomite, dark grey, dense, fractu
at 27-28

Core 28-31.5 dolomite, dark grey, small irregular por

31.5-32 " " large vugs

32-34 " " granular, dark grey

34-36 " " large vugs, dk gr

36-38 " " granular some vugs

38-38.2 Gypsum secondary deposition

38.2-43 dolomite dark grey to brown,
crystalline, irregular porosity, gyp
crystals in vugs

Core 43-44 dolomite as above

44-50 dolomite, dense, gray w/ less lam.
some small irregular porosity

50-55 dolomite grey with vugs gray to la

55-57 dolomite, dense, small vugs, grey

57-58 " dense, large vugs, with
dark grey laminations

Core 58-66 dolomite, dense, grey to dark grey,

66-73 dolomite, porous water wet, crystal
small uniform irregular porosity

Core 73-78.5 dolomite, grey, dense, no porosity

78.5-84 dolomite, light lam. w/ dark gra
dense, gyp 2 cm. ½" thick at 83'

CORE DATA SHEET

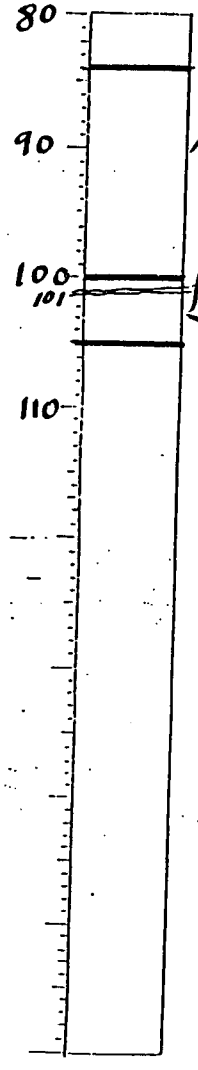
Page ____

Well No. 10-F

Sample No. _____

Columnar Section

Core Description



Core 84-100 as follows:

84-88 dolomite, grey, dense, dry

88-90 " dk grey, crystalline
wet

90-95 dolomite grey to dk grey, de
large irreg. totally polygo
w/ gyp, dry

95-96 dolomite, dark grey, crystalline p
wet

96-100 dolomite, grey, vuggy plugged
w/ gyp, dry, fracture conta
pl. gyp at 97 gyp at 98.5

Core 100-105 as follows:

100-101 dolomite, grey-dk grey, bedd
plane at 100.8,

101 dolomite fracture surface
filled with conglomerate
dolomite rods and gypsum
Core lost at 101

101-105 dolomite, dk grey, dense, wit
spread dk laminations.

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #11-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loofbourrow WEATHER _____

DATE STARTED 5/26/83 COMPLETED 6/1/83 TECHNICIAN MIKE FREY

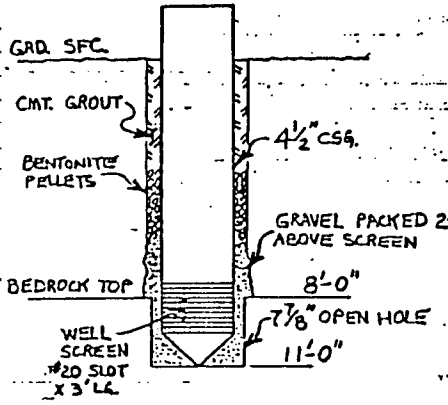
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

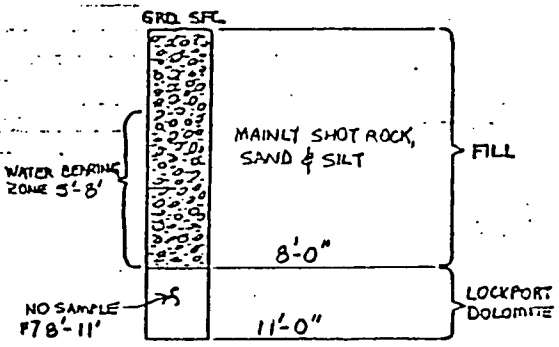
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND, SILT, & SHOT ROCK (FILL) – DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED) – DRILL 7⅞" O.D HOLE 3' INTO BDR. TO 11'-0" – BDR. HIT @ DEPTH OF 8'-0"
10'								NO SAMPLE	– 4½" O.D. CSG. W/3' LG. #20 SLOT WELL SCREEN SET TO 11'-0"
15'									– HOLE GRAVEL PACKED TO 2' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 4'-0" – 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC. – DEVELOPMENT YIELDED 10 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR & HAD SLIGHT HYDROCARBON SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FT. B.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FT. B.

WELL #11-A



GEOLOGY OF #11-A



A-100

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #12-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dennis Loffhouse WEATHER _____

DATE STARTED 5/26/83 COMPLETED 6/1/83 TECHNICIAN MIKE FREY

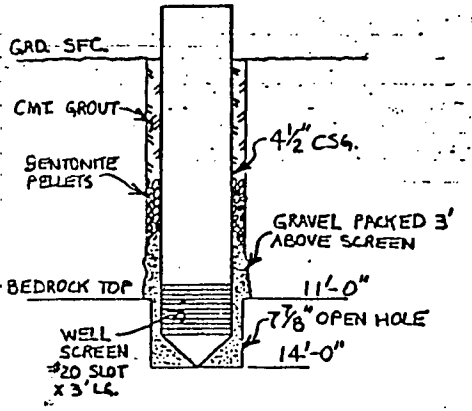
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

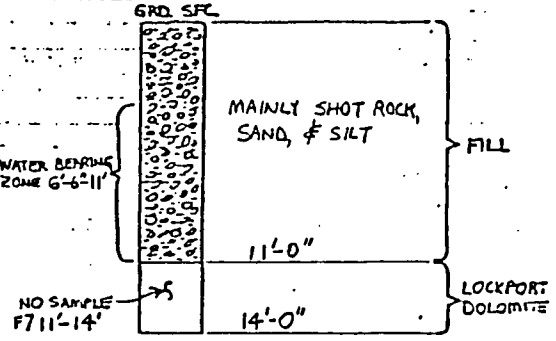
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND, SILT, & SHOT ROCK (FILL)
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
									– DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 14'-0"
10'									– BDR.. HIT @ DEPTH OF 11'-0"
								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 14'-0"
15'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 6'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED 5 GAL./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS MURKY & HAD TYP. RIVER WATER SMELL

NOTES: N = NO. OF BLOWS TO DRIVE ____ SPOON _____ WITH _____ LB. WT. _____ FALL
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FALL

WELL #12-A



GEOLOGY OF #12-A



A-101

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #12-B

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/24/83 COMPLETED 18 JULY 1983 TECHNICIAN _____

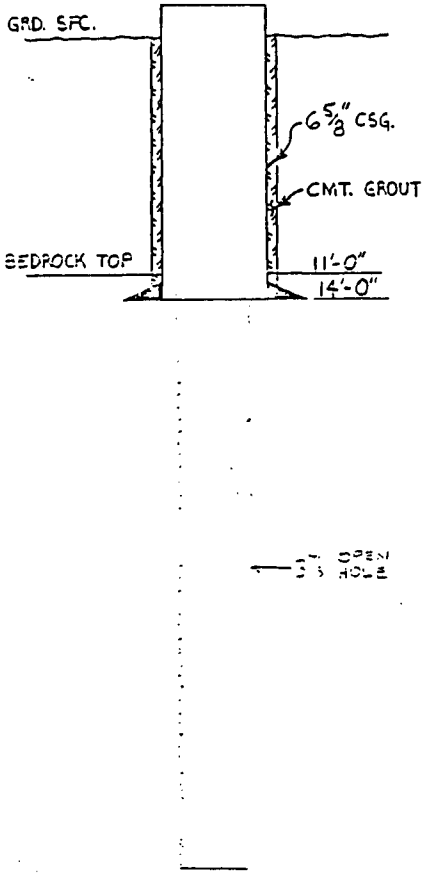
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

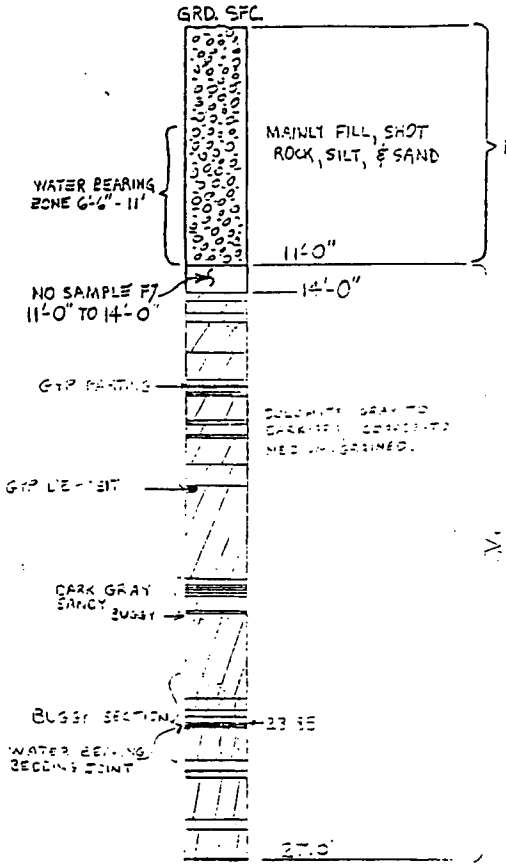
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SAND, SILT, & SHOT ROCK (FILL)
									– DRILL 7 7/8" O.D. HOLE 3'-0" INTO BEDROCK TO 14'-0"
									– 6 5/8" O.D. CSG. CMT. GROUTED @ 14'-0"
									– BEDROCK HIT @ DEPTH OF 11'-0"
								NO SAMPLE	– CORED SAMPLE F/ 14.0' TO 27.0' SAMPLE GRAY TO DARK GRAY DOLOMITE, COARSE TO MEDIUM GRAINED W/ WATER BEARING FRACTURE @ 23.85' (LOST CIRC. TO 23.85' FRACTURE)
								RUN #1 14.0' TO 24.0' REC. 9.82'	
								RUN #2 24.0' TO 27.0' REC. 3.00'	– REAMED F/ 14.0' TO 27.0' W/ 3 7/8" BIT
									– DEVELOPMENT YIELDED 10 GPM W/ 2' DRAWDOWN AFTER 30 MIN INITIAL DEVELOPMENT AT 15 GPM PUMPED WELL FROM 9.5' TO 27.0' IN 30 MIN. WELL RECOVERED TO 9.5' IN LESS THAN 5 MIN. SAMPLE HAD BRONZE COLOR W/ ORGANIC ACID ODOR.

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FA. B

WELL #12-B



GEOLOGY OF #12-B



A-102

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #13-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dave Bolbourn WEATHER _____

DATE STARTED 5/25/83 COMPLETED 5/27/83 TECHNICIAN MIKE FREY

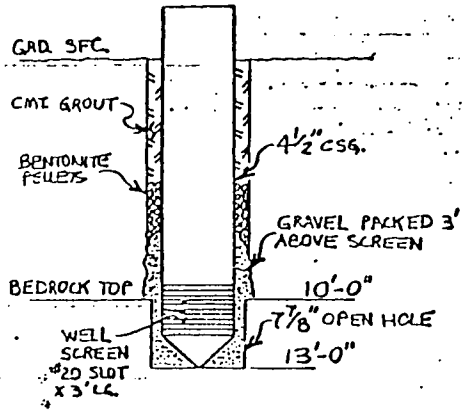
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

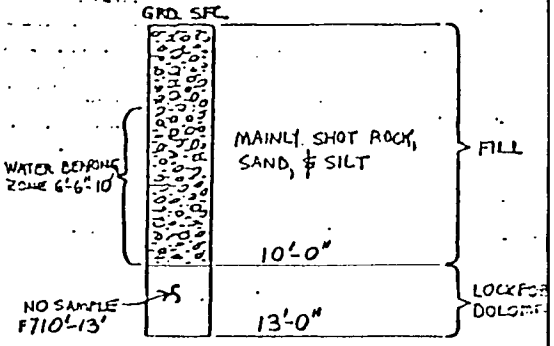
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND, SILT, & SHOT ROCK (FILL) – DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED) – DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 13'-0"
10'									– BDR. HIT @ DEPTH OF 10'-0"
								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 13'-0"
15'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 5'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED < 1 GAL./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS HAZY LOOKING & HAD TYP. RIVER WATER SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FT.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FT.

WELL #13-A



GEOLOGY OF #13-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #14-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loofbourrow WEATHER _____

DATE STARTED 5/24/83 COMPLETED 5/31/83 TECHNICIAN MIKE FREY

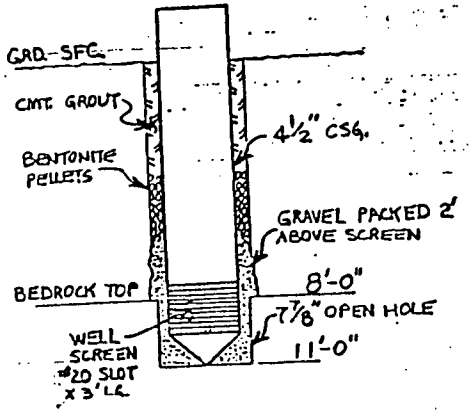
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT _____

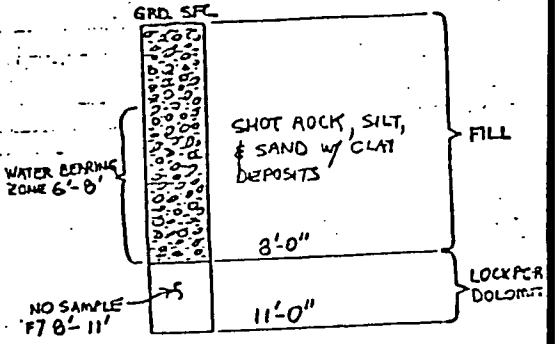
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SHOT ROCK, SILT, & SAND W/ CLAY DEPOSITS – DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED) – DRILL 7⅞" O.D. HOLE 3' INTO BDR TO 11'-0" – BDR. HIT @ DEPTH OF 8'-0"
10'								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 11'-0"
15'									– HOLE GRAVEL PACKED TO 2' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 4'-0" – 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FT.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FT.

WELL #14-A



GEOLOGY OF #14-A



DATE BEGUN 10-1-83
DATE COMPLETED
RIG NUMBER
PROJECT NUMBER HOLE DIA.
PROJECT NAME
LOCATION Plant Site 14
METHOD USED
FIELD PARTY
WEATHER

LOG OF TEST BORING

DUPONT

HOLE NUMBER 14-C
SHEET OF
TOTAL DEPTH
LOGGER Harold Hunter

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER, BLOW COUNT, LOCATION SAMPLED, RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-8'
6½" Casing set at 11' cemented to surface
Cored from 11'-35' - Reamed hole to 5⅞"
Set 4½" O.D. Casing at 25' - Cement to surface
Cored from 25'-70'
Reamed core hole to 3⅞"
Lost circulation at 66'
Total depth 70' GLM

10
35
66'
70'
6½"
4½"

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30"

G-48-A REV. 1-78

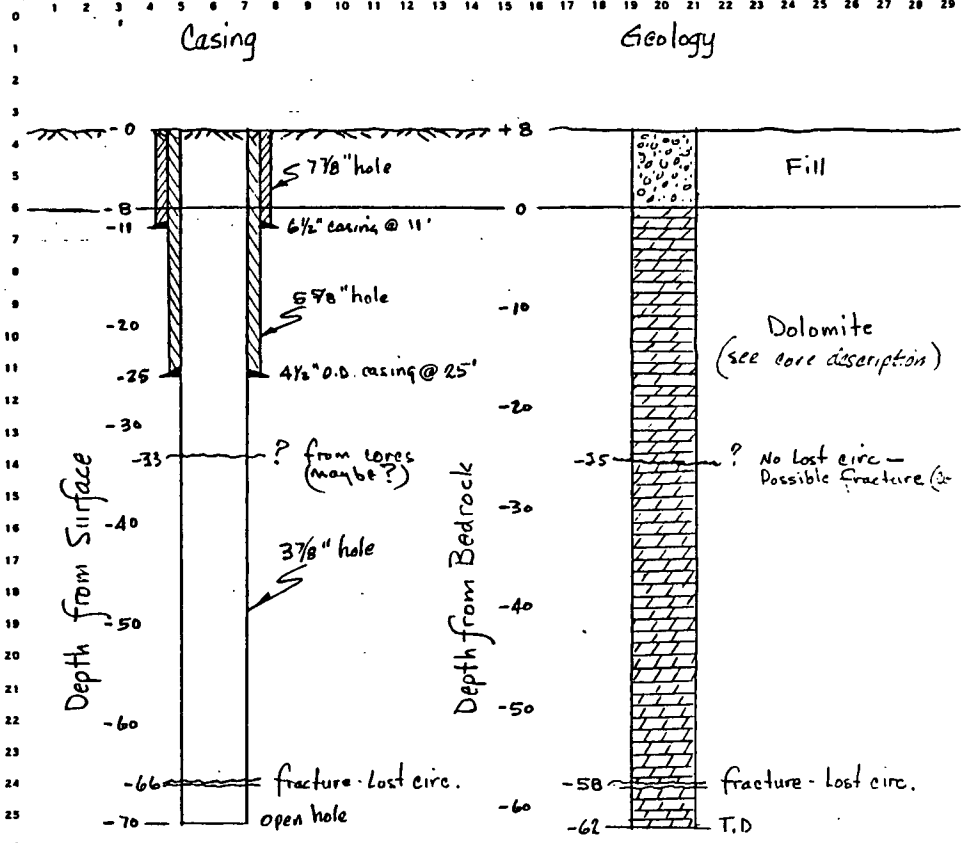
ENGINEERING DUPONT COMPUTATION SHEET

SHEET NO.

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO.

SUBJECT Well No. 14-C WORKS Plant Site

COMPUTER H.E. Hunter DATE 10-6 19 83



HH 10/6/83

USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

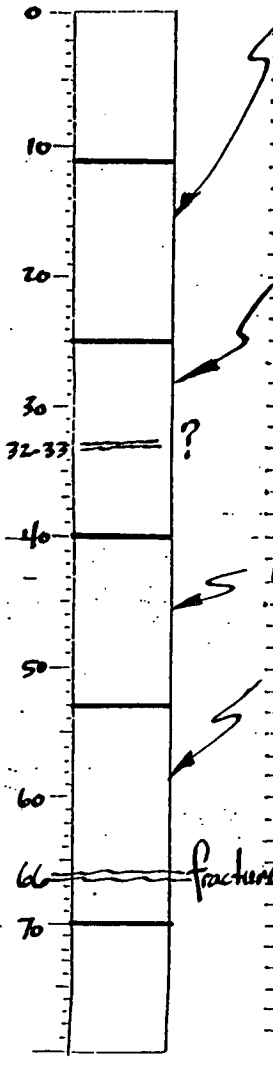
A-105

CORE DATA SHEET Page ____

Well No. 14-C

Sample No. Plant Site

Columnar Section



Core Description

Core 11-25 Recovered 10'
11-12 dolomite, broken, grey
12-13 dolomite, gray-dk gray, dense some irregular por.
13-14 dolomite, gray-brown, broken
14-20 " grey, dense
20-21 dolomite, dk gy, irregular, poor-dry. dolomite, dk gy, irregular, poor wet

Core 25-40 Recovered 14'
25-28 dolomite grey, scattered irreg, dense, dry
28-29 dolomite, grey-dk gy, irregular, gyp plugged irreg por
29-32 dolomite, grey, dense, dry
32-33 dolomite, grey, dk, sandy in part, fracture, wet
33-35 dolomite, grey, scattered irreg dense
35-37 dolomite, dk grey, dense
37-38 " grey, dense, brittle
38-40 " dk gy, dense, gyp in fracs

Core 40-53 Recovered 13'
40-43 dolomite, dark grey,
43-53 dolomite, grey-dk grey, dense, no vis porosity, gyp plugged vugs

Core 53-70 Recovered 16'
53'-56' dolomite, gray-dk gy, dense, silted bedding planes
56-57 dolomite, dense, large gyp plugged vugs (3")
57-60 dolomite, dk gray w/ elongated gyp lams, dense
60-62 dolomite, grey-brn, altered bedding planes, dense
62-67 dolomite, dk grey, uniform small irregular porosity, good
67-69 dolomite, grey-dk gy, altered bedding planes, very dense

Last circulation occured at 60'
Cannot identify fracture zone in Core

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #15-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Laffoon WEATHER _____

DATE STARTED 5/25/83 COMPLETED 5/31/83 TECHNICIAN MIKE FREY

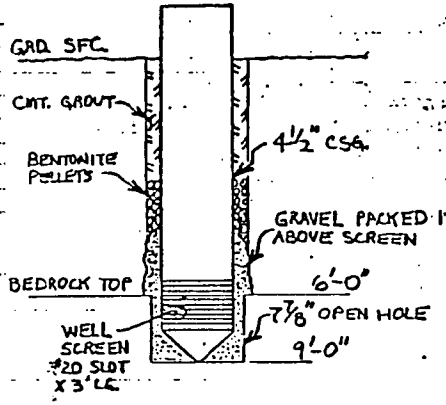
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

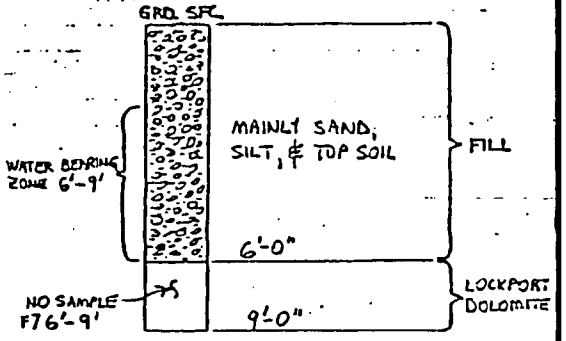
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" / 6"/12" / 12"/18" / 18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'						– SAND, SILT, & TOP SOIL – DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED) – DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 9'-0" – BDR. HIT @ DEPTH OF 6'-0"
10'					NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 9'-0" – HOLE GRAVEL PACKED TO 1' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 3'-0" – 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC. – DEVELOPMENT YIELDED 3 GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR & HAD A TRACE HYDROCARBON SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT: _____ EA.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA.

WELL #15-A



GEOLOGY OF #15-A



A-107

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #15-C

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/25/83 COMPLETED 1 AUGUST 1983 TECHNICIAN _____

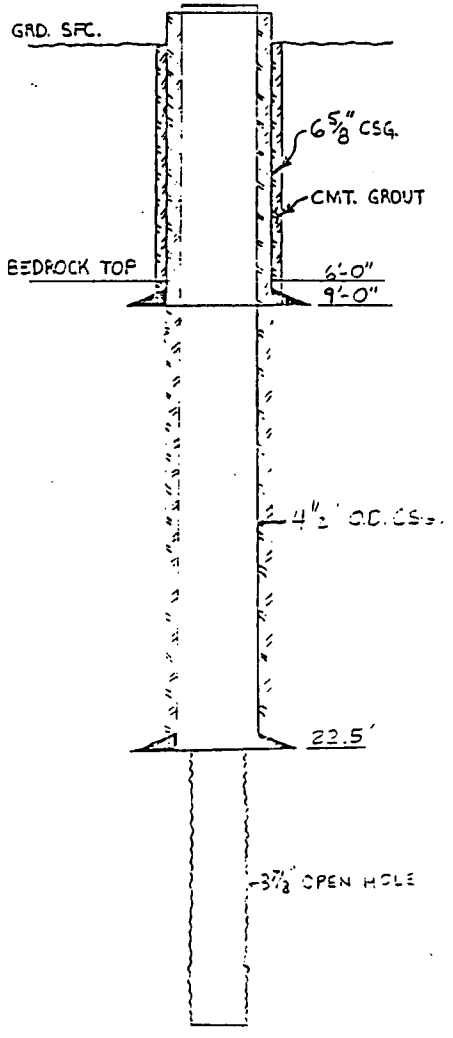
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ –WELLPOINT AT _____

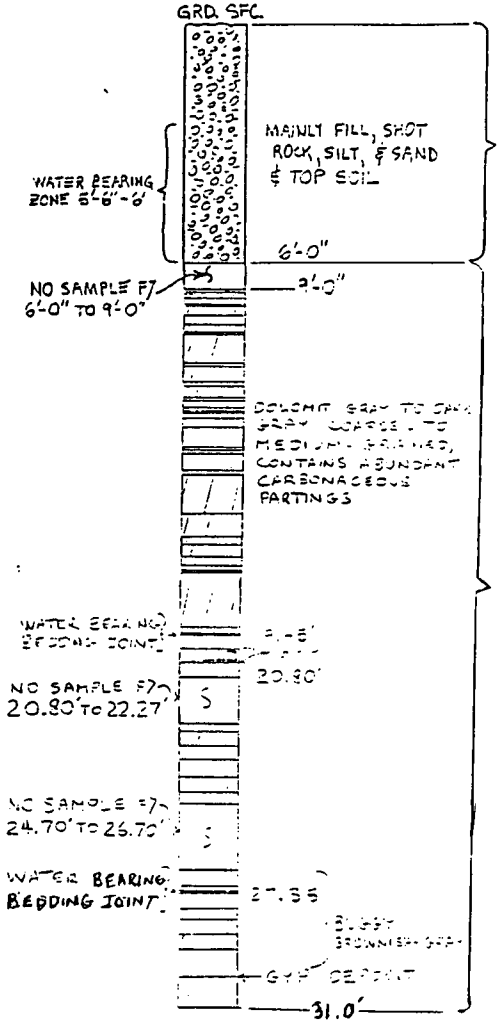
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
					– SAND, SILT, & TOP SOIL
					– DRILL 7 7/8" O.D. HOLE 3'-0" INTO BEDROCK TO 9'-0"
					– 6 5/8" O.D. CSG. CMT. GROUTED @ 9'-0"
				NO SAMPLE	– BEDROCK HIT @ DEPTH OF 6'-0"
10'				RUN #1 9.0' TO 22.5' REC. 11.69'	– CORED SAMPLE F/ 9.0' TO 22.5' SAMPLE GRAY TO DARK-GRAY DOLOMITE, GENERALLY COARSE-TO MEDIUM-GRAINED W/ WATER BEARING FRACTURE @ 19.45'
20'					– REAMED F/ 9.0' TO 22.5' W/ 5 7/8" BIT
				RUN #2 22.5 TO 24.70	– 4 1/2" O.D. CSG. SET @ 22.5'
				RUN #3 26.70' TO 31.00' REC. 3.74	– CORED SAMPLE F/ 22.5' TO 24.70' SAMPLE GRAY TO DARK-GRAY DOLOMIT.
30'					– CORE BARREL BLOCKED. TRIED THREE TIMES TO CLEAR JUNK FROM BOTTOM OF HOLE.
40'					– DRILLED 2' W/ 3 7/8" BIT TO REMOVE JUNK.
					– CORED SAMPLE F/ 26.70' TO 31.00' SAMPLE GRAY TO BROWNISH-GRAY DOLOMITE GENERALLY COARSE GRAINED, CONTAINS EXTENSIVE VUGGY PLACES, W/ WATER BEARING FRACTURE @ 27.35'
50'					– DEVELOPMENT YIELDED 10 GPM W/ 1.5' DRAWDOWN AFTER PERIODS OF 10, 20, & 30 MINS. WATER WAS VERY SLIGHT COLORED W/ SLIGHT ORGANIC ODOR

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. I
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. I

WELL #15-C



GEOLOGY OF #15-C



A-108

LOG OF TEST BORING

DUPONT

DATE BEGUN 10-1-83
DATE COMPLETED 10-2-83
RIG NUMBER
PROJECT NUMBER HOLE DIA.
PROJECT NAME
LOCATION Plant Site 15
METHOD USED
FIELD PARTY
WEATHER

HOLE NUMBER 15-CD
SHEET OF
TOTAL DEPTH
LOGGER Jessica Hunter

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-6'

6½" Casing set at 11' cemented to surfa

Drilled 11-35' w/ 5⅞" bit -
No cores 11-35'

4½" O.D. Casing set at 35' - cemented to su
Cored 35'-47' - see core description
Fracture at 44' - lost 100% circ.
Total Depth - 47' GLM

6' 11' 35' 44' 47'

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30

E-46-A REV. 1-79

ENGINEERING DUPONT COMPUTATION SHEET

SHEET NO

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO

SUBJECT Well No. 15-CD WORKS Plant Site

COMPUTER H.E. Hunter DATE 19

Casing

Geology

7⅞" hole

6½" casing @ 11'

5⅞" hole

4½" O.D. Casing @ 35'

3⅞" hole

Fracture - Lost circ

Open hole T.D.

Depth from Surface

Depth from Bedrock

Fill

Dolomite
(See core description

Cored 35-47
(See core descriptio
on 15 CD

Fracture - Lost 100% ci

T.D.

USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

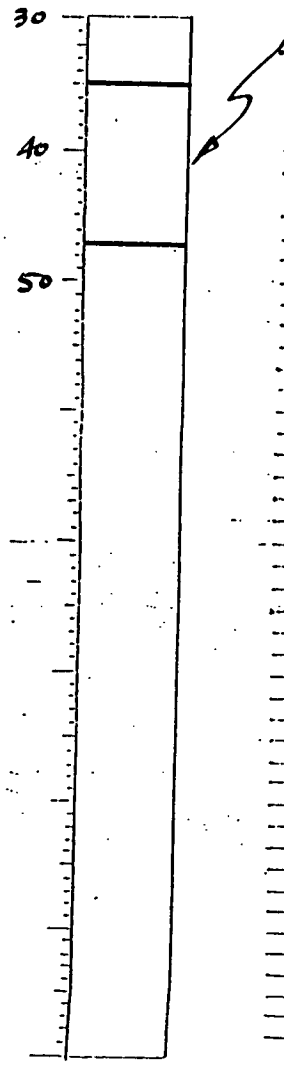
A-109

CORE DATA SHEET Page ___

Well No. 15-CD

Sample No. Plant

Columnar Section



Core Description

Core 35'-47' Recovered 12'
35-36 dolomite, dark grey, dense
36-39 dolomite, ash grey to grey, scat
vugs
39-42 dolomite grey w/ dk grey lams
gyp filled large vugs
42-44 dolomite, dark grey w/ close
spaced grey lams.
44-45 dolomite, grey, fractured co
gyp lam, dolicil, lams
45-47 dolomite, grey, dense, lams
lams gyp, sfo suspor.

DATE BEGUN 10-12-83 LOG OF TEST BORING HOLE NUMBER 15-D

DATE COMPLETED 10-14-83 DUPONT SHEET ___ OF ___

RIG NUMBER ___ TOTAL DEPTH ___

PROJECT NUMBER ___ HOLE DIA. ___ LOGGER Hamid Hunter

PROJECT NAME ___

LOCATION Plant Site 10

METHOD USED ___

FIELD PARTY ___

WEATHER ___

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION: SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill - 0'-6'

6¼" Casing set at 7'

Drilled 5⅞" hole w/ air rig

No Cores - 7'-50'

4½" O.D. Casing set @ 50' - Cemented

Core 51-65

Core 65-73

Ream hole to 3⅞"

Fracture at 68' - Set 100% Circ.

Total Depth 73'

6' 7' 50' 68' 73'

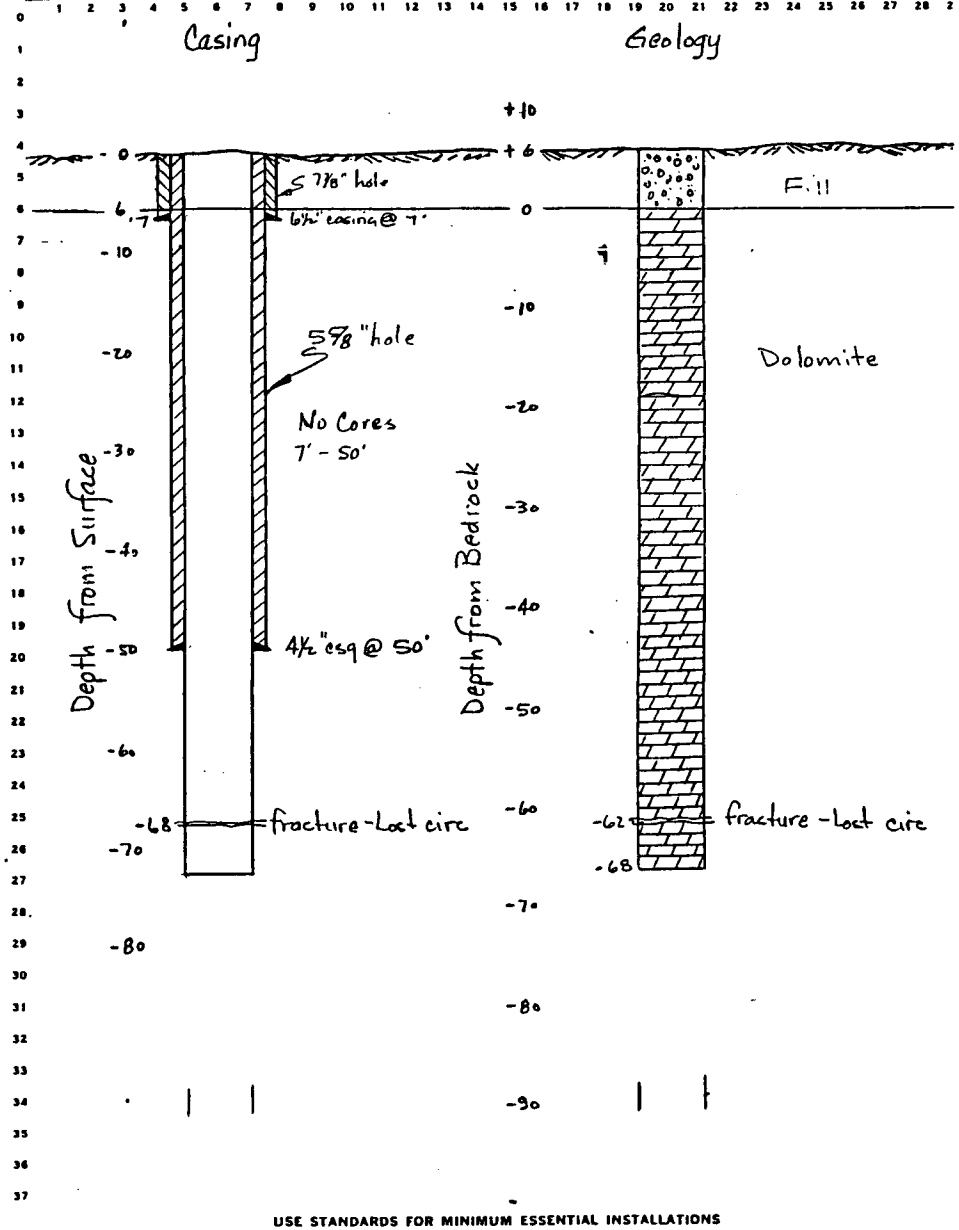
UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30"

G-48-A REV. 1-78 ENGINEERING DUPONT COMPUTATION SHEET SHEET NO. ___

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ OR STUDY NO. ___

SUBJECT Well No. 15-D WORKS Plant Site

COMPUTER H.E. Hunter DATE 10-14- 19 83



USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

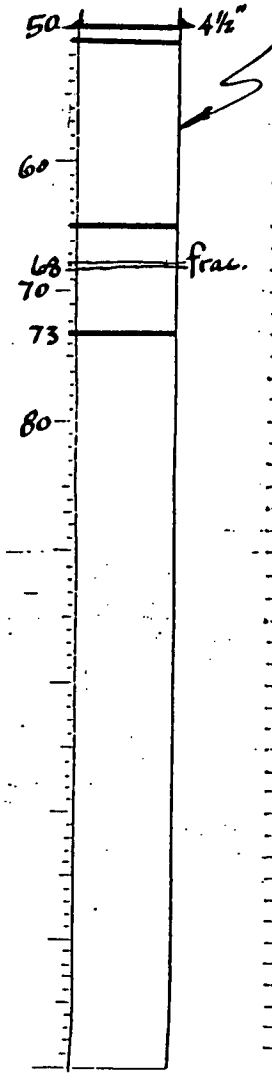
A-111

CORE DATA SHEET Page ____

Well No. 15-D

Sample No. Plant

Columnar Section



Core Description

Core 51-65 Recovered 14'
5 - 61 dolomite, dk gray-gray cloudy
spots gray laminations, dk
vertical fractures filled w/ gyp
some vugs filled w/ gyp.
61-65 dolomite, dk gray-brown
porosity, prob. low, vert. fract
present, w/ gyp

Core 65-73'

LOG OF TEST BORING

DUPONT

DATE BEGUN 9-22-83
DATE COMPLETED 10-7-83
RIG NUMBER
PROJECT NUMBER HOLE DIA.
PROJECT NAME
LOCATION Plant Site 15
METHOD USED
FIELD PARTY
WEATHER

HOLE NUMBER 15-F
SHEET OF
TOTAL DEPTH 105
LOGGER James Hunter

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLING: SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-6' - Top dolomite @ 6'
6½" Casing set at 11' - cemented to surface
Core 11' to 83'
Ream hole to 5⅞"

4½" Casing set at 85' - cemented to surface*
Core 83'- 105' - Fracture at 93' - Lost 90% Cir
Ream hole to 3⅜"
Total depth 105'

* Casing hydrostatically tested for leaks before drilling. Cement plug set 4½" casing at 85'. No leaks.

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1.4" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER 30" D

E-46-A REV. 1-78

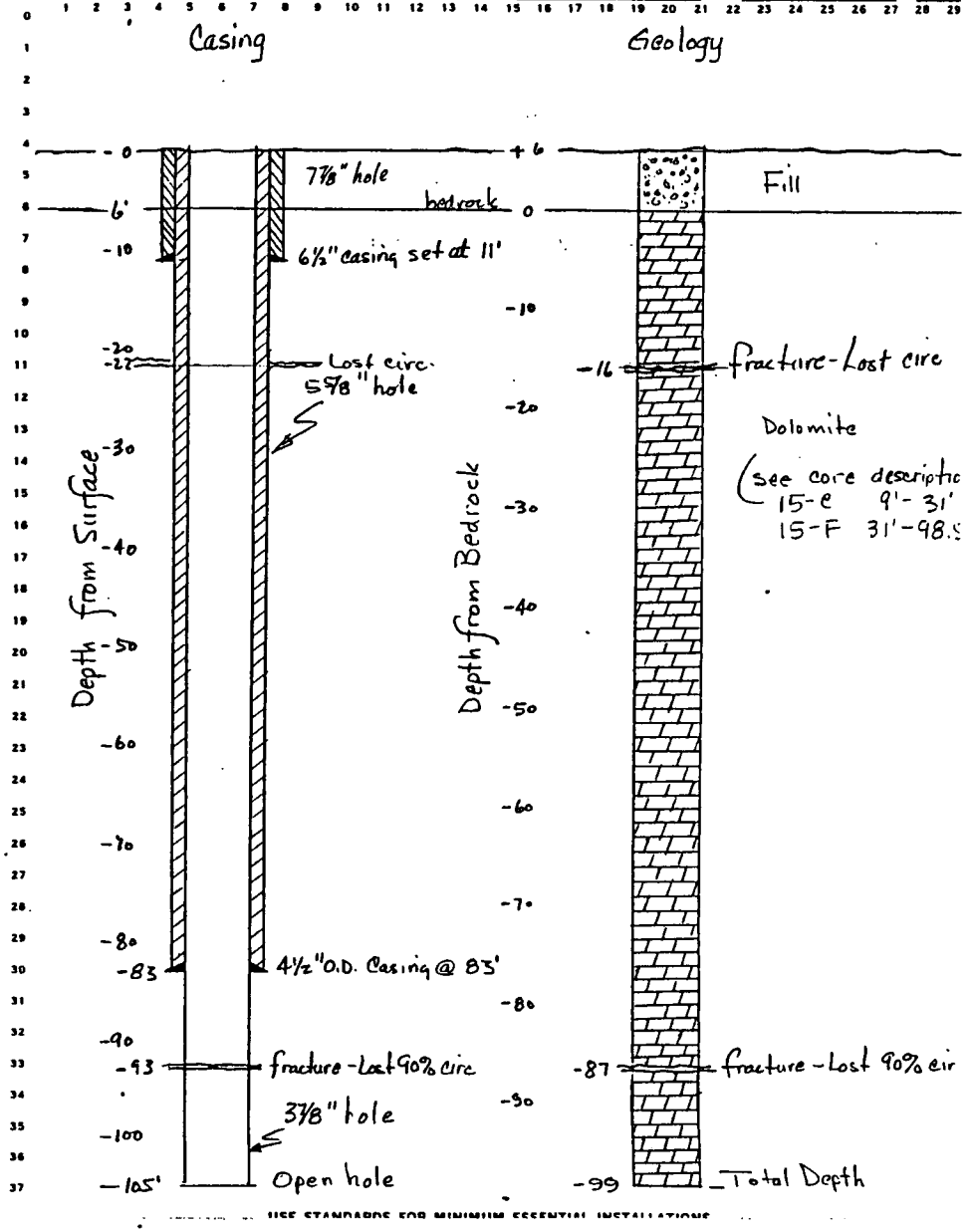
ENGINEERING DUPONT COMPUTATION SHEET

SHEET NO.

TITLE OF PROJ. OR STUDY DuPont Exploratory Drilling Program PROJ. OR STUDY NO.

SUBJECT Well No. 15-F WORKS Plant Site

COMPUTER H.E. Hunter DATE 19



USE STANDARDS FOR MINIMUM ESSENTIAL INSTALLATIONS

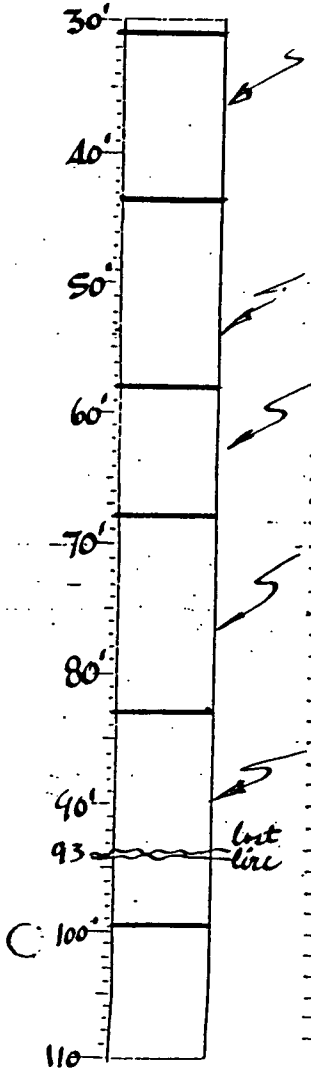
A-113

CORE DATA SHEET Page ___

Well No. 15-F

Sample No. _____

Columnar Section



Core Description

Lost Run at 22'6LM

Core 31-43.5 as follows:
31-33 dolomite, grey, dense, dry
33-35 " dk grey dense wet
35-37 " grey, dense, dry, grey
fine sand inserts
37-39 " grey-dk grey, varying
calc spar variations wet to
39-43.5 " grey to dk grey, to the spar
laminations of dk gy, mos
dry

Core 43.5-58 dolomite, dk grey, uniform
small irregular porosity, wet,
2" gyp. stringer at 48'6", wet,
fractures 54 to 55'

Core 58-68 as follows:
58-63 dolomite, grey-dk grey, dense, dry
63-65 dolomite dk grey, leached vuggy
porosity, wet,
65-66 dolomite grey - dense, dry
66-67.5 " lt grey dense dry
67.5-68 " dk grey, dense dry

Core 68-83 as follows:
68-72 dolomite, grey w/ dk grey lam.
dense dry
72-75 dolomite, dk grey, crys por,
spud wet,
75-83 dolomite, grey-dk grey, dense d
gyp filled fractures, vugs and
fractures, not too productive

Core 84-98.5' recovered 14.5'
84-96 dolomite, grey w/ closely spaced
grey laminations dense, sso.
leachable porosity, last partial
returns at 93'6
96-98.5 dolomite, fractured core at 96'
dark grey, dense, hard no vu
or noticeable porosity

DATE BEGUN 10-31-83 — LOG OF TEST BORING — HOLE NUMBER 15-J

DATE COMPLETED — SHEET — OF

RIG NUMBER — TOTAL DEPTH

PROJECT NUMBER — HOLE DIA. — LOGGER James E. Hunter

PROJECT NAME Plant Site 15

LOCATION

METHOD USED

FIELD PARTY

WEATHER

GROUND WATER TABLE			
DEPTH IN FT.			
TIME			
DATE			

SAMPLING METHOD | SAMPLE NUMBER | BLOW COUNT | LOCATION SAMPLED | RECOVERY | DEPTH IN FEET | SOIL GRAPH | MOISTURE | CONSISTENCY | RQD

DESCRIPTION
SOIL TYPE, COLOR, TEXTURE, ESTIMATED PARTICLE SIZE, SAMPLER DRIVING NOTES, DEPTHS CIRCULATION LOST, NOTES ON DRILLING EASE, BITS USED, ETC.

LOCATION NOTES AND DIAGRAM:

TRAFFIC. DITCH.

VEGETATION:

Fill 0-6' Top bedrock @ 6'

Drilled hole with 6" bit, casing the Schramm air rig from 6' to 150'.

6" hole

No fractures detected while drilling with air.

4½" O.D. Casing at 150' - Cemented to surfa

Cored 154.5-169.5 - Top Rochester Shale 167.5

Reamed open hole to 3⅞"

Total Depth - 169.5'

UNLESS OTHERWISE NOTED ALL SAMPLES ARE TAKEN W/1⅜" I.D. STANDARD PENETRATION SAMPLER DRIVEN W/140 LB. HAMMER

E-48-A REV. 1-78 — ENGINEERING DUPONT COMPUTATION SHEET — SHEET NO

TITLE OF PROJ OR STUDY DuPont Exploratory Drilling — PROJ OR STUDY NO

SUBJECT Well No. 15-J — WORKS Plant Site

COMPUTER H.E. Hunter — DATE — 19

Casing

Geology

7⅞" hole

6⅝" Casing @ 6'

6" hole

Drilled with Schramm air drilling rig to casing point

Cemented to surface

Cored 154.5'-169.5'

4½" O.D. casing set @ 150'

3⅞" open hole

Rochester Shale @ 162.5'

T.D. 169.5'

Depth from Surface: 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130, 140, 150, 160/162.5, 170

Depth from Bedrock: +6, 0, -10, -20, -30, -40, -50, -60, -70, -80, -90, -100, -110, -120, -130, -140, -150, -160, -170

Fill

Lockport Group

Decew Dolomite

156.5'

Shale

Rochester Shale

163.5'

11/12/83

Vertical Scale 1 cm = 10 ft.

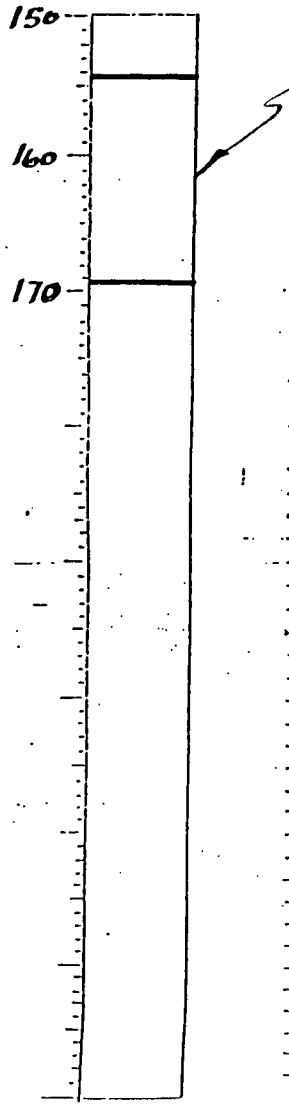
A-115

CORE DATA SHEET

Well No. 15-J

Sample No. Plant Site 15

Columnar Section



Core Description

4½" O.D. Casing set at 150'

Core 154.5 - 169.5' Recovered 15'

154.5 - 162.5 Shaley limestone, mostly lm. buff shale laminations grading from shaley limestone to shale, dense, hard dry

162.5 Top Rochester Shale

162.5 - 169.5 Shale, dark grey, fine grain,

Top Rochester Shale 162.5' G.L.

11/10/83

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL # 16-A

PROJECT DUPONT - EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Steve Loeffelholz WEATHER _____

DATE STARTED 5/25/83 COMPLETED 5/27/83 TECHNICIAN MIKE FREY

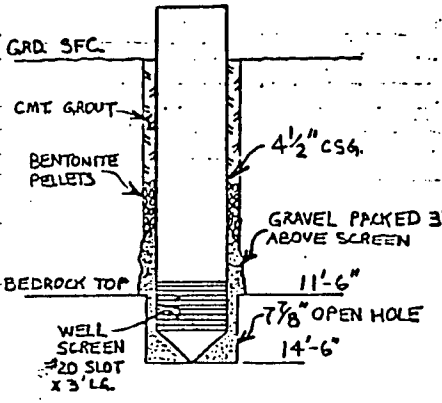
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

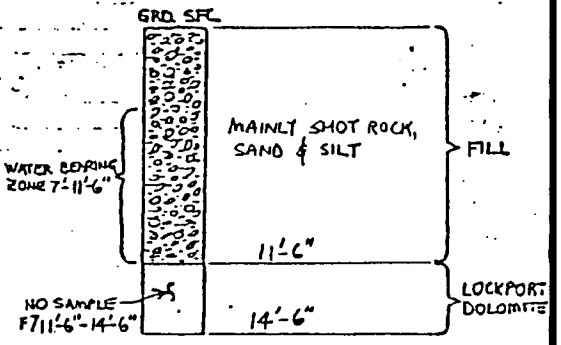
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SAND, SILT, & SHOT ROCK (FILL)
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
5'									– DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 14'-6"
10'									– BDR. HIT @ DEPTH OF 11'-6"
								NO SAMPLE	– 4 1/2" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 14'-6"
15'									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 6'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. B

WELL # 16-A



GEOLOGY OF # 16-A



A-117

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #16-6

PROJECT DU PONT EXPLORATORY WELLS

CLIENT DU PONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/25/83 COMPLETED 19 JULY 83 TECHNICIAN _____

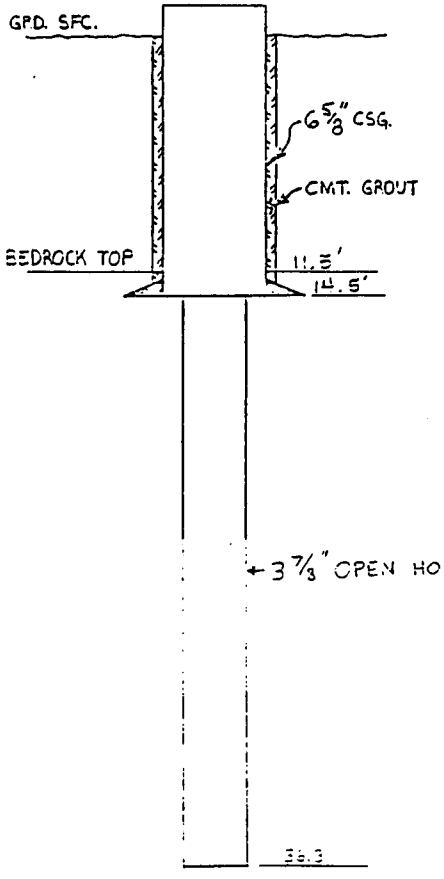
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ –WELLPOINT AT _____

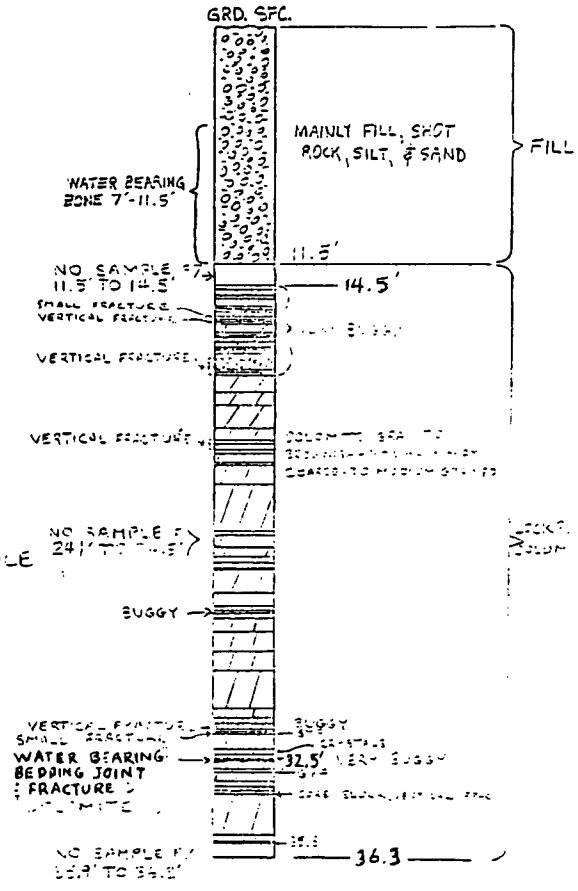
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
10'									- SAND, SILT, & SHOT ROCK (FILL) - DRILL 7 7/8" OD HOLE 3'-0" INTO BEDROCK TO 14'-6" - 6 5/8" O.D. CSG. CMT. GROUTED @ 14'-6" - BEDROCK HIT @ DEPTH OF 11'-6"
20'								NO SAMPLE RUN #1 14.5' TO 24.5' REC. 9.6'	- CORED SAMPLE F/ 14.5' TO 36.3' SAMPLE - GRAY TO BROWNISH-GRAY TO DARK G- COARSE- TO MEDIUM- GRAINED, MULTIPLE VERT FRACTURE, WITH GYP DEPOSITS & VUGGY PLA THROUGOUT, CONTAINS ABUNDANT CARBONACEOUS PARTINGS W/WATER BEARING FRACTURE @ 32.5
30'								RUN #2 24.5 TO 34.1 REC. 9.44' RUN #3 34.1 TO 36.3 REC. 1.8	- REAMED F/ 14.5' TO 36.3' W/ 3 7/8" BIT - DEVELOPMENT YIELDED 10 GPM W/ 4.5' DRAWDOWN AFTER 20 MIN. WATER WAS CLOUDY W/ FOUL ODOR.

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA

WELL #16-6



GEOLOGY OF #16-6



CORE SCALE 1"=1'

A-118

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #17-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Lewis Loftsgaarden WEATHER _____

DATE STARTED 5/26/83 COMPLETED 6/2/83 TECHNICIAN MIKE FREY

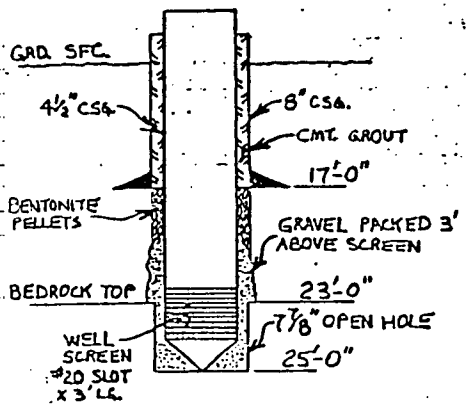
GROUND WATER – CASING IN – _____ AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -VELLPOINT AT _____

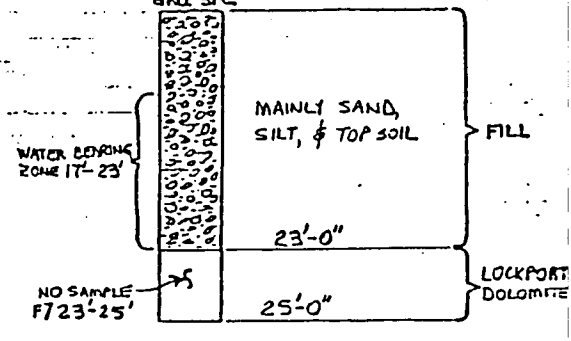
DEPTH BELOW URFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SAND, SILT, & TOP SOIL
5'									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
10'									– DRILL 7⅞" O.D. HOLE 2' INTO BDR. TO 25'-0"
15'									
20'									– BDR. HIT @ DEPTH OF 23'-0"
25'								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 25'-0"
									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 16'
									– 8" CSG. PULLED UP TO 17'-0" & CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED LESS THAN 1 PT./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR W/ FINE SILT & HAD NO SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ I.D.
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ I.D.

WELL #17-A



GEOLOGY OF #17-A



conoco

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #17-B

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/24/83 COMPLETED 21 JULY 83 TECHNICIAN _____

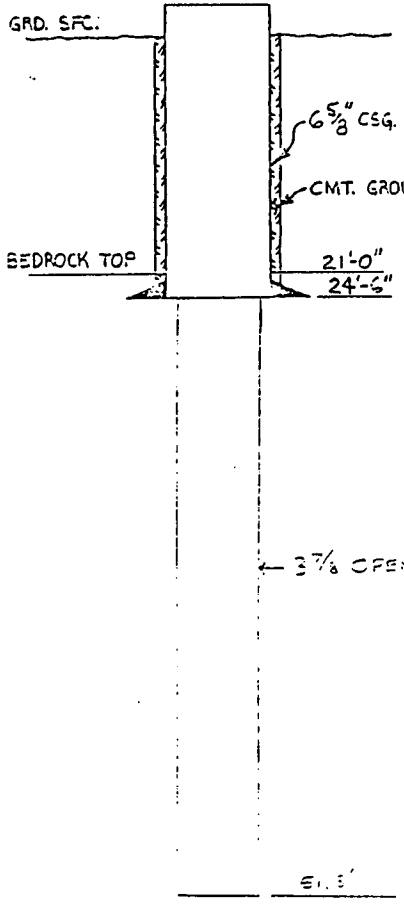
GROUND WATER BELOW SURFACE – CASING IN – _____ AT COMPLETION / TIME _____

– CASING OUT – _____ –WELLPOINT AT _____

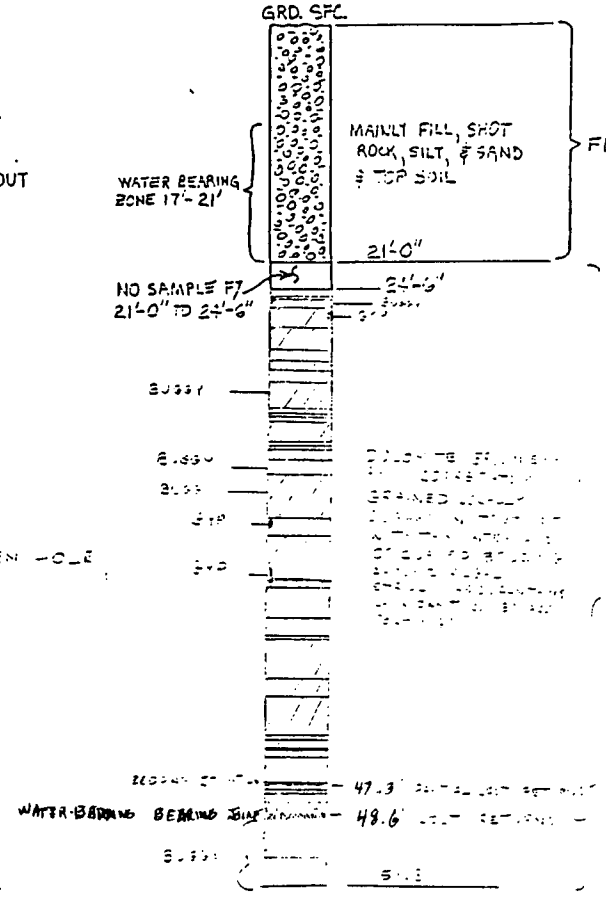
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SAND, SILT, & TOP SOIL
10'									– DRILL 7⅞" O.D. HOLE 3'-6" INTO BEDROCK TO 24'-6"
									– 6⅝" O.D. CSG. CMT. GROUTED @ 24'-6"
20'									– BEDROCK HIT @ DEPTH OF 21'-0"
								NO SAMPLE	– CORED SAMPLE F/24.5' TO 51.8' SAMPLE BROWNISH-GRAY, COARSE-TO MEDIUM-GRAINED, LOCALLY SUGARY IN TEXTURE WITH THIN INTERVALS OF CURLED BEDDING GROUND ALGAL STRUCTURES, ABUNDANT CARBONACEOUS PARTINGS AND GYP DEPOSITS THROUGHOUT
30'								RUN #1 24.5' TO 35.3' REC. 10.77'	
								RUN #2 35.3' TO 45.5' REC. 10.24'	– REAMED F/24.5' TO 51.8' W/3⅞" BIT
40'									– DEVELOPMENT YIELDED 7.5 GPM W/ NO DRAWDOWN AFTER 30 MIN. RATE WAS INCREASED TO 15 GPM FOR 30 MIN. W/ 2.0' DRAWDOWN. WATER WAS CLEAN CLEAR, W/ NO SMELL.
								RUN #3 45.5' TO 51.8' REC. 6.21'	
50									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. E
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. E

WELL #17-B



GEOLOGY OF #17-B



A-120

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #18-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Francis Loffhouse WEATHER _____

DATE STARTED 5/27/93 COMPLETED 6/2/93 TECHNICIAN MIKE FREY

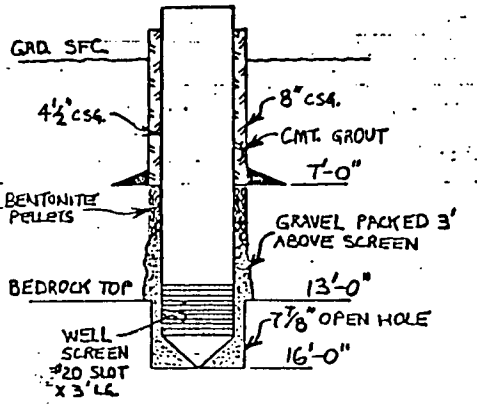
GROUND WATER – CASING IN – _____ AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

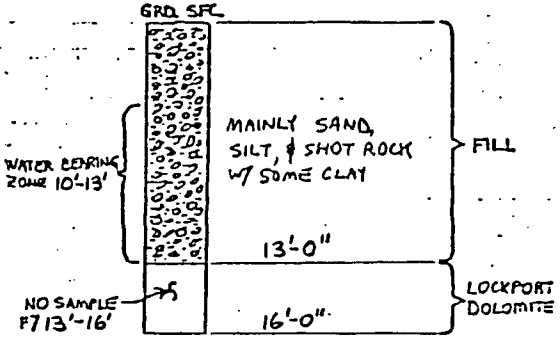
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND, SILT & SHOT ROCK (FILL) W/ SOME CLAY
									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
10'									– DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 16'-0"
									– BDR. HIT @ DEPTH OF 13'-0"
15'								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #10 SLOT WELL SCREEN SET TO 16'-0"
									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 7'-0"
20'									– 8" CSG. PULLED UP TO 7'-0" & CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED < 1 QT./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS CLEAR & HAD A VERY SLIGHT ORGANIC SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. B
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. B

WELL #18-A



GEOLOGY OF #18-A



conoco

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #18-C

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/27/83 COMPLETED 22 JULY 83 TECHNICIAN _____

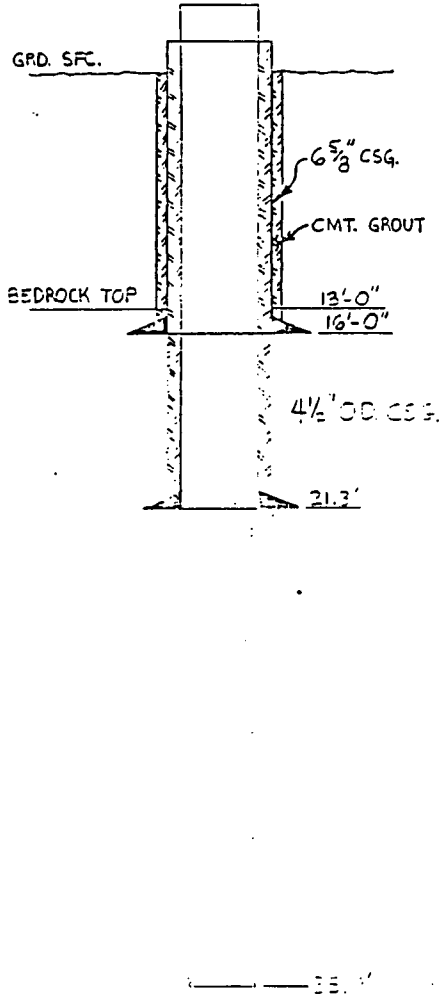
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

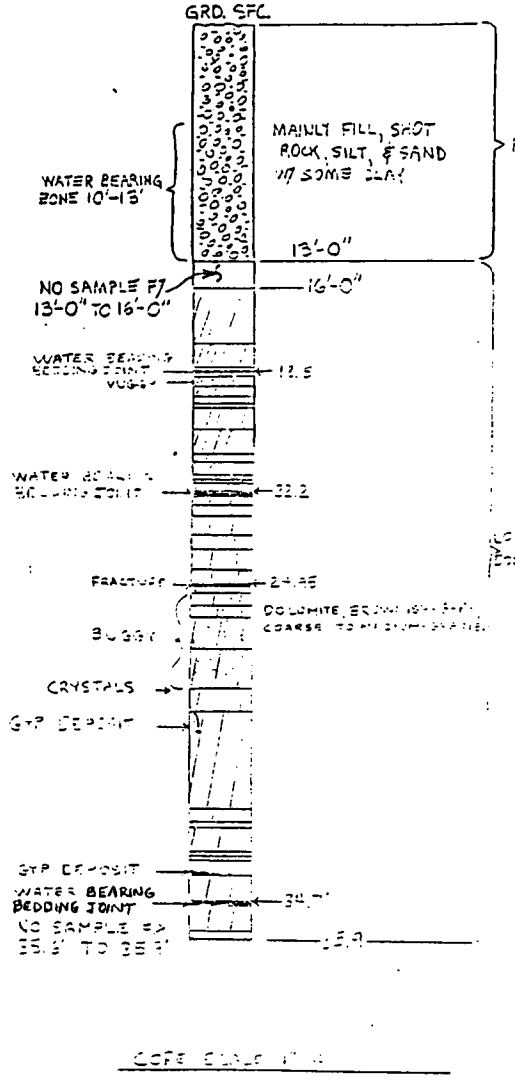
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
10'									– SAND, SILT, & SHOT ROCK (FILL) W/ SOME CLAY – DRILL 7⅞" O.D. HOLE 3'-0" INTO BEDROCK TO 16'-0" – 6⅝" O.D. CSG. CMT. GROUTED @ 16'-0" – BEDROCK HIT @ DEPTH OF 13'-0"
20'								NO SAMPLE RUN #1 16.0' TO 21.3' REC. 5.22	– CORED SAMPLE F/ 16.0' TO 21.3' SAMPLE BROWNISH-GRAY DOLOMITE, COARSE TO MEDIUM GRAINED W/ WATER BEARING FRACTURE @ 18.5' (LOST CIRC TO 18.5' FRAC.)
30'								RUN #2 21.3' TO 35.9' REC. 14.1	– REAMED F/ 16.0' TO 21.3' W/ 5⅞" BIT – 4½" O.D. C.S.G. SET TO 21.3' – CORED SAMPLE F/ 21.3' TO 35.9' SAMPLE BROWNISH-GRAY DOLOMITE COARSE TO MEDIUM GRAINED W/ WATER BEARING FRACTURES @ 22.2' & 34.7' (LOST PARTIAL RETURNS @ 22.2') (LOST TOTAL RETURNS @ 34.7') – REAMED F/ 21.3 TO 35.9' W/ 3⅞" BIT – DEVELOPMENT YIELD 10 GPM W/ 2.5' DRAWDOWN AFTER PERIODS OF 10, 20 & 30 MINS. WATER STARTED OUT DIRTY BUT CLEARED AS PUMPING CONTINUED. NO ODOR.
40'									
50'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. I
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. I

WELL #18-C



GEOLOGY OF #18-C



CORE SCALE 1" = 1'

A-122

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #19-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Diana Hoffmann WEATHER _____

DATE STARTED 5/25/83 COMPLETED 5/25/83 TECHNICIAN MIKE FREY

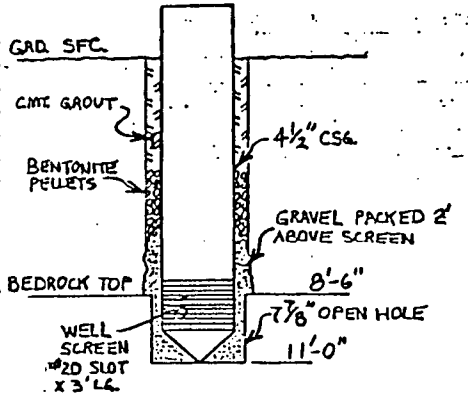
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ WELLPOINT AT _____

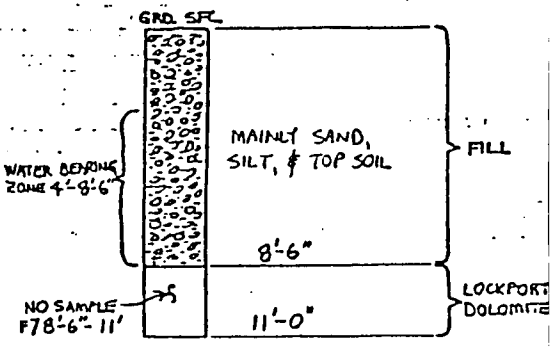
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SAND, SILT, & TOP SOIL W/ SOME ROCK FILL – DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED) – DRILL 7⅞" O.D. HOLE 2'-6" INTO BDR. TO 11'-0" – BDR. HIT @ DEPTH OF 8'-6"
10'								NO SAMPLE	– 4½" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 11'-0"
15'									– HOLE GRAVEL PACKED TO 2' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 4'-0" – 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC. – DEVELOPMENT YIELDED < 1 PT./MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS MUDDY & HAD NO SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. F
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. F

WELL #19-A



GEOLOGY OF #19-A



CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #19-B

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 5/25/93 COMPLETED 27 JULY 93 TECHNICIAN _____

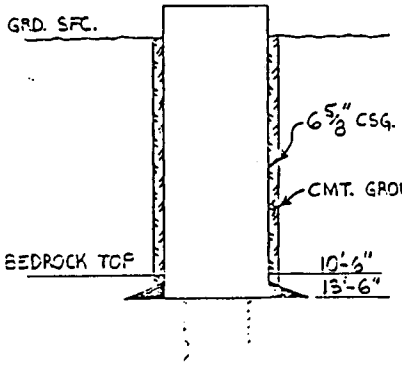
GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ -WELLPOINT AT _____

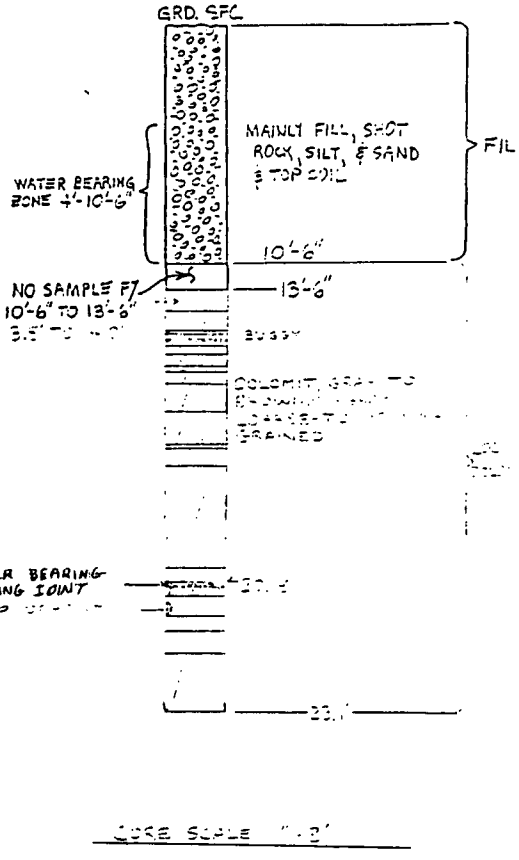
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– SAND, SILT, & TOP SOIL W/ SOME ROCK FILL – DRILL 7⅞" O.D. HOLE 3'-0" INTO BEDROCK TO 13'-6" – 6⅝" O.D. CSG. CMT. GROUTED @ 13'-6" – BEDROCK HIT @ DEPTH OF 10'-6"
10'								NO SAMPLE	– CORED SAMPLE F/ 13.5' TO 23.1' SAMPLE GRAY TO BROWNISH-GRAY DOLOMITE, COARSE-TO MEDIUM GRAINED W/ WATER BEARING FRACTURE @ 20.15' (LOST CIRC. TO 20.15' FRAC.)
20'								RUN #1 13.5' TO 23.1' REC. 9.0'	– REAMED F/ 13.5' TO 23.1' W/ 3⅞" BIT
30'									– DEVELOPMENT YIELDED 10 GPM W/ 3.5' DRAWDOWN AFTER 30 MIN. WATER WAS CLEAN, CLEAR, W/ NO SMELL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. [illegible]
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. [illegible]

WELL #19-B



GEOLOGY OF #19-B



CORE SCALE "=1'

A-124

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #20-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dave Loffcornow WEATHER _____

DATE STARTED 5/25/83 COMPLETED 5/27/83 TECHNICIAN MIKE FREY

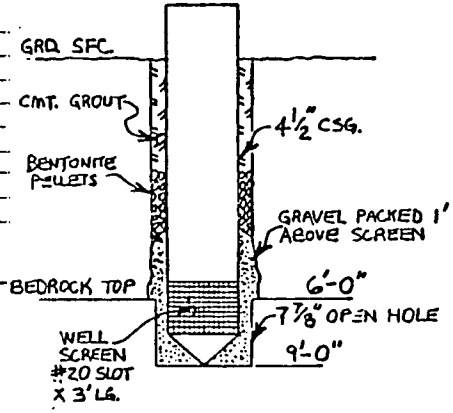
GROUND WATER – CASING IN – _____ AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – _____ –WELLPOINT AT _____

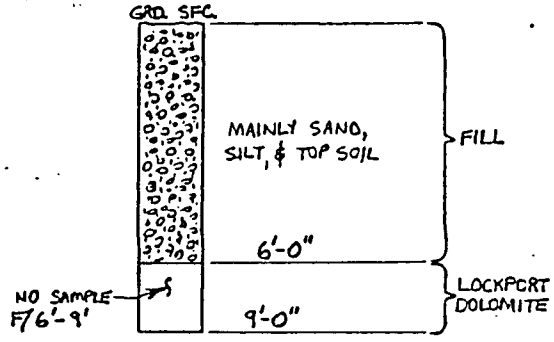
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
					– SAND, SILT, & TOP SOIL
					– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
					– DRILL 7⅞" O.D. HOLE 3' INTO BDR. TO 9'-0"
					– BDR. HIT @ DEPTH OF 6'-0"
				NO SAMPLE	– 4½" O.D CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 9'-0"
					– HOLE GRAVEL PACKED TO 1' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 3'-0"
					– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
					– DEVELOPMENT YIELDED NO WATER FLOW AT ALL (DRY HOLE)

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ FT. BY
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ FT. BY

WELL #20-A



GEOLOGY OF #20-A



A-125

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. WELL #21-A

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Louis Lofthouse WEATHER _____

DATE STARTED 5/5/93 COMPLETED 5/17/93 TECHNICIAN MIKE FREY

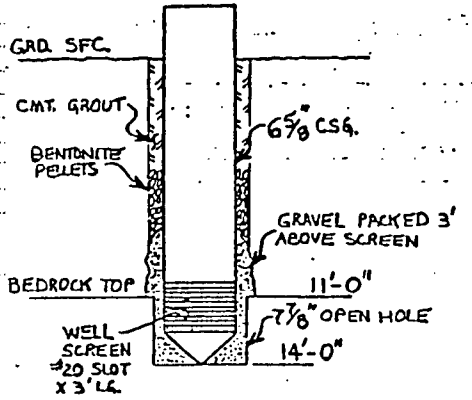
GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – WELLPOINT AT _____

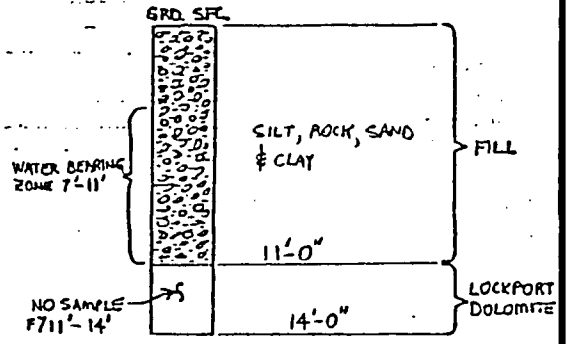
DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'									– SILT & SAND W/ ROCK AND SMALL AMOUNTS OF CLAY
10'									– DRILL 10" O.D. HOLE TO BEDROCK & SET TEMP. 8" CSG. AGAINST BDR. (CSG. NOT CMT. GROUTED)
									– DRILL 7 7/8" O.D. HOLE 3' INTO BDR. TO 14'-0"
									– BDR. HIT @ DEPTH OF 11'-0"
15'								NO SAMPLE	– 6 5/8" O.D. CSG. W/ 3' LG. #20 SLOT WELL SCREEN SET TO 14'-0"
									– HOLE GRAVEL PACKED TO 3' ABOVE WELL SCREEN & BENTONITE PELLETS FILLED ON TOP OF GRAVEL PACK TO 6'-0"
									– 8" CSG. PULLED OUT & ANNULUS OF HOLE CMT. GROUTED TO SFC.
									– DEVELOPMENT YIELDED ½ GAL/MIN. FROM SFC. WATER-BEARING ZONE, WATER WAS YELLOW-BROWNISH IN COLOR & SMELLED BAD (RIVER WATER SMELL)

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____ EA. F
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____ EA. T

WELL #21-A



GEOLOGY OF #21-A



A-126

CONOCO

Attachment 1

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #1 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Steve Dyer WEATHER _____

DATE STARTED 9/11/93 COMPLETED 9/11/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
					– TOO MUCH FILL & ROCK FOR SPOON DRIVING
					– COULDN'T AUGER PAST 3'-0"

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #2 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Steve Dyer WEATHER _____

DATE STARTED 9/9/93 COMPLETED 9/9/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'					– AUGERED TO BEDROCK @ 12'-9"
10'					– TOO MUCH FILL & ROCK FOR SPOON DRIVING
15'					

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

A-127

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #3 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Diane Lofthouse WEATHER _____

DATE STARTED 8/10/93 COMPLETED 8/10/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– AUGERED TO BEDROCK @ 11'-6"
5'									– TOO MUCH FILL & ROCK FOR SPOON DRIVING
									– WATER HIT @ 4'-7"
10'									
15'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #4 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Diane Lofthouse WEATHER _____

DATE STARTED 8/10/93 COMPLETED 8/10/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– NO SAMPLE & NO WATER F/ 0'-4'
5'		4	3				1	5'	– BROWN, SILTY CLAY W/ ROCK FRAGMENTS
				2	3		1		
		4	5				2	7'	– BROWN, SILTY CLAY W/ ROCK FRAGMENTS
				5	7		2		
		10	10				3	9'	– BROWN, SILTY CLAY W/ ROCK FRAGMENTS
10'				8	7		3		
		5	5				4	11'	– BROWN, SILTY CLAY W/ ROCK FRAGMENTS
				3	4		4		
		13	14				5		
				23	50		5	13'	– BROWN, SILTY CLAY
15'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #5 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR [signature] WEATHER _____

DATE STARTED 8/10/93 COMPLETED 8/10/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		10	10				1		– SANDY SILT, SHOT ROCK, & ASSORTED FILL
				22	19		1		
							2		– SPOON REFUSAL
							2		– WATER LEVEL @ 2'-6"
5'									– TOO MUCH FILL & ROCK FOR FURTHER SPOON DRIVING

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #6 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR [signature] WEATHER _____

DATE STARTED 8/10/93 COMPLETED 8/10/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– TOO MUCH FILL & ROCK FOR SPOON DRIVING
									– COULDN'T AUGER PAST 4'-0"

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #7 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loftin WEATHER _____

DATE STARTED 8/8/93 COMPLETED 8/8/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'		8	6	7	5			5'	– SHOT ROCK & ASSORTED FILL (WET)
		4	5	3	2			7'	– SHOT ROCK & ASSORTED FILL (WET)
10'		4	1	3	2			9'	– SILT & ASSORTED FILL (WET)
		20	30	50				11'	– GRAY SILT W/ ROCK FRAGMENTS (WET)
15'								12'-6"	– SPOON REFUSAL
									– TOO MUCH FILL & ROCK FOR FURTHER SPOON DRIVING

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #8 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loftin WEATHER _____

DATE STARTED 8/8/93 COMPLETED 8/8/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– TOO MUCH FILL & ROCK FOR SPOON DRIVING
5'									– AUGERED TO 5'-6" BEFORE REFUSAL
10'									– BAD ORGANIC ODOR HIT W/ WATER @ 3'-0"

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #9 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loftin WEATHER _____

DATE STARTED 8/10/93 COMPLETED 8/10/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
					– TOO MUCH FILL & ROCK FOR SPOON DRIVING
5'					– AUGERED TO 5'-5" BEFORE REFUSAL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #10 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Travis Loftin WEATHER _____

DATE STARTED 8/11/93 COMPLETED 8/11/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6" 6"/12" 12"/18" 18"/24" N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		12 8	1		
		7 7	1		
		4 3	2	3'	– ASSORTED FILL & ROCK
		3 3	2		
5'		8 6	3	5'	– ASSORTED FILL & ROCK, SLIGHT CLAY (WE
		50	3	6'-6"	– ASSORTED FILL & ROCK, SLIGHT CLAY (WE
					– AUGERED TO 6'-6" BEFORE REFUSAL
10'					

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

A-131

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #11 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Steve Coffman WEATHER _____

DATE STARTED 8/8/93 COMPLETED 8/8/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									-TOO MUCH FILL & ROCK FOR SPOON DRIVING
5'									-WATER HIT @ 6'-6"
									-AUGERED TO BDR. @ 8'-6"
10'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #12 SOIL

PROJECT DUPONT - EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Steve Coffman WEATHER _____

DATE STARTED 8/8/93 COMPLETED 8/9/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									-TOO MUCH FILL & ROCK FOR SPOON DRIVING
5'									
10'									-AUGERED TO BDR. @ 10'-6"

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #13 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dave Lockhart WEATHER _____

DATE STARTED 8/8/93 COMPLETED 8/8/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
5'		2	1				1	5'	– BROWN SANDY SILT w/ ROCK FRAGMENTS
				3	4		1		– ASSORTED FILL & ROCK w/ SOME CLAY
		20	15					8'-6"	– AUGERED TO 8'-6" BEFORE REFUSAL
				50					
10'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #14 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR Dave Lockhart WEATHER _____

DATE STARTED 8/4/93 COMPLETED 8/4/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		9	3					2'	– ASSORTED FILL & ROCK w/ ORGANIC ODOR (DRY
				3	4				
		2	2					4'	– ASSORTED FILL & ROCK
				4	3				
5'		50						5'	– AUGERED TO BDR. @ 5'-0" BEFORE REFUSA

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #15 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR [signature] WEATHER _____

DATE STARTED 8/4/93 COMPLETED 8/4/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		10	14				1		
				15	50		1	3'	– SANDY CLAY w/ ROCK FRAGMENTS (MOIST)
		15	10				2		
				14	6		2	5'	– SANDY CLAY w/ ROCK FRAGMENTS (MOIST)
5'		20	20				3		
				50			3	7'-6"	– GRAY SANDY CLAY w/ ROCK FRAGMENTS (WET)
									– AUGERED TO 7'-6" BEFORE REFUSAL
10'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #16 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR [signature] WEATHER _____

DATE STARTED 8/10/93 COMPLETED 8/10/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – –WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		7	15					3'	– ASSORTED FILL & SHOT ROCK
				15	7			5'	– SAND & SILT AND ASSORTED FILL & ROCK
5'		19	50						– AUGERED TO 5'-0" BEFORE REFUSAL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #17 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 9/2/93 COMPLETED 9/2/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		4	4						
				4	8			2'	– BROWN SILT & CLAY (DRY)
		5	5						
				3	8			4'	– BROWN SILT & CLAY (DRY)
5'		5	4						
				5	6			6'	– BROWN SILT & CLAY (DRY)
		11	9						
				7	8			8'	– BROWN SILT W/ RED CLAY (WET)
		2	3						
10'				3	5			10'	– BROWN SILT W/ RED CLAY (WET)
		5	8						
				14	20			12'	– BROWN SILT & CLAY W/ ROCK FRAGMENTS (DRY)
		18	33						
				21	30			14'	– CLAY & ROCK FRAGMENTS (DRY)
15'		29	68						– AUGERED TO 15'-4" BEFORE REFUSAL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. #18 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR JAMES ANTHONY WEATHER _____

DATE STARTED 9/3/93 COMPLETED 9/3/93 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME

BELOW SURFACE – CASING OUT – -WELLPOINT AT

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	4"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
									– NO SAMPLE F/ 0'-5' (BAD FILL)
5'		3	2						
				6	8			7'	– SLIGHT SILT & CLAY AND ASSORTED FILL
		21	20						
				30	27			9'	– BROWN SILT & GRAY CLAY W/ ROCK FRAGMENTS
		50	50						
10'				50	50			11'	– GRAY CLAY (WET)
								12'-6"	– AUGERED TO 12'-6" BEFORE REFUSAL
15'									

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

CONOCO

PROJECT NO. ____ PAGE 1 OF 1 BORING NO. #19 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION ____ INSPECTOR JAMES ANTHONY WEATHER ____

DATE STARTED 8/3/93 COMPLETED 8/3/93 TECHNICIAN STEVE DYER

GROUND WATER BELOW SURFACE – CASING IN – AT COMPLETION / TIME ____

– CASING OUT – ____ -WELLPOINT AT ____

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
		13	6				1		
				13	4		1		
		8	4				2	3'	-ASSORTED FILL & ROCK
				10	50		2		
5'		4	5				3	5'	-ASSORTED FILL & ROCK
				5	6		3		
		13	3				4	7'	-ASSORTED FILL & ROCK
				2	3		4		
		6	5				5	9'	-SILTY CLAY W/ ROCK FRAGMENTS (WET)
10'				8	32		5	11'	-CLAY W/ ASSORTED FILL & ROCK (WET)
		50							-AUGERED TO 11'-6" BEFORE REFUSAL
15'									

NOTES: N = NO. OF BLOWS TO DRIVE ____ SPOON ____ WITH ____ LB. WT. ____

C = NO. OF BLOWS TO DRIVE ____ CASING ____ WITH ____ LB. WT. ____

CONOCO

PROJECT NO. ____ PAGE 1 OF 1 BORING NO. #20 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION ____ INSPECTOR JAMES ANTHONY WEATHER ____

DATE STARTED 8/3/93 COMPLETED 8/3/93 TECHNICIAN STEVE DYER

GROUND WATER BELOW SURFACE – CASING IN – AT COMPLETION / TIME ____

– CASING OUT – ____ -WELLPOINT AT ____

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
								3'	-BROWN CLAY W/ ROCK FRAGMENTS (MOIST)
5'								5'	-BROWN SILTY CLAY W/ ROCK FRAGMENTS (MOI:
									-AUGERED TO 5'-6" BEFORE REFUSAL
10'									

NOTES: N = NO. OF BLOWS TO DRIVE ____ SPOON ____ WITH ____ LB. WT. ____

C = NO. OF BLOWS TO DRIVE ____ CASING ____ WITH ____ LB. WT. ____

CONOCO

PROJECT NO. _____ PAGE 1 OF 1 BORING NO. # 21 SOIL

PROJECT DUPONT EXPLORATORY WELLS

CLIENT DUPONT

ELEVATION _____ INSPECTOR [illegible] WEATHER _____

DATE STARTED 9/4/83 COMPLETED 9/4/83 TECHNICIAN STEVE DYER

GROUND WATER – CASING IN – AT COMPLETION / TIME _____

BELOW SURFACE – CASING OUT – -WELLPOINT AT _____

DEPTH BELOW SURFACE	C	BLOWS ON SAMPLER 0"/6"	6"/12"	12"/18"	18"/24"	N	SAMPLE NO.	DEPTH OF SAMPLE	SOIL AND ROCK CLASSIFICATION REMARKS
								3'	-ASSORTED FILL w/ CLAY
5'								5'	-ASSORTED FILL w/ CLAY
								7'	- SILT & CLAY (MOIST)
10'								9'-6"	- SANDY SILT w/ ROCK FRAGMENTS
									-AUGERED TO 9'-6" BEFORE REFUSAL

NOTES: N = NO. OF BLOWS TO DRIVE _____ SPOON _____ WITH _____ LB. WT. _____
C = NO. OF BLOWS TO DRIVE _____ CASING _____ WITH _____ LB. WT. _____

Water Levels 1-22
Pump Tests 23-108
A Pit in V-2 B

APPENDIX

B

CORRECTED WATER LEVELS

AUGUST 1983, PUMP TEST
WELL 1D, CORRECTED WATER LEVELS FOR
TIME/DRAWDOWN DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[1] Correction	Corrected Water Depth	Δh
8/25/83	0900	0	17.37	0	17.37	0
8/25/83	0908	8	17.90	0	17.90	.53
8/25/83	0915	15	18.30	.01	18.29	.92
8/25/83	0922	22	18.70	.02	18.68	1.31
8/25/83	0932	32	18.80	.03	18.77	1.40
8/25/83	1337	277	19.65	.17	19.48	2.11
8/25/83	1527	387	19.80	.27	19.53	2.16
8/25/83	1644	464	19.90	.36	19.54	2.17
8/25/83	2107	727	20.35	.62	19.73	2.36
8/26/83	0450	1190	19.89	.37	19.52	2.15
8/26/83	0911	1451	19.68	.03	19.65	2.28
8/26/83	1244	1664	19.77	.14	19.63	2.26
8/26/83	1620	1880	19.93	.33	19.60	2.23

(1) Water depths corrected for river fluctuation using well hydrographs.

AUGUST 1983, RECOVERY TEST
WELL 1E, CORRECTED WATER LEVELS FOR
TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Level Elev.	River[1] Correction	Corrected Water Level Elev.	Δh
9/25/83	0855	-5	558.78	0	558.78	0
9/25/83	0902	2	558.78	0	558.78	0
9/25/83	0904	4	558.77	.01	558.78	0
9/25/83	0906	6	558.78	.009	558.79	0
9/25/83	0909	9	558.78	0	558.78	0
9/25/83	0915	15	558.73	.013	558.74	.04
9/25/83	0923	23	558.77	.017	558.79	-.01
9/25/83	0954	54	558.68	.041	558.72	.06
9/25/83	1017	77	558.62	.058	558.68	.10
9/25/83	1042	102	558.58	.074	558.65	.13
9/25/83	1336	276	558.18	.231	558.41	.37
9/25/83	1644	465	557.87	.512	558.38	.40
9/25/83	2103	723	557.44	.908	558.35	.43
9/26/83	0451	1191	557.67	.685	558.36	.42
9/26/83	0916	1452	557.97	.357	558.33	.45

(1) Water depths corrected for river fluctuation using well hydrographs

AUGUST 1983, PUMP TEST
WELL 1J, CORRECTED WATER LEVELS FOR
TIME/DRAWDOWN DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Level Elev.	River[(1)] Correction	Corrected Water Level Elev.	Δh
9/25/83	0850	-10	550.19	.160	550.35	—
9/25/83	0902	2	550.15	.158	550.31	0.04
9/25/83	0908	8	550.09	.156	550.25	0.1
9/25/83	0922	22	549.93	.154	550.08	0.27
9/25/83	0958	58	549.35	.125	549.48	0.87
9/25/83	1020	80	549.03	.108	549.38	0.97
9/25/83	1122	142	548.27	.025	598.25	2.10
9/25/83	1334	274	547.15	0	547.15	3.20
9/25/83	1647	467	546.06	0	546.06	4.29
9/25/83	2101	721	545.16	.025	545.19	5.16
9/26/83	0453	1193	544.74	.188	544.92	5.43
9/26/83	1624	1667	544.83	-.058	544.89	5.46

(1) Water depths corrected for river fluctuation using well hydrographs

OCTOBER 1983, RECOVERY TEST
WELL 2C, CORRECTED WATER LEVELS FOR
TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[(1)] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	17.45	0
10/17/83	0954	54	16.58	.05	16.53	.92
10/17/83	1013	73	16.20	.07	16.13	1.32
10/17/83	1042	102	15.72	.09	15.63	1.82
10/17/83	1115	135	15.25	.12	15.13	2.32
10/17/83	1150	170	14.93	.16	14.77	2.68
10/17/83	1220	200	14.66	.18	14.48	2.97
10/17/83	1714	494	15.6	.46	15.14	2.31
10/17/83	2039	699	15.85	.94	14.91	2.54

(1) River correction based on 917-1235, 10/18 water depth data for 900-1714, 10/17 data points, slope correction factor = 9.23×10^{-4}. For 2039 data point, slope correction factor based on 917-2011, 10/18 water depth data: factor = 1.35×10^{-3}.

AUGUST 1983, PUMP TEST
WELL 4C, CORRECTED WATER LEVELS FOR
TIME/DRAWDOWN DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Level Elev.	River[1] Correction	Corrected Water Level Elev.	Δh
8/25/83	0900	0	(558.77)	.188	558.958	0
8/25/83	0906	6	558.57	.217	558.787	0.171
8/25/83	0915	15	558.27	.229	558.499	0.459
8/25/83	0932	32	558.01	.254	558.264	0.694
8/25/83	1008	68	557.76	.308	558.068	0.890
8/25/83	1058	118	557.59	.383	557.973	0.985
8/25/83	1343	283	557.30	.616	557.916	1.042
8/25/83	1656	476	557.03	.717	557.747	1.211
8/26/83	0053	953	557.00	.775	557.725	1.233
8/26/83	1225	1645	557.32	.492	557.812	1.146

(1) Water depth corrected from river fluctuation using well hydrograph

OCTOBER 1983, RECOVERY TEST
WELL 5F, CORRECTED WATER LEVELS FOR
TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[1] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	17.75	0
10/17/83	0901	1	17.73	0	17.73	.02
10/17/83	0909	9	16.96	.01	16.95	0.80
10/17/83	0913	13	16.62	.02	16.60	1.15
10/17/83	0916	16	16.43	.02	16.41	1.34
10/17/83	0923	23	16.22	.03	16.19	1.56
10/17/83	0932	32	16.07	.04	16.03	1.72
10/17/83	0941	41	15.98	.06	15.92	1.83
10/17/83	0959	59	15.88	.08	15.80	1.95
10/17/83	1020	80	15.79	.11	15.68	2.07
10/17/83	1043	103	15.73	.14	15.59	2.16
10/17/83	1119	139	15.63	.19	15.44	2.31
10/17/83	1145	165	15.61	.22	15.39	2.36
10/17/83	1229	209	15.58	.28	15.30	2.45
10/17/83	1641	461	15.33	.62	14.71	3.04

(1) River correction based on 10/18-10/19 water depth data, the slope correction factor = 1.35×10^{-3}.

OCTOBER 1983, RECOVERY TEST
WELL 5D, CORRECTED WATER LEVELS FOR
TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[(1)] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	18.22	0
10/17/83	0903	3	18.09	0	18.09	0.13
10/17/83	0910	10	16.85	0	16.85	1.37
10/17/83	0914	14	16.10	.01	16.09	2.13
10/17/83	0917	17	15.80	.01	15.79	2.43
10/17/83	0924	24	15.42	.02	15.40	2.82
10/17/83	0933	33	15.18	.02	15.16	3.06
10/17/83	0942	42	15.06	.03	15.03	3.19
10/17/83	1000	60	14.91	.04	14.87	3.35
10/17/83	1021	81	14.74	.05	14.69	3.53
10/17/83	1044	104	14.66	.07	14.59	3.63
10/17/83	1120	140	14.52	.09	14.43	3.79
10/17/83	1146	166	14.47	.10	14.37	3.85

(1) River correction based on 0900-1200, 10/18 water depth data, the slope correction factor = 6.66×10^{-4}.

OCTOBER 1983, RECOVERY TEST
WELL 10D, CORRECTED WATER LEVELS FOR
TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[1] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	15.48	0
10/17/83	0920	20	15.84	.48	15.36	0.12
10/17/83	0941	41	15.75	.44	15.31	0.17
10/17/83	0952	52	15.70	.42	15.28	0.20
10/17/83	1008	68	15.66	.40	15.26	0.22
10/17/83	1053	113	15.53	.32	15.21	0.27
10/17/83	1106	126	15.49	.28	15.21	0.27
10/17/83	1132	152	15.42	.24	15.18	0.30
10/17/83	1155	175	15.38	.20	15.18	0.30
10/17/83	1216	196	15.33	.16	15.17	0.31
10/17/83	1740	520	13.49	.02	13.47	2.01
10/17/83	2058	718	13.65	.12	13.53	1.95
10/18/83	0092	942	13.93	.34	13.59	1.89
10/18/83	0432	1172	14.08	.62	13.46	2.02
10/18/83	0820	1400	14.02	.54	13.48	2.00
10/18/83	1150	1610	13.66	.20	13.46	2.02

(1) Water depths corrected for river fluctuation using 10/18-10/19 well data.

OCTOBER 1983, RECOVERY TEST
WELL 10F, CORRECTED WATER LEVELS FOR TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[(1)] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	9.230	0
10/17/83	0930	30	9.14	0.056	9.084	0.146
10/17/83	0943	43	9.06	0.040	9.020	0.210
10/17/83	0955	55	9.01	0.036	8.974	0.256
10/17/83	1010	70	8.99	0.048	8.942	0.288
10/17/83	1056	116	8.95	0.088	8.862	0.368
10/17/83	1133	153	8.93	0.128	8.802	0.428
10/17/83	1219	199	8.93	0.176	8.754	0.476
10/17/83	1747	527	9.19	0.624	8.566	0.664
10/17/83	2103	723	9.37	0.968	8.402	0.828
10/18/83	0816	1396	8.71	0.088	8.622	0.608
10/18/83	1153	1613	8.94	0.136	8.804	0.426

(1) Water depths corrected for river flucation using well hydrographs.

OCTOBER 1983, RECOVERY TEST
WELL 14C, CORRECTED WATER LEVELS FOR TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[1] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	17.59	0
10/17/83	1601	421	17.47	0	17.47	.12
10/17/83	2056	716	17.44	0	17.44	.15
10/18/83	0034	934	17.35	0	17.35	.24
10/18/83	0427	1167	17.30	0	17.30	.29
10/18/83	0825	1405	17.22	0	17.22	.37
10/18/83	1200	1620	17.13	0	17.13	.46
10/18/83	1630	1890	17.07	0	17.07	.52
10/18/83	1945	2085	17.01	0	17.01	.58
10/19/83	0004	2344	16.94	0	16.94	.65
10/19/83	0404	2584	16.89	0	16.89	.70
10/19/83	0839	2859	16.80	0	16.80	.79

(1) Water depth data suggest no significant river stage influence.

AUGUST 1983, PUMP TEST
WELL 15C, CORRECTED WATER LEVELS FOR
TIME/DRAWDOWN DATA PLOTS
DUPONT NIAGARA PLANT

Date	Time	Elapsed Time	Water Depth	River[(1)] Correction	Corrected Water Depth	Δh
8/25/83	0900	0	13.07	.002	13.068	0
8/25/83	0905	5	13.074	.004	13.070	.002
8/25/83	0910	10	13.095	.006	13.089	.021
8/25/83	0930	30	13.18	.013	13.167	.094
8/25/83	1013	73	13.30	.054	13.246	.178
8/25/83	1053	113	13.35	.100	13.250	.182
8/25/83	1047	287	13.449	.154	13.336	.268
8/25/83	1653	473	13.61	.229	13.381	.313
8/25/83	2123	743	13.86	.525	13.335	.267
8/26/83	0433	1173	13.56	.15	13.410	.342

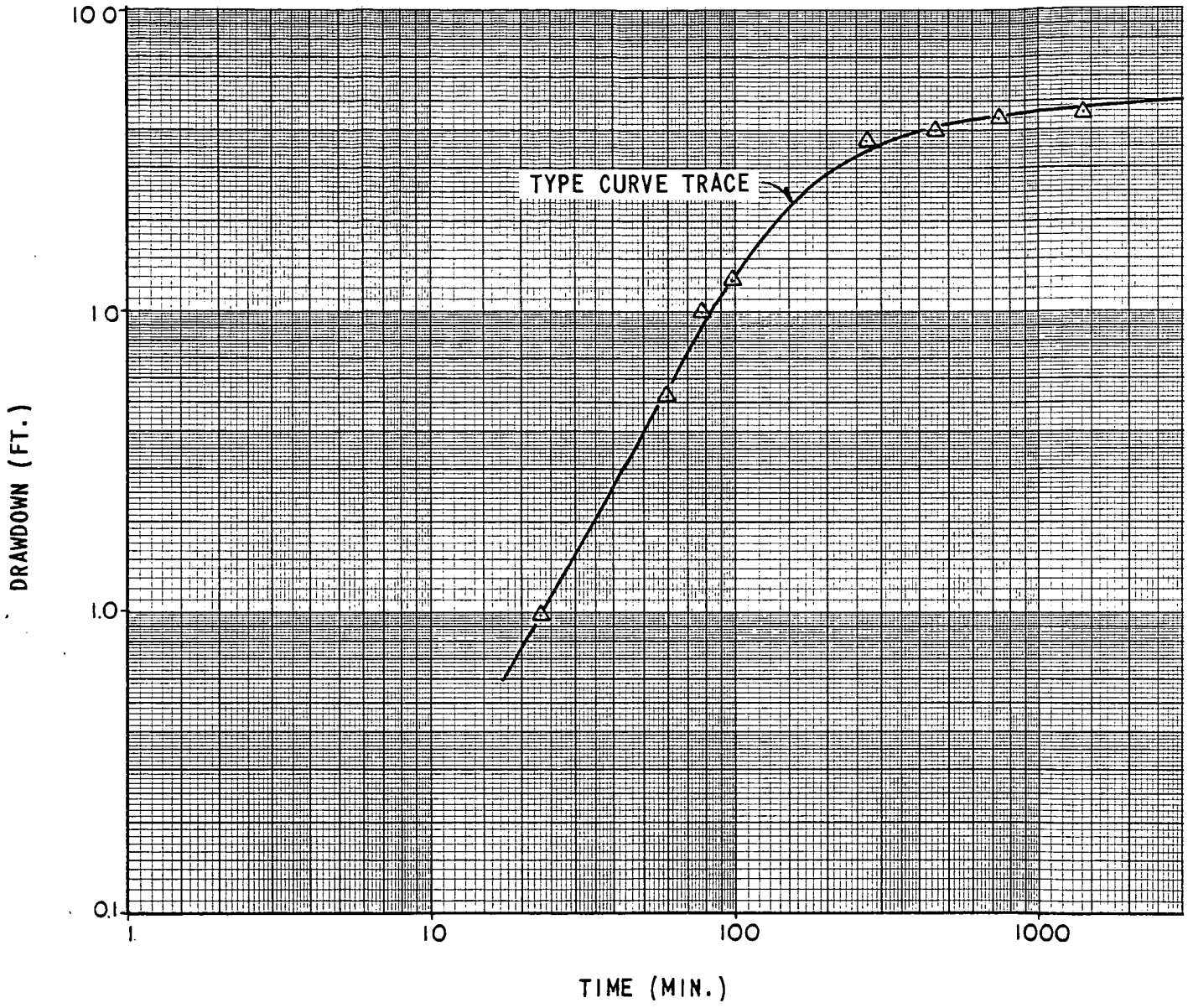
(1) Water depths connected for river fluctuation using well hydrographs

OCTOBER 1983, RECOVERY TEST
WELL 15 CD, CORRECTED WATER LEVELS FOR
TIME/RECOVERY DATA PLOTS
DUPONT NIAGARA PLANT

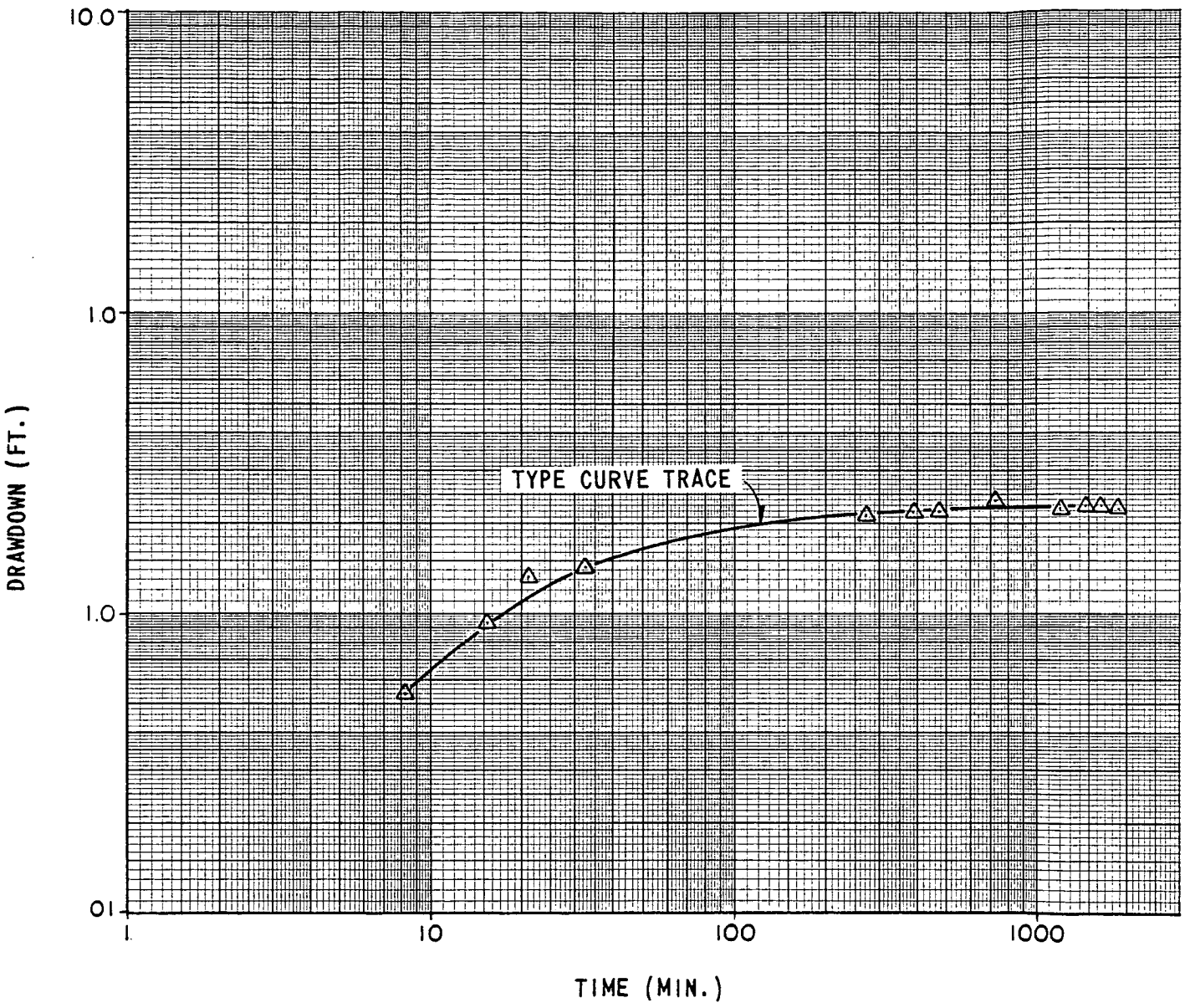
Date	Time	Elapsed Time	Water Depth	River[(1)] Correction	Corrected Water Depth	Δh
10/17/83	0900	0	—	—	21.62	—
10/17/83	0959	59	14.99	.08	14.91	6.71
10/17/83	1004	64	14.95	.08	14.87	6.75
10/17/83	1023	83	14.75	.10	14.65	6.97
10/17/83	1056	116	14.56	.16	14.40	7.22
10/17/83	1134	154	14.35	.18	14.17	7.45
10/17/83	1211	191	14.27	.24	14.03	7.59
10/17/83	1613	433	14.02	.54	13.48	8.14
10/17/83	2004	664	14.39	1.00	13.39	8.23
10/18/83	0047	947	13.91	.52	13.39	8.23
10/18/83	0444	1184	13.73	.28	13.45	8.17
10/18/83	0833	1413	13.52	.28	13.24	8.38
10/18/83	1203	1623	13.77	.12	13.65	7.97
10/18/83	1727	1947	14.14	.64	13.50	8.12
10/18/83	1951	2151	14.50	.94	13.56	8.06

(1) Water depths corrected for river fluctuation using 10/18-10/19 well data

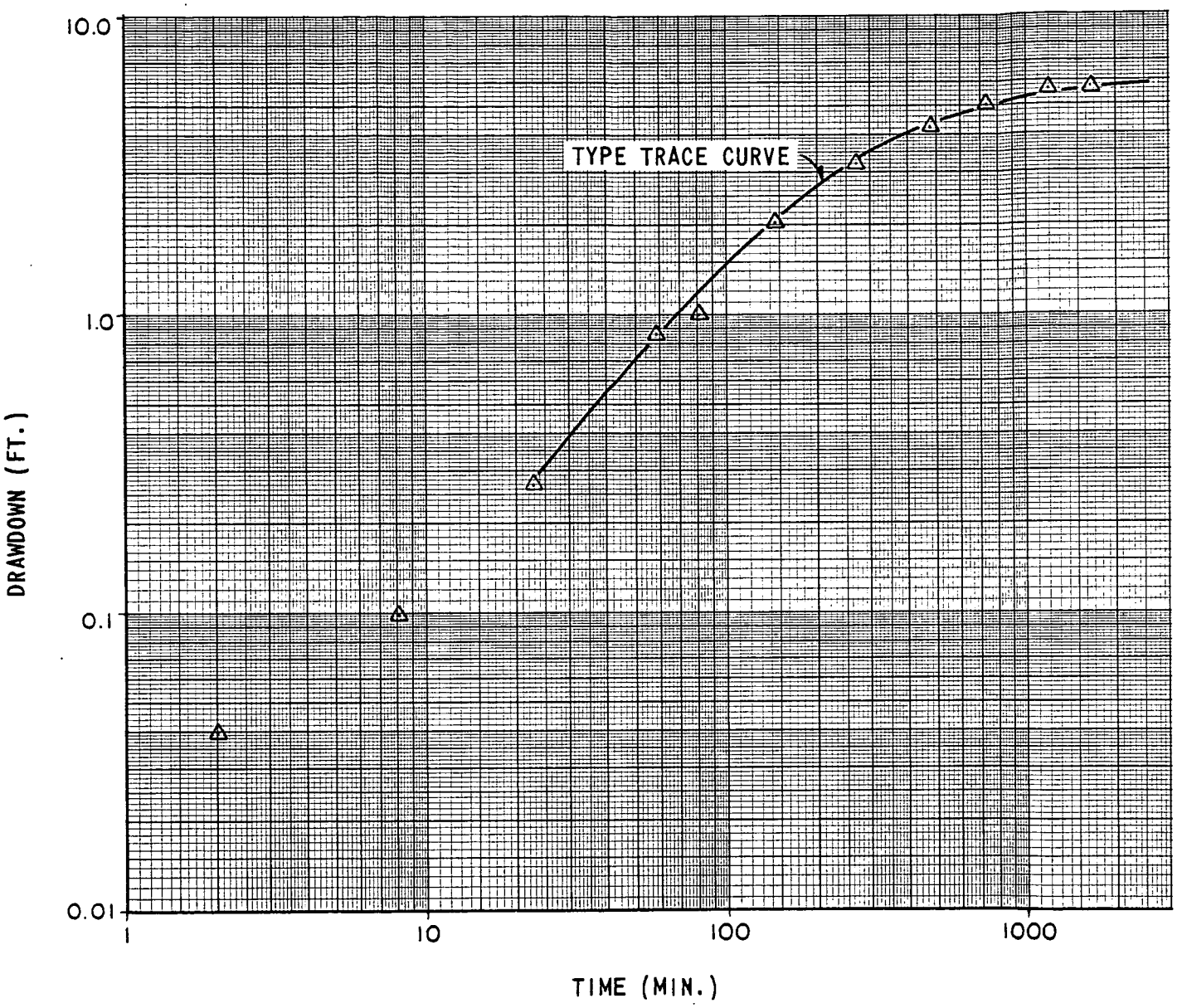
TIME-DRAWDOWN RECOVERY CURVE



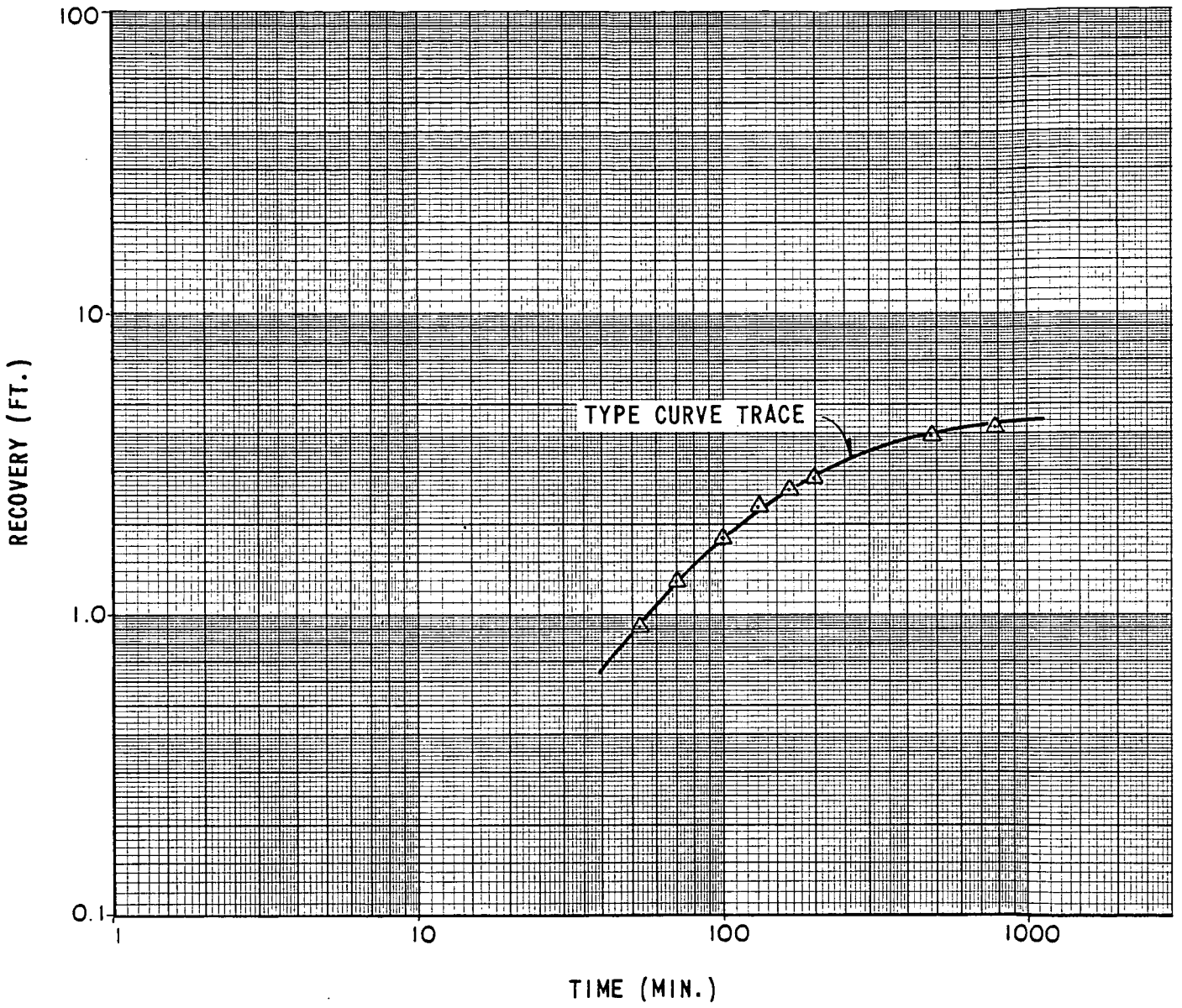
WELL 1E
TIME/DRAWDOWN CURVE
AUGUST 25, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



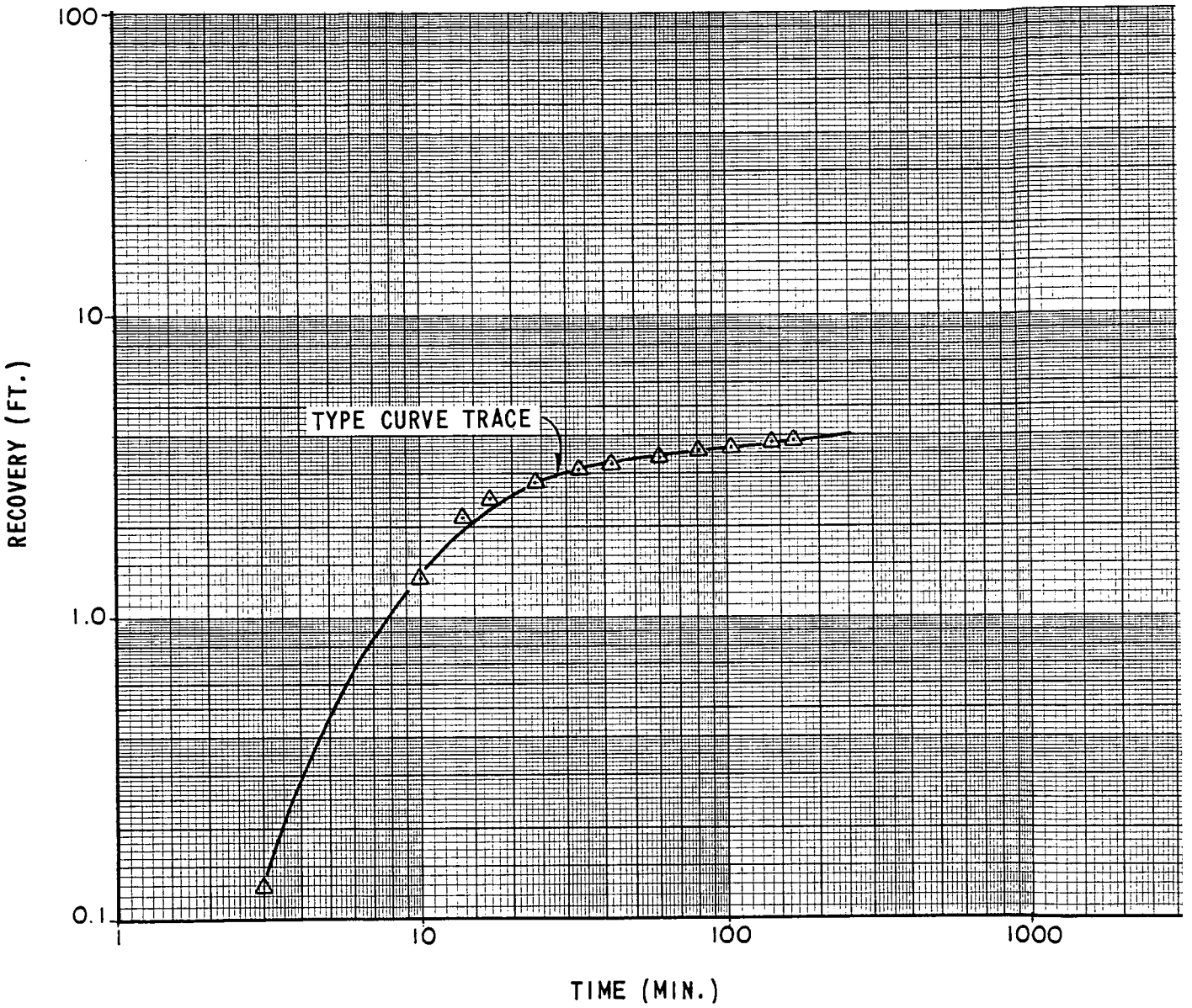
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AUGUST 25, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



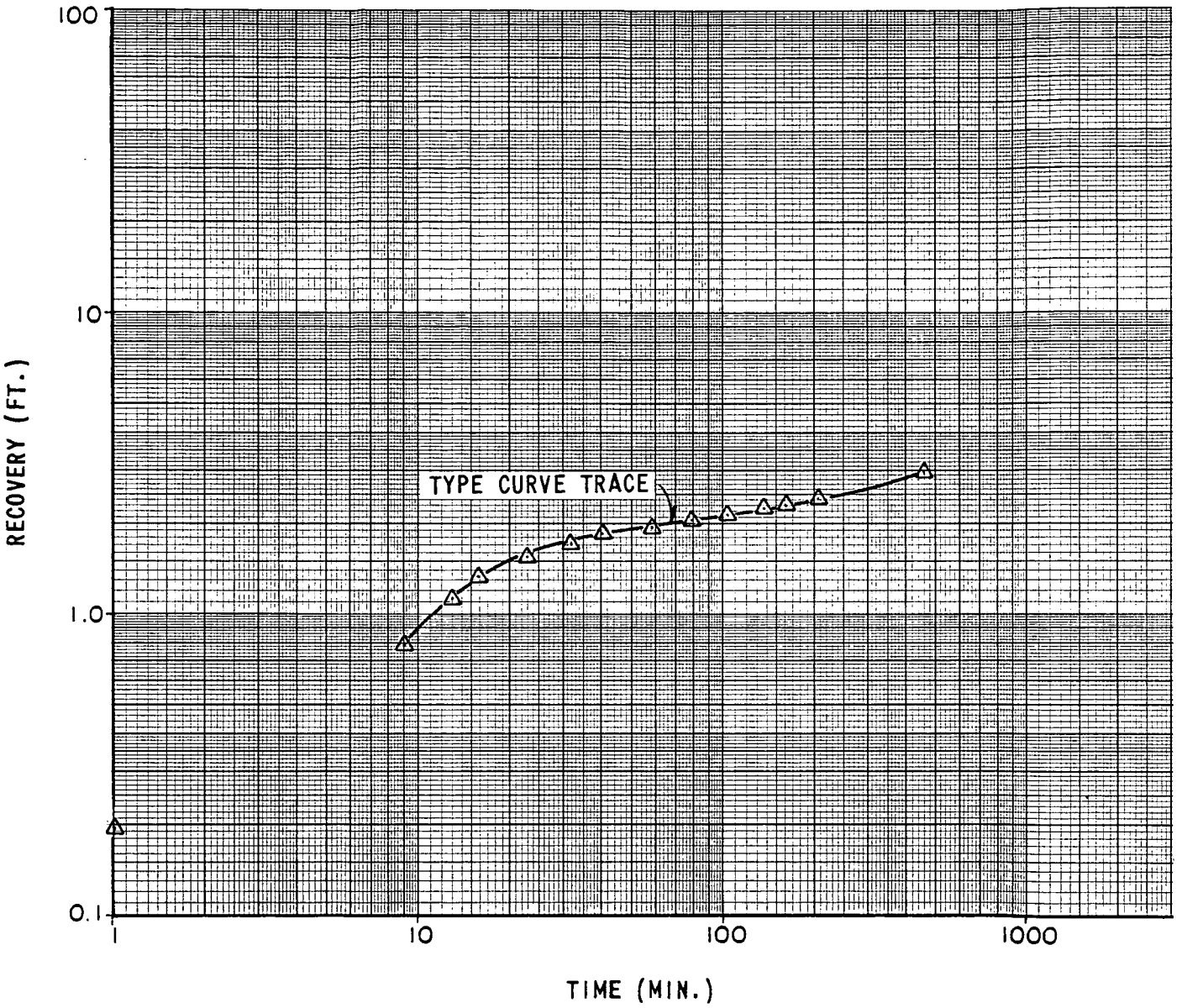
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TIME/DRAWDOWN CURVE
AUGUST 25, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



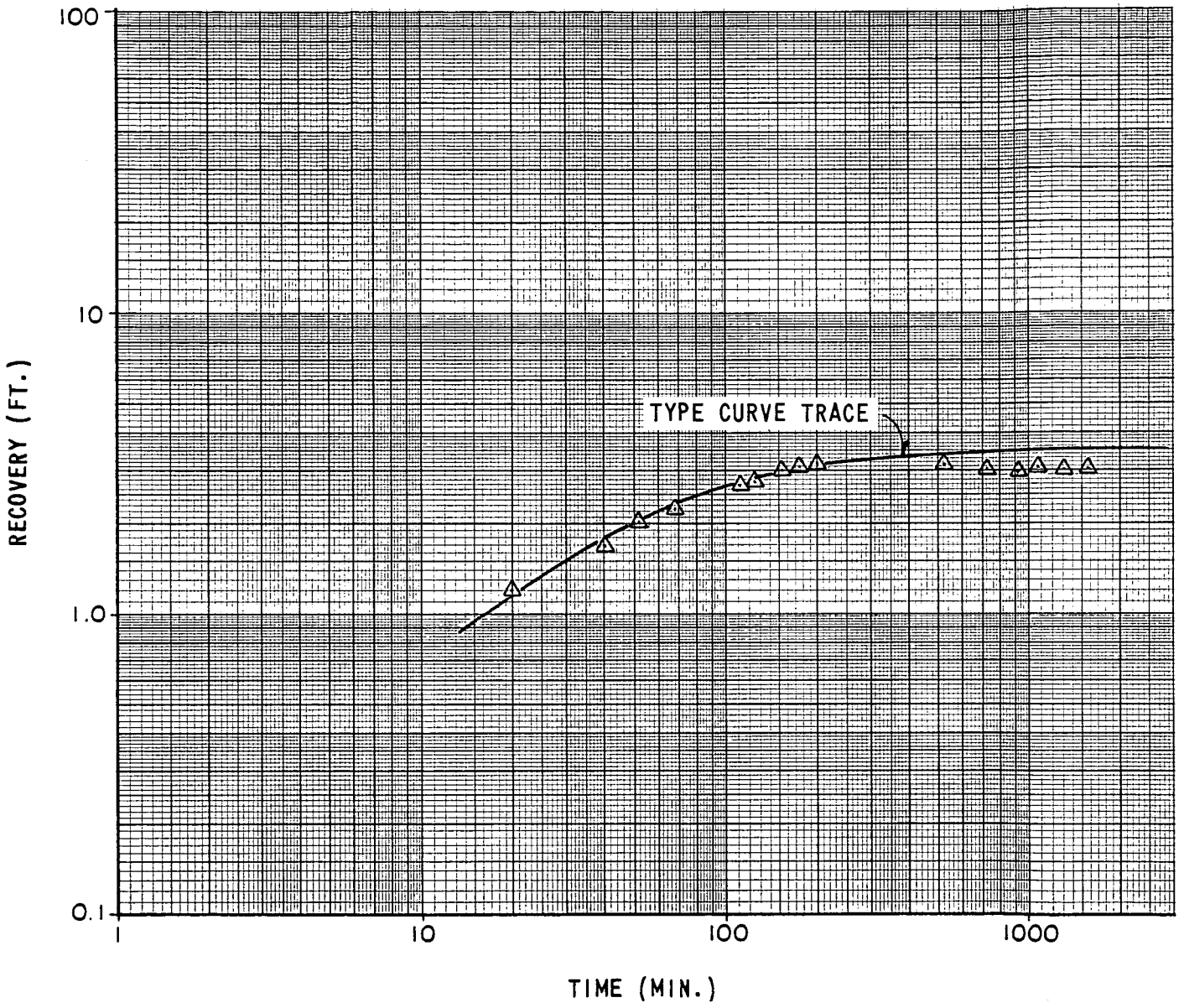
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TIME RECOVERY CURVE
OCTOBER 17, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



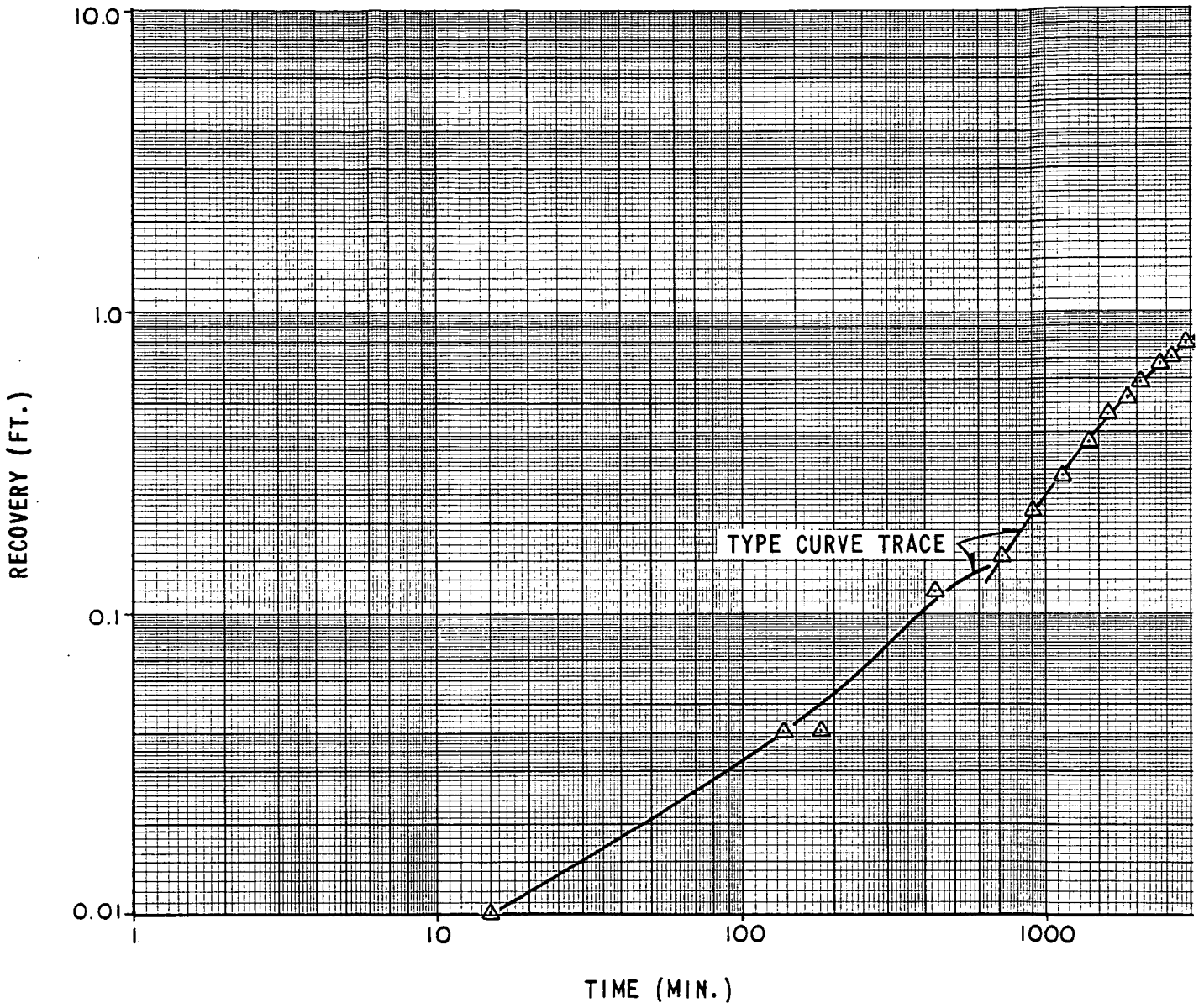
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TIME RECOVERY CURVE
OCTOBER 17, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



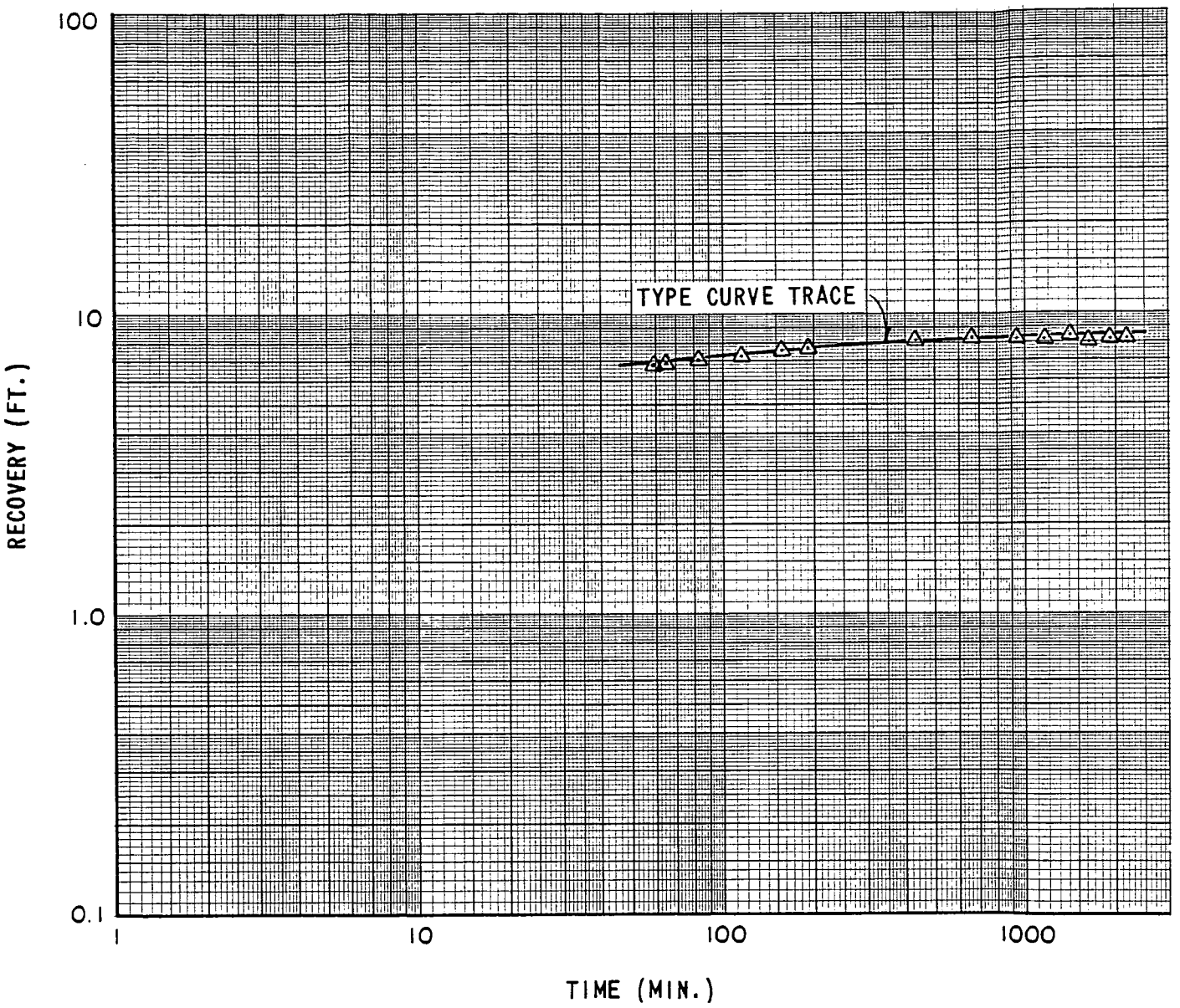
WELL 5F
TIME RECOVERY CURVE
OCTOBER 17, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



WELL 10D
TIME RECOVERY CURVE
OCTOBER 17, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



WELL 14C
TIME RECOVERY CURVE
OCTOBER 17, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.



WELL 15CD
TIME RECOVERY CURVE
OCTOBER 17, 1983 - RECOVERY TEST
NIAGARA PLANT
E. I. DUPONT DE NEMOURS & CO.

AUGUST 25, 1983 PUMP TEST
FIELD DATA

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1A
CASING ELEV- 572.43

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	9.47	562.76	.00
AUG	30	1354.00	-6	9.47	562.76	.00
AUG	30	1414.00	14	9.50	562.73	-.03
AUG	30	1418.00	18	9.50	562.73	-.03
AUG	30	1422.50	23	9.51	562.72	-.04
AUG	30	1455.00	55	9.51	562.72	-.04
AUG	30	1512.00	72	9.53	562.70	-.06
AUG	30	1554.00	114	9.58	562.65	-.11
AUG	30	1513.00	73	9.63	562.60	-.16
AUG	30	1755.00	235	9.75	562.48	-.28
AUG	30	1838.00	278	9.82	562.41	-.35
AUG	30	1941.00	341	9.98	562.25	-.51
AUG	30	2353.00	593	10.07	562.16	-.60
AUG	31	434.00	874	9.59	562.64	-.12
AUG	31	911.00	1151	9.26	562.97	.21
AUG	31	1224.00	1344	9.69	562.54	-.22
AUG	31	1550.00	1550	9.99	562.24	-.52
AUG	31	2019.00	1819	10.18	562.05	-.71
SEPT	1	19.00	2059	9.91	562.32	-.44
SEPT	1	417.00	2297	9.65	562.58	-.18
SEPT	1	755.00	2515	9.17	563.06	.30
SEPT	1	1250.00	2810	9.69	562.54	-.22

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1B
CASING ELEV- 571.61

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	10.45	560.96	.00
AUG	30	1353.00	-7	10.45	560.96	.00
AUG	30	1401.50	1.5	10.46	560.95	-.01
AUG	30	1404.50	4.5	10.47	560.94	-.02
AUG	30	1407.75	7.75	10.45	560.96	.00
AUG	30	1413.00	13	10.46	560.95	-.01
AUG	30	1423.00	23	10.48	560.93	-.03
AUG	30	1433.00	33	10.48	560.93	-.03
AUG	30	1443.00	43	10.48	560.93	-.03
AUG	30	1444.50	44.5	10.46	560.95	-.01
AUG	30	1513.00	73	10.44	560.97	.01
AUG	30	1533.00	93	10.51	560.90	-.06
AUG	30	1554.00	114	10.52	560.89	-.07
AUG	30	1613.50	133.5	10.55	560.86	-.10
AUG	30	1649.00	169	10.61	560.80	-.16
AUG	30	1752.00	232	10.71	560.70	-.26
AUG	30	1835.00	275	10.76	560.65	-.31
AUG	30	1937.00	337	10.95	560.46	-.50
AUG	30	2352.00	592	11.02	560.39	-.57
AUG	31	435.00	875	10.54	560.87	-.09
AUG	31	910.00	1150	10.19	561.22	.26
AUG	31	1225.00	1345	10.60	560.81	-.15
AUG	31	1548.00	1548	10.89	560.52	-.44
AUG	31	2020.00	1820	11.10	560.31	-.65
SEPT	1	18.00	2058	10.84	560.57	-.39
SEPT	1	418.00	2298	10.58	560.83	-.13
SEPT	1	754.00	2514	10.10	561.31	.35
SEPT	1	1248.00	2808	10.55	560.86	-.10

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1C
CASING ELEV- 573.07

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
START - RECOVERY						
AUG	30	1400.00	0	12.97	559.90	.00
AUG	30	1350.00	-10	12.97	559.90	.00
AUG	30	1403.50	3.5	12.97	559.90	.00
AUG	30	1406.50	6.5	12.94	559.93	.03
AUG	30	1409.50	9.5	12.98	559.89	-.01
AUG	30	1416.00	16	12.98	559.89	-.01
AUG	30	1420.00	20	12.98	559.89	-.01
AUG	30	1431.00	31	12.97	559.90	.00
AUG	30	1440.00	40	13.00	559.87	-.03
AUG	30	1452.00	52	12.99	559.88	-.02
AUG	30	1507.50	67.5	13.01	559.86	-.04
AUG	30	1530.00	90	13.01	559.86	-.04
AUG	30	1550.00	110	13.01	559.86	-.04
AUG	30	1611.00	131	13.02	559.85	-.05
AUG	30	1646.00	166	13.02	559.85	-.05
AUG	30	1756.00	236	13.06	559.81	-.09
AUG	30	1840.00	280	13.10	559.77	-.13
AUG	30	1943.00	343	13.14	559.73	-.17
AUG	30	2348.00	588	13.43	559.44	-.46
AUG	31	431.00	871	13.03	559.84	-.06
AUG	31	902.00	1142	12.56	560.31	.41
AUG	31	1220.00	1340	12.64	560.23	.33
AUG	31	1553.00	1553	12.95	559.92	.02
AUG	31	2024.00	1824	13.14	559.73	-.17
SEPT	1	22.00	2062	12.27	560.60	.70
SEPT	1	416.00	2296	12.94	559.93	.03
SEPT	1	757.00	2517	12.64	560.23	.33
SEPT	1	1243.00	2803	12.64	560.23	.33

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1D
CASING ELEV- 572.12

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	19.85	552.07	.00
AUG	30	1351.00	-9	19.85	552.07	.00
AUG	30	1402.00	2	19.75	552.17	.10
AUG	30	1406.00	6	19.53	552.39	.32
AUG	30	1408.17	8.17	19.34	552.58	.51
AUG	30	1411.50	11.5	19.18	552.74	.67
AUG	30	1416.00	16	18.93	552.99	.92
AUG	30	1420.50	20.5	18.78	553.14	1.07
AUG	30	1431.50	31.5	18.52	553.40	1.33
AUG	30	1441.00	41	18.40	553.52	1.45
AUG	30	1452.50	52.5	18.29	553.63	1.56
AUG	30	1510.00	70	18.21	553.71	1.64
AUG	30	1531.50	91.5	18.12	553.80	1.73
AUG	30	1551.00	111	18.07	553.85	1.78
AUG	30	1612.00	132	18.03	553.89	5.14
AUG	30	1647.00	167	18.01	553.91	1.84
AUG	30	1753.00	233	18.00	553.92	1.85
AUG	30	1839.00	279	18.01	553.91	1.84
AUG	30	1940.00	340	18.10	553.82	1.75
AUG	30	2349.00	589	18.07	553.85	1.78
AUG	31	431.00	871	17.66	554.26	2.19
AUG	31	903.00	1143	17.34	554.58	2.51
AUG	31	1221.00	1341	17.53	554.39	2.32
AUG	31	1552.00	1552	17.79	554.13	2.06
AUG	31	2022.00	1822	18.11	553.81	1.74
SEPT	1	21.00	2061	17.89	554.03	1.96
SEPT	1	416.00	2296	17.63	554.29	2.22
SEPT	1	756.00	2516	17.26	554.66	2.59
SEPT	1	1244.00	2804	17.66	554.26	2.19

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1E
CASING ELEV- 570.98

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	13.12	557.66	.00
AUG	30	1352.00	-8	13.12	557.66	.00
AUG	30	1402.25	2.25	13.18	557.60	-.06
AUG	30	1405.25	5.25	13.11	557.67	.01
AUG	30	1408.50	8.5	13.12	557.66	.00
AUG	30	1412.25	12.25	13.12	557.66	.00
AUG	30	1416.75	16.75	13.11	557.67	.01
AUG	30	1421.50	21.5	13.10	557.68	.02
AUG	30	1432.50	32.5	13.04	557.74	.08
AUG	30	1442.00	42	13.08	557.70	.04
AUG	30	1453.50	53.5	13.04	557.74	.08
AUG	30	1510.50	70.5	13.03	557.75	.09
AUG	30	1532.00	92	12.98	557.80	.14
AUG	30	1552.00	112	12.96	557.82	.16
AUG	30	1612.50	132.5	12.93	557.85	.19
AUG	30	1648.00	168	12.90	557.88	.22
AUG	30	1753.00	233	12.88	557.90	.24
AUG	30	1836.00	276	12.88	557.90	.24
AUG	30	1938.00	338	12.90	557.88	.22
AUG	30	2351.00	591	13.18	557.60	-.06
AUG	31	432.00	872	12.73	558.05	.39
AUG	31	903.00	1143	12.28	558.50	.84
AUG	31	1222.00	1342	12.38	558.40	.74
AUG	31	1551.00	1551	12.68	558.10	.44
AUG	31	2021.00	1821	12.93	557.85	.19
SEPT	1	20.00	2060	13.05	557.73	.07
SEPT	1	417.00	2297	12.70	558.08	.42
SEPT	1	752.00	2512	12.38	558.40	.74
SEPT	1	1246.00	2806	12.39	558.39	.73

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1J
CASING ELEV- 572.08

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	27.34	544.54	.00
AUG	30	1355.00	-5	27.34	544.54	.00
AUG	30	1401.00	1	27.32	544.56	.02
AUG	30	1404.00	4	27.30	544.58	.04
AUG	30	1407.25	7.25	27.26	544.62	.08
AUG	30	1410.50	10.5	27.21	544.67	.13
AUG	30	1415.50	15.5	27.12	544.76	.22
AUG	30	1418.75	18.75	27.03	544.85	.31
AUG	30	1424.50	24.5	26.91	544.97	.43
AUG	30	1434.00	34	26.75	545.13	.59
AUG	30	1444.00	44	26.59	545.29	.75
AUG	30	1457.50	57.5	26.39	545.49	.95
AUG	30	1514.00	74	26.15	545.73	1.19
AUG	30	1534.00	94	25.96	545.92	1.38
AUG	30	1554.30	114.5	25.65	546.23	1.69
AUG	30	1615.00	135	25.43	546.45	1.91
AUG	30	1649.50	169.5	25.11	546.77	2.23
AUG	30	1717.00	197	24.88	547.00	2.46
AUG	30	1750.00	230	24.61	547.27	2.73
AUG	30	1834.00	274	24.32	547.56	3.02
AUG	30	1936.00	336	23.95	547.93	3.39
AUG	30	2355.00	595	23.13	548.75	4.21
AUG	31	437.00	877	22.46	549.42	4.88
AUG	31	905.00	1145	21.97	549.91	5.37
AUG	31	1223.00	1343	21.83	550.05	5.51
AUG	31	1547.00	1547	21.83	550.05	5.51
AUG	31	2018.00	1818	22.09	549.79	5.25
SEPT	1	17.00	2057	22.23	549.65	5.11
SEPT	1	415.00	2295	22.05	549.83	5.29
SEPT	1	751.00	2511	21.90	549.98	5.44
SEPT	1	1242.00	2802	21.89	549.99	5.45

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 3B
CASING ELEV- 568.98

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	9.83	558.95	.00
AUG	30	1329.00	-31	9.63	559.95	.00
AUG	30	1401.00	1	9.86	558.92	-.03
AUG	30	1415.00	15	9.78	559.00	.05
AUG	30	1423.00	23	9.73	559.05	.10
AUG	30	1443.00	43	9.67	559.11	.16
AUG	30	1511.00	71	9.66	559.12	.17
AUG	30	1540.00	100	9.66	559.12	.17
AUG	30	1602.00	122	9.68	559.10	.15
AUG	30	1637.00	157	9.67	559.11	.16
AUG	30	1713.00	193	9.73	559.05	.10
AUG	30	1752.00	232	9.74	559.04	.09
AUG	30	1835.00	275	9.79	558.99	.04
AUG	30	1909.00	309	9.83	558.95	.00
AUG	30	1957.00	357	9.94	558.84	-.11
AUG	31	29.00	629	9.96	558.82	-.13
AUG	31	417.00	857	9.69	559.09	.14
AUG	31	941.00	1181	9.51	559.27	.32
AUG	31	1258.00	1378	9.75	559.03	.08
AUG	31	1623.00	1583	9.97	558.81	-.14
AUG	31	2016.00	1816	10.12	558.66	-.29
AUG	31	2356.00	2036	10.01	558.77	-.18
SEPT	1	448.00	2328	9.71	559.07	.12
SEPT	1	800.00	2520	9.55	559.23	.28
SEPT	1	1240.00	2800	9.77	559.01	.06

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 4B
CASING ELEV- 569.98

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
		START - RECOVERY				
AUG	30	1400.00	0	12.71	557.07	.00
AUG	30	1324.00	-36	12.71	557.07	.00
AUG	30	1404.00	4	12.61	557.17	.10
AUG	30	1413.00	13	12.28	557.50	.43
AUG	30	1418.00	18	12.16	557.62	.55
AUG	30	1420.00	20	12.12	557.66	.59
AUG	30	1427.00	27	12.03	557.75	.68
AUG	30	1437.00	37	11.91	557.87	.80
AUG	30	1455.00	55	11.86	557.92	.85
AUG	30	1507.00	67	11.82	557.96	.89
AUG	30	1518.00	78	11.81	557.97	.90
AUG	30	1532.00	92	11.78	558.00	.93
AUG	30	1606.00	126	11.79	557.99	.92
AUG	30	1630.00	150	11.77	558.01	.94
AUG	30	1717.00	197	11.83	557.95	.88
AUG	30	1748.00	228	11.84	557.94	.87
AUG	30	1841.00	281	11.89	557.89	.82
AUG	30	1906.00	306	11.92	557.86	.79
AUG	30	1944.00	344	12.07	557.71	.64
AUG	31	15.00	615	11.92	557.86	.79
AUG	31	415.00	855	11.41	558.37	1.30
AUG	31	857.00	1137	11.50	558.28	1.21
AUG	31	1215.00	1335	11.48	558.30	1.23
AUG	31	1620.00	1580	11.97	557.81	.74
AUG	31	2018.00	1818	12.16	557.62	.55
AUG	31	2352.00	2032	11.83	557.95	.88
SEPT	1	432.00	2312	11.34	558.44	1.37
SEPT	1	809.00	2529	11.05	558.73	1.66
SEPT	1	1225.00	2785	11.47	558.31	1.24

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 7B
CASING ELEV- 571.17

R E C O V E R Y

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	17.32	553.65	.00
AUG	30	1330.00	-30	17.32	553.65	.00
AUG	30	1410.00	10	17.29	553.68	.03
AUG	30	1421.00	21	17.29	553.68	.03
AUG	30	1508.00	68	17.26	553.71	.06
AUG	30	1523.00	83	17.23	553.74	.09
AUG	30	1554.00	114	17.21	553.76	.11
AUG	30	1620.00	140	17.21	553.76	.11
AUG	30	1646.00	166	17.20	553.77	.12
AUG	30	1717.00	197	17.18	553.79	.14
AUG	30	1901.00	301	17.15	553.82	.17
AUG	30	2004.00	364	17.15	553.82	.17
AUG	31	33.00	633	17.29	553.68	.03
AUG	31	357.00	837	17.37	553.60	-.05
AUG	31	957.00	1197	17.54	553.43	-.22
AUG	31	1249.00	1369	17.44	553.53	-.12
AUG	31	1504.00	1504	17.32	553.65	.00
AUG	31	2002.00	1802	17.15	553.82	.17
AUG	31	2340.00	2020	17.17	553.80	.15
SEPT	1	406.00	2286	17.37	553.60	-.05
SEPT	1	822.00	2542	17.57	553.40	-.25
SEPT	1	1335.00	2855	17.40	553.57	-.08

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 8B
CASING ELEV- 568.02

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	6.03	561.79	.00
AUG	30	1327.00	-33	6.03	561.79	.00
AUG	30	1406.00	6	6.09	561.73	-.06
AUG	30	1417.00	17	6.10	561.72	-.07
AUG	30	1440.00	40	6.09	561.73	-.06
AUG	30	1455.00	55	6.11	561.71	-.08
AUG	30	1521.00	81	6.13	561.69	-.10
AUG	30	1548.00	108	6.18	561.64	-.15
AUG	30	1617.00	137	6.22	561.60	-.19
AUG	30	1640.00	160	6.25	561.57	-.22
AUG	30	1710.00	190	6.32	561.50	-.29
AUG	30	1744.00	224	6.35	561.46	-.33
AUG	30	1855.00	295	6.45	561.37	-.42
AUG	30	1956.00	356	6.76	561.06	-.73
AUG	31	4.00	604	6.78	561.04	-.75
AUG	31	426.00	866	6.28	561.54	-.25
AUG	31	925.00	1165	5.87	561.95	.16
AUG	31	1233.00	1353	6.34	561.48	-.31
AUG	31	1601.00	1561	6.61	561.21	-.58
AUG	31	2030.00	1830	6.91	560.91	-.88
SEPT	1	4.00	2044	6.62	561.20	-.59
SEPT	1	456.00	2336	6.26	561.56	-.23
SEPT	1	825.00	2545	5.85	561.97	.18
SEPT	1	1311.00	2831	6.27	561.55	-.24

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10C
CASING ELEV- 570.58

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	12.81	557.57	.00
AUG	30	1345.00	-15	12.81	557.57	.00
AUG	30	1403.00	3	12.80	557.58	.01
AUG	30	1415.00	15	12.78	557.60	.03
AUG	30	1435.00	35	12.78	557.60	.03
AUG	30	1449.00	49	12.79	557.59	.02
AUG	30	1516.00	76	12.79	557.59	.02
AUG	30	1545.00	105	12.79	557.59	.02
AUG	30	1610.00	130	12.78	557.60	.03
AUG	30	1636.00	156	12.79	557.59	.02
AUG	30	1703.00	183	12.78	557.60	.03
AUG	30	1739.00	219	12.79	557.59	.02
AUG	30	1851.00	291	12.79	557.59	.02
AUG	30	1951.00	351	12.79	557.59	.02
AUG	30	2400.00	600	12.81	557.57	.00
AUG	31	423.00	863	12.80	557.58	.01
AUG	31	921.00	1161	12.79	557.59	.02
AUG	31	1230.00	1350	12.82	557.56	-.01
AUG	31	1559.00	1559	12.86	557.52	-.05
AUG	31	2027.00	1827	12.86	557.52	-.05
SEPT	1	2.00	2042	12.82	557.56	-.01
SEPT	1	452.00	2332	12.78	557.60	.03
SEPT	1	830.00	2550	12.78	557.60	.03
SEPT	1	1307.00	2827	12.78	557.60	.03

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 12B
CASING ELEV- 572.14

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	12.30	559.64	.00
AUG	30	1351.00	-9	12.30	559.64	.00
AUG	30	1359.00	-1	12.30	559.64	.00
AUG	30	1401.00	1	12.29	559.65	.01
AUG	30	1413.00	13	12.30	559.64	.00
AUG	30	1433.00	33	12.31	559.63	-.01
AUG	30	1445.00	45	12.31	559.63	-.01
AUG	30	1513.00	73	12.31	559.63	-.01
AUG	30	1543.00	103	12.34	559.60	-.04
AUG	30	1605.00	125	12.35	559.59	-.05
AUG	30	1634.00	154	12.39	559.55	-.09
AUG	30	1658.00	178	12.41	559.53	-.11
AUG	30	1734.00	214	12.43	559.51	-.13
AUG	30	1844.00	284	12.49	559.45	-.19
AUG	30	1947.00	347	12.61	559.33	-.31
AUG	30	2358.00	598	12.61	559.33	-.31
AUG	31	420.00	860	12.41	559.53	-.11
AUG	31	917.00	1157	12.19	559.75	.11
AUG	31	1224.00	1344	12.40	559.54	-.10
AUG	31	1557.00	1557	12.57	559.37	-.27
AUG	31	2026.00	1826	12.72	559.22	-.42
AUG	31	2359.00	2039	12.60	559.34	-.30
SEPT	1	449.00	2329	12.39	559.55	-.09
SEPT	1	832.00	2552	12.19	559.75	.11
SEPT	1	1302.00	2822	12.35	559.59	-.05

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 16B
CASING ELEV- 572.90

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	14.36	558.34	.00
AUG	30	1407.00	7	14.36	558.34	.00
AUG	30	1413.00	13	14.32	558.38	.04
AUG	30	1419.00	19	14.30	558.40	.06
AUG	30	1425.00	25	14.28	558.42	.08
AUG	30	1433.00	33	14.26	558.44	.10
AUG	30	1438.00	38	14.23	558.47	.13
AUG	30	1446.00	46	14.23	558.47	.13
AUG	30	1453.00	53	14.21	558.49	.15
AUG	30	1500.00	60	14.21	558.49	.15
AUG	30	1515.00	75	14.20	558.50	.16
AUG	30	1529.00	89	14.20	558.50	.16
AUG	30	1547.00	107	14.18	558.52	.18
AUG	30	1600.00	120	14.09	558.61	.27
AUG	30	1615.00	135	14.20	558.50	.16
AUG	30	1630.00	150	14.21	558.49	.15
AUG	30	1645.00	165	14.21	558.49	.15
AUG	30	1732.00	212	14.32	558.38	.04
AUG	30	1853.00	293	14.29	558.41	.07
AUG	30	1940.00	340	14.37	558.33	-.01
AUG	31	9.00	609	14.43	558.27	-.07
AUG	31	406.00	846	14.31	558.39	.05
AUG	31	938.00	1178	14.07	558.63	.29
AUG	31	1238.00	1359	14.21	558.49	.15
AUG	31	1628.00	1588	14.44	558.26	-.08
AUG	31	2034.00	1834	14.68	558.02	-.32
SEPT	1	13.00	2053	14.49	558.21	-.13
SEPT	1	505.00	2345	14.33	558.37	.03
SEPT	1	803.00	2523	14.12	558.58	.24
SEPT	1	1328.00	2848	14.23	558.47	.13

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 17B
CASING ELEV- 568.93

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - RECOVERY					
AUG	30	1400.00	0	21.21	547.52	.00
AUG	30	1339.00	-21	21.21	547.52	.00
AUG	30	1427.00	27	21.23	547.50	-.02
AUG	30	1503.00	63	21.22	547.51	-.01
AUG	30	1531.00	91	21.19	547.54	.02
AUG	30	1559.00	119	21.20	547.53	.01
AUG	30	1628.00	148	21.23	547.50	-.02
AUG	30	1652.00	172	21.22	547.51	-.01
AUG	30	1724.00	204	21.20	547.53	.01
AUG	30	1908.00	308	21.18	547.55	.03
AUG	30	2010.00	370	21.27	547.46	-.06
AUG	31	38.00	638	21.68	547.05	-.47
AUG	31	402.00	842	21.89	546.84	-.68
AUG	31	959.00	1199	21.58	547.15	-.37
AUG	31	1154.00	1314	21.40	547.33	-.19
AUG	31	1607.00	1567	21.03	547.70	.18
AUG	31	2005.00	1805	21.06	547.67	.15
AUG	31	2345.00	2025	21.51	547.22	-.30
SEPT	1	404.00	2284	21.75	546.98	-.54
SEPT	1	817.00	2537	21.80	546.93	-.59
SEPT	1	1340.00	2860	21.30	547.43	-.09

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 19B
CASING ELEV- 573.26

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
		START - RECOVERY				
AUG	30	1400.00	0	15.67	557.39	.00
AUG	30	1352.00	-8	15.67	557.39	.00
AUG	30	1407.00	7	15.54	557.52	.13
AUG	30	1416.00	16	15.47	557.59	.20
AUG	30	1422.00	22	15.45	557.61	.22
AUG	30	1428.00	28	15.43	557.63	.24
AUG	30	1436.00	36	15.40	557.66	.27
AUG	30	1442.00	42	15.38	557.68	.29
AUG	30	1450.00	50	15.37	557.69	.30
AUG	30	1456.00	56	15.37	557.69	.30
AUG	30	1503.00	63	15.36	557.70	.31
AUG	30	1518.00	78	15.35	557.71	.32
AUG	30	1533.00	93	15.34	557.72	.33
AUG	30	1550.00	110	15.33	557.73	.34
AUG	30	1606.00	126	15.34	557.72	.33
AUG	30	1618.00	138	15.34	557.72	.33
AUG	30	1633.00	153	15.34	557.72	.33
AUG	30	1648.00	168	15.36	557.70	.31
AUG	30	1737.00	217	15.37	557.69	.30
AUG	30	1858.00	298	15.42	557.64	.25
AUG	30	1932.00	332	15.47	557.59	.20
AUG	31	43.00	643	15.53	557.53	.14
AUG	31	351.00	831	15.45	557.61	.22
AUG	31	947.00	1187	15.25	557.81	.42
AUG	31	1243.00	1363	15.63	557.43	.04
AUG	31	1613.00	1573	15.62	557.44	.05
AUG	31	1952.00	1792	15.78	557.28	-.11
AUG	31	2336.00	2016	15.69	557.37	-.02
SEPT	1	411.00	2291	15.51	557.55	.16
SEPT	1	812.00	2532	15.40	557.66	.27
SEPT	1	1331.00	2851	15.56	557.50	.11

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1A
CASING ELEV- 572.43

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	9.29	562.94	.00
AUG	25	854.00	-6.00	9.29	562.94	.00
AUG	25	911.00	11.00	9.31	562.92	-.02
AUG	25	1124.00	144.00	9.39	562.84	-.10
AUG	25	1205.50	185.50	9.42	562.81	-.13
AUG	25	1338.50	278.50	9.57	562.66	-.28
AUG	25	1529.00	389.00	9.66	562.57	-.37
AUG	25	1646.00	466.00	9.72	562.51	-.43
AUG	26	23.00	923.00	9.81	562.42	-.52
AUG	26	915.00	1455.00	9.25	562.98	.04
AUG	26	1248.00	1668.00	9.39	562.84	-.10
AUG	26	1623.00	1883.00	9.65	562.58	-.36
AUG	26	2056.00	2156.00	10.15	562.08	-.86
AUG	27	106.00	2406.00	9.74	562.49	-.45
AUG	27	451.00	2631.00	9.52	562.71	-.23
AUG	27	845.00	2865.00	9.17	563.06	.12
AUG	27	1218.00	3078.00	9.29	562.94	.00
AUG	27	1552.00	3292.00	9.70	562.53	-.41
AUG	27	2053.00	3593.00	9.92	562.31	-.63
AUG	28	3.00	3783.00	9.64	562.59	-.35
AUG	28	443.00	4063.00	9.48	562.75	-.19
AUG	28	812.00	4272.00	9.14	563.09	.15
AUG	28	1249.00	4549.00	9.51	562.72	-.22
AUG	28	1622.00	4762.00	9.67	562.55	-.38
AUG	28	2102.00	5042.00	10.20	562.03	-.91
AUG	29	5.00	5225.00	9.82	562.41	-.53
AUG	29	431.00	5491.00	9.52	562.71	-.23
AUG	29	908.00	5768.00	9.30	562.93	-.01
AUG	29	1312.00	6012.00	9.58	562.65	-.29
AUG	29	1506.00	6126.00	9.72	562.51	-.43
AUG	29	2131.00	6511.00	10.31	561.92	-1.02
AUG	30	329.00	6869.00	9.57	562.66	-.28
AUG	30	858.00	7198.00	9.27	562.96	.02
AUG	30	1148.00	7368.00	9.33	562.90	-.04

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1B
CASING ELEV- 571.61

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	10.13	561.28	.00
AUG	25	851.00	-9.00	10.13	561.28	.00
AUG	25	902.00	2.00	10.17	561.24	-.04
AUG	25	904.25	4.25	10.16	561.25	-.03
AUG	25	906.00	6.00	10.16	561.25	-.03
AUG	25	910.00	10.00	10.18	561.23	-.05
AUG	25	915.00	15.00	10.18	561.23	-.05
AUG	25	919.00	19.00	10.16	561.25	-.03
AUG	25	923.50	23.50	10.17	561.24	-.04
AUG	25	955.00	55.00	10.21	561.20	-.08
AUG	25	1019.00	79.00	10.26	561.15	-.13
AUG	25	1042.50	102.50	10.25	561.16	-.12
AUG	25	1121.00	141.00	10.27	561.14	-.14
AUG	25	1206.50	186.50	10.31	561.10	-.18
AUG	25	1335.00	275.00	10.42	560.99	-.29
AUG	25	1530.00	390.00	10.54	560.87	-.41
AUG	25	1645.00	465.00	10.60	560.81	-.47
AUG	25	2105.00	725.00	11.07	560.34	-.94
AUG	26	25.00	925.00	10.84	560.57	-.71
AUG	26	452.00	1192.00	10.47	560.94	-.34
AUG	26	913.00	1453.00	10.17	561.24	-.04
AUG	26	1246.00	1666.00	10.32	561.09	-.19
AUG	26	1622.00	1882.00	10.57	560.84	-.44
AUG	26	2054.00	2154.00	11.08	560.33	-.95
AUG	27	103.00	2403.00	10.70	560.71	-.57
AUG	27	453.00	2633.00	10.49	560.92	.59
AUG	27	844.00	2864.00	10.08	561.33	.62
AUG	27	1217.00	3077.00	10.20	561.21	.50
AUG	27	1553.00	3293.00	10.59	560.82	.11
AUG	27	2052.00	3592.00	10.41	561.00	.29
AUG	28	5.00	3785.00	10.62	560.79	.08
AUG	28	441.00	4061.00	10.45	560.96	.25
AUG	28	813.00	4273.00	10.16	561.25	.54
AUG	28	1248.00	4548.00	10.48	560.93	.22
AUG	28	1620.00	4760.00	10.65	560.76	.05
AUG	28	2101.00	5041.00	11.16	560.25	-.46
AUG	29	3.00	5223.00	10.83	560.58	-.13
AUG	29	432.00	5492.00	10.53	560.88	.17
AUG	29	907.00	5767.00	10.29	561.12	.41
AUG	29	1313.00	6013.00	10.62	560.79	.08
AUG	29	1504.00	6124.00	10.71	560.70	-.01
AUG	29	2132.00	6512.00	11.30	560.11	-.60
AUG	30	328.00	6868.00	10.55	560.86	.15
AUG	30	858.00	7198.00	10.24	561.17	.46
AUG	30	1148.00	7368.00	10.34	561.07	.36

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1C
CASING ELEV- 573.07

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	12.43	560.44	.00
AUG	25	853.25	-6.75	12.43	560.44	.00
AUS	25	901.67	1.67	12.51	560.36	-.08
AUG	25	902.75	2.75	12.52	560.35	-.09
AUG	25	904.75	4.75	12.47	560.40	-.04
AUG	25	906.50	6.50	12.49	560.38	-.06
AUG	25	909.00	9.00	12.49	560.38	-.06
AUG	25	910.50	10.50	12.45	560.42	-.02
AUG	25	913.50	13.50	12.45	560.42	-.02
AUS	25	920.50	20.50	12.43	560.44	.00
AUG	25	926.00	26.00	12.42	560.45	.01
AUS	25	941.50	41.50	12.41	560.46	.02
AUS	25	952.50	52.50	12.43	560.44	.00
AUS	25	1016.00	76.00	12.42	560.45	.01
AUG	25	1040.00	100.00	12.45	560.42	-.02
AUG	25	1118.50	138.50	12.48	560.39	-.05
AUS	25	1203.00	183.00	12.53	560.34	-.10
AUG	25	1338.00	278.00	12.67	560.20	-.24
AUG	25	1526.00	386.00	12.83	560.04	-.40
AUG	25	1643.00	463.00	12.92	559.95	-.49
AUS	25	2108.00	728.00	13.32	559.55	-.89
AUG	26	18.00	918.00	13.45	559.42	-1.02
AUG	26	449.00	1189.00	13.17	559.70	-.74
AUG	26	910.00	1450.00	12.81	560.06	-.38
AUG	26	1243.00	1663.00	12.89	559.98	-.46
AUG	26	1619.00	1879.00	13.04	559.83	-.61
AUG	26	2048.00	2148.00	13.31	559.56	-.88
AUG	27	105.00	2405.00	13.43	559.44	-1.00
AUG	27	839.00	2859.00	12.83	560.04	-.40
AUG	27	1211.00	3071.00	12.79	560.08	-.36
AUG	27	1556.00	3296.00	13.06	559.81	-.63
AUG	27	2057.00	3597.00	13.15	559.72	-.72
AUG	28	1.00	3781.00	13.30	559.57	-.87
AUG	28	437.00	4057.00	13.11	559.76	-.68
AUG	28	809.00	4269.00	12.93	559.94	-.50
AUG	28	1245.00	4545.00	12.95	559.92	-.52
AUG	28	1617.00	4757.00	13.14	559.73	-.71
AUG	28	2057.00	5037.00	13.50	559.37	-1.07
AUG	28	2400.00	5220.00	14.63	558.24	-2.20
AUG	29	428.00	5488.00	13.28	559.59	-.85
AUG	29	904.00	5764.00	12.98	559.89	-.55
AUG	29	1308.00	6008.00	13.30	559.57	-.87
AUG	29	1502.00	6122.00	13.19	559.68	-.76
AUG	29	2128.00	6508.00	13.60	559.27	-1.17
AUG	30	321.00	6861.00	13.32	559.55	-.89
AUG	30	1145.00	7365.00	12.92	559.95	-.49

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1D
CASING ELEV- 572.12

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	17.37	554.55	.00
AUG	25	852.00	-8.00	17.31	554.61	.06
AUG	25	900.00	.00	17.37	554.55	.00
AUG	25	901.00	1.00	17.42	554.50	-.05
AUG	25	902.75	2.75	17.52	554.40	-.15
AUG	25	905.75	5.75	17.70	554.22	-.33
AUG	25	908.25	8.25	17.90	554.02	-.53
AUG	25	912.00	12.00	18.17	553.75	-.80
AUG	25	915.17	15.17	18.30	553.62	-.93
AUG	25	917.00	17.00	18.36	553.56	-.99
AUG	25	922.00	22.00	18.70	553.22	-1.33
AUG	25	932.00	32.00	18.80	553.12	-1.43
AUG	25	953.50	53.50	19.07	552.85	-1.70
AUG	25	1016.50	76.50	19.20	552.72	-1.83
AUG	25	1041.25	101.25	19.28	552.64	-1.91
AUG	25	1119.50	139.50	19.39	552.53	-2.02
AUG	25	1204.00	184.00	19.48	552.44	-2.11
AUG	25	1337.00	277.00	19.65	552.27	-2.28
AUG	25	1527.00	387.00	19.80	552.12	-2.43
AUG	25	1644.00	464.00	19.90	552.02	-2.53
AUG	25	2107.00	727.00	20.35	551.57	-2.98
AUG	26	20.00	920.00	20.11	551.81	-2.74
AUG	26	450.00	1190.00	19.89	552.03	-2.52
AUG	26	911.00	1451.00	19.68	552.24	-2.31
AUG	26	1244.00	1664.00	19.77	552.15	-2.40
AUG	26	1620.00	1880.00	19.93	551.99	-2.56
AUG	26	2051.00	2151.00	20.32	551.60	-2.95
AUG	27	104.00	2404.00	20.03	551.89	-2.66
AUG	27	450.00	2630.00	19.86	552.06	-2.49
AUG	27	840.00	2860.00	19.57	552.35	-2.20
AUG	27	1213.00	3073.00	19.71	552.21	-2.34
AUG	27	1555.00	3295.00	20.03	551.89	-2.66
AUG	27	2056.00	3596.00	19.75	552.17	-2.38
AUG	28	1.00	3781.00	19.84	552.08	-2.47
AUG	28	439.00	4059.00	19.79	552.13	-2.42
AUG	28	810.00	4270.00	19.55	552.37	-2.18
AUG	28	1246.00	4546.00	19.83	552.09	-2.46
AUG	28	1618.00	4758.00	19.99	551.93	-2.62
AUG	28	2058.00	5038.00	20.43	551.49	-3.06
AUG	29	1.00	5221.00	20.19	551.73	-2.82
AUG	29	419.00	5479.00	19.92	552.00	-2.55
AUG	29	906.00	5766.00	19.77	552.15	-2.40
AUG	29	1309.00	6009.00	19.93	551.99	-2.56
AUG	29	1503.00	6123.00	20.09	551.83	-2.72
AUG	29	2129.00	6509.00	20.56	551.36	-3.19
AUG	30	326.00	6866.00	19.95	551.97	-2.53
AUG	30	901.00	7201.00	19.74	552.18	-2.37
AUG	30	1246.00	7426.00	19.81	552.11	-2.44

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1E
CASING ELEV- 570.98

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	12.20	558.58	.00
AUG	25	855.00	-5.00	12.20	558.58	.00
AUG	25	901.50	1.50	12.20	558.58	.00
AUG	25	903.50	3.50	12.21	558.57	-.01
AUG	25	906.25	6.25	12.20	558.58	.00
AUG	25	909.00	9.00	12.20	558.58	.00
AUG	25	912.17	12.17	12.25	558.53	-.05
AUG	25	915.00	15.00	12.21	558.57	-.01
AUG	25	918.00	18.00	12.22	558.56	-.02
AUG	25	923.00	23.00	12.25	558.53	-.05
AUG	25	954.50	54.50	12.30	558.48	-.10
AUG	25	1017.25	77.25	12.36	558.42	-.16
AUG	25	1042.00	102.00	12.40	558.38	-.20
AUG	25	1120.00	140.00	12.50	558.28	-.30
AUG	25	1204.75	184.75	12.60	558.18	-.40
AUG	25	1336.00	276.00	12.80	557.98	-.60
AUG	25	1528.00	388.00	13.01	557.77	-.81
AUG	25	1644.50	464.50	13.11	557.67	-.91
AUG	25	2103.00	723.00	13.54	557.24	-1.34
AUG	26	22.00	922.00	13.63	557.15	-1.43
AUG	26	451.00	1191.00	13.31	557.47	-1.11
AUG	26	912.00	1452.00	13.01	557.77	-.81
AUG	26	1245.00	1665.00	13.01	557.77	-.81
AUG	26	1621.00	1881.00	13.19	557.59	-.99
AUG	26	2053.00	2153.00	13.53	557.25	-1.33
AUG	27	102.00	2402.00	13.59	557.19	-1.39
AUG	27	448.00	2628.00	13.34	557.44	-1.14
AUG	27	842.00	2862.00	12.98	557.80	-.78
AUG	27	1215.00	3075.00	12.92	557.86	-.72
AUG	27	1534.00	3294.00	13.14	557.64	-.94
AUG	27	2055.00	3595.00	13.40	557.38	-1.20
AUG	28	2.00	3782.00	13.45	557.33	-1.25
AUG	28	439.00	4059.00	13.12	557.66	-.92
AUG	28	811.00	4271.00	13.01	557.77	-.81
AUG	28	1247.00	4547.00	13.06	557.72	-.86
AUG	28	1619.00	4759.00	13.38	557.40	-1.18
AUG	28	2059.00	5039.00	13.66	557.12	-1.46
AUG	29	2.00	5222.00	13.77	557.01	-1.57
AUG	29	430.00	5490.00	13.42	557.36	-1.22
AUG	29	906.00	5766.00	13.13	557.65	-.93
AUG	29	1311.00	6011.00	13.19	557.59	-.99
AUG	29	1503.00	6123.00	13.31	557.47	-1.11
AUG	29	2130.00	6510.00	13.77	557.01	-1.57
AUG	30	327.00	6867.00	13.45	557.33	-1.25
AUG	30	900.00	7200.00	13.10	557.68	-.90
AUG	30	1147.00	7367.00	13.14	557.64	-.94

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1J
CASING ELEV- 572.08

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	21.89	549.99	.00
AUG	25	850.00	-10.00	21.89	549.99	.00
AUG	25	902.00	2.00	21.93	549.95	-.04
AUG	25	903.50	3.50	21.93	549.95	-.04
AUG	25	905.00	5.00	21.95	549.93	-.06
AUG	25	908.66	8.66	21.99	549.89	-.10
AUG	25	910.08	10.08	22.01	549.87	-.12
AUG	25	914.66	14.66	22.03	549.85	-.14
AUG	25	922.00	22.00	22.15	549.73	-.26
AUG	25	924.50	24.50	22.27	549.61	-.38
AUG	25	958.00	58.00	22.73	549.15	-.84
AUG	25	1020.00	80.00	23.05	548.83	-1.16
AUG	25	1043.50	103.50	23.34	548.54	-1.45
AUG	25	1122.25	142.25	23.81	548.07	-1.92
AUG	25	1207.50	187.50	24.23	547.65	-2.34
AUG	25	1334.00	274.00	24.93	546.95	-3.04
AUG	25	1647.00	467.00	26.02	545.86	-4.13
AUG	25	2101.00	721.00	26.92	544.96	-5.03
AUG	26	26.00	926.00	27.30	544.58	-5.41
AUG	26	453.00	1193.00	27.34	544.54	-5.45
AUG	26	914.00	1454.00	27.33	544.55	-5.44
AUG	26	1247.00	1667.00	27.25	544.63	-5.36
AUG	26	1624.00	1884.00	27.25	544.63	-5.36
AUG	26	2059.00	2159.00	27.43	544.45	-5.54
AUG	27	58.00	2398.00	27.54	544.34	-5.65
AUG	27	447.00	2627.00	27.43	544.45	-5.54
AUG	27	847.00	2867.00	27.13	544.75	-5.24
AUG	27	1219.00	3079.00	27.21	544.67	-5.32
AUG	27	1537.00	3237.00	27.28	544.60	-5.39
AUG	27	2051.00	3591.00	27.32	544.56	-5.43
AUG	28	6.00	3786.00	27.29	544.59	-5.40
AUG	28	445.00	4065.00	27.30	544.58	-5.41
AUG	28	814.00	4274.00	27.21	544.67	-5.32
AUG	28	1250.00	4550.00	27.21	544.67	-5.32
AUG	28	1623.00	4763.00	27.31	544.57	-5.42
AUG	28	2105.00	5045.00	27.15	544.73	-5.26
AUG	29	6.00	5226.00	27.66	544.22	-5.77
AUG	29	433.00	5493.00	27.57	544.31	-5.68
AUG	29	909.00	5769.00	27.38	544.50	-5.49
AUG	29	1315.00	6015.00	27.41	544.47	-5.52
AUG	29	1507.00	6127.00	27.45	544.43	-5.56
AUG	29	2133.00	6513.00	27.70	544.18	-5.81
AUG	30	353.00	6893.00	27.57	544.31	-5.68
AUG	30	902.00	7202.00	27.40	544.48	-5.51
AUG	30	1149.00	7369.00	27.29	544.59	-5.40

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 3B
CASING ELEV- 568.98

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	9.66	559.12	.00
AUG	25	911.00	11.00	9.66	559.12	.00
AUG	25	918.00	18.00	9.73	559.05	-.07
AUG	25	929.00	29.00	9.76	559.02	-.10
AUG	25	937.00	37.00	9.76	559.02	-.10
AUG	25	942.00	42.00	9.76	559.02	-.10
AUG	25	949.00	49.00	9.78	559.00	-.12
AUG	25	955.00	55.00	9.78	559.00	-.12
AUG	25	1003.00	63.00	9.78	559.00	-.12
AUG	25	1018.00	78.00	9.83	558.95	-.17
AUG	25	1027.00	87.00	9.84	558.94	-.18
AUG	25	1037.00	97.00	9.84	558.94	-.18
AUG	25	1103.00	123.00	9.84	558.94	-.18
AUG	25	1149.00	169.00	9.86	558.92	-.20
AUG	25	1335.00	275.00	9.96	558.82	-.30
AUG	25	1552.00	412.00	10.05	558.73	-.39
AUG	25	1702.00	482.00	10.08	558.70	-.42
AUG	25	2130.00	750.00	10.40	558.38	-.74
AUG	26	56.00	956.00	10.10	558.68	-.44
AUG	26	425.00	1165.00	9.94	558.84	-.28
AUG	26	850.00	1430.00	9.77	559.01	-.11
AUG	26	1227.00	1647.00	9.85	558.93	-.19
AUG	26	1701.00	1921.00	10.00	558.78	-.34
AUG	26	2136.00	2196.00	10.36	558.42	-.70
AUG	27	36.00	2376.00	10.08	558.70	-.42
AUG	27	424.00	2604.00	9.96	558.82	-.30
AUG	27	1621.00	3321.00	10.05	558.73	-.39
AUG	27	849.00	2869.00	9.70	559.08	-.04
AUG	27	1209.00	3069.00	9.78	559.00	-.12
AUG	27	1621.00	3321.00	10.05	558.73	-.39
AUG	27	2035.00	3575.00	9.51	559.27	.15
AUG	28	37.00	3817.00	9.81	558.97	-.15
AUG	28	421.00	4041.00	9.79	558.99	-.13
AUG	28	858.00	4318.00	9.67	559.11	-.01
AUG	28	1243.00	4543.00	9.84	558.94	-.18
AUG	28	1659.00	4799.00	10.00	558.78	-.34
AUG	28	2026.00	5006.00	10.22	558.56	-.56
AUG	29	30.00	5250.00	10.08	558.70	-.42
AUG	29	425.00	5486.00	9.97	558.81	-.31
AUG	29	850.00	5750.00	9.76	559.02	-.10
AUG	29	1306.00	6006.00	9.93	558.85	-.27
AUG	29	1510.00	6130.00	10.10	558.68	-.44
AUG	29	2113.00	6493.00	10.43	558.35	-.77
AUG	30	352.00	6892.00	9.89	558.89	-.23
AUG	30	833.00	7173.00	9.78	559.00	-.12
AUG	30	1152.00	7372.00	9.79	558.99	-.13

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 4B
CASING ELEV- 569.98

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	11.41	558.37	.00
AUG	25	906.00	6.00	11.41	558.37	.00
AUG	25	915.00	15.00	11.71	558.07	-.30
AUG	25	920.00	20.00	11.83	557.95	-.42
AUG	25	926.00	26.00	11.92	557.86	-.51
AUG	25	932.00	32.00	11.97	557.81	-.56
AUG	25	940.00	40.00	12.08	557.70	-.67
AUG	25	946.00	46.00	12.12	557.66	-.71
AUG	25	952.00	52.00	12.15	557.63	-.74
AUG	25	958.00	58.00	12.17	557.61	-.76
AUG	25	1008.00	68.00	12.22	557.56	-.81
AUG	25	1021.00	81.00	12.28	557.50	-.87
AUG	25	1031.00	91.00	12.29	557.49	-.88
AUG	25	1041.00	101.00	12.33	557.45	-.92
AUG	25	1051.00	111.00	12.37	557.41	-.96
AUG	25	1058.00	118.00	12.39	557.39	-.98
AUG	25	1136.00	156.00	12.47	557.31	-1.06
AUG	25	1154.00	174.00	12.48	557.30	-1.07
AUG	25	1343.00	283.00	12.68	557.10	-1.27
AUG	25	1546.00	406.00	12.91	556.87	-1.50
AUG	25	1656.00	476.00	12.95	556.83	-1.54
AUG	26	53.00	953.00	12.98	556.80	-1.57
AUG	26	423.00	1163.00	12.72	557.06	-1.31
AUG	26	847.00	1427.00	12.44	557.34	-1.03
AUG	26	1225.00	1645.00	12.66	557.12	-1.25
AUG	26	1652.00	1912.00	12.92	556.86	-1.51
AUG	26	2029.00	2129.00	13.38	556.40	-1.97
AUG	27	28.00	2368.00	12.99	556.79	-1.58
AUG	27	421.00	2601.00	12.71	557.07	-1.30
AUG	27	859.00	2879.00	12.92	556.86	-1.51
AUG	27	1207.00	3067.00	15.55	554.23	-4.14
AUG	27	1621.00	3321.00	13.12	556.66	-1.71
AUG	27	2032.00	3572.00	13.21	556.57	-1.80
AUG	28	34.00	3814.00	12.82	556.96	-1.41
AUG	28	419.00	4039.00	12.74	557.04	-1.33
AUG	28	855.00	4315.00	12.57	557.21	-1.16
AUG	28	1241.00	4541.00	12.85	556.93	-1.44
AUG	28	1652.00	4792.00	13.13	556.65	-1.72
AUG	28	2024.00	5004.00	13.52	556.26	-2.11
AUG	29	26.00	5246.00	13.12	556.66	-1.71
AUG	29	423.00	5483.00	12.80	556.98	-1.39
AUG	29	825.00	5725.00	12.72	557.06	-1.31
AUG	29	1303.00	6003.00	12.88	556.90	-1.47
AUG	29	1512.00	6132.00	13.11	556.67	-1.70
AUG	29	2110.00	6490.00	13.75	556.03	-2.34
AUG	30	350.00	6890.00	12.74	557.04	-1.33
AUG	30	842.00	7182.00	12.53	557.25	-1.12
AUG	30	900.00	7200.00	12.53	557.25	-1.12
AUG	30	1151.00	7371.00	12.63	557.15	-1.22

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 7B
CASING ELEV- 571.17

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	16.87	554.10	.00
AUG	25	900.08	.08	16.87	554.10	.00
AUG	25	910.25	10.25	16.85	554.12	.02
AUG	25	921.42	21.42	16.84	554.13	.03
AUG	25	941.00	41.00	16.83	554.14	.04
AUG	25	1002.17	62.17	16.82	554.15	.05
AUG	25	1021.08	81.08	16.82	554.15	.05
AUG	25	1039.35	99.35	16.81	554.16	.06
AUG	25	1055.92	115.92	16.82	554.15	.05
AUG	25	1113.45	133.45	16.82	554.15	.05
AUG	25	1144.12	164.12	16.79	554.18	.08
AUG	25	1355.83	295.83	16.67	554.30	.20
AUG	25	1550.08	410.08	16.57	554.40	.30
AUG	25	1655.08	475.08	16.51	554.46	.36
AUG	25	2030.03	690.03	16.41	554.56	.46
AUG	26	105.00	965.00	16.45	554.52	.42
AUG	26	407.00	1147.00	16.60	554.37	.27
AUG	26	813.00	1393.00	16.75	554.22	.12
AUG	26	1212.00	1632.00	16.67	554.30	.20
AUG	26	1600.00	1860.00	16.52	554.45	.35
AUG	26	407.00	1147.00	16.60	554.37	.27
AUG	26	813.00	1393.00	16.75	554.22	.12
AUG	26	1212.00	1632.00	16.67	554.30	.20
AUG	26	1600.00	1860.00	16.52	554.45	.35

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
AUG	26	2011.00	2111.00	16.50	554.47	.37
AUG	27	13.00	2353.00	16.70	554.27	.17
AUG	27	409.00	2589.00	16.95	554.02	-.08
AUG	27	1026.00	2966.00	17.13	553.84	-.26
AUG	27	1243.00	3183.00	17.10	553.87	-.23
AUG	27	1609.00	3389.00	16.91	554.06	-.04
AUG	27	2015.00	3555.00	16.76	554.21	.11
AUG	28	45.00	3825.00	16.67	554.30	.20
AUG	28	405.00	4025.00	16.81	554.16	.06
AUG	28	831.00	4291.00	17.03	553.94	-.16
AUG	28	1223.00	4523.00	17.08	553.89	-.21
AUG	28	1707.00	4807.00	17.04	553.93	-.17
AUG	28	2007.00	4987.00	17.04	553.93	-.17
AUG	29	45.00	5265.00	17.23	553.74	-.36
AUG	29	402.00	5462.00	17.40	553.57	-.53
AUG	29	813.00	5713.00	17.55	553.42	-.68
AUG	29	1227.00	5967.00	17.39	553.58	-.52
AUG	29	1526.00	6146.00	17.26	553.71	-.39
AUG	29	2103.00	6483.00	17.07	553.90	-.20
AUG	30	313.00	6853.00	17.21	553.76	-.34
AUG	30	847.00	7187.00	17.44	553.53	-.57
AUG	30	1158.00	7378.00	17.38	553.59	-.51

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 8B
CASING ELEV- 568.02

DRAWDOWN

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	5.83	561.99	.00
AUG	25	854.00	-6.00	5.83	561.99	.00
AUG	25	907.45	7.45	5.84	561.98	-.01
AUG	25	918.83	18.83	5.85	561.97	-.02
AUG	25	937.18	37.18	5.86	561.96	-.03
AUG	25	959.00	59.00	5.87	561.95	-.04
AUG	25	1018.08	78.08	5.88	561.94	-.05
AUG	25	1036.68	96.68	5.90	561.92	-.07
AUG	25	1053.10	113.10	5.91	561.91	-.08
AUG	25	1110.72	130.72	5.92	561.90	-.09
AUG	25	1137.83	157.83	5.93	561.89	-.10
AUG	25	1348.75	288.75	6.08	561.74	-.25
AUG	25	1541.24	401.24	6.18	561.64	-.35
AUG	25	1648.58	468.58	6.24	561.58	-.41
AUG	26	35.00	935.00	6.40	561.42	-.57
AUG	26	434.00	1174.00	6.13	561.69	-.30
AUG	26	859.00	1439.00	5.75	562.07	.08
AUG	26	1236.00	1656.00	5.94	561.88	-.11
AUG	26	1604.00	1664.00	6.19	561.63	-.36
AUG	26	2113.00	2173.00	6.89	560.93	-1.06
AUG	27	49.00	2389.00	6.40	561.42	-.57
AUG	27	436.00	2616.00	6.18	561.64	-.35
AUG	27	954.00	2934.00	5.76	562.05	.07
AUG	27	1226.00	3086.00	5.82	562.00	.01
AUG	27	1635.00	3335.00	6.34	561.48	-.51
AUG	27	2045.00	3585.00	6.30	561.52	-.47
AUG	28	16.00	3796.00	6.27	561.55	-.44
AUG	28	428.00	4048.00	6.12	561.70	-.29
AUG	28	906.00	4326.00	5.79	562.03	.04
AUG	28	1227.00	4527.00	6.12	561.70	-.29
AUG	28	1630.00	4770.00	6.33	561.49	-.50
AUG	28	2037.00	5017.00	6.81	561.01	-.98
AUG	29	15.00	5235.00	6.48	561.34	-.65
AUG	29	411.00	5471.00	6.22	561.60	-.39
AUG	29	816.00	5716.00	5.88	561.94	-.05
AUG	29	1231.00	5971.00	6.07	561.75	-.24
AUG	29	1528.00	6148.00	6.31	561.51	-.48
AUG	29	2121.00	6501.00	7.00	560.82	-1.17
AUG	30	337.00	6877.00	6.19	561.63	-.36
AUG	30	843.00	7183.00	5.80	562.02	.03
AUG	30	1326.00	7466.00	5.58	562.24	.25

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10C
CASING ELEV- 570.58

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	12.71	557.67	.00
AUG	25	849.83	-10.17	12.71	557.67	.00
AUG	25	905.08	5.08	12.72	557.66	-.01
AUG	25	916.60	16.60	12.73	557.65	-.02
AUG	25	933.92	33.92	12.72	557.66	-.01
AUG	25	956.17	56.17	12.73	557.65	-.02
AUG	25	1014.48	74.48	12.74	557.64	-.03
AUG	25	1033.00	93.00	12.73	557.65	-.02
AUG	25	1050.00	110.00	12.75	557.63	-.04
AUG	25	1108.32	128.32	12.73	557.65	-.02
AUG	25	1128.17	148.17	12.74	557.64	-.03
AUG	25	1343.65	283.65	12.73	557.65	-.02
AUG	25	1535.75	395.75	12.72	557.66	-.01
AUG	25	1709.00	489.00	12.72	557.66	-.01
AUG	25	2115.00	735.00	12.71	557.67	.00
AUG	26	33.00	933.00	12.74	557.64	-.03
AUG	26	430.00	1170.00	12.73	557.65	-.02
AUG	26	856.00	1436.00	12.72	557.66	-.01
AUG	26	1232.00	1652.00	12.71	557.67	.00
AUG	26	1606.00	1866.00	12.73	557.65	-.02
AUG	26	2119.00	2179.00	12.75	557.63	-.04
AUG	27	45.00	2385.00	12.73	557.65	-.02
AUG	27	433.00	2613.00	12.71	557.67	.00
AUG	27	1013.00	2953.00	12.69	557.69	.02
AUG	27	1223.00	3083.00	12.71	557.67	.00
AUG	27	1632.00	3332.00	12.77	557.61	-.06
AUG	27	2042.00	3582.00	10.17	560.21	2.54
AUG	28	13.00	3793.00	12.75	557.63	-.04
AUG	28	426.00	4046.00	12.75	557.63	-.04
AUG	28	903.00	4323.00	12.80	557.58	-.09
AUG	28	1228.00	4528.00	12.81	557.57	-.10
AUG	28	1624.00	4764.00	12.78	557.60	-.07
AUG	28	2032.00	5012.00	12.82	557.56	-.11
AUG	29	13.00	5233.00	12.83	557.55	-.12
AUG	29	407.00	5467.00	12.82	557.56	-.11
AUG	29	819.00	5719.00	12.82	557.56	-.11
AUG	29	1241.00	5981.00	12.85	557.53	-.14
AUG	29	1531.00	6151.00	12.88	557.50	-.17
AUG	29	2118.00	6498.00	12.87	557.51	-.16
AUG	30	336.00	6876.00	12.83	557.55	-.12
AUG	30	836.00	7176.00	12.72	557.66	-.01
AUG	30	1150.00	7370.00	12.75	557.63	-.04
AUG	30	1323.00	7463.00	12.81	557.57	-.10

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 12B
CASING ELEV- 572.14

DRAWDOWN

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	12.14	559.80	.00
AUG	25	845.00	-15.00	12.14	559.80	.00
AUG	25	902.75	2.75	12.09	559.85	.05
AUG	25	914.33	14.33	12.12	559.82	.02
AUG	25	931.42	31.42	12.13	559.81	.01
AUG	25	935.00	35.00	12.15	559.79	-.01
AUG	25	954.13	54.13	12.15	559.79	-.01
AUG	25	1012.08	72.08	12.15	559.79	-.01
AUG	25	1030.00	90.00	12.15	559.79	-.01
AUG	25	1048.33	108.33	12.15	559.79	-.01
AUG	25	1105.92	125.92	12.16	559.78	-.02
AUG	25	1122.95	142.95	12.18	559.76	-.04
AUG	25	1336.65	276.65	12.27	559.67	-.13
AUG	25	1529.50	389.50	12.32	559.62	-.18
AUG	25	1706.00	486.00	12.36	559.58	-.22
AUG	26	30.00	930.00	13.45	558.49	-1.31
AUG	26	428.00	1168.00	12.32	559.62	-.18
AUG	26	853.00	1433.00	12.08	559.86	.06
AUG	26	1230.00	1650.00	12.17	559.77	-.03
AUG	26	1608.00	1868.00	12.32	559.62	-.18
AUG	26	2107.00	2167.00	12.66	559.28	-.52
AUG	27	53.00	2393.00	12.38	559.56	-.24
AUG	27	442.00	2622.00	12.30	559.64	-.16
AUG	27	936.00	2916.00	12.10	559.84	.04
AUG	27	1222.00	3082.00	12.13	559.81	.01
AUG	27	1630.00	3330.00	12.36	559.58	-.22
AUG	27	2039.00	3579.00	11.02	560.92	1.12
AUG	28	10.00	3790.00	12.37	559.57	-.23
AUG	28	425.00	4045.00	12.28	559.66	-.14
AUG	28	901.00	4321.00	12.16	559.78	-.02
AUG	28	1230.00	4530.00	12.34	559.60	-.20
AUG	28	1626.00	4766.00	12.44	559.50	-.30
AUG	28	2030.00	5010.00	12.63	559.31	-.49
AUG	29	10.00	5230.00	12.48	559.46	-.34
AUG	29	413.00	5473.00	12.38	559.56	-.24
AUG	29	822.00	5722.00	12.24	559.70	-.10
AUG	29	1243.00	5983.00	12.37	559.57	-.23
AUG	29	1532.00	6152.00	12.45	559.49	-.31
AUG	29	2116.00	6496.00	12.78	559.16	-.64
AUG	30	334.00	6874.00	12.37	559.57	-.23
AUG	30	832.00	7172.00	12.15	559.79	-.01
AUG	30	900.00	7200.00	12.15	559.79	-.01
AUG	30	1147.00	7367.00	12.20	559.74	-.06
AUG	30	1320.00	7460.00	12.29	559.65	-.15

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 16B
CASING ELEV- 572.90

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	14.20	558.50	.00
AUG	25	907.00	7.00	14.20	558.50	.00
AUG	25	914.00	14.00	14.21	558.49	-.01
AUG	25	920.00	20.00	14.24	558.46	-.04
AUG	25	926.00	26.00	14.25	558.45	-.05
AUG	25	933.00	33.00	14.29	558.41	-.09
AUG	25	939.00	39.00	14.30	558.40	-.10
AUG	25	945.00	45.00	14.31	558.39	-.11
AUG	25	952.00	52.00	14.32	558.38	-.12
AUG	25	958.00	58.00	14.34	558.36	-.14
AUG	25	1005.00	65.00	14.34	558.36	-.14
AUG	25	1018.00	78.00	14.35	558.35	-.15
AUG	25	1028.00	88.00	14.37	558.33	-.17
AUG	25	1040.00	100.00	14.38	558.32	-.18
AUG	25	1053.00	113.00	14.39	558.31	-.19
AUG	25	1119.00	139.00	14.39	558.31	-.19
AUG	25	1135.00	155.00	14.40	558.30	-.20
AUG	25	1340.00	280.00	14.50	558.20	-.30
AUG	25	1533.00	393.00	14.62	558.08	-.42
AUG	25	1652.00	472.00	14.63	558.07	-.43
AUG	25	2125.00	745.00	14.87	557.83	-.67
AUG	26	43.00	943.00	14.62	558.08	-.42
AUG	26	442.00	1182.00	14.51	558.19	-.31
AUG	26	906.00	1446.00	14.30	558.40	-.10
AUG	26	1240.00	1660.00	14.39	558.51	.01
AUG	26	1707.00	1927.00	14.53	558.17	-.33
AUG	26	2133.00	2193.00	14.86	557.84	-.66
AUG	27	40.00	2380.00	14.71	557.99	-.51
AUG	27	428.00	2608.00	14.49	558.21	-.29
AUG	27	945.00	2925.00	14.22	558.48	-.02
AUG	27	1234.00	3094.00	14.30	558.40	-.10
AUG	27	1648.00	3348.00	14.55	558.15	-.35
AUG	27	2024.00	3564.00	14.08	558.62	.12
AUG	28	21.00	3801.00	14.33	558.37	-.13
AUG	28	435.00	4055.00	14.31	558.39	-.11
AUG	28	828.00	4288.00	14.22	558.48	-.02
AUG	28	1235.00	4535.00	14.36	558.34	-.16
AUG	28	1642.00	4782.00	14.47	558.23	-.27
AUG	28	2041.00	5021.00	14.75	557.95	-.55
AUG	29	20.00	5240.00	14.62	558.08	-.42
AUG	29	417.00	5477.00	14.46	558.24	-.26
AUG	29	830.00	5730.00	14.34	558.36	-.14
AUG	29	1320.00	6020.00	14.50	558.20	-.30
AUG	29	1537.00	6157.00	14.59	558.11	-.39
AUG	29	2125.00	6505.00	14.96	557.74	-.76
AUG	30	343.00	6883.00	14.49	558.21	-.29
AUG	30	853.00	7193.00	14.36	558.34	-.16
AUG	30	903.00	7203.00	14.32	558.38	-.12
AUG	30	1201.00	7381.00	14.37	558.33	-.17
AUG	30	1343.00	7483.00	14.38	558.32	-.18

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 17B
CASING ELEV- 568.93

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	21.04	547.69	.00
AUG	25	926.75	26.75	21.04	547.69	.00
AUG	25	945.42	45.42	21.03	547.70	.01
AUG	25	1006.82	66.82	21.01	547.72	.03
AUG	25	1025.75	85.75	21.00	547.73	.04
AUG	25	1043.85	103.85	20.97	547.76	.07
AUG	25	1100.35	120.35	20.93	547.80	.11
AUG	25	1117.72	137.72	20.92	547.81	.12
AUG	25	1152.58	172.58	20.85	547.88	.19
AUG	25	1404.75	304.75	20.57	548.16	.47
AUG	25	1559.52	419.52	20.46	548.27	.58
AUG	25	1705.27	485.27	20.40	548.33	.64
AUG	27	1251.00	3111.00	20.67	548.06	.37
AUG	27	1606.00	3306.00	20.72	548.01	.32
AUG	28	55.00	3835.00	20.88	547.85	.16
AUG	28	401.00	4021.00	21.37	547.36	-.33
AUG	28	832.00	4292.00	21.51	547.22	-.47
AUG	28	1207.00	4507.00	21.38	547.35	-.34
AUG	28	1715.00	4815.00	21.45	547.28	-.41
AUG	28	2003.00	4983.00	21.58	547.15	-.54
AUG	29	40.00	5260.00	21.89	546.84	-.85
AUG	28	357.00	5457.00	21.99	546.74	-.95
AUG	28	925.00	5785.00	21.65	547.07	-.62
AUG	29	1223.00	5963.00	21.3	547.43	-.26
AUG	29	1523.00	6143.00	21.15	547.58	-.11
AUG	29	2058.00	6478.00	21.28	547.45	-.24
AUG	30	308.00	6848.00	21.78	546.95	-.74
AUG	30	854.00	7194.00	21.65	547.08	-.61
AUG	30	1204.00	7384.00	21.24	547.49	-.20

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 19B
CASING ELEV- 573.26

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
AUG	25	900.00	.00	15.56	557.50	.00
AUG	25	905.00	5.00	15.56	557.50	.00
AUG	25	912.00	12.00	15.59	557.47	-.03
AUG	25	917.00	17.00	15.60	557.46	-.04
AUG	25	923.00	23.00	15.64	557.42	-.08
AUG	25	929.00	29.00	15.66	557.40	-.10
AUG	25	936.00	36.00	15.68	557.38	-.12
AUG	25	942.00	42.00	15.68	557.38	-.12
AUG	25	947.00	47.00	15.69	557.37	-.13
AUG	25	955.00	55.00	15.69	557.37	-.13
AUG	25	1002.00	62.00	15.72	557.34	-.16
AUG	25	1013.00	73.00	15.71	557.35	-.15
AUG	25	1023.00	83.00	15.73	557.33	-.17
AUG	25	1032.00	92.00	15.75	557.31	-.19
AUG	25	1049.00	109.00	15.75	557.31	-.19
AUG	25	1056.00	116.00	15.75	557.31	-.19
AUG	25	1112.00	132.00	15.75	557.31	-.19
AUG	25	1127.00	147.00	15.75	557.31	-.19
AUG	25	1150.00	170.00	15.75	557.31	-.19
AUG	25	1336.00	276.00	15.82	557.24	-.26
AUG	25	1529.00	389.00	15.88	557.18	-.32
AUG	25	1646.00	466.00	15.91	557.15	-.35
AUG	25	2025.00	685.00	16.08	556.98	-.52
AUG	26	59.00	959.00	15.90	557.16	-.34
AUG	26	410.00	1150.00	15.78	557.28	-.22
AUG	26	820.00	1400.00	15.33	557.73	.23
AUG	26	1217.00	1637.00	15.67	557.39	-.11
AUG	26	1711.00	1931.00	15.79	557.27	-.23
AUG	26	2017.00	2117.00	15.88	557.18	-.32
AUG	27	19.00	2359.00	15.87	557.19	-.31
AUG	27	356.00	2576.00	15.71	557.35	-.15
AUG	27	1017.00	2957.00	15.58	557.48	-.02
AUG	27	1238.00	3098.00	15.79	557.27	-.23
AUG	27	1614.00	3314.00	15.77	557.29	-.21
AUG	27	2021.00	3561.00	15.08	557.98	.48
AUG	28	39.00	3819.00	15.52	557.54	.04
AUG	28	414.00	4034.00	15.56	557.50	.00
AUG	28	840.00	4300.00	15.49	557.57	.07
AUG	28	1158.00	4498.00	15.62	557.44	-.06
AUG	28	1703.00	4803.00	15.72	557.34	-.16
AUG	28	2015.00	4995.00	15.88	557.18	-.32
AUG	29	49.00	5269.00	15.78	557.28	-.22
AUG	29	352.00	5452.00	15.72	557.34	-.16
AUG	29	917.00	5777.00	15.63	557.43	-.07
AUG	29	1250.00	5990.00	15.72	557.34	-.16
AUG	29	1517.00	6137.00	15.83	557.23	-.27
AUG	29	2054.00	6474.00	15.98	557.08	-.42
AUG	30	320.00	6860.00	15.72	557.34	-.16
AUG	30	850.00	7190.00	15.64	557.42	-.08
AUG	30	900.00	7200.00	15.60	557.46	-.04
AUG	30	1149.00	7369.00	15.62	557.44	-.06

OCTOBER 17, 1983 PUMP TEST
FIELD DATA

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1A
CASING ELEV- 572.43

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	9.31	562.92	.00
OCT	17	827	-33	9.31	562.92	.00
OCT	17	940	40	9.38	562.85	-.07
OCT	17	1039	99	9.47	562.76	-.16
OCT	17	1111	131	9.51	562.72	-.20
OCT	17	1236	216	9.64	562.59	-.33
OCT	17	1720	500	9.80	562.43	-.49
OCT	17	2049	709	10.16	562.07	-.85
OCT	18	30	930	9.85	562.38	-.54
OCT	18	424	1164	9.65	562.58	-.34
OCT	18	927	1467	9.43	562.80	-.12
OCT	18	1238	1658	9.75	562.48	-.44
OCT	18	1655	1915	10.00	562.23	-.69
OCT	18	2018	2118	10.41	561.82	-1.10
OCT	19	45	2385	9.87	562.36	-.56
OCT	19	439	2619	9.78	562.45	-.47
OCT	19	938	2918	9.73	562.50	-.42

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1A
CASING ELEV- 572.43

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	9.73	562.50	.00
OCT	19	938	-82	9.73	562.50	.00
OCT	19	1229	89	9.90	562.33	-.17
OCT	19	1254	114	9.93	562.30	-.20
OCT	19	1309	129	9.94	562.29	-.21
OCT	19	1341	161	9.94	562.29	-.21
OCT	19	1411	191	9.97	562.26	-.24
OCT	19	1524	264	10.07	562.16	-.34
OCT	19	1603	303	10.10	562.13	-.37
OCT	20	1007	1387	9.86	562.37	-.13
OCT	20	1317	1577	10.03	562.20	-.30
OCT	21	1102	2882	9.74	562.49	-.01

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1B
CASING ELEV- 571.61

R E C O V E R Y

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	10.28	561.13	.00
OCT	17	827	-33	10.28	561.13	.00
OCT	17	958	58	10.35	561.06	-.07
OCT	17	1038	98	10.41	561.00	-.13
OCT	17	1111	131	10.46	560.95	-.18
OCT	17	1235	215	10.57	560.84	-.29
OCT	17	1728	508	10.77	560.64	-.49
OCT	17	2050	710	11.06	560.35	-.78
OCT	18	28	928	10.75	560.84	-.29
OCT	18	425	1165	10.57	561.02	-.11
OCT	18	927	1467	10.34	561.25	.12
OCT	18	1238	1658	10.60	560.99	-.14
OCT	18	1654	1914	10.86	560.73	-.40
OCT	18	2018	2118	11.24	560.35	-.78
OCT	19	49	2389	10.77	560.82	-.31
OCT	19	438	2618	10.68	560.91	-.22
OCT	19	935	2915	10.63	560.96	-.17

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1B
CASING ELEV- 571.61

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	10.63	560.78	.00
OCT	19	935	-85	10.63	560.78	.00
OCT	19	1232	92	10.79	560.62	-.16
OCT	19	1257	117	10.82	560.59	-.19
OCT	19	1313	133	10.87	560.54	-.24
OCT	19	1339	159	10.87	560.54	-.24
OCT	19	1409	189	10.87	560.54	-.24
OCT	19	1528	268	11.06	560.35	-.43
OCT	19	1604	304	11.03	560.38	-.40
OCT	20	1009	1389	10.78	560.63	-.15
OCT	21	1101	2881	10.66	560.75	-.03

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1C
CASING ELEV- 573.07

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	12.53	560.34	.00
OCT	17	825	-35	12.53	560.34	.00
OCT	17	939	39	12.48	560.39	.05
OCT	17	1009	69	12.45	560.42	.08
OCT	17	1035	95	12.45	560.42	.08
OCT	17	1109	129	12.45	560.42	.08
OCT	17	1147	167	12.44	560.43	.09
OCT	17	1232	212	12.44	560.43	.09
OCT	17	1725	505	12.41	560.46	.12
OCT	17	2046	706	12.77	560.10	-.24
OCT	18	27	927	12.57	560.30	-.04
OCT	18	422	1162	12.35	560.52	.18
OCT	18	922	1462	12.02	560.85	.51
OCT	18	1238	1658	12.13	560.74	.40
OCT	18	1647	1907	12.97	559.90	-.44
OCT	18	2016	2116	12.95	559.92	-.42
OCT	19	46	2386	12.50	560.37	.03
OCT	19	434	2614	12.34	560.53	.19
OCT	19	939	2919	12.20	560.67	.33

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1C
CASING ELEV- 573.07

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	12.20	560.67	.00
OCT	19	939	-81	12.20	560.67	.00
OCT	19	1206	66	12.33	560.54	-.13
OCT	19	1224	84	12.37	560.50	-.17
OCT	19	1250	110	12.41	560.46	-.21
OCT	19	1306	126	12.43	560.44	-.23
OCT	19	1335	155	12.46	560.41	-.26
OCT	19	1405	185	12.52	560.35	-.32
OCT	19	1523	263	12.72	560.15	-.52
OCT	19	1601	301	12.71	560.16	-.51
OCT	20	1003	1383	12.63	560.24	-.43
OCT	20	1313	1573	12.86	560.01	-.66
OCT	21	1105	2885	12.67	560.20	-.47

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1D
CASING ELEV- 572.12

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	16.88	555.04	.00
OCT	17	825	-35	16.88	555.04	.00
OCT	17	939	39	15.41	556.51	1.47
OCT	17	951	51	15.26	556.66	1.62
OCT	17	1010	70	15.10	556.82	1.78
OCT	17	1036	96	14.95	556.97	1.93
OCT	17	1110	130	14.83	557.09	2.05
OCT	17	1148	168	14.74	557.18	2.14
OCT	17	1233	213	14.69	557.23	2.19
OCT	17	1727	507	14.60	557.32	2.28
OCT	17	2045	705	14.85	557.07	2.03
OCT	18	28	928	14.50	557.42	2.38
OCT	18	423	1163	14.27	557.65	2.61
OCT	18	921	1461	14.08	557.84	2.80
OCT	18	1238	1658	14.33	557.59	2.55
OCT	18	1649	1909	14.55	557.37	2.33
OCT	18	2016	2116	14.92	557.00	1.96
OCT	19	43	2383	14.43	557.49	2.45
OCT	19	433	2613	14.32	557.60	2.56
OCT	19	941	2921	14.40	557.52	2.48

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1D
CASING ELEV- 572.12

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	14.40	557.52	.00
OCT	19	941	-79	14.40	557.52	.00
OCT	19	1207	67	16.07	555.85	-1.67
OCT	19	1226	86	16.26	555.66	-1.86
OCT	19	1252	112	16.40	555.52	-2.00
OCT	19	1307	127	16.46	555.46	-2.06
OCT	19	1337	157	16.56	555.36	-2.16
OCT	19	1406	186	16.64	555.28	-2.24
OCT	19	1532	272	16.86	555.06	-2.46
OCT	19	1606	306	16.85	555.07	-2.45
OCT	20	1005	1385	17.06	554.86	-2.66
OCT	20	1314	1574	17.26	554.66	-2.86
OCT	21	1106	2886	17.33	554.59	-2.93

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1E
CASING ELEV- 570.98

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	12.15	558.63	.00
OCT	17	826	-34	12.15	558.63	.00
OCT	17	950	50	12.00	558.78	.15
OCT	17	1010	70	11.91	558.87	.24
OCT	17	1037	97	11.84	558.94	.31
OCT	17	1112	132	11.75	559.03	.40
OCT	17	1148	168	11.66	559.12	.49
OCT	17	1234	214	11.61	559.17	.54
OCT	17	1730	510	11.46	559.32	.69
OCT	17	2044	704	11.77	559.01	.38
OCT	18	29	929	11.52	559.26	.63
OCT	18	425	1165	11.28	559.50	.87
OCT	18	930	1470	10.97	559.81	1.18
OCT	18	1238	1658	11.12	559.66	1.03
OCT	18	1652	1912	11.43	559.35	.72
OCT	18	2017	2117	11.83	558.95	.32
OCT	19	41	2381	11.56	559.22	.59
OCT	19	431	2611	11.33	559.45	.82
OCT	19	940	2920	11.22	559.56	.93

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1E
CASING ELEV- 570.98

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	11.22	559.56	.00
OCT	19	940	-80	11.22	559.56	.00
OCT	19	1207	67	11.46	559.32	-.24
OCT	19	1227	87	11.51	559.27	-.29
OCT	19	1253	113	11.61	559.17	-.39
OCT	19	1308	128	11.67	559.11	-.45
OCT	19	1338	158	11.88	558.90	-.66
OCT	19	1407	187	11.88	558.90	-.66
OCT	19	1526	266	12.13	558.65	-.91
OCT	19	1605	305	12.21	558.57	-.99
OCT	20	1006	1386	12.31	558.47	-1.09
OCT	20	1316	1576	12.51	558.27	-1.29
OCT	21	1100	2880	12.36	558.42	-1.14

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1F
CASING ELEV- 572.69

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	13.31	559.18	.00
OCT	17	824	-36	13.31	559.18	.00
OCT	17	938	38	12.79	559.70	.52
OCT	17	952	52	12.75	559.74	.56
OCT	17	1008	68	12.74	559.75	.57
OCT	17	1034	94	12.73	559.76	.58
OCT	17	1108	128	12.74	559.75	.57
OCT	17	1145	165	12.76	559.73	.55
OCT	17	1231	211	12.80	559.69	.51
OCT	17	1724	504	12.95	559.54	.36
OCT	17	2047	707	13.19	559.30	.12
OCT	18	26	926	12.80	559.69	.51
OCT	18	421	1161	12.55	559.94	.76
OCT	18	923	1463	12.37	560.12	.94
OCT	18	1240	1660	12.75	559.74	.56
OCT	18	1656	1916	13.07	559.42	.24
OCT	18	2015	2115	13.38	559.11	-.07
OCT	19	47	2387	12.78	559.71	.53
OCT	19	435	2615	12.64	559.85	.67
OCT	19	938	2918	12.77	559.72	.54

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1F
CASING ELEV- 572.69

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	12.77	559.72	.00
OCT	19	938	-82	12.77	559.72	.00
OCT	19	1205	65	13.56	558.93	-.79
OCT	19	1224	84	13.62	558.87	-.85
OCT	19	1249	109	13.70	558.79	-.93
OCT	19	1305	125	13.71	558.78	-.94
OCT	19	1334	154	13.77	558.72	-1.00
OCT	19	1403	183	13.79	558.70	-1.02
OCT	19	1520	260	13.99	558.50	-1.22
OCT	19	1602	302	13.98	558.51	-1.21
OCT	20	1002	1382	14.82	557.67	-2.05
OCT	20	1312	1572	14.08	558.41	-1.31
OCT	21	1105	2885	13.79	558.70	-1.02

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1J
CASING ELEV- 572.08

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE	MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN						OCT	17	1723	503	16.95	554.93	4.29
OCT	17	900	0	21.24	550.64	.00	OCT	17	2048	708	16.70	555.18	4.54
							OCT	18	25	925	16.31	555.57	4.93
OCT	17	823	-37	21.24	550.64	.00	OCT	18	421	1161	16.02	555.86	5.22
OCT	17	937	37	20.62	551.26	.62	OCT	18	924	1464	15.68	556.20	5.56
OCT	17	951	51	20.39	551.49	.85	OCT	18	1242	1662	15.68	556.20	5.56
OCT	17	1007	67	20.11	551.77	1.13	OCT	18	1648	1908	15.81	556.07	5.43
OCT	17	1033	93	19.74	552.14	1.50	OCT	18	2013	2113	16.07	555.81	5.17
OCT	17	1107	127	19.34	552.54	1.90	OCT	19	48	2388	15.93	555.95	5.31
OCT	17	1146	166	18.95	552.93	2.29	OCT	19	457	2637	15.81	556.07	5.43
OCT	17	1231	211	18.53	553.35	2.71	OCT	19	937	2917	15.74	556.14	5.50

W

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 1J
CASING ELEV- 572.08

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	15.74	556.14	.00
OCT	19	937	-83	15.74	556.14	.00
OCT	19	1231	91	16.56	555.32	-.82
OCT	19	1255	115	16.85	555.03	-1.11
OCT	19	1310	130	17.01	554.87	-1.27
OCT	19	1343	163	17.33	554.55	-1.59
OCT	19	1408	188	17.57	554.31	-1.83
OCT	19	1530	270	18.29	553.59	-2.55
OCT	19	1603	303	18.42	553.46	-2.68
OCT	20	1000	1380	20.41	551.47	-4.67
OCT	20	1311	1571	20.64	551.24	-4.90
OCT	21	1104	2884	21.46	550.42	-5.72

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 2A
CASING ELEV- 570.10

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	7.19	562.71	.00
OCT	17	832	-28	7.19	562.71	.00
OCT	17	954	54	7.31	562.59	-.12
OCT	17	1042	102	7.47	562.43	-.28
OCT	17	1115	135	7.50	562.40	-.31
OCT	17	1150	170	7.57	562.33	-.38
OCT	17	1220	200	7.65	562.25	-.46
OCT	17	1715	495	7.88	562.02	-.69
OCT	17	2038	698	8.32	561.58	-1.13
OCT	18	21	921	7.87	562.03	-.68
OCT	18	420	1160	7.63	562.27	-.44
OCT	18	917	1457	7.33	562.57	-.14
OCT	18	1235	1655	7.71	562.19	-.52
OCT	18	1658	1918	8.08	561.82	-.89
OCT	18	2011	2111	8.49	561.41	-1.30
OCT	19	37	2377	7.88	562.02	-.69
OCT	19	429	2609	7.75	562.15	-.56
OCT	19	911	2891	7.70	562.20	-.51

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 2A
CASING ELEV- 570.10

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	7.70	562.20	.00
OCT	19	911	-109	7.70	562.20	.00
OCT	19	1201	61	7.95	561.95	-.25
OCT	19	1221	81	7.98	561.92	-.28
OCT	19	1235	95	7.98	561.92	-.28
OCT	19	1246	106	7.99	561.91	-.29
OCT	19	1259	119	8.01	561.89	-.31
OCT	19	1330	150	8.01	561.89	-.31
OCT	19	1413	193	8.04	561.86	-.34
OCT	19	1538	278	8.25	561.65	-.55
OCT	19	1609	309	8.17	561.73	-.47
OCT	20	1012	1392	7.87	562.03	-.17
OCT	20	1327	1587	8.13	561.77	-.43
OCT	21	1050	2870	7.95	561.95	-.25

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 2C
CASING ELEV- 568.6

R E C O V E R Y

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	17.50	550.90	.00
OCT	17	832	-28	17.50	550.90	.00
OCT	17	954	54	16.58	551.82	.92
OCT	17	1013	73	16.20	552.20	1.30
OCT	17	1042	102	15.72	552.68	1.78
OCT	17	1115	135	15.25	553.15	2.25
OCT	17	1150	170	14.93	553.47	2.57
OCT	17	1220	200	14.66	553.74	2.84
OCT	17	1714	494	13.95	554.45	3.55
OCT	17	2039	699	14.20	554.20	3.30
OCT	18	21	921	13.82	554.58	3.68
OCT	18	420	1160	13.55	554.85	3.95
OCT	18	917	1457	13.31	555.09	4.19
OCT	18	1235	1655	13.48	554.92	4.02
OCT	18	1658	1918	13.75	554.65	3.75
OCT	18	2011	2111	14.17	554.23	3.33
OCT	19	38	2378	13.70	554.70	3.80
OCT	19	428	2608	13.58	554.82	3.92
OCT	19	911	2891	13.52	554.88	3.98

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 2C
CASING ELEV- 568.6

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	13.52	554.88	.00
OCT	17	911	41651	13.52	554.88	.00
OCT	17	1201	41821	14.11	554.29	-.59
OCT	17	1220	41840	14.47	553.93	-.95
OCT	17	1236	41856	14.80	553.60	-1.28
OCT	17	1245	41865	14.96	553.44	-1.44
OCT	19	1300	120	15.18	553.22	-1.66
OCT	19	1329	149	15.57	552.83	-2.05
OCT	19	1414	194	16.01	552.39	-2.49
OCT	19	1538	278	15.62	552.78	-2.10
OCT	19	1609	309	16.70	551.70	-3.18
OCT	20	1013	1393	17.41	550.99	-3.89
OCT	20	1321	1581	17.65	550.75	-4.13
OCT	21	1050	2870	17.65	550.75	-4.13

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 4A
CASING ELEV- 569.99

RECOVERY

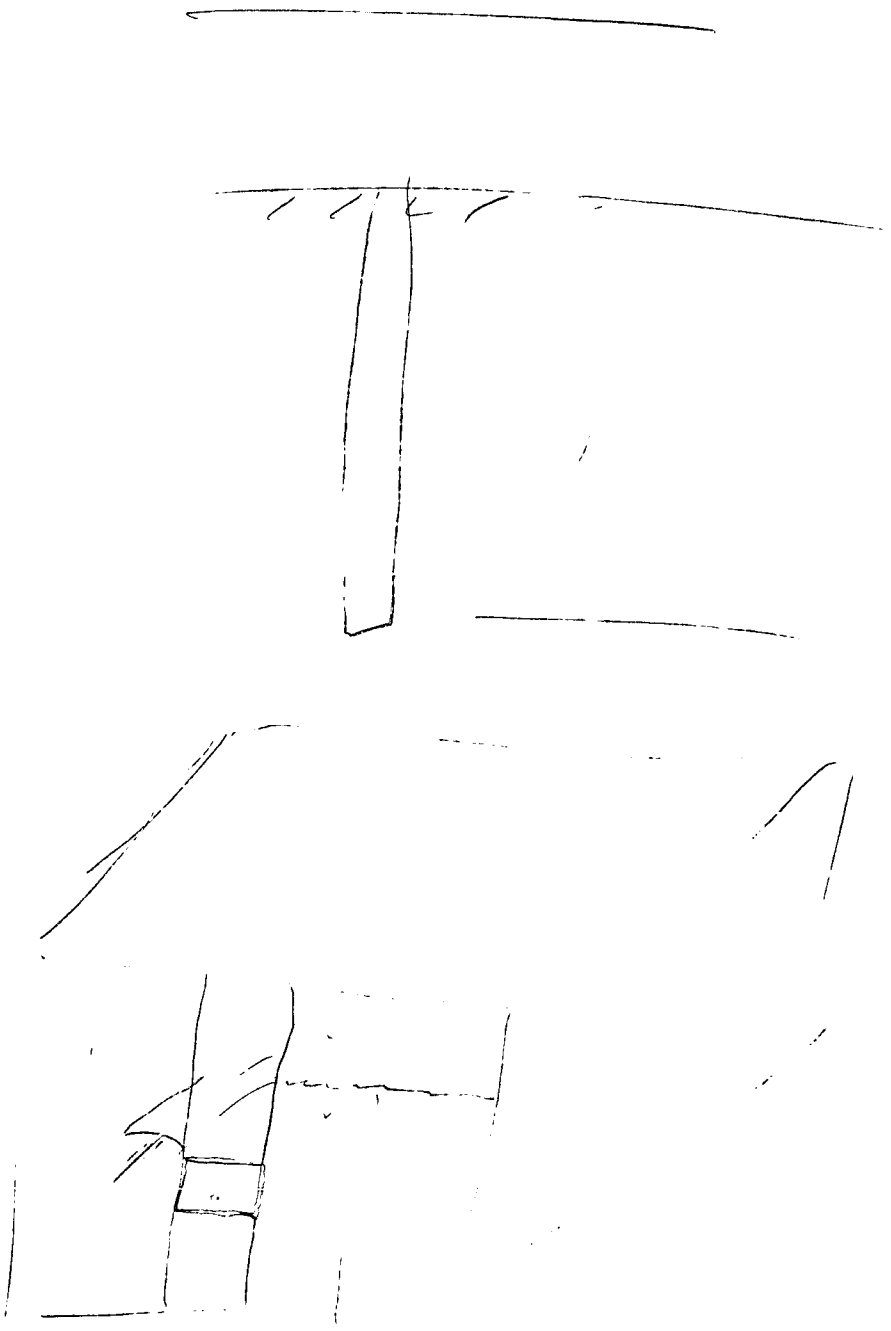
MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	7.22	562.57	.00
OCT	17	855	-5	7.22	562.57	.00
OCT	17	905	5	7.26	562.53	-.04
OCT	17	920	20	7.22	562.57	.00
OCT	17	927	27	7.23	562.56	-.01
OCT	17	937	37	7.24	562.55	-.02
OCT	17	948	48	7.25	562.54	-.03
OCT	17	1011	71	7.32	562.47	-.10
OCT	17	1037	97	7.37	562.42	-.15
OCT	17	1059	119	7.42	562.37	-.20
OCT	17	1149	169	7.52	562.27	-.30
OCT	17	1222	202	7.61	562.18	-.39
OCT	17	1705	485	8.01	561.78	-.79
OCT	17	2035	695	8.56	561.23	-1.34
OCT	17	2354	894	8.05	561.74	-.83
OCT	18	454	1194	7.75	562.04	-.53
OCT	18	912	1452	7.55	562.24	-.33
OCT	18	1227	1647	7.88	561.91	-.66
OCT	18	1700	1920	8.23	561.56	-1.01
OCT	18	2008	2108	8.72	561.07	-1.50
OCT	19	33	2373	8.07	561.72	-.85
OCT	19	424	2604	7.85	561.94	-.63
OCT	19	907	2887	7.83	561.96	-.61

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 4A
CASING ELEV- 569.99

DRAWDOWN

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	7.83	561.96	.00
OCT	19	907	-113	7.83	561.96	.00
OCT	19	1158	58	8.17	561.62	-.34
OCT	19	1243	103	8.21	561.58	-.38
OCT	19	1259	119	8.22	561.57	-.39
OCT	19	1315	135	8.23	561.56	-.40
OCT	19	1338	158	8.25	561.54	-.42
OCT	19	1356	176	8.26	561.53	-.43
OCT	19	1533	273	8.40	561.39	-.57
OCT	19	1554	294	8.42	561.37	-.59
OCT	19	1701	361	8.48	561.31	-.65
OCT	20	1018	1398	8.09	561.70	-.26
OCT	20	1327	1587	8.33	561.46	-.50
OCT	21	1040	2860	7.84	561.95	-.01



WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 4C
CASING ELEV- 569.98

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	11.24	558.54	.00
OCT	17	854	-6	11.24	558.54	.00
OCT	17	906	6	11.21	558.57	.03
OCT	17	919	19	10.58	559.20	.66
OCT	17	928	28	10.37	559.41	.87
OCT	17	935	35	10.26	559.52	.98
OCT	17	949	49	10.17	559.61	1.07
OCT	17	1009	69	10.12	559.66	1.12
OCT	17	1038	98	10.05	559.73	1.19
OCT	17	1057	117	10.03	559.75	1.21
OCT	17	1150	170	10.01	559.77	1.23
OCT	17	1221	201	10.03	559.75	1.21
OCT	17	1701	481	10.17	559.61	1.07
OCT	17	2034	694	10.52	559.26	.72
OCT	17	2354	894	10.09	559.69	1.15
OCT	18	454	1194	9.84	559.94	1.40
OCT	18	912	1452	9.67	560.11	1.57
OCT	18	1227	1647	9.99	559.79	1.25
OCT	18	1700	1920	10.33	559.45	.91
OCT	18	2008	2108	10.79	558.99	.45
OCT	19	31	2371	10.07	559.71	1.17
OCT	19	425	2605	9.95	559.83	1.29
OCT	19	907	2887	10.00	559.78	1.24

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 4C
CASING ELEV- 569.98

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	10.00	559.78	.00
OCT	19	907	-113	10.00	559.78	.00
OCT	19	1157	57	11.09	558.69	-1.09
OCT	19	1240	100	11.40	558.38	-1.40
OCT	19	1257	117	11.44	558.34	-1.44
OCT	19	1320	140	11.48	558.30	-1.48
OCT	19	1341	161	11.54	558.24	-1.54
OCT	19	1359	179	11.57	558.21	-1.57
OCT	19	1535	275	11.72	558.06	-1.72
OCT	19	1556	296	11.80	557.98	-1.80
OCT	19	1702	362	11.89	557.89	-1.89
OCT	20	1017	1397	11.78	558.00	-1.78
OCT	20	1326	1586	12.29	557.49	-2.29
OCT	21	1040	2860	12.03	557.75	-2.03

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5B
CASING ELEV- 572.82

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	17.79	554.83	.00
OCT	17	900	0	17.79	554.83	.00
OCT	17	908	8	17.21	555.41	.58
OCT	17	912	12	16.67	555.95	1.12
OCT	17	915	15	16.39	556.23	1.40
OCT	17	922	22	16.05	556.57	1.74
OCT	17	931	31	15.86	556.76	1.93
OCT	17	940	40	15.75	556.87	2.04
OCT	17	957	57	15.62	557.00	2.17
OCT	17	1018	78	15.52	557.10	2.27
OCT	17	1042	102	15.44	557.18	2.35
OCT	17	1117	137	15.33	557.29	2.46
OCT	17	1143	163	15.32	557.30	2.47
OCT	17	1230	210	15.27	557.35	2.52
OCT	17	1653	473	15.20	557.42	2.59
OCT	17	2029	689	15.55	557.07	2.24
OCT	18	5	905	15.10	557.52	2.69
OCT	18	417	1157	14.90	557.72	2.89
OCT	18	901	1441	14.71	557.91	3.08
OCT	18	1216	1636	15.01	557.61	2.78
OCT	18	1715	1935	15.37	557.25	2.42
OCT	18	1959	2099	15.80	556.82	1.99
OCT	19	24	2364	15.15	557.47	2.64
OCT	19	422	2602	14.99	557.63	2.80
OCT	19	905	2885	15.03	557.59	2.76

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5B
CASING ELEV- 572.82

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	15.03	557.59	.00
OCT	19	905	-115	15.03	557.59	.00
OCT	19	1153	53	16.96	555.66	-1.93
OCT	19	1227	87	17.33	555.29	-2.30
OCT	19	1247	107	17.42	555.20	-2.39
OCT	19	1307	127	17.47	555.15	-2.44
OCT	19	1334	154	17.55	555.07	-2.52
OCT	19	1347	167	17.57	555.05	-2.54
OCT	19	1412	192	17.62	555.00	-2.59
OCT	19	1517	257	17.79	554.83	-2.76
OCT	19	1625	325	17.90	554.72	-2.87
OCT	19	1657	357	17.93	554.69	-2.90
OCT	20	1035	1415	18.06	554.56	-3.03
OCT	20	1332	1592	18.31	554.31	-3.28
OCT	21	1027	2847	18.23	554.39	-3.20

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5CD
CASING ELEV- 572.7

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	20.25	552.25	.00
OCT	17	744	-76	20.25	552.25	.00
OCT	17	1237	217	16.54	555.96	3.71
OCT	17	1631	451	16.00	556.50	4.25
OCT	17	2018	678	16.27	556.23	3.98
OCT	18	7	907	16.12	556.38	4.13
OCT	18	419	1159	15.62	556.88	4.63
OCT	18	858	1438	15.28	557.22	4.97
OCT	18	1221	1641	15.12	557.38	5.13
OCT	18	1706	1926	15.44	557.06	4.81
OCT	18	2001	2101	15.53	556.97	4.72
OCT	19	23	2363	15.54	556.96	4.71
OCT	19	420	2600	15.55	556.95	4.70
OCT	19	856	2876	15.53	556.97	4.72

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5CD
CASING ELEV- 572.7

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	15.53	556.97	.00
OCT	19	856	-124	15.53	556.97	.00
OCT	19	1232	92	15.65	556.85	-.12
OCT	19	1250	110	15.68	556.82	-.15
OCT	19	1302	122	15.70	556.80	-.17
OCT	19	1325	145	15.73	556.77	-.20
OCT	19	1345	165	15.76	556.74	-.23
OCT	19	1411	191	15.79	556.71	-.26
OCT	19	1516	256	15.88	556.62	-.35
OCT	19	1630	330	15.95	556.55	-.42
OCT	19	1651	351	15.99	556.51	-.46
OCT	20	1053	1433	16.43	556.07	-.90
OCT	21	1035	3035	16.58	555.92	-1.05

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5D
CASING ELEV- 571.3

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	18.22	552.88	.00
OCT	17	838	-22	18.22	552.88	.00
OCT	17	903	3	18.09	553.01	.13
OCT	17	910	10	16.85	554.25	1.37
OCT	17	914	14	16.10	555.00	2.12
OCT	17	917	17	15.80	555.30	2.42
OCT	17	924	24	15.42	555.68	2.80
OCT	17	933	33	15.18	555.92	3.04
OCT	17	942	42	15.06	556.04	3.16
OCT	17	1000	60	14.91	556.19	3.31
OCT	17	1021	81	14.74	556.36	3.48
OCT	17	1044	104	14.66	556.44	3.56
OCT	17	1120	140	14.52	556.58	3.70
OCT	17	1146	166	14.47	556.63	3.75
OCT	17	1228	208	14.47	556.63	3.75
OCT	17	1627	447	14.35	556.75	3.87
OCT	17	2028	688	14.69	556.41	3.53
OCT	18	2	902	14.30	556.80	3.92
OCT	18	418	1158	14.06	557.04	4.16
OCT	18	859	1439	13.86	557.24	4.36
OCT	18	1213	1633	13.97	557.13	4.25
OCT	18	1708	1928	13.93	557.17	4.29
OCT	18	2001	2101	14.37	556.73	3.85
OCT	19	21	2361	13.72	557.38	4.50
OCT	19	420	2600	13.58	557.52	4.64
OCT	19	856	2876	13.65	557.45	4.57

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5D
CASING ELEV- 571.3

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	13.65	557.45	.00
OCT	19	856	-124	13.65	557.45	.00
OCT	19	1152	52	16.22	554.88	-2.57
OCT	19	1230	90	16.77	554.33	-3.12
OCT	19	1251	111	16.90	554.20	-3.25
OCT	19	1305	125	16.93	554.17	-3.28
OCT	19	1331	151	17.02	554.08	-3.37
OCT	19	1349	0	17.09	554.01	-3.44
OCT	19	1408	188	17.14	553.96	-3.49
OCT	19	1514	254	17.32	553.78	-3.67
OCT	19	1628	328	17.44	553.66	-3.79
OCT	19	1653	353	17.48	553.62	-3.83
OCT	20	1015	1395	17.79	553.31	-4.14
OCT	20	1337	1597	18.14	552.96	-4.49
OCT	21	1028	2848	18.24	552.86	-4.59

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5F
CASING ELEV- 572.7

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	17.73	554.77	.00
OCT	17	837	-23	17.72	554.78	.01
OCT	17	901	1	17.73	554.77	.00
OCT	17	909	9	16.96	555.54	.77
OCT	17	913	13	16.62	555.88	1.11
OCT	17	916	16	16.43	556.07	1.30
OCT	17	923	23	16.22	556.28	1.51
OCT	17	932	32	16.07	556.43	1.66
OCT	17	941	41	15.98	556.52	1.75
OCT	17	959	59	15.88	556.62	1.85
OCT	17	1020	80	15.79	556.71	1.94
OCT	17	1043	103	15.73	556.77	2.00
OCT	17	1119	139	15.63	556.87	2.10
OCT	17	1145	165	15.61	556.89	2.12
OCT	17	1229	209	15.58	556.92	2.15
OCT	17	1641	461	15.33	557.17	2.40
OCT	17	2023	683	15.68	556.82	2.05
OCT	18	9	909	15.37	557.13	2.36
OCT	18	846	1426	14.86	557.64	2.87
OCT	18	1214	1634	15.25	557.25	2.48
OCT	18	1707	1927	15.46	557.04	2.27
OCT	18	2004	2104	15.83	556.67	1.90
OCT	19	902	2882	15.12	557.38	2.61

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 5F
CASING ELEV- 572.7

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	15.12	557.38	.00
OCT	19	902	-118	15.12	557.38	.00
OCT	19	1307	127	17.36	555.14	-2.24
OCT	19	1311	131	17.44	555.06	-2.32
OCT	19	1329	149	17.43	555.07	-2.31
OCT	19	1352	172	17.44	555.06	-2.32
OCT	19	1406	186	17.47	555.03	-2.35
OCT	19	1512	252	17.64	554.86	-2.52
OCT	19	1627	327	17.75	554.75	-2.63
OCT	19	1654	354	17.77	554.73	-2.65
OCT	20	1040	1420	17.86	554.64	-2.74
OCT	21	1034	2854	18.00	554.50	-2.88

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10A
CASING ELEV- 569.45

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	7.94	561.31	.00
OCT	17	834	-26	7.94	561.31	.00
OCT	17	924	24	7.93	561.32	.01
OCT	17	942	42	7.94	561.31	.00
OCT	17	953	53	7.94	561.31	.00
OCT	17	1009	69	7.94	561.31	.00
OCT	17	1054	114	7.94	561.31	.00
OCT	17	1107	127	7.95	561.30	-.01
OCT	17	1118	138	7.95	561.30	-.01
OCT	17	1132	152	7.96	561.29	-.02
OCT	17	1142	162	7.95	561.30	-.01
OCT	17	1201	181	7.96	561.29	-.02
OCT	17	1215	195	7.95	561.30	-.01
OCT	17	1736	516	7.88	561.37	.06
OCT	17	2101	721	7.96	561.29	-.02
OCT	18	38	938	8.00	561.25	-.06
OCT	18	430	1170	7.96	561.29	-.02
OCT	18	818	1398	7.95	561.30	-.01
OCT	18	1152	1612	7.97	561.28	-.03
OCT	18	1623	1883	8.01	561.24	-.07
OCT	18	1937	2077	8.08	561.17	-.14
OCT	18	2359	2339	8.08	561.17	-.14
OCT	19	400	2580	8.12	561.13	-.18
OCT	19	926	2906	8.10	561.15	-.16

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10A
CASING ELEV- 569.45

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	8.10	561.15	.00
OCT	19	926	-94	8.10	561.15	.00
OCT	19	1223	83	8.12	561.13	-.02
OCT	19	1238	98	8.22	561.03	-.12
OCT	19	1248	108	8.14	561.11	-.04
OCT	19	1309	129	8.10	561.15	.00
OCT	19	1328	148	8.12	561.13	-.02
OCT	19	1343	163	8.11	561.14	-.01
OCT	19	1359	179	8.13	561.12	-.03
OCT	19	1420	200	8.15	561.10	-.05
OCT	19	1508	248	8.17	561.08	-.07
OCT	19	1557	297	8.14	561.11	-.04
OCT	20	951	1371	8.09	561.16	.01
OCT	20	1301	1561	8.13	561.12	-.03
OCT	21	917	2777	8.13	561.12	-.03

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10C
CASING ELEV- 570.58

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	13.00	557.38	.00
OCT	17	823	-37	13.00	557.38	.00
OCT	17	929	29	12.97	557.41	.03
OCT	17	940	40	12.98	557.40	.02
OCT	17	954	54	12.98	557.40	.02
OCT	17	1007	67	12.98	557.40	.02
OCT	17	1055	115	12.99	557.39	.01
OCT	17	1105	125	13.00	557.38	.00
OCT	17	1120	140	13.00	557.38	.00
OCT	17	1130	150	13.00	557.38	.00
OCT	17	1144	164	13.01	557.37	-.01
OCT	17	1155	175	13.01	557.37	-.01
OCT	17	1218	198	13.01	557.37	-.01
OCT	17	1737	517	13.00	557.38	.00
OCT	17	2100	720	13.03	557.35	-.03
OCT	18	39	939	13.04	557.34	-.04
OCT	18	431	1171	13.02	557.36	-.02
OCT	18	819	1399	13.00	557.38	.00
OCT	18	1151	1611	13.03	557.35	-.03
OCT	18	1624	1884	13.03	557.35	-.03
OCT	18	1938	2078	13.05	557.33	-.05
OCT	18	2359	2339	13.01	557.37	-.01
OCT	19	400	2580	13.00	557.38	.00
OCT	19	926	2906	13.05	557.33	-.05

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10C
CASING ELEV- 570.58

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	13.05	557.33	.00
OCT	19	926	-94	13.05	557.33	.00
OCT	19	1224	84	13.10	557.28	-.05
OCT	19	1237	97	13.05	557.33	.00
OCT	19	1249	109	13.05	557.33	.00
OCT	19	1311	131	13.03	557.35	.02
OCT	19	1329	149	13.05	557.33	.00
OCT	19	1344	164	13.05	557.33	.00
OCT	19	1359	179	13.05	557.33	.00
OCT	19	1418	198	13.03	557.35	.02
OCT	19	1509	249	13.08	557.30	-.03
OCT	19	1556	296	13.05	557.33	.00
OCT	20	953	1373	12.88	557.50	.17
OCT	20	1259	1559	12.90	557.48	.15
OCT	21	915	2775	12.83	557.55	.22

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10D
CASING ELEV- 568.2

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	16.12	551.88	.00
OCT	17	825	-35	16.12	551.88	.00
OCT	17	920	20	15.84	552.16	.28
OCT	17	941	41	15.75	552.25	.37
OCT	17	952	52	15.70	552.30	.42
OCT	17	1008	68	15.66	552.34	.46
OCT	17	1053	113	15.53	552.47	.59
OCT	17	1106	126	15.49	552.51	.63
OCT	17	1117	137	15.45	552.55	.67
OCT	17	1132	152	15.42	552.58	.70
OCT	17	1143	163	15.40	552.60	.72
OCT	17	1155	175	15.38	552.62	.74
OCT	17	1216	196	15.33	552.67	.79
OCT	17	1740	520	15.69	552.31	.43
OCT	17	2058	718	15.85	552.15	.27
OCT	18	42	942	16.13	551.87	-.01
OCT	18	432	1172	16.28	551.72	-.16
OCT	18	820	1400	16.22	551.78	-.10
OCT	18	1150	1610	15.86	552.14	.26
OCT	18	1617	1877	15.73	552.27	.39
OCT	18	1937	2077	15.89	552.11	.23
OCT	19	1	2341	16.13	551.87	-.01
OCT	19	401	2581	16.44	551.56	-.32
OCT	19	927	2907	16.26	551.74	-.14

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10D
CASING ELEV- 568.2

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	16.26	551.74	.00
OCT	19	927	-93	16.26	551.74	.00
OCT	19	1220	80	16.42	551.58	-.16
OCT	19	1236	96	15.95	552.05	.31
OCT	19	1241	101	15.92	552.08	.34
OCT	19	1308	128	15.85	552.15	.41
OCT	19	1326	146	15.80	552.20	.46
OCT	19	1342	162	15.80	552.20	.46
OCT	19	1357	177	15.79	552.21	.47
OCT	19	1417	197	15.77	552.23	.49
OCT	19	1505	245	15.75	552.25	.51
OCT	19	1535	275	15.65	552.35	.61
OCT	20	955	1375	15.86	552.14	.40
OCT	20	1256	1556	15.76	552.24	.50
OCT	21	916	2776	16.15	551.85	.11

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10F
CASING ELEV- 567.5

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	9.55	557.75	.00
OCT	17	829	-31	9.55	557.75	.00
OCT	17	930	30	9.14	558.16	.41
OCT	17	943	43	9.06	558.24	.49
OCT	17	955	55	9.01	558.29	.54
OCT	17	1010	70	8.99	558.31	.56
OCT	17	1056	116	8.95	558.35	.60
OCT	17	1108	128	8.94	558.36	.61
OCT	17	1121	141	8.93	558.37	.62
OCT	17	1133	153	8.93	558.37	.62
OCT	17	1145	165	8.93	558.37	.62
OCT	17	1202	182	8.93	558.37	.62
OCT	17	1219	199	8.93	558.37	.62
OCT	17	1747	527	9.19	558.11	.36
OCT	17	2103	723	9.37	557.93	.18
OCT	18	816	1396	8.71	558.59	.84
OCT	18	1153	1613	8.94	558.36	.61
OCT	18	1619	1879	9.14	558.16	.41
OCT	18	1941	2081	9.74	557.56	-.19
OCT	19	930	2910	9.08	558.22	.47

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 10F
CASING ELEV- 567.5

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	9.08	558.22	.00
OCT	19	930	-90	9.08	558.22	.00
OCT	19	1222	82	9.81	557.49	-.73
OCT	19	1234	94	9.89	557.41	-.81
OCT	19	1252	112	9.90	557.40	-.82
OCT	19	1306	126	9.88	557.42	-.80
OCT	19	1327	147	9.89	557.41	-.81
OCT	19	1341	161	9.90	557.40	-.82
OCT	19	1358	178	9.89	557.41	-.81
OCT	19	1415	195	9.91	557.39	-.83
OCT	19	1509	249	10.02	557.28	-.94
OCT	19	1554	294	10.06	557.24	-.98
OCT	21	925	2785	9.74	557.56	-.66

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 14A
CASING ELEV- 572.24

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	7.55	564.49	.00
OCT	17	837	-23	7.55	564.49	.00
OCT	17	915	15	7.56	564.48	-.01
OCT	17	937	37	7.55	564.49	.00
OCT	17	947	47	7.55	564.49	.00
OCT	17	959	59	7.56	564.48	-.01
OCT	17	1047	107	7.55	564.49	.00
OCT	17	1101	121	7.56	564.48	-.01
OCT	17	1112	132	7.56	564.48	-.01
OCT	17	1126	146	7.56	564.48	-.01
OCT	17	1137	157	7.56	564.48	-.01
OCT	17	1150	170	7.56	564.48	-.01
OCT	17	1205	185	7.56	564.48	-.01
OCT	17	1600	420	7.57	564.47	-.02
OCT	17	2055	715	7.61	564.43	-.06
OCT	18	34	934	7.67	564.37	-.12
OCT	18	437	1177	7.65	564.39	-.10
OCT	18	824	1404	7.67	564.37	-.12
OCT	18	1200	1620	7.67	564.37	-.12
OCT	18	1630	1890	7.71	564.33	-.16
OCT	18	1945	2085	7.77	564.27	-.22
OCT	19	4	2344	7.74	564.30	-.19
OCT	19	404	2584	7.74	564.30	-.19
OCT	19	840	2860	7.78	564.26	-.23

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 14A
CASING ELEV- 572.24

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	7.78	564.26	.00
OCT	19	840	-140	7.78	564.26	.00
OCT	19	1230	90	7.81	564.23	-.03
OCT	19	1242	102	7.83	564.21	-.05
OCT	19	1302	122	7.99	564.05	-.21
OCT	19	1318	138	7.80	564.24	-.02
OCT	19	1337	157	7.79	564.25	-.01
OCT	19	1350	170	7.80	564.24	-.02
OCT	19	1408	188	7.80	564.24	-.02
OCT	19	1514	254	7.80	564.24	-.02
OCT	19	1620	320	7.84	564.20	-.06
OCT	20	1103	1443	7.82	564.22	-.04
OCT	20	1306	1566	7.84	564.20	-.06
OCT	21	1056	2876	7.90	564.14	-.12

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 14C
CASING ELEV- 570.3

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	17.60	552.50	.00
OCT	17	837	-23	17.60	552.50	.00
OCT	17	916	16	17.58	552.52	.02
OCT	17	935	35	17.56	552.54	.04
OCT	17	948	48	17.56	552.54	.04
OCT	17	959	59	17.56	552.54	.04
OCT	17	1049	109	17.55	552.55	.05
OCT	17	1100	120	17.56	552.54	.04
OCT	17	1113	133	17.56	552.54	.04
OCT	17	1125	145	17.55	552.55	.05
OCT	17	1138	158	17.55	552.55	.05
OCT	17	1149	169	17.55	552.55	.05
OCT	17	1207	187	17.55	552.55	.05
OCT	17	1601	421	17.47	552.63	.13
OCT	17	2056	716	17.44	552.66	.16
OCT	18	34	934	17.35	552.75	.25
OCT	18	437	1177	17.30	552.80	.30
OCT	18	825	1405	17.22	552.88	.38
OCT	18	1200	1620	17.13	552.97	.47
OCT	18	1630	1890	17.07	553.03	.53
OCT	18	1945	2085	17.01	553.09	.59
OCT	19	4	2344	16.94	553.16	.66
OCT	19	404	2584	16.89	553.21	.71
OCT	19	839	2859	16.80	553.30	.80

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 14C
CASING ELEV- 570.3

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	16.80	553.30	.00
OCT	19	839	-141	16.80	553.30	.00
OCT	19	1229	89	16.90	553.20	-.10
OCT	19	1243	103	16.84	553.26	-.04
OCT	19	1300	120	16.71	553.39	.09
OCT	19	1327	147	16.77	553.33	.03
OCT	19	1335	155	16.77	553.33	.03
OCT	19	1351	171	16.77	553.33	.03
OCT	19	1406	186	16.77	553.33	.03
OCT	19	1516	256	16.75	553.35	.05
OCT	19	1619	319	16.75	553.35	.05
OCT	20	1102	1442	16.53	553.57	.27
OCT	20	1307	1567	16.55	553.55	.25
OCT	21	1056	2876	16.44	553.66	.36

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15A
CASING ELEV- 571.25

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	2.90	568.15	.00
OCT	17	835	-25	2.90	568.15	.00
OCT	17	1001	61	2.95	568.10	-.05
OCT	17	1026	86	2.95	568.10	-.05
OCT	17	1059	119	2.95	568.10	-.05
OCT	17	1136	156	2.94	568.11	-.04
OCT	17	1214	194	2.95	568.10	-.05
OCT	17	1618	438	2.97	568.08	-.07
OCT	17	2009	669	2.93	568.12	-.03
OCT	18	46	946	2.95	568.10	-.05
OCT	18	442	1182	2.95	568.10	-.05
OCT	18	831	1411	2.95	568.10	-.05
OCT	18	1205	1625	2.95	568.10	-.05
OCT	18	1729	1949	3.00	568.05	-.10
OCT	18	1950	2090	3.00	568.05	-.10
OCT	19	13	2353	2.99	568.06	-.09
OCT	19	412	2592	2.97	568.08	-.07
OCT	19	847	2867	2.97	568.08	-.07

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15A
CASING ELEV- 571.25

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	2.97	568.08	.00
OCT	19	847	-133	2.97	568.08	.00
OCT	19	1231	91	2.95	568.10	.02
OCT	19	1620	320	2.98	568.07	-.01
OCT	20	1030	1410	3.07	567.98	-.10
OCT	20	1352	1612	3.04	568.01	-.07
OCT	21	1017	2837	3.10	567.95	-.13

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15CD
CASING ELEV- 570.7

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	21.62	548.88	.00
OCT	17	831	-29	21.62	548.88	.00
OCT	17	959	59	14.99	555.51	6.63
OCT	17	1004	64	14.95	555.55	6.67
OCT	17	1023	83	14.75	555.75	6.87
OCT	17	1056	116	14.56	555.94	7.06
OCT	17	1134	154	14.35	556.15	7.27
OCT	17	1211	191	14.27	556.23	7.35
OCT	17	1613	433	14.02	556.48	7.60
OCT	17	2004	664	14.39	556.11	7.23
OCT	18	47	947	13.91	556.59	7.71
OCT	18	444	1184	13.73	556.77	7.89
OCT	18	833	1413	13.52	556.98	8.10
OCT	18	1203	1623	13.77	556.73	7.85
OCT	18	1727	1947	14.14	556.36	7.48
OCT	18	1951	2091	14.50	556.00	7.12
OCT	19	10	2350	13.91	556.59	7.71
OCT	19	410	2590	13.82	556.68	7.80
OCT	19	845	2865	13.82	556.68	7.80

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15CD
CASING ELEV- 570.7

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	13.82	556.68	.00
OCT	19	845	-135	13.82	556.68	.00
OCT	19	1226	86	19.79	550.71	-5.97
OCT	19	1228	88	19.80	550.70	-5.98
OCT	19	1237	97	19.83	550.67	-6.01
OCT	19	1241	101	19.90	550.60	-6.08
OCT	19	1250	110	19.96	550.54	-6.14
OCT	19	1330	150	20.15	550.35	-6.33
OCT	19	1412	192	20.27	550.23	-6.45
OCT	19	1515	255	20.47	550.03	-6.65
OCT	19	1618	318	20.58	549.92	-6.76
OCT	20	1036	1416	21.52	548.98	-7.70
OCT	20	1353	1613	21.74	548.76	-7.92
OCT	21	1014	2834	22.37	548.13	-8.55

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15D
CASING ELEV- 568.3

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	14.18	553.92	.00
OCT	17	834	-26	14.18	553.92	.00
OCT	17	1002	62	11.55	556.55	2.63
OCT	17	1025	85	11.44	556.66	2.74
OCT	17	1057	117	11.32	556.78	2.86
OCT	17	1136	156	11.23	556.87	2.95
OCT	17	1213	193	11.23	556.87	2.95
OCT	17	1617	437	11.12	556.98	3.06
OCT	17	2007	667	11.51	556.59	2.67
OCT	18	46	946	11.05	557.05	3.13
OCT	18	443	1183	10.82	557.28	3.36
OCT	18	833	1413	10.58	557.52	3.60
OCT	18	1205	1625	10.88	557.22	3.30
OCT	18	1728	1948	11.33	556.77	2.85
OCT	18	1950	2090	11.75	556.35	2.43
OCT	19	12	2352	11.00	557.10	3.18
OCT	19	411	2591	10.90	557.20	3.28
OCT	19	846	2866	10.92	557.18	3.26

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15D
CASING ELEV- 568.3

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	10.92	557.18	.00
OCT	19	846	-134	10.92	557.18	.00
OCT	19	1225	85	13.70	554.40	-2.78
OCT	19	1227	87	13.71	554.39	-2.79
OCT	19	1231	91	13.71	554.39	-2.79
OCT	19	1242	102	13.82	554.28	-2.90
OCT	19	1249	109	13.80	554.30	-2.88
OCT	19	1331	151	13.89	554.21	-2.97
OCT	19	1413	193	13.99	554.11	-3.07
OCT	19	1516	256	14.13	553.97	-3.21
OCT	19	1618	318	14.27	553.83	-3.35
OCT	20	1035	1415	14.57	553.53	-3.65
OCT	20	1350	1610	14.80	553.30	-3.88
OCT	21	1018	2838	14.77	553.33	-3.85

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15F
CASING ELEV- 569.3

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	10.79	558.31	.00
OCT	17	830	-30	10.79	558.31	.00
OCT	17	1000	60	10.00	559.10	.79
OCT	17	1024	84	10.00	559.10	.79
OCT	17	1057	117	9.96	559.14	.83
OCT	17	1135	155	9.93	559.17	.86
OCT	17	1212	192	9.96	559.14	.83
OCT	17	1613	433	9.96	559.14	.83
OCT	17	2006	666	10.63	558.47	.16
OCT	18	49	949	9.93	559.17	.86
OCT	18	445	1185	9.70	559.40	1.09
OCT	18	834	1414	9.48	559.62	1.31
OCT	18	1204	1624	9.77	559.33	1.02
OCT	18	1727	1947	10.27	558.83	.52
OCT	18	1951	2091	10.73	558.37	.06
OCT	19	10	2350	9.97	559.13	.82
OCT	19	409	2589	9.83	559.27	.96
OCT	19	845	2865	9.77	559.33	1.02

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 15F
CASING ELEV- 569.3

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	9.77	559.33	.00
OCT	19	845	-135	9.77	559.33	.00
OCT	19	1223	83	10.95	558.15	-1.18
OCT	19	1226	86	10.97	558.13	-1.20
OCT	19	1228	88	10.98	558.12	-1.21
OCT	19	1237	97	10.99	558.11	-1.22
OCT	19	1241	101	11.02	558.08	-1.25
OCT	19	1248	108	11.05	558.05	-1.28
OCT	19	1329	149	11.13	557.97	-1.36
OCT	19	1411	191	11.19	557.91	-1.42
OCT	19	1514	254	11.34	557.76	-1.57
OCT	19	1616	316	11.42	557.68	-1.65
OCT	20	1037	1417	11.38	557.72	-1.61
OCT	20	1355	1615	12.16	556.94	-2.39
OCT	21	1016	2836	11.24	557.86	-1.47

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 16A
CASING ELEV- 572.33

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	17	900	0	7.64	564.49	.00
OCT	17	837	-23	7.64	564.49	.00
OCT	17	1029	89	7.67	564.46	-.03
OCT	17	1101	121	7.65	564.48	-.01
OCT	17	1140	160	7.71	564.42	-.07
OCT	17	1220	200	7.68	564.45	-.04
OCT	17	1422	322	7.66	564.47	-.02
OCT	17	2012	672	7.71	564.42	-.07
OCT	18	55	955	7.70	564.43	-.06
OCT	18	448	1188	7.67	564.46	-.03
OCT	18	841	1421	7.67	564.46	-.03
OCT	18	1207	1627	7.71	564.42	-.07
OCT	18	1735	1955	7.71	564.42	-.07
OCT	18	1955	2095	7.77	564.36	-.13
OCT	19	18	2358	7.75	564.38	-.11
OCT	19	416	2596	7.75	564.38	-.11
OCT	19	849	2869	7.74	564.39	-.10

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 16A
CASING ELEV- 572.33

D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
	START - DRAWDOWN					
OCT	19	1100	0	7.74	564.39	.00
OCT	19	849	-131	7.74	564.39	.00
OCT	19	1238	98	7.80	564.33	-.06
OCT	19	1616	316	7.78	564.35	-.04
OCT	20	1027	1407	7.82	564.31	-.08
OCT	20	1342	1602	7.81	564.32	-.07
OCT	21	1022	2842	7.78	564.35	-.04

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 16B
CASING ELEV- 572.90

RECOVERY

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
START - DRAWDOWN						
OCT	17	900	0	14.47	558.23	.00
OCT	17	838	-22	14.47	558.23	.00
OCT	17	1029	89	14.09	558.61	.38
OCT	17	1100	120	14.05	558.65	.42
OCT	17	1140	160	14.05	558.65	.42
OCT	17	1220	200	14.04	558.66	.43
OCT	17	1621	441	14.02	558.68	.45
OCT	17	2011	671	14.35	558.35	.12
OCT	18	55	955	14.05	558.65	.42
OCT	18	450	1190	13.90	558.80	.57
OCT	18	840	1420	13.77	558.93	.70
OCT	18	1207	1627	13.90	558.80	.57
OCT	18	1735	1955	14.21	558.49	.26
OCT	18	1955	2095	14.48	558.22	-.01
OCT	19	17	2357	14.00	558.70	.47
OCT	19	416	2596	14.00	558.70	.47
OCT	19	849	2869	13.94	558.76	.53

WOODWARD-CLYDE CONSULTANTS
RESULTS OF AQUIFER TEST
DUPONT-NIAGARA FALLS PLANT

WELL- 16B
CASING ELEV- 572.90

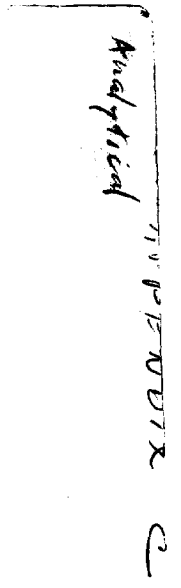
D R A W D O W N

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE
START - DRAWDOWN						
OCT	19	1100	0	13.94	558.76	.00
OCT	19	849	-131	13.94	558.76	.00
OCT	19	1238	98	14.59	558.11	-.65
OCT	19	1615	315	14.83	557.87	-.89
OCT	20	1343	1603	14.93	557.77	-.99
OCT	21	1022	2842	14.84	557.86	-.90

MONTH	DAY	TIME CLOCK	TIME ELAPSED	MEASURED DEPTH	WATER ELEV	ELEV CHANGE

APPENDIX

C



APPENDIX C

In order to assess the groundwater conditions in the vicinity of the Niagara Plant site, samples were obtained and analyzed from monitoring wells. Presented in Appendix C is the chemical analytical data generated for these investigations. The data is presented chronologically as follows:

Pages	Source
C-2 through C-9	Sampling of DEC wells
C-10 through C-12	Sampling of DuPont wells 1A-G, and 21A
C-13 through C-24	July, 1983 Sampling of Regolith wells
C-25 through C-27	July, 1983 Sampling of Production wells
C-28 through C-55	September, 1983 Sampling of DuPont wells
C-56 through C-82	October, 1983 Sampling of DuPont wells
C-83 through C-135	November, 1983 Sampling of DuPont wells
C-136 through C-156	December, 1983 Sampling of DuPont wells
C-157 through C-166	August, 1983 Sampling of DuPont wells

Additional chemistry data not generated specifically for these studies is identified in Appendix D, References.

§3C2104

bcc: ATGentilucci - C&P (W)
REAustin, Legal (W)
AJBoettler, C&P (W)
BGSchaeffer, Engg. (L)

Woodward-Clyde

E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
NIAGARA FALLS, N.Y. 14302

CHEMICALS AND PIGMENTS DEPARTMENT
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010

(3)

July 5, 1983

Mr. Peter J. Buechi
New York State Dept. of
Environmental Conservation
600 Delaware Avenue
Buffalo, NY 14202-1073

DU PONT SITE GROUNDWATER STUDY

Dear Mr. Buechi:

Attached is information which represents a status report on our site groundwater study through 6/28/83.

We have completed drilling all 21 of our planned regolith wells and have developed all but three of these wells. Updated drilling logs including yield data for the developed wells are included as Attachment 1. Completion of these wells is expected by 7/15/83 at which time sampling is expected to begin. Early sampling of the regolith wells, which represents a timing change to our analytical scope submitted 5/27/83, will decrease analytical lag time and allow more complete analysis of the sample data. No reduction in scope will occur and each well will be sampled first for the full priority pollutant scan and twice more for approved indicator compound analysis as indicated in the original scope.

Attachment 2 summarizes the analytical results of the three sets of samples taken from the DEC wells located along the Robert Moses Parkway. The results are consistent with sampling results reported by DEC which indicated that principle contaminants are volatile chlorinated organic compounds.

Attachment 3 summarizes the analytical results of the initial sampling of site wells 1-A through 1-G and regolith well 21-A. The results for the 7-well cluster, discounting well 1-G, show principle contaminants to be volatile chlorinated organics which are concentrated primarily in the upper aquifers. We believe these data support our position that the initial phase of our investigation should concentrate on identifying contamination levels and flows within the upper aquifers on the site.

Results from well 1-G must be discounted because subsequent testing of the well casing showed a leak present at a depth of about 13 feet. Attachment 4 details the results of packer tests conducted on well 1-G. Repairs to well 1-G will be attempted (details will be provided) and the casing retested. If sealing is not complete, a new well will be drilled to Rochester shale and 1-G will be sealed.

Please let me know if you need further information or have any questions.

Sincerely,

Timothy D. VanDomelen
Engineer - R&D

TDV:mrp
Attach.

	WELL 1	WELL 2				WELL 3				WELL 4			
Date	5/12/83	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12
Base/Neutrals ug/l													
Acenaphthene	No sample	-	-	-	-	-	-	-	<19*	-	-	-	-
Anthracene	"	-	-	-	<1.9*	-	-	-	-	-	-	-	-
Bis(2-Chloroethyl) ether	"	-	-	-	-	-	-	-	-	-	-	?	-
Bis(2-ethylhexyl) phthalate	No sample	22	-	-	-	-	-	-	-	17	-	-	-
Butylbenzylphthalate	No sample	-	-	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	No sample	-	<1.9*	-	-	4.8+	9.9	28	45	14	<1.9*	<1.9*	<1.9*
1,3-Dichlorobenzene	No sample	-	10	7.4	2.2	4.7+	6.2	19	34	20	<1.9*	3.8	2.4
1,4-Dichlorobenzene	No sample	-	6.2	5.0	<4.4*	-	<4.4*	12	<44	13	4.9	7.3	5.8
Diethylphthalate	No sample	10	-	-	-	2.5	-	-	-	10	-	-	-
Di-N-butyl-phthalate	No sample	9.9	-	-	-	-	-	-	-	23	-	-	-
Fluoranthene	No sample	-	<2.2*	-	<2.2*	-	<2.2*	12	<22	-	-	-	-
Fluorene	No sample	-	<1.9*	<1.9*	<1.9*	-	<1.9*	2.0	-	-	<1.9*	-	-
Hexachlorobenzene	No sample	-	-	-	-	-	3.4	26	52	-	?	-	-
Hexachlorobutadiene	No sample	-	-	-	-	15	25	760	920	-	<0.9*	<1.3*	-
Hexachlorocyclo-pentadiene	No sample	-	-	-	-	-	<25*	<25*	-	-	-	-	-
Hexachloroethane	No sample	-	-	-	-	280	370	2500	1600	-	-	-	-
Naphthalene	No sample	4.2+	-	-	-	-	-	?	<16	-	-	-	<1.6*
N-Nitrosodiphenyl-amine	No sample	-	-	-	-	-	-	-	-	-	-	-	-
Phenanthrene	No sample	-	-	-	<5.4*	-	-	6.0	<54	-	-	-	-
Pyrene	No sample	-	-	-	<1.9*	-	<1.9*	9.6	<19	-	-	-	-
1,2,4-Trichlorobenzene	No sample	-	<1.9*	<1.9*	<1.9*	72	110	490	640	22	3.4	5.0	3.5
25 Compounds not detected in any well													
Volatile u g/l													
Benzene	<4.4*	-	33	17	5.1	2,500	15	-	-	-	110	-	-
Carbon Tetrachloride	-	-	-	-	-	-	30	-	-	-	-	-	-
Chlorobenzene	<6.0*	1.2	12	14	<6.0*	510	29	-	-	460	<60*	-	-
Chloroethane	-	-	-	-	-	-	<10*	-	-	-	-	-	-
Chloroform	-	100	-	-	-	11,000	25,000	35,000	38,000	150,000	340,000	220,000	150,000
Chloromethane	-	-	-	-	-	-	<10*	-	-	-	-	-	-
1,1-Dichloroethane	-	-	7.9	8.1	<4.7*	-	18	-	-	-	47*	-	-
1,2-Dichloroethane	-	-	-	-	-	-	140	-	-	-	600	-	-
1,1-Dichloroethylene	-	-	<2.8*	<2.8*	<2.8*	-	-	-	-	-	140	-	<2,800*
Trans-1,2-Dichloro-ethylene	-	160	750	210	140	20,000	36,000	44,000	32,000	9,100	22,000	20,000	15,000
Ethylbenzene	-	-	<7.2*	<7.2*	<7.2*	-	< 7.2*	-	-	-	-	-	-
Methylene Chloride	-	-	-	-	-	2,200,000	4,000,000	2,900,000	3,000,000	120,000	140,000	91,000	62,000
1,1,2,2-Tetrachloro-ethane	-	39	<6.9*	6.2	<6.9*	310,000	220,000	260,000	260,000	11,000	91	-	-
Tetrachloroethylene	<4.1*	6.1	11	-	18	48,000	48,000	71,000	87,000	2,200	130	-	-
Toluene	-	28	11	11	<6.0*	820	< 6.0*	-	-	1,200	<60*	-	-
1,1,1-Trichloroethane	-	-	-	-	-	-	1,700	-	-	-	-	-	-
1,1,2-Trichloroethane	-	-	-	-	-	270	7,700	<25,000*	<25,000*	-	600	-	<5,000
Trichloroethylene	-	110	17	16	26	470,000	630,000	700,000	880,000	52,000	14,000	15,000	11,000
Trichlorofluoromethane	-	-	-	-	-	-	-	-	-	-	-	-	-
Vinyl Chloride	-	-	900	450	100	-	3,600	-	-	-	9,200	26,000	<10,000*

	WELL 1	WELL 2				WELL 3				WELL 4			
Date	5/12/83	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12
Pesticides/PCBs ug/l													
Aldrin	No sample	-	-	-	-	-	1.4	-	-	-	-	-	-
Heptachlor	"	-	-	-	-	-	-	-	-	-	.26	-	-
α - BHC	"	-	.46	.64	.59	35	360	1200	1000	-	2.1	8.1	4.9
β - BHC	"	-	.23	2.2	2.3	20	34	140	95	-	.32	<1	.93
γ - BHC	"	-	<0.8	19	<2	8.5	18	140	63	-	.33	.57	.19
δ - BHC	"	-	< .3	<0.5	.46	110	55	190	150	-	.12	.60	.24

12 Pesticides and 7 PCBs not detected in any well.

NOTES:

+, * = Estimated present at less than detection limit
NR = Not Reported
- = Not Detected
? = Possibly Detected

1/13 Sample analyzed by U.S. Geological Survey
Others analyzed for Du Pont by RECRA Research

	WELL 1	WELL 2				WELL 3				WELL 4			
Date	5/12/83	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12
pH NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Conductivity, u mhos	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature °C.	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Inorganic u g/l													
Antimony	670	1.3	45	< 20	230	.7	99	23	410	NR	150	38	97
Arsenic	89	NR	< 5	< 5	14	27	33	52	59	NR	45	79	17
Beryllium	< 5	<10	< 3	< 3	< 5	<10	< 3	< 3	<50	10	< 3	< 3	< 5
Cadmium	21	2	< 5	< 6	< 6	2	< 5	< 6	< 6	2	< 5	< 6	< 6
Chromium	304	10	34	10	34	5	26	28	< 41	5	28	12	< 5
Copper	412	7	30	14	112	5	34	70	110	1	124	38	< 3
Lead	1600	47	44	50	111	15	67	190	120	6	397	190	8
Mercury	3	NR	1.2	< .8	< .6	0.1	< .8	< .8	2	NR	< .8	< .8	< .6
Nickel	230	5	< 50	50	< 50	20	< 50	< 50	< 50	2	< 50	< 50	< 50
Selenium	< 5	NR	< 5	< 5	< 5	< 1	< 5	< 5	< 5	NR	< 5	< 5	< 5
Silver	< 8	< 1	< 6	< 30	< 8	< 1	< 6	< 5	< 8	< 1	< 6	< 5	< 8
Thallium	<10	NR	5	< 10	<10	NR	15	< 10	<10	NR	15	< 10	< 10
Zinc	97,000	2,500	13,000	3,700	19,000	9,200	18,000	9,900	8,100	3,600	60,000	65,000	4,200
Cyanide	< 10	130	1300	790	330	<10	51	70	120	3000	33	25	54
Total Phenolics	NA	NR	<10	<10	<10	NR	147	145	120	NR	14	19	<10
Acid/Phenolics ug/l													
2-Chlorophenol	No sample	-	-	-	-	-	< 3.3*	-	-	-	-	-	-
2,4-Dimethylphenol	No sample	-	-	-	-	-	-	-	-	-	-	<2.7*	-
4-Nitrophenol	No sample	-	-	-	3.7	-	-	-	-	-	-	-	-
Pentachlorophenol	No sample	-	15	< 3.6*	45	-	2400	270	39	-	260	95	18
Phenol	No sample	-	-	-	<1.5*	-	37	90	70	14	2.3	8.8	2.6
2,4,6-Trichlorophenol	No sample	-	-	-	-	-	< 2.7*	-	-	-	-	-	-

5 Other Compounds not detected in any well.

SOTaylor
9307C(095A)

DLC WELL RESULTS

	WELL 5				WELL 6			
Date	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12
pH	6.6	NA	NA	NA	7.7	NA	NA	NA
Conductivity, u mhos	2500	NA	NA	NA	627	NA	NA	NA
Temperature °C.	9.3	NA	NA	NA	8.0	NA	NA	NA
Inorganic u g/l								
Antimony	1.0	4.4	<20	< 20	1.3	34	<20	< 20
Arsenic	1	31	< 5	10	1	<5	< 5	32
Beryllium	NR	<3	< 3	< 5	<10	< 3	< 3	< 5
Cadmium	2	<5	< 6	51	3	< 5	< 6	27
Chromium	4	30	18	22	11	26	18	89
Copper	6	84	30	160	71	70	21	227
Lead	27	240	80	419	430	203	106	675
Mercury	5.9	<.8	<.8	< .6	0.1	<.8	<.8	<.7
Nickel	7	<50	<50	<50	10	<50	<50	< 50
Selenium	<1	<5	< 5	< 5	<1	<5	< 5	< 5
Silver	<1	< 6	11	< 8	<1	< 6	< 5	< 8
Thallium	NR	5	<10	<10	NR	< 5	<10	< 10
Zinc	2400	17000	3200	12000	520	14000	6100	12000
Cyanide	<10	1300	330	230	<10	<10	12	< 10
Total Phenolics	NR	<10	<10	< 10	NR	<10	<10	<10
Acid/Phenolics ug/l								
2-Chlorophenol	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	-	-	-	-	-	-	-	-
4-Nitrophenol	-	-	-	-	-	-	-	-
Pentachlorophenol	-	240	39	11	-	260	140	-
Phenol	-	-	-	<1.5*	-	-	<1.5*	1.6
2,4,6-Trichlorophenol	-	-	-	-	-	-	-	-

5 Other Compounds not detected in any well.

	WELL 5				WELL 6			
Date	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12
Base/Neutrals ug/l								
Acenaphthene	-							
Anthracene	-	-	-	-	-	-	-	-
Bis(2-Chloroethyl) ether	-	-	-	-	-	-	-	-
Bis(2-ethylhexyl) phthalate	-	-	-	-	7.1	-	-	-
Butylbenzylphthalate	29	-	-	-	-	-	-	-
1,2-Dichlorobenzene	-	<1.9*	-	-	-	-	-	-
1,3-Dichlorobenzene	-	<1.9*	-	<1.9*	-	-	-	-
1,4-Dichlorobenzene	-	<4.4*	-	<4.4*	-	-	-	-
Diethylphthalate	-	-	-	-	8.3	-	-	-
Di-N-butyl-phthalate	13	-	-	-	7.3	-	-	-
Fluoranthene	-	-	-	-	-	4.3	-	-
Fluorene	-	-	-	-	-	-	-	-
Hexachlorobenzene	-	-	-	-	-	1.9*	-	-
Hexachlorobutadiene	-	<0.9*	-	<0.9*	-	<0.9*	-	-
Hexachlorocyclo-pentadiene	-	-	-	-	-	-	-	-
Hexachloroethane	-	-	-	1.6*	-	-	-	-
Naphthalene	-	-	-	-	-	-	-	-
N-Nitrosodiphenyl-amine	-	-	-	-	-	<1.9*	-	-
Phenanthrene	-	-	-	-	-	-	-	-
Pyrene	-	-	-	-	-	11	-	-
1,2,4-Trichlorobenzene	-	<1.9*	-	-	-	?	<1.9*	-
25 Compounds not detected in any well								
Volatile u g/l								
Benzene	-	-	-	-	-	-	-	-
Carbon Tetrachloride	-	-	-	-	-	-	-	-
Chlorobenzene	4.3	-	-	-	-	-	-	-
Chloroethane	-	-	-	-	-	-	-	-
Chloroform	62	52	55	62	29	<1.6*	-	-
Chloromethane	-	-	-	-	-	-	-	-
1,1-Dichloroethane	-	-	-	-	-	-	-	-
1,2-Dichloroethane	-	-	-	-	-	-	-	-
1,1-Dichloroethylene	-	-	-	<2.8*	-	-	-	
Trans-1,2-Dichloro-ethylene	180	190	210	200	-	-	-	
Ethylbenzene	.64	-	-	-	3.9+	-	-	-
Methylene Chloride	2300	40	3.6	<2.8*	11	20	-	-
1,1,2,2-Tetrachloro-ethane	66	87	60	80	11	29	<6.9*	-
Tetrachloroethylene	13	43	33	38	1.7	16	<4.1*	
Toluene	2.8	-	-	-	1.1	-	-	-
1,1,1-Trichloroethane	-	-	2	-	-	-	-	-
1,1,2-Trichloroethane	-	-	<5.0*	<5.0*	-	-	-	-
Trichloroethylene	130	190	620	110	7.2	64	3.8	<1.9*
Trichlorofluoromethane	-	<10*	<10*	<10*	-	-	-	-
Vinyl Chloride	-	-	-	-	-	-	-	-

9 Volatiles not detected in any well

DEC WELL RESULTS

	WELL 5				WELL 6			
Date	1/13	3/30	4/6	5/12	1/13	3/30	4/6	5/12
Pesticides/PCBs ug/l								
Aldrin	-	-	-	-	-	-	-	-
Heptachlor	-	-	-	-	-	-	-	-
α - BHC	-	.27	1.3	.92	-	.20	.38	.43
β -BHC	-	.22	< 10	< 2	-	< .05	< 3	< 0.2
γ -BHC	-	23	130	< 1	-	< .1	2.3	.69
δ -BHC	-	< .5	< 10	< 0.5	-	< .05	< .5	.05

12 Pesticides and 7 PCBs not detected in any well.

NOTES:

+, * = Estimated present at less than detection limit
NR = Not Reported
- = Not Detected
? = Possibly Detected

1/13 Sample analyzed by U.S. Geological Survey
Others analyzed for Du Pont by RECRA Research

AREA 1 SAMPLE ANALYSIS 6/20/83

COMPOUND	CONCENTRATION (PPB)							
	1A	1B	1C	1D	1E	1F	1G	21A
Acid/Phenolics								
Phenol	3.6	5.7	-(1)	-	5.5	8.7	-	9.1
Base/Neutrals								
Bis (2-ethylhexyl) phthalate	-	-	-	-	-	-	200	-
Butylbenzylphthalate	-	-	-	-	-	-	46	-
1,2 Dichlorobenzene	(2)	52			4.7	5.9		
1,3 Dichlorobenzene	-	25			2.1	2.3	2.7	
1,4 Dichlorobenzene	-	14						
Hexachlorobenzene		3.3		-			-	
Hexachlorobutadiene	14	14	18			3.7	11	1.5
Hexachloroethane	15	71	56			2.0	22	
Naphthalene	2.1		-	-	2.0			1.7
N-Nitrosodiphenylamine		2.9	-	-	3.4	3.8	-	-
1,2,4-Trichlorobenzene	-	390	90	8.0	24	63	16	2.9
Pesticides/PCB's								
α - BHC	-	130	80	.89	.54	9.8	160	6.9
β - BHC	-	12	21	.19	.45	1.3	22	.30
δ - BHC	-	74	8.4	.12	.27	2.1	55	25
γ - BHC	-	150	100	1.1	.43	4.0	170	
Aldrin	-	-	3.0	.04	-	-	7.0	

AREA 1 SAMPLE ANALYSIS 6/20/83 (Cont'd)

OMPOUND	CONCENTRATION (PPB)							
	1A	1B	1C	1D	1E	1F	1G	21A
Volatiles								
enzene		6700	1300		34	45	860	-
arbon Tetrachloride	-	410	1800	-	-	-		-
hlorobenzene	-	600		-				-
hloroform	18000	2100	2000	-	9.1	14	970	-
,1 Dichloroethane	52	-		-	-	-		-
,2 Dichloroethane	94	-		-	-	-	-	-
,1 Dichloroethylene	290	1600	1800	-			150	650
rans-1,2-Dichloroethylene	23000	20000	14000	9000	340	100	8600	390000
ethylene Chloride	140000	60000	5100	550		-	7600	-
,1,2,2-Tetrachloroethane	13000	84000	-		-	-	-	1700
etrachloroethylene	42000	72000	79000	360	1100	2900	99000	4700
,1,1-Trichloroethane	200	260	230	-	-	-	1800	-
,1,2-Trichloroethane	320	2600	2500	-	-	-	480	-
richloroethylene	140000	42000	480000	2600	4600	4000	310000	360000
inyl Chloride	2400	2200	1400	790	50	50	50	5800

OMPOUND	CONCENTRATION (PPM)							
	1A	1B	1C	1D	1E	1F	1G	21A
Metals								
otal Zinc	.92	.40	.23	.36	.33	.40	1.30	.12
oluble Barium	.25	.30	.27	.35	.31	.23	.32	.33
otal Antimony	.034	.036			.036			.022
otal Arsenic								.008
otal Cadmium	.006		.026	.032			.009	
otal Copper	.015	.013	.018	.010	.015	.025	.047	.070
otal Lead	.010	.014			.006		.039	.027

AREA 1 SAMPLE ANALYSIS 6/20/83 (Cont'd)

COMPOUND	CONCENTRATION (PPM)							
	1A	1B	1C	1D	1E	1F	1G	21A
Other								
Total Recoverable Phenolics		.024	.019		.013	.023	.027	.051
Total Cyanide	.060	.54	1.50	.125			.012	.96
Total Non-Filterable Residue	24	92	110	58	190	65	440	140
Total Organic Carbon	13	30	23	30	12	15	26	30

Note: (1) (-) = Not Detected
(2) ( ) = Below Detectable Limit

Compounds below detectable limits or not detected in all wells are not listed.

9390C (160A)
TDV:nmw

CH-17 REV. 10 80

DUPONT
ESTABLISHED 1802
E. I. DU PONT DE NEMOURS & COMPANY
INCORPORATED
NIAGARA FALLS, N.Y. 14302

CHEMICALS AND PIGMENTS DEPARTMENT
RESEARCH & DEVELOPMENT DIVISION

bcc: ATGentilucci - C&P - Wilm.
REAustin - Legal - Wilm.
AJBoettler - C&P - Wilm.
RGSchaeffer - Engrg.-Louviers

bbcc: RNKnowles
AHSchultz
BJNorthan/File 056.3
RJGentilucci
(3) TDVanDomelen
File 010

September 2, 1983

Mr. Peter J. Buechi
New York State Department
of Environmental Conservation
600 Delaware Avenue
Buffalo, NY 14202-1073

Dear Mr. Buechi:

Du Pont Site Groundwater Study

Attached is information which represents a status report on our site groundwater study through September 1, 1983.

Well installation based on our May 2, 1983 plan was completed August 3 with drilling of well 1-J to Rochester shale. Well 1-G has been permanently sealed per the procedure provided to DEC. Split-spoon sampling of the overburden materials has been attempted at all of the 21 regolith well sites. Sample logs are included as Attachment 1.

The first of two planned pumping tests using the Olin Corporation cooling water wells as pumping wells was begun on August 25 and was completed September 1. A step increase of about 1500 GPM was achieved by Olin and this rate was held for a 5 day period. Level response for each of the bedrock monitor wells was recorded during the test period and for 2 days following shutdown of the second Olin pump. The data obtained must now be corrected for response to Niagara River level changes to determine true response to the pumping changes. River level response data will be collected over the next three weeks.

Attachment 2 summarizes the results of priority pollutant analysis for samples from the 21 regolith wells, except well 20-A. No sample could be obtained from 20-A because the well did not recharge sufficiently after being pumped dry. Results from the site bedrock wells were received August 31 from Recra Environmental Labortories. These results will be forwarded to DEC following a review of analytical procedures.

Attachment 3 summarizes the analytical results on bottom samples from the two out-of-service production wells located in the west plant. We believe the analytical results to be indicative of groundwater quality in the deeper aquifers ("D", "E" and "F") in the area of the wells.

Sampling of the 39 site monitor wells for indicator compound analysis is expected to begin September 7. The proposed indicator compound listing revised based on the initial sample results is included as Attachment 4. We would welcome a meeting with DEC personnel within the next week to discuss the analysis list and any potential revisions.

Included as Attachment 5 is the proposed plan to investigate potential off-site migration of contaminants along manmade passages crossing site boundries. This investigation plan should be considered as an addition to the overall site investigation plan submitted May 2, 1983.

Please let me know if you need further information or have any questions.

Sincerely,

TIMOTHY D. VANDOMELEN
Engineer - R&D

0924D (168A)
TDV:jrm
Attach.

ATTACHMENT 2

DuPont status report

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 1-A	2-A	3-A	4-A	5-A	6-A	7-A	8-A	9-A	10-A
ACID/PHENOLICS											
2-chlorophenol	3.3	-(1)	-	-	-	-	-	-	-	-	-
2,4-dichlorophenol	2.7	-	-	-	-	-	-	-	-	-	-
2,4-dimethylphenol	2.7	-	-	-	-	-	-	-	-	-	-
4,6-dinitro-o-cresol	24	-	-	-	-	-	-	-	-	-	-
2,4-dinitrophenol	42	-	-	-	-	-	-	-	-	-	-
2-nitrophenol	3.6	-	-	-	-	-	-	-	-	-	-
4-nitrophenol	2.4	-	-	-	-	-	-	-	-	-	-
p-chloro-m-cresol	3.0	-	-	-	-	-	-	-	-	-	-
phentachlorophenol	3.6	-	-	-	-	-	-	BMDL(2)	300	-	-
phenol	1.5	-	-	9.2	-	-	-	-	-	-	-
2,4,6-trichlorophenol	2.7	-	-	-	-	-	-	-	-	-	-
BASE/NEUTRALS											
acenaphthene	1.9	-	-	12	-	-	-	-	-	BMDL	-
acenaphthylene	3.5	-	-	8.2	-	-	-	-	-	-	-
anthracene	1.9	-	-	2.1	-	-	-	-	-	BMDL	-
benzidine	44	-	-	-	-	-	-	-	-	-	-
benzo(a)anthracene	7.8	-	-	-	-	-	-	-	-	BMDL	-
benzo(a)pyrene	2.5	-	-	-	-	-	-	-	-	BMDL	-
benzo(b)fluoranthene	4.8	-	-	-	-	-	-	-	-	BMDL	-
benzo(g,h,i)perylene	4.1	-	-	-	-	-	-	-	-	7.8	-
benzo(k)fluoranthene	2.5	-	-	-	-	-	-	-	-	-	-
bis(2-chloroethoxy)methane	5.3	-	-	-	-	-	-	-	-	-	-
bis(2-chloroethyl)ether	5.7	-	-	-	-	-	-	-	-	-	-
bis(2-chloroisopropyl)ether	5.7	-	-	-	-	-	-	-	-	-	-
bis(2-ethylhexyl)phthalate	2.5	-	-	-	-	-	-	-	-	-	-
4-bromophenylphenylether	1.9	-	-	-	-	-	-	-	-	-	-
butylbenzylphthalate	2.5	-	-	-	-	-	-	-	-	-	-
2-chloronaphthalene	1.9	-	-	-	-	-	-	-	-	-	-
4-chlorophenylphenylether	4.2	-	-	-	-	-	-	-	-	-	-
chrysene	2.5	-	-	-	-	-	-	-	-	9.5	-
dibenzo(a,h)anthracene	2.5	-	-	-	-	-	-	2.1	-	-	-
1,2-dichlorobenzene	1.9	-	-	-	-	-	-	2.8	-	BMDL	-
1,3-dichlorobenzene	1.9	-	-	-	-	-	-	-	-	BMDL	-
1,4-dichlorobenzene	4.4	-	-	-	BMDL	-	-	-	-	-	-
3,3'-dichlorobenzidine	16.5	-	-	-	-	-	-	-	-	-	-
diethylphthalate	22	-	-	-	-	-	-	-	-	-	-
dimethylphthalate	1.6	-	-	-	-	-	-	-	-	-	-
di-n-butylphtnalate	2.5	-	-	-	-	-	-	-	-	-	-
2,6-dinitrotoluene	1.9	-	-	-	-	-	-	-	-	-	-
2,4-dinitrotoluene	5.7	-	-	-	-	-	-	-	-	-	-
di-n-octylphthalate	2.5	-	-	-	-	-	-	-	-	-	-
1,2-diphenylhydrazine	25	-	-	-	-	-	-	-	-	-	-
fluoranthene	2.2	-	-	3.3	BMDL	-	-	-	-	-	-

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

PESTICIDES/PCB's COMPOUND	UNITS OF MEASURE	CONCENTRATION 1-A	2-A	3-A	4-A	5-A	6-A	7-A	8-A	9-A	10-A
Aldrin	ppb	(0.1) (9)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.5)	(0.05)
α-BHC	ppb	(0.1)	0.05	0.05	0.03	0.02	(0.01)	0.03	(0.01)	(0.5)	(0.05)
β-BHC	ppb	(0.2)	(0.01)	(0.01)	0.03	(0.01)	(0.01)	(0.01)	(0.1)	(0.5)	(0.05)
δ-BHC	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.5)	(0.05)
γ-BHC	ppb	(0.1)	(0.01)	0.02	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.5)	(0.05)
Chlordane	ppb	(0.5)	(0.1)	(0.1)	(0.1)	(0.1)	(0.01)	(0.01)	(1)	(5)	(0.5)
4,4'-DDD	ppb	(0.1)	(0.01)	(0.01)	0.19	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
4,4'-DDE	ppb	(0.1)	(0.01)	(0.01)	0.16	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
4,4'-DDT	ppb	(0.2)	(0.01)	(0.01)	0.04	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
Dieldrin	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
α-Endosulfan	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
β-Endosulfan	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
Endosulfan sulfate	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
Endrin	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
Endrin aldehyde	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
Heptachlor	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
Heptachlor epoxide	ppb	(0.1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.1)	(0.1)	(0.1)	(0.5)	(0.05)
PCB-1016	ppb	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.2)	(2)	(4)	(0.2)
PCB-1221	ppb	(1)	(0.4)	(0.4)	(0.4)	(0.4)	(0.2)	(0.4)	(4)	(8)	(0.4)
PCB-1232	ppb	(1)	(0.4)	(0.4)	(0.4)	(0.4)	(0.2)	(0.4)	(4)	(8)	(0.4)
PCB-1242	ppb	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.2)	(2)	(4)	(0.2)
PCB-1248	ppb	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.2)	(2)	(4)	(0.2)
PCB-1254	ppb	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.2)	(2)	(4)	(0.2)
PCB-1260	ppb	(0.5)	(0.2)	(0.2)	(0.2)	(0.2)	(0.1)	(0.2)	(2)	(4)	(0.2)
Toxaphene	ppb	(0.5)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(1)	(5)	(0.5)

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

PESTICIDES/PCB's COMPOUND	UNITS OF MEASURE	CONCENTRATION 11-A	12-A	13-A	14-A	15-A	16-A	17-A	18-A	19-A	21-A
Aldrin	ppb	(0.05)	(0.05)	(0.01)	(5)	(0.05)	(0.1)	(0.1)	(5)	0.02	(0.01)
α-BHC	ppb	(0.05)	0.05	(0.01)	(5)	(0.05)	0.39	0.32	(5)	0.05	(0.01)
β-BHC	ppb	(0.05)	(0.05)	(0.01)	(10)	0.20	(0.1)	(0.1)	24	0.24	(0.01)
δ-BHC	ppb	(0.05)	(0.05)	(0.01)	(5)	(0.05)	(0.1)	(0.1)	(5)	(0.01)	(0.01)
γ-BHC	ppb	(0.05)	(0.05)	(0.01)	(5)	(0.05)	0.13	0.31	(5)	0.01	(0.01)
Chlordane	ppb	(0.5)	(0.5)	(0.01)	(10)	(0.5)	(1)	(1)	(5)	(0.1)	(0.1)
4,4'-DDD	ppb	(0.05)	(0.05)	(0.1)	(5)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
4,4'-DDE	ppb	(0.05)	(0.1)	(5)	(0.05)	(0.1)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
4,4'-DDT	ppb	(0.05)	(0.05)	(0.1)	(5)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
Dieldrin	ppb	(0.05)	(0.05)	(0.1)	(5)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
α-Endosulfan	ppb	(0.05)	(0.05)	(0.1)	(5)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
β-Endosulfan	ppb	(0.05)	(0.05)	(0.1)	(1)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
Endosulfan sulfate	ppb	(0.05)	(0.05)	(0.1)	(1)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
Endrin	ppb	(0.05)	(0.05)	(0.1)	(1)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
Endrin aldehyde	ppb	(0.05)	(0.05)	(0.1)	(1)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
Heptachlor	ppb	(0.05)	(0.05)	(0.1)	(5)	(0.05)	(0.1)	0.72	(1)	(0.01)	(0.01)
Heptachlor epoxide	ppb	(0.05)	(0.05)	(0.1)	(5)	(0.05)	(0.1)	(0.1)	(1)	(0.01)	(0.01)
PCB-1016	ppb	(1)	(0.5)	(0.2)	(10)	(0.5)	(1)	(1)	(5)	(0.5)	(0.2)
PCB-1221	ppb	(2)	(1)	(0.4)	(20)	(1)	(2)	(2)	(10)	(1)	(0.4)
PCB-1232	ppb	(2)	(1)	(0.4)	(20)	(1)	(2)	(2)	(10)	(1)	(0.4)
PCB-1242	ppb	(1)	(0.5)	(0.2)	(10)	(0.5)	(1)	(1)	(5)	(0.5)	(0.2)
PCB-1248	ppb	(1)	(0.5)	(0.2)	(10)	(0.5)	(1)	(1)	(5)	(0.5)	(0.2)
PCB-1254	ppb	(1)	(0.5)	(0.2)	(10)	(0.5)	(1)	(1)	(5)	(0.5)	(0.2)
PCB-1260	ppb	(1)	(0.5)	(0.2)	(10)	(0.5)	(1)	(1)	(5)	(0.5)	(0.2)
Toxaphene	ppb	(0.5)	(0.5)	(0.1)	(10)	(0.5)	(1)	(1)	(5)	(0.1)	(0.1)

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

METALS COMPOUND	UNITS OF MEASURE	CONCENTRATION 1-A	2-A	3-A	4-A	5-A	6-A	7-A	8-A	9-A	10-A
Total Antimony	mg/l	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	0.024	(0.02)	(0.02)
Total Arsenic	mg/l	(0.005)	0.006	0.006	0.006	(0.005)	(0.005)	0.014	0.011	0.006	0.011
Total Beryllium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Cadmium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	0.010	0.163	0.006	(0.005)
Total Chromium	mg/l	(0.004)	(0.004)	(0.004)	(0.004)	0.092	(0.004)	0.006	0.048	0.030	0.004
Total Copper	mg/l	0.010	0.008	0.008	0.008	0.052	(0.004)	0.004	0.458	0.014	0.008
Total Lead	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	0.033	(0.005)	(0.005)	0.259	(0.005)	(0.005)
Total Mercury	mg/l	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Total Nickel	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	0.042	0.103	0.005
Total Selenium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Silver	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Thallium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Zinc	mg/l	0.064	1.9	0.102	0.057	0.219	0.065	0.099	0.698	0.086	0.136
Soluble Barium	mg/l	(0.05)	(0.05)	0.08	0.74	0.19	(0.05)	(0.05)	0.10	(0.05)	0.17
OTHER COMPOUND											
Total Non-Filterable Residue (130°C)	mg/l	4.6	22	23	2.0	210	28	72	72	68	18
Total Organic Carbon	mg/l	13	5.0	9.0	18	13	26	16	720	420	12
Total Recoverable Phenolics	mg/l	0.012	0.01	0.017	(0.01)	(0.01)	(0.01)	(0.01)	2.8	(0.01)	(0.01)
Total Cyanide	mg/l	0.059	0.024	3.3	0.016	0.088	0.024	1.3	37	0.62	0.021

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

METALS COMPOUND	UNITS OF MEASURE	CONCENTRATION 11-A	12-A	13-A	14-A	15-A	16-A	17-A	18-A	19-A	21-A
Total Antimony	mg/l	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Total Arsenic	mg/l	(0.005)	0.007	(0.005)	(0.005)	0.007	(0.005)	(0.005)	0.009	(0.005)	(0.005)
Total Beryllium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Cadmium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	0.009	(0.005)	0.006	(0.005)	(0.005)
Total Chromium	mg/l	0.018	0.007	(0.004)	0.008	0.032	0.016	(0.005)	0.118	0.018	0.026
Total Copper	mg/l	0.022	0.007	0.006	0.032	6.6	0.024	0.014	0.198	0.076	0.021
Total Lead	mg/l	(0.055)	0.005	0.006	0.032	0.022	0.012	(0.005)	0.270	0.234	0.005
Total Mercury	mg/l	(0.001)	(0.001)	(0.001)	0.001	(0.001)	0.022	(0.001)	0.001	(0.001)	(0.001)
Total Nickel	mg/l	0.006	0.006	(0.005)	0.050	0.028	0.017	0.007	0.099	0.030	(0.005)
Total Selenium	mg/l	(0.005)	(0.005)	(0.005)	0.010	0.016	(0.005)	(0.005)	0.006	(0.005)	0.006
Total Silver	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Thallium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Zinc	mg/l	0.171	0.073	0.153	0.257	0.331	0.072	0.074	2.3	1.1	0.100
Soluble Barium	mg/l	(0.05)	(0.05)	(0.05)	(0.05)	0.19	0.05	0.06	0.07	(0.05)	(0.05)
OTHER COMPOUND											
Total Non-Filterable Residue (103°C)	mg/l	16	57	19	150	260	41	5.2	540	4.8	12
Total Organic Carbon	mg/l	9.5	14	17	22	10	45	5.1	23	22	54
Total Recoverable Phenolics	mg/l	(0.01)	(0.01)	0.049	0.012	(0.01)	0.037	(0.01)	0.038	(0.01)	0.050
Total Cyanide	mg/l	0.044	0.010	0.044	0.036	9.6	40	(0.02)	0.041	0.081	0.56

(1) Not detected
(2) Below Method Detection Limit
(3) Method Detection Limit x 100
(4) Method Detection Limit x 10
(5) Method Detection Limit x 2
(6) Method Detection Limit x 5
(7) Method Detection Limit x 50
(8) Method Detection Limit x 20
(9) DMDL - Method Detection Limit in parentheses

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

BASE/NEUTRALS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 1-A	2-A	3-A	4-A	5-A	6-A	7-A	8-A	9-A	10-A
fluorene	1.9	BMDL	-	16	BMDL	-	-	-	-	-	-
hexachlorobenzene	1.9	-	-	-	-	-	-	-	-	-	-
hexachlorobutadiene	0.9	2.8	BMDL	-	BMDL	-	-	-	-	-	-
hexachlorocyclopentadiene	25	-	-	-	-	-	-	-	-	-	-
hexachloroethane	1.6	-	-	-	-	-	-	-	-	-	-
indeno (1,2,3-cd)pyrene	3.7	-	-	-	-	-	-	-	-	10	-
isophorone	2.2	-	-	-	-	-	-	-	-	-	-
naphthalene	1.6	BMDL	BMDL	100	BMDL	-	-	-	5.9	2.7	-
nitrobenzene	1.9	-	-	-	-	-	-	-	-	-	-
N-nitrosodimethylamine	25	-	-	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	25	-	-	-	-	-	-	-	-	-	-
N-nitrosodiphenylamine	1.9	-	-	-	-	-	-	-	-	-	-
phenanthrene	5.4	-	-	22	BMDL	-	-	-	-	BMDL	-
pyrene	1.9	-	-	BMDL	BMDL	-	-	-	-	-	-
1,2,4-trichlorobenzene	1.9	BMDL	-	-	-	-	-	-	-	2.1	-

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

ACID/PHENOLICS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 11-A	12-A	13-A	14-A	15-A	16-A	17-A	18-A	19-A	21-A
2-chlorophenol	3.3	-	-	-	-	-	-	-	-	-	-
2,4-dichlorophenol	2.7	-	-	-	-	-	-	-	-	-	-
2,4-dimethylphenol	2.7	-	-	-	-	-	BMDL	-	3.7	-	-
4,6-dinitro-o-cresol	24	-	-	-	-	-	-	-	-	-	-
2,4-dinitrophenol	42	-	-	-	-	-	-	-	-	-	-
2-nitrophenol	3.6	-	-	-	-	-	-	-	-	-	-
4-nitrophenol	2.4	-	-	-	-	-	-	-	-	-	-
p-chloro-m-cresol	3.0	-	-	-	-	-	-	-	-	-	-
pentachlorophenol	3.6	-	-	-	4.6	-	-	-	35	-	-
phenol	1.5	-	-	5.4	-	-	12	-	-	-	4.1
2,4,6-trichlorophenol	2.7	-	-	-	-	-	2.7	-	16	BMDL	-
BASE/NEUTRALS											
COMPOUND											
acenaphthene	1.9	-	BMDL	3.5	-	-	4.3	-	-	BMDL	BMDL
acenaphthylene	3.5	-	-	-	-	-	BMDL	-	-	-	-
anthracene	1.9	-	-	BMDL	-	-	-	-	-	-	-
benzidine	44	-	-	-	-	-	-	-	-	-	-
benzo(a)anthracene	7.8	-	-	-	-	-	-	-	-	-	-
benzo(a)pyrene	2.5	-	-	-	-	-	-	-	-	-	-
benzo(b)fluoranthene	4.8	-	-	-	-	-	-	-	-	-	-
benzo(g,h,i)perylene	4.1	-	-	-	-	-	-	-	-	-	-
benzo(k)fluoranthene	2.5	-	-	-	-	-	-	-	-	-	-
bis(2-chloroethoxy)methane	5.3	-	-	-	-	-	-	-	-	-	-
bis(2-chloroethyl)ether	5.7	-	-	-	-	-	-	-	-	-	-
bis(2-chloroisopropyl)ether	5.7	-	-	-	-	-	-	-	-	-	BMDL
bis(2-ethylhexyl)phthalate	2.5	-	-	-	-	-	-	-	-	-	-
4-bromophenylphenylether	1.9	-	-	-	-	-	-	-	-	-	-
butylbenzylphthalate	2.5	-	-	-	-	-	-	-	-	-	-
2-chloronaphthalene	1.9	-	-	-	-	-	-	-	-	-	-
4-chlorophenylphenylether	4.2	-	-	-	-	-	-	-	-	-	-
chrysene	2.5	-	-	-	-	-	-	-	-	-	-
dibenzo(a,h)anthracene	2.5	-	-	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	1.9	BMDL	BMDL	-	-	-	-	BMDL	3.0	-	-
1,3-dichlorobenzene	1.9	-	-	-	-	-	BMDL	-	BMDL	-	-
1,4-dichlorobenzene	4.4	BMDL	BMDL	-	-	-	-	-	18	-	BMDL
3,3'-dichlorobenzidine	16.5	-	-	-	-	-	-	-	-	-	-
diethylphthalate	22	-	-	-	-	-	-	-	-	-	-
dimethylphthalate	1.6	-	-	-	-	-	-	-	-	-	-
di-n-butylphthalate	2.5	-	-	-	-	-	-	-	-	-	-
2,6-dinitrotoluene	1.9	-	-	-	-	-	-	-	-	-	-
2,4-dinitrotoluene	5.7	-	-	-	-	-	-	-	-	-	-
di-n-octylphthalate	2.5	-	-	-	-	-	-	-	-	-	-
1,2-diphenylhydrazine	25	-	-	-	-	-	-	-	-	-	-
fluoranthene	2.2	-	-	2.7	-	-	3.3	-	-	-	-
fluorene	1.9	-	BMDL	2.4	-	BMDL	6.6	-	-	BMDL	BMDL

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

BASE/NEUTRALS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 11-A	12-A	13-A	14-A	15-A	16-A	17-A	18-A	19-A	21-A
hexachlorobenzene	1.9	-	-	-	9.0	-	-	-	BMDL	-	-
hexachlorobutadiene	0.9	BMDL	BMDL	-	710	-	BMDL	BMDL	-	-	1.8
hexachlorocyclopentadiene	25	-	-	-	-	-	-	-	-	-	-
hexachloroethane	1.6	BMDL	BMDL	-	880	1.8	-	-	-	-	-
indeno (1,2,3-cd) pyrene	3.7	-	-	-	-	-	-	-	-	-	-
isophorone	2.2	-	-	-	-	-	-	-	-	-	-
naphthalene	1.6	-	-	13	BMDL	-	54	-	-	-	2.6
nitrobenzene	1.9	-	-	-	-	-	-	-	-	-	-
N-nitrosodimethylamine	25	-	-	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	25	-	-	-	-	-	-	-	-	-	-
N-nitrosodiphenylamine	1.9	-	-	-	-	-	-	-	BMDL	-	-
phenanthrene	5.4	-	-	BMDL	-	BMDL	16	-	-	-	-
pyrene	1.9	-	-	BMDL	-	-	2.3	-	-	-	-
1,2,4-trichlorobenzene	1.9	-	-	BMDL	-	-	-	BMDL	BMDL	-	BMDL

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

VOLATILES COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 1-A	2-A	3-A	4-A	5-A	6-A	7-A	8-A	9-A	10-A
acrolein	400	-	-(3)	-(4)	-(5)	-	-	-	BMDL(6)	-(6)	-(6)
acrylonitrile	400	-	-	-	-	-	-	-	-	-	-
benzene	4.4	BMDL	-	-	BMDL	BMDL	BMDL	BMDL	4,000	24	BMDL
bromodichloromethane	2.2	-	-	-	-	-	-	-	-	-	-
bromoform	4.7	-	-	-	-	-	-	-	-	-	-
bromomethane	10	-	-	-	-	-	-	-	-	-	-
carbon tetrachloride	2.8	-	-	-	-	-	-	-	-	-	-
chlorobenzene	6.0	-	-	-	-	-	-	7.7	-	-	BMDL
chloroethane	10	-	-	-	-	-	-	-	-	-	-
2-chloroethylvinyl ether	10	-	-	-	-	-	-	-	-	-	-
chloroform	1.6	11,000	1,600	21	-	-	3.5	-	-	-	-
chloromethane	10	-	-	-	-	-	-	-	-	110	-
dibromochloromethane	3.1	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	4.7	20	-	-	BMDL	5.7	6.6	-	-	-	42
1,2-dichloroethane	2.8	32	-	-	-	-	-	-	-	-	-
1,1-dichloroethylene	2.8	140	-	-	-	21	-	-	1,400	19	-
trans-1,2-dichloroethylene	1.6	32,000	19,000	3,900	290	760	1.9	1.6	12,000	1,200	180
1,2-dichloropropane	6.0	-	-	-	-	-	-	-	BMDL	-	-
1,3-dichloropropene	5.0	-	-	-	-	-	-	-	-	-	-
ethylbenzene	7.2	-	-	-	-	-	-	-	36	BMDL	-
methylene chloride	2.8	46,000	9,600	-	-	-	14	-	20	-	-
1,1,2,2-tetrachloroethane	6.9	2,900	-	-	BMDL	-	-	-	-	-	-
tetrachloroethylene	4.1	17,000	BMDL	-	-	32	-	-	BMDL	BMDL	-
toluene	6.0	BMDL	-	-	-	BMDL	-	-	900	52	-
1,1,1-trichloroethane	3.8	130	-	-	-	1,100	-	-	-	-	60
1,1,2-trichloroethane	5.0	160	-	-	BMDL	-	-	-	-	-	-
trichloroethylene	1.9	62,000	4,000	BMDL	14	52	-	-	150	160	-
vinyl chloride	10	2,600	4,400	680	430	690	220	-	730	930	120
		1 - 112		4601	734	2661	246	9	19236	2495	402
		38600									

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

VOLATILES COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 11-A	12-A	13-A	14-A	15-A	16-A	17-A	18-A	19-A	21-A
acrolein	400	-(6)	-	-(7)	-(7)	-(7)	-(7)	-	-	-(8)	-(6)
acrylonitrile	400	-	-	-	-	-	-	-	-	-	-
benzene	4.4	BMDL	BMDL	-	-	-	-	-	82	-	-
bromodichloromethane	2.2	-	-	-	-	-	-	-	-	-	-
bromoform	4.7	-	-	-	-	-	-	-	-	-	-
bromomethane	10	-	-	-	-	-	-	-	-	-	-
carbon tetrachloride	2.8	-	-	-	-	-	-	-	-	-	-
chlorobenzene	6.0	BMDL	-	-	-	-	-	-	17	-	-
chloroethane	10	-	-	-	-	-	-	-	BMDL	-	-
2-chloroethylvinyl ether	10	-	-	-	-	-	-	-	-	-	-
chloroform	1.6	-	-	270,000	460	14,000	220	-	-	120	26
chloromethane	10	-	-	-	-	-	-	-	-	-	-
dibromochloromethane	3.1	-	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	4.7	BMDL	-	-	-	-	-	-	85	-	-
1,2-dichloroethane	2.8	-	-	150	-	-	BMDL	-	-	-	-
1,1-dichloroethylene	2.8	-	-	160	380	-	-	-	-	-	280
trans-1,2-dichloroethylene	1.6	960	14	14,000	4,200	BMDL	610	1.8	45	140	39,000
1,2-dichloropropane	6.0	-	-	-	-	-	-	-	-	-	-
1,3-dichloropropene	5.0	-	-	-	-	-	-	-	-	-	-
ethylbenzene	7.2	-	-	-	-	-	-	-	17	-	-
methylene chloride	2.8	-	-	6,800	-	2,500	-	-	-	-	-
1,1,2,2-terrachloroethane	6.9	-	-	510	92,000	-	-	-	-	-	1,600
tetrachloroethylene	4.1	-	BMDL	17,000	56,000	1,100	BMDL	14	BMDL	82	2,200
toluene	6.0	-	-	-	-	-	-	-	10	-	-
1,1,1-trichloroethane	3.8	-	-	-	BMDL	-	680	-	4.8	-	-
1,1,2-trichloroethane	5.0	-	-	880	1,200	BMDL	-	-	-	-	110
trichloroethylene	1.9	-	3.6	30,000	140,000	2,000	6,400	2.4	2.0	180	24,000
vinyl chloride	10	600	28	2,600	-	-	-	-	32	-	4,000
		1560	45.6	342100	299740	17600	7910	18	295	542	71216

0056D

ATTACHMENT 3

2 Sept 1983
DuPont Status Report

SITE GROUNDWATER INVESTIGATION

PRODUCTION WELL PRIORITY POLLUTANT ANALYSIS

ACID/PHENOLICS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) PW-18	PW-24
2-chlorophenol	3.3	-(1)	-
2,4-dichlorophenol	2.7	-	-
2,4-dimethylphenol	2.7	-	-
4,6-dinitro-o-cresol	24	-	-
2,4-dinitrophenol	42	-	-
2-nitrophenol	3.6	-	-
4-nitrophenol	2.4	-	-
p-chloro-m-cresol	3.0	-	-
phentachlorophenol	3.6	4.3	-
phenol	1.5	-	-
2,4,6-trichlorophenol	2.7	-	-
BASE/NEUTRALS			
COMPOUND			
acenaphthene	1.9	-	-
acenaphthylene	3.5	-	-
anthracene	1.9	-	-
benzidine	44	-	-
benzo(a)anthracene	7.8	-	-
benzo(a)pyrene	2.5	-	-
benzo(b)fluoranthene	4.8	-	-
benzo(g,h,i)perylene	4.1	-	-
benzo(k)fluoranthene	2.5	-	-
bis(2-chloroethoxy)methane	5.3	-	-
bis(2-chloroethyl)ether	5.7	-	-
bis(2-chloroisopropyl)ether	5.7	-	-
bis(2-ethylhexyl)phthalate	2.5	-	-
4-bromophenylphenylether	1.9	-	-
butylbenzylphthalate	2.5	-	-
2-chloronaphthalene	1.9	-	-
4-chlorophenylphenylether	4.2	-	-
chrysene	2.5	-	-
dibenzo(a,h)anthracene	2.5	-	-
1,2-dichlorobenzene	1.9	-	-
1,3-dichlorobenzene	1.9	-	-
1,4-dichlorobenzene	4.4	-	-
3,3'-dichlorobenzidine	16.5	-	-
diethylphthalate	22	-	-
dimethylphthalate	1.6	-	-
di-n-butylphthalate	2.5	-	-
2,6-dinitrotoluene	1.9	-	-
2,4-dinitrotoluene	5.7	-	-
di-n-octylphthalate	2.5	-	-
1,2-diphenylhydrazine	25	-	-
fluoranthene	2.2	-	-

0925D

SITE GROUNDWATER INVESTIGATION

PRODUCTION WELL PRIORITY POLLUTANT ANALYSIS

ACID/PHENOLICS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) PW-18	PW-24
fluorene	1.9	-	-
hexachlorobenzene	1.9	-	-
hexachlorobutadiene	0.9	BMDL(2)	BMDL
hexachlorocyclopentadiene	25	-	-
hexachloroethane	1.6	BMDL	-
indeno (1,2,3-cd)pyrene	3.7	-	-
isophorone	2.2	-	-
naphthalene	1.6	-	-
nitrobenzene	1.9	-	-
N-nitrosodimethylamine	25	-	-
N-nitrosodi-n-propylamine	25	-	-
N-nitrosodiphenylamine	1.9	-	-
phenanthrene	5.4	-	-
pyrene	1.9	-	-
1,2,4-trichlorobenzene	1.9	BMDL	BMDL

0925D

SITE GROUNDWATER INVESTIGATION

PRODUCTION WELL PRIORITY POLLUTANT ANALYSIS

VOLATILES COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) PW-18	PW-24
acrolein	400	-	-(1)
acrylonitrile	400	-	-
benzene	4.4	BMDL	-
bromodichloromethane	2.2	-	-
bromoform	4.7	-	-
bromomethane	10	-	-
carbon tetrachloride	2.8	-	-
chlorobenzene	6.0	-	-
chloroethane	10	-	-
2-chloroethylvinyl ether	10	-	-
chloroform	1.6	69	-
chloromethane	10	-	-
dibromochloromethane	3.1	-	-
1,1-dichloroethane	4.7	-	-
1,2-dichloroethane	2.8	-	-
1,1-dichloroethylene	2.8	5.2	BMDL
trans-1,2-dichloroethylene	1.6	280	380
1,2-dichloropropane	6.0	-	-
1,3-dichloropropene	5.0	-	-
ethylbenzene	7.2	-	-
methylene chloride	2.8	-	-
1,1,2,2-tetrachloroethane	6.9	91	BMDL
tetrachloroethylene	4.1	700	410
toluene	6.0	-	-
1,1,1-trichloroethane	3.8	BMDL	-
1,1,2-trichloroethane	5.0	10	-
trichloroethylene	1.9	780	260
vinyl chloride	10	BMDL	36

0925D

SITE GROUNDWATER INVESTIGATION

PRODUCTION WELL PRIORITY POLLUTANT ANALYSIS

METALS COMPOUND	UNITS OF MEAUSRE	CONCENTRATION (ppb) PW-18	PW-24
Total Antimony	mg/l	(0.02)	(0.02)
Total Arsenic	mg/l	(0.005)	(0.005)
Total Beryllium	mg/l	(0.005)	(0.005)
Total Cadmium	mg/l	(0.005)	(0.005)
Total Chromium	mg/l	(0.004)	0.006
Total Copper	mg/l	0.064	0.040
Total Lead	mg/l	0.007	0.014
Total Mercury	mg/l	(0.0008)	(0.0008)
Total Nickel	mg/l	(0.005)	(0.005)
Total Selenium	mg/l	(0.005)	(0.005)
Total Silver	mg/l	(0.005)	(0.005)
Total Thallium	mg/l	(0.005)	(0.005)
Total Zinc	mg/l	0.351	0.316
Soluble Barium	mg/l	0.05	(0.05)
OTHER			
COMPOUND			
Total Non-Filterable Residue (130°C)	mg/l	15	160
Total Organic Carbon	mg/l	6.5	9.0
Total Recoverable Phenolics	mg/l	0.036	(0.01)
Total Cyanide	mg/l	(0.01)	(0.01)

(1) Not detected
(2) Below Method Detection Limit
(3) BMDL - Method Detection Limit in parentheses

0925D

SITE GROUNDWATER INVESTIGATION

PRODUCTION WELL PRIORITY POLLUTANT ANALYSIS

PESTICIDES/PCB's COMPOUND	UNITS OF MEASURE	CONCENTRATION (ppb) PW-18	PW-24
Aldrin	ppb	(0.05)(3)	(0.05)
α-BHC	ppb	0.48	0.30
β-BHC	ppb	(0.05)	(0.05)
δ-BHC	ppb	0.22	(0.05)
γ-BHC	ppb	0.53	(0.05)
Chlordane	ppb	(0.5)	(0.5)
4,4'-DDD	ppb	(0.05)	(0.05)
4,4'-DDE	ppb	(0.05)	(0.05)
4,4'-DDT	ppb	(0.05)	(0.05)
Dieldrin	ppb	(0.05)	(0.05)
α-Endosulfan	ppb	(0.05)	(0.05)
β-Endosulfan	ppb	(0.05)	(0.05)
Endosulfan sulfate	ppb	(0.05)	(0.05)
Endrin	ppb	(0.05)	(0.05)
Endrin aldehyde	ppb	(0.05)	(0.05)
Heptachlor	ppb	(0.05)	(0.05)
Heptachlor epoxide	ppb	(0.05)	(0.05)
PCB-1016	ppb	(0.5)	(0.5)
PCB-1221	ppb	(1.0)	(1.0)
PCB-1232	ppb	(1.0)	(1.0)
PCB-1242	ppb	(0.5)	(0.5)
PCB-1248	ppb	(0.5)	(0.5)
PCB-1254	ppb	(0.5)	(0.5)
PCB-1260	ppb	0.50	(0.5)
Toxaphene	ppb	(0.5)	(0.5)

0856D

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Prepared For:

E. I. Du Pont de Nemours &
Company, Inc.
P.O. Box 787
Niagara Falls, NY 14302

Prepared By:

Recra Environmental Laboratories
4248 Ridge Lea Road
Amherst, NY 14226

Report Date: October 6, 1983

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

INTRODUCTION:

On September 8 through 13, 1983, samples were received at Recra Environmental Laboratories. A request was made by E. I. Du Pont de Nemours & Company, Inc. to have the samples analyzed for nine specific Volatile compounds, PCB's and BHC isomers, total cyanide and recoverable phenolics, and miscellaneous parameters.

This report will address the results of those analyses.

METHODS:

All analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

The specific Volatile compounds were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). PCB's and BHC isomers were screened by Gas Chromatography.

RESULTS AND DISCUSSION:

Chloroform was detected in the Volatile field blanks received on September 9 and September 12 at a concentration of 1.8 µg/l and 5.3 µg/l respectively.

No compounds of interest were detected in the other field blanks.

The variation in the detection limits for the Volatile analyses is a function of the amount of sample used in the analyses.

Sample chromatograms from the Volatile analyses are enclosed.

Analyses for BHC isomers/PCB's are based upon the matching of retention times between samples and standards on a single gas chromatographic column.

RESULTS AND DISCUSSION (CONT'D.):

Metals and miscellaneous values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Confirmatory analyses for the BHC isomers and PCB's were not performed.

Compounds reported as ND are "not detected". Compounds reported as BMDL are confirmed as being present in the sample at a level "below method detection limit".

The presence of an asterisk (*) in the data tables signifies that the particular compound is indicated as being possibly present at a level below the detection limit.

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Barbara J. Krajewski
GC/MS Analyst

BJK/jah

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 1A	1B	14A
benzene	4,400	ND*	BMDL	ND
chlorobenzene	6,000	ND*	BMDL	ND
chloroform	1,600	11,000 ug/l	4,200 ug/l	BMDL
trans-1,2-dichloroethylene	1,600	32,000 ug/l	28,000 ug/l	BMDL
methylene chloride	2,800	72,000 ug/l	200,000 ug/l	ND
1,1,2,2-tetrachloroethane	6,900	BMDL	96,000 ug/l	39,000 ug/l
tetrachloroethylene	4,100	16,000 ug/l	6,500 ug/l	72,000 ug/l
trichloroethylene	1,900	35,000 ug/l	380,000 ug/l	57,000 ug/l
vinyl chloride	10,000	ND*	BMDL	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/12/83	9/12/83	9/8/83
Analysis Date	10/1/83	10/1/83	9/28/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	110%	110%	86%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	110%	110%	95%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	110%	110%	94%

FOR RECRA ENVIRONMENTAL LABORATORIES Gustave J. Kasperski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 1C	5A	6A
benzene	4.4	2,700 ug/l	4.4 ug/l	ND*
chlorobenzene	6.0	190 ug/l	ND	ND
chloroform	1.6	880 ug/l	7.6 ug/l	2.6 ug/l
trans-1,2-dichloroethylene	1.6	12,000 ug/l	1,400 ug/l	1.7 ug/l
methylene chloride	2.8	ND	BMDL	ND
1,1,2,2-tetrachloroethane	6.9	130,000 ug/l	ND	ND
tetrachloroethylene	4.1	81,000 ug/l	62 ug/l	ND
trichloroethylene	1.9	450,000 ug/l	210 ug/l	ND
vinyl chloride	10	1,700 ug/l	360 ug/l	220 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/13/83	9/7/83	9/7/83
Analysis Date	10/2/83	9/26/83	9/27/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	100%	100%	100%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	96%	94%	110%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	95%	100%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Gustave J. Kasperski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 1D	2A
benzene	440	BMDL	ND*
chlorobenzene	600	ND	ND
chloroform	160	ND	1,500 ug/l
trans-1,2-dichloroethylene	160	7,300 ug/l	19,000 ug/l
methylene chloride	280	ND	8,100 ug/l
1,1,2,2-tetrachloroethane	690	BMDL	ND
tetrachloroethylene	410	BMDL	780 ug/l
trichloroethylene	190	2,800 ug/l	11,000 ug/l
vinyl chloride	1,000	BMDL	4,500 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/13/83	9/7/83
Analysis Date	10/3/83	9/26/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	110%	96%
Internal Standard - Level	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	97%	93%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	93%	95%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kingsbury

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 1E	9A	10A
benzene	22	ND	BMDL	BMDL
chlorobenzene	30	ND	ND	43 ug/l
chloroform	8.0	16 ug/l	35 ug/l	ND
trans-1,2-dichloroethylene	8.0	200 ug/l	960 ug/l	3,800 ug/l
methylene chloride	14	ND	BMDL	ND
1,1,2,2-tetrachloroethane	35	BMDL	ND	ND
tetrachloroethylene	21	27 ug/l	BMDL	ND
trichloroethylene	9.5	25 ug/l	47 ug/l	BMDL
vinyl chloride	50	BMDL	1,400 ug/l	1,400 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/13/83	9/8/83	9/8/83
Analysis Date	10/3/83	9/27/83	9/27/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	97%	78%	80%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	110%	75%	84%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	100%	*	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kingsbury

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 1F	5C	19A
benzene	88	BMDL	ND	ND
chlorobenzene	120	BMDL	ND	ND
chloroform	32	230 ug/l	BMDL	100 ug/l
trans-1,2-dichloroethylene	32	1,500 ug/l	430 ug/l	120 ug/l
methylene chloride	56	530 ug/l	ND	ND
1,1,2,2-tetrachloroethane	140	280 ug/l	ND	ND
tetrachloroethylene	82	780 ug/l	ND	BMDL
trichloroethylene	38	1,500 ug/l	BMDL	120 ug/l
vinyl chloride	200	BMDL	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/13/83	9/7/83	9/9/83
Analysis Date	10/3/83	9/27/83	10/1/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	100%	98%	100%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	94%	96%	100%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	100%	92%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kasperski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 1J	3A
benzene	44	46 ug/l	ND
chlorobenzene	60	BMDL	ND
chloroform	16	25 ug/l	BMDL
trans-1,2-dichloroethylene	16	520 ug/l	1,800 ug/l
methylene chloride	28	BMDL	ND
1,1,2,2-tetrachloroethane	69	BMDL	ND
tetrachloroethylene	41	3,300 ug/l	ND
trichloroethylene	19	2,800 ug/l	ND
vinyl chloride	100	BMDL	1,400 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/13/83	9/7/83
Analysis Date	10/3/83	9/26/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	87%	98%
Internal Standard - Level	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	82%	96%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	98%	98%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kasperski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION	
		3B	8B
benzene	2,200	ND	3,200 ug/l
chlorobenzene	3,000	ND	ND
chloroform	880	130,000 ug/l	ND
trans-1,2-dichloroethylene	880	52,000 ug/l	85,000 ug/l
methylene chloride	1,400	72,000 ug/l	BMDL
1,1,2,2-tetrachloroethane	3,500	BMDL	ND
tetrachloroethylene	2,100	8,000 ug/l	BMDL
trichloroethylene	950	140,000 ug/l	5,700 ug/l
vinyl chloride	5,000	6,100 ug/l	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/7/83	9/8/83
Analysis Date	9/26/83	9/27/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	120%	76%
Internal Standard - Level	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	130%	77%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	130%	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Lubar J Kiyanski

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION	
		4A	4B
benzene	8.8	ND*	ND
chlorobenzene	12	ND*	ND
chloroform	3.2	19 ug/l	7.1 ug/l
trans-1,2-dichloroethylene	3.2	31 ug/l	69 ug/l
methylene chloride	5.6	54 ug/l	BMDL
1,1,2,2-tetrachloroethane	14	ND	BMDL
tetrachloroethylene	8.2	ND	34 ug/l
trichloroethylene	3.8	BMDL	330 ug/l
vinyl chloride	20	47 ug/l	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/7/83	9/7/83
Analysis Date	9/26/83	9/26/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	85%	110%
Internal Standard - Level	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	97%	100%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	93%	98%

FOR RECRA ENVIRONMENTAL LABORATORIES Lubar J Kiyanski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 7A	7B	12A
benzene	4.4	BMDL	6.6 ug/l	BMDL
chlorobenzene	6.0	14 ug/l	BMDL	ND
chloroform	1.6	ND	58 ug/l	ND
trans-1,2-dichloroethylene	1.6	3.2 ug/l	14 ug/l	120 ug/l
methylene chloride	2.8	ND	12 ug/l	ND
1,1,2,2-tetrachloroethane	6.9	ND	ND	BMDL
tetrachloroethylene	4.1	ND	6.4 ug/l	BMDL
trichloroethylene	1.9	ND	29 ug/l	3.0 ug/l
vinyl chloride	10	ND*	BMDL	76 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/8/83	9/8/83	9/8/83
Analysis Date	9/27/83	9/28/83	9/28/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	96%	100%	100%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	98%	100%	97%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	*	*	100%

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Gidget J Kuzmicki

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 8A	13A	16A
benzene	200	6,000 ug/l	ND*	ND
chlorobenzene	300	ND	ND*	ND*
chloroform	80	ND	50,000 ug/l	3,200 ug/l
trans-1,2-dichloroethylene	80	17,000 ug/l	29,000 ug/l	780 ug/l
methylene chloride	140	BMDL	3,000 ug/l	200 ug/l
1,1,2,2-tetrachloroethane	350	ND	840 ug/l	BMDL
tetrachloroethylene	210	ND	20,000 ug/l	BMDL
trichloroethylene	95	150 ug/l	55,000 ug/l	6,800 ug/l
vinyl chloride	500	1,200 ug/l	2,000 ug/l	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/8/83	9/12/83	9/9/83
Analysis Date	9/27/83	10/1/83	9/30/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	98%	100%	90%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	95%	110%	80%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	*	110%	87%

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Gidget J Kuzmicki

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION	
		10C	11A
benzene	22	31 ug/l	24 ug/l
chlorobenzene	30	BMDL	45 ug/l
chloroform	8.0	ND	ND
trans-1,2-dichloroethylene	8.0	1,400 ug/l	640 ug/l
methylene chloride	14	ND	ND
1,1,2,2-tetrachloroethane	35	BMDL	ND
tetrachloroethylene	21	BMDL	ND
trichloroethylene	9.5	51 ug/l	BMDL
vinyl chloride	50	360 ug/l	1,000 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/8/83	9/8/83
Analysis Date	9/27/83	9/28/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	100%	110%
Internal Standard - Level	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	98%	110%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	88%	97%

FOR RECRA ENVIRONMENTAL LABORATORIES Gaetan J Kayatta

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION	
		12B	15C
benzene	110	BMDL	640 ug/l
chlorobenzene	150	ND*	300 ug/l
chloroform	40	55 ug/l	270,000 ug/l
trans-1,2-dichloroethylene	40	7,400 ug/l	14,000 ug/l
methylene chloride	70	330 ug/l	100,000 ug/l
1,1,2,2-tetrachloroethane	170	3,300 ug/l	50,000 ug/l
tetrachloroethylene	100	5,500 ug/l	57,000 ug/l
trichloroethylene	48	12,000 ug/l	170,000 ug/l
vinyl chloride	250	1,500 ug/l	970 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/8/83	9/9/83
Analysis Date	9/28/83	9/29/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	120%	110%
Internal Standard - Level	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	120%	110%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	120%	120%

FOR RECRA ENVIRONMENTAL LABORATORIES Gaetan J Kayatta

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 15A
benzene	55	ND
chlorobenzene	75	ND
chloroform	20	2,500 ug/l
trans-1,2-dichloroethylene	20	32 ug/l
methylene chloride	35	210 ug/l
1,1,2,2-tetrachloroethane	86	ND
tetrachloroethylene	52	400 ug/l
trichloroethylene	24	450 ug/l
vinyl chloride	130	ND

ADDITIONAL SAMPLE INFORMATION	
Sample Date	9/9/83
Analysis Date	9/28/83
Internal Standard - Level	40 ug/l
bromochloromethane - Recovery	94%
Internal Standard - Level	40 ug/l
2-bromo-1-chloropropane - Recovery	100%
Internal Standard - Level	40 ug/l
1,4-dichlorobutane - Recovery	97%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Fitzpatrick

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 16B	18C	21A
benzene	440	BMDL	490 ug/l	ND
chlorobenzene	600	ND*	2,600 ug/l	ND
chloroform	160	460,000 ug/l	ND	ND
trans-1,2-dichloroethylene	160	7,900 ug/l	5,500 ug/l	28,000 ug/l
methylene chloride	280	74,000 ug/l	ND	ND
1,1,2,2-tetrachloroethane	690	BMDL	ND	630 ug/l
tetrachloroethylene	410	3,700 ug/l	ND	1,000 ug/l
trichloroethylene	190	16,000 ug/l	BMDL	16,000 ug/l
vinyl chloride	1,000	3,200 ug/l	2,200 ug/l	3,000 ug/l

ADDITIONAL SAMPLE INFORMATION			
Sample Date	9/9/83	9/12/83	9/12/83
Analysis Date	9/30/83	10/1/83	10/2/83
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
bromochloromethane - Recovery	90%	110%	100%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
2-bromo-1-chloropropane - Recovery	84%	110%	100%
Internal Standard - Level	40 ug/l	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	87%	*	95%

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Fitzpatrick

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 17A	17B
benzene	4.4	ND	ND
chlorobenzene	6.0	ND	ND
chloroform	1.6	4.2 ug/l	2.8 ug/l
trans-1,2-dichloroethylene	1.6	2.2 ug/l	14 ug/l
methylene chloride	2.8	ND*	BMDL
1,1,2,2-tetrachloroethane	6.9	ND	ND
tetrachloroethylene	4.1	8.5 ug/l	7.5 ug/l
trichloroethylene	1.9	3.0 ug/l	2.5 ug/l
vinyl chloride	10	ND	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/9/83	9/9/83
Analysis Date	10/1/83	10/1/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	100%	100%
Internal Standard - Level	40 ug/l	40 ug/l
2-brome-1-chloropropane - Recovery	97%	100%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	110%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kopanda

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 10/6/83

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION 18A	18B
benzene	4.4	130 ug/l	BMDL
chlorobenzene	6.0	10 ug/l	BMDL
chloroform	1.6	1.6 ug/l	160 ug/l
trans-1,2-dichloroethylene	1.6	25 ug/l	110 ug/l
methylene chloride	2.8	ND	30 ug/l
1,1,2,2-tetrachloroethane	6.9	ND	BMDL
tetrachloroethylene	4.1	ND	12 ug/l
trichloroethylene	1.9	ND	16 ug/l
vinyl chloride	10	20 ug/l	980 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/12/83	9/9/83
Analysis Date	10/1/83	10/1/83
Internal Standard - Level	40 ug/l	40 ug/l
bromochloromethane - Recovery	90%	100%
Internal Standard - Level	40 ug/l	40 ug/l
2-brome-1-chloropropane - Recovery	85%	110%
Internal Standard - Level	40 ug/l	40 ug/l
1,4-dichlorobutane - Recovery	96%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kopanda

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 2A (9/7/83)	3A (9/7/83)	3B (9/7/83)	4A (9/7/83)
α-BHC	ug/l	0.07	<0.04	0.16	0.02
β-BHC	ug/l	0.07	0.05	<0.1	<0.01
δ-BHC	ug/l	<0.04	0.04	0.24	<0.01
γ-BHC	ug/l	<0.01	<0.02	0.34	<0.01
PCB-1016	ug/l	<0.3	<0.2	<0.5	<0.1
PCB-1221	ug/l	<0.6	<0.4	<1	<0.2
PCB-1232	ug/l	<0.6	<0.4	<1	<0.2
PCB-1242	ug/l	<0.3	<0.2	<0.5	<0.1
PCB-1248	ug/l	<0.3	<0.2	<0.5	<0.1
PCB-1254	ug/l	<0.3	<0.2	<0.5	<0.1
PCB-1260	ug/l	<0.3	<0.2	<0.5	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Victoria J. Praccio

DATE 10/6/83

[illegible]

[illegible] ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 4B (9/7/83)	5A (9/7/83)	5C (9/7/83)	6A (9/7/83)
α-BHC	ug/l	0.03	<0.01	<0.8	<0.02
β-BHC	ug/l	<0.01	<0.01	<0.02	<0.02
δ-BHC	ug/l	<0.01	<0.01	<0.01	<0.02
γ-BHC	ug/l	<0.01	<0.01	<0.04	<0.02
PCB-1016	ug/l	<0.1	<0.1	<0.3	<0.2
PCB-1221	ug/l	<0.2	<0.2	<0.6	<0.4
PCB-1232	ug/l	<0.2	<0.2	<0.6	<0.4
PCB-1242	ug/l	<0.1	<0.1	<0.3	<0.2
PCB-1248	ug/l	<0.1	<0.1	<0.3	<0.2
PCB-1254	ug/l	<0.1	<0.1	<0.3	<0.2
PCB-1260	ug/l	<0.1	<0.1	<0.3	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Victoria J. Praccio

DATE 10/6/83

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[illegible] ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 7A (9/8/83)	7B (9/8/83)	8A (9/8/83)	8B (9/8/83)
α-BHC	ug/l	0.03	<0.01	0.17	<0.01
β-BHC	ug/l	0.02	0.05	<0.01	<0.01
δ-BHC	ug/l	<0.01	0.05	<0.01	<0.01
γ-BHC	ug/l	<0.01	<0.01	0.11	0.02
PCB-1016	ug/l	<0.1	<0.1	<0.2	<0.1
PCB-1221	ug/l	<0.2	<0.2	<0.4	<0.2
PCB-1232	ug/l	<0.2	<0.2	<0.4	<0.2
PCB-1242	ug/l	<0.1	<0.1	<0.2	<0.1
PCB-1248	ug/l	<0.1	<0.1	<0.2	<0.1
PCB-1254	ug/l	<0.1	<0.1	<0.2	<0.1
PCB-1260	ug/l	<0.1	<0.1	<0.2	0.16

FOR REGRA ENVIRONMENTAL LABORATORIES Deborah J. Praino

DATE 10/6/83

REGRA ENVIRONMENTAL LABORATORIES
I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 9A (9/8/83)	10A (9/8/83)	10C (9/8/83)	11A (9/8/83)
α-BHC	ug/l	<0.01	<0.01	0.10	<0.01
β-BHC	ug/l	<0.01	0.02	0.07	0.02
δ-BHC	ug/l	<0.01	<0.01	0.24	<0.01
γ-BHC	ug/l	0.01	<0.01	0.05	<0.01
PCB-1016	ug/l	<0.1	<0.1	<0.1	<0.1
PCB-1221	ug/l	<0.2	<0.2	<0.2	<0.2
PCB-1232	ug/l	<0.2	<0.2	<0.2	<0.2
PCB-1242	ug/l	<0.1	<0.1	<0.1	<0.1
PCB-1248	ug/l	<0.1	<0.1	<0.1	<0.1
PCB-1254	ug/l	<0.1	<0.1	<0.1	<0.1
PCB-1260	ug/l	<0.1	<0.1	<0.1	<0.1

FOR REGRA ENVIRONMENTAL LABORATORIES Deborah J. Praino

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 12A (9/8/83)	12B (9/8/83)	14A (9/8/83)
α-BHC	µg/l	0.07	8.9	<0.1
β-BHC	µg/l	<0.02	0.21	<0.1
δ-BHC	µg/l	<0.06	<1	<0.1
γ-BHC	µg/l	0.04	2.8	<0.1
PCB-1016	µg/l	<2	<2	<1
PCB-1221	µg/l	<4	<4	<2
PCB-1232	µg/l	<4	<4	<2
PCB-1242	µg/l	<2	<2	<1
PCB-1248	µg/l	2.6	2.6	<1
PCB-1254	µg/l	<1	<1	<1
PCB-1260	µg/l	<1	<1	<1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Rocco

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 15A (9/9/83)	15B (9/9/83)	16A (9/9/83)	16B (9/9/83)
α-BHC	µg/l	0.06	3.4	<0.01	15
β-BHC	µg/l	0.09	2.1	0.04	1.9
δ-BHC	µg/l	<0.01	12	<0.01	<0.1
γ-BHC	µg/l	<0.01	17	<0.01	2.1
PCB-1016	µg/l	<0.1	<0.5	<0.1	<0.5
PCB-1221	µg/l	<0.2	<1	<0.2	<1
PCB-1232	µg/l	<0.2	<1	<0.2	<1
PCB-1242	µg/l	<0.1	<0.5	<0.1	<0.5
PCB-1248	µg/l	<0.1	<0.5	<0.1	<0.5
PCB-1254	µg/l	<0.1	<0.5	<0.1	<0.5
PCB-1260	µg/l	<0.1	<0.5	<0.1	<0.5

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Rocco

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 1A (9/12/83)	1B (9/12/83)	13A (9/12/83)
a-BHC	µg/1	0.16	42	<0.04
3-BHC	µg/1	<0.02	<20	<0.02
5-BHC	µg/1	0.03	38	<0.03
Y-BHC	µg/1	0.03	52	0.03
PCB-1016	µg/1	<0.1	<30	<0.5
PCB-1221	µg/1	<0.2	<60	<1
PCB-1232	µg/1	<0.2	<60	<1
PCB-1242	µg/1	<0.1	<30	<0.5
PCB-1248	µg/1	<0.1	<30	<0.5
PCB-1254	µg/1	<0.1	<30	<0.5
PCB-1260	µg/1	<0.1	<30	<0.5

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Barrow

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 17A (9/9/83)	17B (9/9/83)	19A (9/9/83)	19B (9/9/83)
a-BHC	µg/1	0.05	0.08	0.04	0.40
3-BHC	µg/1	0.03	<0.05	0.06	0.06
5-BHC	µg/1	<0.1	0.08	<0.01	0.06
Y-BHC	µg/1	0.07	0.10	<0.01	0.04
PCB-1016	µg/1	<2	<1	<0.1	<0.1
PCB-1221	µg/1	<4	<2	<0.2	<0.2
PCB-1232	µg/1	<4	<2	<0.2	<0.2
PCB-1242	µg/1	<2	<1	<0.1	<0.1
PCB-1248	µg/1	<2	<1	<0.1	<0.1
PCB-1254	µg/1	<2	<1	<0.1	<0.1
PCB-1260	µg/1	<2	<1	<0.1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Barrow

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 18A (9/12/83)	18C (9/12/83)	21A (9/12/83)
α-BHC	ug/l	<0.01	6.1	<0.01
β-BHC	ug/l	<0.01	0.80	<0.01
δ-BHC	ug/l	<0.01	1.1	<0.01
γ-BHC	ug/l	<0.01	1.8	<0.01
PCB-1016	ug/l	<0.1	<1	<0.1
PCB-1221	ug/l	<0.2	<2	<0.2
PCB-1232	ug/l	<0.2	<2	<0.2
PCB-1242	ug/l	<0.1	<1	<0.1
PCB-1248	ug/l	<0.1	<1	<0.1
PCB-1254	ug/l	<0.1	<1	<0.1
PCB-1260	ug/l	<0.1	<1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Brosius

DATE 10/6/83

6

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 1C (9/13/83)	1D (9/13/83)	1E (9/13/83)
α-BHC	ug/l	310	0.08	0.07
β-BHC	ug/l	37	0.07	0.02
δ-BHC	ug/l	0.96	1.3	0.05
γ-BHC	ug/l	480	0.52	0.08
PCB-1016	ug/l	<50	<1	<0.2
PCB-1221	ug/l	<100	<2	<0.4
PCB-1232	ug/l	<100	<2	<0.4
PCB-1242	ug/l	<50	<1	<0.2
PCB-1248	ug/l	<50	<1	<0.2
PCB-1254	ug/l	110	<1	<0.2
PCB-1260	ug/l	<100	<1	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Brosius

DATE 10/6/83

6

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 1F (9/13/83)	1J (9/13/83)
α-BHC	ug/l	1.7	0.82
β-BHC	ug/l	0.15	0.06
δ-BHC	ug/l	0.11	0.20
γ-BHC	ug/l	0.79	0.33
PCB-1016	ug/l	<0.5	<0.5
PCB-1221	ug/l	<1	<1
PCB-1232	ug/l	<1	<1
PCB-1242	ug/l	<0.5	<0.5
PCB-1248	ug/l	<0.5	<0.5
PCB-1254	ug/l	<0.5	<0.5
PCB-1260	ug/l	<0.5	<0.5

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Prasuo

DATE 10/10/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 2A (9/7/83)	3A (9/7/83)	3B (9/7/83)	4A (9/7/83)
Total Non-Filterable Residue (103°C)	mg/l	48	130	19	400
Total Organic Carbon	mg/l	5.0	7.7	130	26
Total Recoverable Phenolics	mg/l	<0.01	<0.01	0.053	<0.01
Total Cyanide	mg/l	0.15	2.2	0.48	0.013
Soluble Barium	mg/l	0.30	0.06	0.25	0.55
Soluble Copper	mg/l	0.004	<0.004	0.016	0.008

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 4B (9/7/83)	5A (9/7/83)	5C (9/7/83)	6A (9/7/83)
Total Non-Filterable Residue (103°C)	mg/l	11	270	19	310
Total Organic Carbon	mg/l	1.9	9.0	13	31
Total Recoverable Phenolics	mg/l	<0.01	<0.01	0.020	<0.01
Total Cyanide	mg/l	1.0	2.0	0.54	0.36
Soluble Barium	mg/l	0.05	0.58	0.70	0.13
Soluble Copper	mg/l	<0.004	<0.004	0.010	0.010

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Zinn

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 7A (9/8/83)	7B (9/8/83)	8A (9/8/83)	8B (9/8/83)
Total Non-Filterable Residue (103°C)	mg/l	62	15	180	<2
Total Organic Carbon	mg/l	18	18	570	420
Total Recoverable Phenolics	mg/l	<0.01	0.050	0.15	0.10
Total Cyanide	mg/l	8.0	0.56	30	23
Soluble Barium	mg/l	0.16	0.24	0.07	0.03
Soluble Copper	mg/l	<0.004	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Zinn

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 9A (9/8/83)	10A (9/8/83)	10C (9/8/83)	11A (9/8/83)
Total Non-Filterable Residue (103°C)	mg/l	17	100	2.8	44
Total Organic Carbon	mg/l	220	17	15	18
Total Recoverable Phenolics	mg/l	<0.01	<0.01	<0.01	<0.01
Total Cyanide	mg/l	8.2	0.31	0.28	0.017
Soluble Barium	mg/l	0.10	0.09	0.07	0.07
Soluble Copper	mg/l	<0.004	<0.004	<0.004	0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/16/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 12A (9/8/83)	12B (9/8/83)	14A (9/8/83)
Total Non-Filterable Residue (103°C)	mg/l	34	26	51
Total Organic Carbon	mg/l	28	46	34
Total Recoverable Phenolics	mg/l	<0.01	<0.01	<0.01
Total Cyanide	mg/l	<0.01	0.024	0.045
Soluble Barium	mg/l	0.06	0.14	0.09
Soluble Copper	mg/l	<0.004	<0.004	0.014

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/16/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 15A (9/9/83)	15C (9/9/83)	16A (9/9/83)	16B (9/9/83)
Total Non-Filterable Residue (103°C)	mg/l	390	6.6	510	170
Total Organic Carbon	mg/l	20	50	330	73
Total Recoverable Phenolics	mg/l	<0.01	0.010	0.32	0.076
Total Cyanide	mg/l	0.17	0.12	0.040	0.013
Soluble Barium	mg/l	0.12	0.10	0.08	0.05
Soluble Copper	mg/l	0.060	2.4	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 17A (9/9/83)	17B (9/9/83)	19A (9/9/83)	19B (9/9/83)
Total Non-Filterable Residue (103°C)	mg/l	6.4	67	16	78
Total Organic Carbon	mg/l	17	20	31	34
Total Recoverable Phenolics	mg/l	<0.01	<0.01	<0.01	<0.01
Total Cyanide	mg/l	0.013	<0.01	0.052	0.17
Soluble Barium	mg/l	0.07	0.04	0.05	0.06
Soluble Copper	mg/l	<0.004	<0.004	0.020	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 1A (9/12/83)	1B (9/12/83)	13A (9/12/83)
Total Non-Filterable Residue (103°C)	mg/l	6.8	9.2	41
Total Organic Carbon	mg/l	42	68	20
Total Recoverable Phenolics	mg/l	<0.01	0.053	0.012
Total Cyanide	mg/l	0.060	0.080	0.020
Soluble Barium	mg/l	0.05	0.14	0.15
Soluble Copper	mg/l	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Zinn

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 18A (9/12/83)	18C (9/12/83)	21A (9/12/83)
Total Non-Filterable Residue (103°C)	mg/l	170	4.2	6.8
Total Organic Carbon	mg/l	54	41	70
Total Recoverable Phenolics	mg/l	0.014	0.012	0.028
Total Cyanide	mg/l	0.080	0.14	0.10
Soluble Barium	mg/l	0.18	0.05	0.19
Soluble Copper	mg/l	<0.004	0.006	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Zinn

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 1C (9/13/83)	1D (9/13/83)	1E (9/13/83)
Total Non-Filterable Residue (103°C)	mg/l	320	13	110
Total Organic Carbon	mg/l	42	35	23
Total Recoverable Phenolics	mg/l	<0.01	<0.01	<0.01
Total Cyanide	mg/l	0.070	0.10	<0.01
Soluble Barium	mg/l	0.04	0.12	0.05
Soluble Copper	mg/l	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 1F (9/13/83)	1J (9/13/83)
Total Non-Filterable Residue (103°C)	mg/l	<2	72
Total Organic Carbon	mg/l	34	30
Total Recoverable Phenolics	mg/l	<0.01	<0.01
Total Cyanide	mg/l	0.060	0.065
Soluble Barium	mg/l	0.12	0.22
Soluble Copper	mg/l	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 10/6/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE 6A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
chloroform	ug/l	2.8	2.5	2.6	0.21	8.1
trans-1,2-dichloroethylene	ug/l	1.7	1.7	1.7	0	0
vinyl chloride	ug/l	230	220	220	7.1	3.2

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapinski

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORY

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 10/6/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE 7B

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
benzene	ug/l	6.8	6.4	6.6	0.28	4.2
chlorobenzene	ug/l	0.88	0.99	0.94	0.08	8.5
chloroform	ug/l	57	60	58	2.1	3.6
trans-1,2-dichloroethylene	ug/l	14	13	14	0.71	5.1
methylene chloride	ug/l	12	11	12	0.71	5.9
tetrachloroethylene	ug/l	6.6	6.1	6.4	0.35	5.5
trichloroethylene	ug/l	34	24	29	7.1	24
vinyl chloride	ug/l	0.91	0.87	0.89	0.03	3.4

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapinski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 10/6/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE 17A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
chloroform	ug/l	3.6	4.8	4.2	0.85	20
trans-1,2-dichloroethylene	ug/l	2.1	2.3	2.2	0.14	6.3
tetrachloroethylene	ug/l	7.9	9.1	8.5	0.85	10
trichloroethylene	ug/l	3.0	3.0	3.0	0	0

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapuscka

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 10/6/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE 21A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
trans-1,2-dichloroethylene	ug/l	27,000	28,000	28,000	710	2.5
1,1,2,2-tetrachloroethane	ug/l	460	800	630	240	38
tetrachloroethylene	ug/l	1,000	1,100	1,000	71	7.1
trichloroethylene	ug/l	16,000	17,000	16,000	710	4.4
vinyl chloride	ug/l	3,200	2,900	3,000	210	7.0

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapuscka

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY & CO.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 10/6/83

VOLATILE RECOVERY ANALYSIS OF
SAMPLE 17A

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
bromomethane	200	220	110
chloroethane	200	220	110
chloromethane	200	300	150
vinyl chloride	200	270	130

ADDITIONAL SAMPLE INFORMATION

Sample Date	9/9/83
Analysis Date	10/1/83
Internal Standard - Level	40 ug/l
bromochloromethane - Recovery	100%
Internal Standard - Level	40 ug/l
1-bromo-1-chloropropane - Recovery	95%
Internal Standard - Level	40 ug/l
1,4-dichlorobutane - Recovery	110%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kazenski

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 10/6/83

REPLICATE PESTICIDE ANALYSIS OF
SAMPLE 1J

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
α-BHC	µg/l	0.92	0.71	0.82	0.15	18
β-BHC	µg/l	0.06	0.06	0.06	0	0
δ-BHC	µg/l	0.20	0.19	0.20	0.0071	3.6
γ-BHC	µg/l	0.37	0.29	0.33	0.057	17

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kazenski

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 10/6/83

PESTICIDE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
γ-BHC	0.22	0.22	100

PESTICIDE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
γ-BHC	0.22	0.18	82

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah G. Braun

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 10/6/83

PESTICIDE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
γ-BHC	0.22	0.21	95

PESTICIDE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
γ-BHC	0.22	0.17	77

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah G. Braun

DATE 10/6/83

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 10/6/83

REPLICATE ANALYSES

PARAMETER	SAMPLE I.D.	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
Total Non-Filterable Residue (103°C)	2A	mg/1	44	52	48	5.6	12
	11A	mg/1	44	43	43.5	0.71	1.6
	19A	mg/1	13.6	17.4	15.5	2.7	17
	1J	mg/1	75	69	72	4.2	5.9
Total Organic Carbon	6A	mg/1	30	31	30.5	0.71	2.3
	10A	mg/1	20	14	17	42	25
	15C	mg/1	45	55	50	7.1	14
	17B	mg/1	21	18	19.5	2.1	11
	13A	mg/1	20	20	20	-	-
	1D	mg/1	32	38	35	4.2	12
Total Recoverable Phenolics	5A	mg/1	<0.01	<0.01	<0.01	-	-
	8A	mg/1	0.15	0.15	0.15	-	-
	1A	mg/1	<0.01	<0.01	<0.01	-	-
Total Cyanide	7A	mg/1	8.0	8.0	8.0	-	-
	11A	mg/1	0.019	0.012	0.0155	0.0049	32
	1B	mg/1	0.090	0.070	0.080	0.014	18

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-871

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 10/6/83

RECOVERY ANALYSIS

PARAMETER	SAMPLE I.D.	µg OF SPIKE	µg RECOVERED	% RECOVERY
Total Organic Carbon	6A	25	20	80
	10C	125	156	125
	1A	125	137.5	110
	1D	125	141	113
Total Cyanide	1B	25	22.3	89
Soluble Barium	2A	500	495	99
	14A	500	470	94
	1J	500	460	92
Soluble Copper	3B	500	515	103
	9A	500	525	105
	17A	500	480	96

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 10/6/83

I.D. #83-871

RECRA ENVIRONMENTAL LABORATORIES

Division of Recra Research, Inc.

November 1, 1983

Mr. Timothy Van Domelen
E. I. du Pont de Nemours & Co., Inc.
P.O. Box 787
Niagara Falls, NY 14302

Re: Analytical Results

Dear Mr. Van Domelen:

Please find enclosed results of the analyses of the samples received at our laboratories on October 6 through 13, 1983.

Please note the comment in the results and discussion section concerning the reliability of low level trichloroethylene data. Our quality control program quickly identified the problem and the source of trichloroethylene has been since eliminated.

Unfortunately, as stated in the report, it's very likely that samples which exhibit trichloroethylene concentrations similar to these field blanks are invalid. If this occurrence, which I deeply regret, will cause you great difficulty interpreting the results, please give me a call so that we can discuss rectifying the situation.

Sincerely,

RECRA ENVIRONMENTAL LABORATORIES

James A. Ploscyca
Laboratory Manager

BJK/JAP/df
Enclosure
cc: Mr. Robert Pedley

I.D. #83-1020
83-1020 A-D

4248 Ridge Lea Road, Amherst, New York 14226

Telephone Sales (716) 838-6200
Laboratory (716) 692-7620

RECRA ENVIRONMENTAL LABORATORIES

Division of Recra Research, Inc.

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Prepared For:

E. I. Du Pont de Nemours &
Company, Inc.
P.O. Box 787
Niagara Falls, NY 14302

Prepared By:

Recra Environmental Laboratories
4248 Ridge Lea Road
Amherst, NY 14226

Report Date: November 1, 1983

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

INTRODUCTION:

On October 6 through 13, 1983 samples were received at Recra Environmental Laboratories. A request was made by E. I. du Pont de Nemours & Company, Inc. to have the samples analyzed for nine specific Volatile compounds, PCB's and BHC isomers, total cyanide and recoverable phenolics and miscellaneous parameters.

This report will address the results of those analyses.

METHODS:

All analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

The specific Volatile compounds were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). PCB's and BHC isomers were screened by Gas Chromatography.

RESULTS AND DISCUSSION:

Trichloroethylene was detected in all Volatile field blanks in concentrations ranging from 15 µg/l to 42 µg/l. The presence of this compound is believed to be due to cross contamination within the laboratory. Recently we received a sample with an unusually high concentration of trichloroethylene. It is our belief that while this sample was stored, it proceeded to contaminate other samples in the immediate vicinity. The level of sample contamination is believed to be within the concentration range stated for the field blanks. Therefore, values reported within the range should not be considered reliable.

RESULTS AND DISCUSSION: (cont'd.)

No other compounds of interest were detected in the field blanks.

The variation in the detection limits for the Volatile analyses is a function of the amount of sample used in the analyses.

Sample chromatograms from the Volatile analyses are enclosed.

Analyses for BHC isomers/PCB's are based upon the matching of retention times between samples and standards on a single gas chromatographic column. Metals and miscellaneous values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Confirmatory analyses for the BHC isomers and PCB's were not performed.

Compounds reported as ND are "not detected". Compounds reported as BMDL are confirmed as being present in the sample at a level "below method detection limit".

The presence of an asterisk (*) in the data tables signifies that the particular compound is indicated as being possibly present at a level below the detection limit.

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Barbara J. Krajewski

Barbara J. Krajewski
GC/MS Analyst

BJK/mdc

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-1A	W-1D	W-2A
benzene	440	ND	BMDL	ND
chlorobenzene	600	ND	ND	ND
chloroform	160	9,300 µg/l	ND	550 µg/l
trans-1,2-dichloroethylene	160	27,000 µg/l	5,300 µg/l	6,400 µg/l
methylene chloride	280	44,000 µg/l	ND	950 µg/l
1,1,2,2-tetrachloroethane	690	1,400 µg/l	1,100 µg/l	ND
tetrachloroethylene	410	14,000 µg/l	BMDL	ND
trichloroethylene	190	26,000 µg/l	5,700 µg/l	1,300 µg/l
vinyl chloride	1,000	1,100 µg/l	ND*	2,100 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/11/83	10/12/83	10/6/83
Analysis Date	10/24/83	10/25/83	10/21/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	120%	100%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	120%	100%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	100%	100%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-1B	W-1C	W-14A
benzene	4,400	ND	BMDL	ND
chlorobenzene	6,000	ND	ND	ND
chloroform	1,600	2,900 µg/l	ND	ND
trans-1,2-dichloroethylene	1,600	23,000 µg/l	21,000 µg/l	ND
methylene chloride	2,800	260,000 µg/l	ND	ND
1,1,2,2-tetrachloroethane	6,900	32,000 µg/l	190,000 µg/l	23,000 µg/l
tetrachloroethylene	4,100	17,000 µg/l	99,000 µg/l	56,000 µg/l
trichloroethylene	1,900	240,000 µg/l	660,000 µg/l	45,000 µg/l
vinyl chloride	10,000	ND*	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/12/83	10/13/83	10/7/83
Analysis Date	10/25/83	10/25/83	10/22/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	95%	96%	110%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	100%	100%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	86%	94%	98%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-1E	W-3A	W-9A
benzene	22	ND	ND	BMDL
chlorobenzene	30	ND	ND	ND
chloroform	8.0	ND	9.3 µg/l	98 µg/l
trans-1,2-dichloroethylene	8.0	460 µg/l	4,900 µg/l	1,000 µg/l
methylene chloride	14	ND	ND	ND
1,1,2,2-tetrachloroethane	35	ND	ND	ND
tetrachloroethylene	21	BMDL	ND	BMDL
trichloroethylene	9.5	15 µg/l	65 µg/l	110 µg/l
vinyl chloride	50	53 µg/l	710 µg/l	1,100 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/13/83	10/6/83	10/10/83
Analysis Date	10/25/83	10/21/83	10/22/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	110%	100%	80%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	110%	110%	94%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	100%	110%	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-1F	W-1J
benzene	44	ND	BMDL
chlorobenzene	60	ND	BMDL
chloroform	16	ND	ND
trans-1,2-dichloroethylene	16	1,700 µg/l	410 µg/l
methylene chloride	28	ND	ND
1,1,2,2-tetrachloroethane	69	BMDL	BMDL
tetrachloroethylene	41	300 µg/l	1,100 µg/l
trichloroethylene	19	190 µg/l	120 µg/l
vinyl chloride	100	BMDL	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/12/83	10/12/83
Analysis Date	10/25/83	10/25/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	88%	95%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	94%	94%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	88%	87%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-3B	W-8B
benzene	2,200	ND	2,400 µg/l
chlorobenzene	3,000	ND	ND
chloroform	880	480,000 µg/l	ND
trans-1,2-dichloroethylene	880	42,000 µg/l	77,000 µg/l
methylene chloride	1,400	740,000 µg/l	ND
1,1,2,2-tetrachloroethane	3,500	BMDL	ND
tetrachloroethylene	2,100	4,400 µg/l	ND
trichloroethylene	950	94,000 µg/l	8,900 µg/l
vinyl chloride	5,000	BMDL	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/6/83	10/10/83
Analysis Date	10/21/83	10/22/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	98%	110%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	100%	110%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	98%	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapcinski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-4A	W-4B	W-10A
benzene	8.8	BMDL	ND	1,400 µg/l
chlorobenzene	12	ND	ND	2,200 µg/l
chloroform	3.2	10 µg/l	9.7 µg/l	ND
trans-1,2-dichloroethylene	3.2	94 µg/l	21 µg/l	12,000 µg/l
methylene chloride	5.6	ND	28 µg/l	27 µg/l
1,1,2,2-tetrachloroethane	14	ND	BMDL	ND
tetrachloroethylene	8.2	ND	BMDL	130 µg/l
trichloroethylene	3.8	34 µg/l	340 µg/l	2,800 µg/l
vinyl chloride	20	180 µg/l	BMDL	1,000 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/6/83	10/6/83	10/10/83
Analysis Date	10/21/83	10/21/83	10/22/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	96%	92%	96%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	93%	100%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	93%	87%	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapcinski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-7B	W-12A	W-17A
benzene	4.4	17 µg/l	9.5 µg/l	ND
chlorobenzene	6.0	ND	ND	ND
chloroform	1.6	10 µg/l	ND	ND
trans-1,2-dichloroethylene	1.6	18 µg/l	250 µg/l	2.9 µg/l
methylene chloride	2.8	ND	ND	ND
1,1,2,2-tetrachloroethane	6.9	ND	BMDL	ND
tetrachloroethylene	4.1	13 µg/l	ND	11 µg/l
trichloroethylene	1.9	35 µg/l	98 µg/l	18 µg/l
vinyl chloride	10	BMDL	130 µg/l	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/10/83	10/7/83	10/11/83
Analysis Date	10/21/83	10/21/83	10/25/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	110%	98%	96%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	110%	120%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	*	110%	110%

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-5C	W-6A	W-7A
benzene	4.4	ND	17 µg/l	BMDL
chlorobenzene	6.0	ND	15 µg/l	16 µg/l
chloroform	1.6	2.1 µg/l	490 µg/l	ND
trans-1,2-dichloroethylene	1.6	230 µg/l	14 µg/l	7.0 µg/l
methylene chloride	2.8	ND	200 µg/l	ND
1,1,2,2-tetrachloroethane	6.9	ND	ND	ND
tetrachloroethylene	4.1	BMDL	ND	ND
trichloroethylene	1.9	23 µg/l	68 µg/l	19 µg/l
vinyl chloride	10	5,800 µg/l	81 µg/l	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/13/83	10/6/83	10/10/83
Analysis Date	10/26/83	10/21/83	10/22/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	96%	92%	96%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	93%	92%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	98%	97%	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-8A	W-13A
benzene	220	4,600 µg/l	ND
chlorobenzene	300	ND	ND
chloroform	80	ND	68,000 µg/l
trans-1,2-dichloroethylene	80	28,000 µg/l	52,000 µg/l
methylene chloride	140	ND	3,200 µg/l
1,1,2,2-tetrachloroethane	350	ND	1,100 µg/l
tetrachloroethylene	210	ND	54,000 µg/l
trichloroethylene	95	350 µg/l	150,000 µg/l
vinyl chloride	500	1,300 µg/l	2,100 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/10/83	10/6/83
Analysis Date	10/22/83	10/21/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	110%	98%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	120%	100%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	*	120%

*Recovery of 1,4-dichlorobutane could not de determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-10C	W-11A	W-18C
benzene	22	180 µg/l	24 µg/l	1,000 µg/l
chlorobenzene	30	280 µg/l	36 µg/l	9,200 µg/l
chloroform	8.0	ND	ND	16 µg/l
trans-1,2-dichloroethylene	8.0	2,500 µg/l	480 µg/l	4,100 µg/l
methylene chloride	14	ND	ND	ND
1,1,2,2-tetrachloroethane	35	BMDL	ND	BMDL
tetrachloroethylene	21	BMDL	ND	BMDL
trichloroethylene	9.5	1,300 µg/l	23 µg/l	60 µg/l
vinyl chloride	50	660 µg/l	900 µg/l	2,000 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/10/83	10/10/83	10/13/83
Analysis Date	10/24/83	10/24/83	10/26/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	93%	120%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	98%	100%	100%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	*	110%	*

*Recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-12B	W-16A	W-16B
benzene	440	ND	ND	ND
chlorobenzene	600	ND	ND	ND
chloroform	160	ND	2,500 µg/l	2,000,000 µg/l
trans-1,2-dichloroethylene	160	15,000 µg/l	1,400 µg/l	20,000 µg/l
methylene chloride	280	ND	ND	200,000 µg/l
1,1,2,2-tetrachloroethane	690	2,300 µg/l	ND	5,200 µg/l
tetrachloroethylene	410	7,100 µg/l	ND	38,000 µg/l
trichloroethylene	190	17,000 µg/l	4,200 µg/l	93,000 µg/l
vinyl chloride	1,000	1,700 µg/l	BMDL	6,000 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/7/83	10/11/83	10/11/83
Analysis Date	10/21/83	10/24/83	10/25/83
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
bromochloromethane - Recovery	97%	98%	96%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	88%	100%	98%
Internal Standard - Level	40 µg/l	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	76%	96%	98%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kaczynski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-15A	W-21A
benzene	220	ND	ND
chlorobenzene	300	ND	ND
chloroform	80	610,000 µg/l	130 µg/l
trans-1,2-dichloroethylene	80	1,400 µg/l	58,000 µg/l
methylene chloride	140	59,000 µg/l	ND
1,1,2,2-tetrachloroethane	350	1,200 µg/l	13,000 µg/l
tetrachloroethylene	210	13,000 µg/l	4,100 µg/l
trichloroethylene	95	25,000 µg/l	40,000 µg/l
vinyl chloride	500	BMDL	4,900 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/11/83	10/7/83
Analysis Date	10/24/83	10/22/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	110%	140%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	97%	110%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	92%	96%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kaczynski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-17B	W-18A
benzene	4.4	ND	19 µg/l
chlorobenzene	6.0	ND	8.6 µg/l
chloroform	1.6	1.9 µg/l	ND
trans-1,2-dichloroethylene	1.6	19 µg/l	39 µg/l
methylene chloride	2.8	ND	ND
1,1,2,2-tetrachloroethane	6.9	BMDL	ND
tetrachloroethylene	4.1	24 µg/l	ND
trichloroethylene	1.9	48 µg/l	11 µg/l
vinyl chloride	10	BMDL	40 µg/l

ADDITIONAL SAMPLE INFORMATION		
Sample Date	10/11/83	10/13/83
Analysis Date	10/25/83	10/26/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	95%	96%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	92%	93%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	92%	95%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/1/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-19A	W-19B
benzene	4.4	ND	BMDL
chlorobenzene	6.0	ND	8.1 µg/l
chloroform	1.6	70 µg/l	27,000 µg/l
trans-1,2-dichloroethylene	1.6	150 µg/l	3,100 µg/l
methylene chloride	2.8	ND	2,700 µg/l
1,1,2,2-tetrachloroethane	6.9	ND*	260 µg/l
tetrachloroethylene	4.1	78 µg/l	1,500 µg/l
trichloroethylene	1.9	150 µg/l	2,000 µg/l
vinyl chloride	10	BMDL	2,800 µg/l

ADDITIONAL SAMPLE INFORMATION		
Sample Date	10/13/83	10/13/83
Analysis Date	10/26/83	10/26/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	100%	100%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	93%	100%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	100%	110%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-2A (10/6/83)	W-3A (10/6/83)	W-3B (10/6/83)
α-BHC	µg/l	0.09	0.051	<0.01
β-BHC	µg/l	<0.01	<0.01	<0.01
δ-BHC	µg/l	0.015	<0.01	<0.01
γ-BHC	µg/l	<0.01	<0.01	<0.01
PCB-1016	µg/l	<0.1	<0.2	<0.2
PCB-1221	µg/l	<0.2	<0.4	<0.4
PCB-1232	µg/l	<0.2	<0.4	<0.4
PCB-1242	µg/l	<0.1	<0.2	<0.2
PCB-1248	µg/l	<0.1	<0.2	<0.2
PCB-1254	µg/l	<0.1	<0.2	<0.2
PCB-1260	µg/l	<0.1	<0.2	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviss

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-4A (10/6/83)	W-4B (10/6/83)	W-6A (10/6/83)	W-13A (10/6/83)
α-BHC	µg/l	0.075	0.12	0.10	0.043
β-BHC	µg/l	<0.01	<0.01	0.17	<0.01
δ-BHC	µg/l	<0.01	<0.01	0.14	<0.01
γ-BHC	µg/l	<0.01	<0.01	<0.01	<0.01
PCB-1016	µg/l	<0.2	<0.1	<0.1	<0.1
PCB-1221	µg/l	<0.4	<0.2	<0.2	<0.2
PCB-1232	µg/l	<0.4	<0.2	<0.2	<0.2
PCB-1242	µg/l	<0.2	<0.1	<0.1	<0.1
PCB-1248	µg/l	<0.2	<0.1	<0.1	<0.1
PCB-1254	µg/l	<0.2	<0.1	<0.1	<0.1
PCB-1260	µg/l	<0.2	<0.1	<0.1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviss

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)			
		W-12A (10/7/83)	W-12B (10/7/83)	W-14A (10/7/83)	W-21A (10/7/83)
α-BHC	µg/l	0.12	7.3	0.52	0.10
β-BHC	µg/l	<0.01	<0.2	0.20	<0.01
δ-BHC	µg/l	<0.01	<0.2	<0.2	<0.01
γ-BHC	µg/l	<0.01	1.2	<0.2	<0.01
PCB-1016	µg/l	<0.1	<10	<1	<1
PCB-1221	µg/l	<0.2	<20	<2	<2
PCB-1232	µg/l	<0.2	<20	<2	<2
PCB-1242	µg/l	<0.1	<20	<1	<1
PCB-1248	µg/l	<0.1	25	<1	<1
PCB-1254	µg/l	<0.1	<10	<1	<1
PCB-1260	µg/l	<0.1	<10	<1	<1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviss

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)			
		W-7A (10/10/83)	W-7B (10/10/83)	W-8A (10/10/83)	W-8B (10/10/83)
α-BHC	µg/l	0.064	0.062	0.16	0.11
β-BHC	µg/l	0.024	0.039	<0.1	<0.01
δ-BHC	µg/l	0.032	0.078	<0.1	<0.01
γ-BHC	µg/l	0.080	0.10	0.33	0.093
PCB-1016	µg/l	<0.1	<0.2	<0.5	<0.1
PCB-1221	µg/l	<0.2	<0.4	<1	<0.2
PCB-1232	µg/l	<0.2	<0.4	<1	<0.2
PCB-1242	µg/l	<0.1	<0.2	<0.5	<0.1
PCB-1248	µg/l	<0.1	<0.2	<0.5	<0.1
PCB-1254	µg/l	<0.1	<0.2	<0.5	<0.1
PCB-1260	µg/l	<0.1	<0.2	<0.5	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviss

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)			
		W-9A (10/10/83)	W-10A (10/10/83)	W-10C (10/10/83)	W-11A (10/10/83)
α-BHC	µg/1	≤0.01	0.18	0.31	0.20
β-BHC	µg/1	<0.1	0.039	0.078	<0.01
δ-BHC	µg/1	<0.1	<0.01	0.23	<0.01
γ-BHC	µg/1	0.16	0.20	0.23	0.01
PCB-1016	µg/1	<0.5	<0.2	<0.2	<0.2
PCB-1221	µg/1	<1	<0.4	<0.4	<0.4
PCB-1232	µg/1	<1	<0.4	<0.4	<0.4
PCB-1242	µg/1	<0.5	<0.2	<0.2	<0.2
PCB-1248	µg/1	<0.5	<0.2	<0.2	<0.2
PCB-1254	µg/1	<0.5	<0.2	<0.2	<0.2
PCB-1260	µg/1	<0.5	<0.2	<0.2	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Praus

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1A (10/11/83)	W-15A (10/11/83)
α-BHC	µg/1	0.34	0.23
β-BHC	µg/1	<0.01	0.20
δ-BHC	µg/1	0.047	0.031
γ-BHC	µg/1	0.031	0.039
PCB-1016	µg/1	<0.2	<0.2
PCB-1221	µg/1	<0.4	<0.4
PCB-1232	µg/1	<0.4	<0.4
PCB-1242	µg/1	<0.2	<0.2
PCB-1248	µg/1	<0.2	<0.2
PCB-1254	µg/1	<0.2	< 0.2
PCB-1260	µg/1	<0.2	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Praus

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)			
		W-16A (10/11/83)	W-16B (10/11/83)	W-17A (10/11/83)	W-17B (10/11/83)
α-BHC	µg/l	≤0.01	47	0.15	0.15
β-BHC	µg/l	<0.01	1.4	<0.01	<0.01
δ-BHC	µg/l	0.023	8.9	<0.01	<0.01
γ-BHC	µg/l	<0.01	8.2	0.14	0.11
PCB-1016	µg/l	<0.2	<5	<0.2	<0.2
PCB-1221	µg/l	<0.4	<10	<0.4	<0.4
PCB-1232	µg/l	<0.4	<10	<0.4	<0.4
PCB-1242	µg/l	<0.2	<5	<0.2	<0.2
PCB-1248	µg/l	<0.2	<5	<0.2	<0.2
PCB-1254	µg/l	<0.2	<5	<0.2	<0.2
PCB-1260	µg/l	<0.2	<5	<0.2	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Praviss

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)			
		W-1B (10/12/83)	W-1D (10/12/83)	W-1F (10/12/83)	W-1J (10/12/83)
α-BHC	µg/l	22	0.42	0.73	1.3
β-BHC	µg/l	6.6	0.077	0.14	0.10
δ-BHC	µg/l	1.7	0.40	<0.02	0.10
γ-BHC	µg/l	33	0.51	0.17	0.17
PCB-1016	µg/l	<10	<0.1	<0.1	<0.5
PCB-1221	µg/l	<20	<0.2	<0.2	<1
PCB-1232	µg/l	<20	<0.2	<0.2	<1
PCB-1242	µg/l	<10	<0.1	<0.1	<0.5
PCB-1248	µg/l	<10	<0.1	<0.1	<0.5
PCB-1254	µg/l	<10	<0.1	<0.1	<0.5
PCB-1260	µg/l	<10	<0.1	<0.1	<0.5

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Praviss

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1C (10/13/83)	W-1E (10/13/83)	W-5C (10/13/83)
α-BHC	µg/l	150	0.50	0.20
β-BHC	µg/l	19	0.046	0.023
δ-BHC	µg/l	130	0.32	0.046
γ-BHC	µg/l	200	0.50	0.038
PCB-1016	µg/l	<10	<1	<0.1
PCB-1221	µg/l	<20	<2	<0.2
PCB-1232	µg/l	<20	<2	<0.2
PCB-1242	µg/l	<10	<1	<0.1
PCB-1248	µg/l	<10	<1	<0.1
PCB-1254	µg/l	44	<1	<0.1
PCB-1260	µg/l	<40	<1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviso

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-18A (10/13/83)	W-18C (10/13/83)	W-19A (10/13/83)	W-19B (10/13/83)
α-BHC	µg/l	0.069	9.2	0.17	3.0
β-BHC	µg/l	0.038	1.5	0.12	0.18
δ-BHC	µg/l	0.069	1.7	0.12	0.10
γ-BHC	µg/l	0.046	3.0	0.086	0.095
PCB-1016	µg/l	<0.1	<0.2	<0.1	<0.1
PCB-1221	µg/l	<0.2	<0.4	<0.2	<0.2
PCB-1232	µg/l	<0.2	<0.4	<0.2	<0.2
PCB-1242	µg/l	<0.1	<0.2	<0.1	<0.1
PCB-1248	µg/l	<0.1	<0.2	<0.1	<0.1
PCB-1254	µg/l	<0.1	<0.2	<0.1	<0.1
PCB-1260	µg/l	<0.1	<0.2	<0.1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviso

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-2A (10/6/83)	W-3A (10/6/83)	W-3B (10/6/83)
Total Non-Filterable Residue (103°C)	mg/l	43	4.0	19
Total Organic Carbon	mg/l	15	9.0	45
Total Recoverable Phenolics	mg/l	<0.01	0.015	0.063
Total Cyanide	mg/l	3.3	1.4	5.0
Soluble Barium	mg/l	0.33	0.16	0.45
Soluble Copper	mg/l	<0.004	<0.004	0.008

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-4A (10/6/83)	W-4B (10/6/83)	W-6A (10/6/83)	W-13A (10/6/83)
Total Non-Filterable Residue (103°C)	mg/l	59	13	65	18
Total Organic Carbon	mg/l	7.0	4.3	5.0	9.3
Total Recoverable Phenolics	mg/l	0.012	<0.01	<0.01	0.012
Total Cyanide	mg/l	0.052	<0.01	0.049	0.038
Soluble Barium	mg/l	0.68	0.06	0.31	0.29
Soluble Copper	mg/l	<0.004	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-12A (10/7/83)	W-12B (10/7/83)	W-14A (10/7/83)	W-21A (10/7/83)
Total Non-Filterable Residue (103°C)	mg/l	110	29	140	110
Total Organic Carbon	mg/l	4.5	4.5	11	53
Total Recoverable Phenolics	mg/l	<0.01	<0.01	<0.01	0.044
Total Cyanide	mg/l	0.011	0.10	0.059	0.033
Soluble Barium	mg/l	0.15	0.27	0.11	0.28
Soluble Copper	mg/l	0.010	0.008	0.022	0.008

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-7A (10/10/83)	W-7B (10/10/83)	W-8A (10/10/83)	W-8B (10/10/83)
Total Non-Filterable Residue (103°C)	mg/l	110	9.0	320	110
Total Organic Carbon	mg/l	7.8	20	460	100
Total Recoverable Phenolics	mg/l	0.013	0.072	2.4	0.35
Total Cyanide	mg/l	1.3	0.052	61	9.9
Soluble Barium	mg/l	0.20	0.37	0.07	0.07
Soluble Copper	mg/l	<0.004	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)			
		W-9A (10/10/83)	W-10A (10/10/83)	W-10C (10/10/83)	W-11A (10/10/83)
Total Non-Filterable Residue (103°C)	mg/l	110	380	24	52
Total Organic Carbon	mg/l	100	14	3.0	8.0
Total Recoverable Phenolics	mg/l	0.030	0.065	0.029	0.025
Total Cyanide	mg/l	3.5	0.062	<0.01	0.100
Soluble Barium	mg/l	0.36	0.34	0.11	0.24
Soluble Copper	mg/l	0.006	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE)	
		W-1A (10/11/83)	W-15A (10/11/83)
Total Non-Filterable Residue (103°C)	mg/l	1,550	150
Total Organic Carbon	mg/l	12	22
Total Recoverable Phenolics	mg/l	0.035	<0.01
Total Cyanide	mg/l	0.12	3.5
Soluble Barium	mg/l	0.16	0.43
Soluble Copper	mg/l	<0.004	19

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-16A (10/11/83)	W-16B (10/11/83)	W-17A (10/11/83)	W-17B (10/11/83)
Total Non-Filterable Residue (103°C)	mg/1	34	36	150	1,120
Total Organic Carbon	mg/1	150	84	4.5	4.5
Total Recoverable Phenolics	mg/1	0.39	0.071	0.014	<0.01
Total Cyanide	mg/1	36	7.1	<0.01	<0.01
Soluble Barium	mg/1	0.11	0.32	0.07	0.13
Soluble Copper	mg/1	0.024	0.010	0.014	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1B (10/12/83)	W-1D (10/12/83)	W-1F (10/12/83)	W-1S (10/12/83)
Total Non-Filterable Residue (103°C)	mg/1	66	13	5.4	91
Total Organic Carbon	mg/1	30	<2	<2	<2
Total Recoverable Phenolics	mg/1	0.052	<0.01	<0.01	<0.01
Total Cyanide	mg/1	0.11	0.025	<0.01	<0.01
Soluble Barium	mg/1	0.41	0.35	0.27	0.60
Soluble Copper	mg/1	0.006	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-1C (10/13/83)	W-1E (10/13/83)	W-5C (10/13/83)
Total Non-Filterable Residue (103°C)	mg/l	73	93	<2
Total Organic Carbon	mg/l	17	<2	6.5
Total Recoverable Phenolics	mg/l	0.013	<0.01	<0.01
Total Cyanide	mg/l	0.23	<0.01	<0.01
Soluble Barium	mg/l	0.20	0.18	0.16
Soluble Copper	mg/l	<0.004	<0.004	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES Q. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/1/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-18A (10/13/83)	W-18B (10/13/83)	W-19A (10/13/83)	W-19B (10/13/83)
Total Non-Filterable Residue (103°C)	mg/l	240	3.8	790	63
Total Organic Carbon	mg/l	37	35	30	6.8
Total Recoverable Phenolics	mg/l	0.018	<0.01	<0.01	<0.01
Total Cyanide	mg/l	0.060	0.72	0.063	1.1
Soluble Barium	mg/l	0.13	0.13	0.08	0.13
Soluble Copper	mg/l	<0.004	0.006	0.010	<0.004

FOR RECRA ENVIRONMENTAL LABORATORIES Q. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE W-1D

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
benzene	µg/1	100	120	110	14	13
trans-1,2-dichloroethylene	µg/1	4,900	5,700	5,300	560	10
1,1,2,2-tetrachloroethane	µg/1	1,200	1,000	1,100	140	13
tetrachloroethylene	µg/1	250	250	250	0	0
trichloroethylene	µg/1	6,100	5,300	5,700	560	9.8

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kiszewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE W-11A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
benzene	µg/1	25	23	24	1.4	5.8
chlorobenzene	µg/1	38	33	36	3.5	9.7
trans-1,2-dichloroethylene	µg/1	540	420	480	85	18
trichloroethylene	µg/1	23	23	23	0	0
vinyl chloride	µg/1	1,100	700	900	280	31

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kiszewski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE W-14A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
1,1,2,2-tetrachloroethane	µg/l	28,000	18,000	23,000	7,100	31
tetrachloroethylene	µg/l	73,000	39,000	56,000	24,000	43
trichloroethylene	µg/l	56,000	34,000	45,000	15,000	33

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kuzemski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES
QUALITY CONTROL

Report Date: 11/1/83

VOLATILE RECOVERY ANALYSIS OF
SAMPLE W-17B

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
bromomethane	200	160	80
chloroethane	200	160	80
chloromethane	200	160	80
vinyl chloride	200	170	85

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/11/83
Analysis Date	10/25/83
Internal Standard - Level	40 µg/l
bromochloromethane - Recovery	85%
Internal Standard - Level	40 µg/l
2-bromo-1-chloropropane - Recovery	81%
Internal Standard - Level	40 µg/l
1,4-dichlorobutane - Recovery	77%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kuzemski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES
QUALITY CONTROL

Report Date: 11/1/83

VOLATILE RECOVERY ANALYSIS OF
SAMPLE W-19A

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
bromomethane	200	230	110
chloroethane	200	230	110
chloromethane	200	200	100
vinyl chloride	200	240	120

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/13/83
Analysis Date	10/26/83
Internal Standard - Level	40 µg/l
bromochloromethane - Recovery	110%
Internal Standard - Level	40 µg/l
2-bromo-1-chloropropane - Recovery	93%
Internal Standard - Level	40 µg/l
1,4-dichlorobutane - Recovery	110%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krzyzanski

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE PESTICIDE/PCB ANALYSIS OF
SAMPLE W-11A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
α-BHC	µg/l	0.20	0.20	0.20	0	0
γ-BHC	µg/l	0.40	0.40	0.40	0	0

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Praxus

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE PESTICIDE/PCB ANALYSIS OF
SAMPLE W-13A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
α-BHC	µg/1	0.047	0.039	0.043	0.0057	13

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praus

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE PESTICIDE/PCB ANALYSIS OF
SAMPLE W-17B

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
α-BHC	µg/1	0.21	0.086	0.15	0.088	59
γ-BHC	µg/1	0.11	0.11	0.11	0	0

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praus

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/1/83

REPLICATE PESTICIDE/PCB ANALYSIS OF
SAMPLE W-19A

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
α-BHC	µg/1	0.17	0.16	0.17	0.0071	4.3
β-BHC	µg/1	0.15	0.099	0.12	0.036	29
δ-BHC	µg/1	0.11	0.13	0.12	0.014	12
γ-BHC	µg/1	0.090	0.081	0.086	0.0064	7.4

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Prarios

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 11/1/83

PESTICIDE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
γ-BHC	0.22	0.15	68

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Prarios

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & CAOMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 11/1/83

PESTICIDE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
γ-BHC	0.22	0.29	130

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Travis

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
QUALITY CONTROL

Report Date: 11/1/83

PCB RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
PCB-1254	1.0	0.90	90

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J Travis

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 11/1/83

REPLICATE ANALYSIS

PARAMETER	SAMPLE I.D.	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
Total Non-Filterable Residue (103°C)	W-14A	mg/l	133	150	141.5	12	8.5
	W-7A	mg/l	110	105	107.5	3.53	3.3
	W-1A	mg/l	1,565	1,528	1,546	26	1.6
	W-1B	mg/l	71.6	59.0	66	8.9	13
	W-19A	mg/l	713	857	785	101	13
Total Organic Carbon	W-4B	mg/l	4.0	4.5	4.25	0.35	8.3
	W-7A	mg/l	7.5	8.0	7.75	0.35	4.6
	W-1B	mg/l	30.5	30.0	30.25	0.35	1.2
	W-19B	mg/l	6.5	7.0	6.75	0.35	5.2
Total Recoverable Phenolics	W-4A	mg/l	0.011	0.012	0.0115	0.0007	6.1
	W-7A	mg/l	0.010	0.015	0.015	0.0035	28
	W-1B	mg/l	0.041	0.063	0.0515	0.014	29
	W-18A	mg/l	0.0177	0.0182	0.0179	0.00035	2.0
Total Cyanide	W-14A	mg/l	0.056	0.062	0.059	0.004	7.2
	W-10A	mg/l	0.060	0.064	0.062	0.0028	4.6
	W-17A	mg/l	<0.01	<0.01	<0.01	-	-

FOR RECRA ENVIRONMENTAL LABORATORIES Q. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 11/1/83

RECOVERY ANALYSIS

PARAMETER	SAMPLE I.D.	µg OF SPIKE	µg RECOVERED	% RECOVERY
Total Organic Carbon	W-7A	500	501	100.2
	W-1B	500	468.5	93.7
	W-19B	125	125	100
Total Cyanide	W-1E	1,000	680	68
	W-19B	50	37.5	75
Soluble Barium	W-21A	750	780	104
	W-11A	1,500	1,560	104
	W-19B	1,500	1,110	74
Soluble Copper	W-21A	500	530	106
	W-11A	500	495	99
	W-17B	500	505	101
	W-1J	500	510	102

FOR RECRA ENVIRONMENTAL LABORATORIES Q. V. Finn

DATE 11/1/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1020

RECRA ENVIRONMENTAL LABORATORIES
Division of Recra Research, Inc.

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
PRIORITY POLLUTANT ANALYSES

Prepared For:

E. I. Du Pont de Nemours &
Company, Inc.
P.O. Box 787
Niagara Falls, NY 14302

Prepared By:

Recra Environmental Laboratories
4248 Ridge Lea Road
Amherst, NY 14226

Report Date: November 28, 1983

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

INTRODUCTION:

On October 27 through November 3, 1983, samples were received at Recra Environmental Laboratories. A request was made by E. I. Du Pont de Nemours & Company, Inc. to have the samples analyzed for selected fractions of the Environmental Protection Agency decreed priority pollutants, soluble barium, and miscellaneous water quality parameters. It was also requested that the base neutral/acid phenolic and volatile fractions undergo a broad spectrum analyses.

Due to insufficient sample volume, sample W-14C Bottom was to be analyzed for nine specific volatile compounds, PCB and BHC isomers, soluble copper and barium, and miscellaneous water quality parameters only.

This report will address the results of those analyses.

METHODS:

Priority pollutant analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

Organic priority pollutants were analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). Pesticide priority pollutants were analyzed by Gas Chromatography.

RESULTS AND DISCUSSION:

No Volatile field blank was received.

Volatile detection limits are a function of the amount of sample used in the analysis.

RESULTS AND DISCUSSION (CONT'D.):

The detection limit for 1,1,2-trichloroethane in sample W-2C is elevated due to a high degree of interference from compounds that were not of interest.

The presence of α-BHC and γ-BHC was detected in sample W-2C and W-15C. Other pesticides were not detected via GC/MS either because they were at levels below the detection limit of 4.0 µg/l or confirmatory criteria was not met.

Computer library identification was not made where peaks were already identified as priority pollutants, a computer library match could not be made, or the level of confidence was less than 80%. There was no Volatile broad spectrum information for samples W-5C', W-5C", W-5F, W-10F, W-15C, W-15D, and no extractable broad spectrum information for samples W-5C', W-5C", W-5F and W-10F.

Analyses for specific Pesticides/PCB's are based upon the matching of retention times between samples and standards on a single gas chromatographic column. Gas chromatographic, metal and miscellaneous values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Compounds reported as ND are "not detected". Compounds reported as BMDL are confirmed as being present in the sample at a level "below method detection limit".

The presence of an asterisk (*) in the data tables signifies that the particular compound is indicated as being possibly present at a level below the detection limit.

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Barbara J. Krajewski

Barbara J. Krajewski
GC/MS Analyst

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

ACID/PHENOLICS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-5C'	W-5C"	W-5F
2-chlorophenol	3.3	ND	ND	ND
2,4-dichlorophenol	2.7	ND	ND	ND
2,4-dimethylphenol	2.7	ND	ND	ND
4,6-dinitro-o-cresol	24	ND	ND	ND
2,4-dinitrophenol	42	ND	ND	ND
2-nitrophenol	3.6	ND	ND	ND
4-nitrophenol	2.4	ND	ND	ND
p-chloro-m-cresol	3.0	ND	ND	ND
pentachlorophenol	3.6	8.5 µg/l	ND*	ND
phenol	1.5	ND	ND	ND
2,4,6-trichlorophenol	2.7	ND	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/27/83	10/27/83	10/27/83
Extraction Date	11/6/83	11/6/83	11/6/83
Analysis Date	11/8/83	11/8/83	11/8/83
Internal Standard (IS) - Level	20 µg/l	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery	120%	120%	110%
Surrogate Standard (SS1) - Level	113 µg/l	113 µg/l	113 µg/l
2-fluorophenol - Recovery	31%	48%	37%
Surrogate Standard (SS2) - Level	120 µg/l	120 µg/l	120 µg/l
pentafluorophenol - Recovery	45%	61%	63%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kuzewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

ACID/PHENOLICS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15C	W-15D	W-15F
2-chlorophenol	3.3	ND	ND	ND
2,4-dichlorophenol	2.7	ND	ND	ND
2,4-dimethylphenol	2.7	ND	ND	ND
4,6-dinitro-o-cresol	24	ND	ND	ND
2,4-dinitrophenol	42	ND	ND	ND
2-nitrophenol	3.6	ND	ND	ND
4-nitrophenol	2.4	ND	ND	ND
p-chloro-m-cresol	3.0	ND	ND	ND
pentachlorophenol	3.6	ND	ND	ND
phenol	1.5	ND	ND	ND
2,4,6-trichlorophenol	2.7	ND	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	11/3/83	11/3/83	11/3/83
Extraction Date	11/8/83	11/8/83	11/8/83
Analysis Date	11/11/83	11/11/83	11/11/83
Internal Standard (IS) - Level	20 µg/l	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery	110%	120%	120%
Surrogate Standard (SS1) - Level	113µg/l	113 µg/l	113 µg/l
2-fluorophenol - Recovery	37%	37%	44%
Surrogate Standard (SS2) - Level	120 µg/l	120 µg/l	120 µg/l
pentafluorophenol - Recovery	45%	48%	48%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kuzewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

ACID/PHENOLICS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-10D	W-10F	W-2C
2-chlorophenol	3.3	ND	ND	ND
2,4-dichlorophenol	2.7	ND	ND	ND
2,4-dimethylphenol	2.7	ND	ND	ND
4,6-dinitro-o-cresol	24	ND	ND	ND
2,4-dinitrophenol	42	ND	ND	ND
2-nitrophenol	3.6	ND	ND	ND
4-nitrophenol	2.4	ND	ND	ND
p-chloro-m-cresol	3.0	ND	ND	ND
pentachlorophenol	3.6	ND	ND	ND
phenol	1.5	ND	ND	ND
2,4,6-trichlorophenol	2.7	ND	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/28/83	10/28/83	10/31/83
Extraction Date	11/6/83	11/6/83	11/6/83
Analysis Date	11/8/83	11/8/83	11/7/83
Internal Standard (IS) - Level	20 µg/l	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery	110%	110%	110%
Surrogate Standard (SS1) - Level	113 µg/l	113 µg/l	113 µg/l
2-fluorophenol - Recovery	40%	43%	48%
Surrogate Standard (SS2) - Level	120 µg/l	120 µg/l	120 µg/l
pentafluorophenol - Recovery	66%	54%	60%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krzyzanski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-5C'	W-5C"	W-5F
acenaphthene	1.9	ND	ND	ND
acenaphthylene	3.5	ND	ND	ND
anthracene	1.9	ND	ND	ND
benzidine	44	ND	ND	ND
benzo(a)anthracene	7.8	ND	ND	ND
benzo(a)pyrene	2.5	ND	ND	ND
benzo(b)fluoranthene	4.8	ND	ND	ND
benzo(g,h,i)perylene	4.1	ND	ND	ND
benzo(k)fluoranthene	2.5	ND	ND	ND
bis(2-chloroethoxy)methane	5.3	ND	ND	ND
bis(2-chloroethyl)ether	5.7	ND	ND	ND
bis(2-chloroisopropyl)ether	5.7	ND	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND	ND
4-bromophenylphenylether	1.9	ND	ND	ND
butylbenzylphthalate	2.5	ND	ND	ND
2-chloronaphthalene	1.9	ND	ND	ND
4-chlorophenylphenylether	4.2	ND	ND	ND
chrysene	2.5	ND	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND	ND
1,2-dichlorobenzene	1.9	ND	ND	ND
1,3-dichlorobenzene	1.9	ND	ND*	ND
1,4-dichlorobenzene	4.4	ND	ND*	ND
3,3'-dichlorobenzidine	16.5	ND	ND	ND
diethylphthalate	22	ND	ND	ND
dimethylphthalate	1.6	ND	ND	ND
di-n-butylphthalate	2.5	ND	ND	ND

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-5C'	W-5C"	W-5F
2,6-dinitrotoluene	1.9	ND	ND	ND
2,4-dinitrotoluene	5.7	ND	ND	ND
di-n-octylphthalate	2.5	ND	ND	ND
1,2-diphenylhydrazine	25	ND	ND	ND
fluoranthene	2.2	ND	ND	ND
fluorene	1.9	BMDL	ND	ND
hexachlorobenzene	1.9	ND	ND	ND
hexachlorobutadiene	0.9	ND	ND	ND
hexachlorocyclopentadiene	25	ND	ND	ND
hexachloroethane	1.6	ND	ND	ND
indeno (1,2,3-cd)pyrene	3.7	ND	ND	ND
isophorone	2.2	ND	ND	ND
naphthalene	1.6	ND	ND	ND
nitrobenzene	1.9	ND	ND	ND
N-nitrosodimethylamine	25	ND	ND	ND
N-nitrosodi-n-propylamine	25	ND	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND	ND
phenanthrene	5.4	ND	ND	ND
pyrene	1.9	ND	ND	ND
1,2,4-trichlorobenzene	1.9	ND	ND	ND
ADDITIONAL SAMPLE INFORMATION				
Sample Date		10/27/83	10/27/83	10/27/83
Extraction Date		11/6/83	11/6/83	11/6/83
Analysis Date		11/8/83	11/8/83	11/8/83
Internal Standard - Level		20 µg/l	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery		120%	120%	110%
Surrogate Standard (SS3) - Level		116 µg/l	116 µg/l	116 µg/l
decafluorobiphenyl - Recovery		71%	88%	75%
Surrogate Standard (SS4) - Level		120 µg/l	120 µg/l	120 µg/l
2-fluorobiphenyl - Recovery		85%	76%	71%

FOR RECRA ENVIRONMENTAL LABORATORIES Gabriela J Kuzewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-10D	W-10F	W-2C
acenaphthene	1.9	ND	ND	ND
acenaphthylene	3.5	ND	ND	ND
anthracene	1.9	ND	ND	ND
benzidine	44	ND	ND	ND
benzo(a)anthracene	7.8	ND	ND	ND
benzo(a)pyrene	2.5	ND	ND	ND
benzo(b)fluoranthene	4.8	ND	ND	ND
benzo(g,h,i)perylene	4.1	ND	ND	ND
benzo(k)fluoranthene	2.5	ND	ND	ND
bis(2-chloroethoxy)methane	5.3	ND	ND	ND
bis(2-chloroethyl)ether	5.7	ND	ND	ND
bis(2-chloroisopropyl)ether	5.7	ND	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND	ND
4-bromophenylphenylether	1.9	ND	ND	ND
butylbenzylphthalate	2.5	ND	ND	ND
2-chloronaphthalene	1.9	ND	ND	ND
4-chlorophenylphenylether	4.2	ND	ND	ND
chrysene	2.5	ND	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND	ND
1,2-dichlorobenzene	1.9	BMDL	BMDL	13 µg/l
1,3-dichlorobenzene	1.9	BMDL	BMDL	8.8 µg/l
1,4-dichlorobenzene	4.4	BMDL	BMDL	8.8 µg/l
3,3'-dichlorobenzidine	16.5	ND	ND	ND
diethylphthalate	22	ND	ND	ND
dimethylphthalate	1.6	ND	ND	ND
di-n-butylphthalate	2.5	ND	ND	ND

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-10D	W-10F	W-2C
2,6-dinitrotoluene	1.9	ND	ND	ND
2,4-dinitrotoluene	5.7	ND	ND	ND
di-n-octylphthalate	2.5	ND	ND	ND
1,2-diphenylhydrazine	25	ND	ND	ND
fluoranthene	2.2	ND	ND	ND
fluorene	1.9	ND	ND	ND
hexachlorobenzene	1.9	ND	ND	ND
hexachlorobutadiene	0.9	1.1 µg/l	BMDL	1.4 µg/l
hexachlorocyclopentadiene	25	ND	ND	ND
hexachloroethane	1.6	7.7 µg/l	ND	12 µg/l
indeno (1,2,3-cd)pyrene	3.7	ND	ND	ND
isophorone	2.2	ND	ND	ND
naphthalene	1.6	ND	ND	BMDL
nitrobenzene	1.9	ND	ND	ND
N-nitrosodimethylamine	25	ND	ND	ND
N-nitrosodi-n-propylamine	25	ND	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND	ND
phenanthrene	5.4	ND	ND	ND
pyrene	1.9	ND	ND	ND
1,2,4-trichlorobenzene	1.9	3.1 µg/l	BMDL	58 µg/l

ADDITIONAL SAMPLE INFORMATION			
Sample Date	10/28/83	10/28/83	10/31/83
Extraction Date	11/6/83	11/6/83	11/6/83
Analysis Date	11/8/83	11/8/83	11/7/83
Internal Standard - Level	20 µg/l	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery	110%	110%	110%
Surrogate Standard (SS3) - Level	116 µg/l	116 µg/l	116 µg/l
decafluorobiphenyl - Recovery	78%	66%	70%
Surrogate Standard (SS4) - Level	120 µg/l	120 µg/l	120 µg/l
2-fluorobiphenyl - Recovery	68%	64%	68%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kujawski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15C	W-15D	W-15F
acenaphthene	1.9	ND	ND	ND
acenaphthylene	3.5	ND	ND	ND
anthracene	1.9	ND	ND	ND
benzidine	44	ND	ND	ND
benzo(a)anthracene	7.8	ND	ND	ND
benzo(a)pyrene	2.5	ND	ND	ND
benzo(b)fluoranthene	4.8	ND	ND	ND
benzo(g,h,i)perylene	4.1	ND	ND	ND
benzo(k)fluoranthene	2.5	ND	ND	ND
bis(2-chloroethoxy)methane	5.3	ND	ND	ND
bis(2-chloroethyl)ether	5.7	ND	ND	ND
bis(2-chloroisopropyl)ether	5.7	ND	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND	ND
4-bromophenylphenylether	1.9	ND	ND	ND
butylbenzylphthalate	2.5	ND	ND	ND
2-chloronaphthalene	1.9	ND	ND	ND
4-chlorophenylphenylether	4.2	ND	ND	ND
chrysene	2.5	ND	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND	ND
1,2-dichlorobenzene	1.9	30 µg/l	12 µg/l	11 µg/l
1,3-dichlorobenzene	1.9	16 µg/l	7.0 µg/l	5.5 µg/l
1,4-dichlorobenzene	4.4	8.8 µg/l	BMDL	BMDL
3,3'-dichlorobenzidine	16.5	ND	ND	ND
diethylphthalate	22	ND	ND	ND
dimethylphthalate	1.6	ND	ND	ND
di-n-butylphthalate	2.5	ND	ND	ND

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15C	W-15D	W-15F
2,6-dinitrotoluene	1.9	ND	ND	ND
2,4-dinitrotoluene	5.7	ND	ND	ND
di-n-octylphthalate	2.5	ND	ND	ND
1,2-diphenylhydrazine	25	ND	ND	ND
fluoranthene	2.2	ND	ND	ND
fluorene	1.9	BMDL	ND	ND
hexachlorobenzene	1.9	3.8 µg/1	BMDL	ND*
hexachlorobutadiene	0.9	86 µg/1	28 µg/1	26 µg/1
hexachlorocyclopentadiene	25	ND	ND	ND
hexachloroethane	1.6	170 µg/1	89 µg/1	91 µg/1
indeno (1,2,3-cd)pyrene	3.7	ND	ND	ND
isophorone	2.2	ND	ND	ND
naphthalene	1.6	2.0 µg/1	BMDL	BMDL
nitrobenzene	1.9	4.4 µg/1	2.5 µg/1	ND*
N-nitrosodimethylamine	25	ND	ND	ND
N-nitrosodi-n-propylamine	25	ND	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND	ND
phenanthrene	5.4	ND	ND	ND
pyrene	1.9	ND	ND	ND
1,2,4-trichlorobenzene	1.9	170 µg/1	53 µg/1	35 µg/1
ADDITIONAL SAMPLE INFORMATION				
Sample Date		11/3/83	11/3/83	11/3/83
Extraction Date		11/8/83	11/8/83	11/8/83
Analysis Date		11/11/83	11/11/83	11/11/83
Internal Standard - Level		20 µg/1	20 µg/1	20 µg/1
deuterated phenanthrene - Recovery		110%	120%	120%
Surrogate Standard (SS3) - Level		116 µg/1	116 µg/1	116 µg/1
decafluorobiphenyl - Recovery		74%	82%	73%
Surrogate Standard (SS4) - Level		120 µg/1	120 µg/1	120 µg/1
2-fluorobiphenyl - Recovery		83%	83%	77%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kingsbury

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-5C'	W-5C"
acrolein	4,000	ND	ND
acrylonitrile	4,000	ND	ND
benzene	44	ND	ND
bromodichloromethane	22	ND	ND
bromoform	47	ND	ND
bromomethane	50	ND	ND
carbon tetrachloride	28	ND	ND
chlorobenzene	60	ND	ND
chloroethane	100	ND	ND
2-chloroethylvinyl ether	100	ND	ND
chloroform	16	ND	ND
chloromethane	100	ND	ND
dibromochloromethane	31	ND	ND
1,1-dichloroethane	47	ND	BMDL
1,2-dichloroethane	28	ND	ND
1,1-dichloroethylene	28	ND	190 µg/1
trans-1,2-dichloroethylene	16	300 µg/1	530 µg/1
1,2-dichloropropane	60	ND	ND
1,3-dichloropropene	50	ND	ND
ethylbenzene	72	ND	ND
methylene chloride	28	ND	ND
1,1,2,2-tetrachloroethane	69	ND	ND
tetrachloroethylene	41	ND	BMDL

(Continued)

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-5C'	W-5C"
toluene	60	ND	ND
1,1,1-trichloroethane	38	230 µg/l	280 µg/l
1,1,2-trichloroethane	50	ND	ND
trichloroethylene	19	140 µg/l	320 µg/l
vinyl chloride	100	250 µg/l	470 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/27/83	10/27/83
Analysis Date	11/16/83	11/16/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	110%	110%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	100%	93%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	100%	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kuzmicki

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-5F
acrolein	400	ND
acrylonitrile	400	ND
benzene	4.4	ND
bromodichloromethane	2.2	ND
bromoform	4.7	ND
bromomethane	10	ND
carbon tetrachloride	2.8	BMDL
chlorobenzene	6.0	ND
chloroethane	10	ND
2-chloroethylvinyl ether	10	ND
chloroform	1.6	270 µg/l
chloromethane	10	ND
dibromochloromethane	3.1	ND
1,1-dichloroethane	4.7	ND
1,2-dichloroethane	2.8	ND
1,1-dichloroethylene	2.8	ND
trans-1,2-dichloroethylene	1.6	38 µg/l
1,2-dichloropropane	6.0	ND
1,3-dichloropropene	5.0	ND
ethylbenzene	7.2	ND
methylene chloride	2.8	90 µg/l
1,1,2,2-tetrachloroethane	6.9	ND
tetrachloroethylene	4.1	27 µg/l

(Continued)

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION W-5F
toluene	6.0	ND
1,1,1-trichloroethane	3.8	BMDL
1,1,2-trichloroethane	5.0	ND
trichloroethylene	1.9	50 µg/l
vinyl chloride	10	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/27/83
Analysis Date	11/16/83
Internal Standard - Level	40 µg/l
bromochloromethane - Recovery	96%
Internal Standard - Level	40 µg/l
2-bromo-1-chloropropane - Recovery	98%
Internal Standard - Level	40 µg/l
1,4-dichlorobutane - Recovery	97%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Fraguski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION W-10D	W-10F
acrolein	4,000	ND	ND
acrylonitrile	4,000	ND	ND
benzene	44	560 µg/l	ND
bromodichloromethane	22	ND	ND
bromoform	47	ND	ND
bromomethane	100	ND	ND
carbon tetrachloride	28	90 µg/l	ND
chlorobenzene	60	BMDL	BMDL
chloroethane	100	ND	ND
2-chloroethylvinyl ether	100	ND	ND
chloroform	16	180 µg/l	ND
chloromethane	100	ND	ND
dibromochloromethane	31	ND	ND
1,1-dichloroethane	47	ND*	ND
1,2-dichloroethane	28	ND	ND
1,1-dichloroethylene	28	63 µg/l	BMDL
trans-1,2-dichloroethylene	16	2,800 µg/l	3,500 µg/l
1,2-dichloropropane	60	ND	ND
1,3-dichloropropene	50	ND	ND
ethylbenzene	72	ND	ND
methylene chloride	28	41 µg/l	ND
1,1,2,2-tetrachloroethane	69	15,000 µg/l	ND
tetrachloroethylene	41	5,200 µg/l	250 µg/l

(Continued)

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION	
		W-10D	W-10F
toluene	60	ND	ND
1,1,1-trichloroethane	38	83 µg/l	ND*
1,1,2-trichloroethane	50	130 µg/l	ND*
trichloroethylene	19	32,000 µg/l	66 µg/l
vinyl chloride	100	BMDL	310 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/28/83	10/28/83
Analysis Date	11/16/83	11/17/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	97%	110%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	92%	110%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	120%	120%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kingsley

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

C-92A

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION W-2C
acrolein	8,000	ND
acrylonitrile	8,000	ND
benzene	88	170 ug/l
bromodichloromethane	44	ND
bromoform	94	ND
bromomethane	200	ND
carbon tetrachloride	56	180 ug/l
chlorobenzene	120	BMDL
chloroethane	200	ND
2-chloroethylvinyl ether	200	ND
chloroform	32	1,600 ug/l
chloromethane	200	ND
dibromochloromethane	62	ND
1,1-dichloroethane	94	ND*
1,2-dichloroethane	56	BMDL
1,1-dichloroethylene	56	1,200 ug/l
trans-1,2-dichloroethylene	32	5,500 ug/l
1,2-dichloropropane	120	ND
1,3-dichloropropene	100	ND
ethylbenzene	140	ND
methylene chloride	56	57,000 ug/l
1,1,2,2-tetrachloroethane	140	40,000 ug/l
tetrachloroethylene	82	41,000 ug/l

(Continued)

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (ug/l)	SAMPLE IDENTIFICATION W-2C
toluene	120	ND
1,1,1-trichloroethane	76	2,400 ug/l
1,1,2-trichloroethane	25,000	ND
trichloroethylene	38	190,000 ug/l
vinyl chloride	200	340 ug/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	10/31/83
Analysis Date	11/17/83
Internal Standard - Level	40 ug/l
bromochloromethane - Recovery	110%
Internal Standard - Level	40 ug/l
2-bromo-1-chloropropane - Recovery	110%
Internal Standard - Level	40 ug/l
1,4-dichlorobutane - Recovery	*

*The recovery of 1,4-dichlorobutane could not be determined due to the high degree of interference from compounds that were not of interest.

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kazenski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-15C	W-15D
crolein	200,000	ND	ND
crylonitrile	200,000	ND	ND
enzene	2,200	ND	ND
romodichloromethane	1,100	ND	ND
romoform	2,400	ND	ND
romomethane	5,000	ND	ND
arbon tetrachloride	1,400	3,000 µg/l	5,200 µg/l
hlorobenzene	3,000	ND	ND
hloroethane	5,000	ND	ND
-chloroethylvinyl ether	5,000	ND	ND
hloroform	800	42,000 µg/l	93,000 µg/l
hloromethane	5,000	ND	ND
ibromochloromethane	1,600	ND	ND
,1-dichloroethane	2,400	ND	ND
,2-dichloroethane	1,400	ND	ND*
,1-dichloroethylene	1,400	ND	BMDL
rans-1,2-dichloroethylene	800	2,900 µg/l	3,200 µg/l
,2-dichloropropane	3,000	ND	ND
,3-dichloropropene	2,500	ND	ND
thylbenzene	3,600	ND	ND
ethylene chloride	1,400	24,000 µg/l	18,000 µg/l
,1,2,2-tetrachloroethane	3,400	42,000 µg/l	11,000 µg/l
etrachloroethylene	2,000	52,000 µg/l	18,000 µg/l

(Continued)

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-15C	W-15D
toluene	3,000	ND	ND
1,1,1-trichloroethane	1,900	BMDL	ND*
1,1,2-trichloroethane	2,500	BMDL	BMDL
trichloroethylene	950	160,000 µg/l	48,000 µg/l
vinyl chloride	5,000	ND	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	11/3/83	11/3/83
Analysis Date	11/18/83	11/18/83
Internal Standard - Level	40 µg/l	40 µg/l
bromochloromethane - Recovery	100%	110%
Internal Standard - Level	40 µg/l	40 µg/l
2-bromo-1-chloropropane - Recovery	95%	110%
Internal Standard - Level	40 µg/l	40 µg/l
1,4-dichlorobutane - Recovery	100%	110%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kazenske

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-15F
acrolein	20,000	ND
acrylonitrile	20,000	ND
benzene	220	800 µg/l
bromodichloromethane	110	ND
bromoform	240	ND
bromomethane	500	ND
carbon tetrachloride	140	8,500 µg/l
chlorobenzene	300	7,300 µg/l
chloroethane	500	ND
2-chloroethylvinyl ether	500	ND
chloroform	80	47,000 µg/l
chloromethane	500	ND
dibromochloromethane	160	ND
1,1-dichloroethane	240	ND
1,2-dichloroethane	140	250 µg/l
1,1-dichloroethylene	140	760 µg/l
trans-1,2-dichloroethylene	80	4,100 µg/l
1,2-dichloropropane	300	ND
1,3-dichloropropene	250	ND
ethylbenzene	360	ND
methylene chloride	140	7,400 µg/l
1,1,2,2-tetrachloroethane	340	ND
tetrachloroethylene	200	30,000 µg/l

(Continued)

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

VOLATILES

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-15F
toluene	300	ND
1,1,1-trichloroethane	190	BMDL
1,1,2-trichloroethane	250	ND
trichloroethylene	95	78,000 µg/l
vinyl chloride	500	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	11/3/83
Analysis Date	11/18/83
Internal Standard - Level	40 µg/l
bromochloromethane - Recovery	91%
Internal Standard - Level	40 µg/l
2-bromo-1-chloropropane - Recovery	95%
Internal Standard - Level	40 µg/l
1,4-dichlorobutane - Recovery	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kasperski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
SPECIFIC VOLATILE ANALYSES

Report Date: 11/28/83

COMPOUND	METHOD DETECTION LIMIT (µg/l)	SAMPLE IDENTIFICATION W-14C BOTTOM
benzene	220	BMDL
chlorobenzene	300	ND
chloroform	80	BMDL
trans-1,2-dichloroethylene	80	2,600 µg/l
methylene chloride	140	160 µg/l
1,1,2,2-tetrachloroethane	340	ND
tetrachloroethylene	200	8,100 µg/l
trichloroethylene	95	18,000 µg/l
vinyl chloride	500	BMDL

ADDITIONAL SAMPLE INFORMATION

Sample Date	11/2/83
Analysis Date	11/18/83
Internal Standard - Level	40 µg/l
bromochloromethane - Recovery	100%
Internal Standard - Level	40 µg/l
2-bromo-1-chloropropane - Recovery	97%
Internal Standard - Level	40 µg/l
1,4-dichlorobutane - Recovery	100%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

PESTICIDES/PCB'S

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-2C (10/31/83)
Aldrin	µg/l	<0.5
α-BHC	µg/l	26
β-BHC	µg/l	3.4
δ-BHC	µg/l	1.3
γ-BHC	µg/l	19
Chlordane	µg/l	<0.5
4,4'-DDD	µg/l	<0.05
4,4'-DDE	µg/l	<0.05
4,4'-DDT	µg/l	<0.05
Dieldrin	µg/l	<0.05
α-Endosulfan	µg/l	<0.05
β-Endosulfan	µg/l	<0.05
Endosulfan sulfate	µg/l	<0.05
Endrin	µg/l	<0.05
Endrin aldehyde	µg/l	<0.05
Heptachlor	µg/l	<0.05
Heptachlor epoxide	µg/l	<0.05
PCB-1016	µg/l	<2
PCB-1221	µg/l	<4
PCB-1232	µg/l	<4
PCB-1242	µg/l	<2
PCB-1248	µg/l	<2
PCB-1254	µg/l	<2
PCB-1260	µg/l	<2
Toxaphene	µg/l	<0.5

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

PESTICIDES/PCB'S

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-5C' (10/27/83)	W-5C" (10/27/83)	W-5F (10/27/83)
Aldrin	µg/l	<0.01	0.05	<0.01
α-BHC	µg/l	0.04	0.09	<0.01
β-BHC	µg/l	0.04	0.03	<0.01
δ-BHC	µg/l	<0.01	0.06	<0.01
γ-BHC	µg/l	<0.01	<0.01	<0.01
Chlordane	µg/l	<0.1	<0.1	<0.1
4,4'-DDD	µg/l	<0.01	<0.01	<0.1
4,4'-DDE	µg/l	<0.01	<0.01	<0.1
4,4'-DDT	µg/l	<0.01	<0.01	<0.1
Dieldrin	µg/l	<0.01	<0.01	<0.1
α-Endosulfan	µg/l	<0.01	<0.01	<0.1
β-Endosulfan	µg/l	<0.01	<0.01	<0.1
Endosulfan sulfate	µg/l	<0.01	<0.01	<0.1
Endrin	µg/l	<0.01	<0.01	<0.1
Endrin aldehyde	µg/l	<0.01	<0.01	<0.1
Heptachlor	µg/l	<0.01	<0.01	<0.1
Heptachlor epoxide	µg/l	<0.01	<0.01	<0.1
PCB-1016	µg/l	<0.2	<1	<0.2
PCB-1221	µg/l	<0.4	<2	<0.4
PCB-1232	µg/l	<0.4	<2	<0.4
PCB-1242	µg/l	<0.2	<1	<0.2
PCB-1248	µg/l	<0.2	<1	<0.2
PCB-1254	µg/l	<0.2	<1	<0.2
PCB-1260	µg/l	<0.2	<1	<0.2
Toxaphene	µg/l	<0.1	<0.1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Brazio

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

PESTICIDES/PCB'S

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-10D (10/28/83)	W-10F (10/28/83)
Aldrin	µg/l	0.06	<0.01
α-BHC	µg/l	2.3	1.4
β-BHC	µg/l	3.8	0.22
δ-BHC	µg/l	0.41	0.03
γ-BHC	µg/l	2.7	0.03
Chlordane	µg/l	<0.1	<0.1
4,4'-DDD	µg/l	<0.01	<0.01
4,4'-DDE	µg/l	<0.01	<0.01
4,4'-DDT	µg/l	<0.01	<0.01
Dieldrin	µg/l	<0.01	<0.01
α-Endosulfan	µg/l	<0.01	<0.01
β-Endosulfan	µg/l	<0.01	<0.01
Endosulfan sulfate	µg/l	<0.01	<0.01
Endrin	µg/l	<0.01	<0.01
Endrin aldehyde	µg/l	<0.01	<0.01
Heptachlor	µg/l	0.11	<0.01
Heptachlor epoxide	µg/l	<0.01	<0.01
PCB-1016	µg/l	<0.2	<0.2
PCB-1221	µg/l	<0.4	<0.4
PCB-1232	µg/l	<0.4	<0.4
PCB-1242	µg/l	<0.2	<0.2
PCB-1248	µg/l	<0.2	<0.2
PCB-1254	µg/l	<0.2	<0.2
PCB-1260	µg/l	<0.2	<0.2
Toxaphene	µg/l	<0.1	<0.1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Brazio

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

PESTICIDES/PCB'S

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION W-15C (11/3/83)	W-15D (11/3/83)	W-15F (11/3/83)
Aldrin	µg/l	<0.2	<0.5	<0.1
α-BHC	µg/l	<0.2	17	<0.2
β-BHC	µg/l	<0.2	3.2	2.0
δ-BHC	µg/l	<0.2	4.9	<0.5
γ-BHC	µg/l	<0.2	16	<0.5
Chlordane	µg/l	<2	<1	<0.2
4,4'-DDD	µg/l	<0.2	<0.5	<0.05
4,4'-DDE	µg/l	<0.2	<0.5	<0.05
4,4'-DDT	µg/l	<0.2	<0.5	<0.05
Dieldrin	µg/l	<0.2	<0.5	<0.05
α-Endosulfan	µg/l	<0.2	<0.5	<0.05
β-Endosulfan	µg/l	<0.2	<0.5	<0.05
Endosulfan sulfate	µg/l	<0.2	<0.5	<0.05
Endrin	µg/l	<0.2	<0.5	<0.05
Endrin aldehyde	µg/l	<0.2	<0.5	<0.05
Heptachlor	µg/l	<0.2	<0.5	<0.05
Heptachlor epoxide	µg/l	<0.2	<0.5	<0.05
PCB-1016	µg/l	<4	<5	<1
PCB-1221	µg/l	<8	<10	<2
PCB-1232	µg/l	<8	<10	<2
PCB-1242	µg/l	<4	<5	<1
PCB-1248	µg/l	<4	<5	<1
PCB-1254	µg/l	<4	<5	<1
PCB-1260	µg/l	<4	<5	<1
Toxaphene	µg/l	<2	<0.5	<0.2

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Pearce
DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY

Report Date: 11/28/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-14C BOTTOM (11/2/83)
α-BHC	µg/l	32
β-BHC	µg/l	4.4
δ-BHC	µg/l	4.7
γ-BHC	µg/l	37
PCB-1016	µg/l	<1
PCB-1221	µg/l	<2
PCB-1232	µg/l	<2
PCB-1242	µg/l	<1
PCB-1248	µg/l	<1
PCB-1254	µg/l	<1
PCB-1260	µg/l	<1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Pearce
DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
ATOMIC ABSORPTION SPECTROPHOTOMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

METALS

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-2C (10/31/83)	W-5C' (10/27/83)	W-5C" (10/27/83)	W-5F (10/27/83)
Total Antimony	mg/l	<0.02	<0.02	<0.02	<0.02
Total Arsenic	mg/l	<0.005	<0.005	<0.005	<0.005
Total Beryllium	mg/l	<0.005	0.008	0.008	0.010
Total Cadmium	mg/l	<0.008	<0.008	<0.008	<0.008
Total Chromium	mg/l	<0.006	0.016	0.020	0.022
Total Copper	mg/l	<0.004	<0.004	<0.004	<0.004
Total Lead	mg/l	<0.005	<0.005	0.046	<0.005
Total Mercury	mg/l	<0.0005	<0.0005	<0.0005	<0.0005
Total Nickel	mg/l	<0.01	<0.01	<0.01	<0.01
Total Selenium	mg/l	<0.005	<0.005	<0.005	<0.005
Total Silver	mg/l	0.010	<0.008	<0.008	<0.008
Total Thallium	mg/l	<0.005	<0.005	<0.005	<0.005
Total Zinc	mg/l	0.022	0.097	0.033	0.076
Soluble Barium	mg/l	0.31	0.43	0.31	<0.08

FOR RECRA ENVIRONMENTAL LABORATORIES Q. V. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
ATOMIC ABSORPTION SPECTROPHOTOMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

METALS

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-10D (10/28/83)	W-10F (10/28/83)	W-14C BOTTOM (11/2/83)
Total Antimony	mg/l	<0.02	<0.02	-
Total Arsenic	mg/l	<0.005	<0.005	-
Total Beryllium	mg/l	<0.005	<0.005	-
Total Cadmium	mg/l	0.011	<0.008	
Total Chromium	mg/l	0.008	0.018	-
Total Copper	mg/l	0.004	<0.004	-
Total Lead	mg/l	<0.005	<0.005	-
Total Mercury	mg/l	<0.0005	<0.0005	-
Total Nickel	mg/l	<0.01	<0.01	-
Total Selenium	mg/l	<0.005	<0.005	-
Total Silver	mg/l	<0.008	<0.008	-
Total Thallium	mg/l	<0.005	<0.005	-
Total Zinc	mg/l	0.026	0.025	-
Soluble Barium	mg/l	0.41	0.34	0.31
Soluble Copper	mg/l	-	-	0.008

FOR RECRA ENVIRONMENTAL LABORATORIES Q. V. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
ATOMIC ABSORPTION SPECTROPHOTOMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 11/28/83

METALS

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-15C (11/3/83)	W-15D (11/3/83)	W-15F (11/3/83)
Total Antimony	mg/l	<0.02	<0.02	<0.02
Total Arsenic	mg/l	<0.005	<0.005	<0.005
Total Beryllium	mg/l	<0.005	<0.005	<0.005
Total Cadmium	mg/l	<0.008	<0.008	<0.008
Total Chromium	mg/l	0.010	0.020	0.007
Total Copper	mg/l	2.5	18	<0.004
Total Lead	mg/l	0.013	<0.005	0.008
Total Mercury	mg/l	<0.0005	<0.0005	<0.0005
Total Nickel	mg/l	<0.01	0.014	<0.01
Total Selenium	mg/l	<0.005	<0.005	<0.005
Total Silver	mg/l	<0.008	<0.008	<0.008
Total Thallium	mg/l	<0.005	<0.005	<0.005
Total Zinc	mg/l	0.172	0.040	0.016
Soluble Barium	mg/l	0.29	0.34	<0.08

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/28/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-2C (10/31/83)	W-5C' (10/27/83)	W-5C" (10/27/83)	W-5F (10/27/83)
Total Non-Filterable Residue (103°C)	mg/l	4.4	12	8.6	<2
Total Organic Carbon	mg/l	37	1.5	2.0	<1
Total Cyanide	mg/l	0.19	0.091	0.14	<0.01
Total Recoverable Phenolics	mg/l	<0.01	<0.01	0.016	0.015

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 11/28/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-10D (10/28/83)	W-10F (10/28/83)
Total Non-Filterable Residue (103°C)	mg/l	2.8	<2
Total Organic Carbon	mg/l	<1	<1
Total Cyanide	mg/l	0.012	<0.01
Total Recoverable Phenolics	mg/l	0.016	0.014

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Fann

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY. INC.

Report Date: 11/28/83

PARAMETER	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-15C (11/3/83)	W-15D (11/3/83)	W-15F (11/3/83)
Total Non-Filterable Residue (103°C)	mg/l	50	16	18
Total Organic Carbon	mg/l	4.7	15	<1
Total Cyanide	mg/l	2.1	23	0.056
Total Recoverable Phenolics	mg/l	<0.01	0.012	<0.01

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Fann

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE EXTRACTABLE ANALYSIS OF
SAMPLE W-2C

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
1,2-dichlorobenzene	µg/l	15	11	13	2.8	21
1,3-dichlorobenzene	µg/l	10	7.6	8.8	1.7	19
1,4-dichlorobenzene	µg/l	10	7.7	8.8	1.6	18
hexachlorobutadiene	µg/l	1.5	1.3	1.4	0.14	10
hexachloroethane	µg/l	13	10	12	2.1	18
naphthalene	µg/l	BMDL	BMDL	BMDL	-	-
1,2,4-trichlorobenzene	µg/l	65	51	58	9.9	17

FOR RECRA ENVIRONEMTNAL LABORATORIES Beatrice J Kiegiewicz

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE EXTRACTABLE ANALYSIS OF
SAMPLE W-15C

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
1,2-dichlorobenzene	µg/l	30	30	30	0	0
1,3-dichlorobenzene	µg/l	15	17	16	1.4	8.8
1,4-dichlorobenzene	µg/l	8.0	9.5	8.8	1.1	12
fluorene	µg/l	BMDL	BMDL	BMDL	-	-
hexachlorobenzene	µg/l	3.1	4.5	3.8	0.99	26
hexachlorobutadiene	µg/l	76	95	86	13	15
hexachloroethane	µg/l	160	180	170	14	8.2
naphthalene	µg/l	2.1	1.9	2.0	0.14	7.0
nitrobenzene	µg/l	4.5	4.3	4.4	0.14	3.2
1,2,4-trichlorobenzene	µg/l	150	190	170	28	16

FOR RECRA ENVIRONMENTAL LABORATORIES Beatrice J Kiegiewicz

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 11/28/83

EXTRACTABLE RECOVERY ANALYSIS OF
METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
2-chlorophenol	100	65	65
1,3-dichlorobenzene	100	72	72
di-n-octylphthalate	100	76	76
fluoranthene	100	90	90
fluorene	100	78	78
naphthalene	100	82	82
nitrobenzene	100	83	83
pentachlorophenol	100	37	37
phenol	100	60	60

ADDITIONAL INFORMATION

Extraction Date	11/8/83
Analysis Date	11/11/83
Internal Standard (IS) - Level	20 µg/l
deuterated phenanthrene - Recovery	110%
Surrogate Standard (SS1) - Level	113 µg/l
2-fluorophenol - Recovery	42%
Surrogate Standard (SS2) - Level	120 µg/l
pentafluorophenol - Recovery	54%
Surrogate Standard (SS3) - Level	116 µg/l
decafluorobiphenyl - Recovery	65%
Surrogate Standard (SS4) - Level	120 µg/l
2-fluorobiphenyl - Recovery	82%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kasperski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE W-14C BOTTOM

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
benzene	µg/l	BMDL	BMDL	BMDL	-	-
chloroform	µg/l	BMDL	BMDL	BMDL	-	-
trans-1,2-dichloroethylene	µg/l	2,600	2,600	2,600	0	0
methylene chloride	µg/l	170	140	160	21	13
tetrachloroethylene	µg/l	8,300	8,000	8,100	210	2.6
trichloroethylene	µg/l	18,000	17,000	18,000	710	3.9
vinyl chloride	µg/l	BMDL	BMDL	BMDL	-	-

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kasperski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE VOLATILE ANALYSIS OF
SAMPLE W-15C

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
carbon tetrachloride	µg/l	3,000	3,000	3,000	0	0
chloroform	µg/l	41,000	44,000	42,000	2,100	5.0
trans-1,2-dichloroethylene	µg/l	3,000	2,800	2,900	140	4.8
methylene chloride	µg/l	23,000	25,000	24,000	1,400	5.8
1,1,2,2-tetrachloroethane	µg/l	40,000	45,000	42,000	3,500	8.3
tetrachloroethylene	µg/l	48,000	57,000	52,000	6,400	12
1,1,1-trichloroethane	µg/l	BMDL	BMDL	BMDL	-	-
1,1,2-trichloroethane	µg/l	BMDL	BMDL	BMDL	-	-
trichloroethylene	µg/l	160,000	170,000	160,000	7,100	4.4

FOR RECRA ENVIRONMENTAL LABORATORIES Sabina Klajewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE PESTICIDE/PCB ANALYSIS OF
SAMPLE W-2C

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
α-BHC	µg/l	36	15	26	15	58
β-BHC	µg/l	4.9	1.9	3.4	2.1	62
δ-BHC	µg/l	2.0	0.50	1.3	1.1	85
γ-BHC	µg/l	27	11	19	11	60

REPLICATE PESTICIDE/PCB ANALYSIS OF
SAMPLE W-15F

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 3	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
β-BHC	µg/l	3.4	0.65	2.0	1.9	96

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Brown

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY,INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 11/28/83

PESTICIDE RECOVERY ANALYSIS OF METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
Aldrin	0.26	0.27	104
γ-BHC	0.22	0.25	114
4,4' DDE	0.25	0.20	80
β-Endosulfan	0.76	0.63	83
Endrin	0.26	0.26	100
Heptachlor	0.23	0.21	91

PESTICIDE RECOVERY ANALYSIS OF METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
Aldrin	0.26	0.21	81
γ-BHC	0.22	0.25	114
4,4'-DDE	0.25	0.25	100
β-Endosulfan	0.76	0.65	86
Endrin	0.26	0.26	100
Heptachlor	0.23	0.22	96

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Branco

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE ANALYSES

PARAMETER	SAMPLE I.D.	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
Total Antimony	W-15F	mg/l	<0.02	<0.02	<0.02	-	-
Total Arsenic	W-15F	mg/l	<0.005	<0.005	<0.005	-	-
Total Beryllium	W-15F	mg/l	<0.005	<0.005	<0.005	-	-
Total Cadmium	W-15F	mg/l	<0.008	<0.008	<0.008	-	-
Total Chromium	W-15F	mg/l	<0.006	<0.006	<0.006	-	-
Total Copper	W-15F	mg/l	<0.004	<0.004	<0.004	-	-
Total Lead	W-15F	mg/l	0.005	0.010	0.075	0.0035	47
Total Mercury	W-15F	mg/l	<0.0005	<0.0005	<0.0005	-	-
Total Nickel	W-15F	mg/l	<0.01	<0.01	<0.01	-	-
Total Selenium	W-15F	mg/l	<0.005	<0.005	<0.005	-	-
Total Silver	W-15F	mg/l	<0.008	<0.008	<0.008	-	-
Total Thallium	W-15F	mg/l	<0.005	<0.005	<0.005	-	-
Total Zinc	W-15F	mg/l	0.013	0.018	0.0155	0.003	23

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Fiore

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 11/28/83

RECOVERY ANALYSES

PARAMETER	SAMPLE IDENTIFICATION	µg OF SPIKE	µg RECOVERED	% RECOVERY
Total Antimony	W-15F	150	119	79
Total Arsenic	W-15F	0.3	0.237	79
Total Beryllium	W-15F	500	465	93
Total Cadmium	W-15F	500	435	87
Total Chromium	W-15F	150	154	103
Total Copper	W-15D	500	515	103
Total Lead	W-15F	125	94	75
Total Mercury	W-15F	0.3	0.276	92
Total Selenium	W-15D	0.3	0.27	90
Total Silver	W-15F	1,000	920	92
Total Thallium	W-15F	125	114	91
Total Zinc	W-15F	1,000	950	95
Soluble Barium	W-15F	5,000	6,250	125

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 11/28/83

REPLICATE ANALYSES

PARAMETER	SAMPLE I.D.	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
Total Non-Filterable Residue (103°C)	W-15C	mg/l	49.2	51.6	50.4	1.69	3.4
Total Organic Carbon	W-15C	mg/l	5.0	4.5	4.75	0.35	7.4
	W-5C"	mg/l	0.141	0.143	0.142	0.0014	0.99
Total Cyanide	W-15D	mg/l	23.25	23.5	23.37	0.18	0.76
Total Recoverable Phenolics	W-15C	mg/l	<0.01	<0.01	<0.01	-	-

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 11/28/83

RECOVERY ANALYSIS

PARAMETER	SAMPLE IDENTIFICATION	µg OF SPIKE	µg RECOVERED	% RECOVERY
Total Organic Carbon	W-15C	250	297	119
Total Recoverable Phenolics	W-15F	10	9.6	96

FOR RECRA ENVIRONMENTAL LABORATORIES R. U. Finn

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-2C

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
243	1,1,3,4-tetrachloro-1,3-butadiene	Unable to confirm in the absence of a standard, possibly a tetrachlorobutadiene
533	2-[2-(2-methoxyethoxy)ethoxy] ethanol acetate	Unable to confirm in the absence of a standard
538	1,1-dichloro-2,2-difluoroethane	Unable to confirm in the absence of a standard, coeluting with another compound

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Krajewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

[Similarity/Condensed Search: MW Range: 42- 350]

REF. SPECT #= 243 LSN= 243. MW= 0 FRN=24153 RET. TIME= 24.8
89 PEAKS, 54 SIGNIFICANT MAX K 26.7

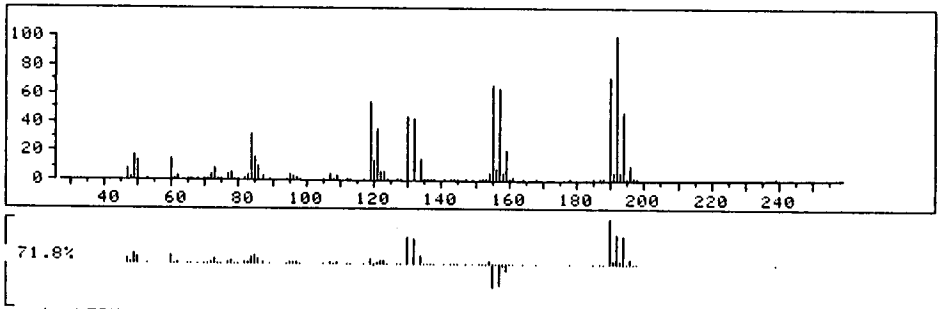
LIBRARY 3000 25341 SPECTRA SEARCHED, 3 HIT(S)

.9800 + 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)
SPEC= 866 LSN= 11739. MW= 190 C4H2Cl4
FRN = 3008 [NBS 11740.] CAS # 0042769380 EPA # 0000008267
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
24.8 10 47% .0 0 0% .0 0 0% MULTIPLIER= .77

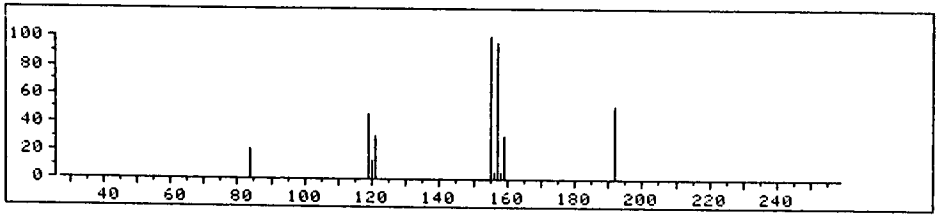
.8208 + 1,3,4-Thiadiazolium, 5-hydroxy-3-methyl-2-phenyl-, hydroxide , inner salt (8CI9CI)
SPEC= 1117 LSN= 11990. MW= 192 C9H8N2OS
FRN = 3008 [NBS 11991.] CAS # 0016430050 EPA # 0000041555
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 173
13.9 6 20% .0 0 0% 2.4 1 3% MULTIPLIER= .61

.5993 * 2-Propyn-1-one, 1-(2-thienyl)-, (2,4-dinitrophenyl)hydrazone (9CI)
SPEC= 2822 LSN= 23314. MW= 316 C13H8N4O4S
FRN = 3014 [NBS 23316.] CAS # 0056588206 EPA # 0000048223
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 650
15.5 7 9% .0 0 0% 9.1 3 18% MULTIPLIER= 1.24

>PAUSE
3 HITS: REFERENCE FRN 24153 SCAN 243



1 LFRN 3008 SPECT 866 MW= 190 C4H2Cl4
.9800 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)



[Similarity/Condensed Search: MW Range: 42- 350]

AVERAGED SPECTRUM FROM FRN 24153
-528 -536 + 533

66 PEAKS, 25 SIGNIFICANT MAX K 24.1

LIBRARY 3000 25341 SPECTRA SEARCHED, 5 HIT(S)

.9764 Ethanol, 2-[2-(2-methoxyethoxy)ethoxy]-, acetate (8CI9CI)
SPEC= 2915 LSN= 13788. MW= 206 C9H18O5
FRN = 3008 [NBS 13789.] CAS # 0003610273 EPA # 0000009450
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
18.6 8 55% .0 0 0% .0 0 0% MULTIPLIER= .71

.9747 2-Pentanol, 4,4-dimethyl- (8CI9CI)
SPEC= 2337 LSN= 2337. MW= 116 C7H16O
FRN = 3002 [NBS 2337.] CAS # 0006144930 EPA # 0000001893
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
17.8 8 37% .0 0 0% .0 0 0% MULTIPLIER= .42

.9737 1,3-Dioxolane, 2-(3-methoxypropyl)-2-methyl- (9CI)
SPEC= 1929 LSN= 7688. MW= 160 C8H16O3
FRN = 3005 [NBS 7688.] CAS # 0054751803 EPA # 0000046876
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 317
16.4 7 53% .0 0 0% .0 0 0% MULTIPLIER= .58

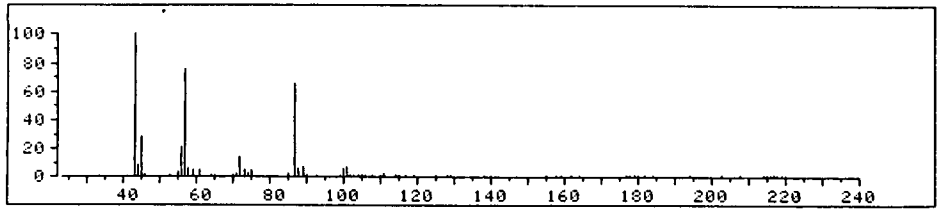
.9728 Heptane, 2,5-dimethyl- (8CI9CI)
SPEC= 3400 LSN= 3400. MW= 128 C9H20
FRN = 3002 [NBS 3400.] CAS # 0002216300 EPA # 0000002653
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
15.9 7 52% .0 0 0% .0 0 0% MULTIPLIER= .69

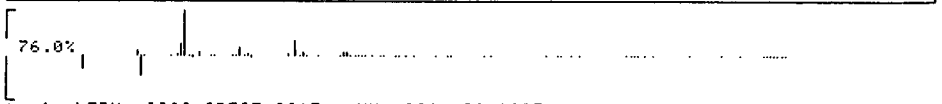
.9725 1-Octen-3-ol (8CI9CI)
SPEC= 3331 LSN= 3331. MW= 128 C8H16O
FRN = 3002 [NBS 3331.] CAS # 0003391864 EPA # 0000002687
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 431
15.4 7 27% .0 0 0% .0 0 0% MULTIPLIER= .50

>PAUSE

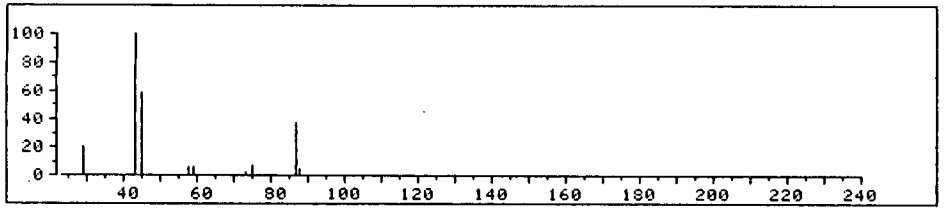
PRINTED IN U.S.A. GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK RECORDING CHARTS NO. HP 9270-0640

5 HITS: AVERAGED SPECTRUM (FRN 24153) -528 -536 + 533





1 LFRN 3008 SPECT 2915 MW= 206 C9H18O5
.9764 Ethanol, 2-[2-(2-methoxyethoxy)ethoxy]-, acetate (8CI9CI)



[Similarity/Condensed Search: MW Range: 42- 350]

REF. SPECT #= 538 LSN= 538. MW= 0 FRN=24153 RET. TIME= .9
94 PEAKS, 68 SIGNIFICANT MAX K 25.5

LIBRARY 3000 25341 SPECTRA SEARCHED, 5 HIT(S)

.9712 + Ethane, 1,1-dichloro-2,2-difluoro- (8CI9CI)
SPEC= 3942 LSN= 3942. MW= 134 C2H2Cl2F2
FRN = 3002 [NBS 3942.] CAS # 0000471432 EPA # 0000003253
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 649
15.6 7 19% .0 0 0% .0 0 0% MULTIPLIER= .37

.8520 Ethane, 1,1,2,2-tetrachloro- (8CI9CI)
SPEC= 2720 LSN= 8479. MW= 166 C2H2Cl4
FRN = 3005 [NBS 8480.] CAS # 0000079345 EPA # 0000034547
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 720
18.1 8 20% .0 0 0% 2.5 1 1% MULTIPLIER= .83

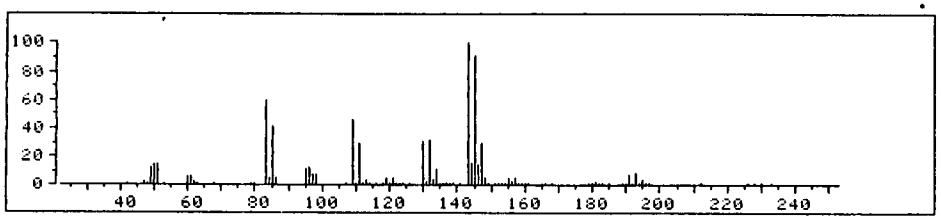
.7256 3,6-Dioxa-2,7-disilaoctane, 2,2,7,7-tetramethyl- (8CI9CI)
SPEC= 2899 LSN= 13772. MW= 206 C8H22O2Si2
FRN = 3008 [NBS 13773.] CAS # 0007381308 EPA # 0000043215
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 593
15.6 7 7% .0 0 0% 5.1 2 5% MULTIPLIER= .41

.6549 Propane, 1,1,2,3,3-pentachloro- (8CI9CI)
SPEC= 3795 LSN= 14668. MW= 214 C3H3Cl5
FRN = 3008 [NBS 14670.] CAS # 0015104617 EPA # 0000010027
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
17.6 7 46% .0 0 0% 8.2 3 23% MULTIPLIER= 1.09

.6333 + 2H-Quinolizin-1-ol, octahydro-, cis- (9CI)
SPEC= 1168 LSN= 6927. MW= 155 C9H17NO
FRN = 3005 [NBS 6927.] CAS # 0010447195 EPA # 0000039718
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 548
15.0 7 15% .0 0 0% 7.7 3 4% MULTIPLIER= .50
>PAUSE

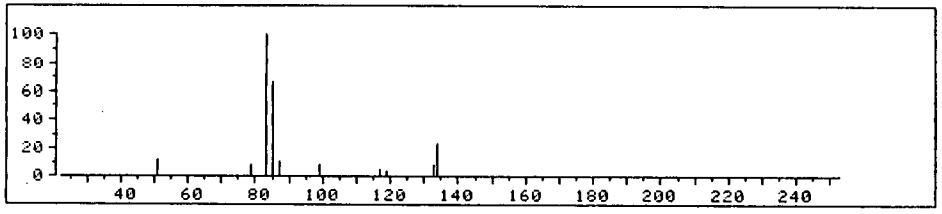
PRINTED IN U.S.A. GRAPHIC CONTROLS CORPORATION BUFFALO NEW YORK RECORDING CHARTS NO. HP 9270-0640
PRINTED IN U.S.A. GRAPHIC CONTROLS CORPORATION BUFFALO NEW YORK RECORDING CHARTS NO. HP 9270-0640

5 HITS: REFERENCE FRN 24153 SCAN 538





* 1 LFRN 3002 SPECT 3942 MW= 134 C2H2Cl2F2
.9712 Ethane, 1,1-dichloro-2,2-difluoro- (8Cl9Cl)



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GRAPHIC CONTROLS CORPORATION BUFFALO NEW YORK
RECORDING CHARTS
NO HP 9270-0640

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRPAHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-10D

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
149	pentachloroethane	Unable to confirm in the absence of a standard, possibly as written

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara Kingsolver

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

[Similarity/Condensed Search: MW Range: 40- 350]

AVERAGED SPECTRUM FROM FRN 24161
+ 149 -145 -152

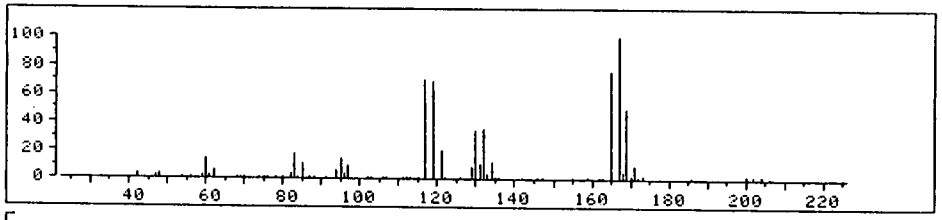
75 PEAKS, 19 SIGNIFICANT MAX K 24.9

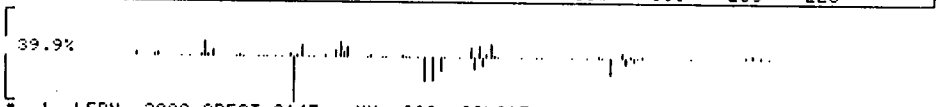
LIBRARY 3000 25346 SPECTRA SEARCHED, 2 HIT(S)

.9819 Ethane, pentachloro- (8CI9CI)
SPEC= 2145 LSN= 13018. MW= 200 C2HCl5
FRN = 3008 [NBS 13019.] CAS # 0000076017 EPA # 0000022495
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 670
24.9 10 72% .0 0 0% .0 0 0% MULTIPLIER= .78

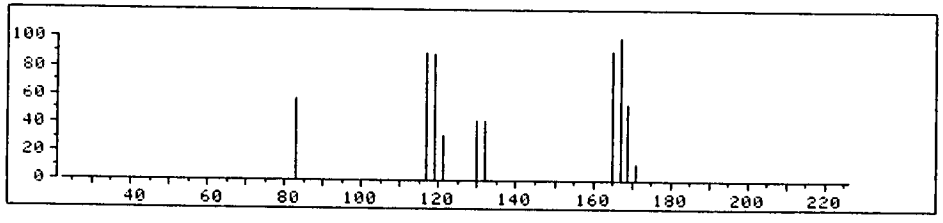
.8465 Ethane, 1,1,1,2-tetrachloro-2,2-difluoro- (8CI9CI)
SPEC= 2376 LSN= 13249. MW= 202 C2Cl4F2
FRN = 3008 [NBS 13250.] CAS # 0000076119 EPA # 0000009167
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
17.2 7 50% 2.5 1 4% .0 0 0% MULTIPLIER= .79

>PAUSE
2 HITS: AVERAGED SPECTRUM (FRN 24161) + 149 -145 -152





1 LFRN 3008 SPECT 2145 MW= 200 C2HCl5
.9819 Ethane, pentachloro- (8CI9CI)



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RECORDING CHARTS GRAPHIC CONTROLS CORPORATION BUFFALO NEW YORK

NO. HP 92700640

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-15C

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
226	1,1,3,4-tetrachloro-1,3-butadiene	Unable to confirm in the absence of a standard, possibly a tetrachlorobutadiene
241	1,1,3,4-tetrachloro-1,3-butadiene	Unable to confirm in the absence of a standard, possibly a tetrachlorobutadiene
276	1,1,3,4-tetrachloro-1,3-butadiene	Unable to confirm in the absence of a standard, possibly a tetrachlorobutadiene
517	2-[2-(2-methoxyethoxy)ethoxy]-ethanol acetate	Unable to confirm in the absence of a standard

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kuzemski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES

T.D. #83-1135

[Similarity/Condensed Search: MW Range: 42- 350]

AVERAGED SPECTRUM FROM FRN 24211
-222 -229 + 226

101 PEAKS, 56 SIGNIFICANT MAX K 26.7

LIBRARY 3000 25341 SPECTRA SEARCHED, 5 HIT(S)

.9802 * 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)
SPEC= 866 LSN= 11739. MW= 190 C4H2Cl4
FRN = 3008 [NBS 11740.] CAS # 0042769380 EPA # 0000008267
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
25.1 10 46% .0 0 0% .0 0 0% MULTIPLIER= .88

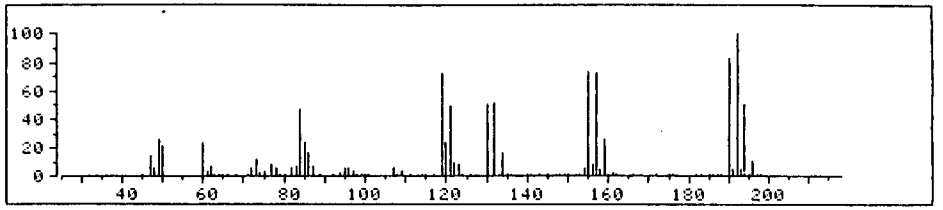
.7065 * 1,2-Dithiane-4-carboxylic acid (9CI)
SPEC= 2460 LSN= 8219. MW= 164 C5H8O2S2
FRN = 3005 [NBS 8219.] CAS # 0014091997 EPA # 0000006152
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 636
15.2 7 13% .0 0 0% 5.3 2 6% MULTIPLIER= .42

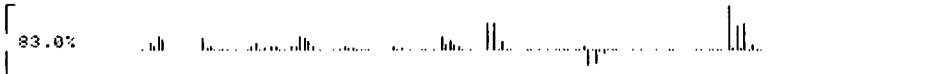
.7037 * 2-Propenoic acid, 2,3-dichloro- (9CI)
SPEC= 4671 LSN= 4671. MW= 140 C3H2Cl2O2
FRN = 3002 [NBS 4671.] CAS # 0013167367 EPA # 0000003783
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
14.4 7 6% .0 0 0% 5.1 2 3% MULTIPLIER= .30

.6814 * 2-Propyn-1-one, 1-(2-thienyl)-, (2,4-dinitrophenyl)hydrazone (9CI)
SPEC= 2822 LSN= 23314. MW= 316 C13H8N4O4S
FRN = 3014 [NBS 23316.] CAS # 0056588206 EPA # 0000048223
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 650
15.5 7 10% .0 0 0% 6.4 2 11% MULTIPLIER= .97

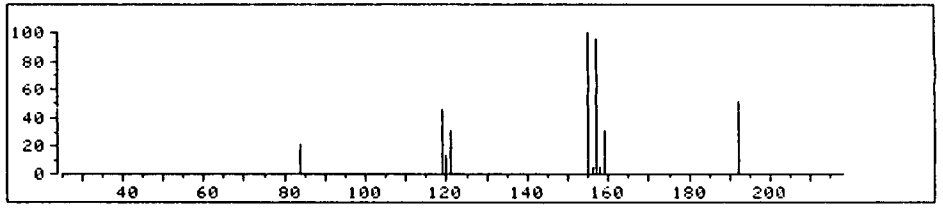
.6339 * Cyclohexanecarboxylic acid, 4-methyl-, methyl ester (9CI)
SPEC= 1389 LSN= 7148. MW= 156 C9H16O2
FRN = 3005 [NBS 7148.] CAS # 0051181409 EPA # 0000005336
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
14.2 7 4% .0 0 0% 7.2 3 4% MULTIPLIER= .33
>PAUSE

5 HITS: AVERAGED SPECTRUM (FRN 24211) -222 -229 + 226





1 LFRN 3008 SPECT 866 MW= 190 C4H2Cl4
.9802 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)



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CHECKING CHARTS
NO. HP 9270-0640

[Similarity/Condensed Search: MW Range: 42- 350]

REF. SPECT #= 241 LSN= 241. MW= 0 FRN=24211 RET. TIME= .9
91 PEAKS, 52 SIGNIFICANT MAX K 25.9

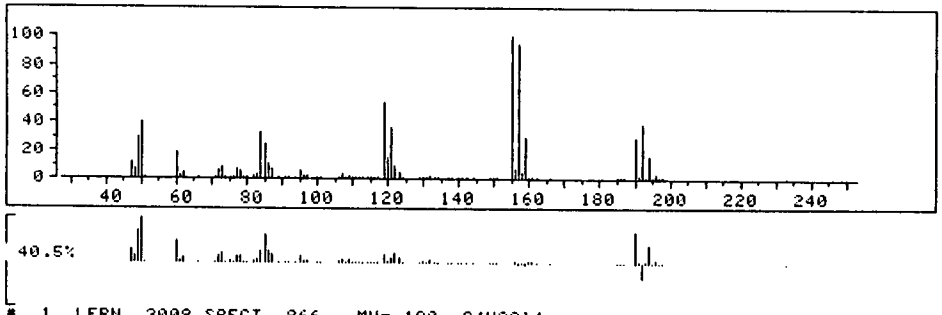
LIBRARY 3000 25341 SPECTRA SEARCHED, 3 HIT(S)

.9811 + 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)
SPEC= 866 LSN= 11739. MW= 190 C4H2C14
FRN = 3008 [NBS 11740.] CAS # 0042769380 EPA # 0000008267
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
25.1 10 56% .0 0 0% .0 0 0% MULTIPLIER= .97

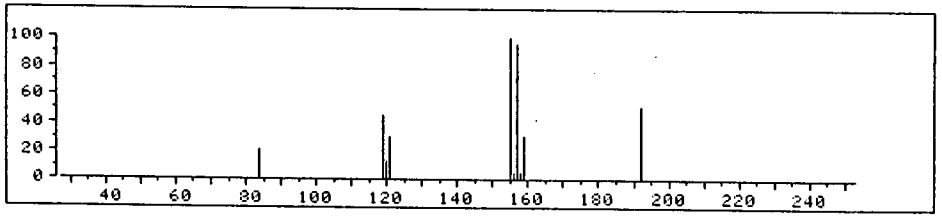
.6836 * 2-Propyn-1-one, 1-(2-thienyl)-, (2,4-dinitrophenyl)hydrazone (9CI)
SPEC= 2822 LSN= 23314. MW= 316 C13H8N4O4S
FRN = 3014 [NBS 23316.] CAS # 0056588206 EPA # 0000048223
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 650
15.5 7 10% .0 0 0% 6.2 2 9% MULTIPLIER= .59

.6652 * Carbonodithioic acid, O,S-diethyl ester (9CI)
SPEC= 318 LSN= 6077. MW= 150 C5H10OS2
FRN = 3005 [NBS 6077.] CAS # 0000623790 EPA # 0000032174
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
11.9 6 4% .0 0 0% 5.2 2 5% MULTIPLIER= .34

>PAUSE
3 HITS: REFERENCE FRN 24211 SCAN 241



1 LFRN 3008 SPECT 866 MW= 190 C4H2C14
.9811 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)



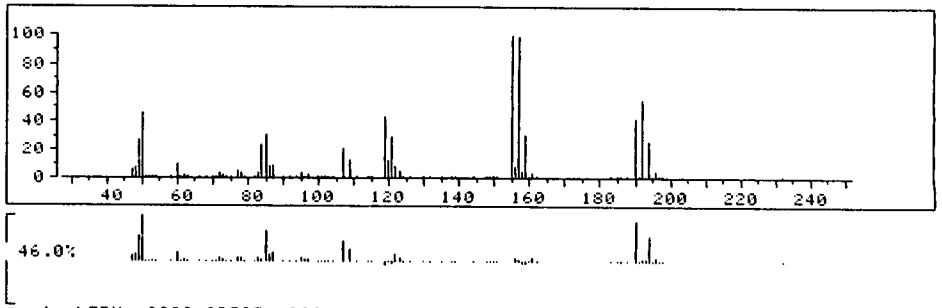
[Similarity/Condensed Search: MW Range: 42- 350]

REF. SPECT #= 276 LSN= 276. MW= 0 FRN=24211 RET. TIME= 1.2
85 PEAKS, 40 SIGNIFICANT MAX K 26.1

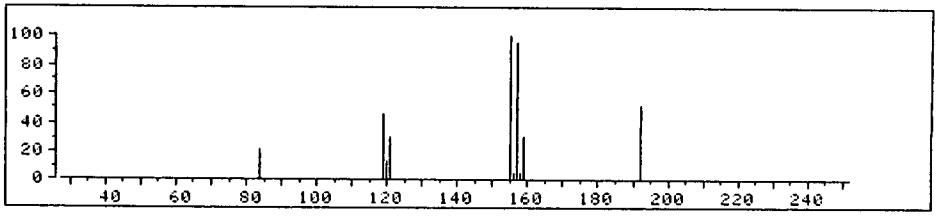
LIBRARY 3000 25341 SPECTRA SEARCHED, 1 HIT(S)

.9808 + 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)
SPEC= 866 LSN= 11739. MW= 190 C4H2C14
FRN = 3008 [NBS 11740.] CAS # 0042769380 EPA # 0000008267
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
25.1 10 56% .0 0 0% .0 0 0% MULTIPLIER= 1.00

>PAUSE
1 HIT: REFERENCE FRN 24211 SCAN 276



1 LFRN 3008 SPECT 866 MW= 190 C4H2C14
.9808 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)



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[Similarity/Condensed Search: MW Range: 42- 350]

AVERAGED SPECTRUM FROM FRN 24211
-513 -520 + 517

55 PEAKS, 23 SIGNIFICANT MAX K 24.7

LIBRARY 3000 25341 SPECTRA SEARCHED, 5 HIT(S)

.9759 Ethanol, 2-[2-(2-methoxyethoxy)ethoxy]-, acetate (8CI9CI)
SPEC= 2915 LSN= 13788. MW= 206 C9H18O5
FRN = 3008 [NBS 13789.] CAS # 0003610273 EPA # 0000009450
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
18.8 8 55% .0 0 0% .0 0 0% MULTIPLIER= .71

.9728 .alpha.-D-Xylofuranoside, methyl 3,5-di-O-methyl- (9CI)
SPEC= 1088 LSN= 11961. MW= 192 C8H16O5
FRN = 3008 [NBS 11962.] CAS # 0003253836 EPA # 0000033590
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 266
15.8 7 22% .0 0 0% .0 0 0% MULTIPLIER= .31

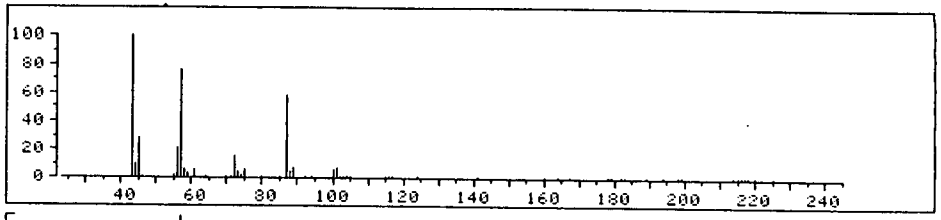
.9722 Heptane, 2,5-dimethyl- (8CI9CI)
SPEC= 3400 LSN= 3400. MW= 128 C9H20
FRN = 3002 [NBS 3400.] CAS # 0002216300 EPA # 0000002653
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
15.8 7 54% .0 0 0% .0 0 0% MULTIPLIER= .78

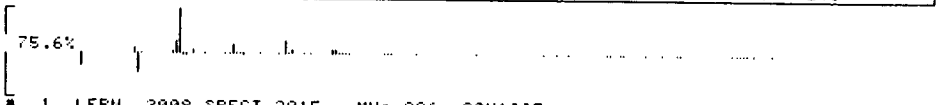
.9712 Methanol, dibutoxy- (9CI)
SPEC= 4158 LSN= 9917. MW= 176 C9H20O3
FRN = 3005 [NBS 9918.] CAS # 0054518046 EPA # 0000007141
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
14.3 6 44% .0 0 0% .0 0 0% MULTIPLIER= .90

.9705 Propanoic acid, 1-methylpropyl ester (9CI)
SPEC= 3573 LSN= 3573. MW= 130 C7H14O2
FRN = 3002 [NBS 3573.] CAS # 0000591344 EPA # 0000020793
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 655
14.1 6 32% .0 0 0% .0 0 0% MULTIPLIER= .90

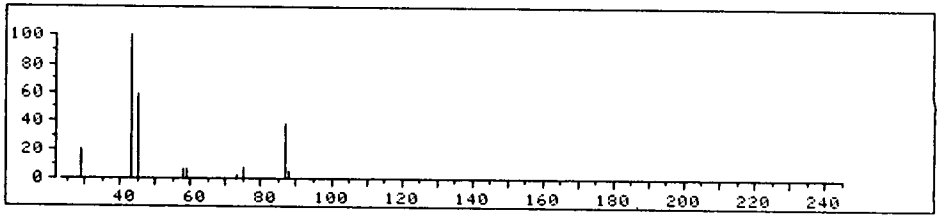
>PAUSE

5 HITS: AVERAGED SPECTRUM (FRN 24211) -513 -520 + 517





* 1 LFRN 3008 SPECT 2915 MW= 206 C9H18O5
.9759 Ethanol, 2-[2-(2-methoxyethoxy)ethoxy]-, acetate (8CI9CI)



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RECORDING CHARTS
NO. HP 9270-0640

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-15D

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
297	1,1,3,4-tetrachloro-1,3-butadiene	Unable to confirm in the absence of a standard, possibly a tetrachlorobutadiene

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kagenski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

[Similarity/Condensed Search: MW Range: 40- 350]

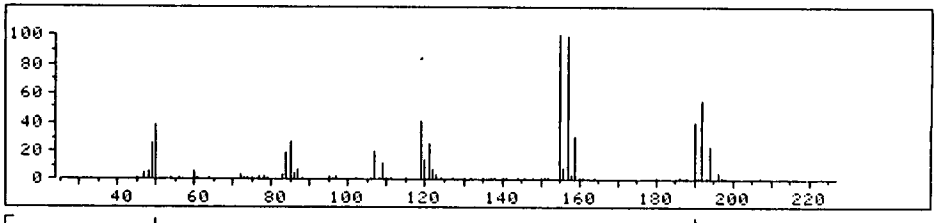
AVERAGED SPECTRUM FROM FRN 24212
+ 297 -294 -299

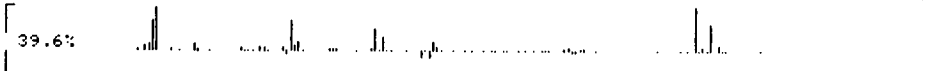
77 PEAKS, 22 SIGNIFICANT MAX K 25.4

LIBRARY 3000 25346 SPECTRA SEARCHED, 1 HIT(S)

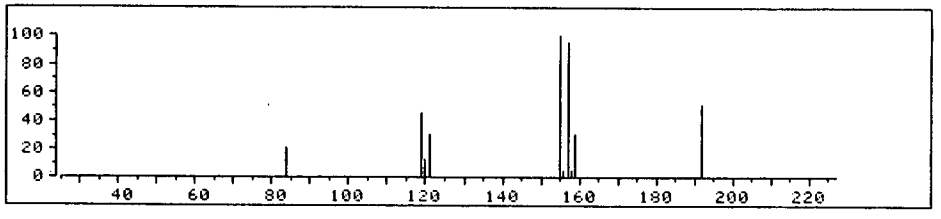
.9786 + 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)
SPEC= 866 LSN= 11739. MW= 190 C4H2Cl4
FRN = 3008 [NBS 11740.] CAS # 0042769380 EPA # 0000008267
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
22.1 9 57% .0 0 0% .0 0 0% MULTIPLIER= 1.16

>PAUSE
1 HIT: AVERAGED SPECTRUM (FRN 24212) + 297 -294 -299





1 LFRN 3008 SPECT 866 MW= 190 C4H2Cl4
.9786 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)



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GRAPHIC CONTROLS CORPORATION BUFFALO NEW YORK
RECORDING CHARTS
NO. HP 92700640

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-15F

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
180	1,1,3,4-tetrachloro-1,3-butadiene	Unable to confirm in the absence of a standard, possibly a tetrachlorobutadiene
1086	5-methyl-2-undecene	Unable to confirm in the absence of a standard, probably an aliphatic hydrocarbon

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Klajewski

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

[Similarity/Condensed Search: MW Range: 40- 350]

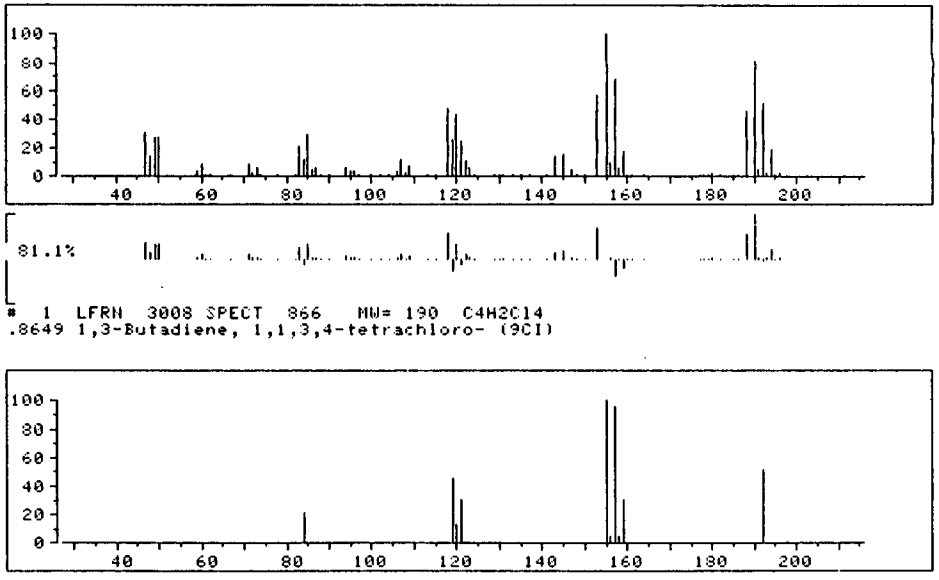
AVERAGED SPECTRUM FROM FRN 24213
+ 180 -177 -183

79 PEAKS, 34 SIGNIFICANT MAX K 25.6

LIBRARY 3000 25346 SPECTRA SEARCHED, 1 HIT(S)

.8649 + 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)
SPEC= 866 LSN= 11739. MW= 190 C4H2Cl4
FRN = 3008 [NBS 11740.] CAS # 0042769380 EPA # 0000008267
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
19.2 8 33% 2.3 1 3% .0 0 0% MULTIPLIER= .92
>PAUSE

1 HIT: AVERAGED SPECTRUM (FRN 24213) + 180 -177 -183



1 LFRN 3008 SPECT 866 MW= 190 C4H2Cl4
.8649 1,3-Butadiene, 1,1,3,4-tetrachloro- (9CI)

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HEWLETT-PACKARD GRAPHIC CONTROLS CORPORATION BUFFALO, NEW YORK
NO. HP 92700640

[Similarity/Condensed Search: MW Range: 40- 350]

REF. SPECT #= 1086 LSN= 1086. MW= 0 FRN=24213 RET. TIME= .8
67 PEAKS, 48 SIGNIFICANT MAX K 25.3

LIBRARY 3000 25346 SPECTRA SEARCHED, 5 HIT(S)

.9788 + 2-Undecene, 5-methyl- (9CI)
SPEC= 3030 LSN= 8789. MW= 168 C12H24
FRN = 3005 [NBS 8790.] CAS # 0056851344 EPA # 0000045332
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
22.5 10 41% .0 0 0% .0 0 0% MULTIPLIER= 1.14

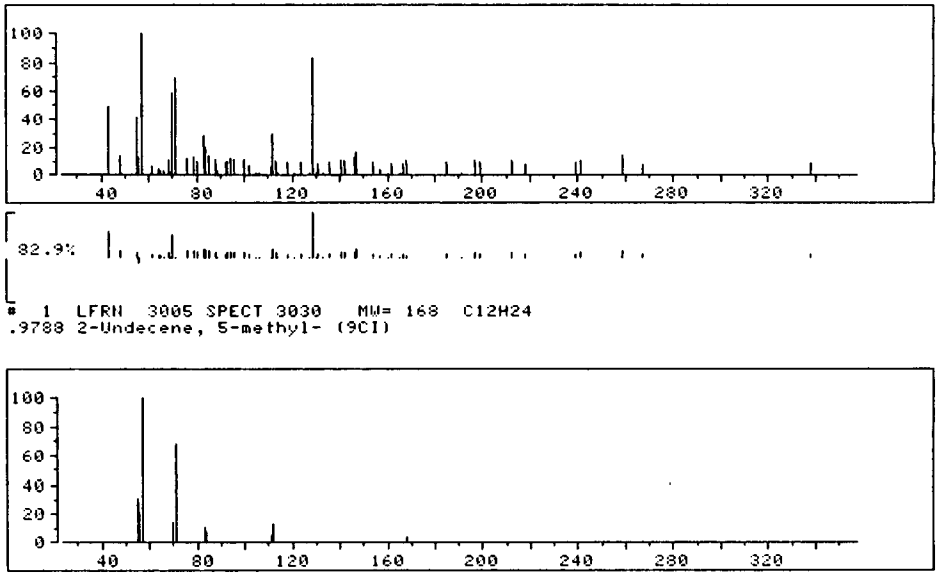
.9769 Nonane, 4-methyl-5-propyl- (9CI)
SPEC= 148 LSN= 11021. MW= 184 C13H28
FRN = 3008 [NBS 11022.] CAS # 0062185551 EPA # 0000046182
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
20.5 9 41% .0 0 0% .0 0 0% MULTIPLIER= 1.10

.9768 Undecane, 4,5-dimethyl- (8CI)
SPEC= 126 LSN= 10999. MW= 184 C13H28
FRN = 3008 [NBS 11000.] CAS # 0017312797 EPA # 0000045130
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
20.5 9 40% .0 0 0% .0 0 0% MULTIPLIER= 1.59

.9767 Decane, 2,6,7-trimethyl- (9CI)
SPEC= 141 LSN= 11014. MW= 184 C13H28
FRN = 3008 [NBS 11015.] CAS # 0062108252 EPA # 0000045047
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 424
20.2 9 39% .0 0 0% .0 0 0% MULTIPLIER= .97

.9764 Decane, 4-methyl- (8CI9CI)
SPEC= 1243 LSN= 7002. MW= 156 C11H24
FRN = 3005 [NBS 7002.] CAS # 0002847725 EPA # 0000045167
MATCHING PEAKS CONTAMINATED MISSING PEAKS QUAL INDEX= 728
20.2 9 42% .0 0 0% .0 0 0% MULTIPLIER= 1.23
>PAUSE

5 HITS: REFERENCE FRN 24213 SCAN 1086



1 LFRN 3005 SPECT 3030 MW= 168 C12H24
.9788 2-Undecene, 5-methyl- (9CI)

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RECORDING CHARTS
NO. HP 9270-0640

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GRAPHIC CONTROLS CORPORATION BUFFALO NEW YORK
RECORDING CHARTS
NO HP 9270-0640

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
VOLATILE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-2C

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
667	tetrachloroethene	Unable to confirm in the absence of a standard, possibly a tetrachloroethylene isomer

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kagenda

DATE 11/28/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

LIBRARY SEARCH DATA: 5205 # 667 BASE M/E: 166
11/17/83 3:32:00 + 22:14 CALI: CAL1114 # 5 RIC: 43391.
SAMPLE: W-2C DF 20 JOB 11358 VOA
665 TO # 670 SUMMED - # 657 TO # 665 - # 670 TO # 685 (1.00

25409 SPECTRA IN LIBRARY88 SEARCHED FOR MAXIMUM PURITY
111 MATCHED AT LEAST 4 OF THE 16 LARGEST PEAKS IN THE UNKNOWN

RANK	IN	NAME
1	1625	ETHENE, TETRACHLORO-
2	2203	PROPENE, 1, 2-DICHLORO-3, 3, 3-TRIFLUORO-
3	4399	1, 3, 5-TRIAZIN-2-AMINE, 4, 6-DICHLORO-
4	6439	PHOSPHORODICHLORIDOTHIOICACID, O-METHYLESTER
5	440	ETHANE, 1, 1, 2, 2-TETRACHLORO-

RANK	FORMULA	M.WT	B.PK	PURITY	FIT	RFIT
1	C2. CL4	164	166	814	981	820
2	C3. H. CL2. F3	164	129	525	774	621
3	C3. H2. N4. CL2	164	129	455	723	582
4	C. H3. O. S. CL2. P	164	134	451	669	547
5	C2. H2. CL4	166	83	393	692	417

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
VOLATILE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

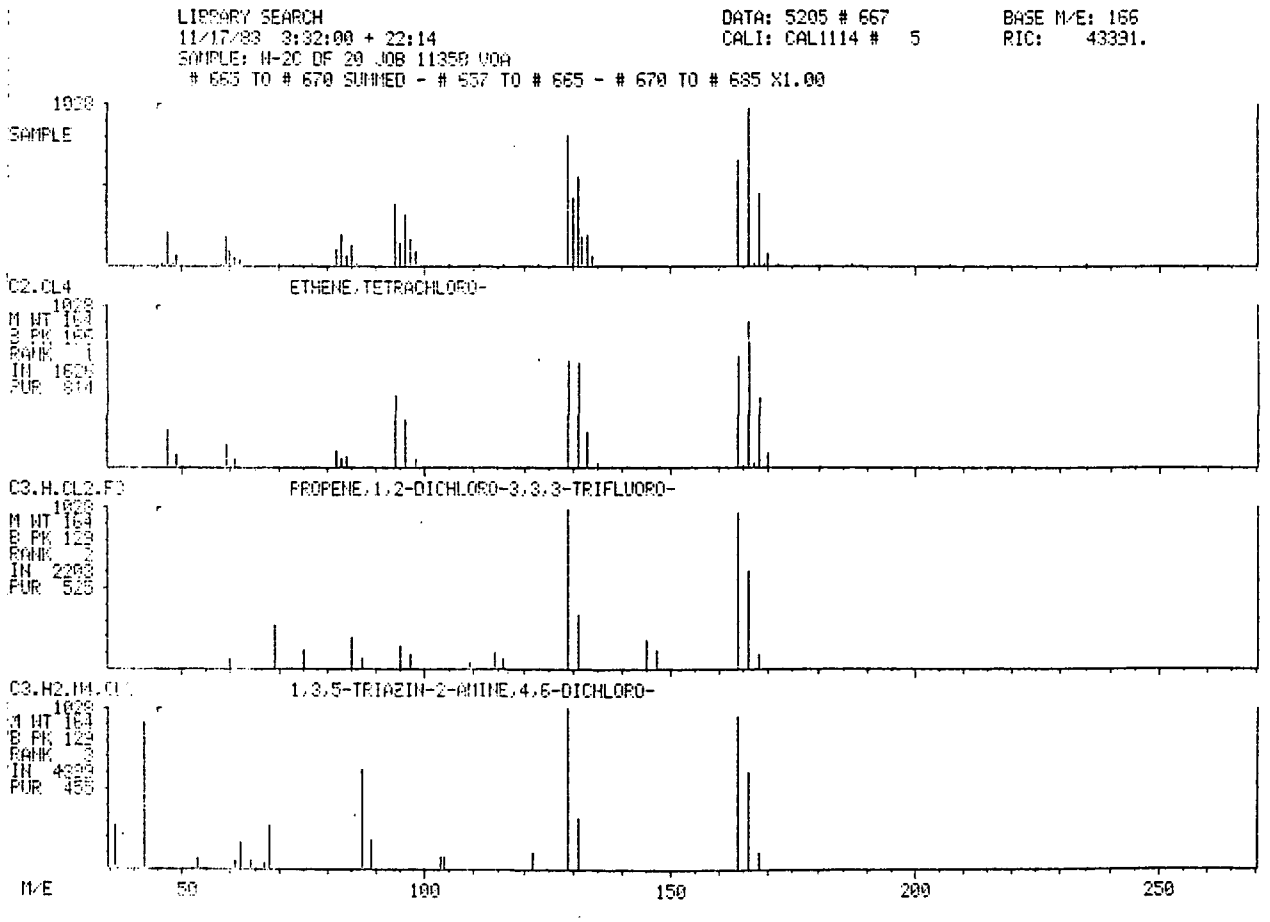
SAMPLE I.D.: W-10D

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
145	carbondisulfide	Unable to confirm in the absence of a standard
372	tetrahydrothiophene	Unable to confirm in the absence of a standard
674	tetrachloroethene	Unable to confirm in the absence of a standard, possibly a tetrachloroethylene isomer

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Figueroa

DATE 11/28/83

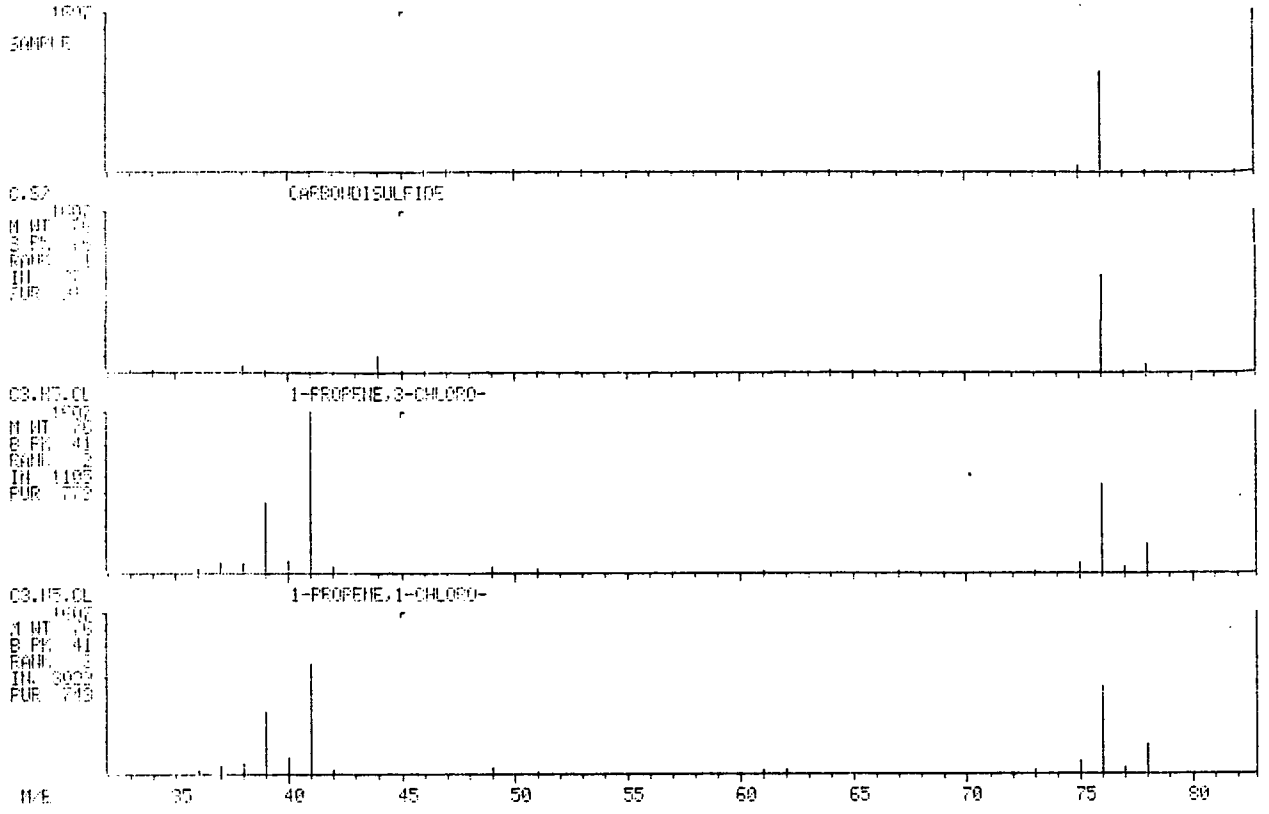
RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135



LIBRARY SEARCH
11/15/83 22:21:00 + 4:50
SAMPLE: 5197 N-100 JOB 11354 VOA
141 TO # 149 SUMMED - # 131 TO # 139 - # 153 TO # 165 X1.00

DATA: 5197 # 145
CALI: CAL1114 # 5

BASE M/E: 76
RIC: 3039.



LIBRARY SEARCH
11/15/83 22:21:00 + 4:50
SAMPLE: 5197 N-100 JOB 11354 VOA
141 TO # 149 SUMMED - # 131 TO # 139 - # 153 TO # 165 X1.00

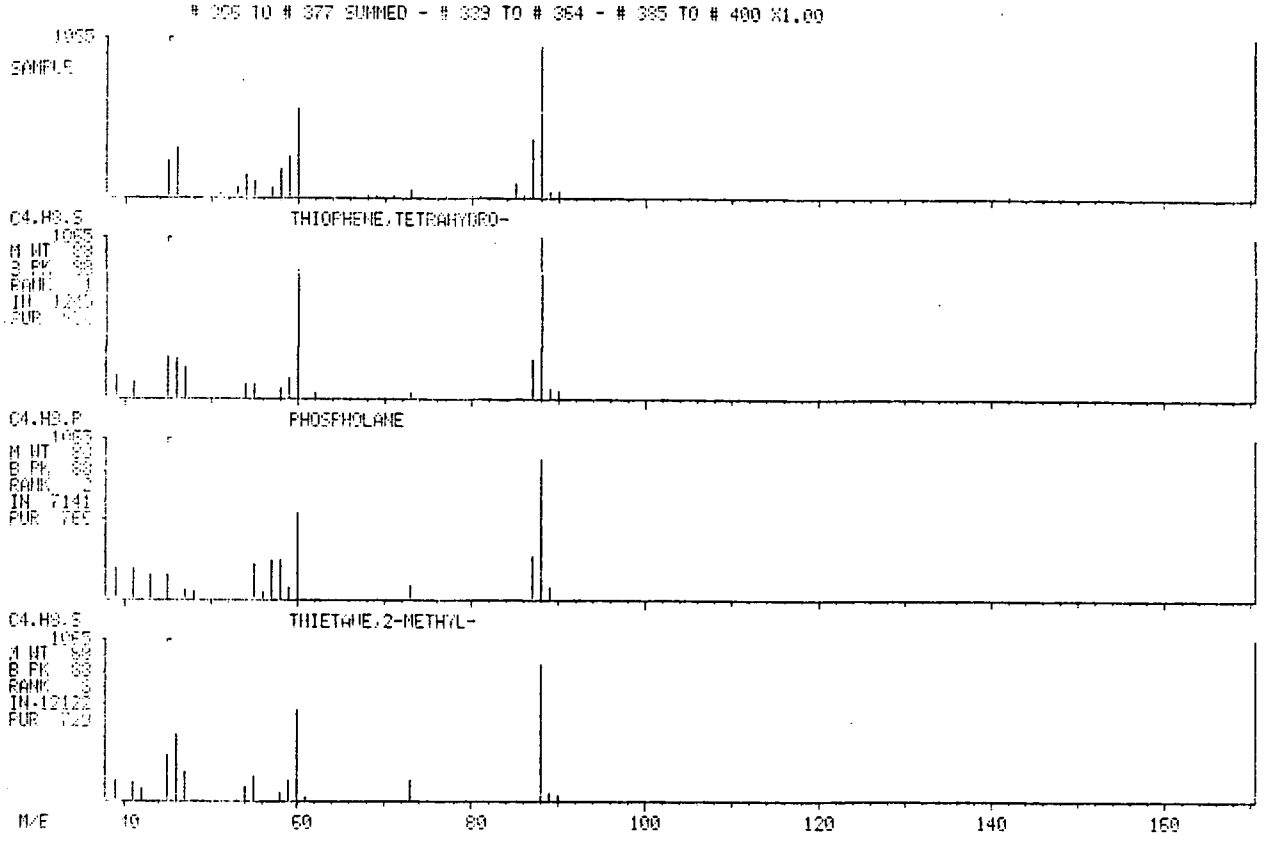
DATA: 5197 # 145
CALI: CAL1114 # 5

BASE M/E: 76
RIC: 3039.

SEARCH SPECTRA IN LIBRARY SEARCHED: 570 AS (###) 5 ?
250 MATCHED AT LEAST 3 OF THE 10 LARGEST PEAKS IN THE UNKNOWN

RANK	IN	NAME
1	272	CARBONDISULFIDE
2	1105	1-PROPENE,3-CHLORO-
3	3099	1-PROPENE,1-CHLORO-
4	11394	1-PROPENE,1-CHLORO-,(Z)-
5	2184	ACETONITRILE,CHLORODIFLUORO-

RANK	FORMULA	M.WT	B.PK	PURITY	FIT	RFIT
1	C. S2	76	76	912	971	914
2	C3. H5. CL	76	41	779	793	847
3	C3. H5. CL	76	41	749	762	844
4	C3. H5. CL	76	41	733	745	845
5	C2. N. CL. F2	111	76	725	783	919

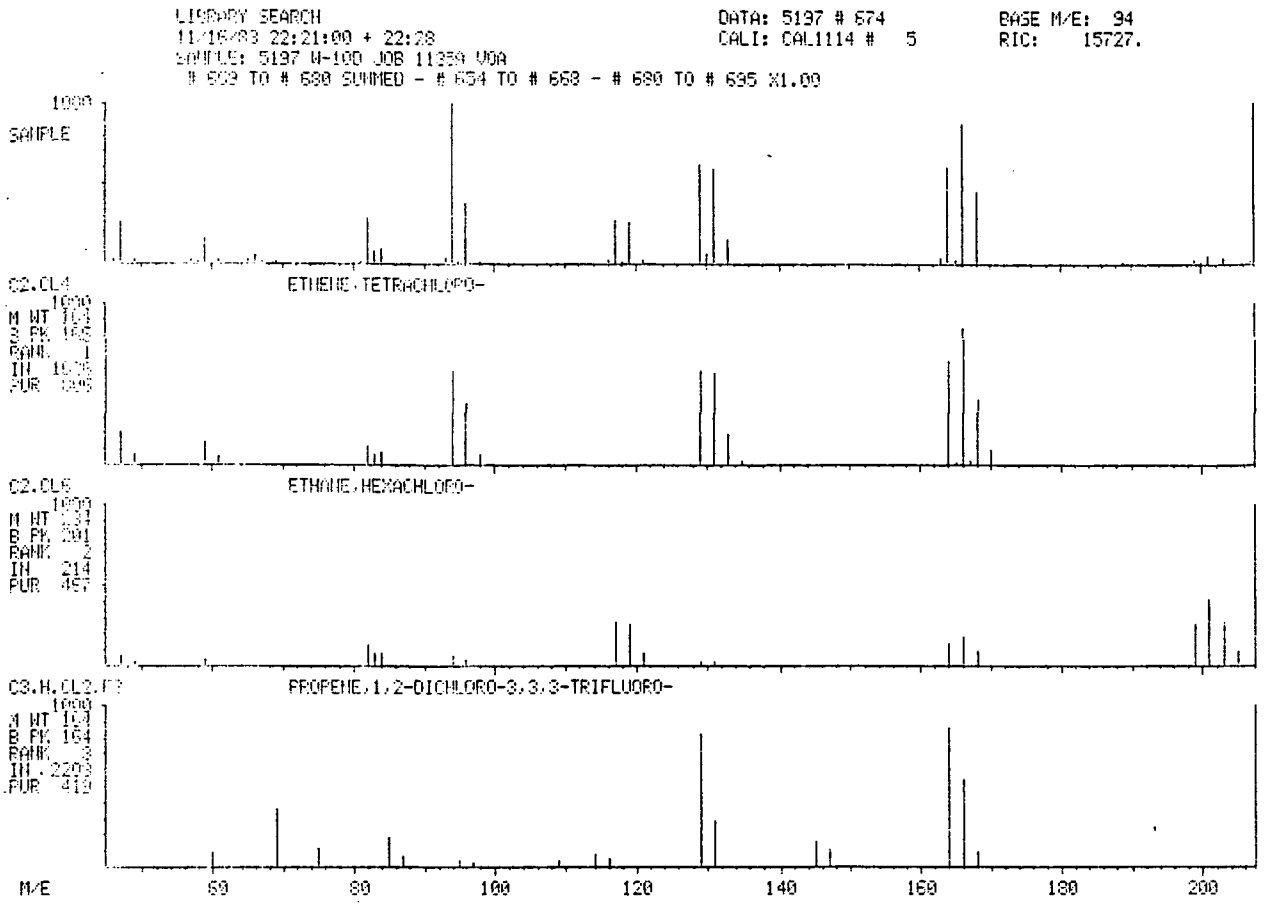


LIBRARY SEARCH DATA: 5197 # 371 BASE M/E: 88
11/15/83 22:21:00 + 12:22 CALI: CAL1114 # 5 RIC: 367615.
SAMPLE: 5197 W-100 JOB 11358 VOA
355 TO # 377 SUMMED - # 339 TO # 364 - # 385 TO # 400 X1.00

35409 SPECTRA IN LIBRARY SEARCHED FOR MATCHES FOR PEAK
172 MATCHED AT LEAST 5 OF THE 15 LARGEST PEAKS IN THE UNKNOWN

RANK	IN	NAME	M.WT	B.PK	PURITY	FIT	RFIT
1	1249	THIOPHENE,TETRAHYDRO-	88	88	534	926	899
2	714	PHOSPHOLANE	86	88	756	917	799
3	12122	THIETANE,2-METHYL-	88	88	729	919	770
4	1577	1,4-DIOXANE	88	88	579	830	580
5	5574	1,3,6-TRIOXOCANE	118	88	575	854	589

RANK	FORMULA
1	C4.H8.S
2	C4.H9.P
3	C4.H8.S
4	C4.H8.O2
5	C5.H10.O3



LIBRARY SEARCH
11/16/83 22:21:00 + 22:28
SAMPLE: 5197 W-100 JOB 11359A V0A
669 TO # 680 SUMMED - # 654 TO # 668 - # 680 TO # 695 X1.00

DATA: 5197 # 674
CALI: CAL1114 # 5
BASE M/E: 94
RIC: 15727.

5400 SPECTRA IN LIBRARY SEARCHED FOR MINIMUM PURITY
35 MATCHED AT LEAST 4 OF THE 10 LARGEST PEAKS IN THE UNKNOWN

RANK	IN	NAME	M.WT	B.PK	PURITY	FIT	RFIT
1	1625	ETHENE,TETRACHLORO-	164	166	905	951	932
2	214	ETHANE,HEXACHLORO-	234	201	467	505	490
3	4303	PROPENE,1,2-DICHLORO-3,3,3-TRIFLUORO-	164	164	419	712	504
4	6439	PHOSPHORODICHLORIDOTHIOICACID,O-METHYLESTER	164	134	354	585	554
5	4399	1,3,5-TRIAZIN-2-AMINE,4,6-DICHLORO-	164	68	310	579	520

RANK	FORMULA
1	C2.CL4
2	C2.CL6
3	C3.H.CL2.F3
4	C.H3.O.S.CL2.P
5	C3.H2.N4.CL2

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
VOLATILE BROAD SPECTRUM ANALYSES

Report Date: 11/28/83

SAMPLE I.D.: W-15F

SCAN #	COMPUTER LIBRARY CHOICE	COMMENTS
684	tetrachloroethene	Unable to confirm in the absence of a standard, probably a tetrachloroethylene isomer

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kuzemka

DATE 11/28/83

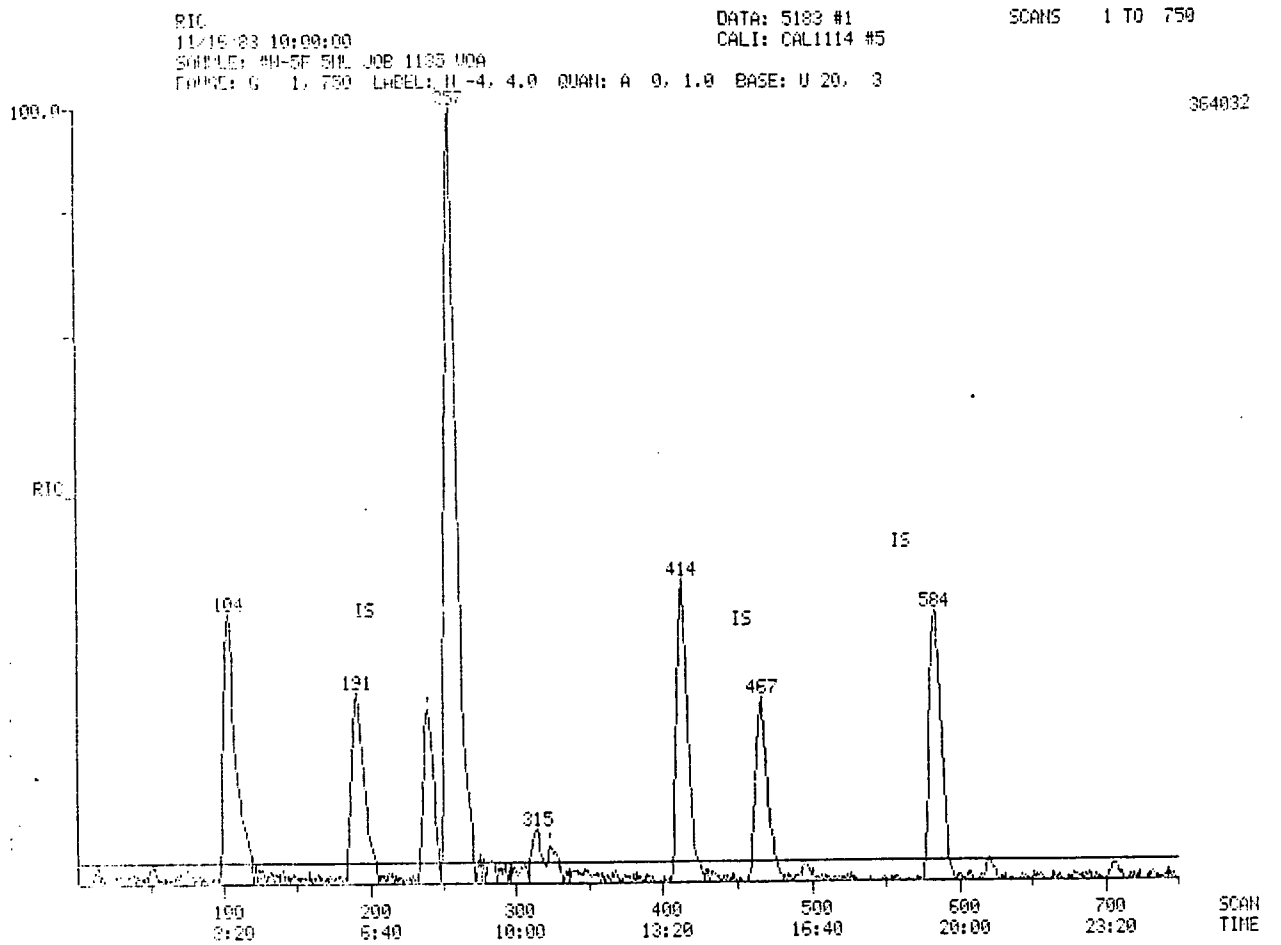
RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1135

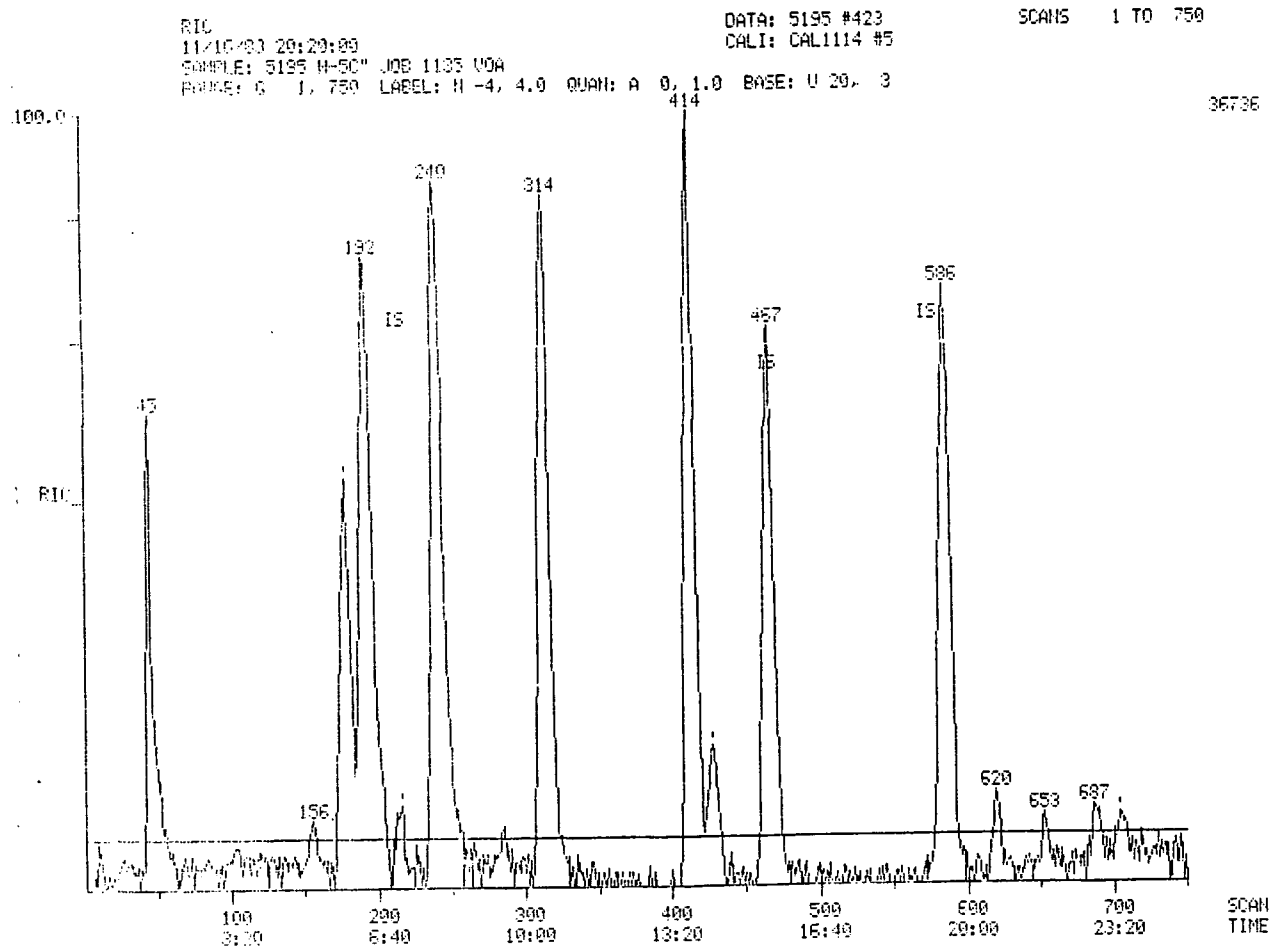
LIBRARY SEARCH DATA: 3230 # 683 BASE M/E: 166
11/18/83 14:56.00 + 22:16 CALI. CALI116 # 2 RIC: 27935.
SAMPLE: #15-F VOA 1135-C VOA 100UL IN 5ML
677 TO # 690 SUMMED - # 657 TO # 677 - # 651 TO # 715 (1.00)

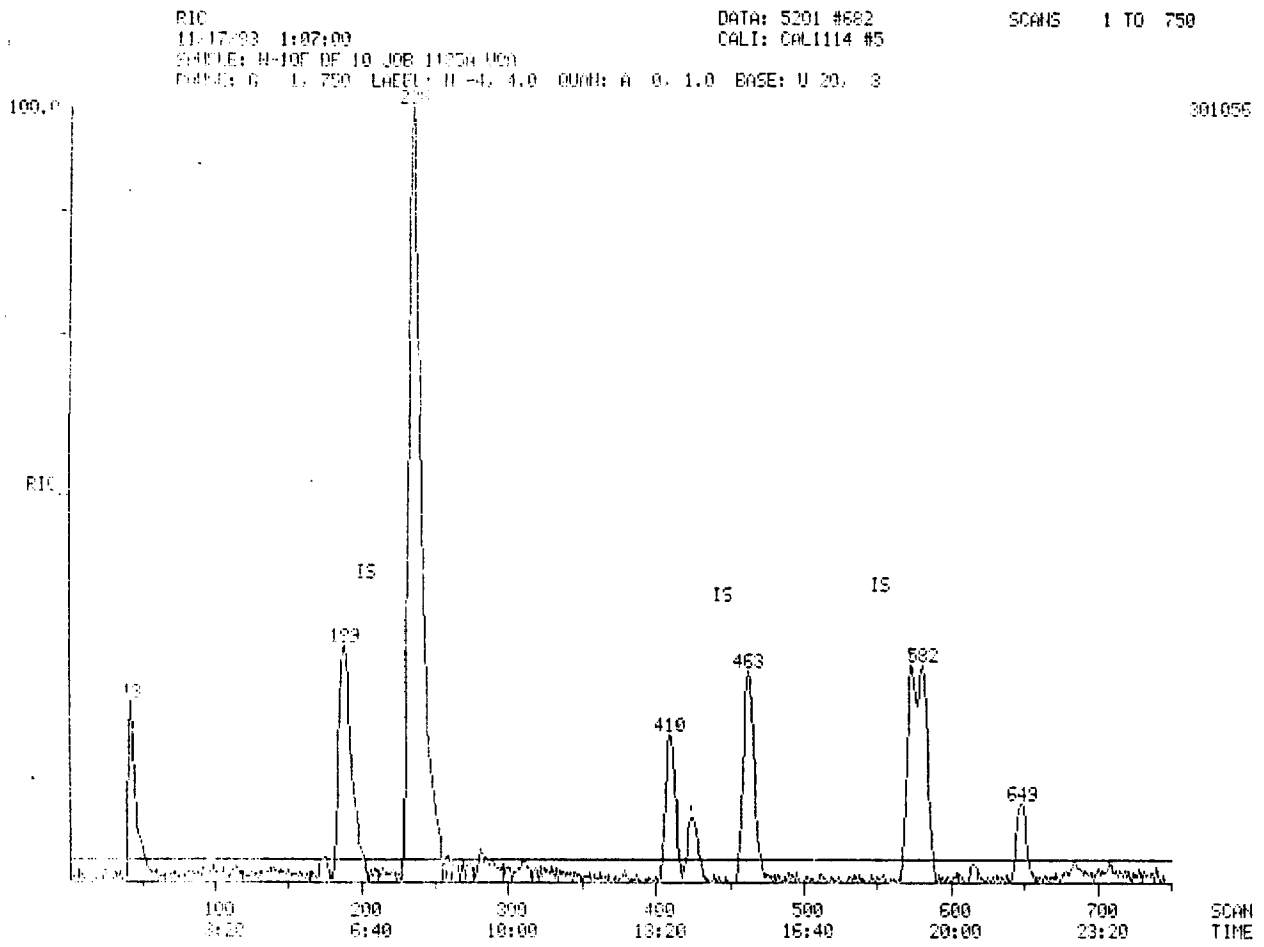
25409 SPECTRA IN LIBRARYNB SEARCHED FOR MAXIMUM PURITY
385 MATCHED AT LEAST 3 OF THE 16 LARGEST PEAKS IN THE UNKNOWN

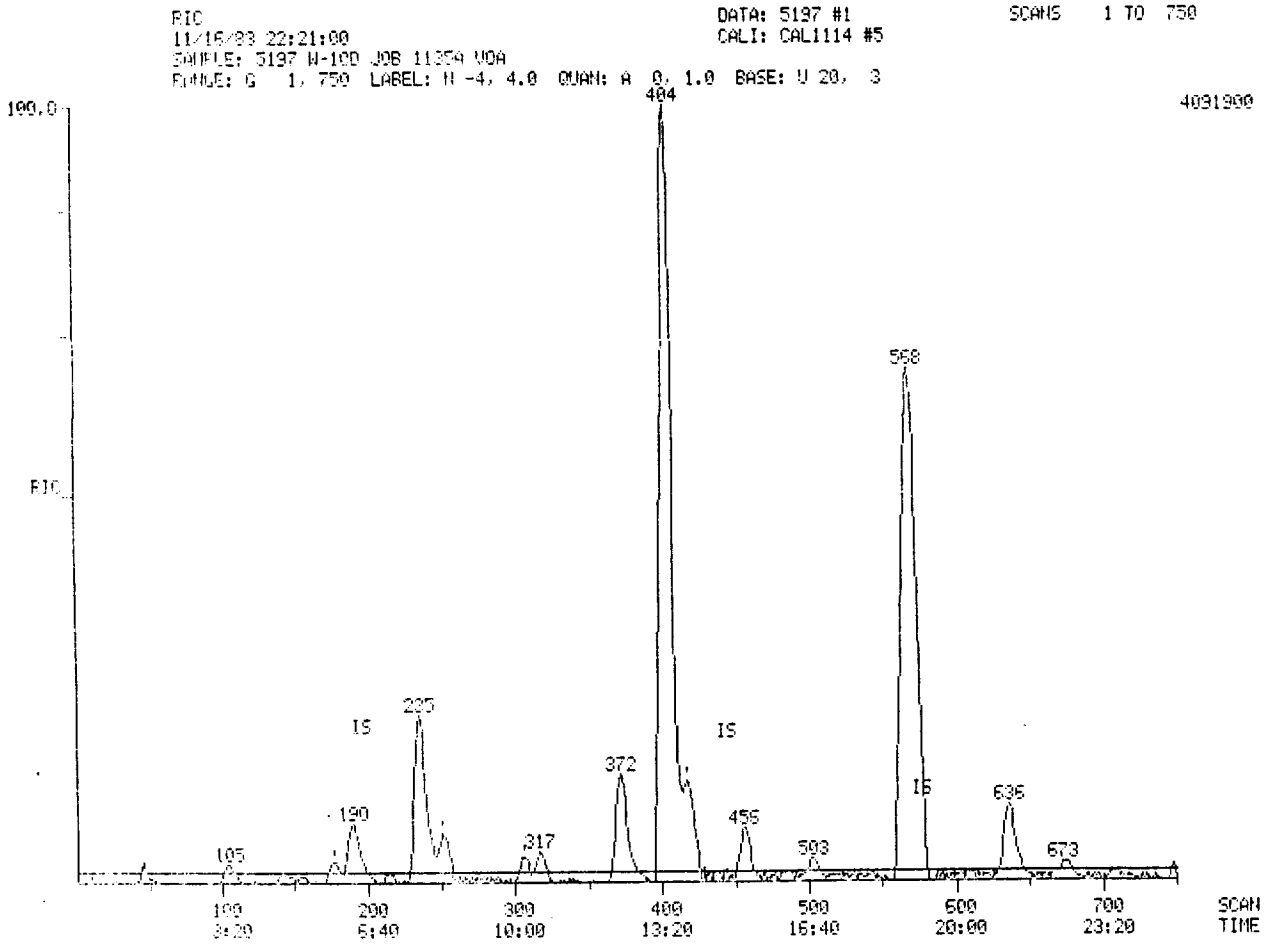
RANK IN NAME
1 1122 ETHENE, TETRACHLORO-
2 214 ETHANE, HEXACHLORO-
3 2203 PROPENE, 1,2-DICHLORO-3,3,3-TRIFLUORO-
4 6439 PHOSPHORODICHLORIDOTHIOICACID, O-METHYLESTER
5 4399 1,3,5-TRIAZIN-2-AMINE, 4,6-DICHLORO-

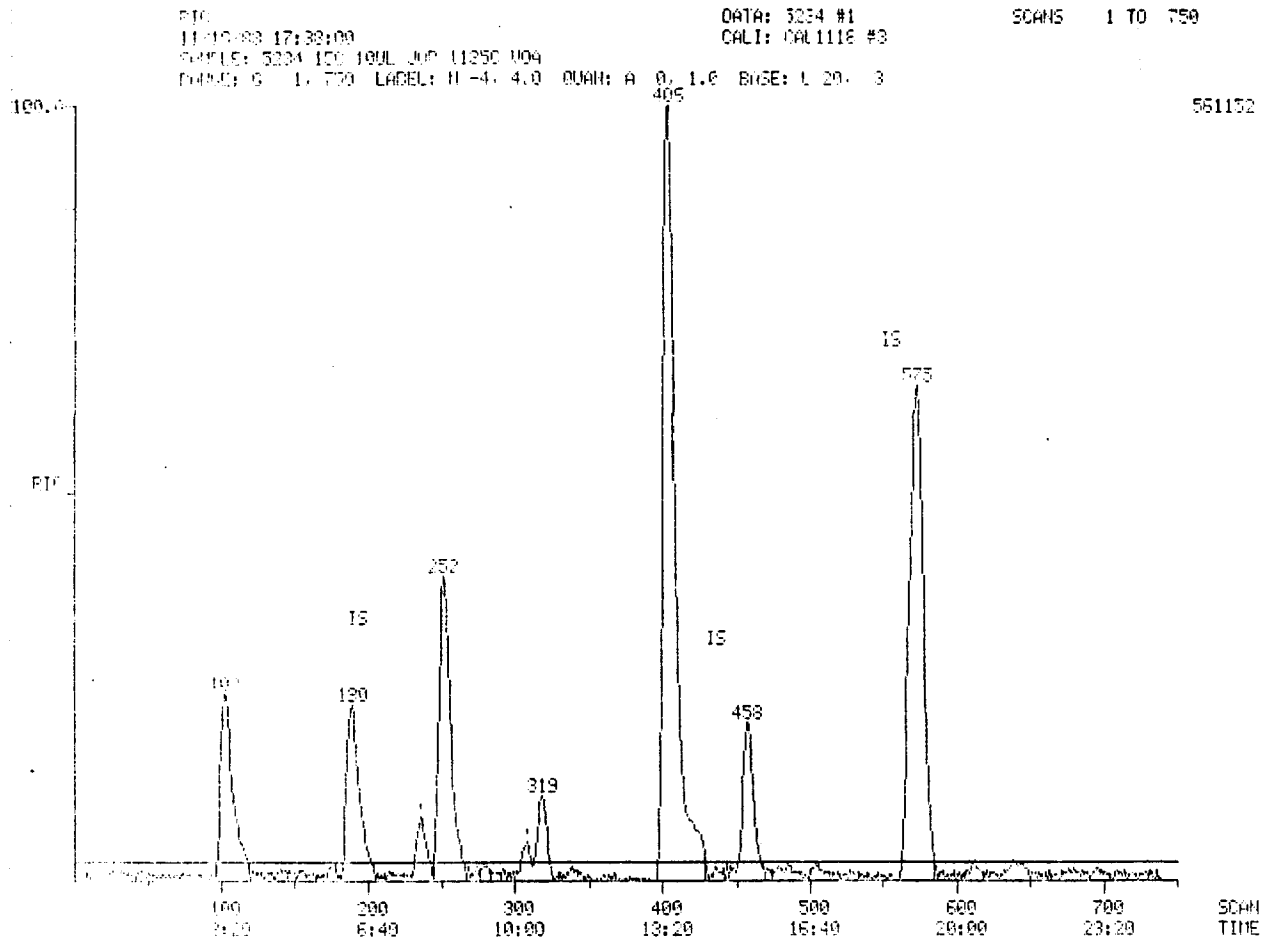
RANK	FORMULA	M.WT	B PK	PURITY	FIT	RFIT
1	C2. CL4	164	166	779	967	790
2	C2. CL6	234	117	722	773	736
3	C3. H. CL2. F3	164	164	467	750	568
4	C. H3. O. S. CL2. P	164	164	380	593	585
5	C3. H2. N4. CL2	164	164	365	594	560

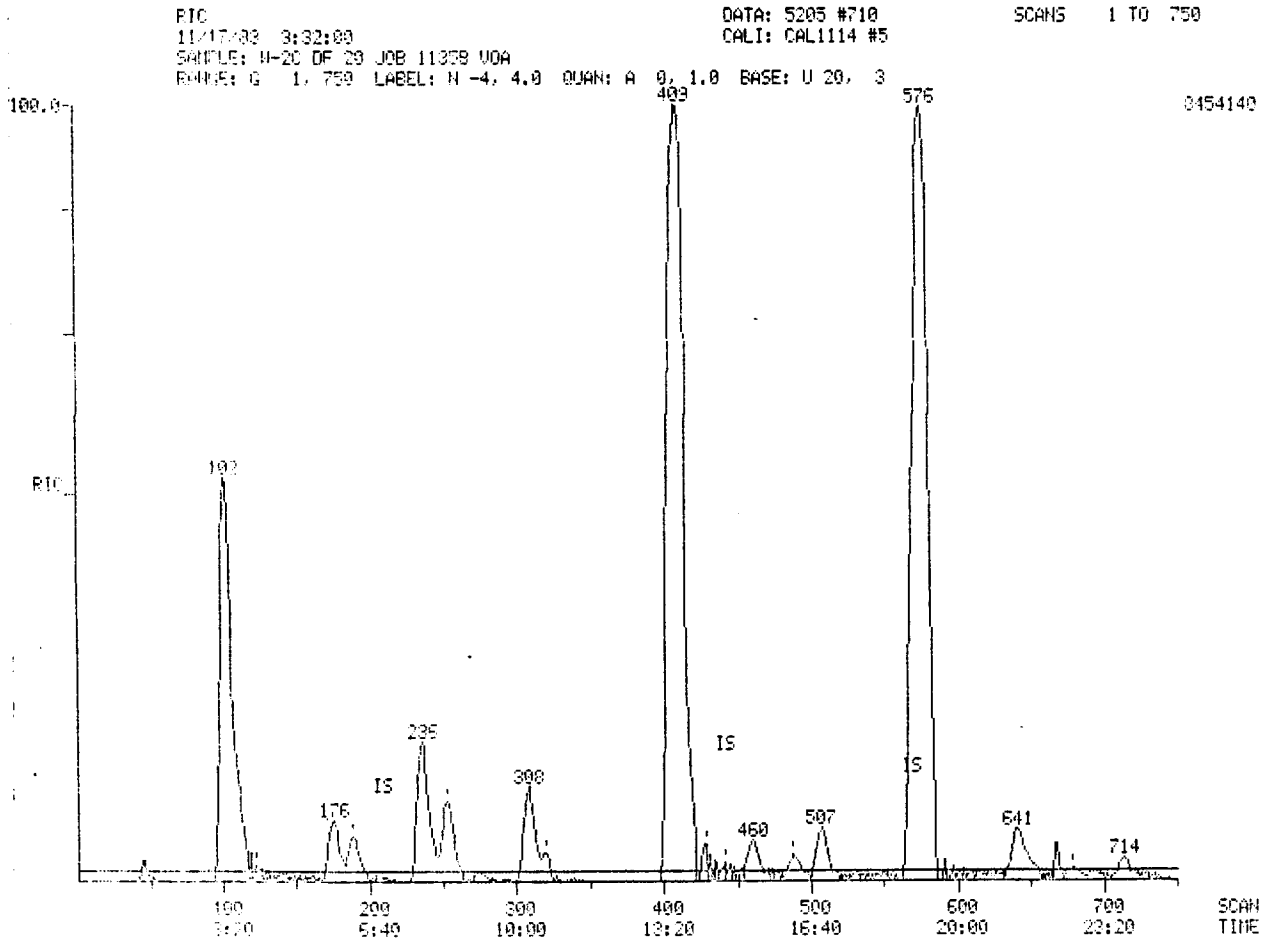

RIC
11/19/93 10:00:00
SAMPLE: MW-5F 5ML JOB 1135 VOA
DATA: 5183 #1
CALI: CAL1114 #5
SCANS 1 TO 750
364032
100.0
RIC
104
IS
191
257
315
414
IS
467
IS
584
100
3:20
200
6:40
300
10:00
400
13:20
500
16:40
600
20:00
700
23:20
SCAN
TIME

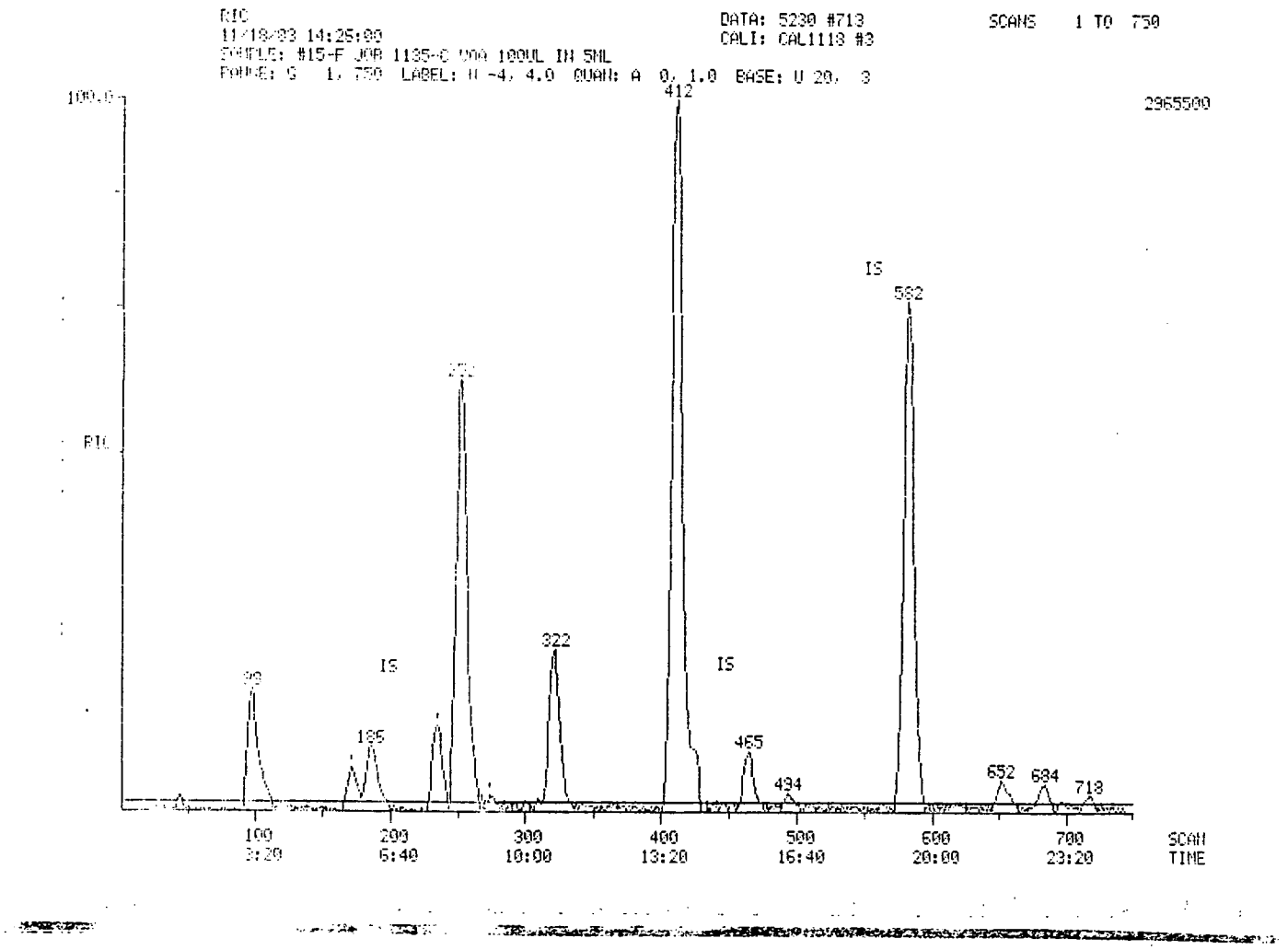

RIC
11/15/93 20:20:00
SAMPLE: 5195 M-5C" JOB 1135 VOA
DATA: 5195 #423
CALI: CAL1114 #5
SCANS 1 TO 750
36736
100.0
RIC
43
156
192
IS
240
314
414
467
IS
586
IS
620
653
687
100
3:20
200
6:40
300
10:00
400
13:20
500
16:40
600
20:00
700
23:20
SCAN
TIME

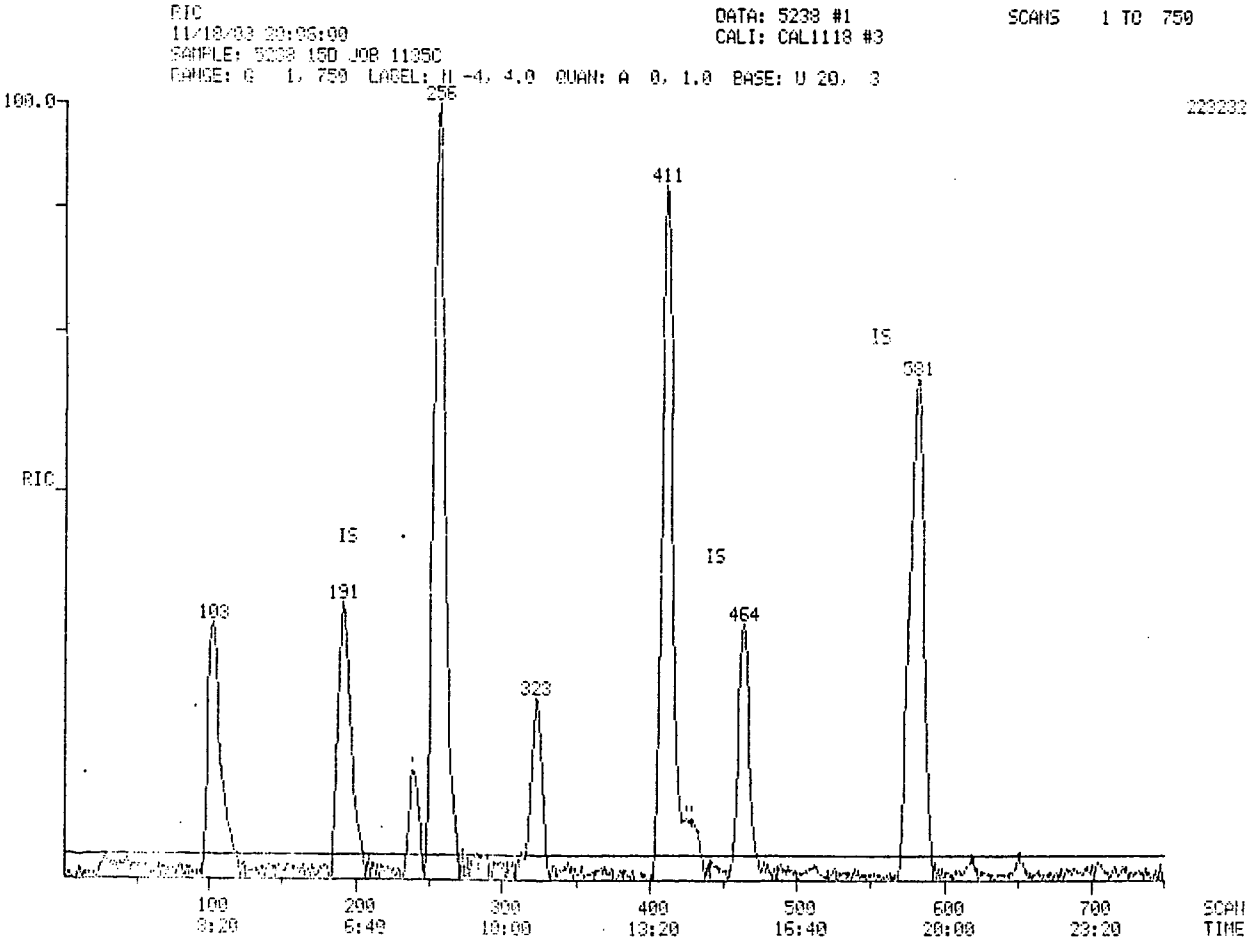

RIC
11/17/93 1:07:00
SAMPLE: W-10F DF 10 JOB 11354 VOA
RANGE: G 1, 750 LABEL: N -4, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
DATA: 5201 #682
CALI: CAL1114 #5
SCANS 1 TO 750
301056
100.0
RIC
IS
IS
IS
129
463
582
410
649
100
3:20
200
6:40
300
10:00
400
13:20
500
16:40
600
20:00
700
23:20
SCAN
TIME

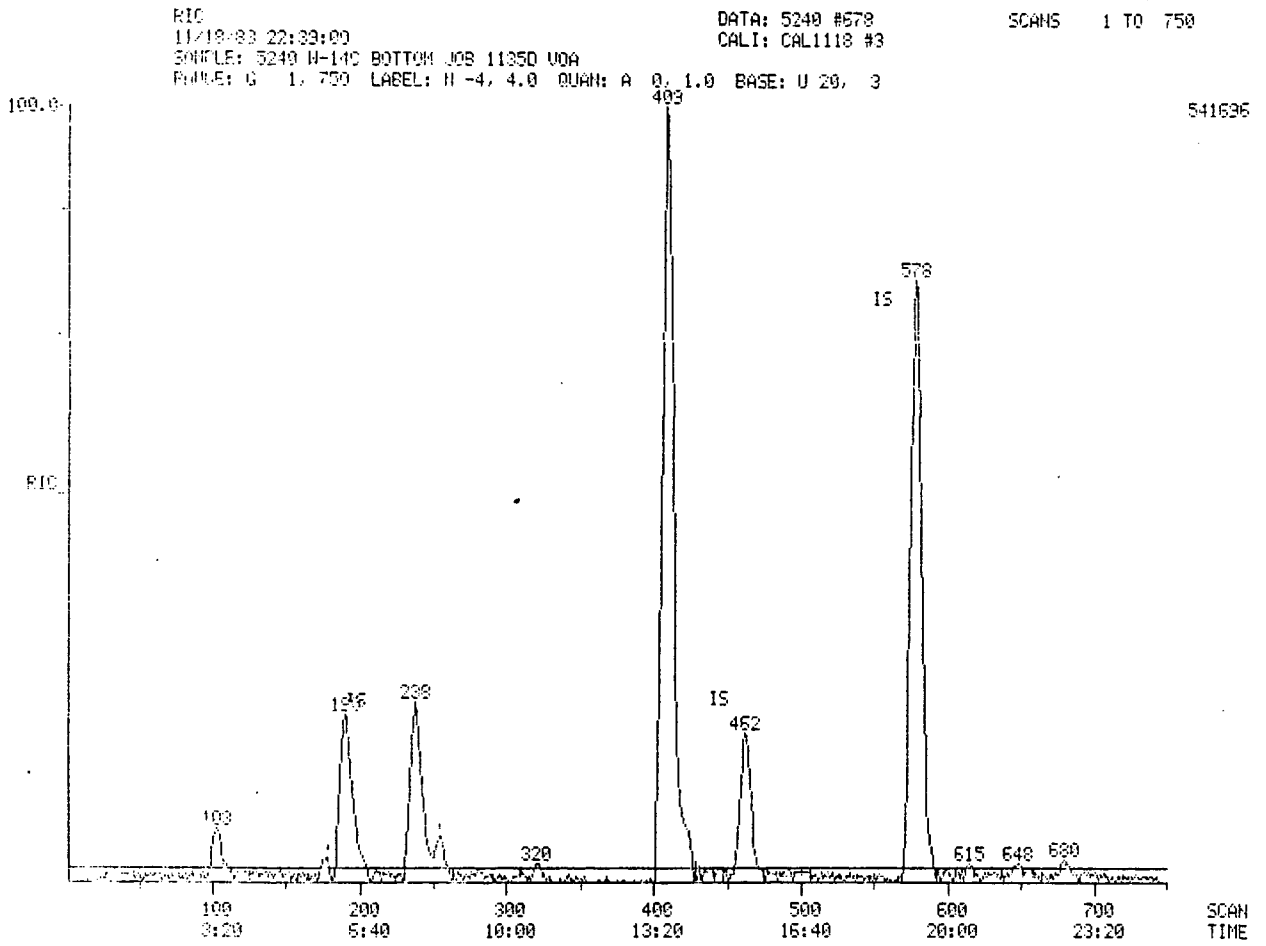

RIC
11/16/93 22:21:00
SAMPLE: 5197 W-10D JOB 11354 VOA
RANGE: G 1, 750 LABEL: N -4, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
DATA: 5197 #1
CALI: CAL1114 #5
SCANS 1 TO 750
4031900
100.0
RIC
404
568
220
IS
IS
IS
372
190
455
636
105
317
503
673
100
3:20
200
6:40
300
10:00
400
13:20
500
16:40
600
20:00
700
23:20
SCAN
TIME


PIC
DATA: 5234 #1
SCANS 1 TO 750
CALI: CAL1118 #3
SAMPLE: 5234 ICC 10UL JUP 11250 V04
RANGE: G 1, 750 LABEL: N -4, 4.0 QUAN: A 0, 1.0 BASE: L 20, 3
100.0
561152
RIC
405
IS
575
IS
252
IS
120
458
319
100
200
300
400
500
600
700
SCAN
TIME


PIC
DATA: 5205 #710
SCANS 1 TO 750
CALI: CAL1114 #5
SAMPLE: N-20 DF 20 JOB 11359 V0A
RANGE: G 1, 750 LABEL: N -4, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
100.0
0454140
RIC
409
576
192
IS
IS
IS
236
300
176
460
507
641
714
100
200
300
400
500
600
700
SCAN
TIME


RIC
11/18/93 14:25:00
SAMPLE: #15-F JOB 1135-C 000 100UL IN 5ML
RANGE: 0 1, 750 LABEL: H -4, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
DATA: 5230 #713
CALI: CAL1113 #3
SCANS 1 TO 750
100.0
2965500
RIC
412
IS
562
322
IS
IS
465
494
652
684
718
100
3:20
200
6:40
300
10:00
400
13:20
500
16:40
600
20:00
700
23:20
SCAN
TIME


RIC
11/18/93 20:06:00
SAMPLE: 5238 15D JOB 1135C
RANGE: 0 1, 750 LABEL: H -4, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
DATA: 5238 #1
CALI: CAL1113 #3
SCANS 1 TO 750
100.0
223232
RIC
256
411
IS
381
IS
IS
191
464
323
100
3:20
200
6:40
300
10:00
400
13:20
500
16:40
600
20:00
700
23:20
SCAN
TIME


RIC
11/18/83 22:39:00
DATA: 5240 #678
CALI: CAL1118 #3
SCANS 1 TO 750
SAMPLE: 5240 W-14C BOTTOM JOB 1135D VOA
FILE: G 1, 750 LABEL: W -4, 4.0 QUAN: A 0, 1.0 BASE: U 20, 3
100.0
541636
RIC
403
578
IS
IS
462
198
208
193
320
615
648
680
100
3:20
200
5:40
300
10:00
400
13:20
500
15:40
600
20:00
700
23:20
SCAN
TIME

RECRA ENVIRONMENTAL LABORATORIES
Division of Recra Research, Inc.

December 8, 1983

Mr. Timothy Van Domelen
E. I. Du Pont de Nemours &
Company, Inc.
P.O. Box 787
Niagara Falls, NY 14302

Re: Analytical Results

Dear Mr. Van Domelen:

Please find enclosed results of the analyses of the samples received at our laboratories on November 30 and December 1, 1983.

If you have any questions concerning these data, do not hesitate to contact the undersigned.

Sincerely,

RECRA ENVIRONMENTAL LABORATORIES

Barbara J Kozenda for

James A. Ploscyca
Laboratory Manager

BJK/JAP/jah
Enclosure
cc: Robert Pedley

I.D. #83-1268
83-1268A

RECRA ENVIRONMENTAL LABORATORIES
Division of Recra Research, Inc.

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
PRIORITY POLLUTANT ANALYSES

Prepared For:

E. I. Du Pont de Nemours &
Company, Inc.
P.O. Box 787
Niagara Falls, NY 14302

Prepared By:

Recra Environmental Laboratories
4248 Ridge Lea Road
Amherst, NY 14226

Report Date: December 8, 1983

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

INTRODUCTION:

On November 30 and December 1, 1983, samples were received at Recra Environmental Laboratories. A request was made by E. I. Du Pont de Nemours & Company, Inc. to have the samples analyzed for selected fractions of the Environmental Protection Agency decreed priority pollutants, soluble barium, and miscellaneous water quality parameters. It was also requested that the base neutral/acid phenolic and volatile fractions undergo a broad spectrum analysis to identify the five largest non-priority pollutant peaks.

This report will address the results of those analyses.

METHODS:

Priority pollutant analyses were conducted according to Environmental Protection Agency (EPA) methodologies.

Organic priority pollutants are analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). Pesticide priority pollutants were analyzed by Gas Chromatography.

RESULTS AND DISCUSSION:

The volatile analysis was subcontracted and the results can be found in Appendix A.

Computer identification was derived by a comparison of the sample peak mass spectra to those in the computer's library of mass spectra. None of the compounds listed could be confirmed due to the absence of a standard. Computer

RESULTS AND DISCUSSION (CONT'D.):

library identification was not made where peaks were already identified as priority pollutants, a computer library match could not be made, or the level of confidence was less than 80%.

Provided with each computer identification is the Chemical Abstracts Service (CAS) Registry number. Specific comments are intended to provide additional interpretive information to the computer's identification.

Confirmatory analysis for Pesticides/PCB's was not performed since all values reported by Gas Chromatography were below levels detectable by GC/MS.

Analyses for specific Pesticides/PCB's are based upon the matching of retention times between samples and standards on a single gas chromatographic column. Gas chromatographic values reported as "less than" (<) indicate the working detection limit for the given sample and/or parameter.

Compounds reported as ND are "not detected". Compounds reported as BMDL are confirmed as being present in the sample at a level "below method detection limit" and are not subject to reliable quantitation.

The presence of an asterisk (*) in the data tables signifies that the particular compound is indicated as being <u>possibly</u> present at a level below the detection limit, meeting some but not all confirmatory criteria.

Respectfully Submitted,

RECRA ENVIRONMENTAL LABORATORIES

Barbara J. Krajewski

Barbara J. Krajewski
GC/MS Analyst

BJK/jah

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

REport Date: 12/8/83

ACID/PHENOLICS

COMPOUND	METHOD DETECTION LIMIT ug/l	SAMPLE IDENTIFICATION W-15CD	W-15D
2-chlorophenol	3.3	ND	ND
2,4-dichlorophenol	2.7	ND	ND
2,4-dimethylphenol	2.7	ND	ND
4,6-dinitro-o-cresol	24	ND	ND
2,4-dinitrophenol	42	ND	ND
2-nitrophenol	3.6	ND	ND
4-nitrophenol	2.4	ND	ND
p-chloro-m-cresol	3.0	ND	ND
pentachlorophenol	3.6	ND	ND
phenol	1.5	ND	ND
2,4,6-trichlorophenol	2.7	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	11/30/83	12/1/83
Extraction Date	12/2/83	12/2/83
Analysis Date	12/3/83	12/3/83
Internal Standard (IS) - Level	20 ug/l	20 ug/l
deuterated phenanthrene - Recovery	130%	140%
Surrogate Standard (SS1) - Level	160 ug/l	160 ug/l
2-fluorophenol - Recovery	33%	41%
Surrogate Standard (SS2) - Level	110 ug/l	110 ug/l
pentafluorophenol - Recovery	35%	40%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapinski

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

ACID/PHENOLICS

COMPOUND	METHOD DETECTION LIMIT ug/l	SAMPLE IDENTIFICATION W-15F	W-15J
2-chlorophenol	3.3	ND	ND
2,4-dichlorophenol	2.7	ND	ND
2,4-dimethylphenol	2.7	ND	ND
4,6-dinitro-o-cresol	24	ND	ND
2,4-dinitrophenol	42	ND	ND
2-nitrophenol	3.6	ND	ND
4-nitrophenol	2.4	ND	ND
p-chloro-m-cresol	3.0	ND	ND
pentachlorophenol	3.6	ND	ND
phenol	1.5	ND	ND
2,4,6-trichlorophenol	2.7	ND	ND

ADDITIONAL SAMPLE INFORMATION

Sample Date	12/1/83	12/1/83
Extraction Date	12/2/83	12/2/83
Analysis Date	12/3/83	12/3/83
Internal Standard (IS) - Level	20 ug/l	20 ug/l
deuterated phenanthrene - Recovery	120%	130%
Surrogate Standard (SS1) - Level	160 ug/l	160 ug/l
2-fluorophenol - Recovery	38%	36%
Surrogate Standard (SS2) - Level	110 ug/l	110 ug/l
pentafluorophenol - Recovery	38%	35%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Kapinski

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15CD	W-15C
acenaphthene	1.9	ND	ND
acenaphthylene	3.5	ND	ND
anthracene	1.9	ND	ND
benzidine	44	ND	ND
benzo(a)anthracene	7.8	ND	ND
benzo(a)pyrene	2.5	ND	ND
benzo(b)fluoranthene	4.8	ND	ND
benzo(g,h,i)perylene	4.1	ND	ND
benzo(k)fluoranthene	2.5	ND	ND
bis(2-chloroethoxy)methane	5.3	ND	ND
bis(2-chloroethyl)ether	5.7	ND	ND
bis(2-chloroisopropyl)ether	5.7	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND
4-bromophenylphenylether	1.9	ND	ND
butylbenzylphthalate	2.5	ND	ND
2-chloronaphthalene	1.9	ND	ND
4-chlorophenylphenylether	4.2	ND.	ND
chrysene	2.5	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND
1,2-dichlorobenzene	1.9	12 µg/l	8.3 µg/l
1,3-dichlorobenzene	1.9	6.0 µg/l	3.9 µg/l
1,4-dichlorobenzene	4.4	BMDL	BMDL
3,3'-dichlorobenzidine	16.5	ND	ND
diethylphthalate	22	ND	ND
dimethylphthalate	1.6	ND	ND
di-n-butylphthalate	2.5	ND	ND

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15CD	W-15C
2,6-dinitrotoluene	1.9	ND	ND
2,4-dinitrotoluene	5.7	ND	ND
di-n-octylphthalate	2.5	ND	ND
1,2-diphenylhydrazine	25	ND	ND
fluoranthene	2.2	ND*	BMDL
fluorene	1.9	ND*	ND
hexachlorobenzene	1.9	BMDL	ND*
hexachlorobutadiene	0.9	38 µg/l	23 µg/l
hexachlorocyclopentadiene	25	ND	ND
hexachloroethane	1.6	54 µg/l	28 µg/l
indeno (1,2,3-cd)pyrene	3.7	ND	ND
isophorone	2.2	ND	ND
naphthalene	1.6	BMDL	6.1 µg/l
nitrobenzene	1.9	ND	ND
N-nitrosodimethylamine	25	ND	ND
N-nitrosodi-n-propylamine	25	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND
phenanthrene	5.4	ND	BMDL
pyrene	1.9	ND	ND
1,2,4-trichlorobenzene	1.9	24 µg/l	21 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	11/30/83	12/1/83
Extraction Date	12/2/83	12/2/83
Analysis Date	12/3/83	12/3/83
Internal Standard - Level	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery	130%	140%
Surrogate Standard (SS3) - Level	130 µg/l	130 µg/l
decafluorobiphenyl - Recovery	78%	89%
Surrogate Standard (SS4) - Level	50 µg/l	50 µg/l
2-fluorobiphenyl - Recovery	76%	90%

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kasperski

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

C-141

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15F	W-15J
acenaphthene	1.9	ND	ND
acenaphthylene	3.5	ND	ND
anthracene	1.9	ND	ND
benzidine	44	ND	ND
benzo(a)anthracene	7.8	ND	ND
benzo(a)pyrene	2.5	ND	ND
benzo(b)fluoranthene	4.8	ND	ND
benzo(g,h,i)perylene	4.1	ND	ND
benzo(k)fluoranthene	2.5	ND	ND
bis(2-chloroethoxy)methane	5.3	ND	ND
bis(2-chloroethyl)ether	5.7	ND	ND
bis(2-chloroisopropyl)ether	5.7	ND	ND
bis(2-ethylhexyl)phthalate	2.5	ND	ND
4-bromophenylphenylether	1.9	ND	ND
butylbenzylphthalate	2.5	ND	ND
2-chloronaphthalene	1.9	ND	ND
4-chlorophenylphenylether	4.2	ND	ND
chrysene	2.5	ND	ND
dibenzo(a,h)anthracene	2.5	ND	ND
1,2-dichlorobenzene	1.9	4.3 µg/l	8.3 µg/l
1,3-dichlorobenzene	1.9	2.7 µg/l	3.9 µg/l
1,4-dichlorobenzene	4.4	BMDL	BMDL
3,3'-dichlorobenzidine	16.5	ND	ND
diethylphthalate	22	ND	ND
dimethylphthalate	1.6	ND	ND
di-n-butylphthalate	2.5	ND	ND

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

BASE/NEUTRALS

COMPOUND	METHOD DETECTION LIMIT µg/l	SAMPLE IDENTIFICATION W-15F	W-15J
2,6-dinitrotoluene	1.9	ND	ND
2,4-dinitrotoluene	5.7	ND	ND
di-n-octylphthalate	2.5	ND	ND
1,2-diphenylhydrazine	25	ND	ND
fluoranthene	2.2	ND	ND
fluorene	1.9	ND	BMDL
hexachlorobenzene	1.9	ND	ND*
hexachlorobutadiene	0.9	22 µg/l	23 µg/l
hexachlorocyclopentadiene	25	ND	ND
hexachloroethane	1.6	25 µg/l	28 µg/l
indeno (1,2,3-cd)pyrene	3.7	ND	ND
isophorone	2.2	ND	ND
naphthalene	1.6	ND	6.1 µg/l
nitrobenzene	1.9	ND	ND
N-nitrosodimethylamine	25	ND	ND
N-nitrosodi-n-propylamine	25	ND	ND
N-nitrosodiphenylamine	1.9	ND	ND
phenanthrene	5.4	ND	BMDL
pyrene	1.9	ND	ND
1,2,4-trichlorobenzene	1.9	11 µg/l	21 µg/l

ADDITIONAL SAMPLE INFORMATION

Sample Date	12/1/83	12/1/83
Extraction Date	12/2/83	12/2/83
Analysis Date	12/3/83	12/3/83
Internal Standard - Level	20 µg/l	20 µg/l
deuterated phenanthrene - Recovery	120%	130%
Surrogate Standard (SS3) - Level	130 µg/l	130 µg/l
decafluorobiphenyl - Recovery	60%	68%
Surrogate Standard (SS4) - Level	50 µg/l	50 µg/l
2-fluorobiphenyl - Recovery	72%	68%

FOR RECRA ENVIRONMENTAL LABORATORIES Julia J Kasperski

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES

Report Date: 12/8/83

PESTICIDES/PCB'S

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) 15CD (11/30/83)	15D (12/1/83)	15F (12/1/83)	15J (12/1/83)
Aldrin	µg/l	<0.05	<0.05	<0.05	<0.01
α-BHC	µg/l	<0.05	<0.05	<0.05	0.03
β-BHC	µg/l	<0.05	<0.05	<0.05	0.35
δ-BHC	µg/l	<0.05	<0.05	<0.05	0.11
γ-BHC	µg/l	<0.05	<0.05	<0.05	0.03
Chlordane	µg/l	<1	<1	<1	<1
4,4'-DDD	µg/l	<0.05	<0.05	<0.05	<0.05
4,4'-DDE	µg/l	<0.05	<0.05	<0.05	<0.05
4,4'-DDT	µg/l	<0.05	<0.05	<0.05	<0.05
Dieldrin	µg/l	<0.05	<0.05	<0.05	<0.05
α-Endosulfan	µg/l	<0.05	<0.05	<0.05	<0.05
β-Endosulfan	µg/l	<0.05	<0.05	<0.05	<0.05
Endosulfan sulfate	µg/l	<0.05	<0.05	<0.05	<0.05
Endrin	µg/l	<0.05	<0.05	<0.05	<0.05
Endrin aldehyde	µg/l	<0.05	<0.05	<0.05	<0.05
Heptachlor	µg/l	<0.05	<0.05	<0.05	<0.05
Heptachlor epoxide	µg/l	<0.05	<0.05	<0.05	<0.05
PCB-1016	µg/l	<2	<2	<2	<2
PCB-1221	µg/l	<4	<4	<4	<4
PCB-1232	µg/l	<4	<4	<4	<4
PCB-1242	µg/l	<2	<2	<2	<2
PCB-1248	µg/l	<2	<2	<2	<2
PCB-1254	µg/l	<1	<1	<1	<1
PCB-1260	µg/l	<1	<1	<1	<1
Toxaphene	µg/l	<1	<1	<1	<1

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Prarie

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 12/8/83

METALS

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-15CD (11/30/83)	W-15D (12/1/83)	W-15F (12/1/83)	W-15J (12/1/83)
Total Antimony	mg/l	<0.02	<0.02	<0.02	<0.02
Total Arsenic	mg/l	<0.005	0.007	<0.005	<0.005
Total Beryllium	mg/l	<0.006	<0.006	<0.006	<0.006
Total Cadmium	mg/l	<0.01	<0.01	<0.01	<0.01
Total Chromium	mg/l	0.026	0.022	0.014	0.012
Total Copper	mg/l	0.048	0.256	0.714	0.196
Total Lead	mg/l	<0.005	<0.005	<0.005	0.015
Total Mercury	mg/l	<0.0006	<0.0006	<0.0006	<0.0006
Total Nickel	mg/l	0.012	0.017	0.016	0.017
Total Selenium	mg/l	<0.005	<0.005	<0.005	<0.005
Total Silver	mg/l	<0.01	<0.01	<0.01	<0.01
Total Thallium	mg/l	<0.01	<0.01	<0.01	<0.01
Total Zinc	mg/l	0.094	0.071	0.083	0.098
Soluble Barium	mg/l	0.22	0.23	0.18	0.76

FOR RECRA ENVIRONMENTAL LABORATORIES [illegible]

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.

Report Date: 12/8/83

MISCELLANEOUS

COMPOUND	UNITS OF MEASURE	SAMPLE IDENTIFICATION (DATE) W-15CD (11/30/83)	W-15D (12/1/83)	W-15F (12/1/83)	W-15J (12/1/83)
Total Cyanide	mg/l	0.055	23.5	0.052	0.18
Total Recoverable Phenolics	mg/l	<0.01	0.020	0.027	<0.01
Total Non-Filterable Residue (103°C)	mg/l	69	11	27	70
Total Organic Carbon	mg/l	20	11	2.5	8.0

FOR RECRA ENVIRONMENTAL LABORATORIES R. V. Finn

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES

I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 12/8/83

REPLICATE EXTRACTABLE ANALYSIS OF SAMPLE W-15F

COMPOUND IDENTIFICATION	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
1,2-dichlorobenzene	µg/l	5.1	3.6	4.3	1.1	25
1,3,-dichlorobenzene	µg/l	3.2	2.1	2.7	0.78	28
1,4-dichlorobenzene	µg/l	BMDL	BMDL	BMDL	-	-
hexachlorobutadiene	µg/l	27	18	22	6.4	29
hexachloroethane	µg/l	31	20	25	7.7	30
1,2,4-trichlorobenzene	µg/l	13	8.7	11	3.0	27

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J. Kasperski

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES

I.D.#83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY INC.
GA CHROMATOGRAPHY/MASS SPECTROMETRY
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 12/8/83

EXTRACTABLE RECOVERY ANALYSIS OF METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
2-chlorophenol	100	58	58
1,3-dichlorobenzene	100	81	81
2,4-dichlorophenol	100	58	58
di-n-octylphthalate	100	74	74
fluoranthene	100	82	82
fluorene	100	86	86
naphthalene	100	96	96
nitrobenzene	100	95	95
2,4,6-trichlorophenol	100	64	64

ADDITIONAL SAMPLE INFORMATION

Extraction Date	12/2/83
Analysis Date	12/3/83
Internal Standard (IS) - Level	20 µg/l
deuterated phenanthrene - Recovery	140%
Surrogate Standard (SSI) - Level	160 µg/l
2-fluorophenol - Recovery	74%
Surrogate Standard (SS2) - Level	110 µg/l
pentafluorophenol - Recovery	55%
Surrogate Standard (SS3) - Level	130 µg/l
Decafluorobiphenyl - Recovery	79%
Surrogate Standard (SS4) - Level	50 µg/l
2-fluorobiphenyl - Recovery	94%

FOR RECRA ENVIRONMENTAL LABORATORIES Patricia J. Kasperski

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY
PRIORITY POLLUTANT ANALYSES
QUALITY CONTROL

Report Date: 12/8/83

PESTICIDE RECOVERY ANALYSIS OF METHOD BLANK

COMPOUND IDENTIFICATION	ng OF SPIKE	ng RECOVERED	% RECOVERY
Aldrin	0.22	0.19	86
γ-BHC	0.22	0.25	110
4,4' DDE	0.26	0.20	77
β-Endosulfan	0.85	0.64	75
Endrin	0.21	0.18	86
Heptachlor	0.24	0.24	100

FOR RECRA ENVIRONMENTAL LABORATORIES Deborah J. Praviss

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 12/8/83

RECOVERY ANALYSES

PARAMETER	SAMPLE IDENTIFICATION	µg OF SPIKE	µg RECOVERED	% RECOVERY
Total Arsenic	W-15D	0.5	0.445	89
Total Cadmium	W-15J	1,000	1,000	100
Total Chromium	W-15J	500	465	93
Total Copper	W-15J	500	485	97
Total Lead	W-15F	50	42	84
Total Cyanide	W-15J	10	10.7	107
Total Organic Carbon	W-15J	25	24.25	97
Soluble Barium	W-15J	5,000	5,450	109

FOR RECRA ENVIRONMENTAL LABORATORIES Q.V. Fiss

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
QUALITY CONTROL

Report Date: 12/8/83

REPLICATE ANALYSES

PARAMETER	SAMPLE I.D.	UNITS OF MEASURE	VALUE 1	VALUE 2	MEAN	STANDARD DEVIATION	PERCENT COEFFICIENT OF VARIATION
Total Cyanide	W-15D	mg/l	0.176	0.192	0.184	0.011	6.1
Total Recoverable Phenolics	W-15F	mg/l	0.0265	0.0269	0.0267	0.0002	1.1
Total Non-Filterable Residue (103°C)	W-15J	mg/l	68	72	70	2.8	4.0
Total Organic Carbon	W-15J	mg/l	8.0	8.0	8.0	0	0

FOR RECRA ENVIRONMENTAL LABORATORIES Q.V. Fiss

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 12/8/83

SAMPLE I.D.: W-15CD

SCAN #	COMPUTER LIBRARY CHOICE	CAS #	COMMENTS
167	2,2,3-trichloropropanoic acid	3278464	
214	4-methylphenyl ester butanoic acid	14617926	Possibly a tetrachlorobutadiene
253	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
273	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
343	3,4,4-trimethyl-5-oxo-2-hexenoic acid ethyl ester	6994985	

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Nagendi

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 12/8/83

SAMPLE I.D.: W-15D

SCAN #	COMPUTER LIBRARY CHOICE	CAS #	COMMENTS
211	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
251	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
272	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
305	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
389	1,2,3-trichlorobenzene	87616	Probably a trichlorobenzene

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Nagendi

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 12/8/83

SAMPLE I.D.: W-15F

SCAN #	COMPUTER LIBRARY CHOICE	CAS #	COMMENTS
45	4-hydroxy-4-methyl-2-pentanone	123422	
249	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
271	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
304	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
343	3-bromo-1,1,1-trichloropropane	13749376	

FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Klapecki

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

ANALYTICAL RESULTS

E. I. DU PONT DE NEMOURS & COMPANY, INC.
GAS CHROMATOGRAPHY/MASS SPECTROMETRY
EXTRACTABLE BROAD SPECTRUM ANALYSES

Report Date: 12/8/83

SAMPLE I.D.: W-15J

SCAN #	COMPUTER LIBRARY CHOICE	CAS #	COMMENTS
167	2-(1-methylheptyl)cyclohexanone	54549905	
214	4,6-dichloro-2-methyl-1,3-benzenediol	52956215	Possibly a tetrachlorobutadiene
251	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
271	1,1,3,4-tetrachloro-1,3-butadiene	42769380	Possibly a tetrachlorobutadiene
998	eicosane	112958	Probably an aliphatic hydrocarbon

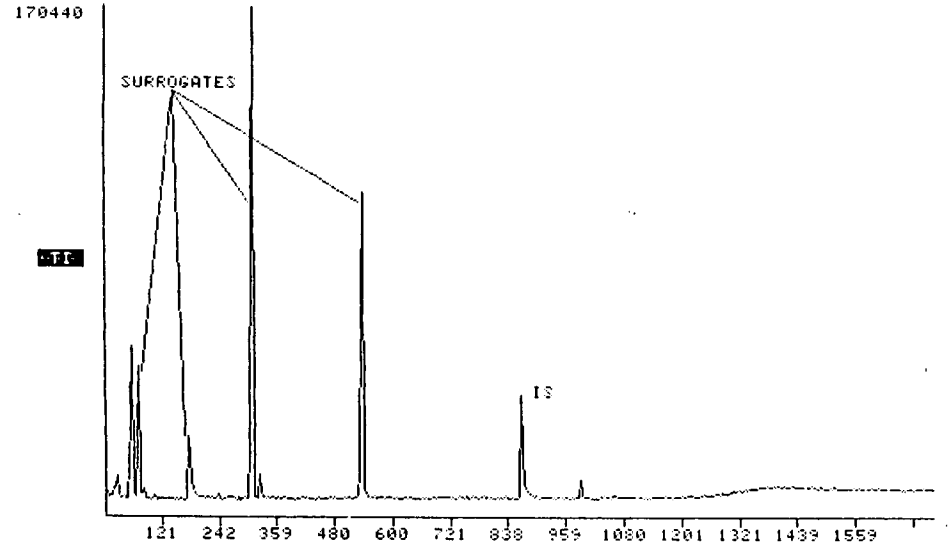
FOR RECRA ENVIRONMENTAL LABORATORIES Barbara J Klapecki

DATE 12/8/83

RECRA ENVIRONMENTAL LABORATORIES
I.D. #83-1268

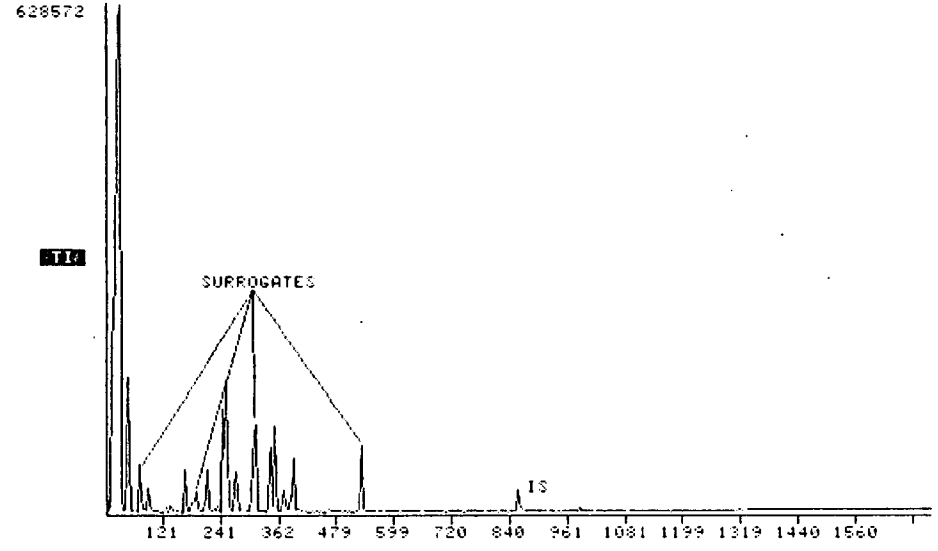
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MISC PP9549/50 BN/AP

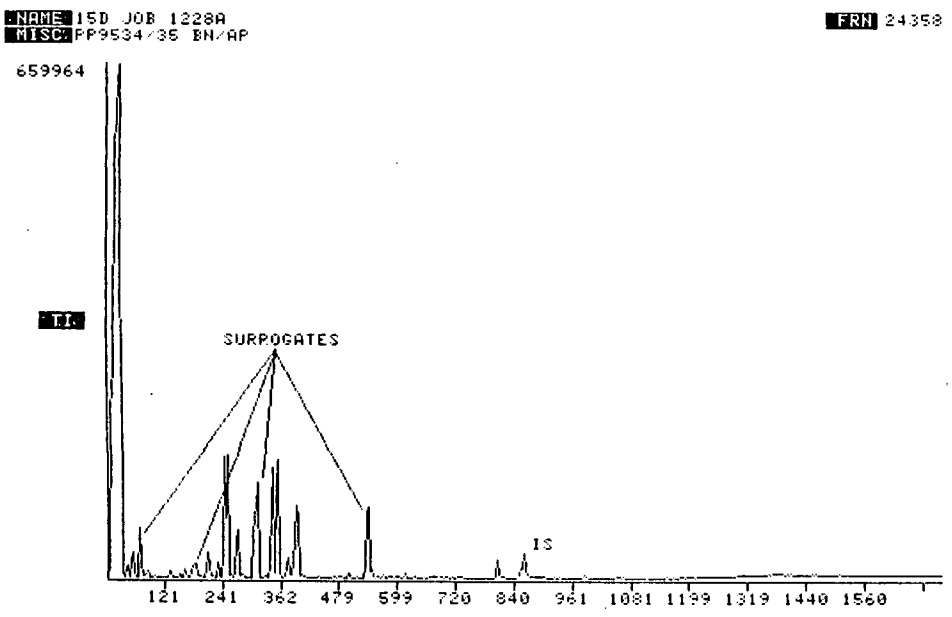
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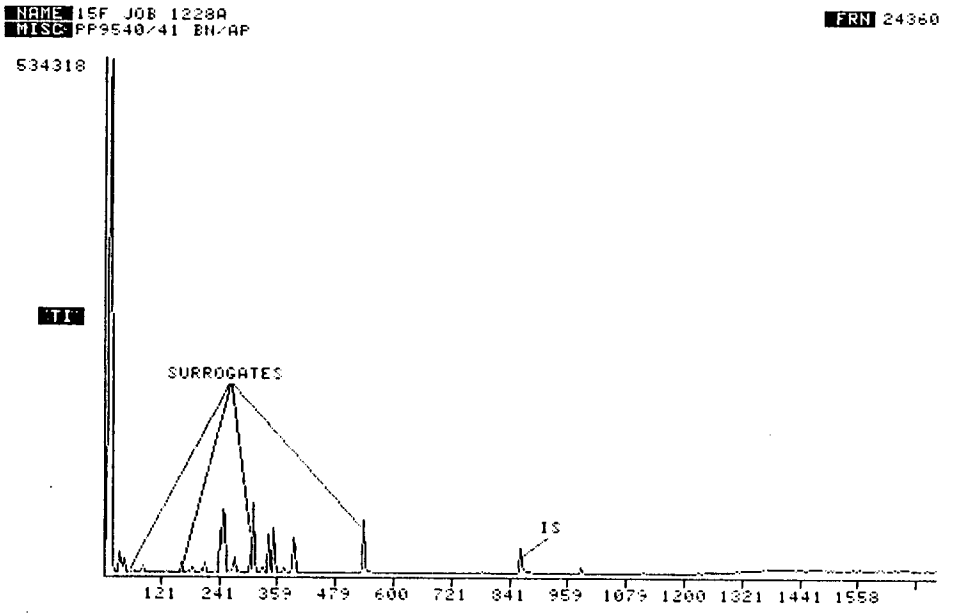


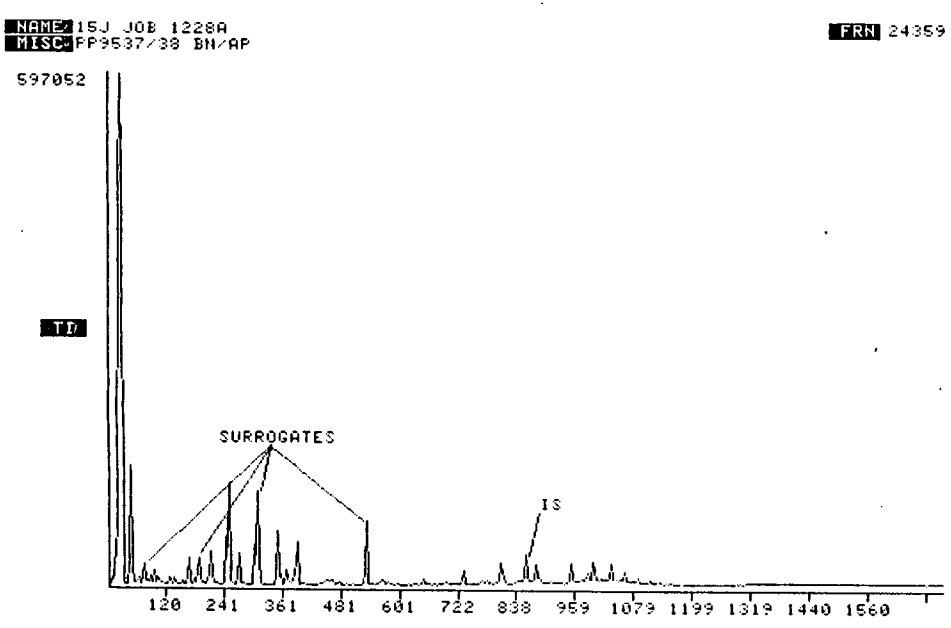
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NAME ~~LCD~~ JOB 1268
MISC PP9531/32 BN/AP

FRN 24357




NAME 15D JOB 1228A
MISC PP9534/35 BN/AP
FRN 24358
659964
TIC
SURROGATES
IS
121 241 362 479 599 720 840 961 1081 1199 1319 1440 1560


NAME 15F JOB 1228A
MISC PP9540/41 BN/AP
FRN 24360
534318
TIC
SURROGATES
IS
121 241 359 479 600 721 841 959 1079 1200 1321 1441 1558



APPENDIX A

VOLATILE PRIORITY POLLUTANT ANALYSIS

RECRA ENVIRONMENTAL LABORATORIES

ecology and environment, inc.
P.O. Box D, Buffalo, N.Y. 14225 Tel. (716) 631-0360
International Specialists in the Environmental Sciences

LABORATORY REPORT

GC/MS FRACTION - VOLATILE COMPOUNDS - METHOD 624
(Detection limits: at least 10 ug/L except for Acrolein and Acrylonitrile at 100 ug/L)
ND: Material was analyzed for but not detected

POLLUTANT AND CAS NUMBER	CONCENTRATION, ug/L			
E & E Lab Number 83-	4557	4558	4559	4560
Client Identification	15CD	15D	15F	15J
1V. Acrolein (107-02-8)	< 2500	< 1000	< 1000	< 1000
2V. Acrylonitrile (107-13-1)	< 2500	< 1000	< 1000	< 1000
3V. Benzene (71-43-2)	< 250	< 100	< 100	< 100
4V. Bis (Chloromethyl) Ether (542-88-1)	< 250	< 100	< 100	< 100
5V. Bromoform (75-25-2)	< 250	< 100	< 100	< 100
6V. Carbon Tetrachloride (56-23-5)	< 250	< 100	< 100	< 100
7V. Chlorobenzene (108-90-7)	< 250	< 100	< 100	< 100
8V. Chlorodibromomethane (124-48-1)	< 250	< 100	< 100	< 100
9V. Chloroethane (75-00-3)	< 250	< 100	< 100	< 100
10V. 2-Chloroethylvinyl Ether (110-75-8)	< 250	< 100	< 100	< 100
11V. Chloroform (67-66-3)	21000	1790	6060	33800

GC/MS FRACTION - VOLATILE COMPOUNDS - METHOD 624 (Continued)
(Detection limits: at least 10 ug/L except for Acrolein and Acrylonitrile at 100 ug/L)
ND: Material was analyzed for but not detected

POLLUTANT AND CAS NUMBER	CONCENTRATION, ug/L			
E & E Lab Number 83-	4557	4558	4559	4560
Client Identification	15CD	15D	15F	15J
12V. Dichlorobromomethane (75-27-4)	< 250	< 100	< 100	< 100
13V. Dichlorodifluoromethane (75-71-8)	< 250	< 100	< 100	< 100
14V. 1,1-Dichloroethane (75-34-3)	< 250	< 100	< 100	< 100
15V. 1,2-Dichloroethane (107-06-2)	< 250	< 100	< 100	< 100
16V. 1,1-Dichloroethylene (75-35-4)	< 250	< 100	< 100	< 100
17V. 1,2-Dichloropropane (78-87-5)	< 250	< 100	< 100	< 100
18V. 1,3-Dichloropropylene (542-75-6)	< 250	< 100	< 100	< 100
19V. Ethylbenzene (100-41-4)	< 250	< 100	< 100	< 100
20V. Methyl Bromide (74-83-9)	< 250	< 100	< 100	< 100
21V. Methyl Chloride (74-87-3)	< 250	< 100	< 100	< 100
22V. Methylene Chloride (75-09-2)	26000	5590	2750	5400
23V. 1,1,2,2-Tetrachloroethane (79-34-5)	< 250	< 100	< 100	< 100
24V. Tetrachloroethylene (127-18-4)	30200	24600	7420	13000

GC/MS FRACTION - VOLATILE COMPOUNDS - METHOD 624 (Continued)
(Detection limits: at least 10 ug/L except for Acrolein and Acrylonitrile at 100 ug/L)
ND: Material was analyzed for but not detected

POLLUTANT AND CAS NUMBER	CONCENTRATION, ug/L			
E & E Lab Number 83-	4557	4558	4559	4560
Client Identification	15CD	15D	15F	15J
25V. Toluene (108-88-3)	< 250	< 100	< 100	< 100
26V. 1,2-trans-Dichloroethylene (156-60-5)	2170	< 100	1380	349
27V. 1,1,1-Trichloroethane (71-55-6)	< 250	< 100	< 100	< 100
28V. 1,1,2-Trichloroethane (79-00-5)	250	< 100	< 100	< 100
29V. Trichloroethylene (79-01-6)	55900	3180	5350	18900
30V. Trichlorofluoromethane (75-69-4)	< 250	< 100	< 100	< 100
31V. Vinyl Chloride (75-01-4)	< 250	< 100	< 100	< 100

SHEET 3 OF 3

175041

QUALITY CONTROL FOR ACCURACY
PERCENT RECOVERY FOR SURROGATE SPIKES

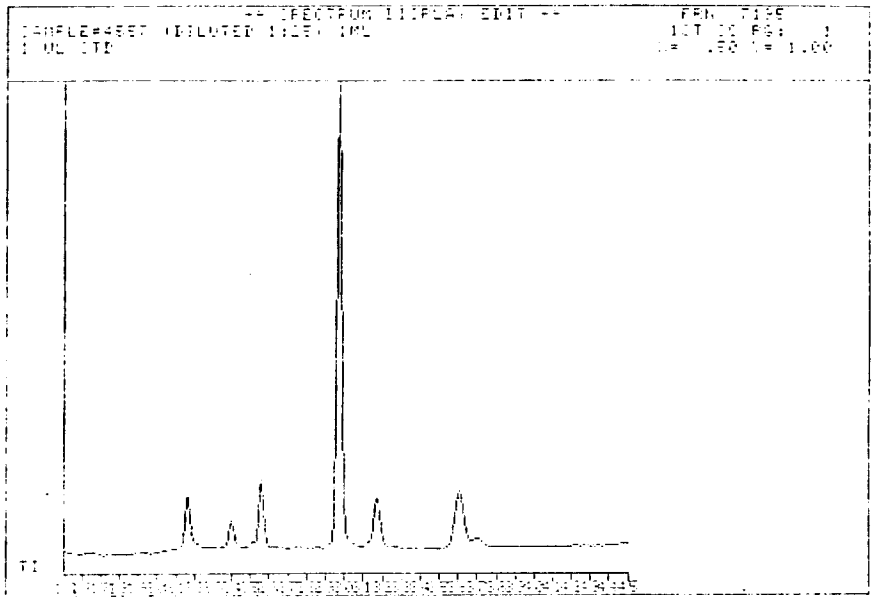
		Percent Recovery			
E & E Sample No. 83-		4557	4558	4559	4560
Client Identification		15CD	15D	15F	15J
Compound	ug/L				
Bromochloromethane	40*	15.0	33.8	25.1	39.6
2-Bromo-1-chloropropane	40*	30.1	67.6	58.5	99.9
1,4-Dichlorobutane	40*	27.8	79.1	63.2	116

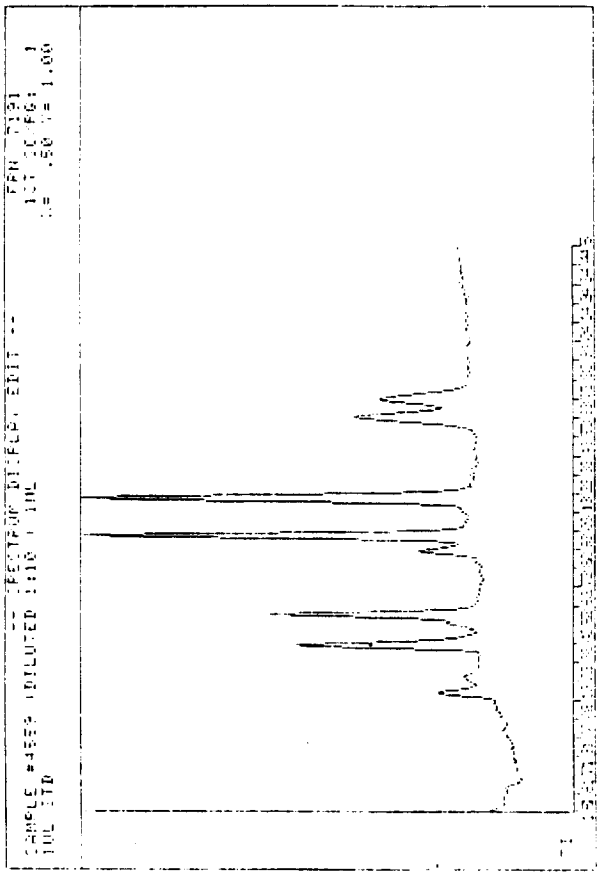
*This amount was added to the sample dilution, not to the original sample, therefore this value is lower than the reported detection limits.

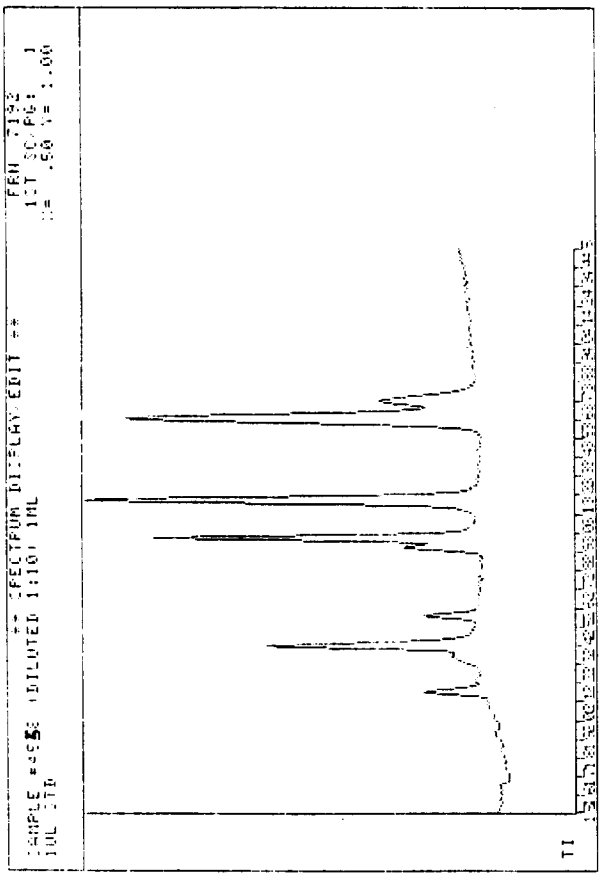
QUALITY CONTROL FOR ACCURACY
PERCENT RECOVERY FOR SPIKED SAMPLE ANALYSES

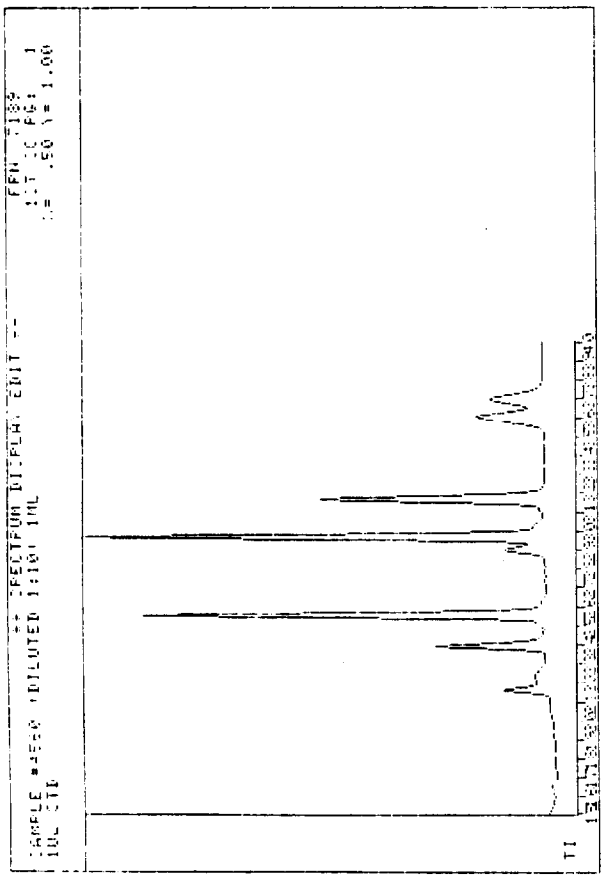
E & E Lab Number 83- 4557	Original Value*	Amount Added	Amount Found	
Compound		(ug/L)		Percent Recovery
Methylene Chloride	1040	40	40.8	102
Chloroform	840	40	40.5	101
Tetrachloroethylene	1210	40	40.5	101
Toluene	< 100	40	22.2	55.5

*Value present in sample dilution used for analysis.
Same dilution value used in spiked analysis.








** SPECTRUM DISPLAY EDIT **
SAMPLE #1234 DILUTED 1:100 1ML
10UL STD
PPM 1189
1.50 Y= 1.000
TI

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

8-5-83 - 8-16-83

ACID/PHENOLICS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 1-B	1-C	1-D	1-E	1-J	3-B	4-B	5-C	7-B
2-chlorophenol	3.3	-(1)	-	-	-	-	-	-	-	-
2,4-dichlorophenol	2.7	-	-	-	-	-	-	-	-	-
2,4-dimethylphenol	2.7	-	-	-	-	-	3.6	-	-	-
4,6-dinitro-o-cresol	24	-	-	-	-	-	-	-	-	-
2,4-dinitrophenol	42	-	-	-	-	-	-	-	-	-
2-nitrophenol	3.6	-	-	-	-	-	-	-	-	-
4-nitrophenol	2.4	-	-	-	-	-	-	-	-	-
p-chloro-m-cresol	3.0	-	-	-	-	-	-	-	-	-
phentachlorophenol	3.6	-	-	-	-	-	-	-	-	-
phenol	1.5	7.2	3.3	-	-	-	BMDL(2)	BMDL	-	-
2,4,6-trichlorophenol	2.7	-	-	-	-	BMDL	18	BMDL	-	43
						-	-	-	-	-

BASE/NEUTRALS COMPOUND										
acenaphthene	1.9	BMDL	3.0	-	-	-	BMDL	-	-	-
acenaphthylene	3.5	-	-	-	-	-	-	-	-	-
anthracene	1.9	BMDL	2.9	-	-	-	BMDL	-	-	-
benzidine	44	-	-	-	-	-	-	-	-	-
benzo(a)anthracene	7.8	BMDL	30	-	-	-	BMDL	-	-	BMDL
benzo(a)pyrene	2.5	BMDL	8.7	-	-	-	-	-	-	-
benzo(b)fluoranthene	4.8	BMDL	19	-	-	-	-	-	-	-
benzo(g,h,i)perylene	4.1	-	6.0	-	-	-	-	-	-	-
benzo(k)fluoranthene	2.5	-	-	-	-	-	-	-	-	-
bis(2-chloroethoxy)methane	5.3	-	-	-	-	-	-	-	-	-
bis(2-chloroethyl)ether	5.7	-	-	-	-	-	-	-	-	-
bis(2-chloroisopropyl)ether	5.7	-	-	-	-	-	-	-	-	-
bis(2-ethylhexyl)phthalate	2.5	-	-	-	-	-	-	-	-	-
4-bromophenylphenylether	1.9	-	-	-	-	-	-	-	-	-
butylbenzylphthalate	2.5	-	-	-	-	-	-	-	-	-
2-chloronaphthalene	1.9	-	-	-	-	-	-	-	-	-
4-chlorophenylphenylether	4.2	-	-	-	-	-	-	-	-	-
chrysene	2.5	-	-	-	-	-	-	-	-	-
dibenzo(a,h)anthracene	2.5	-	7.7	-	-	-	-	-	-	-
1,2-dichlorobenzene	1.9	11	40	BMDL	-	3.6	-	BMDL	-	-
1,3-dichlorobenzene	1.9	4.1	22	-	-	BMDL	-	-	-	-
1,4-dichlorobenzene	4.4	BMDL	10	-	-	-	-	-	-	-
3,3'-dichlorobenzidine	16.5	-	-	-	-	-	-	-	-	-
diethylphthalate	22	-	-	-	-	-	-	-	-	-
dimethylphthalate	1.6	-	-	-	-	-	-	-	-	-
di-n-butylphthalate	2.5	-	-	-	-	-	-	-	-	-
2,6-dinitrotoluene	1.9	-	-	-	-	-	-	-	-	-
2,4-dinitrotoluene	5.7	-	-	-	-	-	-	-	-	-
di-n-octylphthalate	2.5	-	-	-	-	-	-	-	-	-
1,2-diphenylhydrazine	25	-	-	-	-	-	-	-	-	-
fluoranthene	2.2	2.3	35	-	-	-	BMDL	BMDL	-	BMDL

0856D

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

BASE/NEUTRALS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 1-B	1-C	1-D	1-E	1-J	3-B	4-B	5-C	7-B
hexachlorobenzene	1.9	4.8	41	-	-	-	-	BMDL	2.2	-
hexachlorobutadiene	0.9	21	720	-	-	-	BMDL	BMDL	2.4	BMDL
hexachlorocyclopentadiene	25	-	-	-	-	-	-	-	-	-
hexachloroethane	1.6	30	1200	-	-	-	-	BMDL	-	-
indeno (1,2,3-cd)pyrene	3.7	-	10	-	-	-	-	-	-	-
isophorone	2.2	-	-	-	-	-	-	-	-	-
naphthalene	1.6	BMDL	3.9	-	-	BMDL	29	-	-	-
nitrobenzene	1.9	-	-	-	-	-	-	-	-	-
N-nitrosodimethylamine	25	-	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	25	-	-	-	-	-	-	-	-	-
N-nitrosodiphenylamine	1.9	BMDL	-	-	-	-	-	-	-	-
phenanthrene	5.4	BMDL	12	-	-	-	BMDL	-	-	BMDL
pyrene	1.9	2.2	24	-	-	-	BMDL	-	-	BMDL
1,2,4-trichlorobenzene	1.9	69	1500	3.0	-	2.0	BMDL	BMDL	-	BMDL

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

ACID/PHENOLICS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 8-B	10-C	12-B	15-C	16-B	17-B	18-C	19-B
2-chlorophenol	3.3	-	-	-	-	-	-	BMDL	-
2,4-dichlorophenol	2.7	-	-	-	-	-	-	BMDL	-
2,4-dimethlyphenol	2.7	-	-	-	-	-	-	-	-
4,6-dinitro-o-cresol	24	-	-	-	-	-	-	-	-
2,4-dinitrophenol	42	-	-	-	-	-	-	-	-
2-nitrophenol	3.6	-	-	-	-	-	-	-	-
4-nitrophenol	2.4	-	-	-	-	-	-	-	-
p-chloro-m-cresol	3.0	-	-	-	-	-	-	-	-
pentachlorophenol	3.6	-	-	-	-	-	-	-	-
phenol	1.5	43	-	-	BMDL	21	-	BMDL	-
2,4,6-trichlorophenol	2.7	-	-	-	-	BMDL	-	-	-
BASE/NEUTRALS COMPOUND									
acenaphthene	1.9	-	-	BMDL	BMDL	BMDL	-	-	-
acenaphthylene	3.5	-	-	-	-	-	-	-	-
anthracene	1.9	-	-	-	-	-	-	-	-
benzidine	44	-	-	-	-	-	-	-	-
benzo(a)anthracene	7.8	-	-	-	-	BMDL	-	-	-
benzo(a)pyrene	2.5	-	-	-	-	BMDL	-	-	-
benzo(b)fluoranthene	4.8	-	-	-	-	BMDL	-	-	-
benzo(g,h,i)perylene	4.1	-	-	-	-	-	-	-	-
benzo(k)fluoranthene	2.5	-	-	-	-	-	-	-	-
bis(2-chloroethoxy)methane	5.3	-	-	-	-	-	-	-	-
bis(2-chloroethyl)ether	5.7	-	-	-	-	-	-	-	-
bis(2-chloroisopropyl)ether	5.7	-	-	-	-	-	-	-	-
bis(2-ethylhexyl)phthalate	2.5	-	-	-	-	-	-	-	-
4-bromophenylphenylether	1.9	-	-	-	-	-	-	-	-
butylbenzylphthalate	2.5	-	-	-	-	-	-	-	-
2-chloronaphthalene	1.9	-	-	-	-	-	-	-	-
4-chlorophenylphenylether	4.2	-	-	-	-	-	-	-	-
chrysene	2.5	-	-	-	-	-	-	-	-
dibenzo(a,h)anthracene	2.5	-	-	-	-	-	-	-	-
1,2-dichlorobenzene	1.9	-	7.2	BMDL	26	3.4	-	450	-
1,3-dichlorobenzene	1.9	-	2.0	-	14	6.2	-	120	BMDL
1,4-dichlorobenzene	4.4	-	BMDL	BMDL	6.5	5.4	-	560	-
3,3'-dichlorobenzidine	16.5	-	-	-	-	-	-	-	-
diethylphthalate	22	-	-	-	-	-	-	-	-
dimethylphthalate	1.6	-	-	-	-	-	-	-	-
di-n-butylphthalate	2.5	-	-	-	-	-	-	-	-
2,6-dinitrotoluene	1.9	-	-	-	-	-	-	-	-
2,4-dinitrotoluene	5.7	-	-	-	-	-	-	-	-
di-n-octylphthalate	2.5	-	-	-	-	-	-	-	-
1,2-diphenylhydrazine	25	-	-	-	-	-	-	-	-
fluoranthene	2.2	-	-	-	-	2.9	BMDL	-	-
fluorene	1.9	-	-	-	-	BMDL	-	-	-

0856D

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

BASE/NEUTRALS COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 8-B	10-C	12-B	15-C	16-B	17-C	18-C	19-B
hexachlorobenzene	1.9	-	-	BMDL	-	BMDL	-	-	-
hexachlorobutadiene	0.9	-	4.2	9.3	8.0	7.4	-	1.6	-
hexachlorocyclopentadiene	25	-	-	-	-	-	-	-	-
hexachloroethane	1.6	-	11	8.1	91	17	-	-	-
indeno (1,2,3-cd)pyrene	3.7	-	-	-	-	-	-	-	-
isophorone	2.2	-	-	-	-	-	-	-	-
naphthalene	1.6	6.2	-	-	2.1	8.7	-	BMDL	-
nitrobenzene	1.9	-	-	-	-	-	-	-	-
N-nitrosodimethylamine	25	-	-	-	-	-	-	-	-
N-nitrosodi-n-propylamine	25	-	-	-	-	-	-	BMDL	-
N-nitrosodiphenylamine	1.9	-	-	BMDL	-	-	-	-	-
phenanthrene	5.4	-	-	-	-	6.6	BMDL	-	-
pyrene	1.9	-	-	-	-	BMDL	BMDL	-	-
1,2,4-trichlorobenzene	1.9	-	13	BMDL	73	28	-	140	BMDL

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

VOLATILES COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 1-B	1-C	1-D	1-E	1-J	3-B	4-B	5-C	7-B
acrolein	400	-(3)	-(4)	-(5)	-	-(5)	-(5)	-(6)	-(4)	-
acrylonitrile	400	-	-	-	-	-	-	-	-	-
benzene	4.4	4400	1300	170	BMDL	BMDL	BMDL	BMDL	-	8.6
bromodichloromethane	2.2	-	-	-	-	-	-	-	-	-
bromoform	4.7	-	-	-	-	-	-	-	-	-
bromomethane	10	-	-	-	-	-	-	-	-	-
carbon tetrachloride	2.8	-	1900	-	-	-	160	80	-	-
chlorobenzene	6.0	470	BMDL	-	-	BMDL	-	-	-	BMDL
chloroethane	10	-	-	-	-	-	-	-	-	-
2-chloroethylvinyl ether	10	-	-	-	-	-	-	-	-	-
chloroform	1.6	2800	1500	35	BMDL	22	4,200,000	730	-	970
chloromethane	10	-	-	-	-	-	BMDL	-	-	-
dibromochloromethane	3.1	-	-	-	-	-	-	-	-	-
1,1-dichloroethane	4.7	-	-	-	-	-	85	-	-	BMDL
1,2-dichloroethane	2.8	-	-	-	-	-	1200	-	-	-
1,1-dichloroethylene	2.8	1400	900	BMDL	-	-	190	-	-	BMDL
trans-1,2-dichloroethylene	1.6	37,000	12,000	6800	120	880	18,000	180	240	19
1,2-dichloropropane	6.0	-	-	-	-	-	-	-	-	-
1,3-dichloropropene	5.0	-	-	-	-	-	-	-	-	-
ethylbenzene	7.2	-	-	-	-	-	-	-	BMDL	BMDL
methylene chloride	2.8	120,000	3700	190	-	-	1,800,000	340	50,000	-
1,1,2,2-tetrachloroethane	6.9	47,000	87,000	720	68	69	1100	BMDL	-	-
tetrachloroethylene	4.1	80,000	120,000	300	57	3400	4100	310	-	-
toluene	6.0	-	-	-	-	-	-	-	-	6.0
1,1,1-trichloroethane	3.8	500	BMDL	-	-	-	BMDL	-	BMDL	-
1,1,2-trichloroethane	5.0	1100	2000	BMDL	BMDL	-	2700	BMDL	-	-
trichloroethylene	1.9	320,000	590,000	3800	220	2300	78,000	1300	-	46
vinyl chloride	10	3900	1600	150	25	BMDL	2800	BMDL	BMDL	BMDL

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

VOLATILES COMPOUND	METHOD DETECTION LIMIT (ppb)	CONCENTRATION (ppb) 8-B	10-C	12-B	15-C	16-B	17-B	18-C	19-B
acrolein	400	-(3)	-(6)	-(7)	-(3)	-(3)	-	-(5)	-
acrylonitrile	400	-	-	-	-	-	-	-	-
benzene	4.4	3500	59	-	940	-	-	340	BMDL
bromodichloromethane	2.2	-	-	BMDL	-	-	-	-	-
bromoform	4.7	-	-	-	-	-	-	-	-
bromomethane	10	-	-	-	-	-	-	-	-
carbon tetrachloride	2.8	-	85	-	38,000	3200	-	-	-
chlorobenzene	6.0	-	BMDL	-	370	-	-	4900	BMDL
chloroethane	10	-	-	-	-	-	-	-	-
2-chloroethylvinyl ether	10	-	-	-	-	-	-	-	-
chloroform	1.6	-	26	-	170,000	39,000	1.8	88	30
chloromethane	10	-	-	-	-	-	-	-	-
dibromochloromethane	3.1	-	-	-	-	-	-	-	-
1,1-dichloroethane	4.7	-	-	-	BMDL	-	-	-	-
1,2-dichloroethane	2.8	-	-	-	510	220	-	-	-
1,1-dichloroethylene	2.8	14,000	-	BMDL	220	BMDL	-	BMDL	-
trans-1,2-dichloroethylene	1.6	7100	630	5300	14,000	5800	14	5800	140
1,2-dichloropropane	6.0	-	-	-	-	-	-	-	-
1,3-dichloropropene	5.0	-	-	-	-	-	-	-	-
ethylbenzene	7.2	BMDL	-	-	-	-	-	-	-
methylene chloride	2.8	-	-	-	83,000	53,000	-	-	-
1,1,2,2-terrachloroethane	6.9	-	4300	910	50,000	-	BMDL	-	BMDL
tetrachloroethylene	4.1	870	2300	2800	76,000	4300	7.2	BMDL	26
toluene	6.0	1100	-	-	-	-	-	BMDL	-
1,1,1-trichloroethane	3.8	-	BMDL	-	1700	-	-	BMDL	-
1,1,2-trichloroethane	5.0	-	BMDL	-	460	290	-	-	-
trichloroethylene	1.9	11,000	14,000	7400	230,000	13,000	7.2	140	25
vinyl chloride	10	1300	130	1100	2100	3400	BMDL	2700	760

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

PESTICIDES/PCB's COMPOUND	UNITS OF MEASURE	CONCENTRATION 1-B	1-C	1-D	1-E	1-J	3-B	4-B	5-C	7-B
Aldrin	ppb	(5) (8)	(50)	(0.05)	(0.01)	0.06	(0.05)	(0.05)	(0.01)	(0.01)
-BHC	ppb	50	770	(0.05)	0.06	3.4	5.1	0.28	(0.01)	0.02
-BHC	ppb	7.9	90	(0.05)	0.03	0.10	(1)	0.06	(0.01)	(0.01)
-BHC	ppb	26	440	(0.05)	0.03	0.61	0.70	0.11	(0.01)	(0.01)
-BHC	ppb	53	1100	(0.05)	0.06	0.85	0.22	0.32	(0.01)	(0.01)
Chlordane	ppb	(20)	(50)	(0.5)	(0.1)	(0.1)	(1)	(0.1)	(0.1)	(0.1)
4,4'-DDD	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
4,4'-DDE	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
4,4'-DDT	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
Dieldrin	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
-Endosulfan	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
-Endosulfan	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
Endosulfan sulfate	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
Endrin	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
Endrin aldehyde	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
Heptachlor	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
Heptachlor epoxide	ppb	(5)	(10)	(0.05)	(0.01)	(0.01)	(0.5)	(0.05)	(0.01)	(0.01)
PCB-1016	ppb	1407	(500)	(0.5)	(0.1)	(0.1)	(2)	(0.2)	(0.1)	(0.2)
PCB-1221	ppb	(80)	(1000)	(1)	(0.2)	(0.2)	(4)	(0.4)	(0.2)	(0.4)
PCB-1232	ppb	(80)	(1000)	(1)	(0.2)	(0.2)	(4)	(0.4)	(0.2)	(0.4)
PCB-1242	ppb	(40)	(500)	(0.5)	(0.1)	(0.1)	(2)	(0.2)	(0.1)	(0.2)
PCB-1248	ppb	(40)	(500)	(0.5)	(0.1)	(0.1)	(2)	(0.2)	(0.1)	(0.2)
PCB-1254	ppb	(40)	360	(0.5)	(0.1)	(0.1)	(2)	(0.2)	(0.1)	(0.2)
PCB-1260	ppb	(40)	(300)	(0.5)	(0.1)	(0.1)	(2)	(0.2)	(0.1)	(0.2)
Toxaphene	ppb	(20)	(50)	(0.5)	(0.1)	(0.1)	(1)	(0.2)	(0.1)	(0.1)

0856D

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

PESTICIDES/PCB's COMPOUND	UNITS OF MEASURE	CONCENTRATION 8-B	10-C	12-B	15-C	16-B	17-B	18-C	19-B
Aldrin	ppb	(0.5)	(0.1)	0.29	(1)	(0.1)	(0.1)	(0.1)	(0.01)
-BHC	ppb	(0.5)	5.1	1.9	64	14	0.28	5.2	0.48
-BHC	ppb	(0.5)	0.04	0.45	12	1.6	(0.1)	1.2	(0.07)
-BHC	ppb	(0.5)	1.6	0.30	22	0.75	(0.1)	(1)	0.03
-BHC	ppb	(0.5)	4.8	1.1	69	1.1	0.18	1.6	0.01
Chlordane	ppb	(1)	(1)	(1)	(10)	(1)	(1)	(1)	(0.1)
4,4'-DDD	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
4,4'-DDE	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
4,4'-DDT	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
Dieldrin	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
-Endosulfan	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
-Endosulfan	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
Endosulfan sulfate	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
Endrin	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
Endrin aldehyde	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
Heptachlor	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
Heptachlor epoxide	ppb	(0.5)	(0.1)	(0.5)	(1)	(0.1)	(0.1)	(0.1)	(0.01)
PCB-1016	ppb	(5)	(1)	(5)	(10)	(2)	(1)	(1)	(0.1)
PCB-1221	ppb	(10)	(2)	(10)	(20)	(4)	(2)	(2)	(0.2)
PCB-1232	ppb	(10)	(2)	(10)	(20)	(4)	(2)	(2)	(0.2)
PCB-1242	ppb	(5)	(1)	(5)	(10)	(2)	(1)	(1)	(0.1)
PCB-1248	ppb	(5)	(1)	(5)	(10)	(2)	(1)	(1)	(0.1)
PCB-1254	ppb	(5)	(1)	(5)	(10)	(2)	(1)	(1)	(0.1)
PCB-1260	ppb	(5)	(1)	(5)	(10)	(2)	(1)	(1)	(0.1)
Toxaphene	ppb	(1)	(0.1)	(1)	(10)	(1)	(1)	(1)	(0.1)

0856D

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

METALS COMPOUND	UNITS OF MEASURE	CONCENTRATION 1-B	1-C	1-D	1-E	1-J	3-B	4-B	5-C	7-B
Total Antimony	mg/l	(0.02)	(0.03)	(0.02)	(0.02)	(0.027)	(0.020)	0.025	(0.02)	(0.02)
Total Arsenic	mg/l	(0.005)	0.005	(0.005)	0.14	(0.005)	0.007	(0.005)	(0.005)	(0.005)
Total Beryllium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Cadmium	mg/l	0.011	0.319	(0.005)	(0.005)	0.124	(0.005)	0.009	(0.005)	(0.005)
Total Chromium	mg/l	0.006	0.051	(0.005)	(0.005)	0.006	(0.005)	0.006	(0.005)	(0.005)
Total Copper	mg/l	0.016	0.246	0.018	0.016	0.756	0.050	0.004	0.010	0.024
Total Lead	mg/l	0.021	0.074	(0.005)	(0.005)	0.089	(0.005)	(0.005)	(0.005)	(0.005)
Total Mercury	mg/l	(0.001)	(0.0035)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Total Nickel	mg/l	(0.005)	0.146	(0.005)	(0.05)	(0.007)	0.092	0.023	(0.005)	(0.005)
Total Selenium	mg/l	0.008	0.009	(0.005)	(0.005)	(0.005)	(0.005)	0.005	(0.005)	(0.005)
Total Silver	mg/l	(0.005)	(0.005)	0.006	0.005	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Thallium	mg/l	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total Zinc	mg/l	1.75	1.93	0.344	0.060	0.520	0.085	0.224	0.072	0.092
Soluble Barium	mg/l	0.48	0.38	0.24	0.50	1.0	0.09	0.09	0.36	(0.05)
OTHER COMPOUND										
Total Non-Filterable Residue (130°C)	mg/l	39	52	68	28	30	11	6.4	5.2	44
Total Organic Carbon	mg/l	28	13	19	3.0	3.0	75	4.3	5.6	10
Total Recoverable Phenolics	mg/l	0.03	(0.01)	(0.01)	(0.01)	(0.01)	0.081	0.017	(0.01)	0.038
Total Cyanide	mg/l	0.074	1.7	(0.01)	(0.01)	0.018	20	(0.01)	0.26	0.35

SITE GROUNDWATER INVESTIGATION

MONITOR WELL PRIORITY POLLUTANT ANALYSIS

METALS COMPOUND	UNITS OF MEASURE	CONCENTRATION 8-B	10-C	12-B	15-C	16-B	17-B	18-C	19-B
Total Antimony	mg/l	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Total Arsenic	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	0.014	(0.005)	(0.005)
Total Beryllium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Cadmium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	0.009	(0.005)	(0.005)	(0.005)
Total Chromium	mg/l	0.012	(0.005)	0.008	(0.005)	0.032	(0.005)	0.008	0.010
Total Copper	mg/l	0.012	0.010	0.004	0.746	0.018	0.016	0.012	0.016
Total Lead	mg/l	0.011	(0.005)	(0.005)	0.005	0.026	(0.005)	0.009	(0.005)
Total Mercury	mg/l	(0.001)	(0.001)	(0.001)	(0.001)	0.0015	(0.001)	(0.001)	0.001
Total Nickel	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Selenium	mg/l	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Total Silver	mg/l	(0.005)	0.062	(0.005)	(0.005)	(0.005)	0.025	(0.005)	(0.005)
Total Thallium	mg/l	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Total Zinc	mg/l	0.090	0.113	0.072	0.192	0.098	0.118	0.070	0.100
Soluble Barium	mg/l	(0.05)	(0.05)	0.08	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
OTHER COMPOUND									
Total Non-Filterable Residue (103°C)	mg/l	5.0	2.8	17	1.4	25	13	13	110
Total Organic Carbon	mg/l	200	11	4.3	29	130	(1)	23	5.3
Total Recoverable Phenolics	mg/l	1.2	(0.01)	(0.01)	(0.01)	0.12	(0.01)	0.012	(0.01)
Total Cyanide	mg/l	17	0.11	0.070	0.94	89.0	(0.01)	0.89	0.33

(1) Not detected
(2) Below Method Detection Limit
(3) Method Detection Limit x 50
(4) Method Detection Limit x 100
(5) Method Detection Limit x 10
(6) Method Detection Limit x 5
(7) Method Detection Limit x 20
(8) BMDL - Method Detection Limit in parentheses

APPENDIX

D

APPENDIX D
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LIST OF DUPONT DRAWINGS

Drawing Number	Sheet Number	Title	Last Revision Date
EE40-6386	1 of 1	Map, Niagara Plant, Test Well Locations	4/22/83
EE40-6385	1 of 1	Map, Niagara Plant, Previous Shorelines	4/15/83
EE40-2802	1 of 9	Map, Niagara Plant, Northwest Plant Area, Storm Sewers	1/27/65
EE40-2802	2 of 9	Map, Niagara Plant, Northeast Plant Area Sewers	6/10/64
EE40-2802	3 of 9	Map, Niagara Plant, West Plant South of Adams Ave., Sewers-Storm	11/30/64
EE40-2802	4 of 9	Map, Niagara Plant, East Plant South of Adams Ave., Sewers	10/8/64
EE40-2802	5 of 9	Map, Niagara Plant, East Plant - East Area, Sewers	6/17/64
EE40-2802	6 of 9	Map, Niagara Plant, Southwest Plant Area, Sewers	10/29/64
EE40-2802	7 of 9	Map, Niagara Plant, West Plant South of Riverside Ave., Sewers	10/8/64
EE40-2802	8 of 9	Map, Niagara Plant, West Plant South of Adams Ave., Sewers-Sanitary	12/16/64
EE40-2802	9 of 9	Map, Niagara Plant, Northwest Plant Area, Sanitary Sewers	1/27/65
EE40-2749	1 of 2	Map, Niagara Plant, Monuments, Bench Marks, and Elevations	9/21/60
EE40-2749	2 of 2	Map, Niagara Plant, Monuments, Bench Marks, and Elevations	9/21/60
EE-40-5295	1 of 1	Arrangement, Underground Pressure Pipes, Adams Ave. & Alundum Rd., Plan and Sections	9/19/79
EE-40-6388	1 of 1	Layout Plan, for 12 kv Adams Station, Relocation to North of Buffalo Ave.	—

LIST OF DUPONT DRAWINGS (CONTINUED)

Drawing Number	Sheet Number	Title	Last Revision Date
EE-40-344	1 of 1	Sewerage System, DuPont Rd. to Chemical Rd., Plan & Profiles	5/5/52
NF 16212	1 of 1	Sewerage System, 12" ϕ Acid Proof Sewer, DuPont Rd. South of Bldg. 64 Arrangement & Details	11/30/55
NF 16454	1 of 1	Sewerage System, 10" Acid Proof Sewer, Chemical Rd., MH #83 to Riverside Ave., Plan-Profile-Details	4/28/50
NF 16455	1 of 1	Sewerage System, 10" Acid Proof Sewer, Chemical Rd., South of Riverside Ave., Plan-Profile-Details	1/3/50
NF 17540	1 of 1	Sewerage System, 18" A.P. Sewer in DuPont Rd. and, 24" A.P. Sewer at Gill Creek, from DuPont Rd. to Buffalo Ave., Arrangement and Details	11/11/55
NF 17541	1 of 1	Sewerage System, 18" A.P. Sewer in DuPont Rd., and 24" A.P. Sewer at Gill Creek, from DuPont Rd. to Buffalo Ave., Details	3/19/54
NF 20950	1 of 1	Sewerage System, DuPont Rd. - MH 100 to MH 101, 12 ϕ A.P. Sanitary, Sewer, Arrangement & Details	12/17/54
PA7 13G-117	1 of 1	Niagara Parkway, Plan & Profile SH 7	12/8/51
W 90966	1 of 1	Niagara Falls ADN Plant, Sanitary, Storm & Cooling Water Sewers, Plan & Details, Sheet No. 2	1/18/77
EE40-6382	1 of 1	Map, Niagara Plant, West of Gill Creek, Exploratory Well Locations & Details	4/18/83
EE40-6382	1 of 1	Map, Niagara Plant, West of Gill Creek, Exploratory Well Locations & Details	4/28/83