



Occidental Chemical Corporation

Industrial & Specialty Chemicals

HISTORICAL DATA BASE

Buffalo Avenue Plant

prepared for:

New York State Settlement Discussions

August 1, 1984

Volume II

Appendices

REPRINTED ON

APR 26 1985



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APPENDIX A

STRATIGRAPHIC AND FIELD LOGS, MONITORING WELLS AND
BOREHOLE INSTALLATIONS

LIST OF
GEOLOGIC LOGS

NIAGARA PLANT:

B-1	B-25	WS-73	BH3-81
B-1A	B-25A	WS-74	BH4-81
B-2	B-26	WS-75	BH5-81
B-2A	B-26A	WS-83	BH6-81
B-3	B-27	WS-84	BH7-81
B-3A	B-27A	WS-89	BH8-81
B-4	B-28	WS-93	BH14-81
B-4A	B-28A	WS-94	BH9-82
B-5	B-29	WS-95	BH15-82
B-5A	B-29A	WS-96	BH16-82
B-6	B-30	WS-97	BH17-82
B-6A	B-30A	WS-98	BH18-82
B-7	B-31	WS-105	BH19-82
B-7A	B-31A	WS-107	BH20-82
B-8	B-32	WS-109	BH21-82
B-8A	B-32A	WS-110	BH22-82
B-9	B-33A	WS-111	BH23-82
B-9A	B-34	WS-112	SP-1A
B-10	B-34A	WS-113	SP-2A
B-10A	B-35A	WS-116	SP-3A
B-11	B-36A	WS-117	SP-4A
B-11A	B-37A	WS-118	SP-5
B-12	B-38A	WS-121	SP-5A
B-12A	B-39A	WS-122	SP-6
B-13	B-40	WS-124	SP-6A
B-13A	B-40A	WS-136	SP-7
B-14	B-40B	WS-137	SP-7A
B-14A	B-41	WS-150	SP-8
B-14B	B-41A	WS-151	SP-8A
B-15A	B-42A	WS-154	SP-9
B-16	B-43A	WS-156	SP-9A
B-16A	B-44A	WS-157	H-4
B-17	B-45A	WS-158	H-5
B-17A	B-46A	WS-159	H-6
B-18	B-47A	WS-160	H-7
B-18A	WS-53	WS-165	H-8
B-19	WS-54	TRW-1	H-9
B-19A	WS-55	OW-1S-80	H-10
B-20	WS-56	OW-2S-80	H-16
B-20A	WS-57	OW-3S-80	EM-9
B-21	WS-58	OW-4S-80	EM-10
B-21A	WS-59	OW-5S-80	EM-18
B-22	WS-61	OW-6S-80	
B-22A	WS-62	OW-7S-80	
B-23	WS-64	OW-8S-80	
B-23A	WS-65	OW-9S-80	
B-24	WS-67	BH1-81	
B-24A	WS-68	BH2-81	

DRILLING LOGS

BORING TERMS AND SYMBOLS

Fine to Medium Sand - Fine to medium sand that is predominantly composed of medium sand

Blowcounts - The number of blows from a 140 pound hammer falling 30 inches needed to drive a split spoon sampler 6 inches into the sampling regime.

WOR - Samples advanced by the weight of rods only, indicating a very soft material.

WOH - Samples advanced by the weight of rods and 140 pound hammer, indicating a very soft material.

2-11-9-6 - blowcounts
2 - Number of blows to penetrate top 6 inch sample interval
11 - Number of blows to penetrate second 6 inch sample interval
9 - Number of blows to penetrate third 6 inch sample interval
6 - Number of flows to penetrate last 6 inch sample interval

WOH
12 - The split spoon sampler advanced 12 inches under the weight of the rods and 140 pound hammer.

1
12 - The split spoon sample advanced 12 inches after 1 blow of the 140 pound hammer falling 30 inches.

100
2 - The split spoon sample advanced 2 inches after 100 blows of the 140 pounds hammer falling 30 inches - Indicates refusal

Black (Gray-brown) - The color of the sample when first extracted from the ground was black. After storage, the exposed face of the sample became gray-brown while the inner core of the sample remained black.

Blowcount Interpretation

a) Cohesive Soil Very fine grain soils with appreciable dry strength. Plastic can be rolled into a thin thread when damp with no apparent water movement. Clays and silty to sandy clays show cohesion.

<u>Description</u>	<u>Penetration Resistance</u>
	<u>Blows/Foot</u>
Very Soft	0-2
Soft	3-5
Medium	6-15
Stiff	16-25
Hard	26 or more

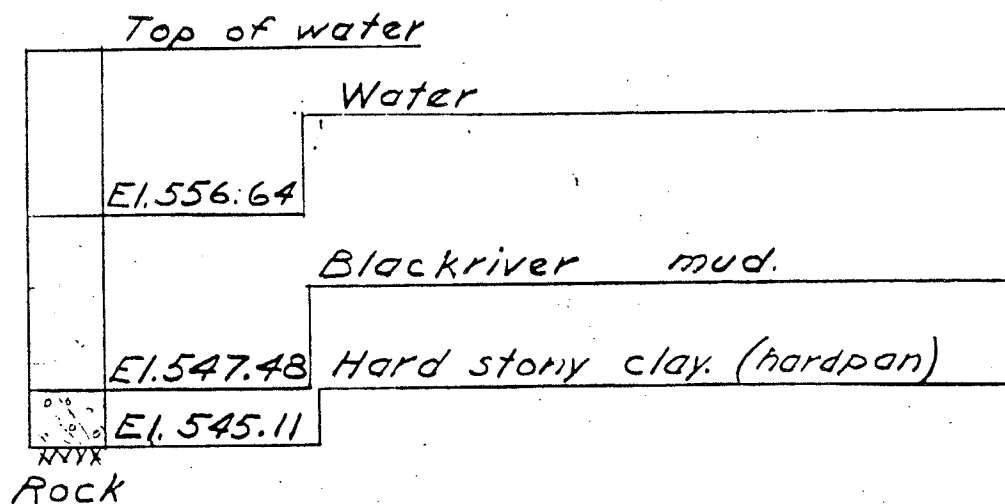
- b) Non-Cohesive Soil Soils composed of silt, sand and gravel, show no cohesion and only slight plasticity.

<u>Description</u>	<u>Penetration Resistance</u>
	<u>Blows/Foot</u>
Loose	0-10
Firm	11-25
Compact	26-40
Dense	41-50
Very Dense	51 or more

SECTION 1

STRATIGRAPHIC LOGS

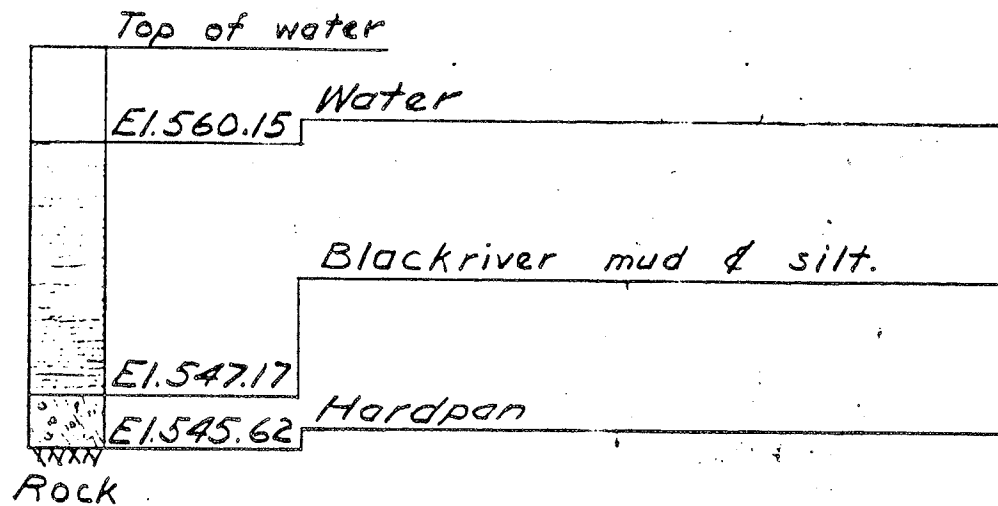
EM-9



SOURCE: WATERWAYS & NIAGARA PARKWAY, FOUNDATION
EXPLORATION, BORING LOGS SH. 2, P.A.S.N.Y.
DRAWING N° PA-7-116-101, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON U.S.L.S. (1956)
HOOKER DATUM = U.S.L.S. - 1.059

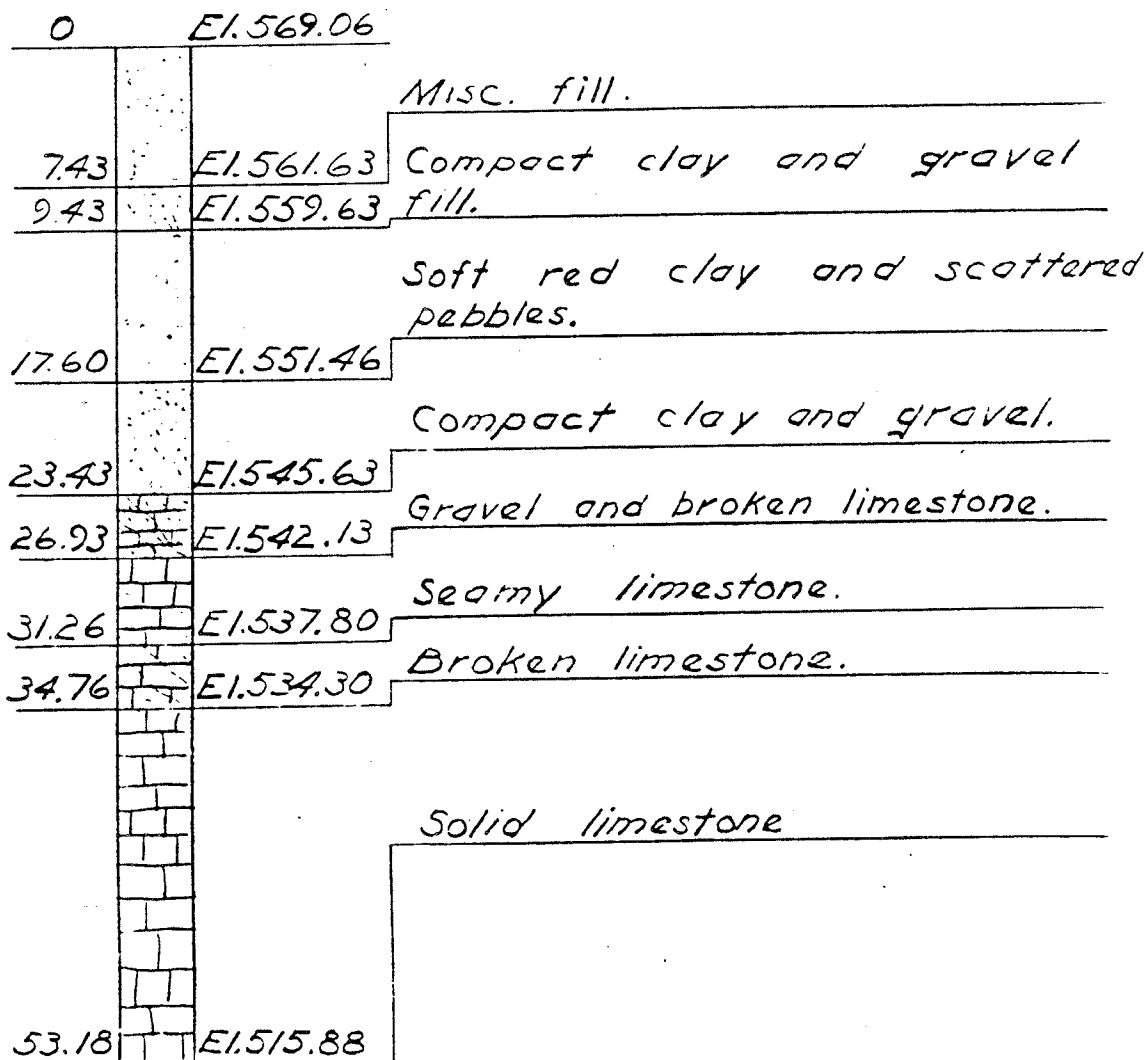
EM-10



SOURCE: WATERWAYS & NIAGARA PARKWAY, FOUNDATION
EXPLORATION, BORING LOGS SH. 2, P.A.S.N.Y.
DRAWING N° PA-7-116-101, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON U.S.L.S. (1956)
HOOKER DATUM = U.S.L.S. - 1.059

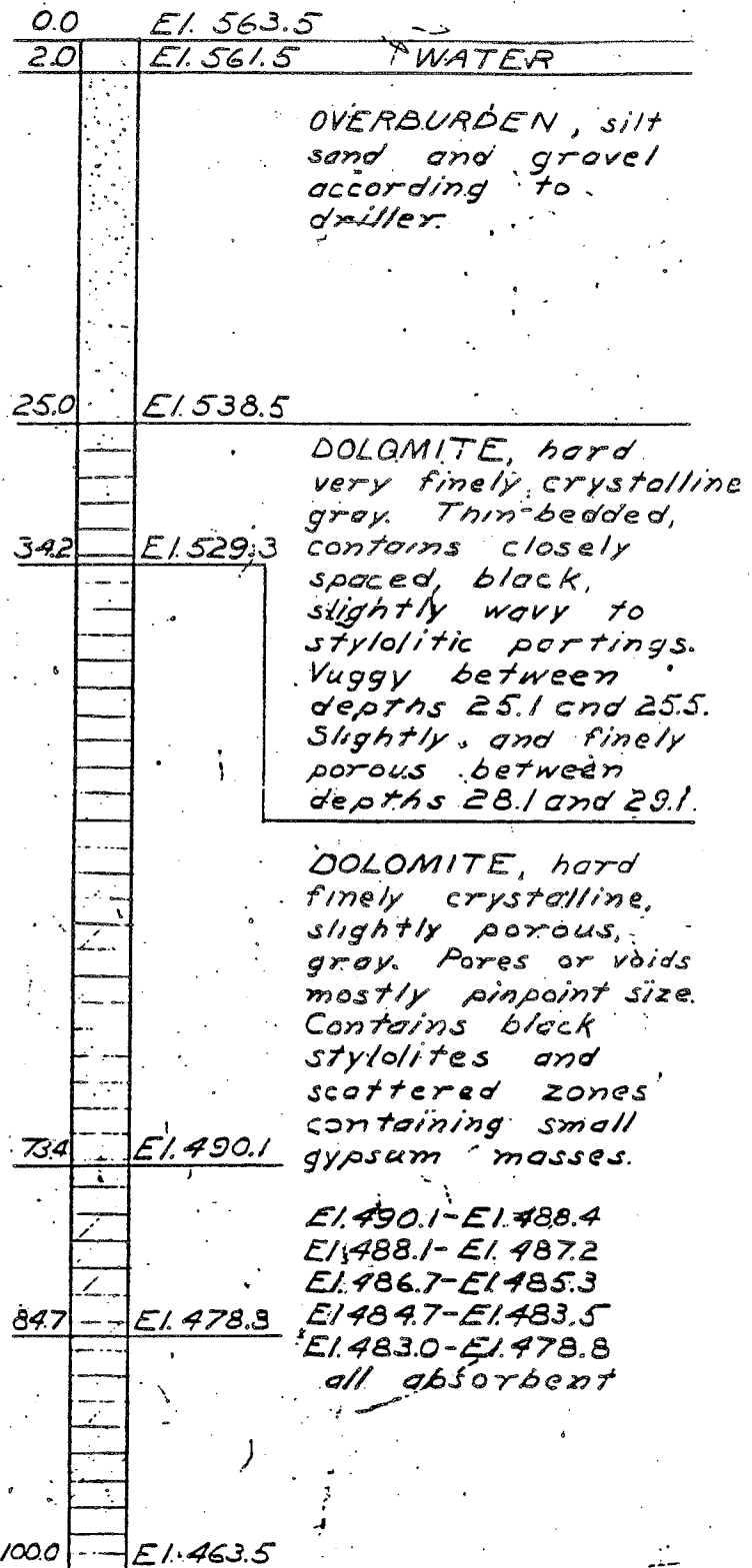
EM-16



SOURCE: WATERWAYS & NIAGARA PARKWAY, FOUNDATION
EXPLORATION, BORING LOGS SH.2, P.A.S.N.Y.
DRAWING Nº PA-7-IIG-101, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON U.S.L.S. (1956)
HOOKER DATUM = U.S.L.S. - 1.059

H-4
N 1,121,750
E 385,110



SOURCE:

WATERWAYS & NIAGARA PARKWAY,
FOUNDATION EXPLORATION, BORING
LOGS SH. I, P.A.S.N.Y. DRAWING N°
PA-7-116-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON
U.S.L.S. (1956), HOOKER
DATUM = U.S.L.S. - 1.059

Core recovery 99.1%

H-5
N 1,121,400
E 385,000

0.0 El. 563.6

WATER

18.0 El. 545.6

OVERBURDEN, sand, silt and gravel

24.0 El. 539.6 according to driller.

DOLOMITE, hard, very finely crystalline to dense, thin-bedded, gray.

35.7 El. 527.9

Contains closely spaced, wavy, black, paper-thin to hairline shale seams. Also

46.8 El. 516.8

contains very scattered gypsum nodules and very thin gypsum seams.

DOLOMITE-hard, finely crystalline; slightly unevenly & finely porous; gray to slightly brownish-gray. Pores mostly pinpoint-size. Contains

71.1 El. 492.5

scattered very thin & thin gypsum seams and small replacement masses of gypsum.

Rock between El. 516.8-El. 492.5 contains

unevenly distributed absorbent zones & packets.

Rock between El. 492.5-

90.0 El. 473.6

El. 473.6 is absorbent.

92.0 El. 471.6

Absorbs water readily when core

97.8 El. 465.8

is being washed off.

100.0 El. 463.6

El. 473.6-El. 471.6 dense, non-porous.

Bottom of core

Bottom of hole

Core recovery 94.3%

SOURCE:

WATERWAYS & NIAGARA PARKWAY,
FOUNDATION EXPLORATION, BORING
LOGS SH. I, P.A.S.N.Y. DRAWING N°
PA-7-116-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON
U.S.L.S. (1956), HOOKER
DATUM = U.S.L.S. - 1.059

H-6
N 1,121,030
E 384,880

0.0 El. 563.2

		OVERBURDEN, silt, clay & gravel according to driller.
240	El. 539.2	
340	El. 529.2	DOLOMITE, hard, dense, thin-bedded, gray. Contains closely spaced, wavy, paper-thin black shale seams or partings.
374	El. 525.8	Contains gypsum as thin seams and as coatings on partings.
476	El. 515.6	DOLOMITE, hard very finely crystalline, slightly brownish-gray.
		DOLIMITE, hard finely crystalline, porous, slightly brownish-gray. Pores are mostly pinpoint-size. Gypsum scattered through core as small replacement masses, as filling in fractures and in vugs, and as thin seams.
		El. 515.6 - El. 465.0 absorbent, variable from slightly absorbent to very absorbent.
100.0	El. 463.2	

Core recovery 94.3%

SOURCE:

WATERWAYS & NIAGARA PARKWAY,
FOUNDATION EXPLORATION, BORING
LOGS SH. I, P.A.S.N.Y. DRAWING NO
PA-7-IIG-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON
U.S.L.S. (1956), HOOKER
DATUM = U.S.L.S. - 1.059

H-71

N 1,120,820
E 385,940

0.0 E1.563.8

WATER

17.0 E1.546.8

20.5 E1.543.3 OVERBURDEN

DOLOMITE, hard to
very hard, dense
thin-bedded, gray.

38.7 E1.525.1

DOLOMITE, hard, finely
to very finely crystal-
line, slightly but non-
uniformly porous,
gray. Contains
scattered coral
fossils.

SOURCE:

WATERWAYS & NIAGARA PARKWAY,
FOUNDATION EXPLORATION, BORING
LOGS SH. I, P.A.S.N.Y. DRAWING N°
PA-7-116-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON
U.S.L.S. (1956), HOOKER
DATUM = U.S.L.S. - 1.059

100.0 E1.463.8

H-8

N 1,121,000

E 385,800

0.0 El. 563.9

WATER

17.0 El. 546.9

20.0 El. 543.9 OVERBURDEN, sand & gravel.

DOLOMITE, hard, dense
thin-bedded, gray.

30.3 El. 533.8

38.8 El. 525.1 DOLOMITE, hard,
finely crystalline
thin-bedded gray.

DOLOMITE, hard,
finely crystalline
slightly porous,
slightly brownish
gray.

SOURCE:

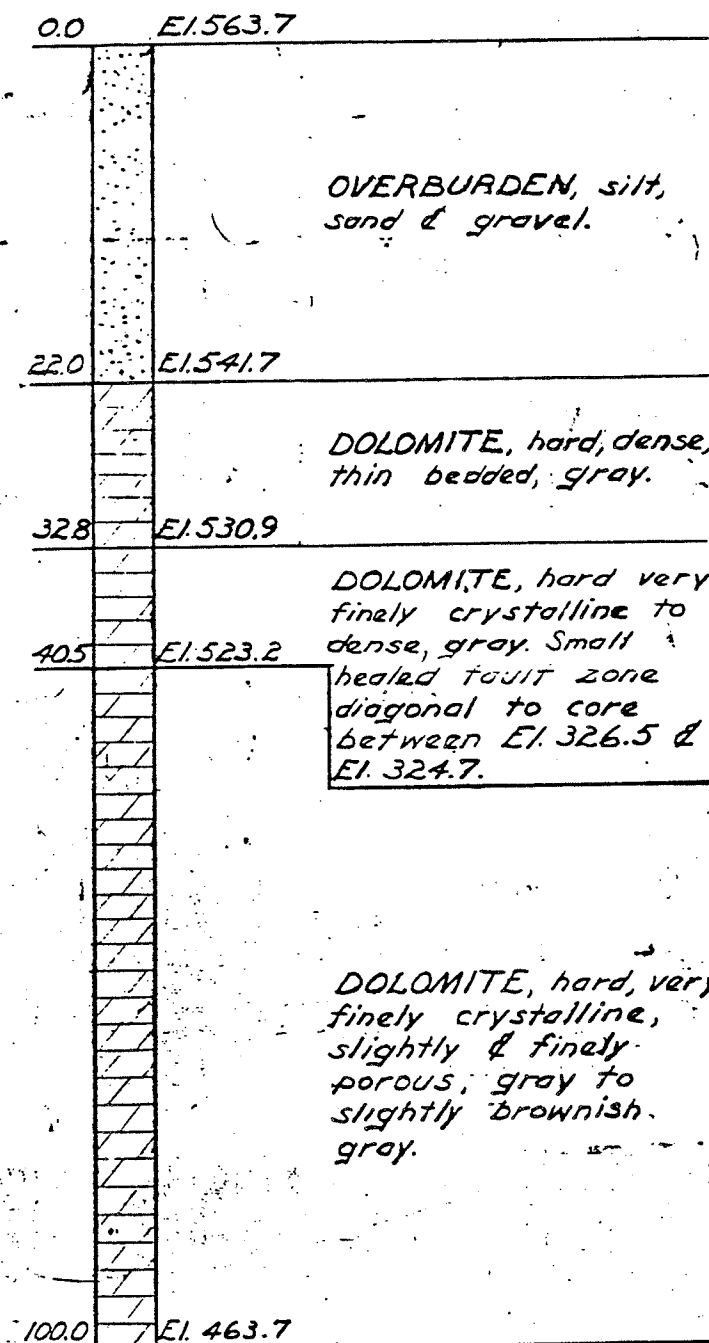
WATERWAYS & NIAGARA PARKWAY,
FOUNDATION EXPLORATION, BORING
LOGS SH. I, P.A.S.N.Y. DRAWING Nº
PA-7-11G-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON
U.S.L.S. (1956), HOOKER
DATUM = U.S.L.S. - 1.059

100.0 El. 463.9

H-9

N 1,121,550
E 385,777



SOURCE: WATERWAYS & NIAGARA PARKWAY, FOUNDATION
EXPLORATION, BORING LOGS SH. I, P.A.S.N.Y.
DRAWING N° PA-7-11G-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON U.S.L.S. (1956)
HOOKER DATUM = U.S.L.S. - 1.059

H-10
 N 1,121,170
 E 384,515

0.0 El. 563.9

5.0	El. 558.9	WATER
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17.0	El. 546.9	OVERBURDEN, Soft gray clay.
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18.0	El. 545.9	Gray clay and gravel.
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ROCK

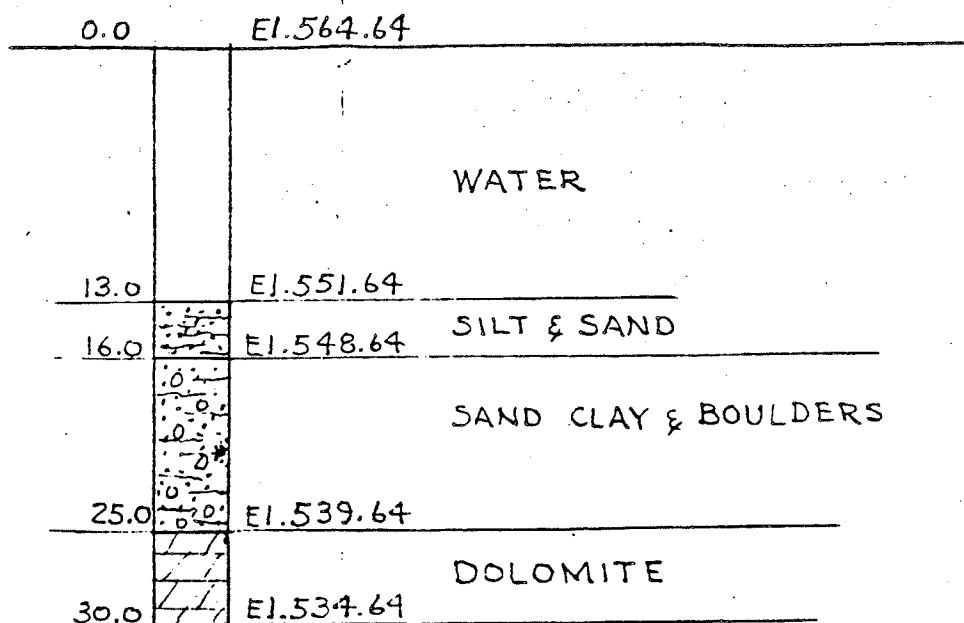
SOURCE: WATERWAYS & NIAGARA PARKWAY, FOUNDATION
 EXPLORATION, BORING LOGS SH. I, P.A.S.N.Y.
 DRAWING Nº PA-7-IIG-100, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON U.S.L.S. (1956)
 HOOKER DATUM = U.S.L.S. - 1.059

H-16

N. 1120 000

E. 387 000



SOURCE: WATERWAYS & NIAGARA PARKWAY, FOUNDATION
EXPLORATION, BORING LOGS SH.3, P.A.S.N.Y.
DRAWING Nº PA-7-116-102, FEBRUARY 25, 1958.

NOTE: ELEVATIONS ARE BASED ON U.S.L.S. (1956)
HOOKER DATUM = U.S.L.S. - 1.059

Location: V Area - Adams Avenue

Elevation 569.1

Conestoga - Rovers & Associates

Location: V Area - On Adams Avenue

Elevation 570.4

Conestoga - Rovers & Associates

Location: V Area - V81 Parking Lot

Elevation 571.9

Conestoga - Rovers & Associa

Location: V Area - V81 Parking Lot

Elevation 571.9

Conestoga - Rovers & Associate

Location: V Area - V81 Parking Lot

Elevation 571.9

Conestoga - Rovers & Associates

Project Name: NIAGARA PLANT
 Job No. 979-626
 Client: HOOKEr CHEMICALS & PLASTICS CORP.
 Borehole Type: 7" Ø Hollow Stem Auger
 Location: U Area - East of U5

Borehole No. WS-58
 Date Completed June 25, 1980
 Geologist/Engineer J. Kay
 Elevation 570.0

Profile			Sample			Penetration Test Blows/Foot	Piezometer or Standpipe Installation
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type	Blows/Foot		
						20 40 60 80	
570		Asphalt					570.0
		Concrete				Grouted Backfill	569.78
			1	SS			Bentonite Plug
560		Reddish brown silty clay - hard					564.0
							Sand Pack
							Well Screen
NOTES: Augers - 7" dia. Well Screen - 2', 1½" dia. Redhead Well Pipe - 1½" dia. Black Steel Well installed below grade with permanent casing for protection							

Elevation 570.0

Conestoga - Rovers & Associa

Location: T Area - T2

Elevation 568.6

Grouted Backfil

Piezometer or Standpipe Installation

570.93

568.6

Bentonite
Plug

Sand Pack
561.6

Well Screen

NOTES: Augers - 7" dia.
Well Screen - 2', 1½" dia.
Redhead
Well Pipe - 1½" dia. Black
Steel

Location: T Area - T2

Elevation 568.5

Conestoga - Rovers & Associat

Location: U Area - South of U 79

Elevation 567.8

Conestoga - Rovers & Associat

Elevation 569.5

Location: U Area - South of U67

Elevation	568.2
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Conestoga - Rovers & Associates

Location: U Area - South of U67

Elevation 569.0

Conestoga - Rovers & Associates

Elevation 569.6

Conestoga - Rovers & Associates

Location: U Area - Southeast of U59

Elevation 569.5

Conestoga - Rovers & Associates

Location: U Area - Southeast of U59

Elevation	569.4
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Conestoga - Rovers & Associates

Elevation 568.7

Conestoga - Rovers & Associates

Job No. 979-626
Client: HOOKER CHEMICALS & PLASTICS CORP.
Borehole Type: 7" Ø Hollow Stem Auger
Location: V Area - South of V 34

Borehole No. WS-84
Date Completed June 30, 1980
Geologist/Engineer J. Kay
Elevation 568.9

[illegible]

Elevation 569.5

Conestoga - Rovers & Associate

Borehole No. WS-93
Date Completed July 2, 1980
Geologist/Engineer J. Kay
Elevation 572.8

Conestoga - Rovers & Associates

Borehole No. WS-94
Date Completed July 2, 1980
Geologist/Engineer J. Kay
Elevation 572.5

Conestoga - Rovers & Associates

Elevation 572.3

Conestoga - Rovers & Associates

Elevation 573.3

Conestoga • Rovers & Associates

Borehole No.	WS-97
Date Completed	July 9, 1980
Geologist/Engineer	J. Kay
Elevation	573.3

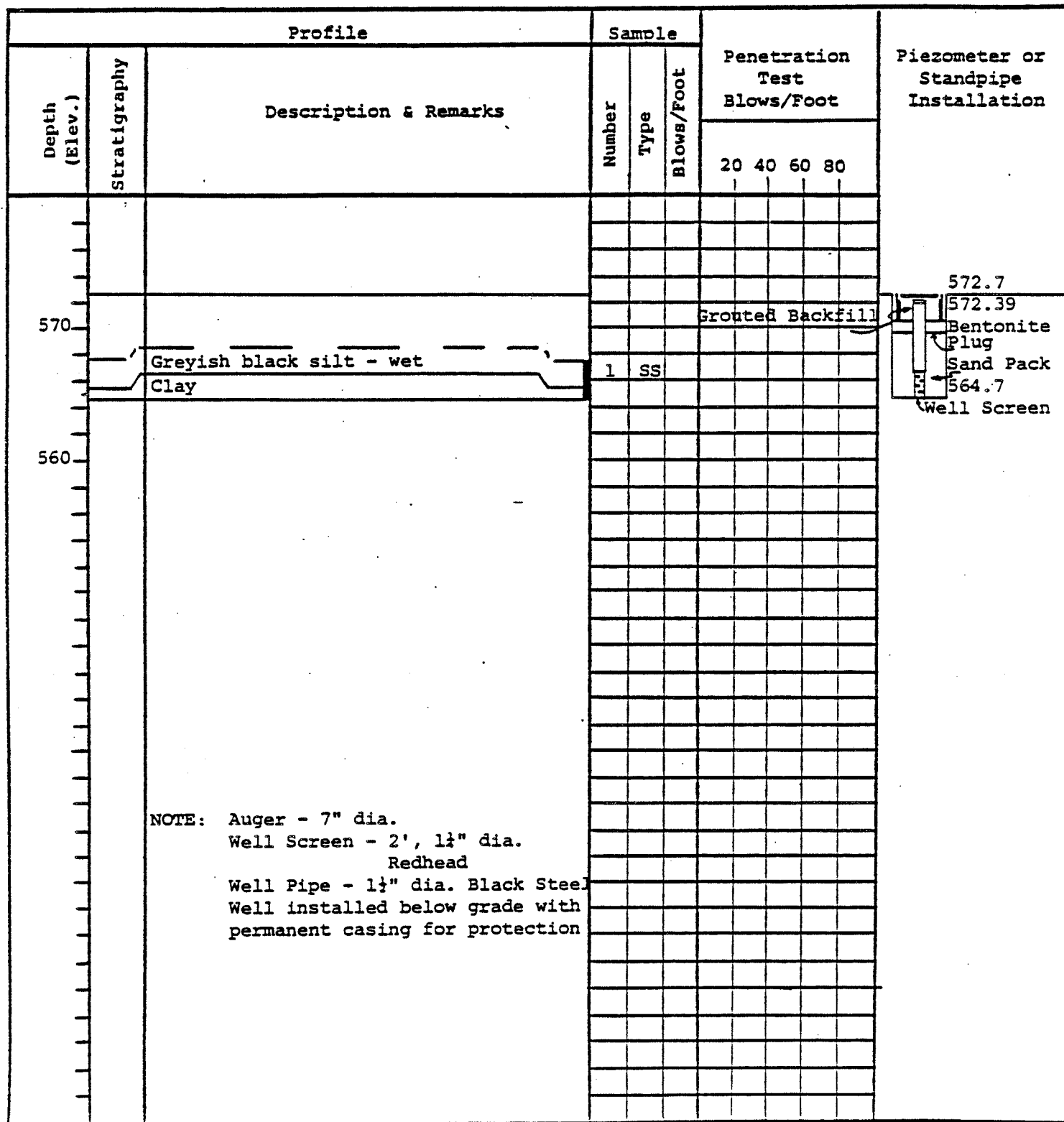
Conestoga - Rovers & Associates

Location: M Area - West of M-26

Elevation 573.3

Conestoga - Rovers & Associates

Borehole No. WS-105
Date Completed July 3, 1980
Geologist/Engineer J. Kay
Elevation 572.7



Borehole No. WS-107
Date Completed July 3, 1980
Geologist/Engineer J. Kay
Elevation 573.6

Conestoga - Rovers & Associates

Project Name: NIAGARA PLANTJob No. 979-626Client: HOOKEE CHEMICALS & PLASTICS CORP.Borehole Type: 7" Ø Hollow Stem AugerLocation: D Area - South of D-26Borehole No. WS-109Date Completed July 2, 1980Geologist/Engineer J. KayElevation 572.3

Profile			Sample		Penetration Test Blows/Foot	Piezometer or Standpipe Installation				
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type						
							Blows/Foot			
					20		40	60	80	
570										572.3
										Bentonite Plug
										Sand Pack
										563.3
										Well Screen
560										

Elevation 573.4

Conestoga • Rovers & Associates

Elevation 573.4

Conestoga • Rovers & Associates

Location: B Area - West of B-24

Elevation 573.4

Conestoga - Rovers & Associates

Location: H Area - East of H-15

Elevation	571.5
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Conestoga - Rovers & Associates

Location: A Area - South of A-6

Elevation 570.9

Conestoga • Rovers & Associates

Location: A Area - South of A-6

Elevation	570.9
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Conestoga - Rovers & Associates

Location: A Area - West of A-6

Elevation 571.4

Conestoga - Rovers & Associates

Elevation 572.3

Elevation 571.6

Conestoga - Rovers & Associates

Elevation 570.6

Conestoga - Rovers & Associates,

Borehole No. WS-136
Date Completed July 14, 1980
Geologist/Engineer J. Kay
Elevation 572.1

Conestoga - Rovers & Associates

Location: F Area - East of F-40

Elevation 571.5

Conestoga - Rovers & Associates

Location: U-ATEA - WEST OF U-76

Elevation 569.8

Conestoga - Rovers & Associates

Borehole No. WS-151
Date Completed MAY 27, 1981
Geologist/Engineer D. MILLARD
Elevation 568.6

Conestoga - Rovers & Associate

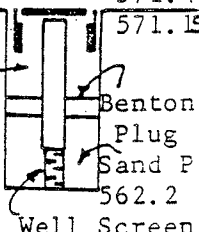
Project Name: NIAGARA PLANT
 Job No. 979-626
 Client: HOOKER CHEMICALS & PLASTICS CORP.
 Borehole Type: 7" Ø HOLLOW STEM AUGER
 Location: A-AREA - SOUTH OF A-1

Borehole No. WS-154
 Date Completed MAY 27, 1981
 Geologist/Engineer D. MILLARD
 Elevation 572.7

Profile			Sample			Penetration Test				Piezometer c Standpipe Installation
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type	Blows/Foot	Blows/Foot				
						Test				
						20	40	60	80	
570										572. 572.36 Bentonite Plug Sand Pack 563.0 Well Screen
		GREY-BROWN & GOLD SILT & SAND	1	SS	10					
			2	SS	17					
		CLAY								
560										
550										
NOTES:										
- Augers - 7" diameter.										
- Well screen - 2', 1½" diameter Redhead.										
- Well pipe - 1½" diameter black steel.										
- Well installed below grade with permanent casing for protection.										

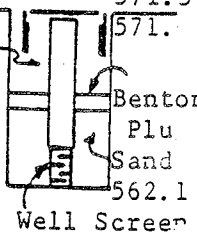
Project Name: NIAGARA PLANT
 Job No. 979-626
 Client: HOOKEER CHEMICALS & PLASTICS CORP.
 Borehole Type: 7" Ø HOLLOW STEM AUGER
 Location: K-AREA - EAST OF K-28

Borehole No. WS-156
 Date Completed MAY 26, 1981
 Geologist/Engineer D. MILLARD
 Elevation 571.4

Profile			Sample			Penetration Test Blows/Foot				Piezometer or Standpipe Installation
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type	Blows/Foot					
						20	40	60	80	
570										
		GREENISH GOLD SILT & SAND - MOIST	1	SS	13					
560		BROWN CLAY-HARD	2	SS	21					
550										
NOTES: - Augers - 7" diameter. - Well screen - 2', 1½" diameter Redhead. - Well pipe - 1½" diameter black steel. - Well installed below grade with permanent casing for protection.										

Project Name: NIAGARA PLANT
 Job No. 979-626
 Client: HOOKEr CHEMICALS & PLASTICS CORP.
 Borehole Type: 7" Ø HOLLOW STEM AUGER
 Location: K-AREA - EAST OF K-28

Borehole No. WS-157
 Date Completed MAY 26, 1981
 Geologist/Engineer D. MILLAR
 Elevation 571.3

Profile			Sample			Penetration Test Blows/Foot	Piezometer or Standpipe Installatio
Depth (Elev.)	Stratigraphy	Description & Remarks	Number	Type	Blows/Foot		
						20 40 60 80	
570							
		GREY BROWN & BLACK SILT, SAND, CLAY & STONE - WET	1	SS	12		
		SILT & SAND - MOIST	2	SS	21		
560		BROWN CLAY-HARD					
550							
NOTES:							
- Augers - 7" diameter.							
- Well screen - 2', 1½" diameter							
Redhead.							
- Well pipe - 1½" diameter black steel.							
- Well installed below grade with							
permanent casing for protection.							

Location: K-AREA EAST OF K-28

Elevation 571.0

Diagram of a well casing showing components and elevations:

- 571.0
- 570.73
- Benton
- Plug
- Sand P
- 561.7
- Well Screen

Conestoga - Rovers & Associate

Location: K-AREA - EAST OF K-27

Elevation 571.8

Conestoga - Rovers & Associates

Location: K-AREA - EAST OF K-27

Elevation 572.0

Conestoga - Rovers & Associate

Location: F-AREA - PARKING LOT

Elevation 570.3

Conestoga - Rovers & Associate

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area - 1981
 JOB №: 9-0621
 CLIENT: Hooker Chemicals & Plastics Corp.
 HOLE TYPE: 7" Ø Hollow Stem Auger
 LOCATION: S-Area East of Lagoons

HOLE №: BH1-81
 DATE COMPLETED: December 3, 1981
 GEOLOGIST/ENGINEER: J. Kay, W. Clarke
 GROUND ELEVATION: 576.2
 TOP OF PIPE ELEVATION: _____

DEPTH (ELEVATION)	PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
570	Fill - Consisting of cinders, slag, glass, stone, vegetation, wood, metal fragments & fibrous material in a dark brown to black sandy matrix - Some Yellow material noted in Sample 6		576.2 7" Ø Auger	1	SS	20	
				2	SS	27	
				3	SS	17	
				4	SS	24	
				5	SS	18	
				6	SS	46	
				7	SS	24	
560	Gray, fine to medium sand - trace silt & fine gravel		Cement Bentonite Backfill	8	SS	8	
	Mottled gray & brown, fine to med. sand - trace vegetation			9	SS	6	
				10	SS	44	
				11	SS	12	
				12	SS	8	
550	Gray silty fine sand, occasional coarse to medium sand, fine gravel			13	SS	13	
	Gray fine to medium sand			14	SS	16	
				15	SS	28	
				16	SS	28	
540	Reddish brown fine gravely, coarse to fine sandy clayey silt till		542.2	17	SS	3	
	Borehole Terminated		- No well installed				
	NOTES: - Trace of Non-Aqueous phase liquids noted in Sample 8, 12, & 1 - Non-aqueous phase5 liquids noted in Sample 9, 16 & 17						



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area
 JOB N°: 9-0621
 CLIENT: Hooker Chemicals & Plastics Corp.
 HOLE TYPE: 7" Ø Hollow Stem Augers
 LOCATION: S-Area - East of Lagoons

HOLE N°: BH2-81
 DATE COMPLETED: December 3, 1981
 GEOLOGIST/ENGINEER: J. Kay, W. Clarke
 GROUND ELEVATION: 573.5
 TOP OF PIPE ELEVATION: _____

DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY	MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
				NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
570	Fill - consisting of stone, cinders, glass, vegetation & metal fragments in a brown to black sandy matrix - purple stonelike material noted in Sample 3		573.5	1	SS	11	
				2	SS	7	
				3	SS	4	
				4	SS	1	
				5	SS	12	
				6	SS	2	
560	Refusal - augered through			7	SS	35	
	Brown - gray fine to medium sand with occasional very thin silt layer			8	SS	100+	
	- trace fine gravel - 555.5 to 557.5			9	SS	100+	
	- trace vegetation - 555.0 & 550.5			10	SS	13	
550	Gr. F. grav., silty coarse to fine sand			11	SS	7	
				12	SS	13	
				13	SS	7	
	Black fine to medium sand			14	SS	26	
				15	SS	24	
540	Red br. coarse to fine gravelly, sandy, clayey silt till			16	SS	19	
	Borehole Terminated		541.5				
	NOTES: - Void encountered between 568.5 & 567.5						
	- Traces of non-aqueous phase liquids noted in Samples 11, 12, 13 & 14						
	- Non-aqueous phase liquids noted in Samples 6, 7, 15, & 16						
			- No well installed				



GRAIN SIZE ANALYSIS



WATER FOUND



STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1981
JOB N° : 9-0621
CLIENT : Hooker Chemicals & Plastics Corp.
HOLE TYPE : 7" Ø Hollow Stem Auger
LOCATION : S-Area - East of Lagoons

HOLE NO: BH3-81

DATE COMPLETED: December 4, 1981

GEOLOGIST/ENGINEER: J. Kay, W. Clarke

GROUND ELEVATION: 572.9

TOP OF PIPE ELEVATION: _____

[illegible]

GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area - 1981
 JOB Nº: 9-0621
 CLIENT: Hooker Chemicals & Plastics Corp.
 HOLE TYPE: 7" Ø Hollow Stem Auger
 LOCATION: S-Area - Southwest corner

HOLE Nº: BH4-81
 DATE COMPLETED: December 8, 1981
 GEOLOGIST/ENGINEER: J. Kay, W. Clarke
 GROUND ELEVATION: 573.2
 TOP OF PIPE ELEVATION: _____

PROFILE			MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
570	Fill - stone cover - trace vegetation		573.2	1	SS	5	
				2	SS	9	
				3	SS	3	
				4	SS	7	
	Fill consisting of brown to black silty sand with some fine gravel, cinders and stone		▼ Cement Bentonite Backfill	5	SS	1	
560				6	SS	5	
				7	SS	3	
				8	SS	17	
	Gray & brown silty fine sand with some fine gravel in Samples 10, 12, 13, & 14		7" Ø Auger	9	SS	21	
				10	SS	15	
550	Gr. silty gravelly coarse to fine sand			11	SS	5	
	Sand & gravel with rock frag.			12	SS	20	
				13	SS	22	
	Dk. brown silty sand till and rock fragments			14	SS	21	
				15	SS	57	
540	Bedrock		541.5	16	SS	93	
			- No well installed				
	NOTES: - Traces of non- aqueous phase liquids noted in Samples 7 & 14 - Non-aqueous phase liquids noted in Samples 15 & 16						



GRAIN SIZE ANALYSIS



WATER FOUND



STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1981
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 7" Ø Hollow Stem Auger
 LOCATION : S-Area - Southwest corner

HOLE N° : BH5-81
 DATE COMPLETED : December 7, 1981
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 573.4
 TOP OF PIPE ELEVATION : _____

PROFILE			MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
			573.4				
570	Fill consisting of cinders, wood, white sandy material, metal fragments, fine gravel, stone, concrete, tar and glass in a brown to black sandy matrix		573.4 Cement Bentonite Backfill 7" Ø Auger 541.6 - No well installed	1	SS	17	
				2	SS	8	
				3	SS	8	
				4	SS	9	
				5	SS	38	
				6	SS	7	
				7	SS	13	
				8	SS	25	
				9	SS	16	
				10	SS	14	
				11	SS	8	
				12	SS	5	
				13	SS	9	
				14	SS	14	
				15	SS	19	
				16	SS	19	
560	Gray fine to medium sand with occasional very thin silt layers		573.4 Cement Bentonite Backfill 7" Ø Auger 541.6 - No well installed				
	Gray medium sand - some fine sand						
550	Gray medium sand with very thin silty fine sand layers						
	Black medium sand						
540	Bl. m. sand-some fine gravel						
	Silty sand till with rock fragments						
	Bedrock						
	NOTES: - Traces of non-aqueous phase liquids noted in Samples 7, 9, 10, 11, 12, & 14						
	- Non-aqueous phase liquids noted Samples 15 & 16						



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1981
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 7" Ø Hollow Stem Auger
 LOCATION : S-Area - Southwest corner

HOLE N° : BH6-81
 DATE COMPLETED : December 8, 1981
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 571.4
 TOP OF PIPE ELEVATION : _____

PROFILE			MONITOR INSTALLATION		SAMPLE			PENETRATION TEST				
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY			NUMBER	TYPE	BLOWS / FOOT	BLOWS / FOOT				
								20	40	60	80	
570	Fill consisting of brick, glass cinders, wood in a brown to gray sandy matrix			571.4	1	SS	18					
	Black silt - liquid			7" ø Auger	2	SS	27					
	Fill - Gray sand with F. Grav. & wd.				3	SS	7					
					4	SS	9					
560	Gray - brown fine to medium sand with trace fine grav. & veg.				5	SS	WOR					
					6	SS	1					
	Gray f. sand - occ. silt lense			Cement Bentonite Backfill	7	SS	22					
					8	SS	9					
	Gray clayey silty fine sand				9	SS	28					
550					10	SS	9					
	Shelby tube				11	SS	25					
					12	SS	15					
	Gray gravelly silty fine sand, trace coarse to medium sand				13	SS	24					
540					14	SS	25					
	Reddish brown coarse to fine gravelly sandy silty clay till			541.1								
	Borehole Terminated											
	NOTES: - Traces of non-aqueous phase liquids noted in Samples 6, 7, 8, 9, 10, & 12											
	- Non-aqueous phase liquids noted in Samples 5, 13 & 14			- No well installed								



GRAIN SIZE ANALYSIS



WATER FOUND



STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1981
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 7" Ø Hollow Stem Auger
 LOCATION : S-Area - Southwest corner

HOLE N° : BH7-81
 DATE COMPLETED : December 7, 1981
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 572.9
 TOP OF PIPE ELEVATION : _____

PROFILE			MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
570	Fill - Consisting of white granular material, cinders, metal fragments, gravel, wood, rubber & glass in a brown to black sandy matrix		572.9	1	SS	17	
				2	SS	47	
				3	SS	12	
				4	SS	10	
				5	SS	13	
560				6	SS	10	
	Gray fine to medium sand with occasional very thin silt layer - trace fine gravel in Samples 8, 13, & 14			7	SS	25	
				8	SS	16	
				9	SS	12	
				10	SS	8	
550				11	SS	9	
	Reddish-brown medium to fine sandy silty clay till			12	SS	17	
				13	SS	19	
	Borehole Terminated			14	SS	12	
540			544.9				
	NOTES: - No recovery from Sample 3 - Traces of non-aqueous phase liquids noted in Samples 8, 9, 10, & 12 - Non-aqueous phase liquids noted in Samples 6, 13, & 14		- No wells installed				



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1981
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 7" Ø Hollow Stem Auger
 LOCATION : S-Area - Southwest corner

HOLE N° : BH8-81
 DATE COMPLETED : December 9, 1981
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 573.1
 TOP OF PIPE ELEVATION : _____

DEPTH (ELEVATION)	PROFILE STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY	MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS/FOOT
				NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
			573.1	1	SS	11	
570	Fill consisting of cinders, brick, wood, gravel, stone, slag, red brown clayey silt, coal, white granular material and glass in a brown to black sandy matrix			2	SS	43	
				3	SS	43	
			7" Ø Auger	4	SS	74	
				5	SS	15	
				6	SS	16	
560	Gray, fine to medium sand with occ. very thin silt layers		Cement Bentonite Backfill	7	SS	9	
				8	SS	33	
	Shelby tube			9	SS	15	
				10	Shelby		
550	Gray silty fine sand with occasional very thin silt layer			11	SS	16	
				12	SS	9	
				13	SS	24	
	Gray silty medium to fine sand			14	SS	18	
				15	SS	4	
540	Red-brown gravelly, coarse to fine sandy silty clay till		543.1				
	Borehole Terminated		- No well installed				
	NOTES: - Traces of non-aqueous liquids noted in Samples 7, 8, 11, 12, & 14 - Non-aqueous phase liquids noted in Samples 9 & 15						



GRAIN SIZE ANALYSIS



WATER FOUND



STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area - 1981
 JOB N°: 9-0621
 CLIENT: Hooker Chemicals & Plastics Corp.
 HOLE TYPE: 7" Ø Hollow Stem Auger
 LOCATION: S-Area - Southwest corner

HOLE N°: BH14-81
 DATE COMPLETED: December 9, 1981
 GEOLOGIST/ENGINEER: J, Kay, W. Clarke
 GROUND ELEVATION: 572.7
 TOP OF PIPE ELEVATION: _____

PROFILE			MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
570	Fill consisting of gravel, cinders, glass, stone, white granular material, metal fragments, wood, bricks and coal in a brown to black sandy matrix		572.7 7" Ø Auger	1	SS	6	
				2	SS	3	
				3	SS	23	
				4	SS	26	
				5	SS	3	
			Cement Bentonite Backfill	6	SS	50	
560	Gray fine to medium sand with occ. very thin silt layers			7	SS	21	
				8	SS	16	
				9	SS	19	
	Shelby tube			10	Shelby		
	Gray silty fine sand - some fine gravel in Samples 11 & 13			11	SS	7	
550				12	SS	13	
	Dark brown fine gravelly, silty, coarse to fine sand			13	SS	19	
				14	SS	20	
	Sand and gravel			15	SS	13	
540	Brown-black silty coarse to fine gravelly sand till, dense		541.2	16	SS	100+	
	Bedrock		- No well installed				
530	NOTES: - Trace of non-aqueous phase liquids noted in Sample 6 - Non-aqueous phase liquids noted in Samples 14, 15, & 16						



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

S-Area - 1982

HOLE NO. BH9-82

DATE COMPLETED: March 8, 1982

GEOLOGIST/ENGINEER: J. Kay, W. Clarke

GROUND ELEVATION: 569.6

TOP OF PIPE ELEVATION: _____



▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area - 1982
 JOB N°: 9-0621
 CLIENT: Hooker Chemicals & Plastics Corp.
 HOLE TYPE: 8" Ø Hollow Stem Augers
 LOCATION: South West of S-Area

HOLE N°: BH15-82
 DATE COMPLETED: March 5, 1982
 GEOLOGIST/ENGINEER: J. Kay, W. Clarke
 GROUND ELEVATION: 568.1
 TOP OF PIPE ELEVATION: _____

DEPTH (ELEVATION)	PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
570	Topsoil		568.1	1	SS	22	
	Fill consisting of gray and white flyash			2	SS	11	
	- layer of brown silt and sand with gravel - Sample 1			3	SS	5	
560			Cement Bentonite Backfill	4	SS	6	
	Black (gray brown) fine to medium sand with occasional silty fine sand lenses			5	SS	20	
	- fine gravel in Samples 4, 5, 6			6	SS	19	
	- vegetation in Sample 4		8" Ø Auger	7	SS	5	
550				8	SS	7	
	Black (gr.br.) sand & grav.			9	SS	5	
	Black (r.br.) clayey si.-grav.			10	SS	4	
540				11	SS	23	
	Red brown clayey silt till			12	SS	7	
	Gray silty sand till			13	SS	75	
	Bedrock		539.9	14	SS	100+	
530			- No well installed				
	NOTE: - traces of non-aqueous phase liquid noted in Samples 11 & 12						



GRAIN SIZE ANALYSIS

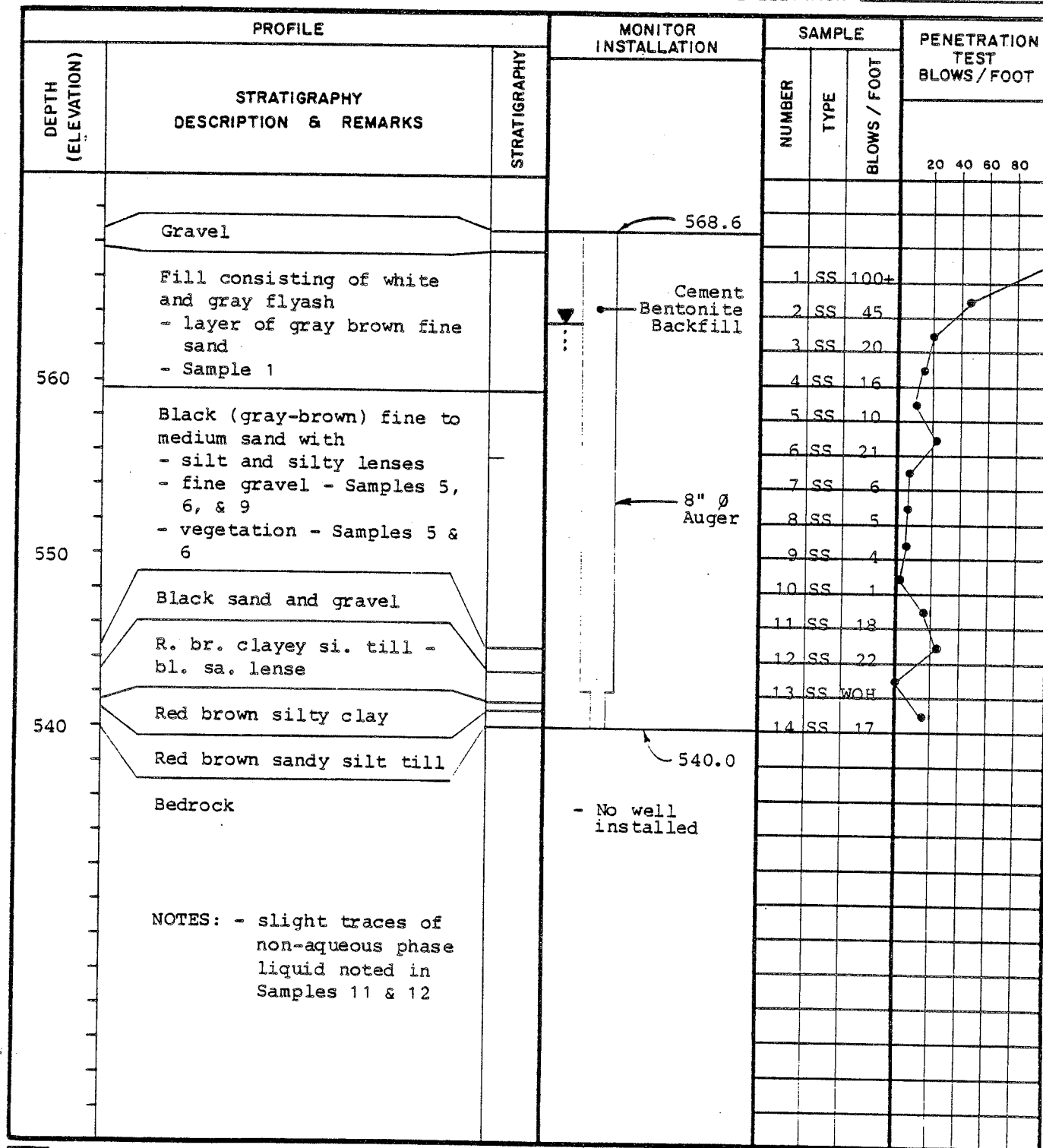
▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1982
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 8" Ø Hollow Stem Augers
 LOCATION : South West of S-Area

HOLE N° : BH16-82
 DATE COMPLETED : March 3, 1982
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 568.6
 TOP OF PIPE ELEVATION : _____



GRAIN SIZE ANALYSIS



WATER FOUND

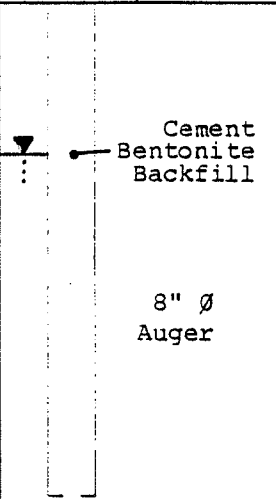


STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1982
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 8" Ø Hollow Stem Auger
 LOCATION : South of the Robert Moses Parkway

HOLE N° : BH17-82
 DATE COMPLETED : March 5, 1982
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 567.8
 TOP OF PIPE ELEVATION : _____

PROFILE			MONITOR INSTALLATION		SAMPLE			PENETRATION TEST BLOWS / FOOT					
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY			NUMBER	TYPE	BLOWS / FOOT						
								20	40	60	80		
570			567.8										
	Topsoil				1	SS	14						
	Fill - red, orange, brown clay & silt with rock fragments				2	SS	100+						
					3	SS	100+						
560	Fill rock fragments with some sand				4	SS	54						
					5	SS	60						
					6	SS	23						
					7	SS	20						
	Gray (gray-brown) fine sand with some medium sand and silt				8	SS	5						
550					9	SS	5						
					10	SS	5						
	Red brown silty till with rock fragments				11	SS	16						
					12	SS	59						
540	Bedrock		544.1										
			- No well installed										



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1982

HOLE N^o: BH18-82

JOB No : 9-0621

DATE COMPLETED: March 4, 1982

CLIENT : Hooker Chemicals & Plastics Corp.

GEOLOGIST/ENGINEER: J. Kay, W. Clarke

HOLE TYPE : 8" Ø Hollow Stem Auger

GROUND ELEVATION: 574.8

LOCATION : South of the Robert Moses Parkway

TOP OF PIPE ELEVATION: _____

PROFILE			MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
	Topsoil		574.8				
570	Fill - red brown silt and clay with - rock fragments - sand		Cement Bentonite Backfill	1	SS	100+	
				2	SS	14	
				3	SS	41	
				4	SS	76	
				5	SS	55	
				6	SS	63	
560	Fill - rock fragments with brown sand			7	SS	50	
	Fill - fine gravel and brown sand			8	SS	22	
				9	SS	26	
				10	SS	20	
				11	SS	21	
550	Black-gray (gray brown) fine to medium sand with some silt and fine gravel			12	SS	3	
				13	SS	4	
	Br. gr. sand and gravel			14	SS	19	
				15	SS	19	
	Red brown silt till (clayey to sandy) - clay layers			16	SS	100+	
540				17	SS	100+	
	Red brown silty sand till		539.4	18	SS	100+	
	Rock fragments						
	Bedrock		- No Well installed				



GRAIN SIZE ANALYSIS



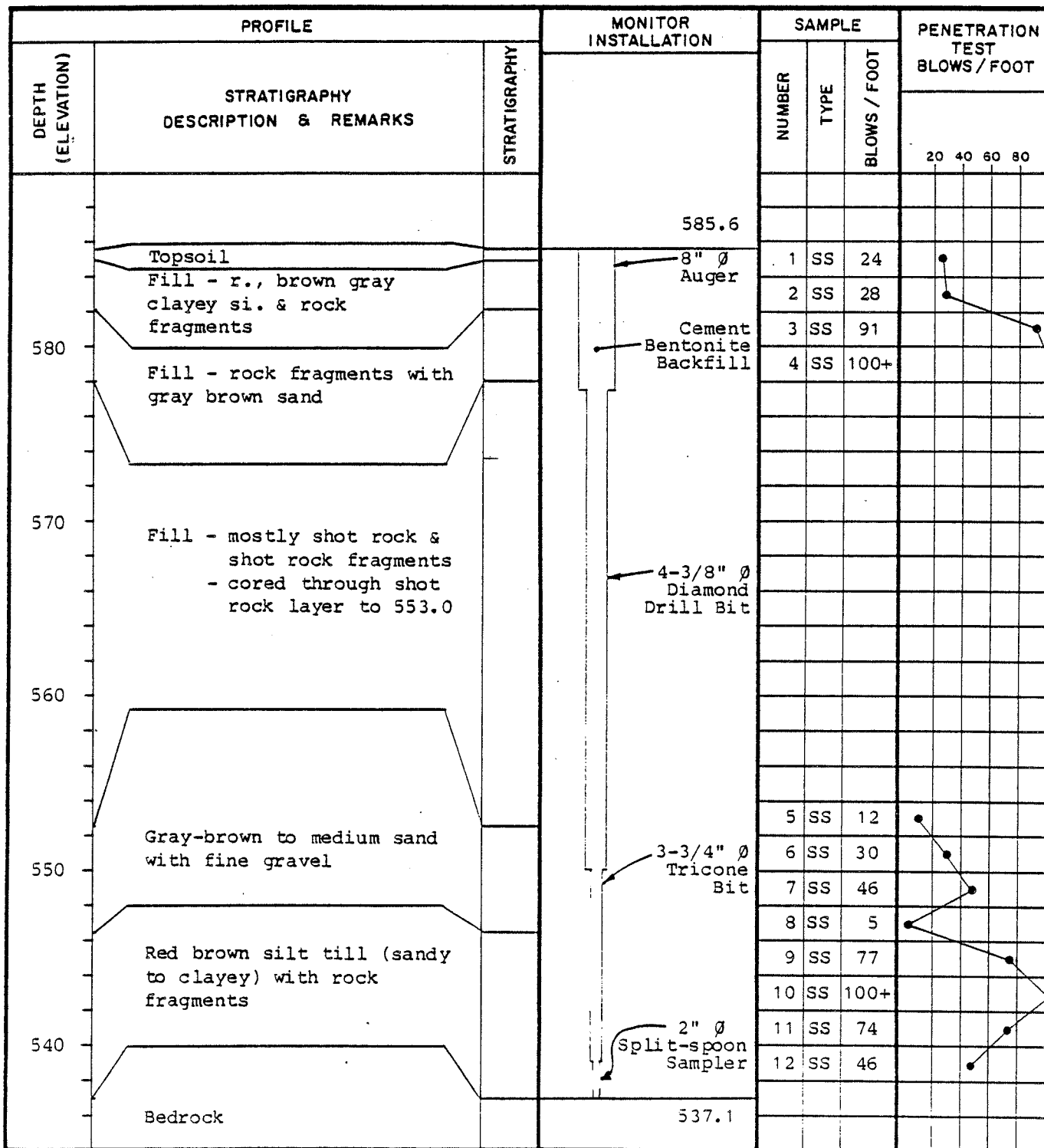
▼ WATER FOUND



▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area - 1982 HOLE N^o: BH19-82
 JOB N^o: 9-0621 DATE COMPLETED: March 12, 1982
 CLIENT: Hooker Chemicals & Plastics Corp. GEOLOGIST/ENGINEER: J. Kay, W. Clarke
 HOLE TYPE: 8" Ø Hollow Stem Augers GROUND ELEVATION: 585.6
 LOCATION: Along north edge of Westbound Lanes (RMP) TOP OF PIPE ELEVATION: _____



☐ GRAIN SIZE ANALYSIS
 ▼ WATER FOUND
 ▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME: S-Area - 1982

HOLE N°: BH20-82

JOB N°: 9-0621

DATE COMPLETED: March 12, 1982

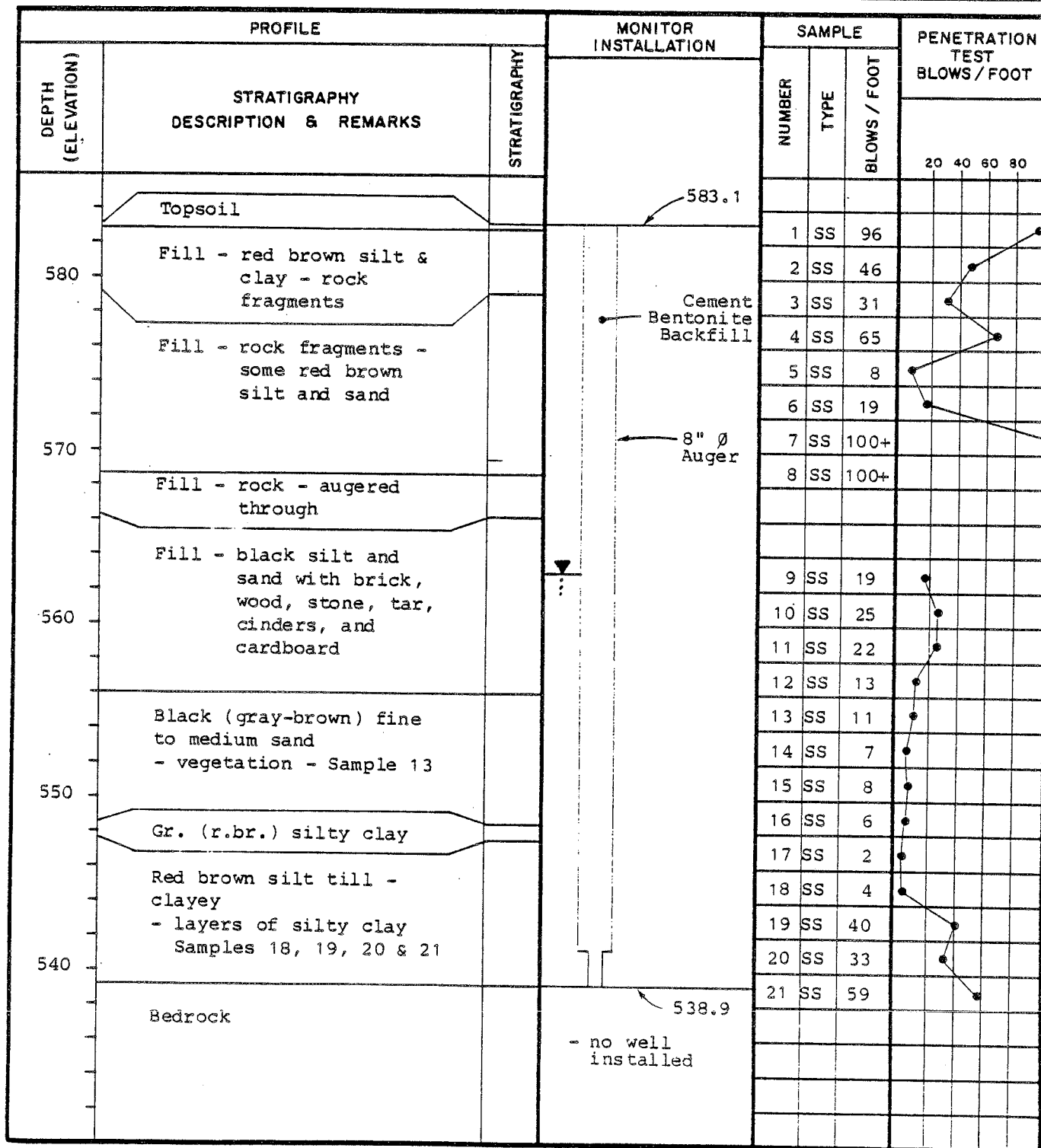
CLIENT: Hooker Chemicals & Plastics Corp.

GEOLOGIST/ENGINEER: J. Kay, W. Clarke

HOLE TYPE: 8" Ø Hollow Stem Augers

GROUND ELEVATION: 583.1

LOCATION: Along north edge of westbound lanes (RMP) TOP OF PIPE ELEVATION:



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1982
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 8" Ø Hollow Stem Auger
 LOCATION : Along north edge of westbound R.M.P.

HOLE N° : BH21-82
 DATE COMPLETED : March 15, 1982
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 579.9
 TOP OF PIPE ELEVATION : _____

DEPTH (ELEVATION)	PROFILE		MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
580	Topsoil		579.9				20 40 60 80
				1	SS	94	
				2	SS	31	
				3	SS	52	
				4	SS	24	
				5	SS	100+	
				6	SS	100+	
570	Fill - brown to red brown silt and sand with various amounts of rock fragments - some gravel and brick			7	SS	99	
				8	SS	51	
				9	SS	100+	
560				10	SS	100+	
				11	SS	43	
				12	SS	28	
				13	SS	21	
550	Gray brown (gray-brown) fine to medium sand with occasional silty fine sand lenses			14	SS	10	
				15	SS	8	
				16	SS	10	
	Bl. (gr.-br.) sand & grav.			17	SS	76	
	Red brown silt till - grading from clayey to sandy			18	SS	100+	
540				19	SS	96	
				20	SS	100+	
	Bedrock		538.7				
530			- No well installed				



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1982

HOLE N°: BH22-82

JOB NO : 9-0621

DATE COMPLETED: March 16, 1982

CLIENT : Hooker Chemicals & Plastics Corp.

GEOLOGIST/ENGINEER: J. Kay. W. Clarke

HOLE TYPE: 8" Ø Hollow Stem Augers

GROUND ELEVATION: 568.5

LOCATION : 10' east of Outfall 003 - West of S-Area TOP OF PIPE ELEVATION:

PROFILE			MONITOR INSTALLATION		SAMPLE			PENETRATION TEST BLOWS / FOOT					
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY			NUMBER	TYPE	BLOWS / FOOT						
								20	40	60	80		
570	Fill Gravel			568.5									
	Fill - white gray and black flyash with sand - - layer of gravel - layer of sand and stone				1	SS	100+						
					2	SS	26						
					3	SS	35						
560	Black (gray-brown) fine to medium sand with occasional silty fine sand lense - vegetation in Samples 5, 6, & 7 - some seashells in 8, 11, & 12				4	SS	5						
					5	SS	8						
					6	SS	15						
					7	SS	17						
					8	SS	8						
550					9	SS	6						
	Bl. (gr.-br.) sand w/grav.			8" Ø Augers	10	SS	6						
					11	SS	WOR						
	Red brown clayey silt till with rock fragments				12	SS	7						
540					13	SS	WOR						
	Bedrock			539.8	14	SS	100+						
				- No well installed	15	SS	100+						



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

STRATIGRAPHIC AND INSTRUMENTATION LOG

PROJECT NAME : S-Area - 1982
 JOB N° : 9-0621
 CLIENT : Hooker Chemicals & Plastics Corp.
 HOLE TYPE : 8" Ø Hollow Stem Auger
 LOCATION : Along north edge of Westbound (RMP)

HOLE N° : BH23-82
 DATE COMPLETED : March 16, 1982
 GEOLOGIST/ENGINEER : J. Kay, W. Clarke
 GROUND ELEVATION : 580.1
 TOP OF PIPE ELEVATION : _____

PROFILE			MONITOR INSTALLATION	SAMPLE			PENETRATION TEST BLOWS / FOOT
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	STRATIGRAPHY		NUMBER	TYPE	BLOWS / FOOT	
							20 40 60 80
580	Topsoil		580.1				
	- Fill - red brown silt and sand with rock fragments			1	SS	40	
				2	SS	31	
				3	SS	20	
				4	SS	17	
				5	SS	12	
570	Fill - rock and rock fragments - some sand			6	SS	35	
				7	SS	100+	
				8	SS	50+	
				9	SS	20	
560	Fill - red brown silt (clayey to sandy) with rock fragments			10	SS	77	
				11	SS	100+	
				12	SS	21	
				13	SS	16	
				14	SS	21	
550	Gray to black (gray brown) fine to medium sand - vegetation in Sample 12			15	SS	7	
	Gray (red brown) silty clay			16	SS	2	
				17	SS	4	
				18	SS	14	
				19	SS	80	
540	Red brown silt till (clayey) - some silty clay layers - some rock fragments			20	SS	57	
				21	SS	98	
	Bedrock		538.2 - No well installed				



GRAIN SIZE ANALYSIS

▼ WATER FOUND

▽ STATIC WATER LEVEL

SECTION 2

FIELD LOGS

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

Page 1 of 2

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemical; and Plastics Corp. Niagara Falls Plant
Sand, fine to medium, tan; fill com- posed of slag; cinders; gravel; sand, fine to coarse; moist	1.5	1.5	LOCATION: NW Corner of Bldg F-31
Fill, composed of broken rock and brick; gravel; cinders; sand, fine to coarse; silt; wet, black, chemi- cal odor	1.5	3.0	WELL No.: B-1
Clay, silty, gray; chemical odor	1.5	4.5	DATE COMPLETED: January 11, 1979
Crushed stone, (auger sample)	2.0	6.5	DRILLING COMPANY: Rochester Drilling Co.
Fill, composed of broken rock and brick; cinders; sand, medium to coarse; clay, silty, gray; wet, chemical odor	1.0	7.5	DRILLING METHOD: Hollow-stem auger ^{1/} Split-spoon
Clay, some silt, gray-brown; chemi- cal odor, dry	1.5	9.0	SAMPLES: R. Lamonica EXAMINED BY: Grade ^{2/}
Clay, some silt, brown, strong chemi- cal odor, dry	1.5	10.5	REFERENCE POINT: 571.0 feet above MSL
Clay, brown-red, sticky, chemical odor	1.5	12.0	ELEVATION OF R. P.: 15 feet of 1½ inch galvanized
Clay, brown-red, sticky, chemical odor	1.5	12.5	SCREEN TYPE: Johnson stainless steel
Clay, brown-red, sticky, no odor	1.5	15.0	DIA.: 1½-inch SLOT No. 10
Clay, brown-red, sticky, faint odor	1.5	16.5	SETTING: 14 feet to 24 feet
(continued)			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: 20.65 feet below March 1, 1979
			PUMPING WATER LEVEL: _____
			YIELD: 2.5 gpm
			REMARKS: 1. Hollow-stem auger to top of rock. Tricone bit in rock. 2/ TOC= 572.35 feet above MSL

WELL LOG

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LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Naigara Falls Plant</u>
Clay, brown-red, sticky (top); till			LOCATION: _____
composed of clay, silty, sticky,			WELL No.: <u>B-1 (continued)</u>
red-brown, with sand, fine to coarse	1.5	18.0	DATE COMPLETED: _____
Till, composed of clay, silty, sticky			DRILLING COMPANY: _____
red-brown, with sand, fine to coarse			DRILLING METHOD: _____
and gravel; no odor	1.5	19.5	SAMPLING METHOD: _____
Till, composed of clay, silty, sticky			SAMPLES: EXAMINED BY: _____
red-brown; with much gravel; sand,			REFERENCE POINT: _____
fine to coarse; no odor	1.5	21.0	ELEVATION OF R. P.: _____
Till, composed of stones; gravel;			CASING: _____
clay, red-brown, sticky; silt;			SCREEN: TYPE: _____
sand, fine to coarse; chemical odor	1.0	22.0	DIAM.: _____ SLOT No. _____
Till, composed of cobbles; gravel,			SETTING: _____
fine to coarse; sand, fine to coarse			PUMPING TEST: DATE: _____
clay, red-brown, sticky; silt;			DURATION: _____
chemical odor; loose; wet.	.5	22.5	STATIC WATER LEVEL: _____
Refusal		22.5	PUMPING WATER LEVEL: _____
Dolomite bedrock drilled for 5 feet			YIELD: _____
with tricone roller rock bit and			REMARKS: _____
water; sand caving into bore hole			
(3.5 feet filled in before screen			
assembly could be installed)			
water loss at 25 feet for a few			
minutes	5.0	27.5	

LEGGETTE, BRASHEARS & GRAHAM, INC.

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1/ Grade = 1.5 feet below
TOC

TOC = 573.285 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Fill, composed of crushed rock;			LOCATION: <u>Purchasing Department Visitors Parking Lot</u>
cinders; silt; dry (auger sample)	1.0	1.0	WELL No. <u>B-2</u>
Fill, composed of cinders; sand;			DATE COMPLETED: <u>January 11, 1979</u>
gravel, (auger sample)	2.0	3.0	DRILLING COMPANY: <u>Rochester Drilling Co.</u>
Silt, clayey, tan-gray, no odor, dry	1.5	4.5	DRILLING METHOD: <u>Hollow-stem auger ^{1/}</u>
No return	1.5	6.0	SAMPLING METHOD: <u>Split-spoon</u>
Silt, clayey, tan-gray; sand, very			SAMPLED BY: <u>R. Lamonica</u>
fine; dry, no odor	1.5	7.5	REFERENCE POINT: <u>Grade ^{2/}</u>
Silt, clayey, tan-gray; sand, very			ELEVATION OF R. P.: <u>571.2 feet above MSL</u>
fine to fine, silty; no odor	1.5	9.0	CASING: <u>17.4 feet of 1 1/2 inch Galvanized</u>
Top: silt, clayey, tan-gray; bottom:			SCREEN TYPE: <u>Johnson Stainless Steel</u>
clay, silty, red-brown; hard, dry,			DIAM. <u>1 1/2 inch</u> SLOT No. <u>10</u>
no odor	1.5	10.5	SETTING: <u>18 feet - 28 feet</u>
Clay, brown, hard, dry, no odor	1.5	12.0	PUMPING TEST: <u>DATE:</u>
Clay, brown-red, sticky; chemical			DURATION: <u></u>
odor	1.5	13.5	STATIC WATER LEVEL: <u>19.11 feet below March 1, 1979</u>
Clay, brown-red, sticky; no odor	1.5	15.0	PUMPING WATER LEVEL: <u></u>
Clay, brown-red, sticky; no odor	1.5	16.5	YIELD: <u>5 gpm</u>
Top: clay, brown-red, silty, some			REMARKS: <u>1. Hollow-stem auger to top of rock and tricolor bit in rock.</u>
gravel Bottom: silt; sand, fine			
brown-red; no odor; change was at			
17.5 feet	1.5	18.0	
Till, composed of clay, brown-red;			<u>2/ TOC = 570.85 feet above MSL</u>
silt; sand, fine to coarse; gravel,			
hard, dry, no odor	1.5	19.5	
(continued)			

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER:
Till, composed of clay, brown-red; silt; sand, fine to coarse; gravel large, hard; dry, no odor; piece of broken rock	1.5	21.0	Hooker Chemical and Plastics Corp. Niagara Falls Plant
Till, composed of clay, brown-red; silt; sand, fine to coarse, gravel large, hard, dry, no odor; piece of broken rock	1.5	22.5	LOCATION: _____
Refusal		22.5	WELL NO.: B-2 (continued)
Augered two more feet into broken rock and till	2.0	24.5	DATE COMPLETED: _____
Drilled 5 feet into bedrock with a tri-cone roller rock bit, with air and water	5.0	29.5	DRILLING COMPANY: _____
(The driller reported lossing cir- culation and a void 1.0 feet into the rock, after which circulation resumed. Sand seams caused the open hole to fill in. A seam was encountered about 2.5 feet into rock which produced a black liquid with a very strong chemical odor).			DRILLING METHOD: _____
			SAMPLING METHOD: _____
			SAMPLES: EXAMINED BY: _____
			REFERENCE POINT: _____
			ELEVATION OF R. P.: _____
			CASING: _____
			SCREEN- TYPE: _____
			DIAH.: _____ SLOT NO. _____
			SETTING: _____
			PUMPING TEST- DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: _____
			PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp Niagara Falls Plant
Augured to 10.5 feet below grade and installed a 10 foot well screen, to .4 feet below grade. Sand packed for full length with cement on top.			LOCATION: Purchasing Department Visitors Parking Lot B-2a
Fill, composed of crushed rock; cinders; silt; dry (auger sample)	1.0	1.0	DATE COMPLETED: January 11, 1979
Fill, composed of cinders; sand; gravel. (auger sample)	2.0	3.0	DRILLING COMPANY: Rochester Drilling Co
Silt, clayey, tan-gray, no odor, dry No return	1.5	4.5	DRILLING METHOD: Hollow-stem auger
Silt, clayey, tan-gray; sand, very fine; dry, no odor	1.5	6.0	SAMPLING METHOD: No samples
Silt, clayey, tan-gray; sand, very fine to fine, silty; no odor	1.5	7.5	SAMPLES: EXAMINED BY: R. Lamonica
Top: silt, clayey, tan-gray; bottom: clay, silty, red-brown; hard, dry, no odor	1.5	9.0	REFERENCE POINT: Grade 1/
			ELEVATION OF R. P.: 571.4 feet above MSL
			CASING: None
			SCREEN: TYPE: Johnson stainless steel
			DIAM.: 1 1/2 inch SLOT NO: 10
			SETTING: 0.4 feet to 10.4 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 7.03 feet below March 1, 197
			PUMPING WATER LEVEL:
			YIELD: .25 gpm
			REMARKS:
			1/ TOC = 571.08 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of cinders; stones;			LOCATION: SW Corner of Bldg T-9
sand, fine to coarse; silt; black,			WELL No.: B-3
dry, no odor	1.5	1.5	DATE COMPLETED: January 10, 1979
Fill, composed of cinders; stones;			DRILLING COMPANY: Rochester Drilling Co.
sand, fine to coarse; silt; black,			DRILLING METHOD: Hollow-stem Auger ^{1/}
wet, no odor	1.5	3.0	SAMPLING METHOD: Split spoon
Fill, composed of silt, brown, clayey			SAMPLES: R. Lamonica
some sand, fine to coarse; gravel;			REFERENCE POINT: Grade ^{2/}
chemical odor	1.5	4.5	ELEVATION OF R. P.: 568.4 feet above MSL
Fill; gravel, fine to coarse; stones;			CASING: 14 feet of 1½-inch galvanized
sand, fine to coarse; some silt and			SCREEN TYPE: Johnson stainless steel
clay; wet, chemical odor	1.5	6.0	DIAM.: 1½ inch SLOT No. 10
Clay, brown, sticky, no odor	1.5	7.5	SETTING: 14.1 feet - 24.1 feet
Clay, brown, silty, no odor	1.5	9.0	PUMPING TEST: DATE:
Clay, brown-red, sticky	7.5	16.5	DURATION:
No return (till)	1.5	18.0	STATIC WATER LEVEL: 15.38 feet below TOC, August 20, 1979
Till, composed of clay; silt; red;			PUMPING WATER LEVEL:
with gravel, coarse; dry	1.5	19.5	YIELD: 5 gpm
Till; composed of clay, silt, gravel,			REMARKS:
stones; dry, no odor	1.0	20.5	1/ Hollow-stem auger to top of rock. Rock core in bedrock.
Refusal	1.0	21.5	
Cored 4 feet into rock with a diamond			
bit (38 inch return).	4.0	25.5	2/ TOC = 568.16 feet above MSL
(Driller reported temporary loss			
of circulation at 25 feet. Sand			
in the rock filled in 1.5 feet of open hole).			

WESTPORT, CONNECTICUT

1/ TOC = 568.17 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Fill; composed of shale, gray, hard, broken (top); cinders; gravel; sand, fine to coarse; some silt; (middle); sand, medium, tan, dry, (bottom), no odor	1.5	1.5	LOCATION: <u>SW corner of yard, south of Bldg. T-2</u> WELL NO.: <u>B-4</u>
Fill; of broken shale, gray; stones; some sand; wet, loose	1.5	3.0	DATE COMPLETED: <u>January 10, 1979</u> DRILLING COMPANY: <u>Rochester Drilling Co.</u> DRILLING METHOD: <u>Hollow-stem auger^{1/}</u>
Fill; as above; wet; faint odor	1.5	4.5	SAMPLING METHOD: <u>Split Spoon</u> SAMPLES EXAMINED BY: <u>R. Lamonica</u> REFERENCE POINT: <u>Grade^{2/}</u>
Note: encountered an obstruction at 4.5 ft. Rig Moved over and augered without sampling to 4.5 ft.			ELEVATION OF R. P.: <u>568.0 feet above MSL</u> CASING: <u>18 feet of 1½-inch gal- vanized</u> SCREEN TYPE: <u>Johnson Stainless Steel</u> DIAM. <u>1½ inch</u> SLOT NO. <u>10</u> SETTING: <u>16-26 feet</u>
Silt; sand, very fine; trace clay; slight odor; dark brown	1.5	6.0	PUMPING TEST: <u>DATE:</u> DURATION: <u> </u>
Clay, brown-red, no odor	1.5	7.5	STATIC WATER LEVEL: <u>17.44 feet below TOC, March 1, 1979.</u>
Silt, clayey, dark brown; trace organic matter; swamp odor	1.5	9.0	PUMPING WATER LEVEL: <u> </u> YIELD: <u>7 gpm</u>
Clay, brown-red, sticky, no odor	6.0	15.0	REMARKS:
Till; composed of clay, brown-red, sticky; stones; gravel; trace sand, fine to coarse; silt	1.5	16.5	<u>1/</u> Hollow-stem auger to top of rock. Tricone bit in bedrock. <u>2/</u> Grade = 2.0 feet below top of casing. TOC = 570.00 feet above MSL
(continued)			

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)
Till; of clay; silt; gravel; stones; sand, fine to coarse; hard; dry	1.5	18.0
Till; of large pieces of broken rock; gravel; clay brown+red; silt; moist	.8	18.8
No return (till)	.7	19.5
Till; of clay, red-brown; silt; gravel; stones; no odor; dry	.8	20.3
Refusal		20.3
Rock drilled with Tricone Roller bit using water; 6 ft.	6.0	26.3

OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
LOCATION: <u>SW corner of yard south of Bldg. T-2</u>
WELL NO.: <u>B-4 (continued)</u>
DATE COMPLETED:
DILLING COMPANY:
DILLING METHOD:
SAMPLING METHOD:
SAMPLES EXAMINED BY:
REFERENCE POINT:
ELEVATION OF R. P.:
CASING:
SCREEN: TYPE:
DIAM.: _____ SLOT NO. _____
SETTING:
PUMPING TEST: DATE:
DURATION:
STATIC WATER LEVEL:
PUMPING WATER LEVEL:
YIELD:
REMARKS:

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Augered to 5.5 feet into the fill with no samples taken. Installed a 5 ft. section of well screen, and sanded it in.			LOCATION: SW corner of yard south of Bldg. T-2 WELL NO.: B-4a DATE COMPLETED: January 10, 1979 DRILLING COMPANY: Rochester Drilling Co. DRILLING METHOD: Hollow-stem auger SAMPLING METHOD: No samples SAMPLES EXAMINED BY: R. Lamonica REFERENCE POINT: Grade 1/ ELEVATION OF R. P.: 567.6 feet above MSL CASING: 1.9 feet of 1½-inch galvanized SCREEN TYPE: Johnson Stainless Steel DIAM.: 1½ inch SLOT NO. 10 SETTING: .5 feet - 5.5 feet PUMPING TEST DATE: DURATION: STATIC WATER LEVEL: 3.13 feet below TOC, March 1, 1979 PUMPING WATER LEVEL: YIELD: 8 gpm REMARKS: 1/ TOC . =569.21 feet above MSL
Fill; composed of shale, gray, hard, broken (top); cinders; gravel; sand, fine to coarse; some silt; (middle); sand, medium, tan, dry, (bottom), no odor	1.5	1.5	
Fill; of broken shale, gray; stones, some sand; wet, loose	1.5	3.0	
Fill; as above; wet; faint odor	1.5	4.5	
Note: encountered an obstruc- tion at 4.5 ft. Rig moved over and augered without sampling to 4.5 ft.			
Silt; sand, very fine; trace clay; slight odor; dark brown	1.5	6.0	

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill; composed of crushed stone:			LOCATION: West Side of Buildin
sand, fine to coarse, brown; silt;			U-82
dry; (auger return)	1.5	1.5	WELL No. B-5
Fill; of stones; gravel; sand, fine			DATE COMPLETED: January 15, 1979
to medium, brown; dry; faint odor	1.5	3.0	DRILLING COMPANY: Rochester Drilling Co
Fill; of stones; gravel; cinders;			DRILLING METHOD: Hollow-stem auger ¹
sand, fine to coarse; dry, faint			SAMPLING METHOD: Split-spoon
odor	1.5	4.5	SAMPLES EXAMINED BY: R. Lamonica
Fill; of stones; gravel; sand, fine			REFERENCE POINT: Grade ² / ₁
to coarse; silt; wet; chemical			ELEVATION OF R. P.: 569.4 feet above MSL
odor	1.5	6.0	CASING: 29.5 feet of 1½ inch galvanized
No return (fill)	1.5	7.5	SCREEN TYPE: Johnson stainless steel
Stones, large, blue. (May be abandoned			DIAM. 1½ inch SLOT No. 10
sewer line); chemical odor	1.5	9.0	SETTING: 21.0 feet to 31.0 feet
Note: Hole abandoned; moved over a			PUMPING TEST: DATE:
few feet and augered to 9 feet			DURATION:
Top: Fill, of stones; gravel; sand;			STATIC WATER LEVEL: 17.16 feet below T.O.C. January 31, 197
cinders; black; strong chemical			PUMPING WATER LEVEL:
odor.			YIELD: 1 gal. in 30 minutes
Bottom: Clay, silty, brown, odor	1.5	10.5	REMARKS:
Clay, brown-red, silty; trace sand,			1/ Hollow-stem auger to top of rock. Rock drilled with tricone bit.
fine to coarse; chemical odor	1.5	12.0	
Clay, brown-red, sticky, chemical			
odor	7.5	19.5	2/ TOC = 569.11 feet above MSL
Till; composed of silt, clayey, brown			
(continued)			

WESTPORT, CONNECTICUT

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp Niagara Falls Plant</u>
Augered to 10.5 feet without sam-			LOCATION: <u>West Side of Bldg</u>
pling, withdrew augers and			<u>U-82</u>
installed a 10 foot screen, top of			WELL NO.: <u>B-5a</u>
which is below grade			DATE COMPLETED: <u>January 15, 1979</u>
Fill; composed of crushed stone:			DRILLING COMPANY: <u>Rochester Drilling Co</u>
dry; (auger return)	1.5	1.5	DRILLING METHOD: <u>Hollow stem auger</u>
Fill; of stones; gravel; sand, fine			SAMPLING METHOD: <u>None</u>
to medium, brown; dry; faint odor	1.5	3.0	SAMPLES: EXAMINED BY: <u>R. Lamonica</u>
Fill; of stones, gravel, cinders,			REFERENCE POINT: <u>Grade 1/</u>
sand, fine to coarse; dry, faint			ELEVATION OF R. P.: <u>569.5 feet above MSL</u>
odor	1.5	4.5	CASING: <u>None</u>
Fill; of stones, gravel, sand, fine			SCREEN: TYPE: <u>Johnson stainless steel</u>
to coarse; silt; wet; chemical			DIAM.: <u>1 1/2 inch</u> SLOT NO. <u>10</u>
odor	1.5	6.0	SETTING: <u>.5 feet to 10.5 feet</u>
No return (fill)	1.5	7.5	PUMPING TEST: DATE: _____
Stones, large, blue, (May be abandoned			DURATION: _____
sewer line); chemical odor	1.5	9.0	STATIC WATER LEVEL: <u>5.22 feet below</u>
Note: hole abandoned; moved over a			<u>TOC March 1, 1979</u>
few feet and augered to 9 feet			PUMPING WATER LEVEL: _____
Top: Fill, of stones; gravel; sand,			YIELD: <u>.5 gpm</u>
cinders, black; strong chemical			REMARKS:
odor.			
Bottom: Clay, silty, brown, odor	1.5	10.5	<u>1/</u> TOC = 569.29 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS
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WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill; composed of stones; gravel; sand, fine to coarse; silt; clay chemical odor; dry	1.5	1.5	LOCATION: South of Bldg. U-68
Fill; of sand, fine to coarse; cinders; gravel; silt; dry, chemical odor	1.5	3.0	WELL No.: B-6
Fill; of gravel; sand, fine to coarse; silt; cinders; wet, dark gray; chemical odor	1.5	4.5	DATE COMPLETED: January 15, 1979
Fill; of silt; clay; much gravel; sand, fine to coarse; wet, dark gray; chemical odor	3.0	7.5	DILLING COMPANY: Rochester Drilling Co.
Fill; gravel; silt; clay; sand, fine to coarse; dark gray, wet, chemical odor	1.5	9.0	DILLING METHOD: Hollow-stem auger ^{1/}
Silt, dark brown; gravel; organic matter; some sand, fine to coarse; wet, chemical odor-	1.5	10.5	SAMPLING METHOD: Split spoon
Silt, gray, clayey; gravel; organ- ic matter; sand, fine to coarse; chemical odor	1.5	12.0	SAMPLES EXAMINED BY: R. Lamonica
Clay, brown-red	7.5	19.5	REFERENCE POINT: Grade ^{2/}
(continued)			ELEVATION OF R. P.: 569.1 feet above MSL
			CASING: 21 ft. of 1½ inch galvanized
			SCREEN TYPE: Johnson Stainless Steel
			DIA.: 1½ inch SLOT No. 10
			SETTING: 21.0 feet-31.0 feet
			PUMPING TEST DATE:
			DURATION:
			STATIC WATER LEVEL: 16.66 feet below TOC, March 1, 79
			PUMPING WATER LEVEL:
			YIELD: 2 gpm
			REMARKS:
			^{1/} Hollow-stem auger to the top of rock. Tricone bit in bedrock
			^{2/} TOC = 568.60 feet above MSL

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Augered 12.5 feet (seated in the clay), withdrew the augers and installed a 10 foot well screen in the open hole; sand packed it. Fill; composed of stones; gravel; sand, fine to coarse; silt; clay chemical odor; dry	1.5	1.5	LOCATION: South of Bldg. U-68 WELL NO.: B-6a DATE COMPLETED: January 15, 1979 DRILLING COMPANY: Rochester Drilling Co. DRILLING METHOD: Hollow stem auger SAMPLING METHOD: No samples SAMPLES EXAMINED BY: R. Lamonica
Fill; of sand, fine to coarse; cinders; gravel; silt; dry. chemical odor	1.5	3.0	REFERENCE POINT: Grade 1 ELEVATION OF R. P.: 569.6 feet above MSL CASING: 2.5 feet of 1½ inch galvanized SCREEN: Johnson stainless steel TYPE: 1½ inch SLOT NO. 10 DIAM.: 2.5 feet-12.5 feet SETTING: 2.5 feet-12.5 feet PUMPING TEST: DATE: DURATION: STATIC WATER LEVEL: 2.29 feet below TOC, March 1, 1979 PUMPING WATER LEVEL: YIELD: .75 gpm
Fill; of gravel; sand, fine to coarse; silt; cinders; wet, dark gray; chemical odor	1.5	4.5	REMARKS: 1/ TOC = 569.33 feet above MSL Note: There is no new elevation for this well. Elevation noted is original
Fill; of silt; clay; much gravel; sand, fine to coarse; wet, dark gray; chemical odor	3.0	7.5	
Fill; gravel; silt; clay; sand, fine to coarse; dark gray, wet, chemi- cal odor	1.5	9.0	
Silt, dark brown; gravel; organic matter; some sand, fine to coarse, wet, chemical odor	1.5	10.5	
Clay, brown-red	3.0	13.5	

WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS

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WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Fill; composed of crushed stone;			LOCATION: <u>West End of U-83</u>
silt,	1.5	1.5	WELL NO.: <u>B-7 Replacement*</u>
Fill; (no return), wet, loose	1.5	3.0	DATE COMPLETED: <u>January 12, 1979</u>
Fill; (no return), wet, loose	1.5	4.5	DRILLING COMPANY: <u>Rochester Drilling Co.</u>
(The auger return for the interval			DRILLING METHOD: <u>Hollow stem auger^{1/}</u>
from 1.5 to 4.5 was cinders; silt;			SAMPLING METHOD: <u>Split spoon</u>
sand)			SAMPLES EXAMINED BY: <u>R. Lamonica</u>
Fill: of silt; sand, fine; black,			REFERENCE POINT: <u>Grade^{2/}</u>
wet	1.5	6.0	ELEVATION OF R. P.: <u>569.7 feet above MSL</u>
Fill: of silt; sand, fine to coarse;			CASING: <u>34 feet of 1½ inch galvanized</u>
gravel; cinders; black, loose, wet	4.5	10.5	SCREEN: <u>Johnson stainless steel</u>
Fill: of silt; sand, fine to coarse;			DIAM.: <u>1½ inch</u> SLOT NO. <u>10</u>
cinders; stones; gravel; not as			SETTING: <u>32.5 feet - 37.5 Feet</u>
loose; wet; black	1.5	12.0	PUMPING TEST: DATE: _____
Fill: of silt; sand; fine to coarse;			DURATION: _____
cinders; loose, wet, black	1.5	13.5	STATIC WATER LEVEL: <u>18.25 feet below TOC, March 30, 1979</u>
Fill: of silt; sand, fine to medium;			PUMPING WATER LEVEL: _____
some coarse; cinders; black, firm,			YIELD: <u>15 gpm</u>
wet	1.5	15.0	REMARKS:
Silt, gray, chemical odor	1.5	16.5	* Original well pulled and reconstructed due to broken seal
Top 1 foot: silt, gray, chemical			^{1/} Hollow-stem auger to top of rock. Rock co: in bedrock.
odor; Bottom 6 inches: Clay,			
brown-red, sticky	1.5	18.0	
Clay, brown-red, sticky	1.5	19.5	
Clay, brown-red, sticky; chemical			^{2/} TOC = 571.08 feet abo MSL
odor	1.5	21.0	

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LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Augered without sampling to 16.5			LOCATION: West End of U-83
feet and installed a 15 foot			WELL No.: B-7a
well screen, sand-packed for its			DATE COMPLETED: January 12, 1979
entire length			DRILLING COMPANY: Rochester Drilling Co
Fill: composed of crushed stone;			DRILLING METHOD: Hollow stem auger
silt.	1.5	1.5	SAMPLING METHOD: No samples taken
Fill: (no return), wet, loose	1.5	3.0	SAMPLES EXAMINED BY: R. Lamonica
Fill: (no return), wet loose	1.5	4.5	REFERENCE POINT: Grade 1/
(The auger return of the interval			ELEVATION OF R. P.: 569.9 feet above MSL
from 1.5 to 4.5 was cinders; silt;			CASING: 3.8 feet of 1 1/2 inch
sand)			galvanized
Fill: of silt; sand, fine; black,			SCREEN TYPE: Johnson Stainless steel
wet	1.5	6.0	DIAM.: 1 1/2 inch SLOT No. 10
Fill: of silt; sand, fine to coarse;			SETTING: 1.5 feet-16.5 feet
gravel; cinders; black, loose, wet	4.5	10.5	PUMPING TEST: DATE:
Fill: of silt; sand, fine to coarse;			DURATION:
cinders; stones gravel; not as			STATIC WATER LEVEL: 4.34 feet below
loose; wet; black	1.5	12.0	TOC, March 1, 1979
Fill: of silt; sand; fine to coarse;			PUMPING WATER LEVEL:
cinders; loose, wet, black	1.5	13.5	YIELD: 1.75 gpm
Fill: of silt; sand, fine to medium,			REMARKS:
some coarse; cinders; black, firm			
wet	1.5	15.0	1/ TOC = 572.06 feet
Silt, gray, chemical odor	1.5	16.5	above MSL

WELL LOG

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER
Fill; composed of trap rock; sand, fine to coarse; gravel; no odor	1.5	1.5	Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill; of trap rock; gravel; sand, fine to coarse; some silt; gray; loose, wet, no odor	3.0	4.5	LOCATION: SW Corner of Bldg. U-52
Silt, dark gray; sand, very fine; precipitate, soft, white; yellow stains; faint odor	1.5	6.0	WELL No. B-8 DATE COMPLETED: January 10, 1979
Silt, dark gray, micaceous; sand, very fine; white stained in places; faint odor	1.5	7.5	DRILLING COMPANY: Rochester Drilling Co.
Silt, dark brown; chemical odor	3.0	10.5	DRILLING METHOD: Hollow-stem auger ^{1/}
Silt, dark gray; sand, fine to me- dium; some gravel, small; wet, loose, chemical odor	1.5	12.0	SAMPLING METHOD: Split Spoon SAMPLES EXAMINED BY: R. Lamonica
Silt, dark brown	1.5	13.5	REFERENCE POINT: Grade ^{2/}
Silt, dark brown; sand, very fine	1.5	15.0	ELEVATION OF R. P.: 569.6 feet above MSL
Silt, dark brown; sand, very fine; odor	1.5	16.5	CASING: 27.5 feet of 1½-inch gal- vanized SCREEN TYPE: Johnson Stainless Steel
Sand, very fine; very silty; dark brown	1.5	18.0	DIA: 1½ inch SLOT No. 10
Top: sand, very fine, silty (6 in.)	.5	18.5	SETTING: 28 feet - 33 feet ^{3/}
Bottom: Clay, brown-red, sticky	1.0	19.5	PUMPING TEST: DATE: _____
(continued)			DURATION: _____
			STATIC WATER LEVEL: 17.45 feet below TOC, March 19, 1979
			PUMPING WATER LEVEL: _____
			YIELD: .25 gpm
			REMARKS: 1/ Hollow-stem augers to top of rock and Tri- cone bit in bedrock 2/ TOC = 569.49 feet above MSL 3/ Original well was screened from .5 feet to 30.5 feet. It was redrilled and replace with the above speci- fications

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Augered to 18.5 feet and install-</u>			<u>LOCATION: U-52</u>
<u>ed well screen assembly. Sand-</u>			<u>WELL No.: B-8a</u>
<u>packed as augers were withdrawn.</u>			<u>DATE COMPLETED: March 6, 1979</u>
<u>Fill: composed of trap rock; sand,</u>			<u>DRILLING COMPANY: Rochester Drilling Co.</u>
<u>fine to coarse; gravel; no</u>			<u>DRILLING METHOD: Hollow-stem auger</u>
<u>odor</u>	<u>1.5</u>	<u>1.5</u>	<u>SAMPLING METHOD: No samples</u>
<u>Fill: of trap rock; gravel; sand,</u>			<u>SAMPLES EXAMINED BY: R. Lamonica</u>
<u>fine to coarse; some silt; gray;</u>			<u>REFERENCE POINT: Grade ¹/₁</u>
<u>loose, wet, no odor</u>	<u>3.0</u>	<u>4.5</u>	<u>ELEVATION OF R. P.: 569.8 feet above MSL</u>
<u>Silt, dark gray; sand, very fine;</u>			<u>CASING: 3.0 feet of 1½-inch gal-</u>
<u>precipitate, soft, white;</u>			<u>vanized</u>
<u>yellow stains; faint odor</u>	<u>1.5</u>	<u>6.0</u>	<u>SCREEN TYPE: Johnson Stainless Steel</u>
<u>Silt, dark gray, micaceous; sand,</u>			<u>DIAM.: 1½ inch SLOT No. 10</u>
<u>very fine; white stained in</u>			<u>SETTING: 3.5 feet - 18.5 feet</u>
<u>places; faint odor</u>	<u>1.5</u>	<u>7.5</u>	<u>PUMPING TEST: DATE:</u>
<u>Silt, dark brown; chemical odor</u>	<u>3.0</u>	<u>10.5</u>	<u>DURATION:</u>
<u>Silt, dark gray; sand, fine to</u>			<u>STATIC WATER LEVEL: 3.28 feet below</u>
<u>medium; some gravel, small;</u>			<u>TOC, March 19, 1979</u>
<u>wet, loose, chemical odor</u>	<u>1.5</u>	<u>12.0</u>	<u>PUMPING WATER LEVEL:</u>
<u>Silt, dark brown</u>	<u>1.5</u>	<u>13.5</u>	<u>YIELD: .5 gpm</u>
<u>Silt, dark brown; sand, very fine</u>	<u>1.5</u>	<u>15.0</u>	<u>REMARKS:</u>
<u>Silt, dark brown; sand, very fine</u>			<u>1/ TOC = 569.59 feet</u>
<u>odor</u>	<u>1.5</u>	<u>16.5</u>	<u>above MSL</u>
<u>(Continued)</u>			

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DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Railroad bed i.e. Trap & silt	2.0	2.0	LOCATION: West side of Bldg.U-81
Crushed stone; gravel; sand fine to coarse; silt; black, dry (fill)	1.5	3.5	WELL No.: B-9
Silt, brown and gray; sand very fine, some medium to coarse; gravel; stones; (fill) chem- ical odor; dry	1.5	5.0	DATE COMPLETED: January 12, 1979
Sand, fine to coarse; silt; clay gray; gravel, cinders; black; (fill) wet, chemical odor	1.5	6.5	DRILLING COMPANY: Rochester Drilling Co.
Sand, fine to very coarse; gravel; silt; black, moist, chemical odor	1.5	8.0	DRILLING METHOD: Hollow-stem auger ^{1/}
Sand, fine to very coarse; gravel; cinders; much silt and clay, gray; wet, chemical odor	1.5	9.5	SAMPLING METHOD: Split Spoon
Sand, very fine; silt; dark gray; strong chemical odor	1.5	11.0	SAMPLES EXAMINED BY: R. Lamonica
Sand, fine to medium; some coarse and very coarse; gravel; silty wet, strong chemical odor, loose, black	4.5	15.5	REFERENCE POINT: Grade ^{2/}
(continued)			ELEVATION OF R. P.: 570.1 feet above MSL
			CASING: 29.5 feet of 1½-inch galvanized
			SCREEN TYPE: Johnson Stainless Steel
			DIA.: 1½ inch SLOT No. 10
			SETTING: 28.5 feet - 33.5 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 16.63 feet below TOC, March 1, 1979
			PUMPING WATER LEVEL: .2 gpm
			YIELD:
			REMARKS:
			1/ Hollow-stem auger to top of rock. Tricone bit in bedrock
			2/ TOC = 570.91 feet above MSL

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)
Sand, fine; silt; black; strong chemical odor	3.0	18.5
Till, red	1.5	20.0
Till, red	1.0	21.0
Till, red, top; sand, fine; bottom	1.5	22.5
Till, red	1.5	24.0
Till, red	.5	24.5
Auger and split spoon refusal	.5	25.0
Till and cobble layers	3.0	28.0
Rock dry top 2 feet, then started making water		
Dolomite bedrock	5.5	33.5

OWNER: Hooker Chemicals and Plastics Corp.

LOCATION: West side of Bldg. U 8

WELL NO.: B-9 (continued)

DATE COMPLETED:

DRILLING COMPANY:

DRILLING METHOD:

SAMPLING METHOD:

SAMPLES EXAMINED BY:

REFERENCE POINT:

ELEVATION OF R. P.:

CASING:

SCREEN TYPE:

DIAM. SLOT NO.

SETTING:

PUMPING TEST DATE:

DURATION:

STATIC WATER LEVEL:

PUMPING WATER LEVEL:

YIELD:

REMARKS:

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Augered to 18 feet and install-			LOCATION: <u>West side of Bldg. U-81</u>
ed a 15 foot screen; sand-			WELL No.: <u>B-9a</u>
packed for its entire length.			DATE COMPLETED: <u>January 13, 1979</u>
Railroad bed i.e. Trap and silt	2.0	2.0	DRILLING COMPANY: <u>Rochester Drilling Co.</u>
Crushed stone; gravel; sand			DRILLING METHOD: <u>Hollow-stem auger</u>
fine to coarse; silt, black,			SAMPLING METHOD: <u>No samples taken</u>
dry (fill)	1.5	3.5	SAMPLES EXAMINED BY: <u>R. Lamonica</u>
Silt, brown and gray; sand very			REFERENCE POINT: <u>Grade ^{1/}</u>
fine, some medium to coarse;			ELEVATION OF R. P.: <u>570.0 feet above MSL</u>
gravel; stones. (fill) chem-			CASING: <u>4 feet of 1½-inch gal-</u>
ical odor; dry	1.5	5.0	vanized
Sand, fine to coarse; silt,			SCREEN TYPE: <u>Johnson Stainless Steel</u>
clay gray; gravel, cinders;			DIA.: <u>1½ inch</u> SLOT NO. <u>10</u>
black; (fill) wet, chemical			SETTING: <u>3 feet- 18 feet</u>
odor	1.5	6.5	PUMPING TEST DATE: _____
Sand, fine to very coarse;			DURATION: _____
gravel; silt; black, moist,			STATIC WATER LEVEL: <u>4.17 feet below</u>
chemical odor	1.5	8.0	TOC, March 1, 1979
Sand, fine to very coarse;			PUMPING WATER LEVEL: _____
gravel; cinders; much silt			YIELD: <u>.5 gpm</u>
and clay, gray; wet, chemical			REMARKS: _____
odor	1.5	9.5	<u>1/</u> TOC.=570.61 feet above MSL
(continued)			

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WELL LOG

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill; broken rock, sand, fine to coarse; silt; chemical odor	1.5	1.5	LOCATION: SW of Bldg N-7
Silt, clayey, brown; few cinders; faint odor	1.5	3.0	WELL No.: B-10
Silt, clayey; brown; with about half the sample being a white soft, chemical precipitate ^{3/}			DATE COMPLETED: January 16, 1979
chemical odor	1.5	4.5	DRILLING COMPANY: Rochester Drilling Co DRILLING METHOD: Hollow stem auger ^{1/}
Fill; of broken rock; gravel; some silt; wet, loose, strong odor	1.5	6.0	SAMPLING METHOD: Split spoon
Fill; of silt; very fine sand; some broken rock; large amounts of black and white precipi- tate; faint odor	1.5	7.5	SAMPLES EXAMINED BY: R. Lamonica REFERENCE POINT: Grade ^{2/}
Fill; of broken rock and brick; gravel; sand, coarse; much white precipitate	1.5	9.0	ELEVATION OF R. P.: 569.7 feet above MSL
Silt; sand, very fine; much white precipitate, chemical odor	1.5	10.5	CASING: 21 feet of 1½-inch gal- vanized SCREEN: Johnson stainless steel TYPE: 1½ inch SLOT No. 10
Sand, very fine to fine, dark brown swamp gas odor	1.5	12.0	SETTING: 20.5-30.5 feet
Sand, very fine to fine, dark brown, swamp gas odor	1.5	13.5	PUMPING TEST: DATE: _____ DURATION: _____ STATIC WATER LEVEL: 11.33 feet below TOC, March 1, 1979 PUMPING WATER LEVEL: _____ YIELD: .25 gpm
(continued)			REMARKS: 1/ Hollow stem augers to top of rock. Tricone bit in bedrock. 2/ TOC = 569.99 feet above MSL 3/ Plant personnel say this used to be a lime stor- age area, and that this may be leached lime

WELL LOG

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Sand, very fine to fine; silty; dark brown; few stones; organic matter;	1.5	15.0	LOCATION: <u>SW of Bldg. N-7</u>
Top: sand, very fine to fine, silty dark brown.			WELL No. <u>B-10 (continued)</u>
Bottom: Till, clay, red; silt; gravel; trace sand, fine to coarse	1.5	16.5	DATE COMPLETED: <u>January 16, 1979</u>
Till; of clay, red; silt; gravel; trace sand, fine to coarse; faint odor	3.0	19.5	DRILLING COMPANY: _____
Till; of clay, red; silt; gravel; trace sand, fine to coarse; no odor	1.5	21.0	DRILLING METHOD: _____
Till; of clay, red; silt; gravel; trace sand, fine to coarse; very hard, dry	1.5	22.5	SAMPLING METHOD: _____
Till, of clay, red; silt; gravel; trace sand, fine to coarse; with broken rock; very hard, dry	1.5	24.0	SAMPLES EXAMINED BY: _____
Till; of clay, wet, sticky, red; with silt; gravel, large, no odor	1.5	25.5	REFERENCE POINT: _____
Refusal		25.5	ELEVATION OF R. P.: _____
Dolomite Bedrock	5.0	30.5	CASING: _____
			SCREEN- TYPE: _____
			DIAM.: _____ SLOT No. _____
			SETTING: _____
			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: _____
			PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Augered to 16 feet and installed			LOCATION: Southwest of Bldg. N-7
feet of screen sand packed			WELL NO.: B-10a
Fill: broken rock, sand, fine to			DATE COMPLETED: January 16, 1979
coarse; silt; chemical odor	1.5	1.5	DRILLING COMPANY: Rochester Drilling Co.
Silt, clayey, brown; few cinders;			DRILLING METHOD: Hollow-stem auger
faint odor	1.5	3.0	SAMPLING METHOD: No samples
Silt, clayey; brown; with about half			SAMPLES EXAMINED BY: R. Lamonica
the sample being a white soft,			REFERENCE POINT: Grade ^{1/}
chemical precipitate ^{2/} , chemical			ELEVATION OF R. P.: 569.4 feet above MSL
odor	1.5	4.5	CASING: 1.0 feet of 1½-inch galvanized
Fill: of broken rock; gravel; some			SCREEN TYPE: Johnson Stainless Steel
silt; wet, loose, strong odor	1.5	6.0	DIAM. 1½ inch SLOT No 10
Fill: of silt; very fine sand; some			SETTING: 1.5-16.5 feet
broken rock; large amounts of			PUMPING TEST: DATE:
black and white precipitate; faint			DURATION:
odor	1.5	7.5	STATIC WATER LEVEL: 1.50 feet below TOC March 1, 1979
Fill: of broken rock and brick;			PUMPING WATER LEVEL:
gravel; sand, coarse; much white			YIELD: .20 gpm
precipitate	1.5	9.0	REMARKS:
Silt; sand, very fine; much white			
precipitate, chemical odor	1.5	10.5	
Sand, very fine to fine, dark brown			
swamp gas odor	1.5	12.0	
Sand, very fine to fine, dark brown,			
swamp gas odor	1.5	13.5	
(Continued)			

^{1/} TOC = 569.04 feet above MSL

^{2/} Plant personnel say this used to be a lime storage area, and that this may be leached lime

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Augered through top fill</u>	<u>1.5</u>	<u>1.5</u>	<u>LOCATION: West end of "N" area storage tanks</u>
<u>Fill; of sand medium to coarse; stones; chemical odor</u>	<u>1.5</u>	<u>3.0</u>	<u>WELL No. B-11</u>
<u>Fill; of sand, medium to coarse; stones; chemical odor</u>	<u>1.5</u>	<u>4.5</u>	<u>DATE COMPLETED: January 15, 1979</u>
<u>No return</u>	<u>1.5</u>	<u>6.0</u>	<u>DILLING COMPANY: Rochester Drilling Co.</u>
<u>No return</u>	<u>1.5</u>	<u>7.5</u>	<u>DILLING METHOD: Hollow-stem auger ^{1/}</u>
<u>Silt; sand, fine; stones; or- ganic matter</u>	<u>1.5</u>	<u>9.0</u>	<u>SAMPLING METHOD: Split Spoon</u>
<u>Sand, very fine to fine; chem- ical odor</u>	<u>1.5</u>	<u>10.5</u>	<u>SAMPLES EXAMINED BY: R. Lamonica</u>
<u>Top: silt, clayey; with sand, fine to coarse, Bottom: clay, red-brown; chemical odor</u>	<u>1.5</u>	<u>12.0</u>	<u>REFERENCE POINT: Grade ^{2/}</u>
<u>Sand, very fine to fine; faint odor</u>	<u>1.5</u>	<u>13.5</u>	<u>ELEVATION OF R. P.: 567.4 feet</u>
<u>Sand, as above; some gravel</u>	<u>1.5</u>	<u>15.0</u>	<u>CASING: 25.6 feet of 1 1/2-inch gal vanized</u>
<u>Till; of silt; clay; brown-red; gravel</u>	<u>9.0</u>	<u>24.0</u>	<u>SCREEN TYPE: Johnson Stainless Steel</u>
<u>Roller Rock for 5 ft.; Dolomite bedrock</u>	<u>5.0</u>	<u>29.0</u>	<u>DIAM.: 1 1/2 inch SLOT No. 10</u>
			<u>SETTING: 24 feet to 29 feet</u>
			<u>PUMPING TEST: DATE:</u>
			<u>DURATION:</u>
			<u>STATIC WATER LEVEL: 9.10 feet below TOC, March 1, 1979</u>
			<u>PUMPING WATER LEVEL:</u>
			<u>YIELD: .75 gpm</u>
			<u>REMARKS:</u>
			<u>1/ Hollow-stem auger to top of rock. Tricone bit in bedrock.</u>
			<u>2/ TOC = 568.50 feet above MSL</u>

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Augered to 12 feet and install- ed and sand packed a ten foot screen with a two foot riser.			LOCATION: <u>West end of "N" area storage tanks</u>
Augered through top fill	1.5	1.5	WELL No.: <u>B-11a</u>
Fill; of sand medium to coarse; stones; chemical odor	1.5	3.0	DATE COMPLETED: <u>January 16, 1979</u>
Fill; of sand, medium to coarse; stones; chemical odor	1.5	4.5	DRILLING COMPANY: <u>Rochester Drilling Co.</u>
No return	1.5	6.0	DRILLING METHOD: <u>Hollow-stem auger</u>
No return	1.5	7.5	SAMPLING METHOD: <u>No samples</u>
Silt; sand, fine; stones; or- ganic matter	1.5	9.0	SAMPLES EXAMINED BY: <u>R. Lamonica</u>
Sand, very fine to fine; chem- ical odor	1.5	10.5	REFERENCE POINT: <u>Grade ¹/₁</u>
Top: silt, clayey; with sand, fine to coarse, Bottom: clay red-brown; chemical odor	1.5	12.0	ELEVATION OF R. P.: <u>567.4 feet above MSL</u>
			CASING: <u>2 feet of 1½-inch gal- vanized</u>
			SCREEN: TYPE: <u>Johnson Stainless Steel</u>
			DIAM.: <u>1½ inch</u> SLOT No. <u>10</u>
			SETTING: <u>2 feet - 12 feet</u>
			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: <u>1.45 feet below TOC, March 1, 1979</u>
			PUMPING WATER LEVEL: _____
			YIELD: <u>3 gpm</u>
			REMARKS: <u>1/ TOC = 568.48 feet above MSL</u>

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Fill; composed of sand, fine</u>			<u>LOCATION: North of "N" area</u>
<u>to very coarse; gravel; silt;</u>			<u>storage tanks</u>
<u>dry, strong chemical odor</u>	<u>1.5</u>	<u>1.5</u>	<u>WELL No. B-12</u>
<u>Fill; (sand, fine to coarse;</u>			<u>DATE COMPLETED: January 16, 1979</u>
<u>silt; gravel) moist, strong</u>			<u>DRILLING COMPANY: Rochester Drilling Co</u>
<u>odor</u>	<u>1.5</u>	<u>3.0</u>	<u>DRILLING METHOD: Hollow-stem auger^{1/}</u>
<u>Fill; (stones; sand, fine to</u>			<u>SAMPLING METHOD: Split Spoon</u>
<u>coarse; silt;) moist, strong</u>			<u>SAMPLES EXAMINED BY: R. Lamonica</u>
<u>odor</u>	<u>1.5</u>	<u>4.5</u>	<u>REFERENCE POINT: Grade^{2/}</u>
<u>Fill; (as above); wet, strong</u>			<u>ELEVATION OF R. P.: 568.6 feet above MSL</u>
<u>odor; much white soft chem-</u>			<u>CASING: 27.5 feet of 1½-inch</u>
<u>ical precipitate</u>	<u>1.5</u>	<u>6.0</u>	<u>galvanized</u>
<u>Fill; composed of silt; sand,</u>			<u>SCREEN TYPE: Johnson Stainless Steel</u>
<u>fine to coarse; gravel;</u>			<u>DIAM. 1½ inch SLOT NO. 10</u>
<u>broken rock and brick; wet,</u>			<u>SETTING: 26.5 feet - 31.5 feet</u>
<u>strong odor, white pasty</u>			<u>PUMPING TEST:</u>
<u>chemical precipitate(lime)</u>	<u>1.5</u>	<u>7.5</u>	<u>DATE:</u>
<u>Fill; (as above); wet, strong</u>			<u>DURATION:</u>
<u>odor</u>	<u>1.5</u>	<u>9.0</u>	<u>STATIC WATER LEVEL: 10.33</u>
<u>Sand, very fine to fine, black;</u>			<u>March 1, 1979</u>
<u>some stones; brick, anthra-</u>			<u>PUMPING WATER LEVEL:</u>
<u>cite; some silt; wet, strong</u>			<u>YIELD: .5 gpm</u>
<u>odor</u>	<u>1.5</u>	<u>10.5</u>	<u>REMARKS:</u>
<u>(Continued)</u>			<u>1/ Hollow-stem augers to</u>
			<u>top of rock; Tricone</u>
			<u>bit in bedrock</u>
			<u>2/ TOC.=569.92 feet</u>
			<u>above MSL</u>

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Sand, very fine to fine, black;</u>			LOCATION: <u>North of "N" area</u>
<u>some stones, brick, anthra-</u>			<u>storage tanks</u>
<u>cite; some silt; wet, strong</u>			WELL NO.: <u>B-12(continued)</u>
<u>odor</u>	<u>1.5</u>	<u>12.0</u>	DATE COMPLETED: _____
<u>Sand, very fine to fine, black;</u>			DRILLING COMPANY: _____
<u>wet, less odor</u>	<u>1.5</u>	<u>13.5</u>	DRILLING METHOD: _____
<u>Sand, very fine to fine; some</u>			SAMPLING METHOD: _____
<u>stones; faint odor</u>	<u>1.5</u>	<u>15.0</u>	SAMPLES EXAMINED BY: _____
<u>Sand, very fine to fine; some</u>			REFERENCE POINT: _____
<u>silt, trace clay; faint odor</u>	<u>1.5</u>	<u>16.5</u>	ELEVATION OF R. P.: _____
<u>Sand, very fine to fine; some</u>			CASING: _____
<u>silt; no odor</u>	<u>4.5</u>	<u>21.0</u>	SCREEN- TYPE: _____
<u>Till; composed of clay, brown-</u>			DIAM. _____ SLOT NO. _____
<u>red; silt; gravel; stones;</u>			SETTING: _____
<u>hard, dry - <i>subangular</i> -</u>	<u>1.5</u>	<u>22.5</u>	PUMPING TEST: DATE: _____
<u>Till; (same as above) <u>slight</u></u>			DURATION: _____
<u>odor</u>	<u>1.5</u>	<u>24.0</u>	STATIC WATER LEVEL: _____
<u>Till; (same as above): <u>slight</u></u>			PUMPING WATER LEVEL: _____
<u>odor</u>	<u>1.5</u>	<u>25.5</u>	YIELD: _____
<u>Till; composed of <i>stone</i> <i>subangular</i> <i>A</i> gravel; <i>A</i> clay.</u>			REMARKS: _____
<u>brown-red; silt; wet, no odor</u>	<u>1.0</u>	<u>26.5</u>	
<u>Refusal</u>		<u>26.5</u>	
<u>Rock drill in dolomite bedrock</u>	<u>5.0</u>	<u>31.5</u>	

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Augered to 21 feet and installed 15 feet of screen; sand packed for its entire length.			LOCATION: North of "N" area storage tanks WELL No.: B-12a
Fill; composed of sand, fine to very coarse; gravel; silt; dry, strong chemical odor	1.5	1.5	DATE COMPLETED: January 17, 1979
Fill; (sand, fine to coarse; silt; gravel) moist, strong odor	1.5	3.0	DRILLING COMPANY: Rochester Drilling Co.
Fill; (stones; sand, fine to coarse; silt;) moist, strong odor	1.5	4.5	DRILLING METHOD: Hollow-stem auger
Fill; (as above); wet, strong odor; much white soft chemical precipi- tate	1.5	6.0	SAMPLING METHOD: No samples
Fill; composed of silt; sand, fine to coarse; gravel; broken rock and brick; wet, strong odor, white pasty chemical precipitate(lime)	1.5	7.5	SAMPLES: EXAMINED BY: R. Lamonica
Fill; (as above); wet, strong odor	1.5	9.0	REFERENCE POINT: Grade ^{1/}
Sand, very fine to fine, black; some stones; brick, anthracite; some silt; wet, strong odor	1.5	10.5	ELEVATION OF R. P.: 5 69.0 feet above MSL
Sand, very fine to fine, black; some stones, brick, anthracite; some silt; wet, strong odor	1.5	12.0	CASING: 7 feet of 1½-inch gal- vanized SCREEN: TYPE: Johnson Stainless Steel
(CONTINUED)			DIAM.: 1½ inch SLOT No. 10 SETTING: 6 feet - 21 feet PUMPING TEST: DATE: DURATION: STATIC WATER LEVEL: 1.49 feet below TOC, March 1, 1979 PUMPING WATER LEVEL: YIELD: .5 gpm REMARKS: 1/ Grade=1.34 feet below top of casing TOC.=57035 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Sand, very fine to fine, black; wet,</u>			<u>LOCATION: North of "N" area</u>
<u>less odor</u>	<u>1.5</u>	<u>13.5</u>	<u>storage tanks</u>
<u>Sand, very fine to fine; some stones</u>			<u>WELL No. B-12a (continued)</u>
<u>faint odor</u>	<u>1.5</u>	<u>15.0</u>	<u>DATE</u>
<u>Sand, very fine to fine; some silt,</u>			<u>COMPLETED:</u>
<u>trace clay; faint odor</u>	<u>1.5</u>	<u>16.5</u>	<u>DRILLING</u>
<u>Sand, very fine to fine; some silt;</u>			<u>COMPANY:</u>
<u>no odor</u>	<u>4.5</u>	<u>21.0</u>	<u>DRILLING</u>
			<u>METHOD:</u>
			<u>SAMPLING</u>
			<u>METHOD:</u>
			<u>SAMPLES:</u>
			<u>EXAMINED BY:</u>
			<u>REFERENCE</u>
			<u>POINT:</u>
			<u>ELEVATION</u>
			<u>OF R. P.:</u>
			<u>CASING:</u>
			<u>SCREEN:</u>
			<u>TYPE:</u>
			<u>DIAM.:</u> <u>SLOT NO.</u>
			<u>SETTING:</u>
			<u>PUMPING TEST:</u>
			<u>DATE:</u>
			<u>DURATION:</u>
			<u>STATIC WATER</u>
			<u>LEVEL:</u>
			<u>PUMPING WATER</u>
			<u>LEVEL:</u>
			<u>YIELD:</u>
			<u>REMARKS:</u>

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Fill; composed of rocks; stones;</u>			<u>LOCATION: East end of "N" area</u>
<u>gravel; sand, fine to coarse; silt</u>			<u>storage tanks</u>
<u>and clay; chemical odor</u>	<u>1.5</u>	<u>1.5</u>	<u>WELL No. B-13</u>
<u>Fill; of sand, medium to coarse,</u>			<u>DATE COMPLETED: 1/18/79</u>
<u>some fine; silt; stones; much</u>			<u>DRILLING COMPANY: Rochester Drilling Co</u>
<u>white, soft precipitate; chemical</u>			<u>DRILLING METHOD: Hollow-stem augers^{1/}</u>
<u>odor</u>	<u>3.0</u>	<u>4.5</u>	<u>SAMPLING METHOD: Split Spoon</u>
<u>Fill; silt; tarry substance; wood;</u>			<u>SAMPLES EXAMINED BY: R. Lamonica</u>
<u>sand; stones; chemical odor</u>	<u>1.5</u>	<u>6.0</u>	<u>REFERENCE POINT: Grade^{2/}</u>
<u>Fill; rocks; silt; sand; petroleum</u>			<u>ELEVATION OF R. P.: 567.3 feet above MSL</u>
<u>odor</u>	<u>1.5</u>	<u>7.5</u>	<u>CASING: 25 feet of 1½ inch gal- vanized</u>
<u>Silt; sand, very fine; black, chem- ical odor</u>	<u>1.5</u>	<u>9.0</u>	<u>SCREEN TYPE: Johnson Stainless Steel</u>
<u>Sand, very fine to fine; silt; black;</u>			<u>DIAM.: 1½ inch SLOT No. 10</u>
<u>chemical odor</u>	<u>1.5</u>	<u>10.5</u>	<u>SETTING: 25 feet - 30 feet</u>
<u>Sand, very fine to fine; silt; black;</u>			<u>PUMPING TEST: DATE:</u>
<u>chemical odor</u>	<u>7.5</u>	<u>18.0</u>	<u>DURATION:</u>
<u>Sand, fine, gray, less odor</u>	<u>1.5</u>	<u>19.5</u>	<u>STATIC WATER LEVEL: 8.75 feet below TC March 1, 1979</u>
<u>Sand, fine, gray-black; chemical</u>			<u>PUMPING WATER LEVEL:</u>
<u>odor</u>	<u>1.5</u>	<u>21.0</u>	<u>YIELD: 10 gpm</u>
<u>Till; of silt, clayey; gravel; red- brown; faint odor</u>	<u>1.5</u>	<u>22.5</u>	<u>REMARKS:</u>
<u>Till; of clay, silty; gravel; faint</u>			<u>1/ Hollow-stem augers to top of rock. Tricone bit in bedrock</u>
<u>odor</u>	<u>1.5</u>	<u>24.0</u>	<u>2/ TOC = 568.44 feet above MSL</u>
(Continued)			

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Augered to 20 feet and installed 20</u>			<u>LOCATION: East end of "N" area</u>
<u>feet of screen, sand packed</u>			<u>storage tanks</u>
<u>ill; composed of rocks; stones;</u>			<u>WELL No. B-13a</u>
<u>gravel; sand, fine to coarse; silt</u>			<u>DATE COMPLETED: January 18, 1979</u>
<u>and clay; chemical odor</u>	1.5	1.5	<u>DRILLING COMPANY: Rochester Drilling Co.</u>
<u>Fill; of sand, medium to coarse,</u>			<u>DRILLING METHOD: Hollow-stem auger</u>
<u>some fine; silt; stones; much</u>			<u>SAMPLING METHOD: none</u>
<u>white, soft precipitate; chemical</u>			<u>SAMPLES EXAMINED BY: R. Lamonica</u>
<u>odor</u>	3.0	4.5	<u>REFERENCE POINT: Grade ^{1/}</u>
<u>ill; silt; tarry substance; wood;</u>			<u>ELEVATION OF R. P.: 567.8 feet above MSL</u>
<u>sand; stones; chemical odor</u>	1.5	6.0	<u>CASING: none</u>
<u>ill; rocks; silt; sand; petroleum</u>			<u>SCREEN TYPE: Johnson Stainless Steel</u>
<u>odor</u>	1.5	7.5	<u>DIAM. 1 1/2 inch SLOT No 10</u>
<u>silt; sand, very fine; black, chem-</u>			<u>SETTING: 0-20 feet</u>
<u>ical odor</u>	1.5	9.0	<u>PUMPING TEST: DATE:</u>
<u>Sand, very fine to fine; silt; black;</u>			<u>DURATION:</u>
<u>chemical odor</u>	1.5	10.5	<u>STATIC WATER LEVEL: .85 feet below TOC</u>
<u>Sand, very fine to fine; silt; black;</u>			<u>March 1, 1979</u>
<u>chemical odor</u>	7.5	18.0	<u>PUMPING WATER LEVEL:</u>
<u>Sand, fine, gray, less odor</u>	1.5	19.5	<u>YIELD: 12 gpm</u>
<u>and, fine, gray-black; chemical</u>			<u>REMARKS:</u>
<u>odor</u>	1.5	21.0	<u>1/ Grade= .58 foot below</u>
			<u>top of casing</u>
			<u>TOC= 568.37 feet</u>
			<u>above MSL</u>

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp, Niaga a Plant
Crushed stone, large pieces, dry	1.5	1.5	
Fill; consisting of silt, brown,			LOCATION: S.W. corner of S-are
some stones; gravel; trace			WELL NO. B-14
sand; dry; chemical odor	3.0	4.5	DATE COMPLETED: January 21, 1979
No return	1.5	6.0	DRILLING COMPANY: Rochester Drilling Co.
Fill; of stones; gravel; clay,			DRILLING METHOD: Hollow-stem auger 1/
gray; silt; some sand, coarse;			SAMPLING METHOD: Split Spoon
wet; chemical odor	1.5	7.5	SAMPLES EXAMINED BY: R. Lamonica
No return	1.5	9.0	REFERENCE POINT: Grade
Fill; of sand, fine to coarse;			ELEVATION OF R. P.:
silt, clayey; gravel; wet;			CASING: None 2/
chemical odor	4.0	13.5	SCREEN TYPE: None
Fill; of sand, very fine to fine,			DIA. SLOT NO.
silty; some gravel; wet; no			SETTING:
odor	1.5	15.0	PUMPING TEST DATE:
Fill; of sand, very fine to			DURATION:
fine, silty; some gravel; clay,			STATIC WATER LEVEL:
gray, soft; wet; odor	1.5	16.5	PUMPING WATER LEVEL:
Fill; of sand, very fine to fine,			YIELD:
some medium; silt; some gravel;			REMARKS:
strong odor	12.0	28.5	1/ Hollow-stem auger to top of rock; tricone bit in bedrock.
Fill; of sand, very fine to fine,			2/ Well was pulled and sealed.
some medium to coarse; silt;			
trace gravel, black, oily			
liquid; strong odor	2.0	30.5	
Fill; of silt; clay; sand, very			
fine to fine, some medium to			

(continued)

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DESCRIPTIONTHICK-
NESS
(FEET)DEPTH
(FEET)

0.5

31.0

LOCATION: _____

WELL NO.: B-14 (continued)

1.7

32.7

DATE COMPLETED: _____

32.7

DRILLING
COMPANY: _____

DRILLING METHOD: _____

SAMPLING METHOD: _____

SAMPLES:
EXAMINED BY: _____

REFERENCE POINT: _____

ELEVATION
OF R. P.: _____

CASING: _____

SCREEN-
TYPE: _____

DIAM. _____ SLOT NO. _____

SETTING: _____

PUMPING TEST:
DATE: _____

DURATION:.....

**STATIC WATER
LEVEL**

PUMPING WATER
LEVEL:_____

YIELD: _____

REMARKS:

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Augered to 31 feet and installed</u>			<u>LOCATION: Southwest corner of "S area</u>
<u>well screen assembly; sand packed,</u>			<u>WELL NO.: B-14b</u>
<u>and withdrew augers</u>			<u>DATE COMPLETED: January 23, 1979</u>
<u>Crushed stone, large pieces, dry</u>	<u>1.5</u>	<u>1.5</u>	<u>DRILLING COMPANY: Rochester Drilling Co.</u>
<u>Fill; consisting of silt, brown</u>			<u>DRILLING METHOD: Hollow-stem auger</u>
<u>some stones; gravel; trace sand;</u>			<u>SAMPLING METHOD: no samples</u>
<u>dry; chemical odor</u>	<u>3.0</u>	<u>4.5</u>	<u>SAMPLES EXAMINED BY: R. Lamonica</u>
<u>No return</u>	<u>1.5</u>	<u>6.0</u>	<u>REFERENCE POINT: Grade ^{1/}</u>
<u>Fill; of stones; gravel; clay, gray;</u>			<u>ELEVATION OF R. P.: 573.0 feet above MSL</u>
<u>silt; some sand, coarse; wet;</u>			<u>CASING: 21 feet of 1½-inch gal- vanized</u>
<u>chemical odor</u>	<u>1.5</u>	<u>7.5</u>	<u>SCREEN: Johnson Stainless Steel</u>
<u>No return</u>	<u>1.5</u>	<u>9.0</u>	<u>DIAM. 1½ inch SLOT NO. 10</u>
<u>Fill; of sand, fine to coarse; silt,</u>			<u>SETTING: 21 feet - 31 feet</u>
<u>clayey; gravel; wet; chemical odor</u>	<u>4.0</u>	<u>13.5</u>	<u>PUMPING TEST: DATE:</u>
<u>Fill; of sand, very fine to fine,</u>			<u>DURATION:</u>
<u>silty; some gravel; wet; no odor</u>	<u>1.5</u>	<u>15.0</u>	<u>STATIC WATER LEVEL: 9.72 feet below TOC, March 1, 1979</u>
<u>Fill; of sand, very fine to fine,</u>			<u>PUMPING WATER LEVEL:</u>
<u>silty; some gravel; clay, gray,</u>			<u>YIELD: 1 gpm</u>
<u>soft; wet; odor</u>	<u>1.5</u>	<u>16.5</u>	<u>REMARKS:</u>
<u>Fill; of sand, very fine to fine,</u>			
<u>some medium; silt; some gravel;</u>			
<u>strong odor</u>	<u>12.0</u>	<u>28.5</u>	
<u>Fill; of sand, very fine to fine,</u>			
<u>some medium to coarse; silt; trace</u>			
<u>gravel, black, oily liquid; strong</u>			
<u>odor</u>	<u>2.0</u>	<u>30.5</u>	
<u>(Continued)</u>			

1/ T.O.C. = 572.78 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION

THICK-
NESS
(FEET)

DEPTH
(FEET)

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: Southwest corner of "C"
area

WELL NO.: B-14b (continued)

DATE
COMPLETED: _____

DRILLING
COMPANY: _____

DRILLING
METHOD: _____

SAMPLING
METHOD: _____

SAMPLES
EXAMINED BY: _____

REFERENCE
POINT: _____

ELEVATION
OF R. P.: _____

CASING: _____

SCREEN:
TYPE: _____

DIAM.: _____ SLOT NO. _____

SETTING: _____

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL: _____

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS:

Fill: of silt; clay; sand, very fine
to fine, some medium to coarse;
stones; strong odor

0.5

31.0

LEGGETTE, BRASHEARS & GRAHAM, INC.

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: South side of "S" area

WELL No.: B-15a

DATE COMPLETED: January 22, 1979

DRILLING COMPANY: Rochester Drilling Co.

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split spoon

SAMPLES:
EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade $\frac{1}{2}$

ELEVATION 572.9 feet above MSL
OF R. F.:

CASING: 5 feet of $1\frac{1}{2}$ -inch gal-
vanized

SCREEN- Johnson Stainless Steel
TYPE:

DIAM. $1\frac{1}{2}$ inch SLOT No. 10

SETTING: 4 feet - 29 feet

PUMPING TEST:
DATE:

DURATION:

STATIC WATER LEVEL: 10.38 feet below
TOC, March 1, 1979

PUMPING WATER
LEVEL:

YIELD: .5 gpm

REMARKS:

1/ TOC = 573.54 feet above
MSL

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WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill; composed of stones; brick;			LOCATION: SE corner of "S" area
gravel; sand, fine to coarse;			WELL No.: B-16
silt; dry; earthy odor	1.5	1.5	DATE COMPLETED: March 1, 1979
Fill; of silt; sand, fine to coarse;			DRILLING COMPANY: Rochester Drilling Co.
brick; stones; dry; white precipitate; faint odor	1.5	3.0	DRILLING METHOD: Drive and wash ^{1/}
Top: Fill of ash and cinders;			SAMPLING METHOD: Split Spoon
Bottom: Fill of silt; and sand,			SAMPLES EXAMINED BY: R. Lamonica
very fine	1.5	4.5	REFERENCE POINT: Grade ^{2/}
Fill; of stones; sand, fine to coarse; silt; brown; dry; no odor	1.5	6.0	ELEVATION OF R. P.: 570.4 feet above MSL
Fill; of brick; stones; gravel;			CASING: 33 feet of 1 1/2-inch galvanized
sand coarse; some silt; wet	1.5	7.5	SCREEN: Johnson Stainless Steel
Fill, of large pieces of broken rock; wet	1.5	9.0	TYPE: 1 1/2 inch SLOT No. 10
rock; wet			SETTING: 31 feet - 36 feet
Fill; large pieces of broken rock;			PUMPING TEST: DATE:
sand, medium to very coarse; wet;			DURATION:
faint odor	1.5	10.5	STATIC WATER LEVEL: 12.26 feet below TOC, March 1, 1979
No return	1.5	12.0	PUMPING WATER LEVEL:
Fill; of broken rock; gravel; sand,			YIELD: 7 gpm
fine to coarse; silt; black; wet	1.5	13.5	REMARKS: 1/ augered to top of clay; drive and wash to top of rock; rock core in bedrock
Fill; of silt; sand, very fine	6.0	19.5	 2/ TOC = 572.27 feet above MSL
Sand, very fine to fine; loose, wet;			
leaves; odor	1.5	21.0	
(Continued)			

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

Page 2 of 2

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: Southeast corner of "S"
area

WELL NO.: B-16 (continued)

DATE
COMPLETED: _____

DRILLING
COMPANY: _____

DRILLING
METHOD: _____

SAMPLING
METHOD: _____

SAMPLES:
EXAMINED BY: _____

REFERENCE
POINT: _____

ELEVATION
OF R. P.: _____

CASING: _____

SCREEN:
TYPE: _____

DIA.: _____ SLOT NO. _____

SETTING: _____

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL: _____

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS:

WELL LOG

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Fill; composed of stones; brick;			LOCATION: <u>Southeast corner of "S"</u>
gravel; sand, fine to coarse;			area
silt; dry; earthy odor	1.5	1.5	WELL NO.: <u>B-16a</u>
Fill; of silt; sand, fine to coarse;			DATE COMPLETED: <u>January 22, 1979</u>
brick; stones; dry; white preci-			DRILLING COMPANY: <u>Rochester Drilling Co</u>
pitrate; faint odor	1.5	3.0	DRILLING METHOD: <u>Hollow-stem auger</u>
Top: Fill of ash and cinders;			SAMPLING METHOD: <u>Split spoon</u>
Bottom: Fill of silt; and sand,			SAMPLES EXAMINED BY: <u>R. Lamonica</u>
very fine	1.5	4.5	REFERENCE POINT: <u>Grade ¹/₁</u>
Fill; of stones; sand, fine to coarse;			ELEVATION OF R. P.: <u>570.6 feet above MSL</u>
silt; brown; dry; no odor	1.5	6.0	CASING: <u>7 feet of 1½-inch gal-</u>
Fill; of brick; stones; gravel:			vanized
sand coarse; some silt; wet	1.5	7.5	SCREEN TYPE: <u>Johnson Stainless Steel</u>
Fill of large pieces of broken			DIAM. <u>1½ inch</u> SLOT NO. <u>10</u>
rock; wet	1.5	9.0	SETTING: <u>6 feet - 26 feet</u>
Fill; large pieces of broken rock;			PUMPING TEST DATE: _____
sand, medium to very coarse; wet;			DURATION: _____
faint odor	1.5	10.5	STATIC WATER LEVEL: <u>8.18 feet below TOC</u>
No return	1.5	12.0	March 1, 1979
Fill; of broken rock; gravel; sand,			PUMPING WATER LEVEL: _____
fine to coarse; silt; black; wet	1.5	13.5	YIELD: <u>5 gpm</u>
Fill; of silt; sand, very fine	6.0	19.5	REMARKS: _____
Sand, very fine to fine; loose, wet;			
leaves; odor	1.5	21.0	
(Continued)			

1/ TOC = 571.64 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Fill, composed of sand, fine to very coarse; silt; stones; brick; dry; chemical odor	1.5	1.5	LOCATION: East side of S-Area B-17
No return	1.5	3.0	WELL No.:
Fill, composed of sand, fine to very coarse; silt; stones; brick; dry; chemical odor	1.5	4.5	DATE COMPLETED: February 28, 1979 Rochester Drilling Company
Fill, composed of sand, fine to very coarse; silt; stones; brick; wet; chemical odor	1.5	6.0	DILLING METHOD: Drive and wash ^{1/}
Fill; of sand, coarse; cinders; silt; stones; brick; wood; wet; chemical odor	1.5	7.5	SAMPLING METHOD: Split spoon
Fill; of sand, coarse; cinders; silt; stones; brick; wood; wet; chemical odor; black, oily liquid	1.5	9.0	SAMPLES EXAMINED BY: R. Lamonica
Fill; of sand, very coarse; gravel; silt; clay; wet; strong chemical odor	1.5	10.5	REFERENCE POINT: Grade ^{2/}
Fill; of sand, very coarse; gravel; silt; clay; wet; black oily liquid; strong odor	1.5	12.0	ELEVATION OF R. P.: 571.7 feet above MSL
Fill; of silt; sand, very fine; mixed with some coarse fill; chemical odor, not wet	1.5	13.5	CASING: 34 feet of 1½-in galvan- ized
Sand, very fine to fine; silt; chemical odor	6.0	19.5	SCREEN: Johnson stainless steel
			DIAM: 1½-in SLOT NO: 10
			SETTING: 33 feet-38 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 13.08 feet below TOC March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: 4 gpm
			REMARKS:
			^{1/} Auger to top of clay; drive and wash to top of rock; tricone rock bit in bedrock.
			^{2/} T.O.C. = 573.01 feet above MSL

(continued)

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CONSULTING GROUND-WATER GEOLOGISTS

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Fill, composed of sand, fine to very coarse; silt; stones; brick; dry; chemical odor	1.5	1.5	LOCATION: East side of S-Area
No return	1.5	3.0	WELL NO.: B-17a
Fill, composed of sand, fine to very coarse; silt; stones; brick; dry; chemical odor	1.5	4.5	DATE COMPLETED: January 22, 1979 DRILLING COMPANY: Rochester Drilling Company
Fill, composed of sand, fine to very coarse; silt; stones; brick; wet; chemical odor	1.5	6.0	DRILLING METHOD: Hollow-stem auger SAMPLING METHOD: Split spoon
Fill; of sand, coarse; cinders; silt; stones; brick; wood; wet; chemical odor	1.5	7.5	SAMPLES EXAMINED BY: R. Lamonica REFERENCE POINT: Grade ¹ / ₁
Fill; of sand, coarse; cinders; silt; stones; brick; wood; wet; chemical odor; black, oily liquid	1.5	9.0	ELEVATION OF R. P.: 571.9 feet above MSL CASING: 8 feet of 1½-in galvanized
Fill; of sand, very coarse; gravel; silt; clay; wet; strong chemical odor	1.5	10.5	SCREEN TYPE: Johnson stainless steel DIAM.: 1½-in SLOT NO. 10
Fill; of sand, very coarse; gravel; silt; clay; wet; black oily liquid; strong odor	1.5	12.0	SETTING: 7 feet - 22 feet PUMPING TEST DATE: _____ DURATION: _____
Fill; of silt; sand, very fine; mixed with some coarse fill; chemical odor, not wet	1.5	13.5	STATIC WATER LEVEL: 7.89 feet below TOC, March 1, 1979 PUMPING WATER LEVEL: _____ YIELD: .5 gpm
Sand, very fine to fine; silt; chemi- cal odor	6.0	19.5	REMARKS: 1/ TOC = 573.83 feet above MSL.

(continued)

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Augered through cobble and stone fill	4.5	4.5	LOCATION: NE corner of S-Area
Fill; composed of stones; sand, coarse; silt; root matter; no odor; wet	1.5	6.0	WELL No.: B-18
Fill: of silt, clayey, black; very fine sand; chemical odor	3.0	9.0	DATE COMPLETED: February 22, 1979
Silt, clayey; sand, very fine; gray; odor	1.5	10.5	DRILLING COMPANY: Rochester Drilling Company
Silt, clayey, gray; with sand, very fine; some sand, coarse, and gravel; odor	4.5	15.0	DRILLING METHOD: Hollow-stem auger ^{1/}
Fill: of silt; clayey; sand, very fine; loose, wet, less odor	2.5	17.5	SAMPLING METHOD: Split spoon
Clay, red-brown, sticky	.5	18.0	SAMPLES EXAMINED BY: Robert Lamonica & G. S. Sikora
Clay, plastic, reddish-brown	11.0	29.0	REFERENCE POINT: Grade ^{2/}
Clay, plastic, reddish-brown; little gravel, coarse	1.5	30.5	ELEVATION OF R. P.: 571.3 feet above MSL
Clay, plastic, red-brown	1.5	31.5	33 feet of 1½-inch galvanized
Clay, plastic, reddish-brown; little gravel, fine; trace of black oily substance	1.5	33.0	CASING: Johnson stainless steel
Bedrock, dark gray	5.0	38.0	DIAM.: 1½-inch SLOT NO. 10
			SETTING: 33 feet - 38 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 13.55 feet below
			TOC, March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: .2 gpm
			REMARKS:
			1/ Hollow-stem augers to top of clay; drive and wash to top of rock; tricone bit in bedrock.
			2/ TOC.=573.46 feet above MSL

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER:
Augered through cobble and stone fill	4.5	4.5	Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Fill; composed of stones; sand, coarse;			LOCATION: Northeast corner of S-Area
silt; root matter; no odor; wet	1.5	6.0	WELL NO.: B-18a
Fill; of silt, clayey, black; very			DATE COMPLETED: January 23, 1979
fine sand; chemical odor	3.0	9.0	DRILLING COMPANY: Rochester Drilling Company
Silt, clayey; sand, very fine; gray;			DRILLING METHOD: Hollow-stem auger
odor	1.5	10.5	SAMPLING METHOD: Split spoon
Silt, clayey, gray; with sand, very			SAMPLES EXAMINED BY: R. Lamonica
fine; some sand, coarse; and			REFERENCE POINT: Grade ¹ / ₁
gravel; odor	4.5	15.0	ELEVATION OF R. P.: 571.3 feet above MS 5 feet of 1½-inch galvanized
Fill; of silt; clayey; sand, very			CASING: Johnson Stainless Ste 1
fine; loose, wet, less odor	2.5	17.5	DIAM.: 1½-in SLOT NO. 10
Clay, red-brown, sticky	.5	18.0	SETTING: 2 feet - 17 feet
			PUMPING TEST: DATE:
			DURATION: 7.00 feet below T
			STATIC WATER LEVEL: March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: 5 gpm
			REMARKS:
			1/ TOC = 574.55 feet above MSL

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
No return (fill)	1.5	1.5	LOCATION: East side of Bldg.V-8C
Fill, of rock; silt; sand, black, wet; chemical odor	7.0	8.5	WELL No.: B-19
Clay, brown-red, hard	0.5	9.0	DATE COMPLETED: March 6, 1979
Clay, brown-red, hard, varved	1.5	10.5	DRILLING COMPANY: Rochester Drilling Company
No sample to insure good seal with the 6-inch casing	1.5	12.0	DRILLING METHOD: Drive and wash ^{1/}
Silt, brown; clayey	1.5	13.5	SAMPLING METHOD: Split spoon
Clay, brown-red, very stiff	1.5	15.0	SAMPLES EXAMINED BY: R. Lamonica
Clay, brown-red, sticky	9.0	24.0	REFERENCE POINT: Grade ^{2/}
Till, composed of silt, brown-red; - sand, fine to medium; gravel, small to large, rounded; stones, rounded; trace clay, moist, hard	1.5	25.5	ELEVATION OF R. P.: 571.6 feet above MSL
Till, composed of gravel, small to large; sand, fine to very coarse; clay, red, sticky; silt; stones	1.5	27.0	CASING: 30.5 feet of 1 1/2-inch galvanized SCREEN TYPE: Johnson stainless steel
Till, composed of silt, red; clay, red, sticky; gravel, small; sand, fine to coarse	1.5	28.5	DIA.: 1 1/2-inch SLOT No. 10
Broken rock (no sample)	2.0	30.5	SETTING: 30.5 - 35.5 feet
Dolomite bedrock	5.0	35.5	PUMPING TEST DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: 11.67 feet below TOC, March 19, 1979
			PUMPING WATER LEVEL: _____
			YIELD: .5 gallons per hour
			REMARKS: ^{1/} Hollow-stem auger to top of clay; drive and wash to top of rock; tricone rock bit in bedrock.
			^{2/} TOC = 571.11 feet above MSL

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	
No return (fill)	1.5	1.5	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Fill, of rock; silt; sand, black, wet; chemical odor	7.0	8.5	LOCATION: East side of Bldg.V-80
Clay, brown-red, hard	0.5	9.0	WELL NO.: B-19a
Clay, brown-red, hard, varved	1.5	10.5	DATE COMPLETED: January 24, 1979
			DRILLING COMPANY: Rochester Drilling Company
			DRILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: Split spoon
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade ^{1/}
			ELEVATION OF R. P.: 571.6 feet above MS
			CASING: 4 feet of 1½-inch gal- vanized
			SCREEN: Johnson stainless steel
			DIAM.: 1½-inch SLOT NO. 10
			SETTING: 4.5-9.5 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 4.83 feet below TOC, March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: 2 gpm
			REMARKS:
			1/ TOC = 571.50 feet above MSL

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Crushed stone (no return)	1.5	1.5	LOCATION: on Buff. Ave near 53rd
Crushed stone; gravel; sand, coarse; chemical odor; dry	1.5	3.0	WELL No.: B-20
Silt, tan; chemical odor, dry	1.5	4.5	DATE COMPLETED: February 17, 1979
Silt, tan; no odor, dry	1.5	6.0	DRILLING COMPANY: Rochester Drilling Co
Silt, tan; faint odor, dry	2.0	8.0	DRILLING METHOD: Hollow-stem auger ^{1/}
Clay, brown-red, silty, hard	1.0	9.0	SAMPLING METHOD: Split Spoon
Clay, silty, hard, brown	3.0	12.0	SAMPLES EXAMINED BY: G. Sikora & R. Lamoni
Clay, plastic, brown-gray	7.5	19.5	REFERENCE POINT: Grade ^{2/}
Till, silty, brown; some cobbles, - angular, dark gray; little sand; trace of white mineral (appears as secondary mineralization in cracks and veins)	1.5	21.0	ELEVATION OF R. P.: 572.2 feet above MSL
Till, clayey, brown; some sand, coarse and cobbles, angular dark gray	1.5	22.5	CASING: 26 feet of 1½-inch gal- vanized SCREEN TYPE: Johnson Stainless Steel
Till, silty, hard, brown; some cob- bles, angular, dark gray	1.5	24.0	DIAM. 1½-inch SLOT NO. 10
No recovery	1.5	25.5	SETTING: 26-31 feet
Bedrock, dark gray	5.5	31.0	PUMPING TEST: DATE: _____
5" to 25'			DURATION: _____
6" to 9'			STATIC WATER LEVEL: 12.95 feet below TOC, March 1, 1979
			PUMPING WATER LEVEL: _____
			Approximately 8 hour YIELD: recovery from evacuation
			REMARKS: 1/ Hollow-stem auger to top of clay; drive ar wash to top of rock; tricone bit in bed- rock.
			2/ TOC = 571.78 feet above MSL

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DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemical and Plastics Corp. Niagara Falls Plant
Crushed stone (no return)	1.5	1.5	LOCATION: Buff. Ave. near 53rd St
Crushed stone; gravel; sand, coarse; chemical odor, dry	1.5	3.0	WELL No. B-20a
Silt, tan; chemical odor, dry	1.5	4.5	DATE COMPLETED: February 19, 1979
Silt, tan; no odor, dry	1.5	6.0	DILLING COMPANY: Rochester Drilling Co.
Silt, tan; faint odor, dry	2.0	8.0	DILLING METHOD: Hollow -stem auger
Clay, brown-red. silty, hard	1.0	9.0	SAMPLING METHOD: Split spoon
Clay, silty, hard, brown	0.5	9.5	SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: grade 1/
			ELEVATION OF R. P.: 572.2 feet above MSL
			CASING: 4 1/2 feet of 1 1/2-inch galvanized
			SCREEN TYPE: Johnson Stainless Steel
			DIAM. 1 1/2-inch SLOT No. 10
			SETTING: 4 1/2 - 9 1/2 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 3.96 feet below TOC, March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: .15 gpm
			REMARKS:
			1/ TOC = 572.06 feet above MSL

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER:
Crushed stone (no return)	1.5	1.5	Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Crushed stone; gravel; sand, coarse; chemical odor; dry	1.5	3.0	LOCATION: Buff. Ave near 53rd St
Silt, tan; chemical odor; dry	1.5	4.5	WELL NO.: B-20a (Abandoned)
Silt, tan; no odor, dry	1.5	6.0	DATE COMPLETED: January 23, 1979
Silt, tan; faint odor, dry	1.5	7.5	DRILLING COMPANY: Rochester Drilling Co.
Change to clay at	.5	8.0	DRILLING METHOD: Hollow-stem auger
Clay, brown-red, silty, hard	1.0	9.0	SAMPLING METHOD: Split Spoon
Dry hole - abandoned			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade
			ELEVATION OF R. P.: _____
			CASING: None
			SCREEN TYPE: None
			DIAM.: _____ SLOT NO. _____
			SETTING: _____
			PUMPING TEST: _____
			DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: _____
			PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp., Niagara Falls Plant</u>
Silt, black	1.5	1.5	LOCATION: <u>Bldg. M-25</u>
Silt, tan-gray	1.5	3.0	WELL NO.: <u>B-21 Replacement</u>
Silt, tan-gray, clayey	1.5	4.5	DATE COMPLETED: <u>February 9, 1979</u>
Silt, tan-gray, clayey	1.5	6.0	DRILLING COMPANY: <u>Rochester Drilling Company</u>
Silt; sand, very fine; clayey	1.5	7.5	DRILLING METHOD: <u>Hollow-stem auger</u>
Top: Silt; sand, very fine; tan			SAMPLING METHOD: <u>Split spoon</u>
Bottom: Clay, brown-red	1.5	9.0	SAMPLES EXAMINED BY: <u>R. Lamonica</u>
Clay, brown-red, stiff, dry	4.5	13.5	REFERENCE POINT: <u>Grade 3/</u>
Clay, brown-red, sticky	4.5	18.0	ELEVATION OF R. P.: <u>572.9 feet above MSL</u>
Till, composed of clay, brown-red,			CASING: <u>30 feet of 1 1/2-inch ga- vanized</u>
sticky; gravel; stones; sand,			SCREEN TYPE: <u>Johnson Stainless Steel</u>
coarse	2.0	20.0	DIAM.: <u>1 1/2 inch</u> SLOT NO. <u>10</u>
Till & fractured rock (no samples)	7.5	27.5	SETTING: <u>30-35 feet</u>
Bedrock	10.0	37.5	PUMPING TEST: _____
			DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: <u>18.69 feet below TOC, March 19, 1979</u>
			PUMPING WATER LEVEL: _____
			YIELD: <u>.15 gpm</u>
			REMARKS:
			<u>1/</u> Original well grouted to top due to faulty construction
			<u>2/</u> Augers to top of clay; drive and wash to top of rock; tricone bit in rock.
			<u>3/</u> TOC = 573.01 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: Building M-25

WELL NO.: B-21a

DATE COMPLETED: January 24, 1979

DRILLING COMPANY: Rochester Drilling Co.

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split spoon

SAMPLES EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade ¹/₂

ELEVATION: 572.9 feet above MSL
OF R. F.:

CASING: 4 feet of 1½-inch gal-
vanized

SCREEN TYPE: Johnson Stainless Steel

DIAM.: 1½ inch SLOT NO. 10

SETTING: 4 feet - 9 feet

PUMPING TEST: DATE:

DURATION:

STATIC WATER LEVEL: 3.34 feet below
TOC, March 1, 1979

PUMPING WATER LEVEL:

YIELD: 1 gpm

REMARKS:

1/₂ TOC. = 572.79 feet above
MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

Page 1 of 1

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: Northeast Gate Pkg. Lot

WELL No.: B-22

DATE COMPLETED: March 6, 1979

DRILLING COMPANY: Rochester Drilling Co.

DRILLING METHOD: Drive and Wash^{1/}

SAMPLING METHOD: Split spoon

SAMPLES: R. Lamonica
EXAMINED BY:

REFERENCE POINT: Grade^{2/}

ELEVATION 573.2 feet above MS
OF R. P.:

CASING: 23.5 feet of 1 1/2-inch
galvanized

SCREEN: Johnson Stainless Steel
TYPE:

DIAMETER: 1 1/2 inch SLOT NO. 10

SETTING: 24 feet - 29 feet

PUMPING TEST:
DATE:

DURATION:

STATIC WATER LEVEL: 14.85 feet below
TOC, March 19, 1979

PUMPING WATER LEVEL:

YIELD: .15 gpm

REMARKS: 1/ Augers to top of clay;
drive and wash to top
of rocks; Tricone bit
in bedrock.

2/ TOC=572.73 feet above
MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: 53rd St. Parking Lot

WELL NO.: B-22a

DATE COMPLETED: January 24, 1979

DRILLING COMPANY: Rochester Drilling Co.

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split spoon

SAMPLES EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade $\frac{1}{1}$

ELEVATION OF R. P.: 573.2 feet above MSL

CASING: 4 feet of $1\frac{1}{2}$ -inch gal-
vanized

SCREEN TYPE: Johnson Stainless Steel

DIAM.: $1\frac{1}{2}$ inch SLOT NO. 10

SETTING: 4 feet to 9 feet

PUMPING TEST: _____
DATE: _____

DURATION: _____

STATIC WATER LEVEL: 4.18 feet below
TOC: March 19, 1979

PUMPING WATER LEVEL: _____

YIELD: .5 gpm

REMARKS:

1/ TOC = 572.62 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp., Niagara Falls Plant</u>
Asphalt, stone fill	1.5	1.5	LOCATION: <u>Stephenson Ave.</u>
Clay, gray; with silt; sand, fine to coarse; cinders	1.5	3.0	WELL No.: <u>B-23</u>
Clay, gray; very silty, tan	4.0	7.0	DATE COMPLETED: <u>February 2, 1979</u>
Clay, brown-red, very stiff; silt	.5	7.5	DRILLING COMPANY: <u>Rochester Drilling Company</u>
No core taken to insure undisturbed formation in which to seal the			DRILLING METHOD: <u>Hollow-stem auger^{1/}</u>
6-inch casing	1.5	9.0	SAMPLING METHOD: <u>Split spoon</u>
Clay, brown-red; with gravel, small, stiff, hard, dry	1.5	10.5	SAMPLES: <u>R. Lamonica</u>
Clay, brown-red, stiff, hard, dry	1.5	12.0	EXAMINED BY: <u>Grade^{2/}</u>
Clay, brown-red, sticky, wet	3.0	15.0	REFERENCE POINT: <u>Grade^{2/}</u>
Clay, brown-red, sticky, wet; trace of gravel, small; and sand, coarse	1.5	16.5	ELEVATION <u>572.5 feet above MSL</u> OF R. P. <u>22 feet of 1½-inch galvanized</u>
Clay, brown-red, sticky, wet	3.0	19.5	CASING: <u>Johnson stainless steel</u>
Till, composed of clay, brown-red, sticky; with broken rock; stones; gravel; sand, coarse, wet	2.0	21.5	SCREEN TYPE: <u>1½-inch</u> DIAM. <u>10</u> SLOT No. <u>10</u>
(The till here is softer than in the rest of the plant, and resembles more the clay than the typical till)			SETTING: <u>22 feet - 27 feet</u>
Broken rock and sand	2.5	24.0	PUMPING TEST: <u>DATE: _____</u>
Competent bedrock; (cored); dolomite, cracked, vuggy, gray (38" return)	5.0	29.0	DURATION: <u>19.30 feet below</u>
Note: The open rock hole continually filled in with sand, and could not be kept open.			STATIC WATER LEVEL: <u>TOC, March 1, 197</u>
			PUMPING WATER LEVEL: <u>_____</u>
			YIELD: <u>7 gpm</u>
			REMARKS: <u>1/ Augered to top of clay drive and wash to top of rock; diamond bit core in bedrock.</u>
			<u>2/ TOC = 571.91 feet above MSI</u>

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

WESTPORT, CONNECTICUT.

OWNER: Hooker Chemicals and
Plastics Corp.,
Niagara Falls Plant

LOCATION: Stephenson Ave.

WELL NO.: B-23a

DATE COMPLETED: January 29, 1979
Rochester Drilling
Company

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split spoon

SAMPLES: R. Lamonica
EXAMINED BY: _____

REFERENCE POINT: _____ Grade ¹/₁

ELEVATION 572.5 feet above MSL
OF R. P.:

1.5 feet of 1½-inch
galvanized

SCREEN: Johnson stainless
TYPE: steel

DIAM. 1½-inch SLOT NO. 10

SETTING: 2 feet to 7-feet

PUMPING TEST: _____
DATE: _____

DURATION: 1.21 feet below

STATIC WATER TOC
LEVEL: _____
March 1, 1979

PUMPING WATER
LEVEL: _____

YIELD: 2 gpm

REMARKS:

1/ TOC = 572.40 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

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WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of crushed stone;			LOCATION: Northeast of Bldg. 28
silt; sand, black	3.0	3.0	WELL NO.: B-24
Augered through obstruction	2.0	5.0	DATE COMPLETED: February 22, 1979
Clay, silty; gray-tan	1.5	6.5	DRILLING COMPANY: Rochester Drilling Co
Silt, clayey; with sand, fine, gray-			DRILLING METHOD: Hollow-stem auger ^{1/}
tan	1.5	8.0	SAMPLING METHOD: Split spoon
Silt, clayey with sand, fine; gray-			SAMPLES EXAMINED BY: R. Lamonica & G. Sikorski
tan	1.0	9.0	REFERENCE POINT: Grade ^{2/}
Clay, red, hard	6.5	15.5	ELEVATION OF R. P.: 573.6 feet above MSL
Till, composed of clay, red-brown			CASING: 22½ feet of 1½-inch galvanized
with much silt, some gravel, fine			SCREEN TYPE: Johnson Stainless Steel
dark gray	3.0	18.5	DIAM.: 1½-inch SLOT NO 10
No recovery	4.0	22.5	SETTING: 22½-27½ feet
Dolomite, dark gray	5.0	27.5	PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: 22.91 feet below TOC, March 1, 1979
			PUMPING WATER LEVEL: _____
			YIELD: .2 gpm
			REMARKS:
			1/ Augers to top of clay Drive and wash to top of rock; Tricone bit in bedrock
			2/ TOC = 573.30 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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OWNER: ~~Hooker Chemicals and~~
Plastics Corp.
Niagara Falls Plant

LOCATION: Northeast of Bldg. C-2

WELL NO.: B-24a

DATE January 26, 1979

DRILLING COMPANY, Rochester Drilling Co.

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split Spoon

SAMPLES:
EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade 1

ELEVATION 573.6 feet above MSL
OF R. P.: _____

CASING: 4 feet of 1½-inch gal-
vanized

SCREEN-
TYPE: Johnson Stainless Steel

DIAM.: 1 1/2 inch SLOT NO. 10

SETTING: 4 feet - 9 feet

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER LEVEL: 2.20 feet below TOC
March 1, 1979

PUMPING WATER
LEVEL: _____

YIELD: .15 gpm

REMARKS:

1/ TOC = 572.99 feet above
MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

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55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Augered through 3 feet of silty fill			LOCATION: <u>North of Bldg. A-5</u>
to avoid obstructions. Silt, sand			WELL NO.: <u>B-25</u>
and gravel.	3.0	3.0	DATE COMPLETED: <u>March 1, 1979</u>
Silt; sand, fine to coarse; some			DRILLING COMPANY: <u>Rochester Drilling Co.</u>
gravel; odor of diesel fuel, wet	1.5	4.5	DRILLING METHOD: <u>Drive and wash^{1/}</u>
Silt, sandy, tan; diesel fuel odor,			SAMPLING METHOD: <u>split spoon</u>
wet	1.5	6.0	SAMPLES: EXAMINED BY: <u>R. Lamonica</u>
Silt, sandy, gray; diesel fuel odor	1.0	7.0	REFERENCE POINT: <u>Grade^{2/}</u>
Clay, red	.5	7.5	ELEVATION OF R. P.: <u>571.3 feet above MSL</u>
Silt, gray, clayey; odor of diesel			CASING: <u>21.5 feet of 1½-inch</u>
fuel	2.0	9.5	galvanized
Clay, brown-red, hard	1.0	10.5	SCREEN: TYPE: <u>Johnson Stainless Steel</u>
Till, composed of silt, red (some			DIAM.: <u>1½ inch</u> SLOT NO. <u>10</u>
grav); clay, red; sand, fine to			SETTING: <u>22 feet - 27 feet</u>
coarse; gravel, small, hard, dry	3.0	13.5	PUMPING TEST: DATE: _____
Till, of silt, red; clay, red; sand,			DURATION: _____
fine to medium; gravel, small to			STATIC WATER LEVEL: <u>19.89 feet below</u>
large, rounded	1.5	15.0	TOC, March 1, 1979
Till, of gravel, small to large;			PUMPING WATER LEVEL: _____
stones; silt, red; clay, red; sand,			YIELD: <u>2 gallons per hour</u>
fine to coarse, hard	1.5	16.5	REMARKS:
No return	1.5	18.0	<u>1/</u> Augers to top of clay
No return	1.5	19.5	Drive and wash to top
Till, of clay, red; silt, red; gravel,			of rock; Tricone bit
small to large; stones; sand, fine			in bedrock
(Continued)			<u>2/</u> TOC = 570.83 feet
			above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: North of Bldg. A-5

WELL No.: B-25 (continued)

DATE
COMPLETED: _____

DRILLING
COMPANY: _____

DRILLING
METHOD: _____

SAMPLING
METHOD: _____

SAMPLES:
EXAMINED BY: _____

REFERENCE
POINT: _____

ELEVATION
OF R. P.: _____

CASING: _____

SCREEN:
TYPE: _____

DIAM.: _____ SLOT NO. _____

SETTING: _____

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL: _____

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS: _____

LEGGETTE, BRASHEARS & GRAHAM, INC.

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1/ TOC .: 570.97feet
above MSL

WELL LOG

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WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Fill, composed of wood; silt; cinders;			LOCATION: Near Bldg. 27 or F-33a
crushed brick; sand	1.5	1.5	WELL NO.: B-26
Silt, clayey, tan-gray	1.5	3.0	DATE COMPLETED: February 14, 1979
Silt, clayey, tan-gray	3.0	6.0	Rochester Drilling Company
Silt, clayey, tan-gray, wet	2.0	8.0	DRILLING METHOD: Hollow-stem auger ^{1/}
Clay, silty, red-brown	1.0	9.0	SAMPLING METHOD: Split spoon
Clay, somewhat silty, laminated,			SAMPLES: EXAMINED BY: R. Lamonica & G. S. Sikora
light brown; chemical odor	4.5	13.5	REFERENCE POINT: Grade ^{2/}
Clay, plastic, brown; trace of			ELEVATION: 571.2 feet above MSL
chemical odor; some till, composed			OF R. P.: 20 feet of 1½-inch galvanized
of sand, fine to medium, brown	1.5	15.0	CASING: Johnson stainless steel
Till, silty; some clay, brown; and			DIAM.: 1½-inch SLOT NO. 10
cobbles, angular, dark gray	1.5	16.5	SETTING: 20 feet - 25 feet
Till, silty; some clay, brown; and			PUMPING TEST: DATE:
cobbles, angular, dark gray; little			DURATION: 19.42 feet below STATIC WATER LEVEL: top of casing
sand, brown; trace of sand-like			March 1, 1979
substance (which does not look			PUMPING WATER LEVEL:
native)	3.0	19.5	YIELD: 15 gpm
Bedrock, dolomite, few rounded frag-			REMARKS: 1/ Hollow-stem auger to top of clay; drive and wash to top of rock; tricone bit in rock.
ments, weathered, dark gray with			2/ TOC=571.38 feet above MSL
some light gray	3.5	23.0	
Bedrock, solid	4.0	27.0	
Hole caved 2 feet, set screen			
20-25 feet below grade.			

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: Bldg. F-33a

WELL NO.: B-26a

DATE COMPLETED: January 26, 1979

DRILLING COMPANY: Rochester Drilling Co.

DRIILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split spoon

SAMPLES EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade ^{1/}

ELEVATION 571.2 feet above MSL
OF R. F.:

CASING: 2.5 feet of 1½-inch
galvanized

SCREEN TYPE: Johnson Stainless Steel

DIAM.: 1½ inch SLOT NO. 10

SETTING: 3 feet - 8 feet

PUMPING TEST:
DATE:

DURATION:

STATIC WATER LEVEL: 3.03 feet below TOC
March 1, 1979

PUMPING WATER LEVEL:

YIELD: 4 gallons per hour

REMARKS:

1/ TOC .=570.91 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Fill (slag) dark gray with some yellow	3.0	3.0	LOCATION: Near Bldg. 77
Sand, fine to medium, dark brown with little white; much silt and clay, brown; few cobbles, black, probably fill	1.5	4.5	WELL NO.: B-27
Sand, fine to very fine, dark brown; some silt, dark brown; trace of clay, brownish-yellow; few cobbles, dark gray	1.5	6.0	DATE COMPLETED: February 12, 1979
Sand, very fine to coarse, angu- lar, dark brown; and gravel, fine to coarse; little sand, fine, white (does not look like native soil or usual fill)	1.5	7.5	DRILLING COMPANY: Rochester Drilling Company
Sand, very fine to coarse, brown; and gravel, fine to coarse, angular, gray	1.5	9.0	DRILLING METHOD: Hollow-stem auger ^{1/}
Sand, very fine; and silt, dark gray; some clay, gray; little organic material, fibrous, black (probably from abandoned sewer)	1.5	10.5	SAMPLING METHOD: Split spoon
Clay, plastic, light brown; some of the sample above	1.5	12.0	SAMPLES EXAMINED BY: G. S. Sikora
Clay, plastic, light brown	3.0	15.0	REFERENCE POINT: Grade ^{2/}
Till, mixture of fine gravel and coarse sand in a clay matrix, brown;			ELEVATION OF R. P.: 572.3 feet above MSL 22.8 feet of 1½-inch galvanized
			CASING: Johnson stainless steel 1½-inch SLOT NO. 10
			SETTING: 23 feet - 28 feet
			PUMPING TEST: DATE:
			DURATION: 23.14 feet below STATIC WATER LEVEL: TOC, on 2/14/79
			PUMPING WATER LEVEL:
			YIELD: 3 gallons per hour
			REMARKS: 1/ Augers to top of clay; drive and wash to top of rock; tricone bit in rock. 2/ Grade = .4 feet above top of casing. TOC = 571.90 feet above MSL

(continued)

LEGGETTE, BRASHEARS & GRAHAM, INC.

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WELL LOG

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DESCRIPTION

THICK-
NESS
(FEET)

DEPTH
(FEET)

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: near Bldg. 77

WELL NO.: B-27a

DATE
COMPLETED: February 13, 1979

DRILLING
COMPANY: Rochester Drilling Co.

DRILLING
METHOD: Hollow-stem auger

SAMPLING
METHOD: Split spoon

SAMPLES:
EXAMINED BY: G. S. Sikora

REFERENCE
POINT: Grade^{1/}

ELEVATION
OF R. P.: 571.6 feet above MSL

CASING: none

SCREEN:
TYPE: Johnson Stainless Steel

DIAM.: 1 1/2 inch SLOT NO. 10

SETTING: 0-10 feet

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL: 5.43 feet below TC
on February 14, 1979

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS:

1/ TOC = 571.43 feet
above MSL

Fill (slag) dark gray with some yellow

3.0

3.0

Sand, fine to medium, dark brown with

little white; much silt and clay,

brown; few cobbles, black, probably

fill

1.5

4.5

Sand, fine to very fine, dark brown;

some silt, dark brown; trace of clay,

brownish-yellow; few cobbles, dark

gray

1.5

6.0

Sand, very fine to coarse, angular.

dark brown; and gravel, fine to

coarse; little sand, fine, white

(does not look like native soil or

usual fill)

1.5

7.5

Sand, very fine to coarse, brown; and

gravel, fine to coarse, angular,

gray

1.5

9.0

Sand, very fine; and silt, dark gray;

some clay gray; little organic

material, fibrous, black (driller

thinks he penetrated an abandoned

sewer

1.5

10.5

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER:
Augered (fill)	3.0	3.0	Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Silt; sand, very fine, tan	2.0	5.0	Buffalo Ave., Bldg.U-6
Silt; sand, very fine, tan	1.0	6.0	LOCATION: B-28a
Clay, brown-red	.5	6.5	WELL NO.:
			DATE COMPLETED: January 25, 1979
			DRILLING COMPANY: Rochester Drilling Company
			DRILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: Split spoon
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade 1/
			ELEVATION OF R. P.: 570.1 feet above MSI
			1 foot of 1½-inch
			CASING: galvanized
			SCREEN TYPE: Johnson stainless steel
			DIAM.: 1½-inch SLOT NO. 10
			SETTING: 1.5 to 6.5 feet
			PUMPING TEST DATE:
			DURATION: 1.84 feet below
			STATIC WATER LEVEL: TOC, March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: 2 gallons in 30 minutes
			REMARKS:
			1/ TOC = 570.02 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Falls Plant
Augered through 1.5 feet of crushed stone fill and silt	1.5	1.5	LOCATION: Buffalo Ave. near Bldg. 53
Fill of silt, brown, clayey; sand, fine to coarse; silt, tan-gray, clayey	1.5	3.0	WELL No.: B-29
Silt, clayey, tan	1.5	4.5	DATE COMPLETED: February 19, 1979
Silt, clayey, tan	1.0	5.5	Rochester Drilling Company
Till, red, composed of clay; silt; small amounts of sand; gravel; stones	0.5	6.0	DRILLING METHOD: Hollow-stem auger ^{1/}
Till, brown, composed of silt; some sand, fine with some medium; and cobbles, dark-gray; little clay, light brown	4.5	10.5	SAMPLING METHOD: Split spoon
Till (possibly, but no fines; gravel, fine to medium with some coarse, dark gray; and sand, fine to medium, brown; small boulder, dark gray	1.5	12.0	SAMPLES EXAMINED BY: R. Lamonica & G. S. Sikora
Till, composed of silt with some clay, brownish-gray; some gravel, fine to medium, dark gray; few cobbles, dark gray and little sand, coarse	9.0	21.0	REFERENCE POINT: Grade ^{2/}
Bedrock, dark gray	5.5	26.5	ELEVATION OF R. P.: 570.8 feet above MSL
Hole filled in about 6 inches before setting screen.			21 feet of 1½-inch galvanized
			CASING: Johnson stainless steel
			SCREEN TYPE: 1½-inch
			DIA.: 10
			SETTING: 21 feet - 26 feet
			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: 17.79 feet below TOC, March 20, 1979
			PUMPING WATER LEVEL: _____
			YIELD: .5 gpm
			REMARKS: 1/ Augers to top of clay; drive and wash to top of rock; tricone bit in rock.
			2/ TOC = 570.46 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

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WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
<u>Fill, of silt; sand, fine to coarse;</u>			LOCATION: <u>Buffalo Ave. Bldg. W-1</u>
<u>gravel; brick</u>	<u>1.5</u>	<u>1.5</u>	WELL NO.: <u>B-30</u>
<u>Silt, tan; sand, very fine</u>	<u>5.8</u>	<u>7.3</u>	DATE COMPLETED: <u>February 9, 1979</u>
<u>Change to clay</u>		<u>7.3</u>	DRILLING COMPANY: <u>Rochester Drilling Co.</u>
<u>Clay, brown-red</u>	<u>.2</u>	<u>7.5</u>	DRILLING METHOD: <u>Hollow-stem auger^{1/}</u>
<u>No core taken to insure a good seal</u>			SAMPLING METHOD: <u>Split spoon</u>
<u>for the 6-inch casing</u>	<u>1.5</u>	<u>9.0</u>	SAMPLES EXAMINED BY: <u>R. Lamonica</u>
<u>Till, composed of clay, brown-red,</u>			REFERENCE POINT: <u>Grade^{2/}</u>
<u>sticky; with gravel; stones; sand,</u>			ELEVATION OF R. P.: <u>571.9 feet above MSL</u>
<u>medium to coarse</u>	<u>1.5</u>	<u>10.5</u>	CASING: <u>26 feet of 1½-inch galv-</u>
<u>Till, same as above, loose, wet</u>	<u>1.5</u>	<u>12.0</u>	<u>vanized</u>
<u>Till, composed of clay, brown-red,</u>			SCREEN TYPE: <u>Johnson Stainless Steel</u>
<u>dry, silty; gravel; stones; some</u>			DIAM.: <u>1½ inch</u> SLOT NO. <u>10</u>
<u>sand, fine to coarse</u>	<u>4.5</u>	<u>16.5</u>	SETTING: <u>26.5-31.5 feet</u>
<u>Till, same as above, wet</u>	<u>1.5</u>	<u>18.0</u>	PUMPING TEST: DATE: _____
<u>Till, of gravel; clay, brown-red,</u>			DURATION: _____
<u>sticky; stones; sand, coarse, wet</u>	<u>4.5</u>	<u>22.5</u>	STATIC WATER LEVEL: <u>19.41 feet TOC^{3/}</u>
<u>No return (till and broken rock)</u>	<u>1.5</u>	<u>24.0</u>	<u>18.23 feet below TOC, 3/1/79</u>
<u>Washed BW 5 inches to 25 Ft. (no re-</u>			PUMPING WATER LEVEL: _____
<u>turn)</u>	<u>1.0</u>	<u>25.0</u>	YIELD: <u>2.5 gpm</u>
<u>Bedrock</u>	<u>7.0</u>	<u>32.0</u>	REMARKS:
<u>NOTE: Backfilled ½ foot and set</u>			<u>1/ augers to top of clay</u>
<u>5 feet of screen from 26½</u>			<u>Drive and wash to top</u>
<u>to 31½ feet below grade</u>			<u>of rock; Tricone bit in</u>
			<u>rock</u>
			<u>2/ TOC = 571.48 feet abo</u>
			<u>MSL</u>
			<u>3/ measured 2/12 before</u>
			<u>development</u>

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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1/ TOC = 571.48 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Augered through 1.5 Ft. of broken rock fill	1.5	1.5	LOCATION: <u>W side of RR Tracks building J-5</u>
Broken rock fill; silt, clayey, tan	1.5	3.0	WELL NO.: <u>B-31</u>
Silt, clayey, tan	1.5	4.5	DATE COMPLETED: <u>February 19, 1979</u>
Silt, clayey, tan; shells and shell fragments	1.5	6.0	DRILLING COMPANY: <u>Rochester Drilling Co.</u>
Clay, brown-red	1.5	7.5	DRILLING METHOD: <u>Hollow-stem auger 1/</u>
Clay, yellowish-brown; few cobbles, small, dark gray	1.5	9.0	SAMPLING METHOD: <u>Split spoon</u>
Clay, silty, yellowish-brown; some cobbles, angular, dark gray	1.0	10.0	SAMPLES: EXAMINED BY: <u>G. S. Sikora</u>
No recovery of samples between 10 and 12 Feet			REFERENCE POINT: <u>Grade 2/</u>
Till, clayey and silty; with many cobbles, large to small, dark gray	1.5	13.5	ELEVATION OF R. P.: <u>571.8 feet above MSL</u>
Till, clayey and silty, greenish- brown; with some gravel, coarse to fine, dark gray	0.5	14.0	CASING: <u>23 1/2 feet of 1 1/2-inch gal- vanized</u>
No recovery of samples between 14 and 15 feet			SCREEN- TYPE: <u>Johnson Stainless Steel</u>
Till, clayey and silty, greenish- brown; with some large cobbles; gravel, fine, dark gray	0.5	15.5	DIAM.: <u>1 1/2 inch</u> SLOT No. <u>10</u>
No recovery	1.0	16.5	SETTING: <u>23 1/2-28 1/2 feet</u>
(Continued)			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: <u>17.49 feet below TOC, March 1, 1979</u>
			PUMPING WATER LEVEL: _____
			YIELD: <u>1 gpm</u>
			REMARKS: 1/ Augers to top of clay Drive and wash to top of rock; Tricone bit in rock
			2/ TOC = 571.61 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

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WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER
Till, silty, greenish-brown; with some cobbles, angular, dark gray; and gravel, fine, dark gray with little white	1.0	17.5	Hooker Chemicals and Plastics Corp. Niagara Falls Plant
No recovery	0.5	18.0	LOCATION: W side of RR Tracks by building J-5
Till, silty, greenish-brown; with some cobbles, dark gray; and gravel, fine to medium, dark gray with little, white	1.5	19.5	WELL NO.: B31(continued)
No recovery	3.0	22.5	DATE COMPLETED:
Till, silty, greenish-brown; with some cobbles, dark gray; and gravel, fine to medium, dark gray	1.0	23.5	DRILLING COMPANY:
Refusal @ 23.5			DRILLING METHOD:
Dolomite, yuggy, dark gray	5.0	28.5	SAMPLING METHOD:
			SAMPLES: EXAMINED BY:
			REFERENCE POINT:
			ELEVATION OF R. P.:
			CASING:
			SCREEN: TYPE:
			DIAM.: SLOT NO.
			SETTING:
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL:
			PUMPING WATER LEVEL:
			YIELD:
			REMARKS:

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Augered through trap rock fill	1.5	1.5	LOCATION: W side of RR Tracks by building J-5
Trap rock fill; silt, clayey, tan	1.5	3.0	WELL No.: B-31a
Silt, clayey, tan	1.5	4.5	DATE COMPLETED: January 25, 1979
Silt, clayey, tan; shells and shell fragments	1.5	6.0	DRILLING COMPANY: Rochester Drilling Co.
Clay, brown-red	1.5	7.5	DRILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: split spoon
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade ^{1/}
			ELEVATION OF R. P.: 571.8 feet above MSL
			CASING: 2 feet Of 1½-inch gal vanized
			SCREEN TYPE: Johnson Stainless Steel
			DIAM.: 1½ inch SLOT No. 10
			SETTING: 2.5 feet - 7.5 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 1.92 feet below T (
			March 1, 1979
			PUMPING WATER LEVEL:
			YIELD: 2 gallons per hour
			REMARKS:
			1/ TOC. = 571.87 above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Fill; of crushed stone; gravel; sand, medium to coarse; dry; faint odor	1.5	1.5	LOCATION: <u>East side of Bldg. N-1</u>
Fill, of silt, very dark brown; and sand, very fine, no odor	1.5	3.0	WELL No.: <u>B-32</u>
No return	2.0	5.0	DATE COMPLETED: <u>January 17, 1979</u>
Fill, of stones; gravel; sand, fine to coarse; silt; clay, no odor	1.5	6.5	DILLING COMPANY: <u>Rochester Drilling Co.</u>
Fill: as above; strong odor	1.5	8.0	DILLING METHOD: <u>Hollow-stem auger^{1/}</u>
Fill: as above, less odor	1.5	9.5	SAMPLING METHOD: <u>Split spoon</u>
Sand, very fine; silty; gravel; strong odor	1.5	11.0	SAMPLES EXAMINED BY: <u>R. Lamonica</u>
Top; stone; gravel; sand, medium to coarse; strong odor Bottom: clay, brown-red	1.5	12.5	REFERENCE POINT: <u>Grade^{2/}</u>
Clay, brown-red, sticky	6.0	18.5	ELEVATION OF R. P.: <u>568.5 feet above MSL</u>
Clay, brown-red, sticky; some sand, coarse; gravel	1.5	20.0	CASING: <u>19 feet of 1½-inch gal- vanized</u>
Till	4.5	24.5	SCREEN: TYPE: <u>Johnson Stainless Steel</u>
Rock	5.0	29.5	DIA.: <u>1½ inch</u> SLOT No. <u>10</u>
			SETTING: <u>19 feet - 29 feet</u>
			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: <u>6.26 feet below</u>
			TOC. Feb. 5, 1979
			PUMPING WATER LEVEL: _____
			YIELD: <u>4 gpm</u>
			REMARKS:
			<u>1/</u> augers to top of rock; Tricone bit in rock
			<u>2/</u> TOC. = 568.37 above MSL

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Because of difficulty getting a hole down at this location it was decided to put 2 wells in the same hole.			LOCATION: E side of Bldg. N-19
After the screen and casing assembly for well 32 were installed in rock, the hole was backfilled with ben- tonite, cuttings, and sand to the top of the clay, and then the shallow assembly installed, and sand packed.			WELL No.: B-32a
			DATE COMPLETED: January 17, 1979
			DRILLING COMPANY: Rochester Drilling Co.
			DRILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: None
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade ¹ / ₁
			ELEVATION OF R. P.: 568.5 feet above MSL
			CASING: 2 feet of 1½-inch gal- vanized
			SCREEN TYPE: Johnson Stainless Steel
			DIAM.: 1½ inch SLOT No. 10
			SETTING: 2-12 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 2.30 feet below TOC, Feb. 5, 1979
			PUMPING WATER LEVEL:
			YIELD: .20 gpm
			REMARKS:
			1/ Top of Casing=568.32 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: NE of Bldg. U-58

WELL NO.: B-33a

DATE COMPLETED: March 26, 1979

DRILLING COMPANY: Rochester Drilling Co

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Split spoon

SAMPLES: R. Lamonica
EXAMINED BY: _____

REFERENCE POINT: _____ Grade 17

ELEVATION OF R. P.: 570.3 feet above MS:

CASING: 5.5 feet of 1½ inch
galvanized

SCREEN: Johnson Stainless
TYPE:

Steel

DIAM.: 1 1/8 inch SLOT NO. 10

SETTING: 5.5-10.5 feet

PUMPING TEST:
DATE:_____

DURATION:

STATIC WATER 5.0 feet below TO
LEVEL: _____
August 22, 1979

PUMPING WATER
LEVEL: _____

YIELD: .15 gpm

REMARKS:

1/ TOC = 570.28 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Asphalt; concrete; and crushed stone	1.5	1.5	LOCATION: ±20 Ft. off SE corner of Bldg. 24
Gravel, fine to medium, angular; little brick	1.5	3.0	WELL NO.: B-34
Sand, silty; and gravel, fine to medium, angular	1.5	4.5	DATE COMPLETED: March 15, 1979
Sand, silty; and gravel, fine to medium, angular; medium to stiff	1.5	6.0	DRILLING COMPANY: Rochester Drilling Co
Silt, clayey, reddish-brown; some sand, fine	1.5	7.5	DRILLING METHOD: Hollow-stem auger & c roller bit
Clay, silty, reddish-brown, medium- stiff	4.5	12.0	SAMPLING METHOD: continuous split-spo
Clay, silty, reddish-brown, medium stiff; with some gravel, fine to medium, angular	9.0	21.0	SAMPLES: EXAMINED BY: Lee Grubman
Gravel, fine to medium, angular; some clay, silty; little sand, fine to coarse	1.0	22.0	REFERENCE POINT: Grade ^{1/}
			ELEVATION: 569.9 feet above MS OF R. P.
			CASING: 26 feet of 1½-inc galvanneal
			SCREEN: Johnson Stainless Steel TYPE:
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 30-26.4 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 10.61 feet below TOC, May 31, 1979
			PUMPING WATER LEVEL:
			YIELD: 3 gpm
			REMARKS:
			1/ TOC=569.68 feet above MSL
			Note: no recovery on 2 samples attempted 22.0- 25.0; cobbles or broken rock. Top of rock at 24 feet drilled with roller bit to 30.0 feet.

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Asphalt; concrete; and crushed stone	1.5	1.5	LOCATION: West side of Bldg. V-10
Gravel, fine to medium, angular; little brick	1.5	3.0	WELL NO.: B-34a
Sand, silty; and gravel, fine to medium, angular	1.5	4.5	DATE COMPLETED: March 28, 1979
Sand, silty; and gravel, fine to medium, angular; medium to stiff	1.5	6.0	DRILLING COMPANY: Rochester Drilling C
Silt, clayey, reddish-brown; some sand, fine	1.5	7.5	DRILLING METHOD: Hollow-stem auger
Clay, silty, reddish-brown, medium stiff	2.5	10.0	SAMPLING METHOD: None ^{1/}
			SAMPLES: EXAMINED BY: Lee Grubman
			REFERENCE POINT: Grade ^{2/}
			ELEVATION OF R. P.: 569.9 feet above MSI
			CASING: 4.7 feet of 1½-inch galvanized
			SCREEN- TYPE: Johnson Stainless St.
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 5 feet - 10 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER 3.55 feet below LEVEL:
			TOC, May 31, 1979
			PUMPING WATER LEVEL:
			YIELD: 1 gpm
			REMARKS:
			1/ Sample descriptions from well log 34
			2/ TOC = 569.34 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: East of Bldg. 70

WELL NO.: B-35a

DATE COMPLETED: March 12, 1979

DRILLING COMPANY: Rochester Drilling

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Continuous Split Spoon

SAMPLES EXAMINED BY: Lee Grubman

REFERENCE POINT: Grade ¹/₁

ELEVATION OF R. P.: 569.4 feet above MSL

CASING: 0.8 foot of 1½-inch
galvanized

SCREEN: Johnson Stainless
TYPE: Steel

DIAM.: 1½ inch SLOT NO. 10

SETTING: 11 feet - 1 foot

PUMPING TEST:
DATE:

DURATION:

STATIC WATER LEVEL: 2.36 feet below
March 20, 1979

PUMPING WATER LEVEL:

YIELD: 6 gpm

REMARKS:

1/ TOC.=569.16 feet
above MSL

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER
Sand, fine, silty, brown; with a lump of chalky tan substance	1.5	1.5	Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Sand, fine, silty, brown-black; little clay; and gravel	3.0	4.5	LOCATION: In "S" area
Sand, fine, silty, brown-black; little clay; and gravel; with garbage, fibrous	1.5	6.0	WELL No.: B-36 a
Clay, silty, red-brown; little sand, fine; and gravel, fine to medium	1.5	7.5	DATE COMPLETED: March 19, 1979
Sand, fine to coarse, brown, oily; and gravel, fine to medium	1.5	9.0	DRILLING COMPANY: Rochester Drilling Co.
Sand, fine to medium, brown, oily; some gravel, fine to medium; little sand, coarse; and silt and garbage	3.0	12.0	DRILLING METHOD: Hollow-stem auger
Silt, fine sandy, black, oily; some sand, medium to coarse	1.5	13.5	SAMPLING METHOD: Continuous Split Spoon
Silt, fine, sandy, black, oily; some sand, medium to coarse; some gravel, fine to medium	1.5	15.0	SAMPLES: EXAMINED BY: Lee Grubman
Sand, fine, silty, black, oily; some sand, medium to coarse; and gravel, fine to medium; with roots	1.5	16.5	REFERENCE POINT: Grade ^{1/}
Sand, fine, filty, brown-black, oily	3.5	20.0	ELEVATION OF R. P.: 575.2 feet above MS
Clay, gray, soft	1.0	21.0	CASING: 7 feet, 6 inches of 1 1/2- inch galvanized SCREEN: Johnson Stainless Steel TYPE: 1 1/2 inch SLOT NO. 10
			SETTING: 21 feet - 6 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 9.89 feet below TOC, March 20, 1979
			PUMPING WATER LEVEL:
			YIELD: 0.25 gpm
			REMARKS:
			1/ TOC = 576.82 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Silt, greenish-brown; some gravel, fine to coarse, dark gray; trace of sand, coarse	1.5	1.5	LOCATION: Southwest corner of Bldg. 3
Sand, very fine, yellowish-brown; some silt, brown	1.5	3.0	WELL NO.: B-37a
Silt, brown; little sand, very fine yellowish-brown	1.5	4.5	DATE COMPLETED: March 12, 1979
Sand, very fine, brownish-yellow; much silt, brown; some clay, brown	3.5	8.0	DRILLING COMPANY: Rochester Drilling Co.
Clay, hard, brown	1.0	9.0	DRILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: Split-spoon
			SAMPLES: EXAMINED BY: G. S. Sikora
			REFERENCE POINT: Land surface 1/
			ELEVATION OF R. P.: 571.9 feet above MSL
			CASING: 3.0 feet of 1½-inch galvanized
			SCREEN: Johnson Stainless Steel
			DIAM.: 1½-inch SLOT NO. 10
			SETTING: 3.0-8.0 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 1.41 feet below TOC March 22, 1979
			PUMPING WATER LEVEL:
			YIELD: 0.25 gpm
			REMARKS: Drilling started 3/12/79
			1/ TOC = 571.70 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

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OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: Near tracks, between
Bldgs. 18 & 11
B-38 a

WELL NO.: _____

DATE COMPLETED: March 14, 1979

DRILLING COMPANY: Rochester Drilling
Co.

DRILLING METHOD: Hollow-stem auger

SAMPLING METHOD: Continuous Split-spoon

SAMPLES EXAMINED BY: Lee Grubman

REFERENCE POINT: Grade ¹/₁

ELEVATION OF R. P.: 572.2 feet above MSL

CASING: None

SCREENING TYPE: Johnson Stainless St.

DIAM.: 1 1/2 inch SLOT NO. 10

SETTING: 5.4-0.4 feet

PUMPING TEST: _____
DATE: _____

DURATION: _____

STATIC WATER LEVEL: 0.17 feet below
TOC, March 20, 1979

PUMPING WATER LEVEL: _____

YIELD: 1 gpm

REMARKS: _____

1/ TOC = 572.09 feet
above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

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1/ TOC = 571.65 feet
above MSL

WELL LOG

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER
			Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of silt, brown and gray; stones; gravel; some sand	3.0	3.0	LOCATION: North side of Bldg. H-18
Silt, tan-gray	4.5	7.5	WELL NO.: B-40
Clay, brown-red, varved, dry, very hard	1.5	9.0	DATE COMPLETED: March 29, 1979
Till, composed of clay, red; silt; sand, very fine; large rounded stones; some gravel, small, round- ed; moist, hard	4.5	13.5	DRILLING COMPANY: Rochester Drilling Co
Till, composed of clay, red; silt; sand, very fine; stones, rounded to angular; much gravel, small to large, rounded to angular; moist	3.0	16.5	DRILLING METHOD: Hollow-stem auger ^{1/}
Till, composed of clay, red; silt; sand, very fine; stones; fine gravel, very hard, moist	1.5	18.0	SAMPLING METHOD: Split-spoon
Till, composed of gravel, medium; clay, red; silt; sand, very fine; few stones	1.5	19.5	SAMPLES EXAMINED BY: R. Lamonica
Till, very hard (Tricone cuttings)	1.5	21.0	REFERENCE POINT: Grade ^{2/}
Till, composed of clay; silt; sand, very fine; stones; gravel, small; moist, very hard	.5	21.5	ELEVATION OF R. P.: 572.1 feet above MSL
(Continued)			CASING: 22 feet of 1½ inch galvanized SCREEN: Johnson Stainless Steel
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 22-27 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 19.42 feet below TOC, April 26, 1979
			PUMPING WATER LEVEL:
			YIELD: .5 gpm
			REMARKS:
			1/ Augers to 7.5 feet, drive and wash to 22 feet, Tricone rock bit to 27 feet.
			2/ TOC = 571.92 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 1 of 1.

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	
			OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of silt, brown and			LOCATION: North side of Bldg. H-18
gray; stones; gravel; some sand	3.0	3.0	WELL NO.: B-40a
Silt, tan-gray	4.5	7.5	DATE COMPLETED: April 2, 1979
Clay, brown-red, varved, dry, very			DRILLING COMPANY: Rochester Drilling Co.
hard	0.5	8.0	DRILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: No samples taken ^{1/}
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade ^{2/}
			ELEVATION OF R. P.: 572.1 feet above MSL
			CASING: 3 feet of 1½-inch galvanized
			SCREEN: Johnson Stainless Steel TYPE:
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 3-8 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 4.80 feet below TOC, June 1, 1979
			PUMPING WATER LEVEL:
			YIELD: .5 gpm
			REMARKS:
			<u>1/</u> Sample descriptions from Well Log B-40
			<u>2/</u> TOC = 571.69 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 1 of 1

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of silt, brown and gray; stones; gravel; some sand	3.0	3.0	LOCATION: North side of Bldg. H-18
Silt, tan-gray	4.5	7.5	WELL NO.: B-40b
Clay, brown-red, varved, dry, very hard	1.5	9.0	DATE COMPLETED: April 2, 1979
Till, composed of clay, red; silt; sand, very fine; large rounded stones; some gravel, small, round- ed; moist, hard	4.5	13.5	DRILLING COMPANY: Rochester Drilling
Till, composed of clay, red; silt; sand, very fine; stones, rounded to angular; much gravel, small to large, rounded to angular; moist	3.0	16.5	DRILLING METHOD: Hollow-stem auger-
Till, composed of clay, red; silt; sand, very fine; stones; fine gravel; very hard, moist	1.5	18.0	SAMPLING METHOD: No samples taken ^{1/}
Till, composed of gravel, medium; clay, red; silt; sand, very fine; few stones	1.5	19.5	SAMPLES EXAMINED BY: R. Lamonica
Till, very hard (Tricone Cuttings)	0.5	20.0	REFERENCE POINT: Grade ^{2/}
			ELEVATION OF R. P.: 572.1 feet above MS
			CASING: 15 feet of 1½-inch galvaniz
			SCREEN: Johnson Stainless St Type:
			DIAM. 1½-inch SLOT NO. 10
			SETTING: 15-20 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 17.47 feet below TOC, April 5, 1979
			PUMPING WATER LEVEL:
			YIELD: .25 gpm
			REMARKS:
			1/ Sample descriptions from Well Log B-40
			2/ TOC = 571.85 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 1 of 1

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of silt; stones;			LOCATION: Energy resources
gravel; sand, black to gray	1.5	1.5	WELL NO.: B-41
Fill, composed of silt; stones;			DATE COMPLETED: April 11, 1979
gravel; some sand, black to gray	1.5	3.0	DRILLING COMPANY: Rochester Drilling Co
Clay, brown to tan to gray; fibrous			DRILLING METHOD: Hollow-stem auger 1/
material present; diesel fuel odor;			SAMPLING METHOD: Continuous split spoo
silt; minor amount of gray, fine			SAMPLES EXAMINED BY: J. Naso
sand	3.0	6.0	REFERENCE POINT: Grade 2/
Clay, rust to brown; silt; very fine			ELEVATION OF R. P.: 571.8 feet above MSI
sand	7.5	13.5	19 feet of 1 1/2 inch galvanized
Till, composed of brown sand, very			CASING: Johnson Stainless Steel
fine; silt; clay; gravel, gray	3.5	16.5	1 1/2 inch 10 DIAM.: SLOT NO.
Till, composed of brown fine to			SETTING: 19-29 feet
coarse sand; silt; tan clay; gravel;			PUMPING TEST: DATE:
pebbles	1.5	18.0	DURATION:
Till, composed of brown to gray; fine			STATIC WATER LEVEL: 23.72 feet below TOC, June 1, 1979
to coarse sand; silt; tan clay;			PUMPING WATER LEVEL:
gravel, gray; pebbles	0.6	18.6	YIELD: 2.5 gpm
Till, composed of brown to gray, fine			REMARKS:
to coarse sand, silt; tan clay;			1/ Tricone bit in bedrock = .2 feet below
gravel, gray; pebbles	.3	19.0	
Dolomite	10.0	29.0	2/ TOC = 571.68 feet above MSL
Note: Obstruction encountered at			
17.5 Ft. below grade (boulder). Re-			
augered 3 Ft. to west of initial site to same depth without sampling.			

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 1 of 1

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	
Fill, composed of silt; stones;			OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
gravel; sand, black to gray	1.5	1.5	LOCATION: Energy Resources
Fill, composed of silt; stones;			WELL NO.: B-41a
gravel; some sand, black to gray	1.5	3.0	DATE COMPLETED: April 9, 1979
Clay, brown to tan to gray; fibrous			DRILLING COMPANY: Rochester Drilling Co
material present; diesel fuel odor;			DRILLING METHOD: Hollow-stem auger
silt; minor amount of gray fine			SAMPLING METHOD: No samples taken ^{1/}
sand	3.0	6.0	SAMPLES EXAMINED BY: J. Naso
Clay, rust to brown; silt; sand, very			REFERENCE POINT: Grade ^{2/}
fine	7.5	13.5	ELEVATION OF R. P.: 571.8 feet above MSL
			CASING: 3.5 feet of 1½-inch galvanized
			SCREEN TYPE: Johnson Stainless Steel
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 3-8 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 2.27 feet below TOC, April 17, 1979
			PUMPING WATER LEVEL:
			YIELD: .3 gpm
			REMARKS:
			^{1/} Sample description from log of well 41.
			^{2/} TOC = 571.89 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Concrete and crushed stone	1.5	1.5	LOCATION: NE corner of Buffalo Avenue and 53rd St.
Fill, coarse, brown	3.0	4.5	WELL NO.: B-42a
Clayey silt, tan-gray, moist	1.5	6.0	DATE COMPLETED: June 7, 1979
Clayey silt, some gravel	1.5	7.5	DRILLING COMPANY: Rochester Drilling Co
Silt, tan, wet, trace clay, gray	1.5	9.0	DRILLING METHOD: Hollow-stem auger
Silt, tan, wet, trace clay, gray	.5	9.5	SAMPLING METHOD: Split spoon
Clay, red, hard, dry	1.0	10.5	SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade 1/
			ELEVATION OF R. P.: 572.8 feet above MSL
			CASING: 5.5 feet of 1½ inch galvanized
			SCREEN TYPE: Johnson Stainless Steel
			DIAM: 1½ inch SLOT NO. 10
			SETTING: 5.5 feet -10.5
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 5.86 feet below TOC, June 25, 1979
			PUMPING WATER LEVEL:
			YIELD: .2 gpm
			REMARKS:
			1/ TOC =572.49 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of silt, very fine to coarse; sand, dark brown to tan, gravel	1.5	1.5	LOCATION: 100 feet south of V-80
Fill, sand, very fine to coarse, dark brown, some gray sand; silt; gravel	1.5	3.0	WELL NO. B-43a
Fill, sand, very fine-coarse, dark brown, dark gray, silt, gravel, black, tan, substance present	1.5	6.0	DATE COMPLETED: May 22, 1979
Fill, sand, very fine-coarse, dark brown, dark gray, silt, some gravel	1.5	7.5	DILLING COMPANY: Rochester Drilling Co.
Clay, red and gray; silt, gray; sand, very fine and gray	1.5	9.0	DILLING METHOD: Hollow-stem auger
Clay, red and gray; silt, gray; sand, very fine and gray	1.5	10.5	SAMPLING METHOD: Continuous Split spoon
			SAMPLES EXAMINED BY: J. Naso
			REFERENCE POINT: Land Surface
			ELEVATION OF R. P.: 568.2 feet above MS
			CASING: 5.5 feet of 1½ inch galvanized
			SCREEN TYPE: Johnson Stainless steel-wire-wound
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 5.5 feet - 10.5 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 2.35 ¹ / ₂
			PUMPING WATER LEVEL:
			YIELD: .7 gpm
			REMARKS:
			1/ From TOC on May 24 1979
			TOC = 568.80 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Topsoil	1.0	1.0	LOCATION: NE corner of Buffalo Avenue and 54th St. B-44a
Sand, medium, brown	2.0	3.0	WELL NO.:
Silt, tan; trace clay, gray	6.5	9.5	DATE COMPLETED: June 7, 1979
Clay, red, dry, hard	1.0	10.5	DILLING COMPANY: Rochester Drilling Co
			DILLING METHOD: Hollow-stem auger
			SAMPLING METHOD: Split spoon
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade 1/
			ELEVATION OF R. P.: 573.2 feet above MSL
			CASING: 4 feet of 1 1/2 inch galvanized
			SCREEN: Johnson Stainless TYPE: Steel
			DIA.: 1 1/2 inch SLOT No. 10
			SETTING: 4.5 feet-9.5 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 7.94 feet below TOC, June 25, 1979
			PUMPING WATER LEVEL:
			YIELD: .1 gpm
			REMARKS:
			1/ TOC = 572.98 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC. Page 1 of 1

55. WEST STATE STREET

DESCRIPTION

**THICK-
NESS
(FEET)**

**DEPTH
(FEET)**

LOCATION: "S" area

WELL NO. B-45a Recovery Well
Pilot Hole

DATE COMPLETED: May 17, 1979

DRILLING COMPANY, Rochester Drilling Co.

DRILLING METHOD: Hollow Stem auger

SAMPLING METHOD: Split spoon

SAMPLES: R. Lamonica
EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade 1

ELEVATION
OF R. P.: 571.6 feet above MSL

CASING: 7.5 feet of 1 1/2-inch

galvanized
SCREEN- Johnson Stainless Steel
TYPE:

DIAM. 1 1/2 inch SLOT No. 10

Range 4.5 - 19.5 feet

PUMPING TEST:
RATE: _____

DURATION:

STATIC WATER LEVEL: 8.33 feet below TOC
June 1, 1979

PUMPING WATER
LEVEL:_____

YIELD: 2.5 gpm

REMARKS:

1/ TOC = 574.47 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, composed of silt, dark brown with little gray; some sand, fine; few cobbles, angular; little clay. gray; trace of unknow material, white	2	2.0	LOCATION: S-Area
No recovery	2	4.0	WELL NO.: B-46a
Till, clayey, with some silt, reddish- brown; little gravel, fine with few small cobbles	2.0	6.0	DATE COMPLETED: June 1, 1979
Clay, silty; with a little sand, fine, reddish-brown; trace of organic plant matter, black	2.0	8.0	DRILLING COMPANY: Rochester Drilling Co.
No recovery	2.0	10.0	DRILLING METHOD: Hollow-stem auger
Gravel, fine with some medium to coarse, dark gray; some sand, fine dark gray; little silt and clay, chemical odor	2.0	12.0	SAMPLING METHOD: Split spoon
Clay, dark gray; and gravel, fine, some sand, fine with some medium, dark gray, little silt; chemical odor; trace of organic plant material, dark gray	3.0	15.0	SAMPLES: EXAMINED BY: G. S. Sikora
Clay, plastic, reddish-brown with some black	3.0	18.0	REFERENCE POINT: Grade 1/
			ELEVATION OF R. P.: 572.7 feet above MSL
			CASING: 6½ feet of 1½ inch galvanized
			SCREEN: TYPE: Johnson Stainless Steel
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 5½ feet - 16 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 6.40 feet below TOC, June 25, 1979
			PUMPING WATER LEVEL:
			YIELD: .5 gpm
			REMARKS:
			Drilling started June 1, 1979
			1/ Grade = 1.0 feet below TOC
			TOC = 573.72 feet above MSL

WESTPORT, CONNECTICUT

1/ TOC = 574.78 feet
above MSL

WS-53

Depth

Description

Moisture

No sampling

Augered to 13.0'

Total Pipe Length: 15.5'

Top of Sand: 7.0' below grade

Top of Bentonite: 6.0' below grade

WS-54

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt - oily	Wet

Augered to 7.0'
Total Pipe Length: 6.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-55

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Clay at approximately 7.0-7.5'	
	Augered to 8.0'	
	Total Pipe Length: 7.75'	
	Top of Sand: 3.5' below grade	
	Top of Bentonite: 2.5' below grade	
	NOTE: Well installed at grade with water box and cap.	

WS-56

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-9.0'	Red-brown clay at approximately 8.0'	
	Augered to 8.0'	
	Total Pipe Length: 7.75'	
	Top of Sand: 3.5' below grade	
	Top of Bentonite: 2.5' below grade	

NOTE: Well installed with casing & plug.

WS-57

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-9.0'	Red clay at approximately 8.0'	
	Augered to 8.0'	
	Total Pipe Length: 7.75'	
	Top of Sand: 3.5' below grade	
	Top of Bentonite: 2.4' below grade	

NOTE: Well installed with casing & cap.

WS-58

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
0.0-0.5'	Asphalt	
0.5-1.25	Concrete	
1.5-3.0	Brick	
4.0-6.5'	Red clay - hard at approximately 6.0'	

Augered to 6.0'

Total Pipe Length: 5.75'

Top of Sand: 3.0' below grade

Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve box
and cover.

WS-59

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
0-0.75'	Asphalt	
0.75-1.5'	Concrete	
4.0-7.0'	No split spoon sample	

Augered to 6.5'
Total Pipe Length: 6.25'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Hard at 6.0' but could not get any
return for split spoon. Very difficult to
auger, 6.0-6.5', red clay on bottom of augers.
Installed at grade with valve box & cap.

WS-61

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
--------------	--------------------	-----------------

	Augered through concrete pad	
4.0-7.0'	Clay at approximately 6.0'	

Augered to 7.0'
Total Pipe Length: 9.5'
Top of Sand: 3.5' below grade
Top of Bentonite: 2.9' below grade

NOTE: 20 lbs of bentonite used, hole must
have collapsed some.

WS-62

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
4.0-6.0'	Greyish-brown silt & sand & clay	Wet at 5.5'

Augered to 9.0'

Total Pipe Length: 12.0'

Top of Sand: 3.9' below grade

Top of Bentonite: 3.0' below grade

WS-64

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey clay at approximately 7.0'	
	Augered to 7.0'	
	Total Pipe Length: 9.6'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	

WS-65

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Silt and sand	
9.0-10.0'	No recovery, hard	

Augered to 9.0'

Total Pipe Length: 8.75'

Top of Sand: 3.0' below grade

Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with gate
box & cap.

WS-67

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
8.0-10.0'	Grey-black silt, sand - red clay at 9.0'	Wet
	Augered to 9.0'	
	Total Pipe Length: 12.0'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	

WS-68

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt - white & yellow flyash (?)	Wet
8.0-10.0'	Grey-black silt - red clay at 9.0'	

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-73

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt sand - light yellow substance, 6.0-7.0'	Wet at 5.0'
8.0-10.0'	Hard at 9.3', end of fill, grey-brown silt & sand	

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with gate box
and cap.

WS-74

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey sand, silt with wood - white & yellow - flyash (?)	Wet
8.0-10.0'	Very hard at 9.0' 9.0-10.0' grey-brown silt & sand	
	Augered to 9.0' Total Pipe Length: 8.75' Top of Sand: 3.0' below grade Top of Bentonite: 2.0' below grade	

NOTE: Installed at grade with valve
box & cap.

WS-75

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt & sand	Wet
8.0-10.0'	Sand & silt	Moist

Augered to 9.0'

Total Pipe Length: 12.0'

Top of Sand: 3.0' below grade

Top of Bentonite: 2.0' below grade

WS-83

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Bricks, grey-brown silt - some red clay at 7.0' with bricks hard to auger	Moist
8.0-10.0'	Red clay - hard to auger at 9.0'	Moist

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-84

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt & pebbles - reddish brown clay at 7.0'	Wet
8.0-10.0'	Sand & red clay	Wet

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Hard to auger at 5.0'.
Installed at grade with valve box & cap.

WS-89

Depth

Description

Moisture

No sampling

Augered to 12.0'

Total Pipe Length: 14.75'

Top of Sand: 6.0' below grade

Top of Bentonite: 5.0' below grade

WS-93

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey silt & sand - hard clay at 7.5'	Moist
	Augered to 9.0'	
	Total Pipe Length: 8.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	
	NOTE: Installed at grade with valve box & cap.	

WS-94

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-9.0'	Grey silt & sand - hard red clay at 7.5'	Moist
	Augered to 9.0'	
	Total Pipe Length: 8.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	
	NOTE: Installed at grade with valve box & cap.	

WS-95

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Sand & grey clay - red-grey clay at 8.0'	Moist

Augered to 10.25'
Total Pipe Length: 10.0'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-96

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Black silt & sand - clay at 7.0'	Wet
	Augered to 9.0'	
	Total Pipe Length: 12.0'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	

WS-97

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey silt & sand - grey clay at 7.0'	Wet

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-98

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Sand and grey silt - grey clay at 7.0'	Wet

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-105

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt - clay at 7.0'	Wet

Augered to 8.0'
Total Pipe Length: 7.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-106

Depth

Description

Moisture

Hard to auger at 3.0'. Could not get
through cement pad - 3 attempts failed.
No well installed

WS-107

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt & sand - red clay at 6.0'	Wet

Augered to 10.0'
Total Pipe Length: 9.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-109

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Sand & black silt - red clay at 8.0' - oily film on augers	Wet

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-110

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt & sand - hard red clay at 7.5'	Wet Dry
8.0-10.0'	Hard clay	Dry

Augered to 10.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Surface water running into
hole, raised well casing 0.5' and made
mound with cement. Installed at grade
with valve box & cap.

WS-111

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Sand - grey clay at 7.0' - red clay at 8.0'	Wet

Augered to 9.0'.
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-112

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt & sand - red-grey clay at 8.0'	Moist

Augered to 9.0'

Total Pipe Length: 11.5'

Top of Sand: 3.0' below grade

Top of Bentonite: 2.0' below grade

WS-113

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-7.0'	Grey-black silt & sand	Moist
7.5'	Red clay	

Augered to 9.0'
Total Pipe Length: 8.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-114

Depth

Description

Moisture

5.0'

Concrete

No well installed

WS-116

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
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	Augered to 7.0'	
	Total Pipe Length: 6.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	

NOTE: Installed at grade with valve
box & cap.

WS-117

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
4.5-7.5'	Grey-green sand - hard at 6.25' - red layered clay at 7.25'	
	Augered to 7.5'	
	Total Pipe Length: 6.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	

NOTE: Installed at grade with valve box & cap.

WS-118

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Black silt & sand - oily - red clay at 7.0'	Wet

Augered to 8.0'
Total Pipe Length: 7.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-121

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
	Oily gravel with small pebbles	Wet
5.0-7.0'	Grey-black silt - oily - hard to auger at 6.5'; fibrous material	Wet
	Augered to 7.0' Total Pipe Length: 6.75' Top of Sand: 3.0' below grade Top of Bentonite: 2.0' below grade	

NOTE: Installed at grade with valve box & cap.

WS-122

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey silt & sand - clay at 6.0'	Moist
	Augered to 9.0'	
	Total Pipe Length: 8.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	

NOTE: Installed at grade with valve
box & cap.

WS-124

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-7.0'	Sand & fill	

Augered to 10.0'
Total Pipe Length: 9.75'
Top of Sand: 3.0' below grade
Top of Bentonite: 2.0' below grade

NOTE: Installed at grade with valve
box & cap.

WS-125

Depth

Description

Moisture

Augered to 9.0' and discontinued.
At 9.0' concrete could not be penetrated.
No well installed.

WS-126

Depth

Description

Moisture

Augered to 4.0' & discontinued.
Concrete at 4.0' could not be penetrated.
No well installed.

WS-136

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey silt & sand - clay at 8.0'	
	Augered to 9.0'	
	Total Pipe Length: 8.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	
	NOTE: Installed at grade with valve box & cap.	

WS-137

<u>Depth</u>	<u>Description</u>	<u>Moisture</u>
5.0-8.0'	Grey-black silt. & sand - clay at 8.0'	Moist
	Augered to 9.0'	
	Total Pipe Length: 8.75'	
	Top of Sand: 3.0' below grade	
	Top of Bentonite: 2.0' below grade	
	NOTE: Installed at grade with valve bos & cap.	

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 1 of 3

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Fill, clay, till	33.0	33.0	LOCATION: <u>S Area</u>
Dolomite bedrock, gray for remainder of hole			WELL NO. <u>TRW-1</u>
(CORING RUNS)			DATE COMPLETED: <u>August 8, 1979</u>
Run #1 (8/6/79) Dolomite, very vuggy			DRILLING COMPANY: <u>Rochester Drilling Co.</u>
6 weathered breaks	1.0	34.0	DRILLING METHOD: <u>Core barrel and air and water</u>
Run #2 (8/7/79) Dolomite, solid	.5	34.5	SAMPLING METHOD: <u>cores</u>
Several fresh breaks	.5	35.0	SAMPLES: EXAMINED BY: <u>R. Lamonica</u>
Solid dolomite	1.0	36.0	REFERENCE POINT: <u>Grade</u>
Solid dolomite with about 7 apparently fresh breaks	2.0	38.0	ELEVATION OF R. P.: <u>TOC = 573.67 feet above MSL</u>
Dolomite with many horizontal breaks along shale partings	1.0	39.0	CASING: <u>Flush joint casing to rock</u>
Run #3 (8/7/79) Difficult coring.			SCREEN: TYPE: <u>None</u>
Solid dolomite with 5 fresh breaks	.5	39.5	DIA. <u> </u> SLOT NO. <u> </u>
Run #4 (8/7/79) Broken dolomite (weak zone) breaks horizontal and diagon- al	.5	40.0	SETTING: <u> </u>
Solid dolomite, few fresh breaks	1.0	41.0	PUMPING TEST: DATE: <u>9/13-17/79</u>
Void	.5	41.5	DURATION: <u>96 hours</u>
Solid dolomite with much gypsum in cracks and vugs; many shale partings; gypsum is very soft, crystalline phase	2.5	44.0	STATIC WATER LEVEL: <u>561.7 feet above MSL</u>
(Continued)			PUMPING WATER LEVEL: <u>536.3 feet above MSL</u>
			YIELD: <u>105 gpm</u>
			REMARKS: Determination of yield during drilling is not possible because of the space restriction when the core barrel is in the hole.

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 2 of 3

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Run #5 Difficult coring; many breaks			LOCATION: S area
diagonal and horizontal	.5	44.5	WELL NO.: TRW-1 (Continued)
Very broken dolomite *	.5	45.0 *	DATE COMPLETED: _____
Solid dolomite, very thin bedded;			DRILLING COMPANY: _____
bedding orientation changes twice			DRILLING METHOD: _____
from horizontal to diagonal (45°);			SAMPLING METHOD: _____
much gypsum in cracks; no vugs	4.0	49.0	SAMPLES: EXAMINED BY: _____
Run #6 (8/7/79) Solid cores; bedding			REFERENCE POINT: _____
changes evident, little gypsum	5.0	54.0	ELEVATION OF R. P.: _____
Run #7 (8/7/79) Solid dolomite	1.5	55.5	CASING: _____
Fracture zone with apparent odor and			SCREEN: TYPE: _____
staining	.2	55.7	DIAM.: _____ SLOT NO. _____
			SETTING: _____
			PUMPING TEST: DATE: _____
Solid dolomite	2.5	58.2	DURATION: _____
Fracture		58.2	STATIC WATER LEVEL: _____
			PUMPING WATER LEVEL: _____
Solid dolomite	.8	59.0	YIELD: _____
Discharge contains black liquid with			REMARKS:
odor		59.0	* Switched to water no return of fluid
Run #8 (8/8/79) Solid dolomite with			
one moist seam	1.3	60.3	
Thin cracks in this zone	.5	60.8	
Solid dolomite	1.2	62.0	
(continued)			

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

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LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

WESTPORT, CONNECTICUT

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: North of Robert
Moses Pkwy.

WELL NO.: SP-1a

DATE COMPLETED: July 26, 1979

DRILLING COMPANY: Rochester Drilling
Co.

DRILLING METHOD: Hollow stem auger

SAMPLING METHOD: Split spoon

SAMPLES EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade 2/

ELEVATION OF R. P.: 571.5 feet above
MSL

CASING: 19 feet of 1 1/2 inch
galvanized

SCREEN TYPE: Johnson Stainless
Steel

DIAM.: 1 1/2 inch SLOT NO. 10

SETTING: 19-24 feet

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER LEVEL: 14.51 feet below
TOC, July 26, 1979

PUMPING WATER LEVEL: _____

YIELD: 1.25 gpm

REMARKS:
1/ Air hammer used in
shot rock zone.

2/ TOC = 571.36 feet
above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Shot rock with sand and silt matrix	8.0	8.0	LOCATION: North of Robert Moses Pkwy.
Boulders	7.0	15.0	WELL NO.: SP-2a
Boulders and shot rock	5.0	20.0	DATE COMPLETED: July 26, 1979
Fine sand and silt and fill materials	3.0	23.0	DRILLING COMPANY: Rochester Drilling Co.
Till (hard)	1.0	24.0	DRILLING METHOD: Hollow stem auger; (flush joint casing; SAMPLING METHOD: none (air hammer)
			SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade 1/
			ELEVATION OF R. P.: 573.4 feet above MSL
			CASING: 19 feet of 1 1/2 inch galvanized
			SCREEN: Johnson Stainless Steel
			DIAM.: 1 1/2 inch SLOT No. 10
			SETTING: 19-24 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 10.42 feet below TOC, September 19, 1979
			PUMPING WATER LEVEL:
			YIELD: .7 gpm
			REMARKS:
			1/ TOC = 572.94 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Shot rock with silt, sand, and clay	15.0	15.0	LOCATION: North of Robert Moses Pkwy.
Split spoon: shot rock with silt, sand, and clay	1.5	16.5	WELL NO.: SP-3a
Shot rock with silt, sand and clay	8.5	25.0	DATE COMPLETED: July 24, 1979
Split spoon: sand, medium, with shot rock	1.5	26.5	DRILLING COMPANY: Rochester Drilling Co.
Sand, medium, with shot rock	1.5	28.0	DRILLING METHOD: Hollow stem auger ¹
Till, brown red	3.5	31.5	SAMPLING METHOD: auger return
			SAMPLES: EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade ^{2/}
			ELEVATION OF R. P.: 573.9 feet above MSL
			CASING: 24 feet of 1½ inch galvanized
			SCREEN: TYPE: Johnson Stainless Steel
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 24-29 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 10.81 feet below TOC, September 19, 1979
			PUMPING WATER LEVEL:
			YIELD: undetermined
			REMARKS:
			1/ Air hammer in shot rock
			2/ TOC = 573.34 feet above MSL

WESTPORT, CONNECTICUT

1/ TOC = 573.25 feet
above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Topsoil, sand, silt, cobbles	1.5	1.5	LOCATION: South of Robert Moses Parkway
Rock, boulders with silt, clay, sand, no water	1.0	2.5	WELL NO.: SP-5
Rock, boulders with silt, clay, sand, no water	1.0	3.5	DATE COMPLETED: July 19, 1979
Rock, boulders (fill for Robert Moses Parkway)	23.5	27.0	DILLING COMPANY: Rochester Drilling C
Till-red	2.5	29.5	DILLING METHOD: Air Hammer
Rock		40.0	SAMPLING METHOD: Return at surface
			SAMPLES EXAMINED BY: Dan Buzea
			REFERENCE POINT: Grade ^{1/}
			ELEVATION OF R. P.: 569.1 feet above MSI
			CASING: 34 feet of 1½ inch galvanized
			SCREEN: Johnson Stainless Steel TYPE:
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 34.5-39.5 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 14.29 feet below TOC. September 20, 19
			PUMPING WATER LEVEL:
			YIELD: 5 gpm
			REMARKS:
			1/ TOC = 568.68 feet above MSI

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION

THICK-
NESS
(FEET)

DEPTH
(FEET)

After SP-5 rock well assembly was in-
stalled it was sand-packed and covered
with 2 feet of bentonite. The shallow
well screen assembly was then installed
and sand-packed to the surface.

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: South of Robert Moses
Parkway

WELL NO.: SP-5a

DATE
COMPLETED: July 19, 1979

DRILLING
COMPANY: Rochester Drilling Co

DRILLING
METHOD: Air Hammer

SAMPLING
METHOD: Surface return

SAMPLES
EXAMINED BY: Dan Buzea

REFERENCE
POINT: Grade^{1/}

ELEVATION
OF R. P.: 569.1 feet above MSL

CASING: 24 feet of 1½ inch
galvanized

SCREEN-
TYPE: Johnson Stainless
Steel

DIAM.: 1½ inch SLOT NO. 10

SETTING: 24.5-29.5 feet

PUMPING TEST-
DATE:

DURATION:

STATIC WATER
LEVEL: 13.73 feet below
TOC, September 20, 1979

PUMPING WATER
LEVEL:

YIELD: 7.5 gpm

REMARKS:

1/ TOC = 568.29 feet
above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Topsoil	1.5	1.5	LOCATION: <u>South of Robert Moses Parkway</u>
Cobbles, stones, sand, silt, clay	4.5	6.0	WELL No. <u>SP-6</u>
Shot rock boulders with sand and silt matrix; no foam, air or water return	19.0	25.0	DATE COMPLETED: <u>July 3, 1979</u>
Till, red	1.0	26.0	DRILLING COMPANY: <u>Rochester Drilling Co</u>
Dolomite bedrock, broken; much silt and fine sand in air discharge	5.0	31.0	DRILLING METHOD: <u>Air Hammer and Flus joint casing, rock core</u> SAMPLING METHOD: <u>Split spoon where possible</u>
			SAMPLES: EXAMINED BY: <u>R. Lamonica</u>
			REFERENCE POINT: <u>Grade 1/</u>
			ELEVATION OF R. P.: <u>568.0 feet above MSL</u>
			CASING: <u>26 feet of 1 1/2 inch galvanized</u>
			SCREEN: TYPE: <u>Johnson Stainless Steel</u>
			DIAM. <u>1 1/2 inch</u> SLOT No. <u>10</u>
			SETTING: <u>26-31 feet</u>
			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: <u>13.30 feet below TOC., September 20 1979</u>
			PUMPING WATER LEVEL: _____
			YIELD: <u>7 gpm</u>
			REMARKS: <u>1/ TOC = 568.01 feet above MSL</u>

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Topsoil	1.5	1.5	LOCATION: South of Robert Moses
Cobbles, stones, sand, silt, clay	4.5	6.0	WELL NO. SP-6a Parkway
Shot rock boulders with sand and silt			DATE COMPLETED: July 3, 1979
matrix; no foam, air or water return	19.0	25.0	DRILLING COMPANY: Rochester Drilling Co
Till, red	1.0	26.0	DRILLING METHOD: Air Hammer and Flush joint casing, rock core
Dolomite bedrock, broken; much silt and			SAMPLING METHOD: split spoon where possible
fine sand in air discharge	5.0	31.0	SAMPLES EXAMINED BY: R. Lamonica
			REFERENCE POINT: Grade 1/
After sandpack around SP-6 screen, two			ELEVATION OF R. P.: 568.0 feet above MSI
boxes of bentonite pellets were added			CASING: 20 feet of 1½ inch galvanized
with a sand pad on top. The screen			SCREEN TYPE: Johnson Stainless Steel
assembly for SP-6a was then put in the			DIAM.: 1½ inch SLOT NO. 10
same hole, sand-packed to the surface,			SETTING: 20-25 feet
and gate-boxed and grouted			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 12.92 feet below TOC, September 20, 1979
			PUMPING WATER LEVEL:
			YIELD: 8 gpm
			REMARKS:
			1/ TOC = 567.61 feet above MSL

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Top soil consisting of clay, silt, brown	1.5	1.5	LOCATION: South of Robert Moore Parkway
Fill, consisting of brown clay; silt,			WELL NO.: SP-7
sand, very fine, brown	1.5	3.0	DATE COMPLETED: June 26, 1979
Fill, consisting of brown clay, silt,			DRILLING COMPANY: Rochester Drilling Co
sand, very fine, brown, cobbles <2cm	1.5	4.5	DRILLING METHOD: Hollow stem auger, tricone and air hammer
Fill, consisting of brown clay; silt,			SAMPLING METHOD: Continuous split spoon
sand, very fine to medium, cobbles;			SAMPLES EXAMINED BY: J. Naso
pebbles	1.5	6.0	REFERENCE POINT: Land Surface ^{1/}
Fill, consisting of brown clay, silt,			ELEVATION OF R. F.: 572.5 feet above MSL
sand, very fine to medium, cobbles and			CASING: 32.5 feet of 1½-inch galvanized
pebbles	1.5	7.5	SCREEN TYPE: Johnson Stainless Steel
(NOTE)			DIAM.: 1½ inch SLOT NO. 10
Casing at 7.5 feet below grade. Open hole			SETTING: 32.5-37.5 feet
drilled to 22 feet. Following day caved			PUMPING TEST: DATE:
back to 14 feet below grade. Re-drill			DURATION:
with little success. Move west 5 feet			STATIC WATER LEVEL: 11.85 feet below TOC, June 25, 1979
and begin drilling with auger ±2-3 feet.			PUMPING WATER LEVEL:
Then begin drilling with 5-inch flush			YIELD: .25 gpm
joint. Difficult drilling.	14.5	22.0	REMARKS:
Shot rock with sand matrix	3.0	25.0	
Till, red	5.5	30.5	
Dolomite bedrock	7.0	37.5	^{1/} TOC = 572.64 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
After installation of SP-7 in the rock,			LOCATION: South of Robert Mose Parkway
it was sand-packed, covered with ben-			WELL NO.: SP-7a
tonite. The shallow well screen assem-			DATE COMPLETED: June 26, 1979
bly was then installed in the same hole			DRILLING COMPANY: Rochester Drilling Co
			DRILLING METHOD: Augers, Tricone and Air Hammer
			SAMPLING METHOD: Split spoon-air dis- charge
			SAMPLES EXAMINED BY: J. Naso
			REFERENCE POINT: Grade <u>1/</u>
			ELEVATION OF R. P.: 572.5 feet above MS
			CASING: 21.4 feet of 1½-inch galvanized
			SCREEN: Johnson Stainless Type: Steel
			DIAM.: 1½ inch SLOT NO. 10
			SETTING: 21.4-26.4 feet
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL: 10.22 feet below TOC, June 25, 1979
			PUMPING WATER LEVEL:
			YIELD: 10 gpm
			REMARKS:
			<u>1/</u> TOC = 572.54 feet above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: South of Robert Moore
Parkway

WELL NO.: SP-8

DATE COMPLETED: July 19, 1979

DRILLING COMPANY: Rochester Drilling Co.

DRILLING METHOD: Air Hammer & Flush
Joint

SAMPLING METHOD: Split Spoon

SAMPLES EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade 1/

ELEVATION OF R. P.: 570.1 feet above MSL

CASING: 39 feet of 1½-inch
galvanized

SCREEN: Johnson Stainless
Steel

DIAM.: 1½-inch SLOT NO. 10

SETTING: 39-44 feet

PUMPING TEST:
DATE:

DURATION:

STATIC WATER LEVEL: 7.85 feet below
TOC, September 19, 19

PUMPING WATER LEVEL:

YIELD:

REMARKS:

1/ TOC = 569.56 feet
above MSL

LEGGETTE, BRASHEARS & GRAHAM, INC.

55 WEST STATE STREET

WESTPORT, CONNECTICUT

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Falls Plant

LOCATION: South of Robert Moses
Parkway

WELL NO.: SP-8A

DATE COMPLETED: July 19, 1979

DRILLING COMPANY: Rochester Drilling Co

DRILLING METHOD: Air Hammer

SAMPLING METHOD: Split spoon

SAMPLES EXAMINED BY: R. Lamonica

REFERENCE POINT: Grade 1/

ELEVATION 570.1 feet above MSL
OF R. F.: _____

CASING: 22 feet of 1½-inch
galvanized

SCREEN: Johnson Stainless Steel
TYPE: _____

DIAM.: 1½ inch SLOT NO. 10

SETTING: 22-27 feet

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER 7.15 feet below
LEVEL: _____

TOC, September 19, 1979

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS:

1/ TOC = 570.00 feet
above MSL

SP-9

<u>Depth</u>	<u>Sample No.</u>	<u>Description</u>	<u>Blowcounts</u>	<u>Moisture</u>
0-1.0'	S-1	Reddish brown silt & sand - some fine roots	4/8/50 0	
2.0-4.0'	S-2	No recovery	65/20/22/40	
4.0-6.0'	S-3	Shot rock fragments with - some brown sand & gravel	28/30/65/80	
6.0-7.0'	S-4	Shot rock fragments with - some brown sand & gravel	45/100 0.5	
9.0-11.0'	S-5	Shot rock fragments with - some brown sand & gravel - some wet silt	9/10/10/65	
11.0-11.8'	S-6	Shot rock fragments with - some brown sand & gravel	80/100 0.3	
14.0-15.8'	S-7	Shot rock fragments with - some brown sand & gravel	14/19/27/100 0.3	
16.0-18.0'	S-8	Shot rock fragments with - some brown sand & gravel	20/40/49/45	
18.0-20.0'	S-9	No recovery	15/19/4/11	
20.0-22.0'	S-10	Shot rock	10/15/20/21	Wet
24.0-26.0'	S-11	Dark brown sand - some silt	1/2/2/2	
26.0-28.0'	S-12	Reddish brown till silt - some sand & gravel	2/19/65/60	
29.0'		Bedrock		
29.0-34.0'	Run 1	First 4' - many voids, possible loose large fragments. Recovery 2.4', last foot solid.		
34.0-38.6'	Run 2	Recovery 4.6', seams at 35.6-35.9', 38.2-38.4'		
38.6-43.0'	Run 3	Recovery 4.0'		

SP-9 (cont)

Total Depth:	43.0'
Total Pipe Length:	42.5'
Top of Sand:	36.0' below grade
Top of Bentonite:	35.0' below grade

NOTE: Large volume of cement needed to fill annular space. Valve box & cap used for protection.

SP-9a

<u>Depth</u>	<u>Sample No.</u>	<u>Description</u>	<u>Blowcounts</u>	<u>Moisture</u>
--------------	-------------------	--------------------	-------------------	-----------------

No sampling

Augered 27.0'

Total Pipe Length: 26.5'

Top of Sand: 19.5' below grade

Top of Bentonite: 18.5' below grade

NOTE: Large volume of cement used to
fill hole.

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
72 DANBURY ROAD
WILTON, CT. 06897

PAGE 1 OF 2 PAGES

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	Hooker Chemicals and OWNER: Plastics Corp., Niagara Plant
Augered through fill composed of			LOCATION: East side of S Area
sand, fine to very coarse; stones;			WELL No. OW-1S-80
brick; dry; chemical odor	0.5	0.5	DATE COMPLETED: 2/14/80
S-1, Fill composed of sand, very			DRILLING COMPANY: Empire Soils Investi- gation Co., Inc.
fine to medium, dark gray, white			DRILLING METHOD: Hollow-stem auger
crystalline material occurring as			SAMPLING METHOD: Split spoon
angular fragments and soft lenses;			SAMPLES EXAMINED BY: M.H. Steinbach
brick; dry	2.0	2.5	REFERENCE POINT: Grade <u>1</u> /
S-2, Fill composed of sand, fine,			ELEVATION OF R. P.: 575.9 ft above MSL
dark gray; with white material, soft			21 ft of 2-inch
and pebbles; dry	2.0	4.5	CASING: black pipe
S-3, Fill composed of sand, very			SCREEN TYPE: Johnson stainless steel
fine, brown; white angular frag-			2-inch SLOT No. 10
ments; strong chemical odor	2.0	6.5	17.5 ft - 22.5 ft.
S-4, Fill composed of sand, fine,			SETTING: _____
gray to black, oily; wood; roots;			PUMPING TEST: _____
strong chemical odor	2.0	8.5	DATE: _____
S-5, Fill composed of very fine sand			DURATION: _____
and silt, dark gray, clayey; oily;			STATIC WATER LEVEL: 11.8 ft below TOC
root material; strong odor	2.0	10.5	2/21/80
S-6, Top: Fill composed of very fine			PUMPING WATER LEVEL: _____
sand, very oily, dark gray-black.			YIELD: _____
Bottom: Fill, sand, medium to			REMARKS: _____
coarse, brown	2.0	12.5	<u>1</u> / TOC= 579.88 above MSL
S-7, Fill composed of sand, coarse;			
brown; clay, black; stones	2.0	14.5	
(continued)			

LEGGETTE, BRASHEARS & GRAHAM, INC.

72 DANBURY ROAD

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
72 DANBURY ROAD
WILTON, CT. 06897

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
Augered through fill composed of sand, very fine to coarse, dark gray; brick; dry	2.0	2.0	LOCATION: South side of S Area OW-2S-80
S-1, Fill of sand, very fine to fine, brown; stones; brick; small lenses of clay, gray; slight odor; dry	2.0	4.0	WELL NO.: DATE COMPLETED: 2/13/80 DRILLING METHOD: Hollow-stem auger SAMPLING METHOD: Split spoon SAMPLES EXAMINED BY: M.H. Steinbach
S-2, Fill of sand, very fine to medium, brown; wood; rubber; small lenses of clay, slight odor; dry	2.0	6.0	REFERENCE POINT: Grade <u>1/</u>
S-3, Fill of clayey silt, dark gray; trace gravel; dry	2.0	8.0	ELEVATION OF R. P.: 575.0 ft above MSL 28.2 ft of 2-inch black pipe
S-4, Fill mainly of clay, dark brown-gray, with silt to medium sand; pebbles; gravel; stones; wet; odor	2.0	10.0	CASING: Johnson stainless steel DIAM.: 2-inch SLOT NO. 10 SETTING: 24.9 ft - 29.9 ft
S-5, Fill, Top: Sand, medium; gravel; dark brown, wet Bottom: Large rock fragments; stones; conglomerate (concrete)	2.0	12.0	PUMPING TEST: DATE: DURATION: 13.4 ft below TOC STATIC WATER LEVEL: 2/21/80 PUMPING WATER LEVEL:
S-6, Fill of sand, fine; wood; gravel; glass; strong chemical odor; dry	2.0	14.0	YIELD: REMARKS:
S-7, Fill, Top: Fine sand, dark gray; black oily residue; gravel; glass; odor Bottom: Fill of sand, fine to medium, green-brown; gravel;			<u>1/</u> TOC = 577.36 ft above MSL.

(continued)

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
72 DANBURY ROAD
WILTON, CT. 06897

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
pebbles; dry	2.0	16.0	
S-8, Top: Fill of gravel, black, oily; glass			LOCATION: _____ WELL NO. OW-2S-80 (continued)
Bottom: Fill of sand, fine, brown- green	2.0	18.0	DATE COMPLETED: _____ DRILLING COMPANY: _____ DRILLING METHOD: _____ SAMPLING METHOD: _____ SAMPLES: EXAMINED BY: _____ REFERENCE POINT: _____ ELEVATION OF R. P.: _____ CASING: _____ SCREEN: TYPE: _____ DIAM. _____ SLOT NO. _____ SETTING: _____ PUMPING TEST: DATE: _____ DURATION: _____ STATIC WATER LEVEL: _____ PUMPING WATER LEVEL: _____ YIELD: _____ REMARKS: _____
S-9, Top: Fill of gravel with medi- um to coarse sand, oily; glass; pebbles			
Bottom: Sand, very fine to fine, dark gray; odor	2.0	20.0	
S-10, Fill of sand, very fine, dark gray, oily; gravel; glass	2.0	22.0	
S-11, Sand, very fine, dark gray; odor; top is very oily	2.0	24.0	
S-12, Sand, very fine, dark gray; odor	2.0	26.0	
S-13, Sand, fine, dark brown; dry; top is oily	2.0	28.0	
S-14, Sand, very fine, dark gray; trace gravel and pebbles in top; bottom sand is homogeneous	2.0	30.0	
S-15, Top: Sand, very fine, dark gray; oily; strong odor; oily resi- due; some gravel 30.0-31.7			
Bottom: Till of clay, brown-red, with stones and rock fragments, 31.7 - 32.0	2.0	32.0	

(continued)

LEGGETTE, BRASHEARS & GRAHAM, INC.

72 DANBURY ROAD
WILTON, CT. 06897

DESCRIPTION

some pebbles

with pebbles and rock fragments

Bottom: Till or bedrock (broken

rock fragments)

Stopped drilling

**THICK-
HEADED
OPINION**

**DEPTH
WENT?**

OWNER: Hooker Chemicals and
Plastics Corp.,
Niagara Plant

LOCATION: _____

WELL No. OW-2S-80 (continued)

DATE COMPLETED: _____

**DRILLING
COMPANY:** _____

DRILLING METHOD: _____

SAMPLING METHOD: _____

SAMPLED:
EXAMINED BY: _____

REFERENCE POINT: _____

ELEVATION
OF R. P. _____

CASINO: _____

SCREEN: _____
TYPE: _____

PLAN: _____ SLOT No. _____

SETTING: _____

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL _____

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS:

WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS
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WILTON, CT. 06897

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
Augered through fill composed of			LOCATION: West side of S Area
sand; brick; stones; dry; chemical			WELL NO.: OW-3S-80
odor	2.0	2.0	DATE COMPLETED: 2/14/80
S-1, Top: Fill of clay, brown;			DRILLING COMPANY: Empire Soils Investiga- tion Co., Inc.
pebbles and gravel; dry			DRILLING METHOD: Hollow-stem auger
Bottom: Fill of silt, dark gray;			SAMPLING METHOD: Split spoon
gravel; glass; small lenses of			SAMPLES EXAMINED BY: M. H. Steinbach
white clay; odor	2.0	4.0	REFERENCE POINT: Grade ^{1/}
S-2, Fill of large round stones in			ELEVATION OF R. P.: 572.9 ft above MSL
brown mud; pebbles; gravel; wet -	2.0	6.0	CASING: 21 ft. of 2-inch black pipe
S-3, Top: Fill of gravel, brown, wet;			SCREEN TYPE: Johnson stainless steel
trace clay			DIAM.: 2-inch SLOT NO.: 10
Bottom: Fill of sand, fine, dark			SETTING: 17.9 ft-22.9 ft
gray, fine to medium; glass;			PUMPING TEST: DATE: _____
rubber; odor	2.0	8.0	DURATION: _____
S-4, Fill of mostly sand, fine to			STATIC WATER LEVEL: 10.8 ft below TOC
medium, brown; silt; glass;			PUMPING WATER LEVEL: _____
pebbles; dry	2.0	10.0	YIELD: _____
S-5, No return	2.0	12.0	REMARKS: _____
S-6, Top: Fill of sand, fine to			
medium, dark brown; wood, vegeta-			
tion; wet			
Bottom: Fill of sand, fine to			
medium; oily; odor	2.0	14.0	
S-7, Fill of sand, fine to medium,			
dark brown; brick; vegetation, odor	2.0	16.0	

^{1/} TOC= 575.97 ft above
MSL

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72 DANBURY ROAD
WILTON, CT. 06897

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WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS
72 DANBURY ROAD
WILTON, CT. 06897

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
Augured through fill of sand; stones; brick; dry; chemical odor	2.0	2.0	LOCATION: West side of S Area
S-1, Fill of cobbles, round and rock fragments; concrete; sand, very fine; clay, brown; odor; dry	2.0	4.0	WELL No.: OW-4S-80
S-2, Fill of clayey sand, very fine to medium, brown; some gravel; oily residue; dry; odor	2.0	6.0	DATE COMPLETED: 2/15/80
S-3, As above; more oily residue	2.0	8.0	Empire Soils Investigation DRILLING Co., Inc.
S-4, No return	2.0	10.0	DRILLING METHOD: Hollow-stem auger
S-5, Fill of sand, very fine to fine, dark brown; roots; odor	2.0	12.0	SAMPLING METHOD: Split spoon
S-6, Fill of sand, very fine, dark brown; odor; dry; cobbles; oily residue	2.0	14.0	SAMPLE: EXAMINED BY: M. H. Steinbach
S-7, Fill of sand, very fine, dark brown; wood; very oily; odor	2.0	16.0	REFERENCE POINT: Grade <u>1/</u>
S-8, Sand, very fine; much silt, dark brown; homogeneous, odor; dry	2.0	18.0	ELEVATION: 572.1 feet above MSI OF R. P.: 24 feet of 2-inch black pipe
S-9, Sand, very fine; much silt, dark brown, homogeneous; odor; dry	2.0	20.0	CASING: Johnson stainless steel TYPE: 2-inch SLOT No. 10
S-10, Sand, very fine; much silt, dark brown; homogeneous; odor; dry; oily residue	2.0	22.0	DIAM.: 21.3 ft-26.3 ft SETTING: _____ PUMPING TEST: DATE: _____
S-11, Lost 0.5 ft (split spoon caught on auger) Sand, very fine; silt, dark brown; roots; very oily; odor (continued)	2.0	24.0	DURATION: _____ STATIC WATER LEVEL: 10.90 ft below TOC 2/21/80 PUMPING WATER LEVEL: _____ YIELD: _____ REMARKS: 1/ TOC=574.92 ft above MSI

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WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
Augered through fill of sand; stones; brick; dry; chemical odor	2.0	2.0	LOCATION: East side of S Area
S-1, Fill of sand, medium, brown and red; lenses of white clayey material; cobbles; dry	2.0	4.0	WELL No. OW-5S-80
S-2, Fill of sand, medium, black; silt; glass; rock fragments; some clay; wood; dry	2.0	6.0	DATE COMPLETED: 2/15/80 Empire Soils Investigati Co., Inc.
S-3, Fill of sand, red-orange and brown, fine; clay and silt; lenses of white clay; odor; dry	2.0	8.0	DRILLING METHOD: Hollow-stem auger SAMPLING METHOD: Split spoon SAMPLES: M.H. Steinbach EXAMINED BY: Grade 1/
S-4, Fill of sand, very fine, black; oily; rock fragments; odor	2.0	10.0	REFERENCE POINT: 578.5 ft above MSL 21 ft of 2-inch black pipe
S-5, Fill of sand, very fine, dark gray; oil residue, mostly dry; some silt and clay; angular rock fragments; pebbles	0.3	10.3	CASING: Johnson stainless steel SCREEN: 2-inch 10 DIA.: SLOT No SETTING: 17.3 ft - 22.3 ft
No return	1.7	12.0	PUMPING TEST: DATE: 2/21/80 DURATION: 11.5 ft below TC STATIC WATER LEVEL: 2/21/80 PUMPING WATER LEVEL: YIELD:
S-6, Fill of sand, medium, dark gray; rock fragments; some silt and gravel; oily; odor	2.0	14.0	REMARKS: 1/ TOC-582.49 ft above MSL
S-7, Fill of sand, medium, dark gray with rock fragments; some silt and gravel; oily; odor; brick; white crystalline material	2.0	16.0	
S-8, Fill of sand, medium, dark gray; rock fragments; some silt and			

(continued)

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72 DANBURY ROAD

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Hooker Chemicals and
OWNER: Plastics Corp.,
Niagara Plant

LOCATION: _____

OW-5S-80 (continued)

WELL No. _____

DATE
COMPLETED: _____

DRILLING
COMPANY: _____

DRILLING
METHOD: _____

SAMPLING
METHOD: _____

SAMPLES
EXAMINED BY: _____

REFERENCE
POINT: _____

ELEVATION
OF R. P.: _____

CASING: _____

SCREEN:
TYPE: _____

DIAM.: _____ SLOT No. _____

SETTING: _____

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL: _____

PUMPING WATER
LEVEL: _____

YIELD: _____

REMARKS: _____

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

72 DANBURY ROAD
WILTON, CT. 06897

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
Augered through fill composed of			
sand, very fine to coarse; stones;			LOCATION: Northeast side of S Area
brick; dry; chemical odor	2.0	2.0	WELL No.: OW-6S-80
S-1, Fill of sand, fine to medium,			DATE COMPLETED: 2/19/80
pale gray, friable, occurring as			DRILLING COMPANY: Empire Soils Investig- ation Co., Inc.
partly clayey, lumps	2.0	4.0	DRILLING METHOD: Hollow-stem auger
S-2, Fill of sand, fine to medium,			SAMPLING METHOD: Split spoon
pale gray, friable, occurring as			SAMPLES EXAMINED BY: M.H. Steinbach
partly clayey, lumps	2.0	6.0	REFERENCE POINT: Grade <u>1</u>
S-3, Top: Fill of sand, very fine to			ELEVATION OF R. P.: 571.4 ft above MSL
fine, dark brown; brick			13.7 ft of 2-inch black pipe
Bottom: Clay, gray; homogeneous	2.0	8.0	CASING: Johnson stainless steel
S-4, 8.0-8.3 fill of sand, medium,			SCREEN TYPE: 2-inch 10
red-brown; silt; pebbles; brick,			DIAM. SLOT No.
8.3-10.0; black oily mud; silt	2.0	10.0	SETTING: 10.7 ft - 15.7 ft
S-5, Fill of sand, medium to coarse,			PUMPING TEST: DATE:
black; pebbles; brick; root			DURATION: 9.2 ft below TOC
material	2.0	12.0	STATIC WATER LEVEL: 2/21/80
S-6, Sand, fine to medium, dark gray	2.0	14.0	PUMPING WATER LEVEL:
S-7, Top: Sand, gray-black; rock			YIELD:
fragments; odor	1.7	15.7	REMARKS:
Bottom; Clay, gray, plastic	0.3	16.0	
S-8, Clay, red-brown; plastic, 16.0-			<u>1</u> / TOC= 574.69 ft above MSL
16.7			
Clay, red-brown; silt; hard, 16.7-			Shelby tube sample taken from 17.0 to 19.0 feet.
18.0	2.0	18.0	

WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS
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DESCRIPTION	THICKNESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp., Niagara Plant</u>
Augered through fill composed of			<u>East side of S Area</u>
sand, fine to very coarse; stones;			<u>LOCATION:</u>
brick; dry; chemical odor	4.0	4.0	<u>WELL No.</u> <u>OW-7S-80</u>
S-1, Fill of sand, very fine, dark			<u>DATE COMPLETED:</u> <u>2/19/80</u>
brown; slight odor; occurring with			<u>EMPIRE SOILS INVESTIGATION COMPANY:</u> <u>tion Co., Inc.</u>
yellow-white clayey material; wood;			<u>DILLING METHOD:</u> <u>Hollow-stem auger</u>
dry	2.0	6.0	<u>SAMPLING METHOD:</u> <u>Split spoon</u>
S-2, Fill of sand, very fine, dark			<u>SAMPLES EXAMINED BY:</u> <u>M. H. Steinbach</u>
brown; slight odor; pale yellow-			<u>REFERENCE POINT:</u> <u>Grade 1/</u>
green, clayey, fine sandy material;			<u>ELEVATION OF R. P.:</u> <u>578.7 ft above MSL</u>
dry; stones; trace gravel	2.0	8.0	<u>21 ft of 2-inch black pipe</u>
S-3, Fill of wood in silty matrix,			<u>CASING:</u> <u>Johnson stainless steel</u>
dark brown; with yellow-green			<u>SCREEN TYPE:</u> <u>2-inch 10</u>
friable material (fine sand); dry	0.5	8.5	<u>DIAM.:</u> <u>SLOT No.</u>
No recovery	1.5	10.0	<u>SETTING:</u> <u>17.3 ft - 22.3 ft</u>
S-4, Fill of yellow-green friable			<u>PUMPING TEST:</u>
sand; clayey in part; fine sand			<u>DATE:</u>
with dark brown clayey and silty			<u>DURATION:</u>
material; dry	2.0	12.0	<u>STATIC WATER LEVEL:</u> <u>12.8 ft below TOC</u>
S-5, Fill of silt, dark gray; oily;			<u>2/21/80</u>
odor; clay; pebbles; brick	2.0	14.0	<u>PUMPING WATER LEVEL:</u>
S-6, Fill of sand, very fine to			<u>YIELD:</u>
medium, dark brown, moist; odor;			<u>REMARKS:</u>
with gravel; rock fragments and			<u>1/ TOC= 582.48ft above MSL</u>
brick	2.0	16.0	<u>Shelby tube sample taken from 24.0-26.0 feet.</u>
S-7, Fill primarily of silt, dark			
brown; yellow-green, clayey material;			

(continued)

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
72 DANBURY ROAD
WILTON, CT. 06897

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER
Augered through fill composed of			Hooker Chemicals and Plastics Corp., Niagara Plant
sand, very fine to coarse, stones;			South side of S Area
brick; dry; chemical odor	1.5	1.5	LOCATION: OW-8S-80
S-1, Fill of sand, very fine, dark			WELL NO. 2/20/80
gray; stones; rock fragments; odor	2.0	3.5	DATE COMPLETED: 2/20/80
No recovery	1.1	4.6	DRILLING COMPANY: Empire Soils Investiga- tion Co., Inc.
S-2, Fill of brown soil; cinders;			DRILLING METHOD: Hollow-stem auger
gravel; stones; root material;			SAMPLING METHOD: Split spoon
rock fragments; odor	0.9	5.5	SAMPLES EXAMINED BY: M.H. Steinbach
S-3, Fill of sand, very fine to			REFERENCE POINT: Grade <u>1</u> /
medium, dark gray; silt; clay;			ELEVATION OF R. P.: 570.2 ft above MSL
gravel; dry; odor	2.0	7.5	25 ft of 2-inch black pipe
S-4, Fill of sand, medium to coarse,			CASING: Johnson stainless steel
yellow-brown, very friable; gravel;			SCREEN TYPE: 2-inch 10
odor	1.0	8.5	DIAM. SLOT NO. 10
S-5, Fill of sand, medium to coarse,			SETTING: 22.0 ft - 27.0 ft.
yellow-brown, very friable; gravel;			PUMPING TEST: DATE:
odor; rock fragments	2.0	10.5	DURATION: 10.4 ft below TOC
S-6, Sand, very fine, dark gray;			STATIC WATER LEVEL: 2/21/80
dry; odor	2.0	12.5	PUMPING WATER LEVEL:
S-7, Sand, very fine, dark gray;			YIELD:
dry; odor	2.0	14.5	REMARKS:
S-8, Sand, very fine, dark gray; dry;			<u>1</u> / TOC= 573.04 ft above MSL
odor	2.0	16.5	
S-9, Sand, very fine, dark gray;			
dry; odor	2.0	18.5	
S-10, Sand, very fine, dark gray;			
dry; odor (continued)	2.0	20.5	

LEGGETTE, BRASHEARS & GRAHAM, INC.

72 DANBURY ROAD

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

72 DANBURY ROAD
WILTON, CT. 06897

PAGE 1 OF 2 PAGES

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp., Niagara Plant
Augered through fill composed of			LOCATION: South side of S Area
shot rock; red-brown clay; (trench			WELL No.: OW-9S-80
liner) and topsoil fill	2.0	2.0	DATE COMPLETED: 2/29/80
S-1, Fill of sand, medium to coarse,			DRILLING COMPANY: Empire Soils Investi- gation Co., Inc.
brown-black; stones; root			DRILLING METHOD: Hollow-stem auger
material; dry; odor	2.0	4.0	SAMPLING METHOD: Split spoon
S-2, Fill of sand, medium to coarse,			SAMPLES EXAMINED BY: M. H. Steinbach
brown-black; stones; root material;			REFERENCE POINT: Grade 1/
dry; odor	2.0	6.0	ELEVATION OF R. P.: 569.5 ft above MSL
S-3, Fill of sand, medium to coarse,			25 ft. of 2-inch black
brown-black; stones; root material;			CASING: pipe
dry; odor	2.0	8.0	SCREEN: Johnson stainless steel
S-4, Fill of sand, dark gray, very			DIAM.: 2-inch SLOT No. 10
oily; stones; pebbles; root material	2.0	10.0	SETTING: 21.5 ft - 26.5 ft.
S-5, Fill of sand, very fine to med-			PUMPING TEST: DATE:
ium, dark brown; cinders; root			DURATION:
material	2.0	12.0	STATIC WATER LEVEL: 9.8 ft below TOC
S-6 Fill of sand, fine to medium,			2/21/80
red-brown; silt; pebbles; trace			PUMPING WATER LEVEL:
vegetation	2.0	14.0	YIELD:
S-7, Sand, very fine to fine, dark			REMARKS:
gray; trace silt; odor	2.0	16.0	1/ TOC=572.97 ft above
S-8, Sand, very fine to fine, dark			MSL
gray; pebbles	2.0	18.0	
S-9, Sand, very fine to fine, dark			
gray, pebbles	2.0	20.0	
S-10, Sand, fine to medium, dark gray	2.0	22.0	

(continued)

LEGGETTE, BRASHEARS & GRAHAM, INC.

72 DANBURY ROAD
WILTON, CT. 06897

PAGE 2 OF 2 PAGES

~~OWNER:~~ Hooker Chemicals and
Plastics Corp.,
Niagara Plant

OW-9S-80 (continued)

DATE COMPLETED: _____

DRILLING
COMPANY: _____

DRILLING METHOD:

SAMPLING METHOD:

SAMPLES:
EXAMINED BY: _____

REFERENCE POINT:

ELEVATION
OF R. P.: _____

CASINO _____

SCREEN: _____
TYPE: _____

DIA. _____ SLOT No. _____

Setting: _____

PUMPING TEST:
DATE: _____

DURATION: _____

STATIC WATER
LEVEL _____

PUMPING WATER

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 1-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Sand with - cinders - brick - slag - metal Fragments - glass - stone	2-11-9-6	Dry
2-4'	2	Fill - Same as Sample 1	5-14-13-8	Dry
4-6'	3	Fill - Sand with - brick - stone	6-9-8-7	Dry
6-8'	4	Fill - Sand with - fine gravel - cinders - roots - stone - glass	9-15-9-4	Dry
8-10'	5	Fill - Sand with - fine gravel - cinders - stone - glass - wood - slag	12-8-10-17	Moist
10-12'	6	Fill - Sand with - fine gravel - cinders - stone - glass - yellow material	10-22-24-21	Wet
12-14'	7	Fill - Sand with - brick - wood - metal fragments	15-14-10-7	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 1-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
14-16'	8	Fill - Sand with - - some clayey chunks - cinders - black non-aqueous phase liquid	4-4-4-8	Wet
16-17.5'	9	Fill - Sand with - - cinders - fibrous material - black non-aqueous phase liquid	2-1-5-18	Wet
17.5-18.0'	9	Gray Fine to Medium Sand	2-1-5-18	Wet
18-20'	10	Gray Fine to Medium Sand - trace fine to medium gravel (well rounded)	19-27-17-21	Moist
20-22'	11	Mottled gray & yellow-brown Fine to Medium Sand - trace vegetation	6-6-6-10	Moist
22-24'	12	Gray Fine to Medium Sand - trace black non-aqueous phase liquid	2-3-5-10	Moist
24-26'	13	Gray & Yellow Brown to Fine to Medium Sand	3-5-8-13	Moist - wet layers
26-28'	14	Gray Fine to Medium Sand	4-3-13-18	Wet
28-30'	15	Gray Fine to Medium Sand - trace black non-aqueous phase liquid	5-11-17-27	Wet
30-32'	16	Gray Fine to Medium Sand - black non-aqueous	10-15-13-21	Wet
32-33'	17	Same as Sample 16	<u>WOR</u> -3-8 12	Wet
33-34'	17	Reddish Brown Clayey Silt Till - plastic	<u>WOR</u> -3-8 12	

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 2-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Sand with - - fine gravel - cinders - glass - stone - vegetation	1-3-8-8	Dry
2-4'	2	Fill - Sand with - - cinders - stone - metal fragments - fine gravel	1-4-3-5	Dry
4-6'	3	Fill - Sand with - - cinders - stone - purple stonelike material - fine gravel	6-4-1 12	Dry
6-8'	4	Fill - Brown Sand with - fine gravel - cinders - glass - vegetation	2-1-1 12	Dry
8-10'	5	Fill - Brown Sand with - fine gravel - cinders	WOR - 7-5-3 6	Dry
10-12'	6	Fill - Soft Gray Sand with - fine gravel - cinders - stone - metal fragments - black non-aqueous phase liquid	2-1-1-11	Wet 10-11.5 Dry 11.5-12

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 2-81

Depth	Sample No.	Description	Blowcounts	Moisture
12-14'	7	Fill - Brown Sand with - fine gravel - cinders - stone - black non-aqueous phase liquid	21-13-22-41	Wet 12-12.5 Dry 12.5-14
14-16'	8	Refusal at 14' - Augered through		
16-18'	9	Brown/Gray Fine to Medium Sand - trace coarse sand - trace fine gravel - occasional silt lense	20-62-52-28	Wet
18-20'	10	Brown/Gray Fine to Medium Sand - trace coarse sand - occasional silt lense - trace vegetation at 18.5'	WOR -5-8-7 6	Wet
20-22'	11	Brown/Gray Fine to Medium Sand - occasional silt lense - trace yellow non-aqueous phase liquid	1-2-5-2	Wet
22-24'	12	Brown/Gray Fine to Medium Sand - occasional silt lense - trace vegetation at 23' - trace yellow non-aqueous phase liquid	2-5-8-7	Wet
24-26'	13	Brown/Gray Fine to Medium Sand - some silt - trace yellow non-aqueous phase liquid	1-1-6-15	Wet
26-28'	14	Gray Fine to Medium Sand - some coarse sand - trace fine gravel - trace black non-aqueous phase liquid	5-11-15-15	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 2-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
28-30'	15	Black Fine to Medium Sand - some coarse sand - black non-aqueous phase liquid	7-17-7-7	Wet
30-31.3'	16	Black Fine to Medium Sand - some coarse sand - black non-aqueous phase liquid	WOR -1-18-12 6	Wet
31.3-32'	16	Reddish Brown Clayey Silt Till - soft	<u>WOR</u> -1-18-12 6	

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 3-81

Depth	Sample No.	Description	Blowcounts	Moisture	
0-2'	1	Fill - Brown Sand with - coal - vegetation - 2" topsoil	7-6-2-2	Dry	
2-4'	2	Fill - Orange-Brown Sand with - topsoil - brick	4-2-2-6	Dry	
4-6'	3	Fill - Brown Sand with - brick - stone	16-9-4-5	Dry	
6-8'	4	Fill - Brown Sand with - brick - stone - vegetation	6-4-2-1	Dry	
8-10'	5	Fill - Gray Sand with - tar - slag - stone - brick	$\frac{\text{WOR}}{6}$ -1-4-1	Dry	
10-12'	6	Fill - Brown Sand with - cinders - tar - stone - fine gravel	2-2-3-6	Dry	
12-14'	7	Fill - Sand with - cinders - slag - black non-aqueous phase liquid	2-5-10-13	Wet	
14-16'	8	Gray Fine to Medium Sand - Fine to Medium bedding with occassional silt lense	9-9-8-14	Wet	Light

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 3-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
16-18'	9	Gray Fine to Medium Sand - Fine to Medium bedding with occassional silt lense - trace black non-aqueous phase liquid	5-5-6-8	Wet
18-20'	10	Gray Fine to Medium Sand - occassional silt lense	<u>WOR</u> -2-4-5 6	Wet
20-22'	11	Same as Sample 10	<u>WOR</u> -4-5-4 6	Wet
22-24'	12	Same as Sample 10	5-6-5-8	Wet
24-26'	13	Same as Sample 10	3-7-13-15	Wet
26-27.7'	14	Gray Fine to <u>Medium</u> Sand - fine to medium gravel - one piece of white material	4-12-21-7	Wet
27.7-28'	15	Reddish Brown Clayey Silt Till - soft	4-12-21-7	

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 4-81

Depth	Sample No.	Description	Blowcounts	Moisture	
0-2'	1	Fill - Gray Stone with - trace vegetation	2-2-3-6	Dry	
2-4'	2	Fill - Gray Stone	4-4-5-10	Dry	
4-4.5'	3	Fill - Gray Stone	5-1-2-4	Dry	
4.5-6'	3	Fill - Brown Sand with - fine gravel	5-1-2-4	Dry	
6-8'	4	Fill - Brown Sand with - silt - cinders - yellow medium sand - fine gravel	2-3-4-5	Dry	
8-10'	5	Fill - Gray Sandy Silt with - trace fine gravel	WOH -1-1 12	Wet	
10-12'	6	Fill - Gray Sandy Silt with - trace fine gravel	WOH -5-1 12	Wet	
12-14'	7	Fill - Black Medium Sand with - stones and fine gravel - trace black non-aqueous phase liquid	2-1-2-4	Wet	
14-16'	8	Gray/Brown Fine to Medium Sand	3-8-9-11	Wet	Medium
16-18'	9	Same as Sample 8	7-10-11-18	Wet	Light
18-20'	10	Gray/Brown Fine to Medium Sand - some fine gravel	5-7-8-8	Wet	Light
20-22'	11	Gray/Brown Fine to Medium Sand	2-2-3-5	Moist	Light
22-24'	12	Gray/Brown Fine to Medium Sand - some fine gravel (rounded)	4-8-12-18	Moist	Light

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 4-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
24-26'	13	Gray/Brown Fine to Medium Sand - some fine gravel (rounded)	6-8-14-14	Wet
26-28'	14	Gray Fine to Medium Sand - some fine gravel (rounded) - trace black non-aqueous phase liquid	7-10-11-17	Wet
28-30'	15	Gray - Medium Sand - fine to medium gravel (rounded) - black non-aqueous phase liquid	12-20-37-16	Wet
30-31.4'	16	Gray Sand and Gravel - some rock fragments - black non-aqueous phase liquid	40-13-80- <u>100</u> 2	Wet
31.4-31.7'	16	Dark Brown Silty Sand Till - some rock fragments	40-13-80- <u>100</u> 2	
31.7'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 5-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Brown Sand with - cinders - metal fragments - white granular material	7-8-9-8	Dry
2-4'	2	Fill - Dark Brown Sand with - fine gravel - stone - brick - white granular material	3-4-4-5	Dry
4-6'	3	Fill - Brown Sand with - some fine gravel (rounded)	5-4-4-6	Dry
6-8'	4	Fill - Brown Sand with - stone - concrete - tar - metal fragments	1-2-7-12	Moist
8-9'	5	Fill - Medium Brown Sand with - trace black non-aqueous phase liquid	1-4-34-15	Wet
9-10'	5	Fill - Dark Brown Sand with - black granular stone	1-4-34-15	Moist
10-12'	6	Fill - Black Sand with - wood - tar - trace fine gravel	2-3-4-4	Moist
12-14'	7	Fill - Black Sand with - fine gravel - glass - trace black non-aqueous phase liquid	6-6-7-8	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 5-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
14-16'	8	Gray Fine to Medium Sand - occasional silt lenses - trace fine gravel	7-11-14-13	Moist
16-18'	9	Gray Fine to Medium Sand - occasional silt lenses - trace black non-aqueous phase liquid	6-8-8-10	Moist
18-20'	10	Same as Sample 9	4-5-9-10	Wet
20-22'	11	Medium Bedded Gray Fine to Medium Sand - trace black non-aqueous phase liquid	3-3-5-7	Wet
22-24'	12	Gray Medium Sand - Well Sorted - trace black non-aqueous phase liquid	2-3-2-3	Wet
24-26'	13	Gray to Black Fine to Medium Sand	1-4-5-12	Wet
26-28'	14	Gray to Black Medium Sand - occasional thin silty fine sand layers - trace black non-aqueous phase liquid	4-5-9-12	Wet
28-30'	15	Gray to Black Medium Sand - Well Sorted - black non-aqueous phase liquid	13-13-6-7	Wet
30-31.5'	16	Black Medium Sand - some gravel - some bedrock fragments - black non-aqueous phase liquid	5-1-18- <u>100</u> 3	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 5-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
31.5-31.8'	16	Silty Sand Till - rock fragments	5-1-18- <u>100</u> 3	
31.8'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 6-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Dark Brown Sand with - brick - glass	1-5-13-27	Moist
2-4'	2	Fill - Gray Sand with - glass	11-14-13-10	Moist
4-6'	3	Fill - Dark Brown Sand with - wood - fine gravel - cinders	3-2-5-8	Moist
6-8'	4	Fill - Gray Sand with - wood - cinders	2-3-6-5	Moist
8-10'	5	Fill - Black Semi Solid non-aqueous phase liquid with - silt and sand	$\frac{WOR}{12}$ - $\frac{WOR}{12}$	Wet
10-12'	6	Fill - Sand with - wood - fine gravel - trace black non aqueous phase liquid	$\frac{WOR}{12}$ -1-4	Wet
12-14'	7	Gray Fine to Medium Sand - Fine Gravel - rounded - trace black non-aqueous phase liquid	3-10-12-16	Moist
14-16'	8	Gray/Brown Fine to Medium sand - fine gravel - rounded & angular - trace vegetation	$\frac{WOR}{6}$ -4-5-7	Moist
16-18'	9	Gray/Brown Fine Sand - occasional silt lenses - trace fine gravel - rounded - trace black non-aqueous phase liquid	7-14-14-14	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 6-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
18-20'	10	Gray Fine Sand - occasional silt lenses - trace black non-aqueous phase liquid	7-5-4-5	Moist
20-22'	11	Gray Brown Fine to Medium Sand	4-11-14-14	Moist
22-24'	12A	Shelby Tube		
24-26'	12	Brown/Gray Fine to Medium Sand - trace black non-aqueous phase liquid	7-5-10-18	Moist
26-28'	13	Gray Fine to Medium Sand - some fine gravel (rounded) - black non-aqueous phase liquid	4-10-14-10	Moist
28-29'	14	Gray Fine to Medium Sand - black non-aqueous phase liquid	18-16-9-28	Wet
29-30'	15	Reddish Brown Clayey Silt Till - some angular gravel at 29.5-30'	18-16-9-28	

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 7-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Mottled Brown Sand with - white granular material	10-10-7-7	Dry
2-4'	2	Fill - Brown Sand with - cinders - gravel - metal fragments - white granular material	5-27-20-10	Dry
4-6'	3	No Recovery	16-7-5-9	Dry
6-8'	4	Fill - Dark Brown Sand with - fine gravel - white granular material	13-7-3-1	Dry
8-9'	5	Fill - Dark Brown Sand with - fine gravel	5-8-5-4	Dry
9-10'	5	Fill - Black Sand with - cinders - slag	5-8-5-4	Dry
10-12'	6	Fill - Black Sand with - wood - rubber - glass - black non-aqueous phase liquid	1-2-8-3	Wet
12-13'	7	Same as Sample 6	4-12-13-20	Wet
13-14'	7	Brown Sand with - fine gravel	4-12-13-20	Moist
14-16'	8	Fine to Medium Sand - trace fine gravel (rounded) - silt lenses - trace black non-aqueous phase liquid	7-8-8-10	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 7-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
16-18'	9	Gray Fine to Medium Sand - trace black non-aqueous phase liquid	3-5-7-14	Moist
18-20'	10	Gray Fine to Medium Sand - occassional silt lenses - trace black non-aqueous phase liquid	2-3-5-5	Moist
20-22'	11	Gray Fine to Medium Sand - occassional silt lenses	3-3-6-16	Moist
22-24'	12	Gray Fine to Medium Sand - occassional silt lenses - trace black non-aqueous phase liquid	4-8-9-14	Wet
24-26'	13	Gray/Black Fine to Medium Sand - occassional silt lenses - some fine to medium gravel (rounded) - black non-aqueous phase liquid	4-6-13-18	Wet
26-27.8'	14	Gray/Black Fine to Medium Sand - occassional silt lenses - some fine to medium gravel (rounded) - black non-aqueous phase liquid	10-6-6-6	Wet
27.8-28'	14	Reddish Brown Clayey Silt (Till?)	10-6-6-6	

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 8-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Mottled Yellow & Brown Fine Sand with - fine gravel - brick - cinders	1-4-7-13	Dry
2-4'	2	Fill - Dark Brown Sand with - brick - stone - slag	7-25-18-15	Dry
4-5'	3	Fill - Reddish Brown Clayey Silt	4-9-34-33	Moist
5-6'	3	Fill - Sand with - stone - brick - slag - coal	4-9-34-33	Dry
6-7'	4	Fill - Reddish Brown Clay & Sandy Silt	14-50-24-16	Dry
7-8'	4	Fill - White Granular Material -fractured rock at 7'	14-50-24-16	Dry
8-10'	5	Fill - Black Sand with - slag - glass - fine gravel - wood	4-6-9-5	Dry
10-12'	6	Fill - Black Sand and Gravel with - rubber - wood - white granular material	6-9-7-8	Wet
12-13.5'	7	Fill - Black Sand & Fine Gravel with- - some white granular material - trace black non-aqueous phase liquid	5-4-5-14	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 8-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
13.5-14'	7	Gray Medium to Coarse Sand - trace black non-aqueous phase liquid	5-4-5-14	Moist
14-16'	8	Gray Fine to Medium Sand - occassional silt lenses - trace black non-aqueous phase liquid	9-14-19-13	Moist
16-18'	9	Gray Fine to Medium Sand - occassional silt lenses - black non-aqueous phase liquid	5-5-10-10	Wet
18-20'	10	Shelby Tube		
20-22'	11	Gray Fine to Medium Sand - occassional silt lenses - trace black non-aqueous phase liquid	5-5-11-15	Moist
22-24'	12	Gray Medium Sand - occassional silt lenses - trace black non-aqueous phase liquid	<u>WOR</u> -4-5-14 6	Moist
24-26'	13	Gray Medium Sand - some fine sand - occassional silt lenses	7-10-14-16	Moist
26-28'	14	Gray Medium Sand - occassional silt lenses - trace black non-aqueous phase liquid	6-6-12-18	Moist
28-29.5	15	Gray Sand and Fine Gravel - grading to clay at 29.5 - black non-aqueous phase liquid	2-2-2-3	Moist
29.5-30	15	Reddish Brown Clayey Silt Till	2-2-2-3	

S-AREA STRATIGRAPHY - DRILLING LOGS

BH9-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.2'	1	Topsoil	3-22- <u>100</u> 6	Frozen
0.2-1.5'	1	Fill - Mottled brown & orange silt with - rock fragments - some sand - some clay - trace fine gravel Refusal at 1.5' Augered to 2.0'	3-22- <u>100</u> 6	Frozen
2-3.2'	2	Fill - Brown silt with - rock fragments - cinders - slag - glass Refusal at 3.2' Augered to 4.0'	31-37- <u>100</u> 2	Frozen
4-6	3	Fill - Mottled brown & orange silt with - rock fragments - some sand - some clay - trace fine gravel - trace vegetation	7-5-30-8	Wet
6-7.5'	4	Fill - Gray to brown silt and sand with - rock fragments Refusal at 7.5' Augered to 8.0'	16-20- <u>100</u> 6	Moist
8-8.5'	5	Fill - Rock fragments with - some gray to brown sand Refusal at 8.5' Augered to 10' - (one foot solid rock encountered)	<u>100</u> 6	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH9-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
10-11.2'	6	Fill - Gray to brown fine to medium sand with - brick - wood	8-8-11-15	Moist
11.2-12'	6	Gray (gray-brown) fine to medium sand	8-8-11-15	Moist
12-14'	7	Gray (gray-brown) fine to medium sand with - some silt - some vegetation	19-34-24-21	Moist
14-16'	8	Gray (gray-brown) fine to medium sand with - some fine rounded gravel - some vegetation - occasional thin silty fine sand lenses	5-2-5-9	Wet
16-18'	9	Gray (gray-brown) fine to medium sand with - some fine rounded gravel - occasional thin silty fine sand lenses	4-3-6-6	Wet
18-20'	10	Gray (gray brown) fine to medium sand with - occasional thin silty fine sand lenses	3-1-2-3	Wet
20-22'	11	Gray (gray brown) fine to medium sand with - some fine rounded gravel - occasional thin silty fine sand lenses	2-3-3-4	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH9-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
22-24'	12	Gray (gray-brown) fine to medium sand with - some angular gravel (standing water in sample jar has turned orange)	7-8-8-15	Wet
24-26'	13	No recovery	15-8-2-2	Wet
26-26.8'	14	Gray sand & gravel - one sea shell	9-16-36-19	Wet
26.8-28'	14	Red brown clayey silt till with - rock fragments	9-16-36-19	Moist
28-30'	15	Red brown silty clay - plastic	2-3-4-6	Moist
30-30.5'	16	Red brown silty clay - plastic	4-17-37- $\frac{100}{4}$	Moist
30.5-31'	16	Red brown silty fine sand with - gravel	4-17-37- $\frac{100}{4}$	Moist
31-31.8'	16	Rock fragments with - some gray silty fine sand	4-17-37- $\frac{100}{4}$	Wet
31.8'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 14-81

Depth	Sample No.	Description	Blowcounts	Moisture
0-2'	1	Fill - Brown Gray Sand and Gravel with - cinders - glass	<u>WOR</u> -2-4-9 6	Dry
2-4'	2	Fill - Sand with - stone - metal fragments - white granular material	4-1-2-4	Dry
4-6'	3	Fill - Brown Sand with - wood - brick - gravel - white granular material	4-10-13-12	Dry
6-8'	4	Fill - Black Sand with - cinders - gravel - white granular material - hard	6-13-13-18	Dry
8-10'	5	Fill - Gray & Brown Sand - gravel - little recovery	1-1-2-3	Dry
10-12'	6	Fill - Black Sand & Gravel (Angular) - trace black non-aqueous phase liquid	33-22-28-19	Wet
12-14'	7	Fill - Sand & Gravel - little recovery	17-10-11-16	Wet
14-16'	8	Gray Fine to Medium Sand with - occasional silt & fine sand lenses	1-6-10-13	Moist
16-18'	9	Black Fine to Medium Sand	6-9-10-14	Wet
18-20'	10	Shelby Tube		Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH 14-81 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
20-22'	11	Brown Fine to <u>Medium</u> Sand - some fine gravel (rounded)	3-2-5-16	Wet
22-24'	12	Brown Fine to <u>Medium</u> Sand	3-5-8-8	Wet
24-26'	13	Brown Fine to <u>Medium</u> Sand - some fine gravel (rounded)	11-10-9-15	Wet
26-27.5'	14	Gray Fine to Medium Sand and Silt	8-8-12-21	Wet
27.5-28'	14	Dark Brown Medium Sand - black non-aqueous phase liquid	8-8-12-21	Wet
28-29'	15	Gray Sand	3-7-6-4	Wet
29-30'	15	Dark Brown Medium Sand - fine gravel - black non-aqueous phase liquid	3-7-6-4	Wet
30-31'	16	Medium to Coarse Sand - fine gravel - rock fragments	9-52- <u>100</u> 6	Wet
31-31.3'	16	Sand and Gravel	19-52- <u>100</u> 6	Wet
31.3-31.5	16	Brown & Black Silty Fine Sand Till - very compact - rock fragments	19-52- <u>100</u> 6	
31.5'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH15-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.5'		Topsoil		
0.5-1'		Augered through		
1-1.5'	1	Fill - Brown silt & sand with - stone	7-10-12-9	Frozen
1.5-3'	1	Fill - White flyash	7-10-12-9	Moist
3-5'	2	Fill - White Flyash	4-5-6-5	Wet
5-7'	3	Fill - Gray and white flyash	2-2-3-4	Wet
7-8.5'	4	Fill - Gray and white flyash	1-3-3-3	Wet
8.5-9'	4	Black (gray-brown) fine to medium sand with - some fine gravel - some silt - vegetation	1-3-3-3	Wet
9-11'	5	Black (gray-brown) fine to medium sand with - trace fine gravel	3-8-12-11	Moist
11-13'	6	Same as Sample 5	7-10-9-11	Wet
13-15'	7	Black (gray-brown) fine to medium sand	WOR-2-3-5 6	Wet
15-17'	8	Black (gray-brown) fine to medium sand with - occasional thin silty fine sand lenses	2-4-3-2	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH15-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
17-19'	9	Same as Sample 8	3-2-3-8	Wet
19-21'	10	Same as Sample 8	$\frac{\text{WOR-4-8}}{12}$	Wet
21-23'	11	Black fine to medium sand with - fine gravel - trace black non-aqueous phase liquid	5-7-16-27	Wet
23-23.5'	12	Black sand and gravel - trace black non-aqueous phase liquid	7-3-4-60	Wet
23.5-25'	12	Black (red-brown) clayey silt	7-3-4-60	Moist
25-25.5'	13	Black clayey silt with - angular gravel	20-35-40-52	Moist
25.5-27'	13	Red brown clayey silt till with - rock fragments	20-35-40-52	Moist
27-27.7'	14	Red brown clayey silt till with - rock fragments	$\frac{42-42-100}{2}$	Moist
27.7-28.2'	14	Gray silty sand till with - rock fragments	$\frac{42-42-100}{2}$	Moist
28.2'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH16-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-1'		Gravel - Parking Lot		
1-1.7'	1	Fill - Gray-brown fine sand with - some fine gravel - some silt Refusal at 1.7' Augered to 3' (ten inch solid rock encountered)	40-100 2	Frozen
3-5'	2	Fill - White flyash	10-18-27-30	Moist
5-6'	3	Fill - White flyash	6-10-10-11	Moist
6-7'	3	Fill - Gray flyash with - slag - cinders	6-10-10-11	Moist
7-9'	4	Fill - White to gray flyash	7-8-8-6	Wet
9-9.2'	5	Fill - White to gray flyash	1-4-6-11	Wet
9.2-11'	5	Black (gray-brown) fine to medium sand with - some silt - vegetation - trace fine gravel - occasional silty fine sand lenses	1-4-6-11	Wet to 10' Moist 10' +
11-13'	6	Black (gray-brown) fine to medium sand with - some silt - occasional silty fine sand lenses - trace fine gravel - vegetation	6-9-12-10	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH16-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
13-15'	7	Black (gray-brown) fine to medium sand with - some silt - occasional medium sand lenses	3-2-4-6	Wet
15-17'	8	Black (gray) fine to medium sand with - some silt	3-2-3-6	Wet
17-19'	9	Black (gray-brown) fine to medium sand with - some silt - trace fine gravel	1-2-2-2	Wet
19-21'	10	Black (gray-brown) fine sand with - silt	<u>WOR-1-5</u> 12	Wet
21-23'	11	Black (gray) fine sand with - silt - slight trace black non-aqueous phase liquid	6-8-10-15	Wet
23-23.5'	12	Same as Sample 11	2-14-8-6	Wet
23.5-24'	12	Black fine to medium sand & silt with - slight trace black non-aqueous phase liquid	2-14-8-6	Wet
24-25'	12	Black sand & gravel with - piece of sea shell - slight trace black non-aqueous phase liquid	2-14-8-6	Wet
25-25.5'	13	Black sand & gravel	<u>WOH-4</u> 18	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH16-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
25.5-26.5'	13	Red brown clayey silt till	$\frac{\text{WOH-4}}{18}$	Moist
26.5-26.6'	13	Black sand	$\frac{\text{WOH-4}}{18}$	Wet
26.6-27'	13	Red brown clayey silt till	$\frac{\text{WOH-4}}{18}$	Moist
27-27.5'	14	Red brown clayey silt till	$\frac{1-5-12-100}{1}$	Moist
27.5-28.2'	14	Red brown silty clay	$\frac{1-5-12-100}{1}$	Moist
28.2-28.6'	14	Red brown sandy silt till - trace clay	$\frac{1-5-12-100}{1}$	Moist
28.6'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH17-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.3'		Topsoil		
0.3-2'	1	Fill - Red brown clay & silt with - rock fragments - vegetation	9-8-6-43	Frozen
2-2.8'	2	Fill - Mottled red, orange & brown clay & silt with - rock fragments Refusal at 2.8' Augered to 4'	16- <u>100</u> 3	Frozen
4-4'	3	No recovery Refusal at 4' Augered to 6'	<u>100</u> 0	
6-8'	4	Fill - Rock fragments	50-28-26-48	Wet
8-10'	5	Fill - Rock fragments with - some brown silty fine sand	5-20-40-15	Wet
10-12'	6	Fill - Rock fragments with - some brown sand	12-10-13-16	Wet
12-14'	7	Fill - Same as Sample 6	14-12-8-7	Wet
14-16'	8	Gray (gray-brown) silt and fine to medium sand	5-3-2-2	Wet
16-18'	9	Gray (gray-brown) silt & fine sand	1-2-3-4	Wet
18-20'	10	Gray (gray-brown) fine sand with - some silt	1-2-3-15	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH17-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
20-22'	11	Red brown silty till with - trace clay - rock fragments	6-8-8-11	Moist
22-23.7'	12	Red brown silty till - some clay - rock fragments	9-17-42- <u>100</u> 2	Moist
23.7'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH18-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.3'	1	Fill - Topsoil	35-70- $\frac{100}{2}$	Frozen
0.3-1.2'	1	Fill - Red brown silt and clay with - rock fragments Refusal at 1.2' Augered to 2'	35-70- $\frac{100}{2}$	Frozen
2-4'	2	Fill - Red brown silt and clay with - rock fragments'	6-6-8-68	Frozen
4-4.5'		Fill - Rock Augered through		
4.5-6.5'	3	Fill - Red brown silt with - some clay - rock fragments	14-28-13-26	Dry
6.5-8.5'	4	Fill - Red brown silt with - little clay - some sand - rock fragments	30-43-33-21	Dry
8.5-10.5'	5	Fill - Red brown silt with - some clay - little sand - rock fragments	7-23-32-17	Moist
10.5-12.5'	6	Fill - Same as Sample 5	12-19-44-35	Moist
12.5-14.5'	7	Fill - Rock fragments with - brown sand	19-17-33-18	Wet at 14'

S-AREA STRATIGRAPHY - DRILLING LOGS

BH18-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
14.5-16.5'	8	Fill - Rock fragments with - brown silty fine sand	11-12-10-7	Wet
16.5-18.5'	9	No recovery	9-13-13-6	Wet
18.5-20.5'	10	Fill - Fine gravel & brown fine to medium sand with - trace silt	6-11-9-12	Wet
20.5-22'	11	Fill - Same as Sample 10	8-10-11-29	Wet
22-22.5'	11	Black (gray-brown) fine to medium sand with - some silt	8-10-11-29	Wet
22.5-24.5'	12	Gray (gray-brown) fine sand with trace fine gravel - occasional silty fine sand lenses	<u>WOH-1-2-4</u> 6	Wet
24.5-26.5'	13	Gray (gray-brown) fine to medium sand with - trace fine gravel	<u>WOH-1-3-9</u> 6	Wet
26.5-27.8'	14	Same as Sample 13	14-10-9-11	Wet
27.8-28.3'	14	Gray brown (gray-brown) sand & gravel	14-10-9-11	Wet
28.3-28.5'	14	Red brown clayey silt till with - rock fragments	14-10-9-11	Moist
28.5-29'	15	Red brown clayey silt till	5-8-11-15	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH18-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
29-30'	15	Red brown silty clay	5-8-11-15	Moist
30-30.5'	15	Red brown sandy silt till	5-8-11-15	Wet
30.5-31.5'	16	Red brown clayey silt till	6-17- $\frac{100}{6}$ -65	Moist
31.5-32.5'	16	Red brown silty sand till	6-17- $\frac{100}{6}$ -65	Wet
32.5-34.5'	17	Red brown silty fine sand till with - rock fragments	36-55-79-87	Moist
34.5-35.2'	18	Same as Sample 17	31- $\frac{100}{5}$	Moist
35.2-35.4'	18	Rock fragments	31- $\frac{100}{5}$	Wet
35.4'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH19-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.5'		Topsoil		
0.5-1'		Fill - Augered through		
1-3'	1	Fill - Red brown and gray clayey silt with - some rock fragments	9-13-11-10	Frozen
3-5'	2	Fill - Rock fragments - (only 3" recovery)	6-13-15-15	Dry
5-6.8'	3	Fill - Rock fragments with - gray brown sand Refusal at 6.8' Augered to 7'	6-50-41- <u>100</u> 4	Dry
7-7.2'	4	Fill - Rock fragments with - gray brown sand Refusal at 7.2' Augered to 7.4'	<u>100</u> 2	Dry
7.4-32.5'	---	Fill - Shot rock - Hard - cored through shot rock with 4 3/8" diameter flush joint casing and diamond bit - used a 3 3/4" diameter tri- cone bit to ream inside flush joint casing		
32.5-34.5'	5	Gray brown (gray-brown) fine sand with - trace fine gravel - vegetation - occasional silty fine sand lenses	7-4-8-9	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH19-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
34.5-36.5'	6	Gray brown (gray-brown) fine to medium sand with - some fine to medium gravel - vegetation - piece of sea shell	8-12-18-15	Wet
36.5-38.5'	7	Gray brown (gray-brown) fine to medium sand with - trace fine to medium gravel - piece of sea shell	13-19-27-23	Wet
38.5-39'	8	Same as Sample 7	<u>WOR-2-3-12</u> 6	Wet
39-40.5'	8	Red brown fine sandy silt till with - trace clay - rock fragments	<u>WOR-2-3-12</u> 6	Moist
40.5-42.5'	9	Red brown silty till with - some clay - stiff - rock fragments	21-27-50-202	Moist
42.5-44.5'	10	Same as Sample 9	Pushed-65-87-74	Moist
44.5-46.5'	11	Same as Sample 9 (only 9" recovery)	70-35-39-73	Moist
46.5-48.5'	12	Same as Sample 9 (only 9" recovery)	12-20-26- <u>150</u> 6	Moist
48.5		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH20-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.2'	1	Fill - Topsoil	3-21-75-84	Frozen
0.2-2'	1	Fill - Red brown silt & clay with - rock fragments	3-21-75-84	Frozen
2-4'	2	Fill - Brown slightly red silt & clay with - some rock fragments	10-19-27-19	Moist
4-6'	3	Fill - Rock fragments with - trace red brown silt	7-13-18-12	Moist
6-8'	4	No recovery	67-53-12-19	
8-10'	5	Fill - Rock fragments with - some red brown silt and fine sand	5-7-1-14	Moist to wet
10-12'	6	Fill - Same as Sample 5	18-12-7-5	Moist to wet
12-13.2'	7	Fill - Red brown silt till with - some clay - some rock fragments Refusal at 13.2' Augered to 14'	3-7- $\frac{100}{2}$	Moist
14-14.2'	8	No recovery Refusal at 14.2' Augered to 18' (rock to 17')	$\frac{100}{2}$	
18-20'	9	Fill - Dark brown silt & sand with - yellow brick - wood - purple stone	8-8-11-12	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH20-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
20-22'	10	Fill - Black sand & silt with - stones	9-8-17-44	Wet
22-24'	11	Fill - black silt & sand with - tar (tar has hardened since being placed in storage)	23-9-13-24	Moist
24-26'	12	Fill - Black silt & sand with - cinders - cardboard - petroleum product odor	10-4-9-6	Wet
26-27'	13	Fill - Same as Sample 12	2-4-7-9	Wet
27-28'	13	Black (gray-brown) fine sand & silt with - vegetation	2-4-7-9	Wet
28-30'	14	Black (gray-brown) fine to medium sand	6-3-4-3	Wet
30-32'	15	Same as Sample 14	3-2-6-7	Wet
32-34'	16	Same as Sample 14	1-3-3-9	Wet
34-34.5'	17	Same as Sample 14	<u>WOR-1-1-2</u> 6	Wet
34.5-35.5'	17	Gray (red-brown) clayey silt - soft	<u>WOR-1-1-2</u> 6	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH20-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
35.5-36'	17	Red brown clayey silt till	$\frac{\text{WOR-1-1-2}}{6}$	Moist
36-37.5'	18	Gray to red brown silty clay - soft	$\frac{\text{WOR-1-3-5}}{6}$	Moist
37.5-38'	18	Red brown clayey silt till	$\frac{\text{WOR-1-3-5}}{6}$	Moist
38-39.5'	19	Red brown clayey silt till with - rock fragments	12-23-17-14	Moist
39.5-40'	19	Red brown silty clay	12-23-17-14	Moist
40-41'	20	Red brown clayey silt till	13-16-17-16	Moist
41-42'	20	Red brown silty clay - plastic	13-16-17-16	Moist
42-42.5'	21	Red brown silty clay	$\frac{15-16-43-100}{8}$	Moist
42.5-44.2'	21	Red brown clayey silt till with - rock fragments	$\frac{15-16-43-100}{8}$	Moist
44.2'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH21-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.5'	1	Fill - Topsoil	40-78-16-16	Frozen
0.5-1.5'	1	Fill - Brown medium sand with - some silt - some gravel - some red brown silt & gravel	40-78-16-16	Frozen
1.5-2'	1	Fill - Rock fragments	40-78-16-16	Frozen
2-4'	2	Fill - Brown sand & silt with - some topsoil - rock fragments	26-16-15-15	Dry
4-6'	3	Fill - Red brown silt & fine sand with - rock fragments	16-13-39-29	Dry
6-8'	4	No recovery	24-17-7-12	
8-10'	5	Fill - Rock fragments with - some red brown silt & sand	33-54-64-33	Dry
10-10.4'	6	Fill - Same as Sample 5 Refusal at 10.4' Augered to 14' (3.5' solid rock encountered)	$\frac{100}{5}$	Dry
14-15'	7	Fill - Red brown silt with - rock fragments	42-37-62-53	Dry

S-AREA STRATIGRAPHY - DRILLING LOGS

BH21-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
15-16'	7	Fill - Brown sand & silt with - rock fragments - some white sand - brick - pieces of purple stone	42-37-62-53	Dry
16-17.9'	8	Fill - Brown sand & silt with - rock fragments - some white sand - brick Refusal at 17.9' Augered to 18'	49-20-31- <u>100</u> 5	Wet at 17'
18-18.4'	9	Fill - Brown sand & silt with - rock fragments Refusal at 18.4' Augered to 20'	<u>100</u> 5	Wet
20-22'	10	Fill - Rock fragments with - some black gray (gray-brown sand) - piece of purple stone	48-92-63-97	Wet
22-24'	11	Fill - Gray brown (gray-brown) sand and gravel with - clay - silt - vegetation	24-20-23-21	Wet
24-26'	12	Gray brown (gray-brown) fine to medium sand with - some fine gravel - vegetation	9-12-16-12	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH21-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
26-28'	13	Gray brown (gray-brown) fine to medium sand with - trace gravel - occasional thin silty fine sand lenses	11-10-11-15	Wet
28-30'	14	Gray brown (gray-brown) fine to medium sand with - occasional thin silty fine sand lenses	1-4-6-8	Wet
30-32'	15	Gray (gray-brown) fine to medium sand	2-3-5-6	Wet
32-33.2'	16	Black (gray-brown) sand & gravel	1-2-8-7	Wet
33.2-34'	16	Red brown clayey silt till - plastic - soft	1-2-8-7	Moist
34-36'	17	Red brown silt till - some clay - rock fragments	10-43-33-45	Moist
36-38'	18	Red brown fine sandy silt till with - rock fragments	42-68-80-69	Moist
38-40'	19	Same as Sample 18	$\frac{16-43-53-71}{4}$	Moist
40-41.2'	20	Same as Sample 18	$\frac{28-37-100}{2}$	Moist
41.2'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH22-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.5'	1	Fill - Gravel - Parking lot	2-17-88-27	Moist
0.5-1'	1	Fill - Brown & yellow sand & stone	2-17-88-27	Moist
1-2'	1	Fill - Gray & white flyash with - sand	2-17-88-27	Moist
2-3'	2	Fill - Gravel	17-17-9-22	Moist
3-3.5'	2	Fill - Black & brown fine to medium sand	17-17-9-22	Moist
3.5-4'	2	Fill - White & gray flyash	17-17-9-22	Moist
4-6'	3	Fill - Gray white & black flyash & sand with - wood	2-19-16-12	Moist
6-7'	4	Fill - Same as Sample 3	5-2-3-5	Wet
7-8'	4	Fill - Black sand with - some fine gravel	5-2-3-5	Wet
8-9'	5	Fill - Black sand with - cinders - slag	5-3-5-15	Wet
9-10'	5	Black (gray-brown) fine to medium sand with - vegetation	5-3-5-15	Wet

S-AREA STRATIGRAPHY - DRILLING LOGS

BH22-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
10-12'	6	Black (gray-brown) fine to medium sand with - occasional silty fine sand or medium sand layer - vegetation	4-6-9-9	Wet
12-14'	7	Same as Sample 6	4-8-9-8	Wet
14-16'	8	Black (gray-brown) fine to medium sand - piece of sea shell	4-4-4-4	Wet
16-18'	9	Black (gray-brown) fine to medium sand	3-3-3-4	Wet
18-20'	10	Black (gray-brown) fine to medium sand - occasional silty fine sand lenses	3-2-4-5	Wet
20-22'	11	Black (gray-brown) medium sand with - several small shells	WOR 24	Wet
22-23'	12	Black (gray-brown) fine to medium sand with - several small shells	7-5-2-2	Wet
23-23.7'	12	Black (gray-brown) sand with - some fine gravel	7-5-2-2	Wet
23.7-23.8'	12	Gray silty clay till	7-5-2-2	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH22-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
23.8-24'	12	Red brown clayey silt till with - rock fragments - soft	7-5-2-2	Moist
24-26'	13	Red brown clayey silt till - soft	$\frac{WOR}{24}$	Moist
26-26.8'	14	Red brown clayey silt till with - rock fragments Refusal at 26.8' Augered to 28'	$\frac{39-115}{4}$	Moist
28-28.7	15	Red brown clayey silt till with - rock fragments - stiff	$\frac{47-100}{2}$	Moist
28.7'		Refusal - Bedrock		

S-AREA STRATIGRAPHY - DRILLING LOGS

BH23-82

Depth	Sample No.	Description	Blowcounts	Moisture
0-0.3'	1	Fill - Topsoil	3-17-23-29	Dry
0.3-2'	1	Fill - Red brown silt & sand with - rock fragments	3-17-23-29	Dry
2-4'	2	Fill - Red brown silt & sand with - rock fragments	11-16-15-7	Dry
4-6'	3	Fill - Same as Sample 2	10-11-9-13	Moist
6-8'	4	Fill - Rock fragments with - trace sand (only 3" recovery)	8-9-8-9	Moist
8-10'	5	Fill - Rock fragments with - some coarse sand	6-6-6-16	Moist
10-12'	6	Fill - Rock fragments (only 2" recovery)	7-13-22-10	Moist
12-12.9'	7	Fill - Rock fragments - trace sand	28- <u>100</u> 5	Wet
12.9-13'	8	No recovery Refusal at 13' Augered through to 16' (all rock)	<u>50</u> 1	
16-18'	9	Fill - Red brown clayey silt with - some sand - rock fragments	9-9-11-20	Dry

S-AREA STRATIGRAPHY - DRILLING LOGS

BH23-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
18-20'	10	Fill - Same as Sample 9	19-24-53-25	Moist
20-21'	11	Fill - Red brown silt & sand with - some clay - rock fragments - wood - vegetation Refusal at 21' Augered to 22'	7- <u>100</u> 6	Wet
22-22.7'	12	Fill - Rock fragments	12-11-10-9	Wet
22.7-24'	12	Gray (gray-brown) fine to medium sand with - silt - vegetation	12-11-10-9	Wet
24-26'	13	Gray (gray-brown) fine to medium sand	8-8-8-8	Wet
26-28'	14	No recovery	9-9-12-16	
28-30'	15	Black (gray-brown) fine to medium sand	2-2-5-7	Wet
30-32'	16	Same as Sample 15	<u>WOH-2-16</u> 12	Wet
32-32.3'	17	Same as Sample 15	6-1-3-4	Wet
32.3-32.5'	17	Black sand & gravel	6-1-3-4	Wet
32.5-33.5'	17	Gray (red-brown) clayey silt	6-1-3-4	Moist

S-AREA STRATIGRAPHY - DRILLING LOGS

BH23-82 (Continued)

Depth	Sample No.	Description	Blowcounts	Moisture
33.5-34'	17	Red brown clayey silt till	6-1-3-4	Moist
34-36'	18	Red brown clayey silt till - soft - little recovery	2-7-7-7	Moist
36-36.5'	19	Same as Sample 18	7-32-48-61	Moist
36.5-37.5'	19	Red brown clay & silt	7-32-48-61	Moist
37.5-38'	19	Red brown silt till with - rock fragments	7-32-48-61	Moist
38-40'	20	Red brown clayey silt till with - rock fragments	11-17-40-76	Moist Wet at 38.5 to 38.8'
40-41.9'	21	Red brown silt till with - some clay - rock fragments	60-53-45- <u>150</u> 5	Moist
41.9'		Refusal - Bedrock		

APPENDIX B
PHYSICAL GEOLOGIC TESTING PROGRAMS

- i) PITTSBURGH TESTING LABORATORY
MARCH 1980

- ii) WOODWARD-CLYDE CONSULTANTS
SOIL TESTING RESULTS
OVERBURDEN INVESTIGATION S-AREA LANDFILL
(APPENDIX A) - APRIL 1982

APPENDIX C

LABORATORY INVESTIGATIONS

Laboratory tests were performed on selected representative split-barrel samples to investigate the physical properties and the stratigraphic continuity of the subsoils. The results of these tests are presented in this Appendix.

PHYSICAL PROPERTY TESTS

Physical property tests were conducted to enable correlation with field classifications and to aid in the investigation of the stratigraphic continuity of the subsoils. These tests included liquid limit, plastic limit and plasticity index (Atterberg Limits), and grain size distribution. The results of these tests are presented on the "Summary of Laboratory Test Results" pages C-2 through C-4. The Atterberg Limits are presented on a Plasticity Chart, page C-13. Grain size distribution curves are presented on pages C-5 through C-12. The classification of the samples is consistent with the ASTM procedure identified below and is commonly known as the "Unified Soil Classification System".

TEST PROCEDURES

All laboratory testing was performed in accordance with accepted American Society for Testing Materials (ASTM) procedures. The following are the tests which were performed and the applicable ASTM test designation number:

<u>LABORATORY TEST</u>	<u>ASTM TEST DESIGNATION NO.</u>
Liquid Limit of Soils	D 423-66 (1972)
Plastic Limit and Plasticity Index of Soils	D 424-59 (1971)
Particle Size Analysis of Soils	D 422-63 (1972)
Classification of Soils for Engineering Purposes	D 2487-69 (1975)

SUMMARY OF LABORATORY TEST RESULTS

BORING and SAMPLE No.	DEPTH - feet	Unified CLASSIFICATION	SPECIAL TESTS	NATURAL WATER CONTENT (%)	ATTERBERG LIMITS		UNCON. COMPRESS.		UNIT DRY WGT. (pcf)	SPECIFIC GRAVITY	GRAIN SIZE		OPT. MOIST.	CONSOLID.	TRIAXIAL			
					LIQUID LIMIT	PLASTIC LIMIT	STRESS (tsf)	STRAIN (%)			SIEVE	HYDR.			U.U.	CU	CELL PRESSURE (psi)	BACK PRESSURE (psi)
BH-1 81																		
S-13	24-26	(SM)									*	*						
S-14	26-28	(SM)									*	*						
S-15	28-30	(SM)									*	*						
S-16	30-32	(SM)									*	*						
BH-2 81																		
S-14	26-28	(SP-SM)									*	*						
S-16	30-32	(ML)			14	11					*	*						
BH-3 81																		
S-10	18-20	(SM)									*	*						
S-11	20-22	(SM)									*	*						
S-12	22-24	(SM)									*	*						
S-13	24-26	(SM)									*	*						
S-14	26-27.7	(SP-SM)									*	*						
BH-4 81																		
S-12	22-24	(SM)									*	*						
S-13	24-26	(SM)									*	*						
S-14	26-28	(SM)									*	*						
S-15	28-30	(SP-SM)									*	*						

* See Test Curves

SUMMARY OF LABORATORY TEST RESULTS

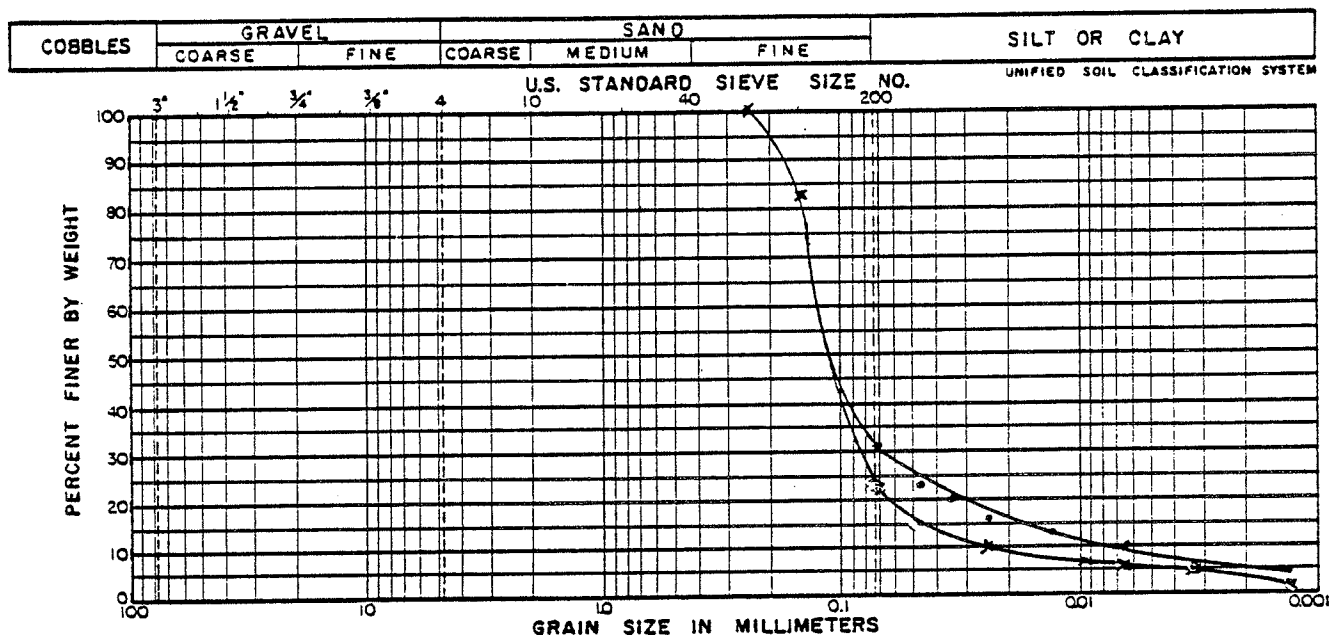
BORING and SAMPLE No	DEPTH - feet	Unified CLASSIFICATION	SPECIAL TESTS	NATURAL WATER CONTENT (%)	ATTERBERG LIMITS		UNCON. COMPRESS.		UNIT DRY WGT. (pcf)	SPECIFIC GRAVITY	GRAIN SIZE		OPT. MOIST.	CONSOLID.	TRIAXIAL			
					LIQUID LIMIT	PLASTIC LIMIT	STRESS (tsf)	STRAIN (%)			SIEVE	HYDR.			U.U.	CIU	CELL PRESSURE (psi)	BACK PRESSURE (psi)
BH-4 81 S-16	30-31.5	(SW-SM)									*	*						
BH-6 81 S-11	20-22	(SM)									*	*						
S-12	24-26	(SM)									*	*						
S-13	26-28	(SM)									*	*						
S-14	28-29	(CL)			28	15					*	*						
S-15	29-30	(CL)			37	23					*	*						
BH-7 81 S-14	27.5-28	(CL)			30	16					*	*						
BH-8 81 S-11	20-22	(SM)									*	*						
S-12	22-24	(SM)									*	*						
S-13	24-26	(SM)									*	*						
S-14	26-28	(SM)									*	*						
S-15a	28-29.5	(CL)			23	13					*	*						
S-15b	29.5-30	(CL)			31	18					*	*						
BH-1481 S-12	22-24	(SP-SM)									*	*						
S-13	24-26	(SP-SM)									*	*						

* See Test Curves

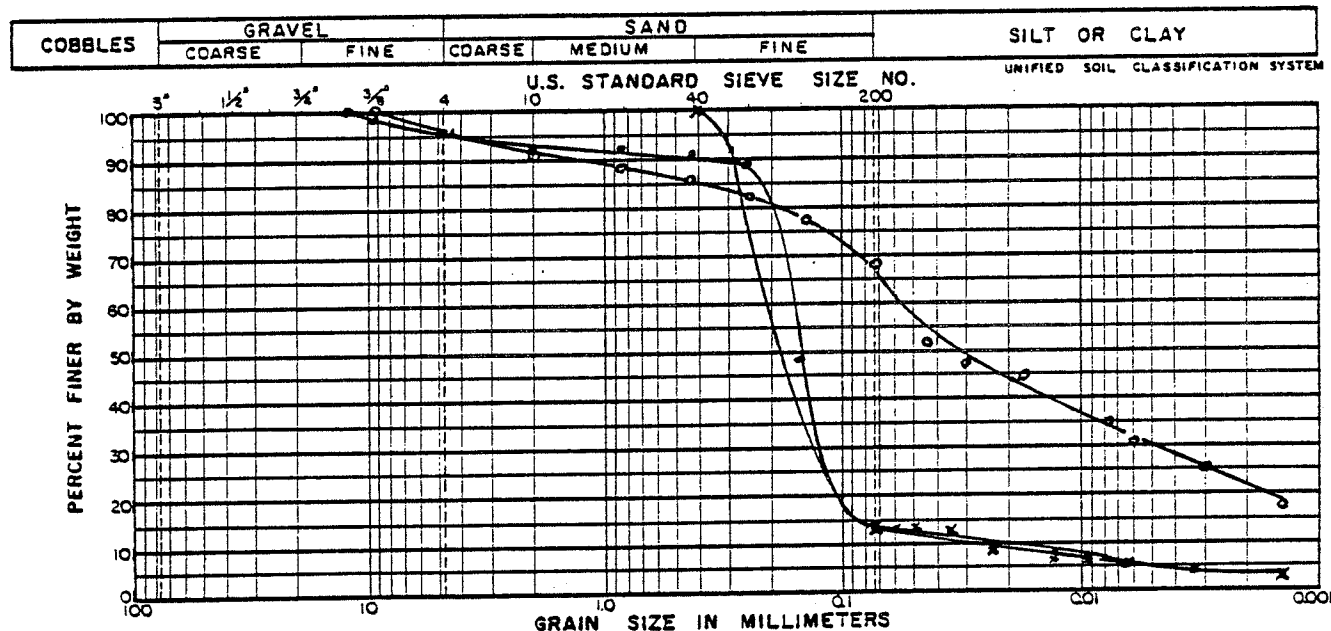
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Ge-

MECHANICAL ANALYSIS

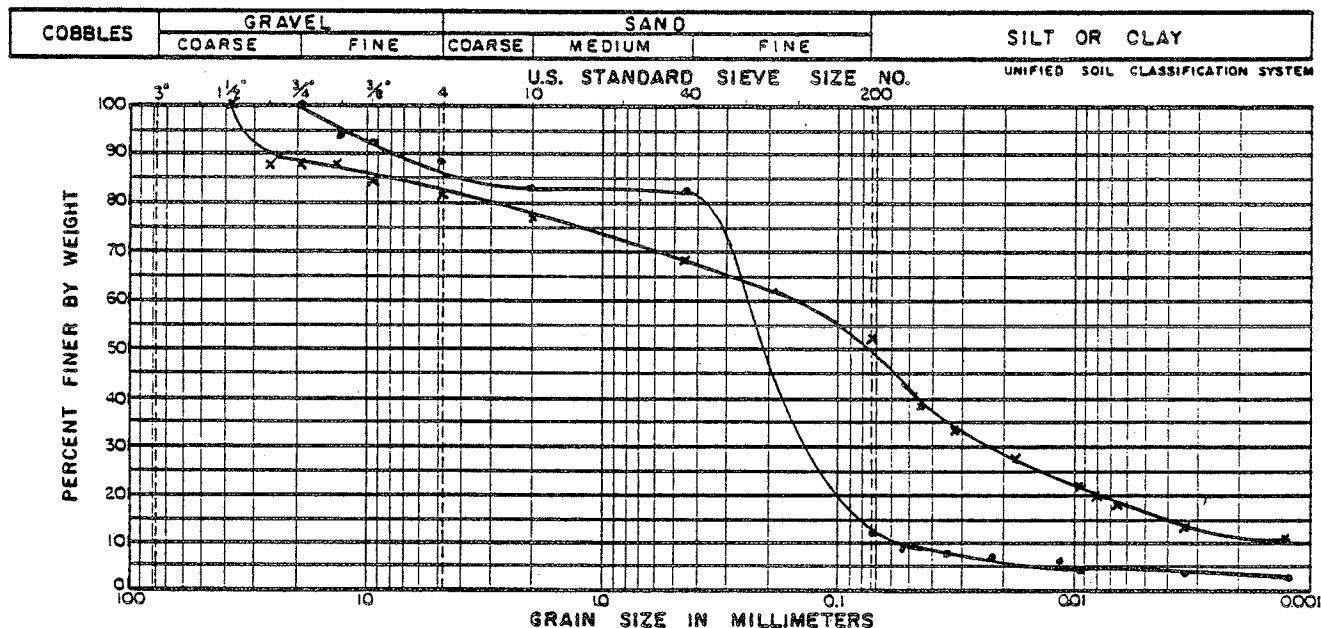


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-1	S-13	24'-26'	•	Brown silty fine SAND (SM)	-	-	-
81							
BH-1	S-14	26'-28'	×	Brown silty fine SAND (SM)	-	-	-
81							

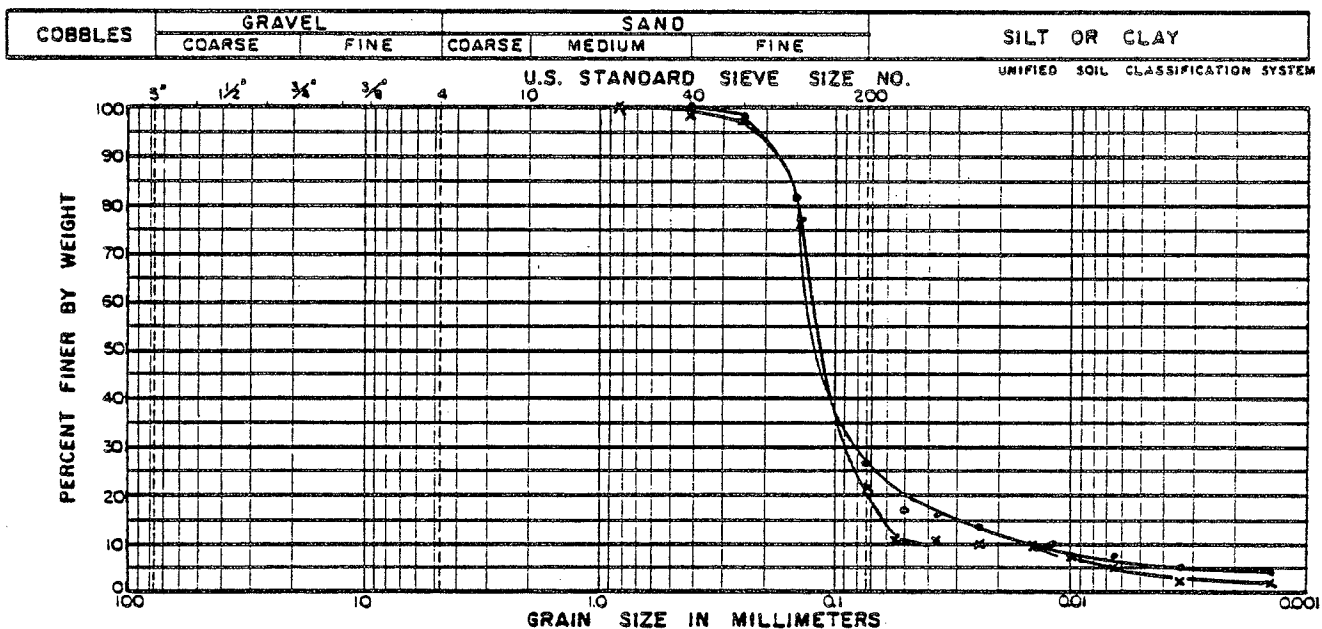


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-1	S-15	28'-30'	•	Brown silty fine SAND, trace coarse to medium sand, fine gravel (SM)	-	-	-
81							
BH-1	S-16	30'-32'	×	Gray silty fine SAND (SM)	-	-	-
81							
BH-1	S-17	32'-34'	◦	Red-brown fine gravelly, coarse to fine sandy clayey SILT (ML)	-	-	-
81							

MECHANICAL ANALYSIS

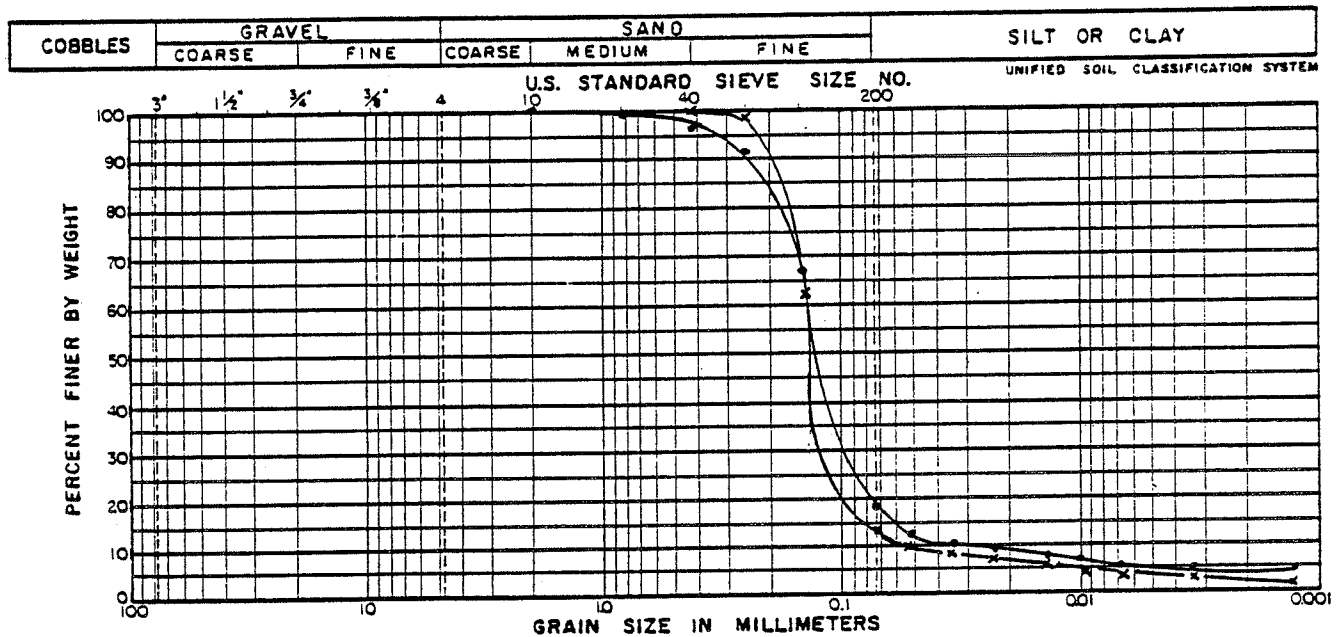


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-2	S-14	26'-28'	•	Greenish-gray fine gravelly, silty coarse to fine SAND (SP-SM)	-	-	-
81							
BH-2	S-16	30'-32'	x	Red-brown coarse to fine gravelly, sandy clayey SILT (ML)	-	14	11
81							

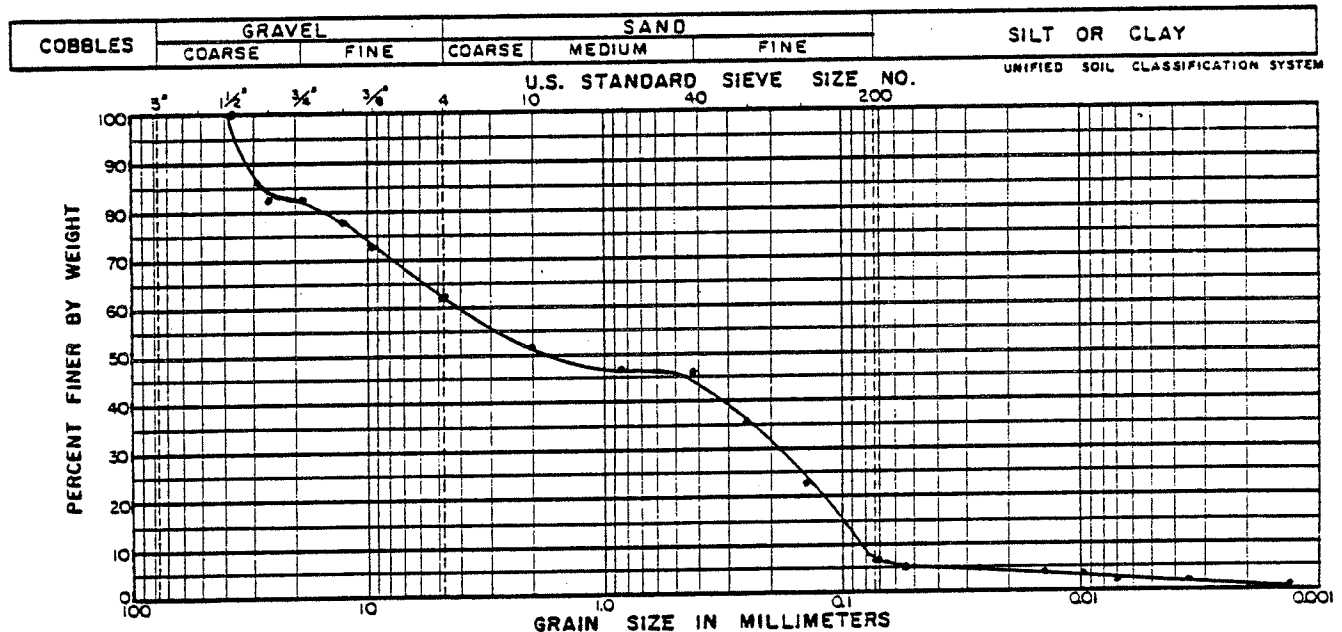


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-3	S-10	18'-20'	•	Brown silty fine SAND (SM)	-	-	-
81							
BH-3	S-11	20'-22'	x	Brown silty fine SAND (SM)	-	-	-
81							

MECHANICAL ANALYSIS

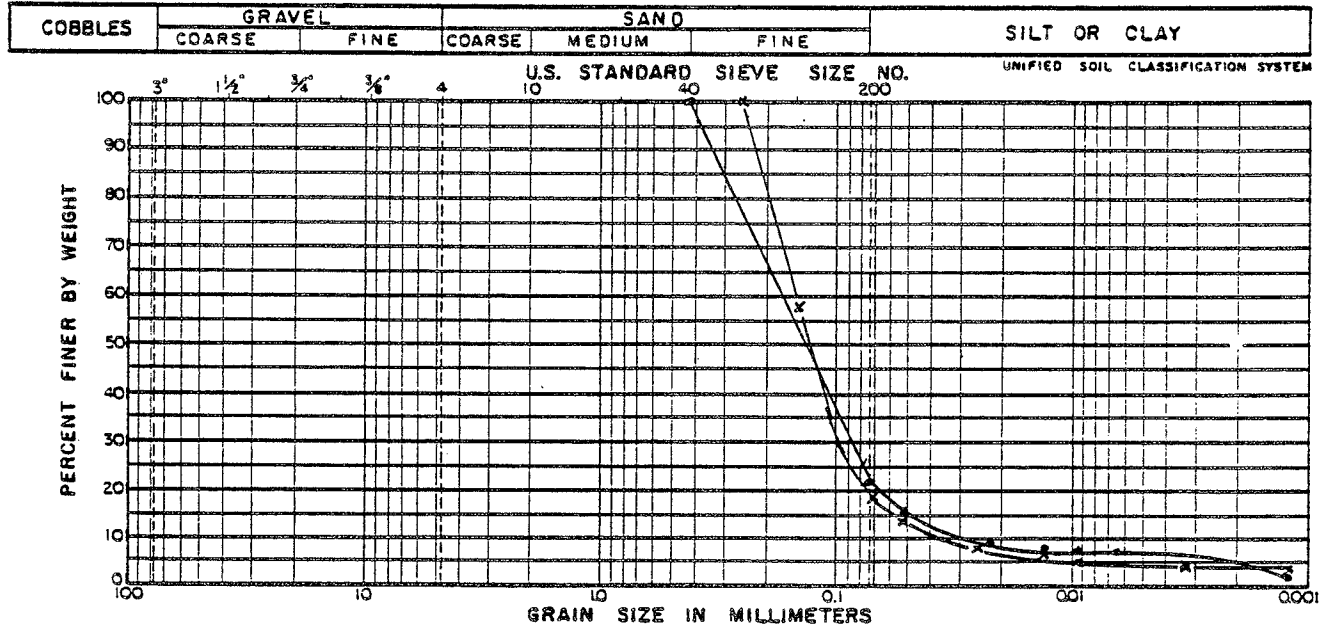


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-3	S-12	22'-24'	•	Brown silty fine SAND, trace medium sand (SM)	-	-	-
81							
BH-3	S-13	24'-26'	*	Brown silty fine SAND (SM)	-	-	-
81							

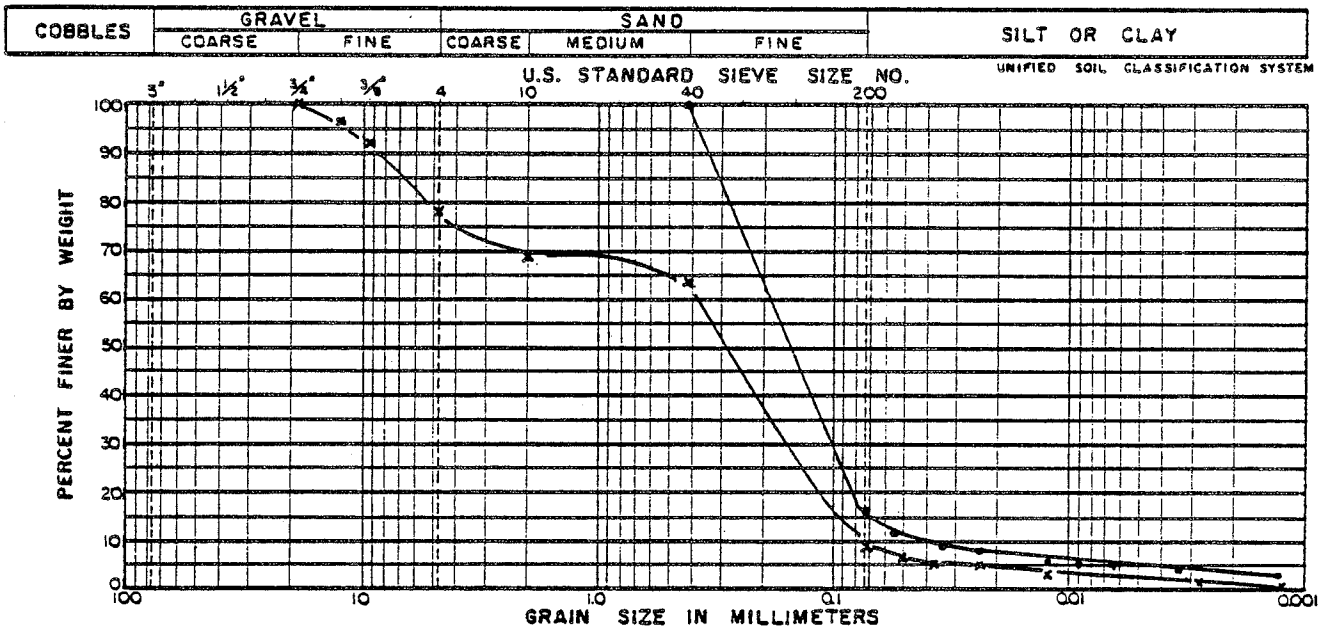


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-3	S-14	26-27.7	•	Brown/white silty coarse to fine SAND			
81				and coarse to fine gravel (SP-SM)	-	-	-

MECHANICAL ANALYSIS

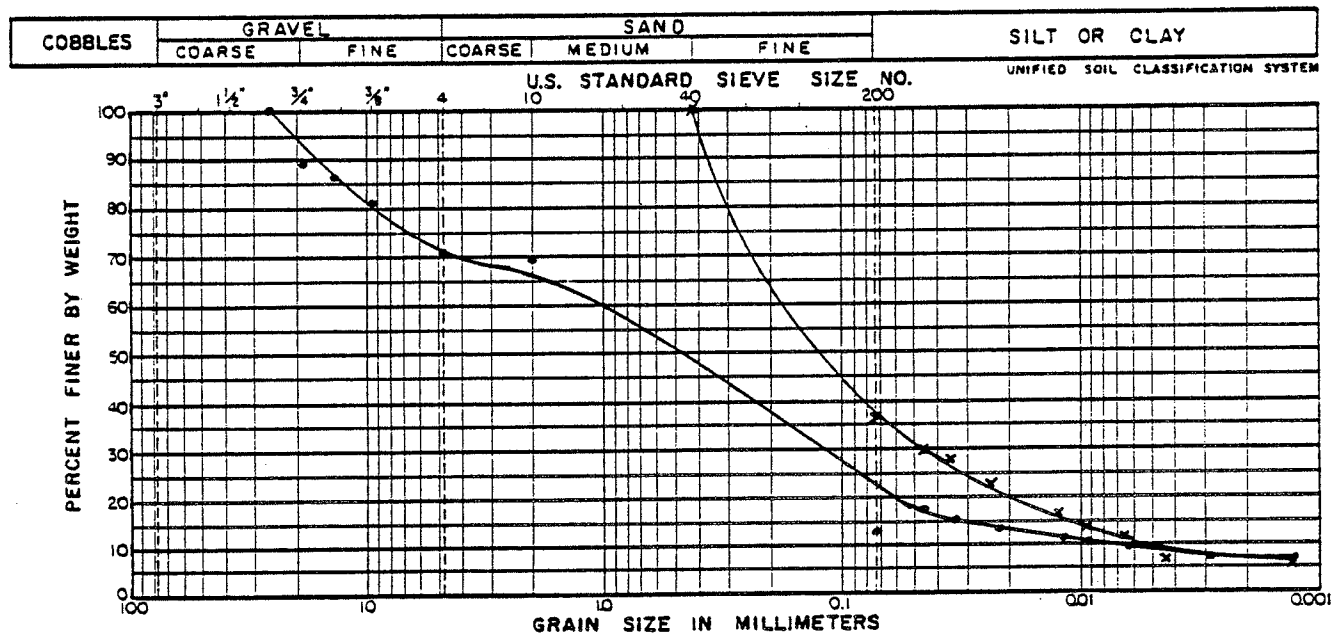


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-4	S-12	22'-24'	•	Gray silty fine SAND (SM)	-	-	-
81							
BH-4	S-13	24'-26'	x	Gray silty fine SAND (SM)	-	-	-
81							

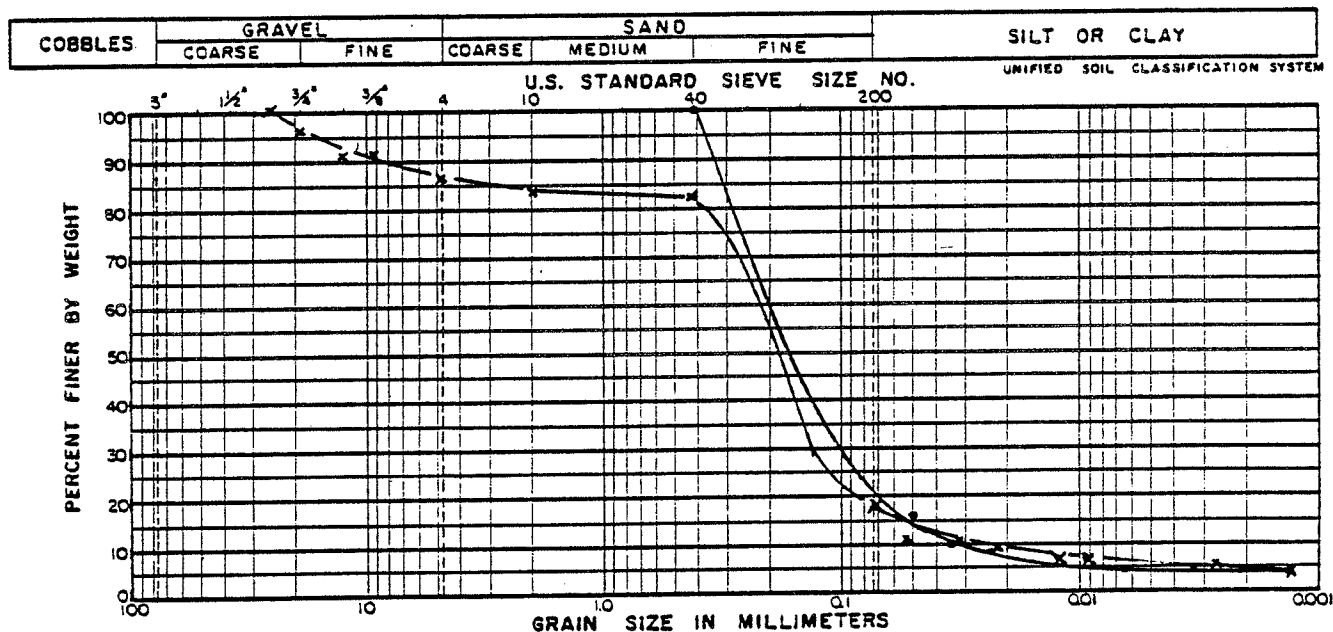


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-4	S-14	26'-28'	•	Gray silty fine SAND (SM)	-	-	-
81							
BH-4	S-15	28'-30'	x	Gray fine gravelly silty coarse to fine SAND (SP-SM)			
81							

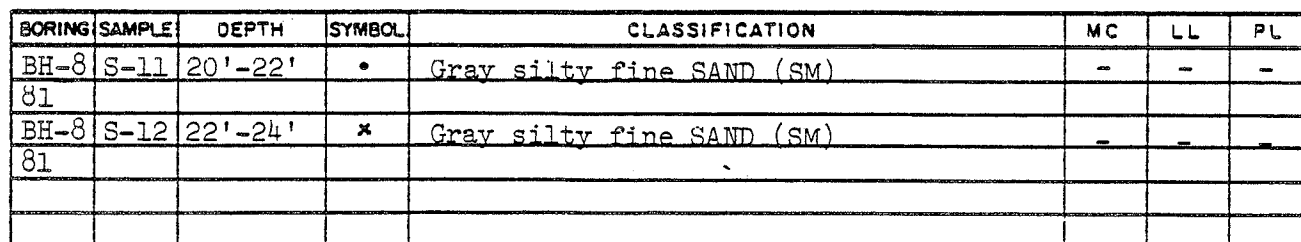
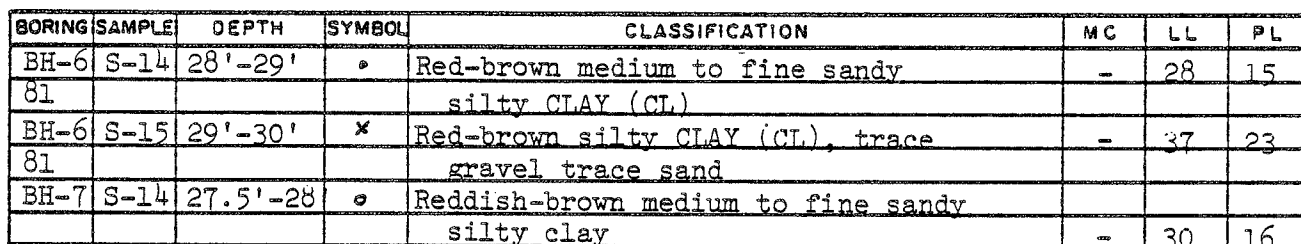
MECHANICAL ANALYSIS



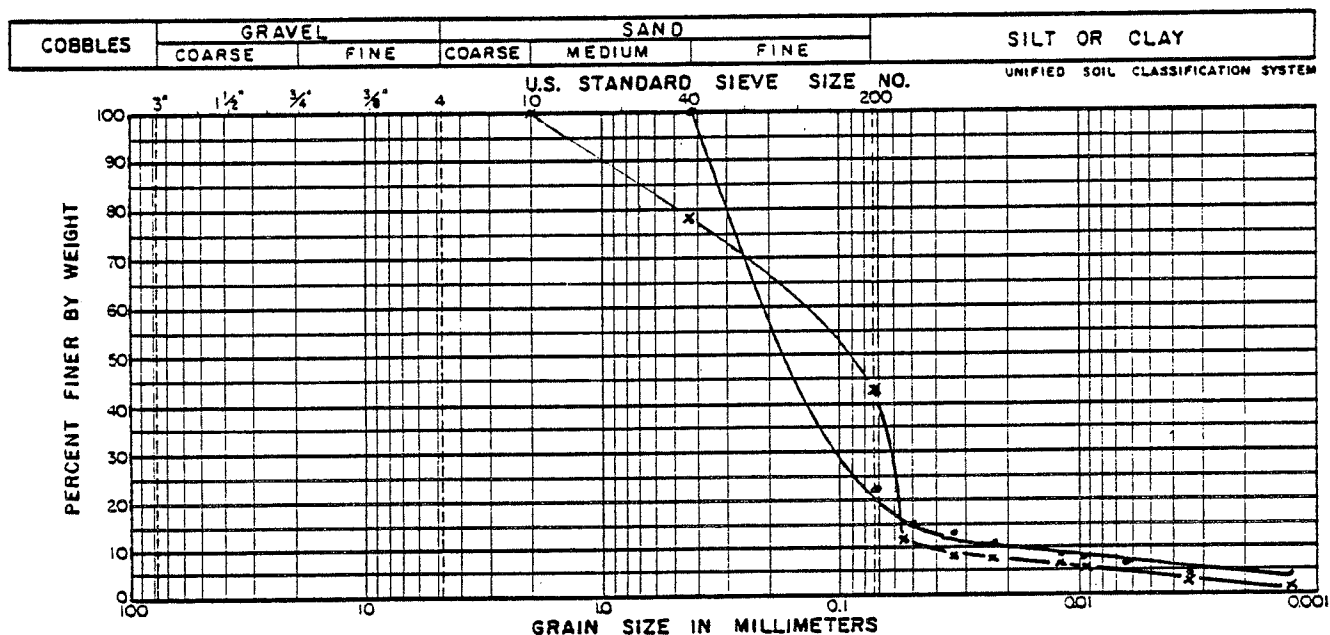
BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-4	S-16	30'-31.5'	•	Greenish-gray silty gravelly coarse to fine SAND (SW-SM)	-	-	-
81							
BH-6	S-11	20'-22'	x	Gray silty fine SAND (SM)	-	-	-
81							



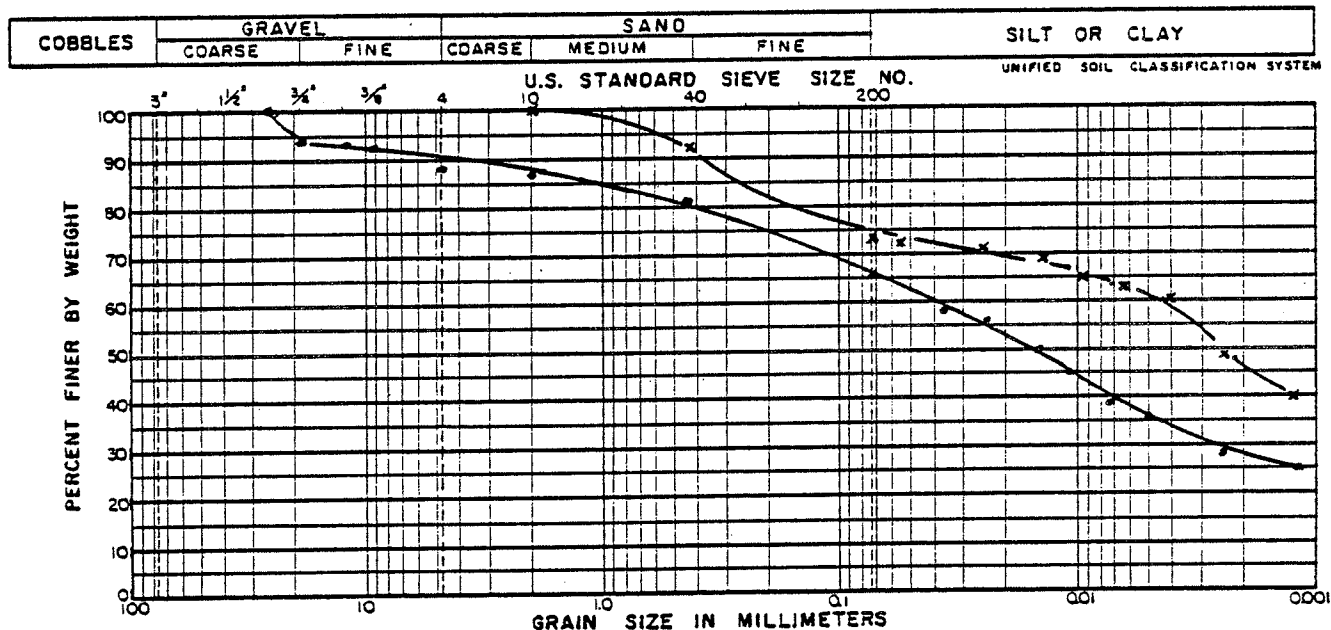
BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-6	S-12	24'-26'	•	Grayish brown clayey silty fine SAND (SM)	-	-	-
81							
BH-6	S-13	26'-28'	x	Dark brown-gray gravelly silty fine SAND, trace coarse to medium sand (SM)	-	-	-
81							



MECHANICAL ANALYSIS

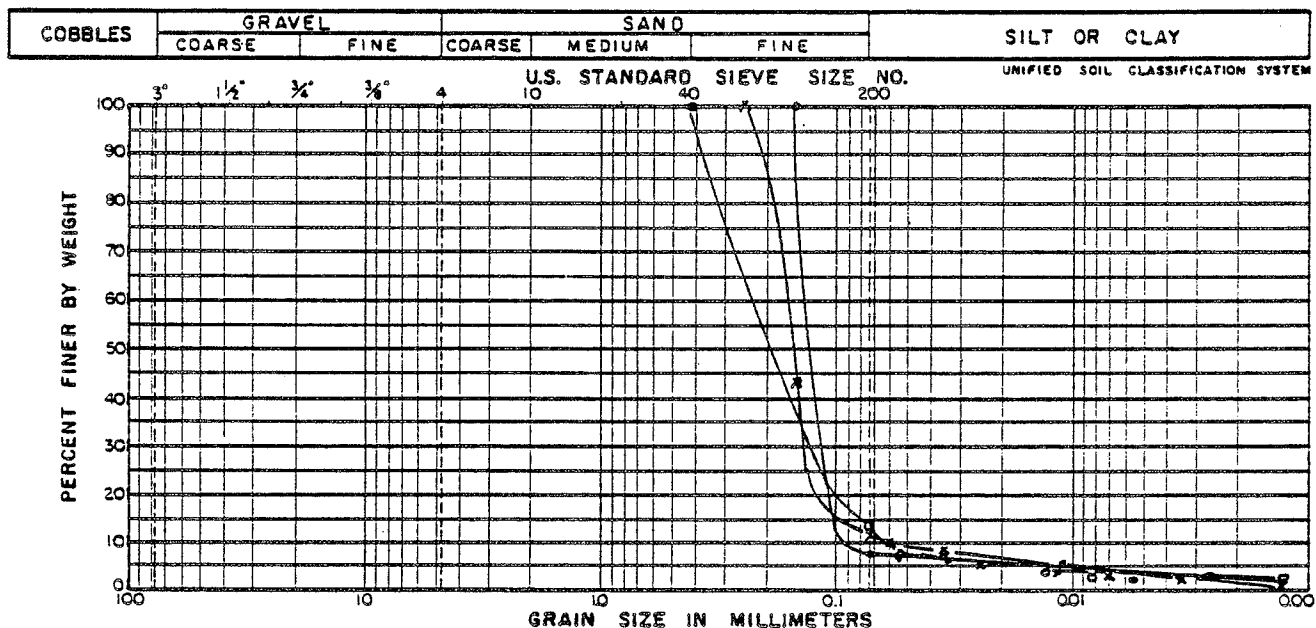


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-8	S-13	24'-26'	•	Gray silty fine SAND (SM)	-	-	-
81							
BH-8	S-14	26'-28'	×	Gray silty medium to fine SAND (SM)	-	-	-
81							

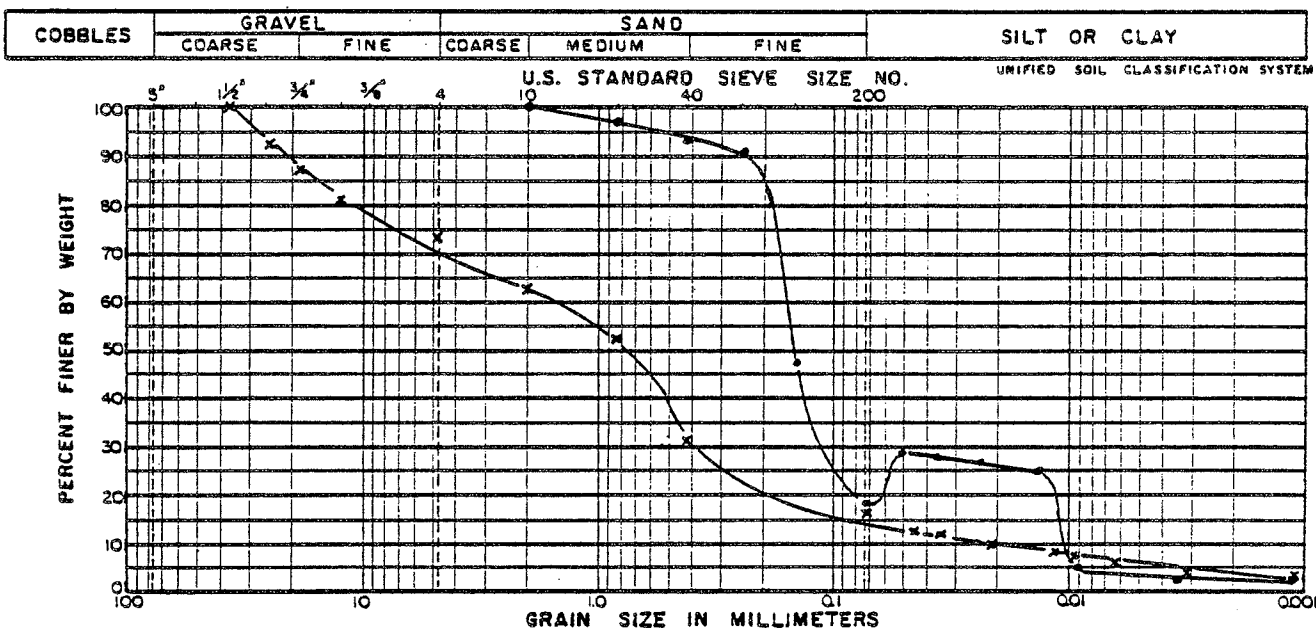


BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-8	S-15a	28'-29.5'	•	Red-brown gravelly, coarse to fine sandy silty CLAY (CL)	-	23	13
81							
BH-8	S-15b	29.5-30'	×	Red-brown medium to fine sandy silty CLAY (CL)	-	31	18
81							

MECHANICAL ANALYSIS

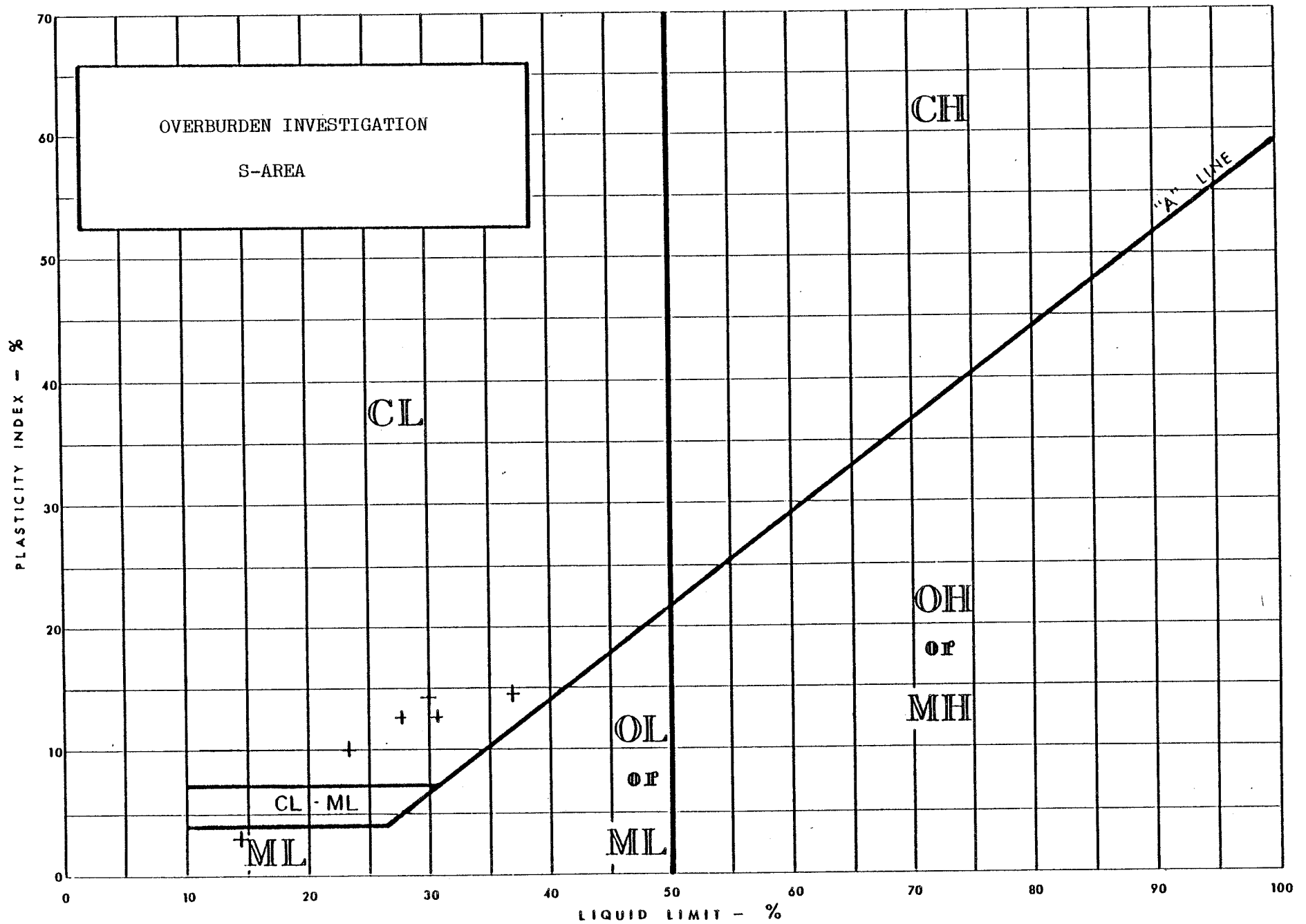


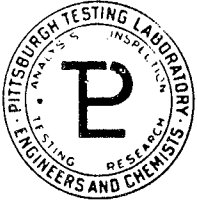
BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-14	S-12	22'-24'	•	Gray silty fine SAND (SP-SM)	-	-	-
81							
BH-14	S-13	24'-26'	×	Gray silty fine SAND (SP-SM)	-	-	-
81							
BH-14	S-14	26-28'	○	Gray silty fine SAND (SM)	-	-	-



BORING	SAMPLE	DEPTH	SYMBOL	CLASSIFICATION	MC	LL	PL
BH-14	S-15	28'-30'	•	Gray fine gravelly, silty, coarse to fine SAND (SM)	-	-	-
BH-14	S-16	30-31.5'	×	Gray silty coarse to fine gravelly SAND (SW-SM)	-	-	-

PLASTICITY CHART





PITTSBURGH TESTING LABORATORY

ESTABLISHED 1881

FORM 407 REV.

AS A MUTUAL PROTECTION TO CLIENTS, THE PUBLIC AND OURSELVES, ALL REPORTS ARE SUBMITTED AS THE CONFIDENTIAL PROPERTY OF CLIENTS, AND AUTHORIZATION FOR PUBLICATION OF STATEMENTS, CONCLUSIONS OR EXTRACTS FROM OR REGARDING OUR REPORTS IS RESERVED PENDING OUR WRITTEN APPROVAL.

LABORATORY No.

ORDER No. BF-8792

March 31, 1980

979-626-
B
April 8/80

CLIENT'S No. Letter 3/7/80

REPORT OF

Tests Of -

Soils

Marked -

Project 979-626

Well Numbers OW1S-80

OW3S-80

OW4S-80

OW8S-80

Reported To -

Conestoga-Rovers & Associates

Consulting Engineers

651 Colby Drive

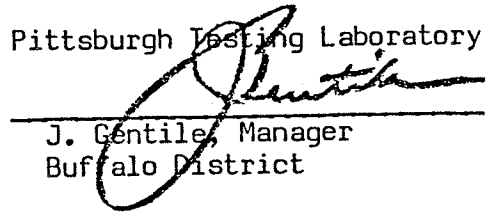
Waterloo, Ontario N2V 1B4

Canada

Four samples of soils, indentified as noted above, were submitted for grain size analysis.

Grain size distribution curves are attached.

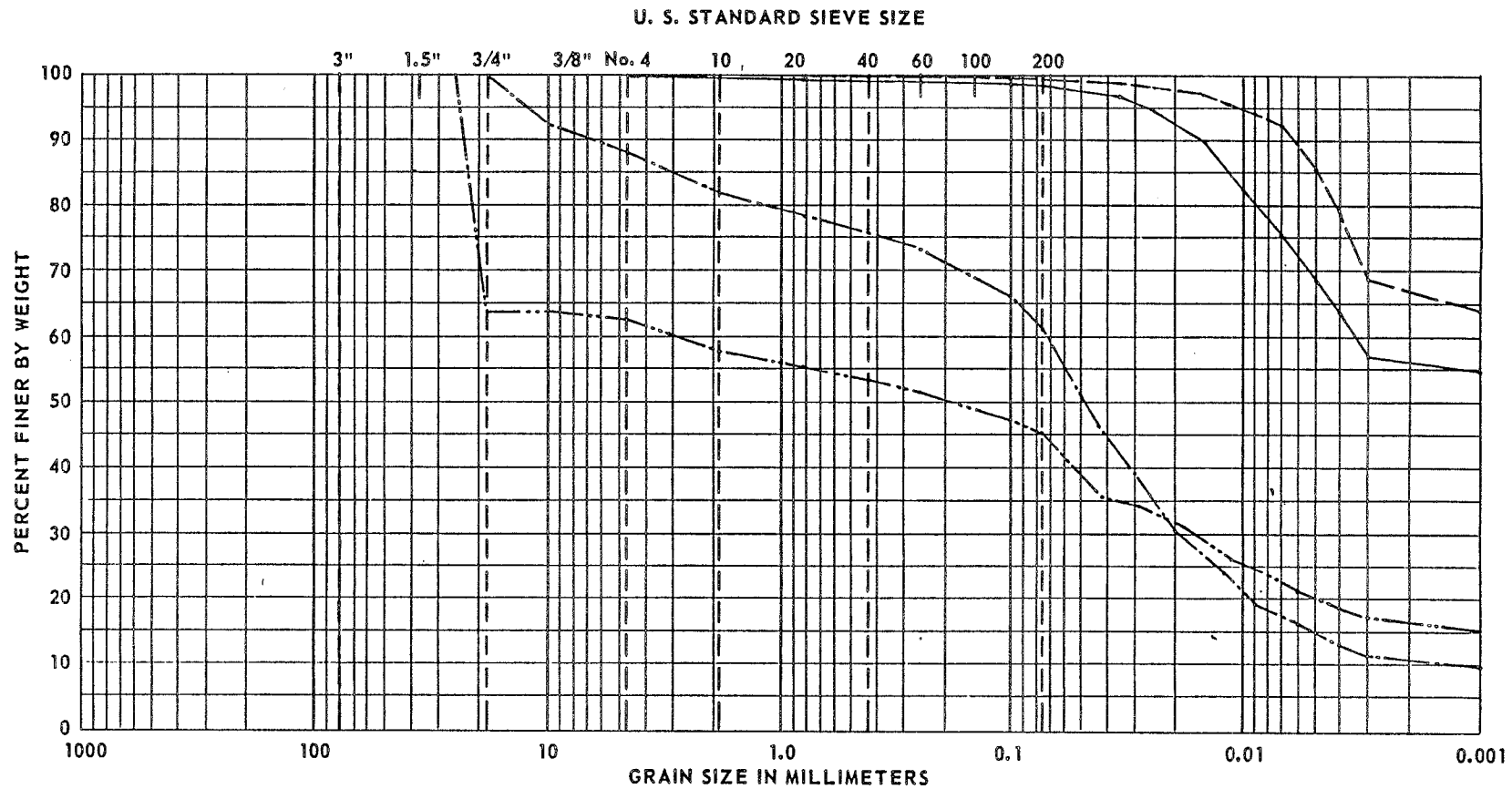
Pittsburgh Testing Laboratory


J. Gentile, Manager
Buffalo District

3/Conestoga-Rovers & Associates
Consulting Engineers

jd

GRAIN SIZE DISTRIBUTION CURVE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	WELL NO.	DEPTH	LINE	CLASSIFICATION	NAT. WC	LL	PL	PI	G _s	REMARKS	PLOTTED BY:
13	OW 1S-80	24.5'-26.5'	—	Reddish Brown Clay with Silt & trace of Sand	42.7				2.768		GWM
12	OW 3S-80	24.0'-25.0'	—	Reddish Brown Clay with some Silt & trace of Sand	48.8				2.770		GWM
13	OW 4S-80	26.3'-28.0'	—	Brown Sandy Silt with some Clay & Gravel	12.1				2.744		GWM
15	OW 8S-80	28.5'-30.5'	—	Gravel & Brown Clayey Silt with some Sand	11.1				2.768		GWM

PITTSBURGH TESTING LABORATORY

ORDER NO. BF 8792

APPENDIX C

SURFICIAL GEOLOGY OF THE NIAGARA FALLS AREA, NEW YORK

BY LEGGETTE, BRASHEARS & GRAHAM INC.

MARCH 3, 1981

SURFICIAL GEOLOGY OF THE NIAGARA FALLS AREA, NEW YORK

History of the Pleistocene, Holocene and Recent Epochs

During Pleistocene time, at least 5 major advances of continental ice sheets have been documented in the central portion of the North American continent, each succeeding advance generally obliterating vestiges of previous glaciation. Therefore, in the Niagara Falls area, surficial glacial sediments are associated primarily with the last major ice advance and subsequent retreat which began about 13,000 years ago in Wisconsinan time.

As the glacier retreated from its last advance 30 or so miles south of Niagara Falls, movement of the ice front was oscillatory, characterized by short periods of advance followed by short periods of retreat. During this time, meltwater was impounded by the ice forming ancient Lake Whittlesey which drained westward and whose level was on the order of 175 feet higher than the present Lake Erie. Subsequent oscillations of the retreating ice front resulted in successively lower lake levels. After ice withdrawal from the general line of the Niagara Escarpment, the lake level dropped rapidly as drainage was captured by the Mohawk-Hudson River system. At this time Early Lake Erie remained of the once-larger water body. At least two possible drainages existed; one located approximately 19 miles west of Niagara Falls and the other partially in the



SWAMP DEPOSITS



POST GLACIAL
LAKE DEPOSITS



END MORaine



PROGLACIAL
LAKE DEPOSITS



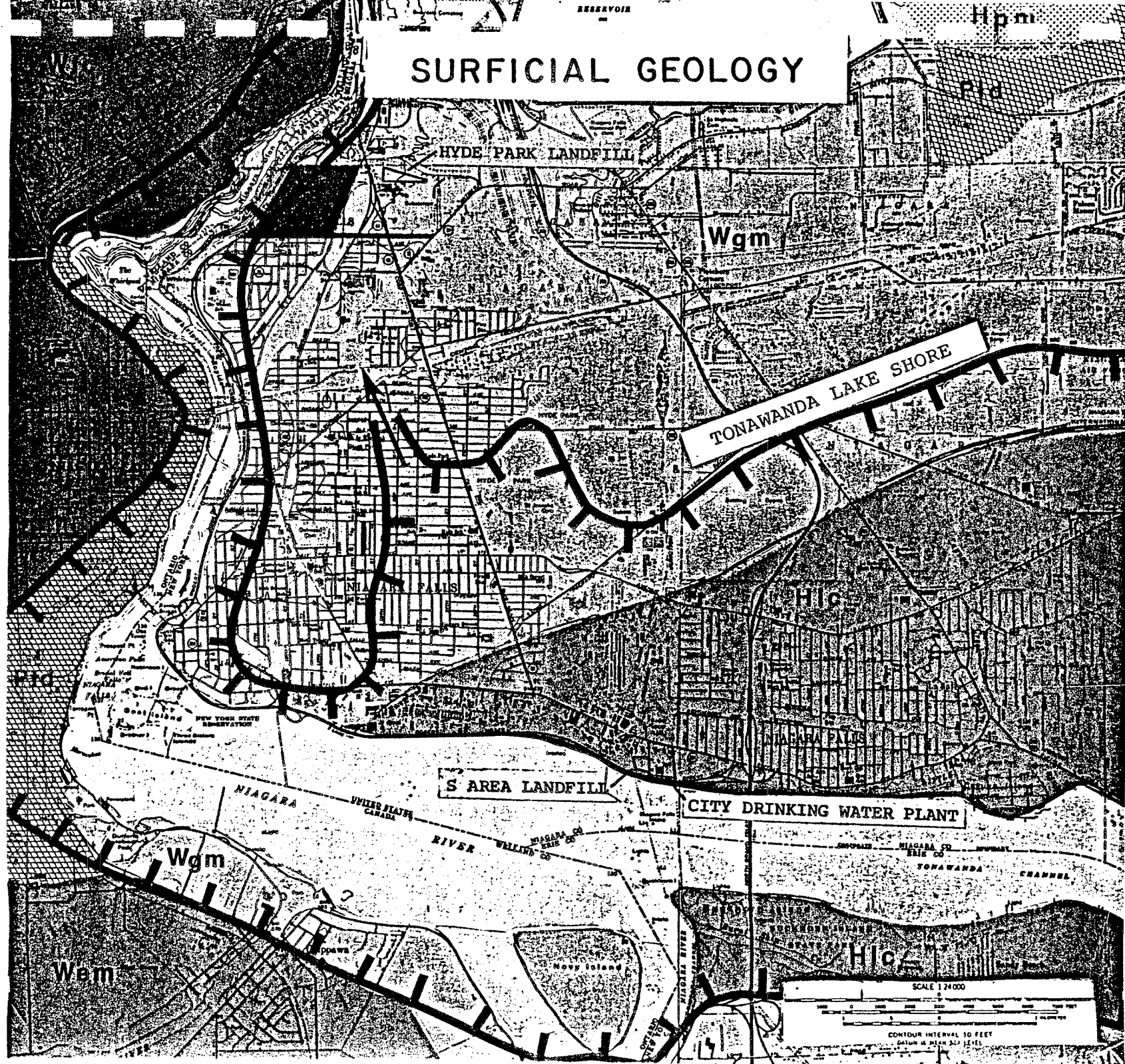
GROUND MORaine
(TILL)



BEDROCK

AFTER E.H. MULLER

SURFICIAL GEOLOGY



present Niagara River channel. However, these were blocked by thick glacial drift deposits and this caused the flooding of the lowland extending east from Niagara Falls nearly 60 miles. The resultant shallow Lake Tonawanda drained through 5 spillways and as the waters receded, all but the drainage through the Niagara Gorge, near Lewiston, dried up. The lake itself dried up about 500 years ago.

Geology of the Pleistocene and Holocene Epochs

Except for the Niagara Gorge and its immediate vicinity, the lowermost geologic unit overlying the Lockport Dolomite bedrock is a ground moraine which is dominantly a lodgment till. As the Wisconsin glacial surges overrode the rock, these sediments were deposited by plastering-on. Muller's description of these materials is as follows:

"...silty clay till and sandy till; sparsely to moderately stony; carbonite and crystalline clasts generally exceed 20 percent; compact and generally very impermeable.

Variably comminuted rock material, transported by and lodged beneath actively flowing ice of the continental ice sheet".

This unit is found everywhere underlying the Hooker Niagara Plant and City Drinking Water Plant except for a small discontinuity in the southwestern corner of the S Area. Its areal distribution, where exposed at the surface, is shown on the attached map. The maximum thickness in the plant

area was measured at more than 15 feet.

As the glaciers receded from the Niagara Falls area and deep ice-marginal lakes were formed, sands, silts, and clays were deposited over the till in a portion of the area. The attached map shows an area in Niagara Falls, Ontario where these sediments are exposed at the surface. In the vicinity of the Niagara Plant, clay is dominant, is characterized by its red or red-brown color and, occasionally is varved, an indication of deep-water deposition. Kindle and Taylor found lake clays at an elevation of about 605 feet just east of Niagara Falls. At the Niagara Plant, these clays are found more than 60 feet lower and up to 17 feet thick. Therefore, it is possible that this area was in one of the deeper parts of the proglacial lakes receiving only the finest-grained sediments. Calkin and Brett found laminated red lake silts in exposures at Goat Island and Whirlpool Park and in an excavation for the Niagara Falls sewage treatment plant. These sections are thin and are probably the result of fluvial erosion as the lakes drained. Muller has described the proglacial lake deposits as follows:

"Silt, fine to medium sand and clay; thin-bedded to massive; regularly bedded; in part with cyclic alternation of clay and silt laminae; moderate bedding plane permeability.

Offshore deposits in basins which required ice-marginal

impoundment for closure; includes primitive lakes in northward-draining troughs as well as ancestral Lakes Whittlesey and Warren in the Erie Basin and Lake Iroquois in the Ontario Basin".

After the last ice sheet had receded from the region, sediment deposition continued in this area in Lake Tonawanda (see attached map). In the Niagara Plant and vicinity, these deposits consist, generally, of gray to tan silt. However, in many borings very fine gray sand or gray to brown clay predominate. In some areas these sediments are not present, probably eroded from the area by fluvial action. Characteristics of these sediments are the presence of fossil mollusks and plant matter. The contact between these and the proglacial silts and clays is generally sharp, primarily by color change, but also by degree of compaction.

Calkin and Brett found similar sediments in exposures at Goat Island and Whirlpool Park and in an excavation for the sewage treatment plant which are generally at the same elevations as those in the Niagara Plant area. Muller describes Lake Tonawanda deposits as follows:

"Silt, fine to medium sand and clay; thin-bedded to massive; in part very regularly bedded with cyclic alteration of clay and silt laminae; moderately permeable along bedding surfaces.

Offshore deposits of lakes in basins which did not require an impounding ice margin for closure, hence

persisted after deglaciation. Notable among filled basins is that of former Lake Tonawanda".

In more recent times, fill has been laid down over the naturally-deposited sediments in much of the region. This varies from a thin veneer which thickens to at least 30 feet along the north shore of the Niagara River. In the Niagara Plant area, fill is on the order of 1'-5' thick to the north and 10'-15' thick along the southern boundary. Along with natural sediments excavated for building foundations, fill consists of waste-construction materials including brick, wood and glass.

Old maps of the region indicate that about 800 feet of the Niagara River along the north shore in the Niagara Plant area was reclaimed by filling. This was done in several stages, the last of which was for constructing the Robert Moses Parkway.

Relationship Between Regional and S Area Vicinity Geology

At the turn of the century, the north shore of the Niagara River was roughly along what is now Adams Avenue according to old U. S. Geological Survey topographic maps and, therefore, all of the S Area and much of the City Water Treatment Plant were probably under the river, subjecting the naturally-deposited sediments to erosion. This may have been the cause for the discontinuity in the till near the southwestern corner of the S Area. However, the configuration of

the shoreline, as illustrated on old local survey maps, is quite irregular which may have reduced the impact of this erosion. More importantly, the clay content and compactness of the till had a major effect on its resistance to fluvial action.

The proglacial clay in the S Area and City Water Treatment Plant was most likely truncated to the south by river erosion. Evidence for this is the steepening of the slope on the clay surface just south of the old shoreline. It follows, therefore, that the fine to very fine sand just above this clay in that area is the result of deposition by the present Niagara River and not part of the old Lake Tonawanda sedimentary sequence.

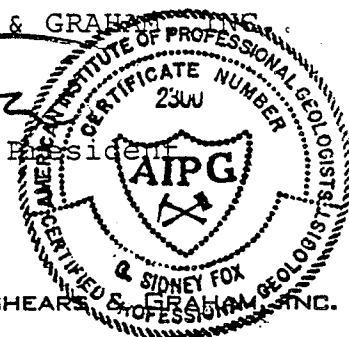
Regionally, the till has been described as being very impermeable. Boring logs in the vicinity of the Niagara Plant show this to be true locally also. Although the proglacial clays are described as being moderately permeable along bedding planes, the description refers to those clays which are varved. Varved clays generally consist of very thin strata of alternating clay and silt. The bedding is flat-lying and the greater permeability is, therefore, horizontal. However, because the depositional environment was in deep quiet lakes the "moderate" permeability designation is relative to the highly impermeable till. Therefore, the entire sequence of glacial sediments is believed to be quite impermeable.

LEGGETTE, BRASHEARS & GRAHAM, INC.

G. Sidney Fox, Vice President

GSF:ag
March 3, 1981

LEGGETTE, BRASHEARS & GRAHAM, INC.



REFERENCES

- Calkin, P. E. - Personal communication
- Calkin, P. E. and Brett, C. E., 1978, Ancestral Niagara River drainage: Stratigraphic and Paleontologic setting: Geological Society of America Bulletin, V. 89, pp. 1140-1154.
- Kindle, E. M., and Taylor, F. B., 1913, U. S. Geological Survey Atlas, Niagara Folio 190.
- Muller, E. H., 1977b, Quaternary geology of Niagara, New York, Niagara Sheet: New York State Museum and Science Service, Albany. Map and chart series No. 28.
- Leggette, Brashears & Graham, Inc., 1981, "Supplementary Geologic Cross Sections in the Vicinity of the S Area and the City Drinking Water Treatment Plant.

APPENDIX D

OVERBURDEN INVESTIGATION, S-AREA, DECEMBER 1981 - MARCH 1982

BY CONESTOGA-ROVERS & ASSOCIATES LIMITED - MAY 18, 1982

**OVERBURDEN INVESTIGATION
S-AREA
DECEMBER, 1981 ~ MARCH, 1982**

**prepared for ;
EPA/STATE/CITY
S-Area Settlement Discussions
May, 1982**

May 18, 1982

CONESTOGA-ROVERS & ASSOCIATES LIMITED

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1.0 INTRODUCTION

In December 1981, Conestoga-Rovers & Associates Limited commissioned Empire Soils Investigations, Inc. to conduct a soil boring program in and adjacent to the S-Area of Hooker's Niagara Falls Plant. Following a delay occasioned by the need to obtain certain permits relating to the sampling activities, the program was completed in March 1982.

The purpose of the soil investigation was to provide additional information on the soil stratigraphy and, in particular, the clay or till strata underlying the S-Area Landfill and surrounding areas. This included a detailed study of the area surrounding Monitoring Wells 14A and 14B (installed in January 1979) in the southwest corner of S-Area and the collection of information on the volume and characteristics of the shot rock used to construct the Robert Moses Parkway.

It should be noted that no groundwater monitoring wells were installed under this program.

This report describes the results of the investigation represented by the on-site drilling.

2.0 BOREHOLE INFORMATION

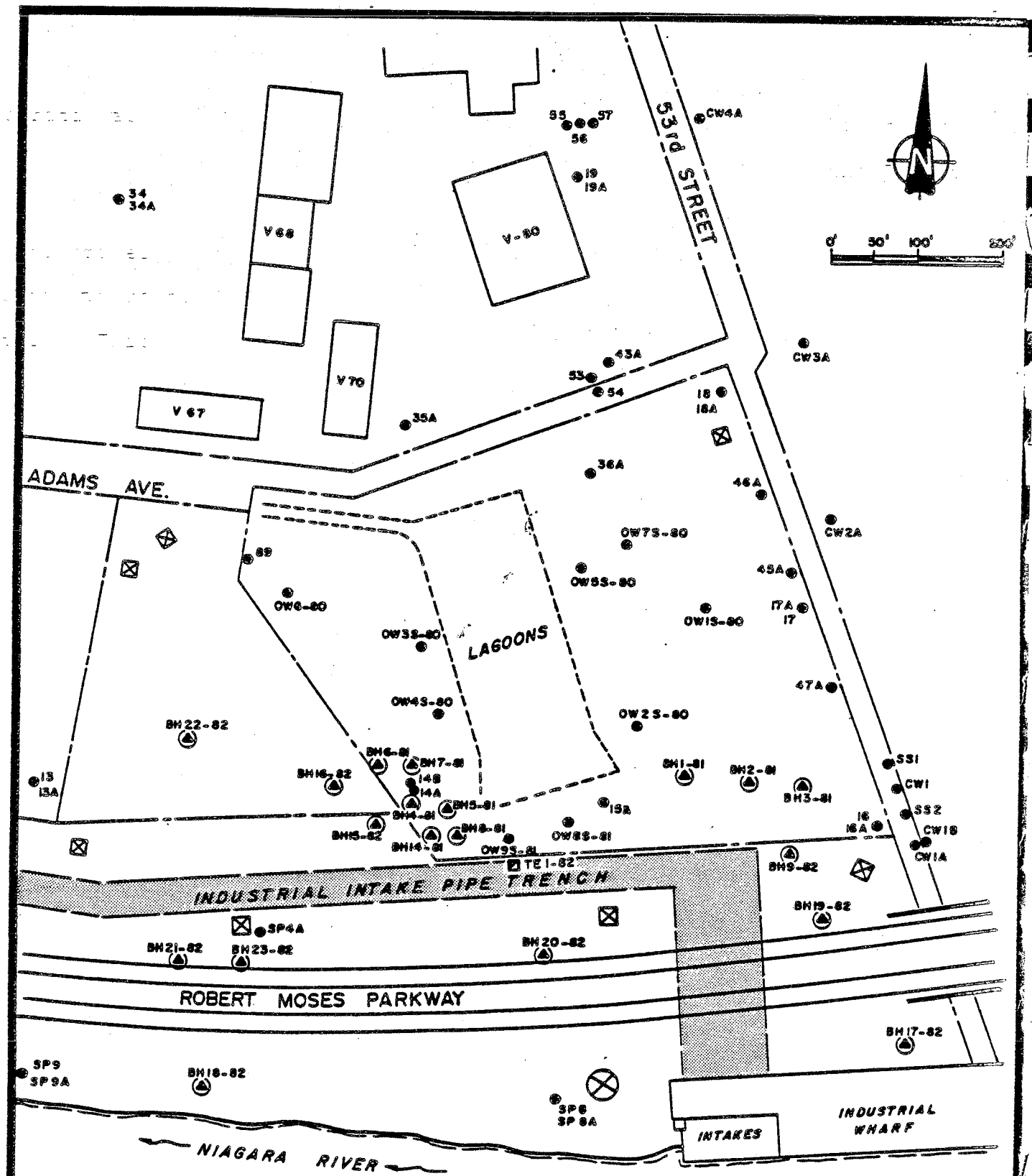
2.1 BOREHOLE LOCATIONS

A total of nineteen (19) boreholes were drilled within and around the S-Area's fenced boundary as identified on Figure 1.

The nine (9) boreholes installed in December 1981 are identified as BH1-81 through BH8-81 and BH14-81. Three (3) of the locations are southeast of the S-Area lagoons while the remaining six (6) borehole locations surround Monitoring Wells 14A and 14B.

The ten (10) boreholes installed in March 1982 are identified as follows:

- two (2) south of the S-Area on PASNY property; BH9-82 and BH15-82
- two (2) west of the S-Area on Niagara Mohawk Power Corp. property; BH16-82 and BH22-82
- two (2) south of the Robert Moses Parkway on Niagara Frontier Parks Commission property; BH17-82 and BH18-82
- and four (4) along the northern edge of the westbound lanes of the Robert Moses Parkway; BH19-82, BH 20-82, BH21-82 and BH23-82.



LEGEND

- ⊙ — BOREHOLE LOCATION (DEC. 81 — MARCH, 82)
- — GROUNDWATER MONITORING WELL
- ⊠ — TEST EXCAVATION (MARCH, 82)

CRA

figure 1
BOREHOLE AND
TEST EXCAVATION LOCATIONS
S-Area Landfill

2.2 BOREHOLES REPLACED BY TEST EXCAVATION

Four (4) boreholes were identified for permit approvals but were subsequently not drilled. These wells were to have been installed through the bedding materials of the industrial intake pipes. However, because of potential damage to the industrial pipes, these boreholes were cancelled. Consequently, there are no boreholes numbered BH10-82 through BH13-82 inclusive.

In place of the cancelled boreholes a test excavation, identified as TE1-82 on Figure 1 was dug along the reported alignment of the north sheeting wall used during the construction of the industrial intake pipes.

2.3 SOIL SAMPLING PROCEDURE

At each borehole location, continuous split spoon samples of the overburden were taken to depth in advance of the augering operation. The split spoon sampling undertaken in December 1981 extended to the top of the till strata. The split spoon sampling undertaken in March 1982 at each borehole extended to refusal on the top of the bedrock.

All blowcounts, soil stratigraphy, and moisture conditions were recorded and representative portions of the collected soil samples were placed in glass jars for storage.

In some cases where shot rock was encountered, it was not possible to obtain continuous split spoon samples. As a result, some of the shot rock was augered through without sampling. On BH19-82, the shot rock was too massive and hard to auger through. Therefore, it was necessary to core through the shot rock with a 4-3/8 inch diameter diamond bit.

In addition, three (3) shelly tube samples were taken of the native sand-silt deposits underlying the fill.

2.4 BOREHOLE BACKFILL PROCEDURE

Each borehole was backfilled from the top of the bedrock to the ground surface with a cement-bentonite grout using a tremie tube to insure positive placement of the grout. Three (3) percent powder bentonite was added to the grout to reduce shrinkage.

3.0 SOIL STRATIGRAPHY

The overburden stratigraphy of the southern portion of the S-Area and surrounding properties encountered during this investigation typically includes a layer of fill material (including structural fill for the Robert Moses Parkway) overlying a layer of native sand and silt deposits overlying a layer of till ranging from clayey to sandy in composition overlying the bedrock.

A summary of the soil stratigraphy for each borehole is presented in Appendix A. The stratigraphy description is assisted by laboratory examination and testing for grain size distribution and Atterberg Limits in certain cases.

The drilling log information as logged in the field is presented in Appendix B.

Appendix C presents the results of physical property testing of selected soil samples (Atterberg Limits, grain size distribution and soil classifications).

3.1 FILL

The fill material was characteristically heterogeneous and consisted of rock fragments, wood, cinders, and fine gravel in a gray to brown sandy matrix. In the area of the Robert Moses Parkway the fill consists primarily of shotrock. Some deposits of white to gray flyash were noted near the surface at BH15-82, BH16-82 and BH22-82. The average depth of fill materials (excluding the six (6) elevated boreholes along and south of the Robert Moses Parkway) was 12.5 feet with an overall range of 8.5 to 17.5 feet.

The four (4) boreholes along and north of Robert Moses Parkway extended through an average 26.5 feet of fill, much of which included shot rock or rock fragments. The two (2) boreholes south of the Robert Moses Parkway encountered 14 and 22 feet of fill materials.

The shot rock material consisted of gray dolomite fragments ranging in size from fine gravel to 3.5 feet. The drill rig was able to auger through the rock at all borehole locations except BH19-82. The shot rock at BH19-82 was extremely hard and it was therefore necessary to core through the shot

rock layer with a 4-3/8 inch diameter diamond bit. At the remaining boreholes, it was possible to auger through the shot rock layer including a 3.5 foot rock encountered in BH20-82.

All six (6) of the boreholes along and south of the Robert Moses Parkway also encountered a layer of rock fragments (up to 3 inch diameter) embedded in a reddish brown silt and clay mixture. This material is bedding placed during the construction of the Robert Moses Parkway. The average thickness of this layer was 9 feet.

3.2 NATIVE SAND AND SILT DEPOSITS

Underlying the fill material is a deposit of native sand and silt. Generally these native deposits were of a silty fine sand with traces of coarse sand. Very thin lenses of fine sand or silt were often noted to be interbedded within the deposit.

The thickness of the sand-silt on and around the S-Area north of the Robert Moses Parkway varied from approximately 14 to 17.5 feet with an average depth of 16 feet. For the six (6) boreholes along the north and south of the Robert Moses Parkway

the average thickness of the sand-silt strata was
-7.5 feet.

Frequently a sandy and gravelly transitional zone below the silty fine sand was found to directly overlay the fine grained matrix. This layer ranged in thickness from 0.0 to approximately 5.0 feet.

3.3 TILL

The till strata generally consisted of reddish brown colored soils ranging from clayey to sandy in composition. The predominant composition was silt. Rock fragments were often noted in the till. A common observation in the till were layers of reddish brown silty clay which were free of any sandy or gravelly material.

On and around the S-Area north of the Robert Moses Parkway the till thickness was observed to range in thickness from approximately 1.0 to 5.0 feet except for borehole locations BH4-81, BH5-81 and BH14-81 (located south of well 14A) where a sand to silty sand till thickness overlying the bedrock was observed to be two (2) to three (3) inches thick.

For the six (6) boreholes along the north and south of
the Robert Moses Parkway the average thickness of the
till encountered was 8 feet with a range variation from
approximately 4 to 10 feet.

4.0 TEST EXCAVATION

In lieu of the boreholes as discussed on Section 2.2 a test excavation, TE1-82, was dug by backhoe. A horizontally buried square timber indicative of sheet piling was encountered at a depth of 5.6 feet below the ground surface. (Top of timber elevations = 562.4). The timber was set 2.6 feet south of the S-Area fence line and laid parallel to the south fence line and industrial intake pipes. Beneath this 10" by 10" timber lay a second similar timber. The location of the test excavation is shown on Figure 1. The above suggests that the sheet piling installed during construction of the industrial pipe trench was left in place.

Restrictions on the allowable depth of excavation and interference with an underground cable limited the amount of information that could be obtained from this investigation.

5.0 PRESENCE OF NON-AQUEOUS PHASE LIQUIDS

The soil samples were examined for the visual and olfactory evidence of non-aqueous phase liquids. Two levels of evidence were observed. There were samples where it appeared to be present and other samples where it was clearly present. These are indicated respectively, as "trace" and "present" presence of non-aqueous phase liquids.

Within the S-Area fenced boundary the two most common elevations at which non-aqueous phase liquids were noted are:

- 1) In the fill material above the fill-native soil interface (present at 6 of the 9 borehole locations with trace amounts in the 3 remaining on-site boreholes).
- 2) In the native sand above the native sand and silt-till interface (present at 8 of the 9 borehole locations).

Outside the S-Area fenced boundary the presence of non-aqueous phase liquids in the overburden materials were noted in only two of the boreholes. At BH15-82 a trace of black non-aqueous phase liquid was noted at a depth of 21 to 23.5 feet in the fine to medium sand overlying the clayey silt. At BH16-82 only a slight trace

of non-aqueous phase liquid was noted. This was again at depth in the sand strata overlying the clayey silt. Each of these boreholes are located within 50 feet of the southwest corner of the S-Area. It is to be noted that non-aqueous phase liquids were not detected in boreholes drilled south of the Parkway. Of the four boreholes located immediately north of the Parkway, only BH20-82 showed the presence of non-aqueous phase liquids.

The presence of non-aqueous phase liquids is noted in the logs presented in Appendix A and B.

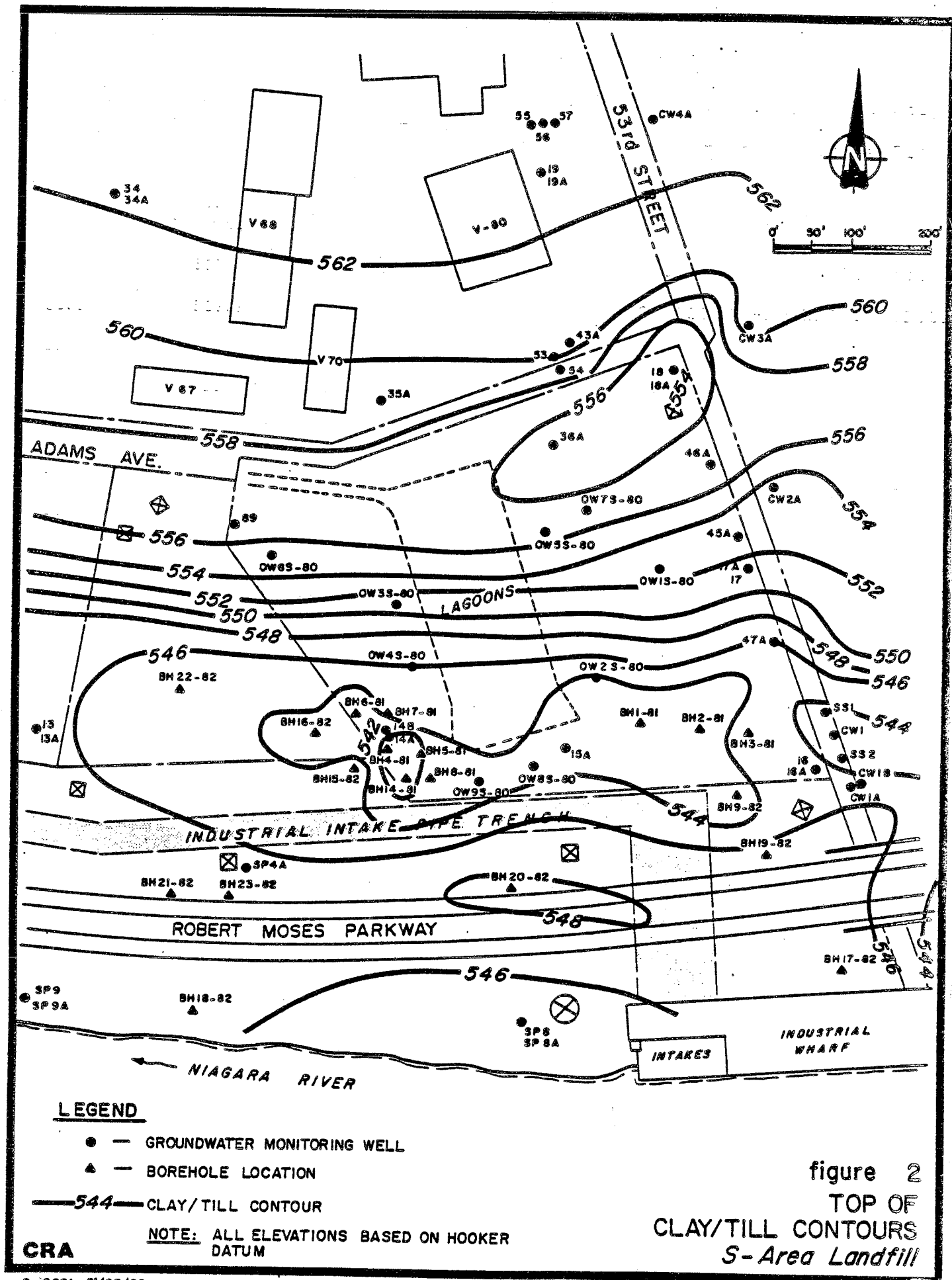
6.0 OVERBURDEN MATERIAL MAPPING

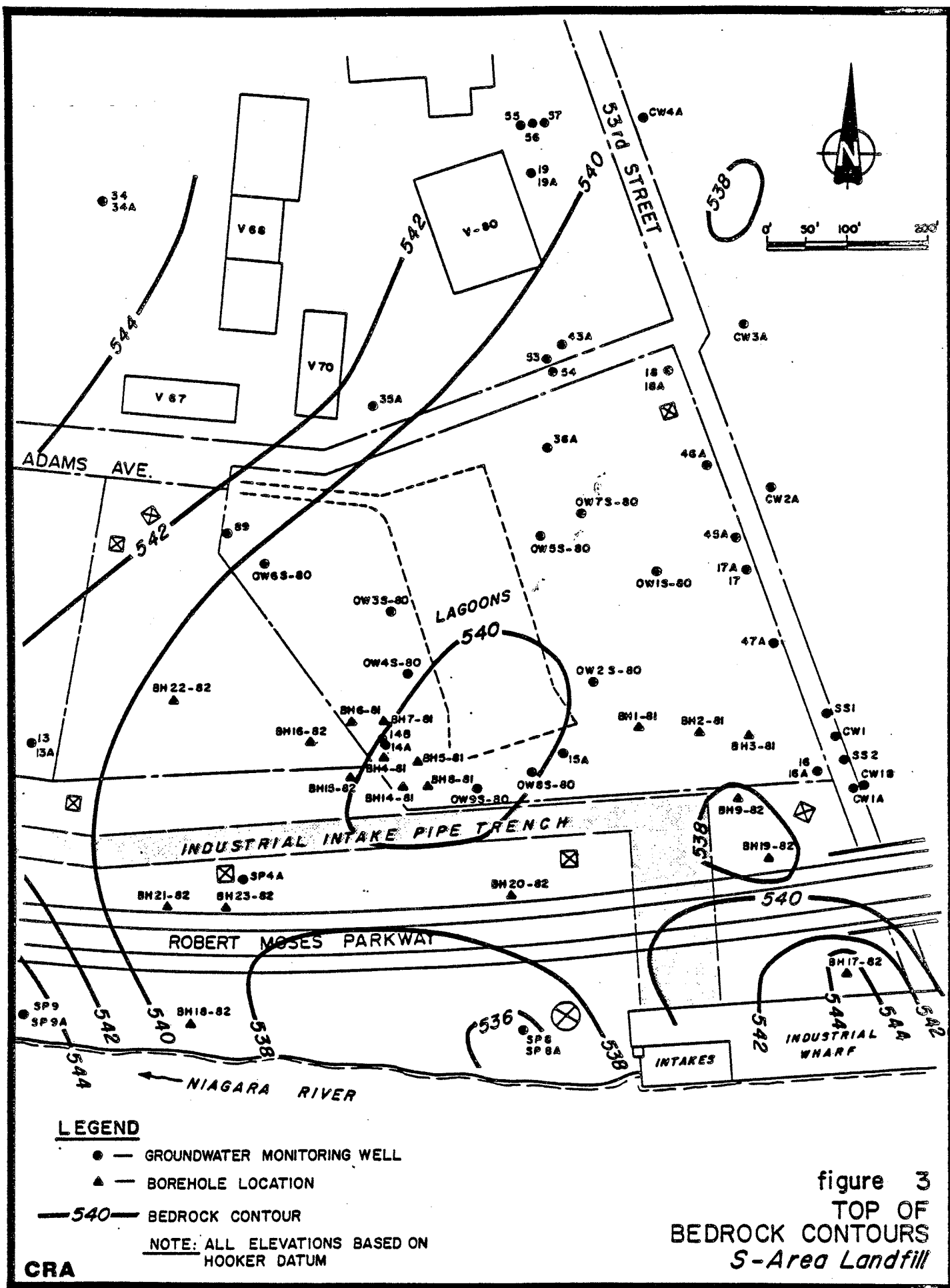
Contour maps of the top of the clay/till strata were drawn using the results of this soil investigation in conjunction with stratigraphic information from previous drilling programs including:

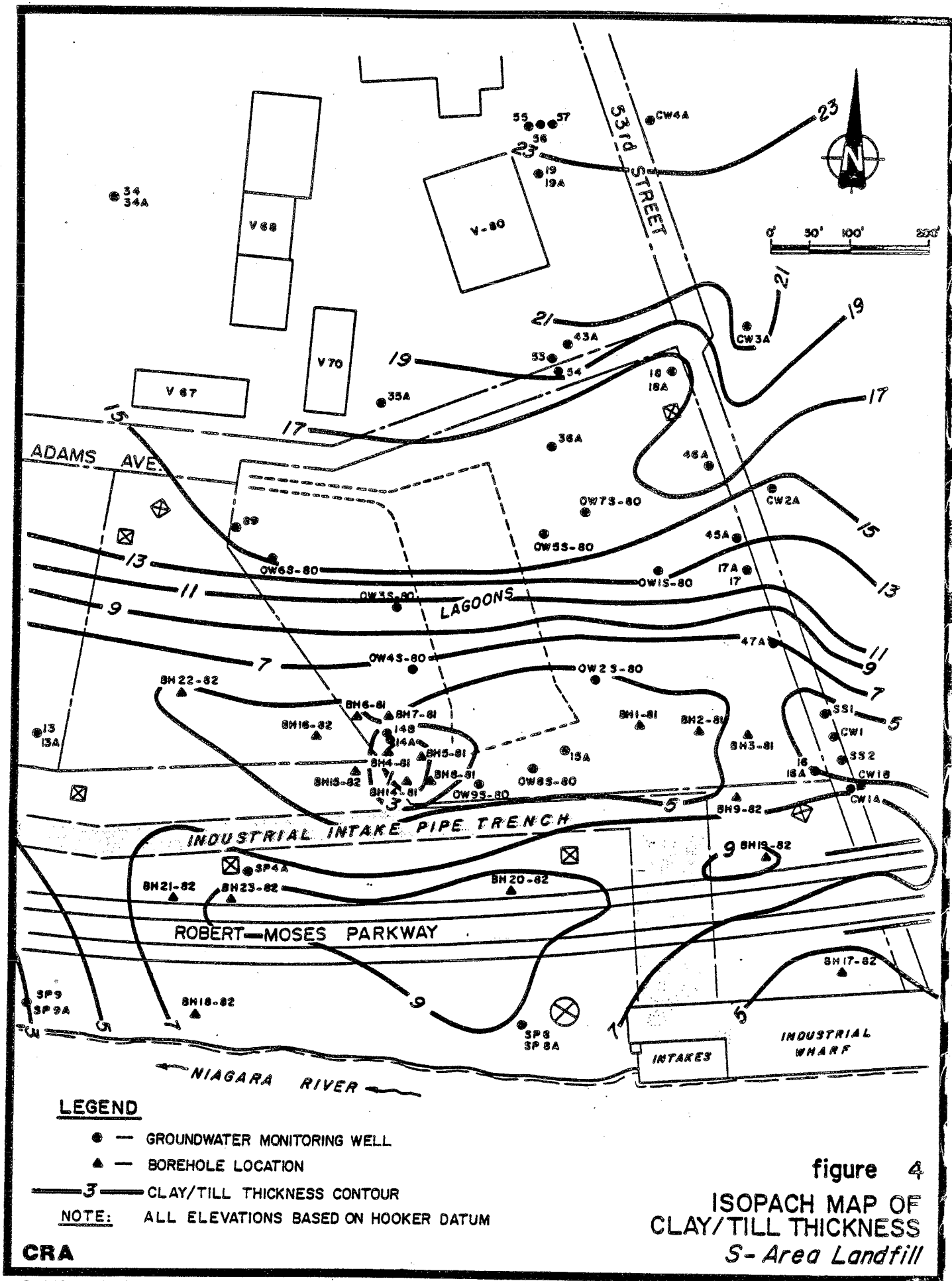
- 1979 and 1980 Niagara Plant Groundwater Monitoring Well Installations
- 1979 Water Treatment Plant Groundwater Monitoring Well Installations
- 1979 and 1980 Robert Moses Parkway Groundwater Monitoring Well Installations
- 1980 S-Area Groundwater Monitoring Well Installations
- 1980 Soil Investigation South of Water Treatment Plant

Figure 2 presents the interpolated surface contours of the clay and or till strata (whichever is first encountered from the surface).

Comparison of these contours with the bedrock surface contours presented in Figure 3 will provide the thickness of the clay/till strata. An isopach map showing the clay/till thickness is presented in Figure 4. (It is to be noted that the soil stratigraphy of SP4A does not appear to be consistent with the data obtained from adjacent boreholes BH21-82 and BH23-82. It is postulated that the refusal encountered and noted in SP4A was not bedrock. As a







LEGEND

- — GROUNDWATER MONITORING WELL
- ▲ — BOREHOLE LOCATION

— 3 — CLAY/TILL THICKNESS CONTOUR

NOTE: ALL ELEVATIONS BASED ON HOOKER DATUM

CRA

9-0621-21/05/82

figure 4
ISOPACH MAP OF
CLAY/TILL THICKNESS
S- Area Landfill

TABLE 1

STRATIGRAPHIC INFORMATION - S-AREA

Well #	Ground Elevation	Depth to Clay/Till (Feet)	Clay/Till Elevation	Depth to Bedrock (Feet)	Bedrock Elevation
12	568.6 (Est.)	21.0	547.6	26.5	542.1
13	567.3	21.0	546.3	27.0	540.3
14	573.1	--	--	32.7	540.4
15A	572.9	29.0	543.9	--	--
16	570.4	25.5	544.9	31.0	539.4
17	571.7	20.5	551.2	33.0	538.7
18	571.3	17.5	553.8	33.0	538.3
19	571.6	8.5	563.1	30.5	541.1
32	568.5	12.0	556.5	24.5	544.0
34	569.9	6.0	563.9	24.9	545.0
35A	569.4	10.5	558.9	--	--
36A	575.2	20.0	555.2	--	--
43A	568.2 (Est.)	7.5	560.7	--	--
45A	571.6	19.2	552.4	--	--
46A	572.2	15.0	557.2	--	--
47A	572.0	27.0	545.0	--	--

Note: All elevations are based on Hooker Datum

TABLE 1 (Continued)
STRATIGRAPHIC INFORMATION - S-AREA

Well #	Ground Elevation	Depth to Clay/Till (Feet)	Clay/Till Elevation	Depth to Bedrock (Feet)	Bedrock Elevation
SP3A	573.9	28.0	545.9	--	--
SP4A (2)	573.4	30.0	543.4	31.0	542.4
SP8	570.1	26.0	544.1	35.0	535.1
SP9	573.8	26.0	547.8	29.0	544.8
CW1	570.6	28.5	542.1	31.5	539.1
CW1B	569.6	24.0	545.6	--	--
CW2A	570.2	17.5	552.7	--	--
CW3A	570.9	10.5	560.4	--	--
CW5	575.8	32.5	543.3	37.0	538.8
CW6	575.1	20.5	554.6	36.0	539.1
CW7	570.4	12.0	558.4	30.5	539.9
CW8A	576.9	34.5	542.4	--	--
CW9	572.0	16.5	555.5	33.0	539.0
CW10	576.6	26.5	550.1	37.0	539.6
CW11	574.3	25.5	548.8	36.0	538.3
CW13	573.4	16.5	556.9	36.0	537.4
OW1S-80	575.9	22.5	553.4	--	--
OW2S-80	575.0	31.7	543.3	--	--
OW3S-80	572.9	22.8	550.1	--	--
OW4S-80	572.1	26.0	546.1	--	--

Note: 1) All elevations are based on Hooker Datum

2) The refusal noted at the time of drilling is postulated not to have been bedrock based on data obtained at BH21-82 & BH23-82.

STRATIGRAPHIC INFORMATION - S-AREA

Note: All elevations are based on Hooker Datum

TABLE 1 (Continued)

STRATIGRAPHIC INFORMATION - S-AREA

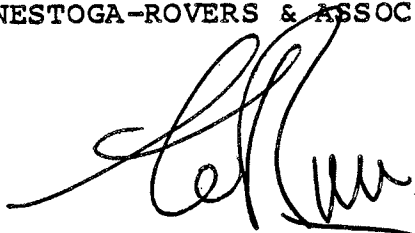
Well #	Ground Elevation	Depth to Clay/Till (Feet)	Clay/Till Elevation	Depth to Bedrock (Feet)	Bedrock Elevation
BH9-82	569.6	26.8	542.8	31.8	537.8
BH15-82	568.1	23.5	544.6	28.2	539.9
BH16-82	568.6	25.5	543.1	28.6	540.0
BH17-82	567.8	20.0	547.8	23.7	544.1
BH18-82	574.8	28.3	546.5	35.4	539.4
BH19-82	585.6	39.0	546.6	48.5	537.1
BH20-82	583.1	34.5	548.6	44.2	538.9
BH21-82	579.9	33.2	546.7	41.2	538.7
BH22-82	568.5	23.7	544.8	28.7	539.8
BH23-82	580.1	32.5	547.6	41.9	538.2

* Silty sand till

Note: All elevations are based on Hooker Datum

result, the stratigraphy of SP4A was not included in the preparation of Figures 2 through 4).

All of Which is Respectfully Submitted,
CONESTOGA-ROVERS & ASSOCIATES LIMITED

A handwritten signature in dark ink, appearing to read 'F. A. Rovers', written in a cursive style.

Frank A. Rovers, P. Eng.

James K. Kay, P. Eng.

APPENDIX E

REGIONAL HYDROGEOLOGIC INVESTIGATION OF THE LOCKPORT FORMATION

BY LEGGETTE, BRASHEARS & GRAHAM INC. - MARCH 1980

PROGRESS REPORT 8
SHALLOW GROUND-WATER QUALITY
INVESTIGATION
HOOKER CHEMICALS AND PLASTICS
CORPORATION
NIAGARA FALLS, NEW YORK PLANT
REGIONAL HYDROGEOLOGIC INVESTIGATION
OF THE LOCKPORT DOLOMITE

Prepared for
Whiteman, Osterman and Hanna
March 1980

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PROGRESS REPORT 8
SHALLOW GROUND-WATER INVESTIGATION
HOOKER CHEMICALS AND PLASTICS CORPORATION
NIAGARA FALLS, NEW YORK PLANT

REGIONAL HYDROGEOLOGIC INVESTIGATION OF
THE LOCKPORT DOLOMITE

INTRODUCTION

During the time period January 2 through February 13, 1980, several data sources were reviewed in an attempt to determine the direction of ground-water movement in the Lockport Formation. A general review of the problem is presented in this report. The geology and the Formation is discussed with emphasis on second-phase fluid flow. Recommendations for additional investigative activities are also presented.

BACKGROUND INFORMATION

Ground-water flow in the bedrock aquifer in the vicinity of the Hooker plant and the City Water Treatment Plant is in a north to northwesterly direction beneath the City of Niagara Falls^{1/} (figure 1). Based on this flow direction water-phase contaminants would be expected to flow in the same general direction. It has been suggested that additional data are required to verify this assumption.

Second-phase organics have been found in relatively few bedrock monitor wells and are generally located in or adjacent to the S Area. The specific gravity of these fluids suggests gravity controlled flow; that is downward migration in the bedrock ground-water system. It is believed that if this is the case the slight hydraulic gradient to north and northwest has little, if any, effect on second-phase fluid flow. The contaminants may move along disturbed parts of the aquifer such as the intake tunnel and Shore Shaft structure at the City Water Treatment Plant and/or along fracture planes and solution cavities in the formation (figure 2). Therefore, a geologic study of the Lockport Formation has been undertaken to possibly reveal the geologic relationship(s) to ground-water contamination.

FIGURE 1

-2-

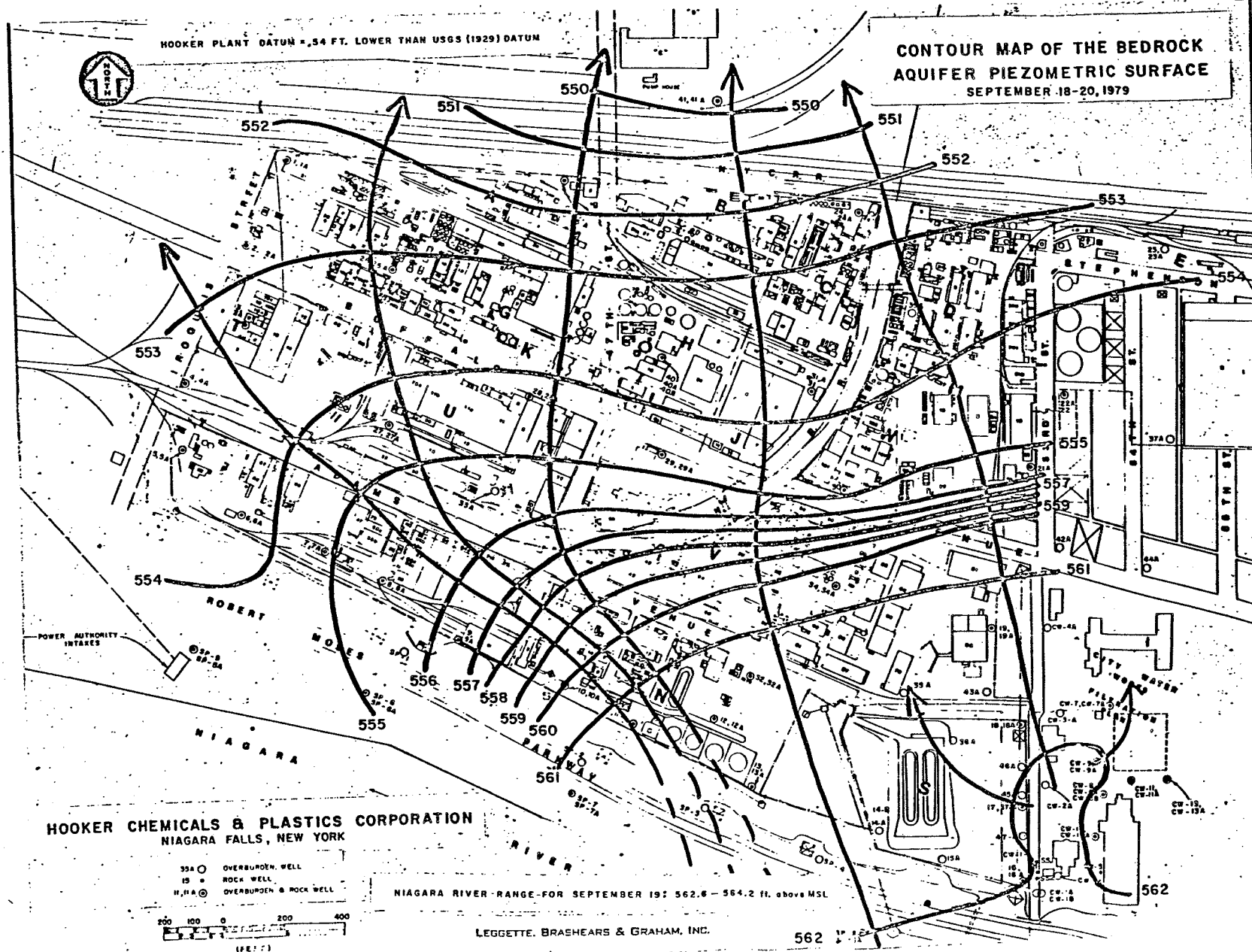
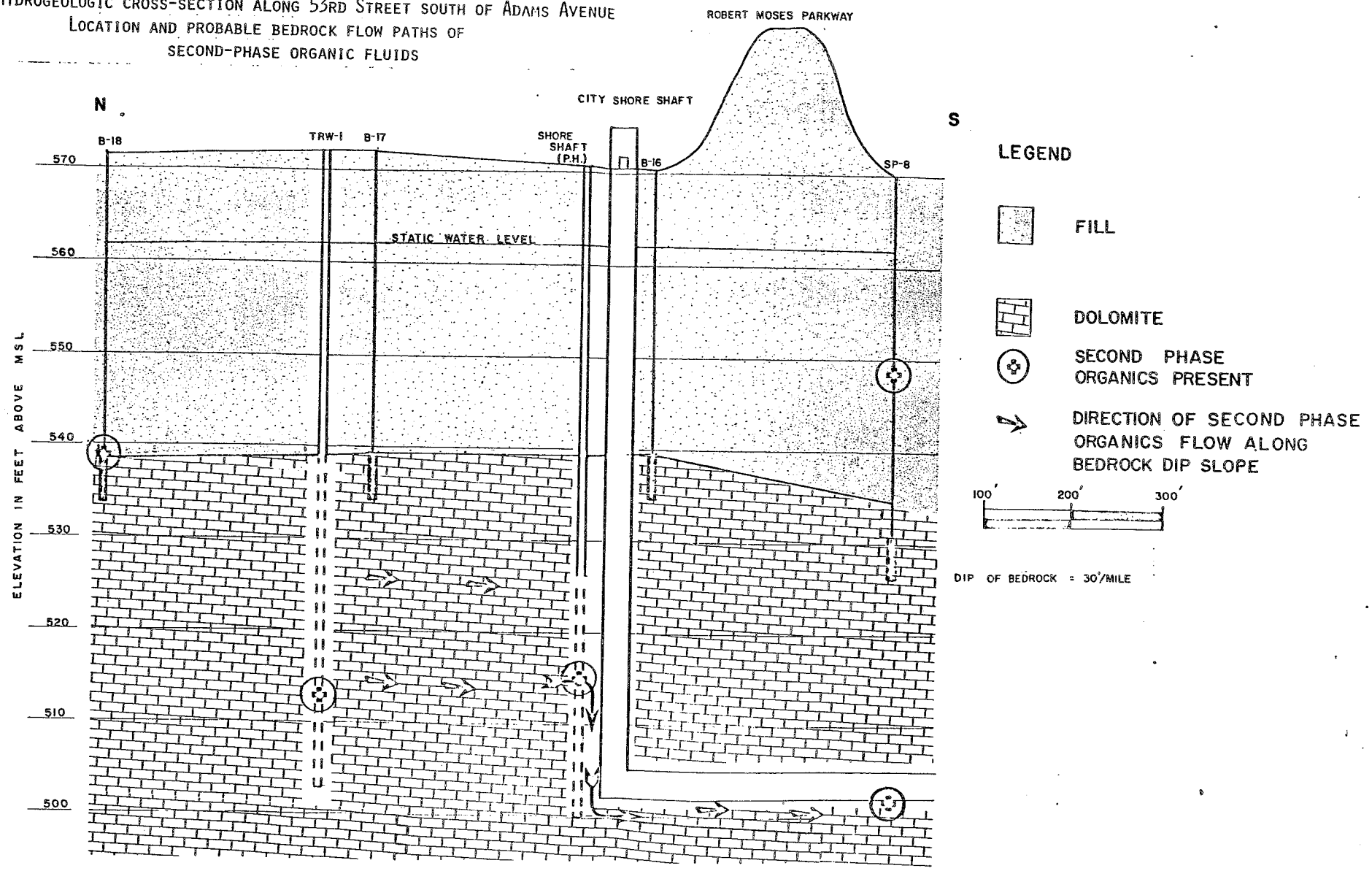


FIGURE 2

HOOGER CHEMICALS AND PLASTICS CORP.
NIAGARA FALLS PLANT, NEW YORK
HYDROGEOLOGIC CROSS-SECTION ALONG 53RD STREET SOUTH OF ADAMS AVENUE
LOCATION AND PROBABLE BEDROCK FLOW PATHS OF
SECOND-PHASE ORGANIC FLUIDS



LEGGETTE, BRACHEARS & GRAHAM, INC

GEOLOGY

The Lockport Formation is of Middle Silurian age (320-350 million years old). It is the eastern extension of the thicker Niagaran carbonate sequence of the Indiana-Illinois Region^{2/}. In the Niagara Falls area, the Lockport Formation is about 180 feet thick, dips at the rate of about 30 feet per mile in a south to southeasterly direction and is comprised of five members. The Lockport Formation consists of dolomite and limestone with several fossiliferous zones.

Figures 3 and 4 illustrate the general structure of the formation in relation to other geologic formations^{3/}. Johnston indicated that there are at least seven distinct water-bearing zones within the Lockport Formation in the vicinity of the Power Authority of the State of New York construction sites and that they can be traced laterally for distances of one to four miles^{4/}. These seven zones are associated with high densities of bedding - plane fractures which dip at 30 feet per mile to the south-southeast. Vertical joint analyses conducted at the American Falls indicate a variety of joint sets with the most pronounced orientation at N. 70°-80° E.^{3/}. Little is known about the areal extent of horizontal or vertical jointing. However, excavations (Southside Interceptor Sewer and Tailrace Tunnel Connection) in the formation have encountered large inflows of ground water^{5/}. Considering this information, it is probable that contaminants follow fractures in the bedrock.

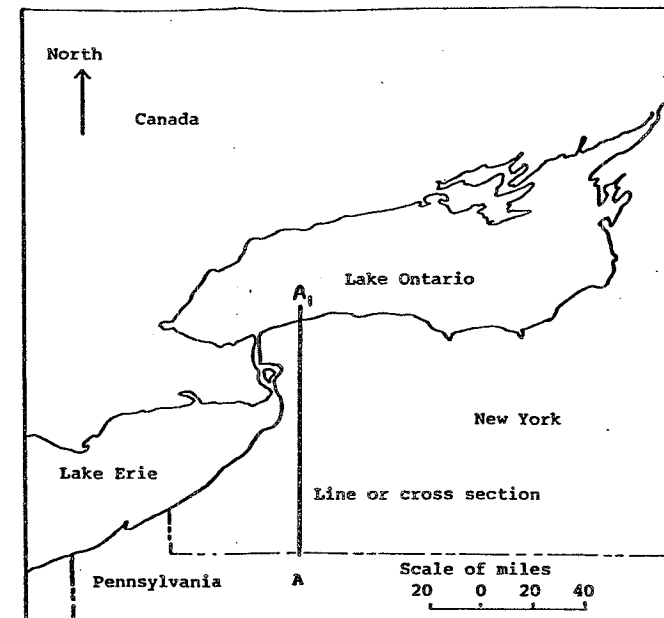
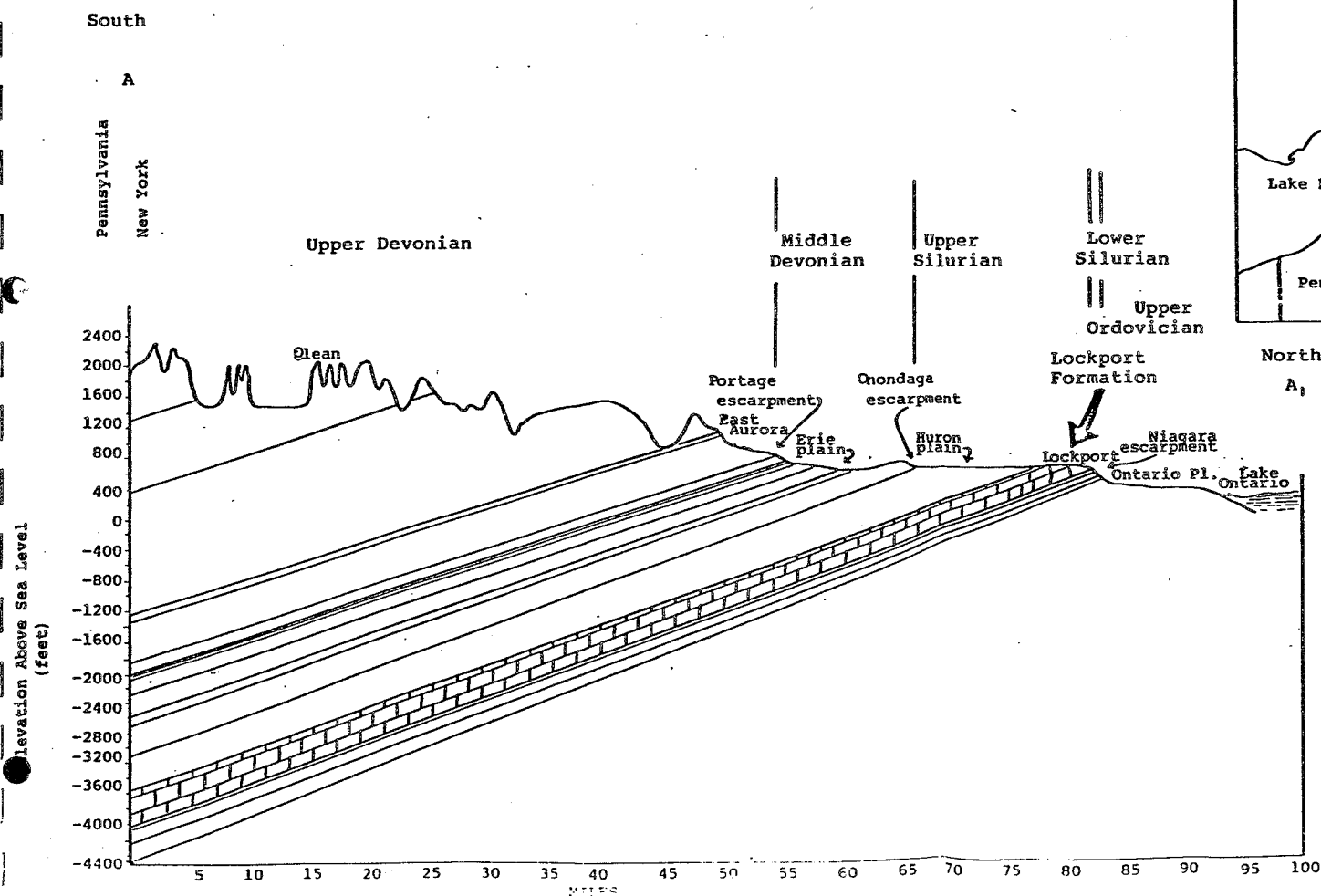
Figure 5 is a generalized stratigraphic section of the Lockport Formation^{2/}. Johnston suggests that the water-bearing zones occur most commonly within intervals of the Lockport Formation containing thin beds of from ¼-inch to 4-inches thick which are directly overlain by thick or massive beds. Crowley's subsurface investigation indicates that outside of Johnston's study area, there may be two possible water zones at depths that are stratigraphically controlled^{6/}. His study reveals no new fracture or hydrogeologic data.

Rock cores in the vicinity of the S Area and the City Water

FIGURE 3

GENERALIZED GEOLOGIC CROSS-SECTION IN WESTERN NEW YORK STATE

(Based on American Falls International Board,
Appendix C, June 1974)



Horizontal Scale
1 inch = Approx. 10 miles
Vertical Scale
1 inch = Approx. 1600 feet
Vertical Exaggeration =
33 X

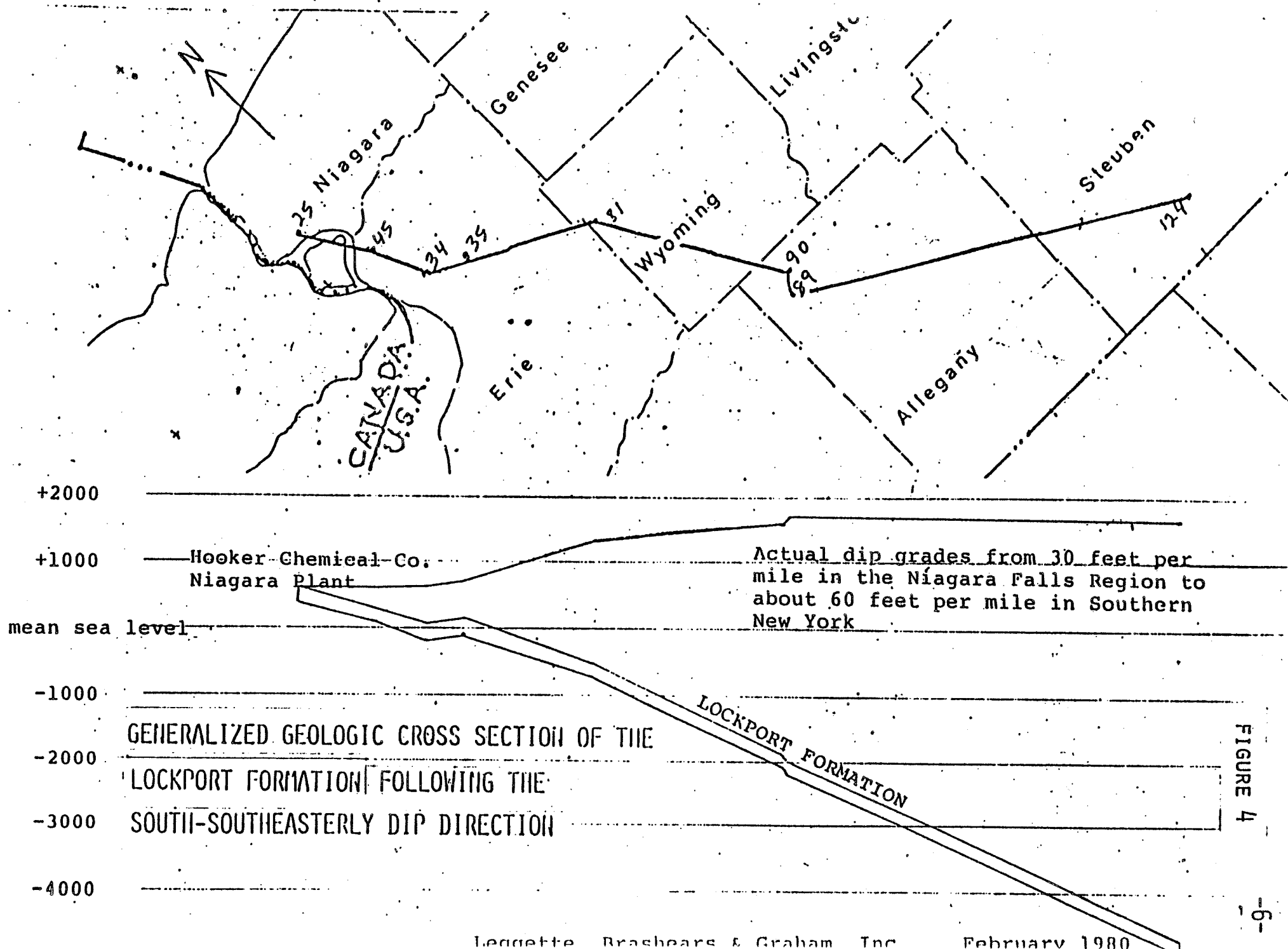
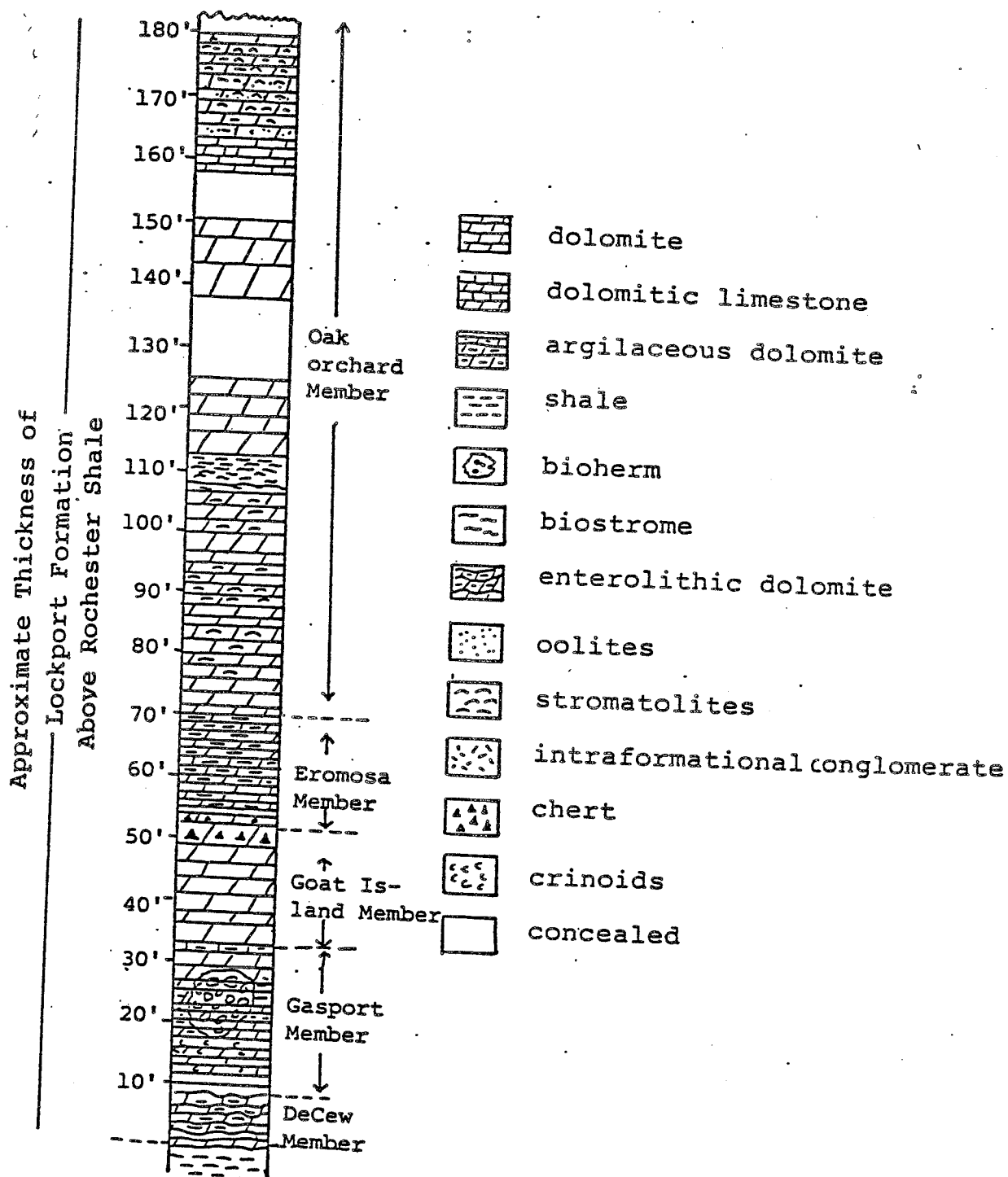


FIGURE 4

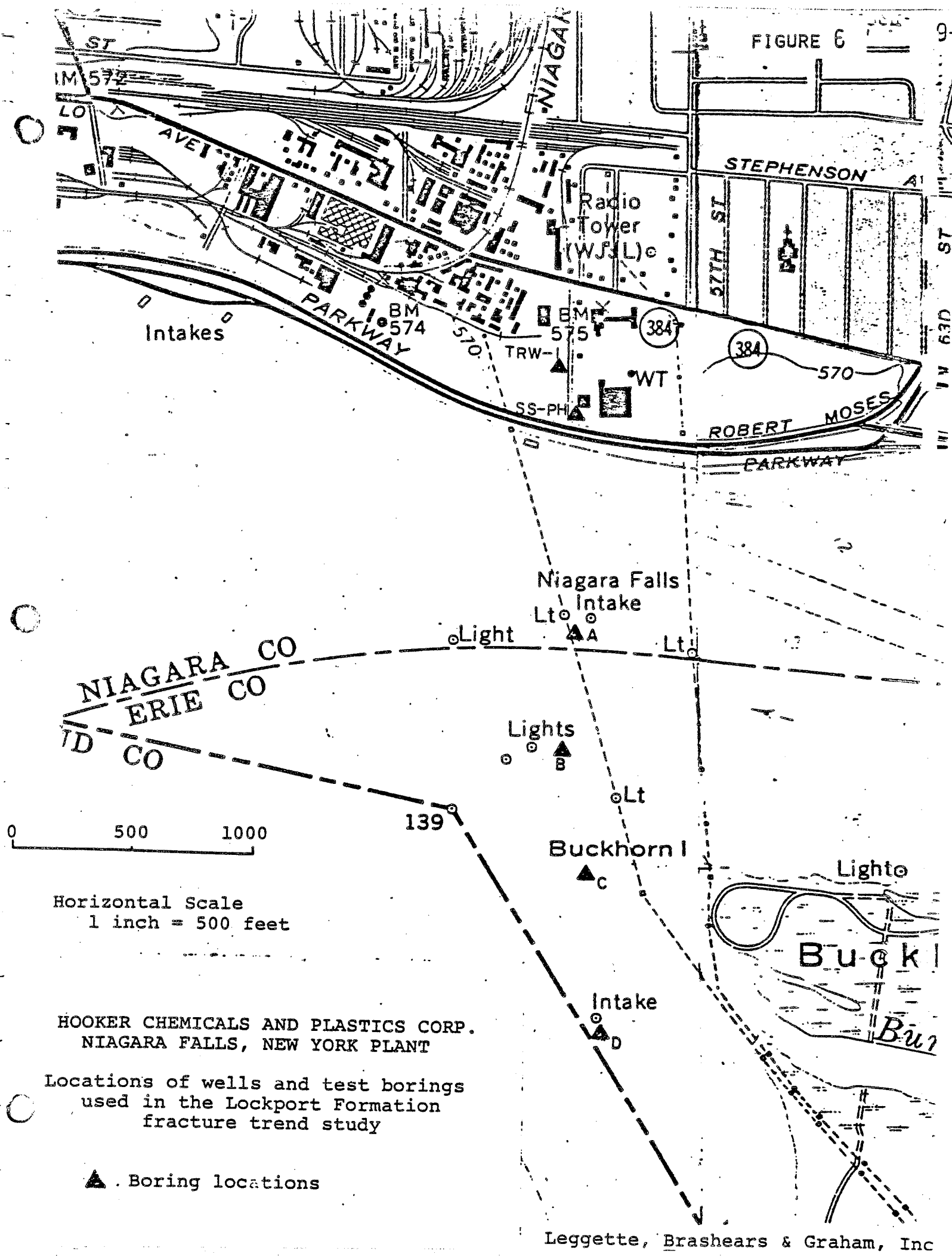
GENERALIZED COLUMNAR SECTION OF LOCKPORT FORMATION
IN NIAGARA FALLS AREA, NEW YORK

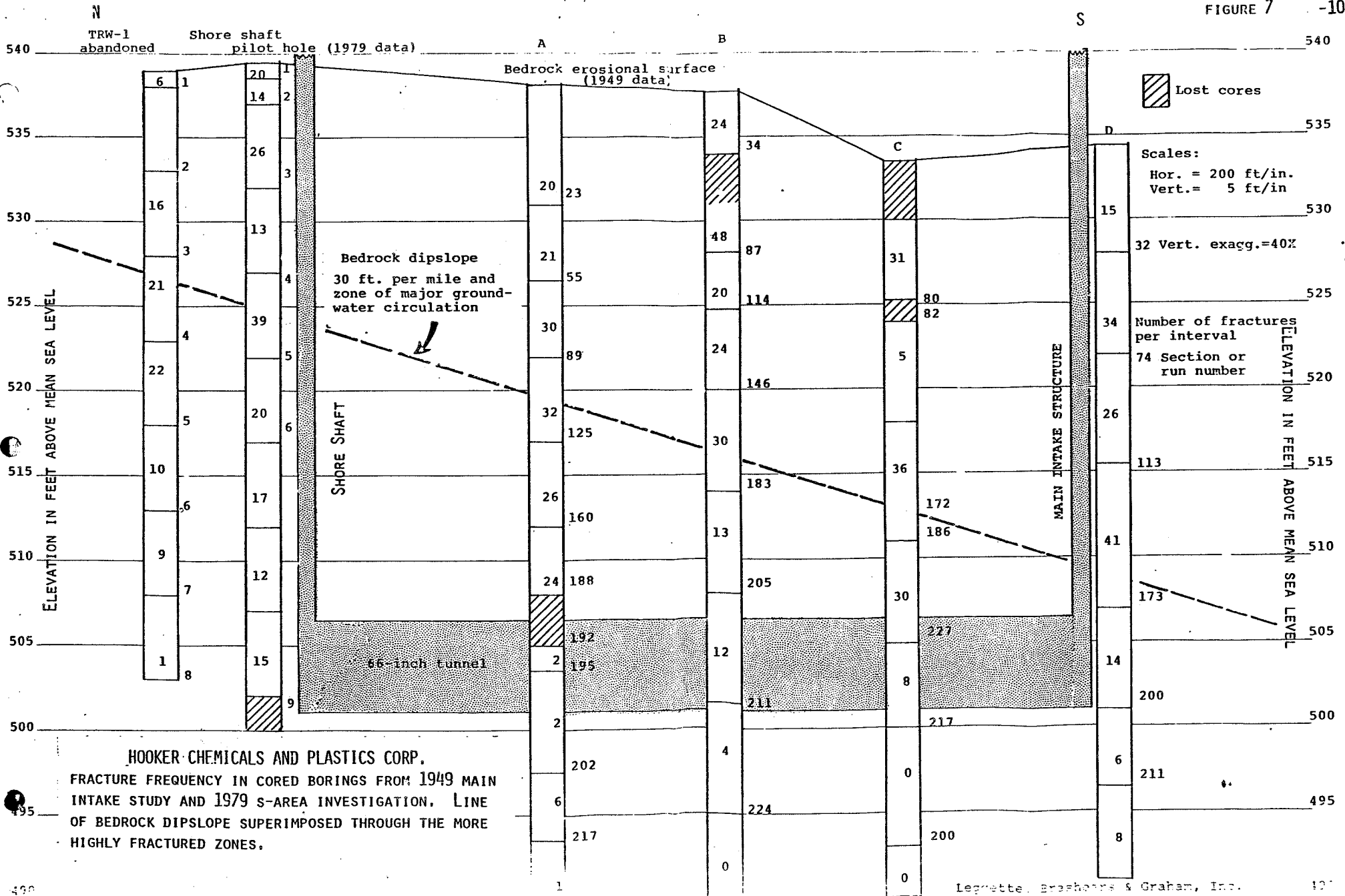
FIGURE 5



Treatment Plant were examined to determine if any relationship exists between rock fractures and the flow direction of second-phase organics. Geologic logs are in the Appendix. Figure 6 shows the locations of the borings. River Borings A-D were drilled in 1949 for the location of the water-intake tunnel. Because of the time elapsed since this work was completed (1950) written information describing drilling specifications (core depths and sampling intervals) were not readily available. Without consistent data control points for River Borings A-D (complete cores and section numbers), accurate fracture correlations were difficult. However, better data control points were present when reviewing TRW-1 and the Shore Shaft pilot hole.

The north-south cross section in figure 7 illustrates the approximate number of fractures in 5-foot intervals for each boring. The bedrock dip of 30 feet per mile has been superimposed on the section and it appears that there is a strong correlation between fracture density and the dip. This indicates that there is a zone through which major ground-water circulation could take place. That zone is indicated by the dashed line on the section. This zone is more than 15 feet above the City's bedrock intake tunnel at the Shore Shaft to about 3 feet at the Emerald Channel intake. Of equal significance, the cross section also shows that fracture densities in the zone through which the tunnel traverses are considerably lower, indicating that the potential for ground-water movement is low. Therefore, it appears that the dashed line zone on figure 7 is more likely to transmit second phase fluids than the zone in which the tunnel is located. Accordingly, a postulation that second phase organics from the S Area get to the bedrock intake tunnel through this fracture zone does not appear to be consistent with these data unless there is a vertical disturbed zone which intersects the fracture zone at the bedrock intake tunnel. Such a vertical disturbed zone exists at the Shore Shaft. Thus one can postulate a flow path through the overburden and upper parts of the bedrock to the Shore Shaft, then down the interface between the Shore Shaft





and the existing geologic materials and then along interface between the bedrock and the tunnel. Inflow to the tunnel itself is probably through existing weep holes. To confirm or deny this hypothesis will require further investigation.

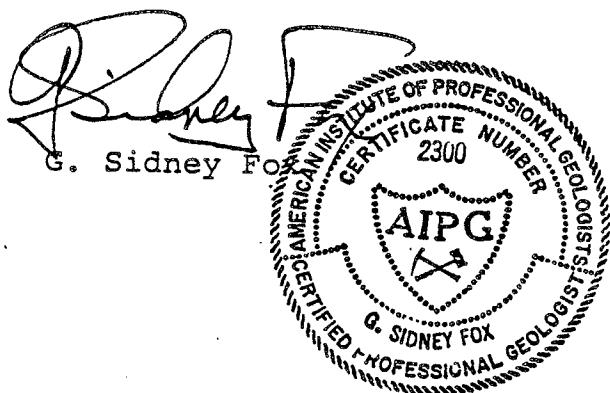
RECOMMENDATIONS

In order to determine if second phase organics and other contaminants enter the bedrock intake tunnel as described above, the following investigative measures are recommended:

- 1) Install monitor wells 5 feet and 10 feet from the Shore Shaft in the overburden on the north, east and south sides of the Shore Shaft building. If a ground-water gradient toward the Shore Shaft is found, downward movement of fluids is a certainty.
- 2) Extract fluid samples from the monitor wells and analyze for organics.

LEGGETTE, BRASHEARS & GRAHAM, INC.

John Naso
John Naso, Jr. Hydrogeologist



dm
March 10, 1980

LEGGETTE, BRASHEARS & GRAHAM, INC.

REFERENCES

- 1/ Leggette, Brashears & Graham, Inc., 1980, Progress Report #6, "Shallow Ground-Water Quality Investigation, Hooker Chemicals & Plastics Corporation, Niagara Falls, New York Plant".
- 2/ Zenger, D. H., 1965, "Stratigraphy of the Lockport Formation (Middle Silurian) in New York State", New York State Museum and Science Service Bulletin, #404, pp.39.
- 3/ American Falls International Board, 1974, "Preservation and Enhancement of the American Falls at Niagara". Appendix C-Geology and Rock Mechanics, Final Report to the International Joint Commission, pp. C12.
- 4/ Johnston, R. H., 1964, "Ground Water in the Niagara Falls Area, New York", State of New York Conservation Department, Water Resources Commission, Bulletin GW-53, pp. 23.
- 5/ Baggettelli, M. 1980, Personal Communication at City of Niagara Falls Engineering Office. Review of Construction Diagrams and Consultant's Report.
- 6/ Crowley, D. J., 1980, Personal Communication at the State University College of New York at Fredonia. Conducted Study of Lithofacies and Paleoenvironmental Analysis of the Lockport Formation.

APPENDIX

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

Page 1 of 3

DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Falls Plant
Fill, clay, till	33.0	33.0	LOCATION: S Area
Dolomite bedrock, gray for remainder of hole.			WELL NO.: TRW-1
(CORING RUNS)			DATE COMPLETED:
Run #1 (8/6/79) Dolomite, very vuggy			DRILLING COMPANY: Rochester Drilling Co.
6 weathered breaks	1.0	34.0	DRILLING METHOD: Core barrel and air and water
Run #2 (8/7/79) Dolomite, solid	.5	34.5	SAMPLING METHOD: cores
Several fresh breaks	.5	35.0	SAMPLES: EXAMINED BY: R. Lamonica
Solid dolomite	1.0	36.0	REFERENCE POINT: Grade
Solid dolomite with about 7 apparently fresh breaks	2.0	38.0	ELEVATION OF R. P.: -
Dolomite with many horizontal breaks along shale partings	1.0	39.0	CASING: Flush joint casing rock
Run #3 (8/7/79) Difficult coring.			SCREEN: TYPE: None
Solid dolomite with 5 fresh breaks	.5	39.5	DIAM.: SLOT NO.
Run #4 (8/7/79) Broken dolomite (weak zone) breaks horizontal and diagon- al	.5	40.0	SETTING:
Solid dolomite, few fresh breaks	1.0	41.0	PUMPING TEST: DATE:
Void	.5	41.5	DURATION:
Solid dolomite with much gypsum in cracks and vugs; many shale partings; gypsum is very soft, crystalline phase	2.5	44.0	STATIC WATER LEVEL:
(Continued)			PUMPING WATER LEVEL:
			YIELD:
			REMARKS: Determination of yield during drilling is not possible because of the space restriction when the core barrel is in the hole.

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals & Plastics Corp.</u> <u>Niagara Falls Plant</u>
Run #5 Difficult coring; many breaks			LOCATION: <u>S area</u>
diagonal and horizontal	.5	44.5	WELL NO.: <u>TRW-1 (Continued)</u>
Very broken dolomite *	.5	45.0 *	DATE COMPLETED: _____
Solid dolomite, very thin bedded;			DRILLING COMPANY: _____
bedding orientation changes twice			DRILLING METHOD: _____
from horizontal to diagonal (45°);			SAMPLING METHOD: _____
much gypsum in cracks; no vugs	4.0	49.0	SAMPLES EXAMINED BY: _____
Run #6 (8/7/79) Solid cores; bedding			REFERENCE POINT: _____
changes evident, little gypsum	5.0	54.0	ELEVATION OF R. P.: _____
Run #7 (8/7/79) Solid dolomite	1.5	55.5	CASING: _____
Fracture zone with apparent odor and			SCREEN TYPE: _____
staining	.2	55.7	DIAM.: _____ SLOT NO. _____
			SETTING: _____
Solid dolomite.	2.5	58.2	PUMPING TEST DATE: _____
Fracture		58.2	DURATION: _____
			STATIC WATER LEVEL: _____
Solid dolomite	.8	59.0	PUMPING WATER LEVEL: _____
Discharge contains black liquid with			YIELD: _____
odor		59.0	REMARKS: _____
Run #8 (8/8/79) Solid dolomite with			* Switched to water no return of fluid
one moist seam	1.3	60.3	
Thin cracks in this zone	.5	60.8	
Solid dolomite	1.2	62.0	
(continued)			

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WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

55 WEST STATE STREET

WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
Augered through to 5 ft. without sampling to avoid obstructions.			LOCATION: <u>53rd St. near Shore Shaft</u>
Fill, coarse, dry	5.0	5.0	WELL NO.: <u>Shore Shaft Pilot # 1</u>
Fill, composed of silt, brown, clayey; stones; gravel; cement blocks; dry	3.0	8.0	DATE COMPLETED: <u>May 16, 1979</u>
Fill, composed of silt, brown, clay- ey; stones; gravel; wet; faint odor	4.5	12.5	DRILLING COMPANY: <u>Rochester Drilling c</u>
Fill, composed of gravel; stones; sand, fine to coarse; silt; black wet, stronger chemical odor	4.5	17.0	DRILLING METHOD: <u>Tricone with air</u>
Fill, composed of sand; fine; silt; gravel; stones; wet; black, diesel fuel odor	1.5	18.5	SAMPLING Cores METHOD: _____
Fill of stones; gravel; sand, fine to coarse; silt; black, wet, diesel fuel and chemical odor	1.5	20.0	SAMPLES: EXAMINED BY: <u>Robert Lamonica & G. S. Sikora</u>
Sand, very fine; silt; brown, wet, no odor	1.5	21.5	REFERENCE POINT: <u>grade</u>
Sand, very fine; silt; brown; wet, chemical odor	3.0	24.5	ELEVATION OF R. P.: _____
Sand, very fine to fine; silt; shell fragments; few stones, rounded; brown, wet, odor	1.5	26.0	CASING: <u>44.5 feet of 4-inch</u>
(Continued)			SCREEN- TYPE: <u>none</u>
			DIAM.: _____ SLOT NO. _____
			SETTING: _____
			PUMPING TEST: DATE: _____
			DURATION: _____
			STATIC WATER LEVEL: <u>9.82 feet below April 19, 1979 . . . L.S.D</u>
			PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: Hooker Chemicals & Plastics Corp. Niagara Falls Plant
Sand, fine to medium, gray, wet, no odor	1.5	27.5	LOCATION: 53rd st. near shore shaft
Sand, very fine; silt; wet, no odor	1.0	28.5	WELL No. Shore Shaft Pilot HC (continued)
Till, composed of clay; silt; sand, fine; stones; gravel; very hard, red	2.0	30.5	DATE COMPLETED:
Till, composed of clay; silt; sand, fine; stones; gravel; very hard, red	1.0	31.5	DRILLING COMPANY:
Dolomite, vuggy, dark gray; little secondary mineralization in fractures; white(probably gypsum)	1.7	33.2	DRILLING METHOD:
Dolomite, dark gray; little second- ary mineralization in fractures, white, (probably gypsum)	5.0	38.2	SAMPLING METHOD:
Dolomite, highly fractured, vuggy, dary gray; little secondary min- eralization, white	2.1	40.3	SAMPLES EXAMINED BY:
Dolomite, dary gray; much secondary mineralization in fractures, white	1.7	42.0	REFERENCE POINT:
Dolomite, dark gray; some secondary mineralization in fractures, white	1.7	43.7	ELEVATION OF R. P.:
Dolomite, numerous bedding plane (continued)			CASING:
			SCREEN- TYPE:
			DIAM.: SLOT NO.
			SETTING:
			PUMPING TEST- DATE:
			DURATION:
			STATIC WATER LEVEL:
			PUMPING WATER LEVEL:
			YIELD:
			REMARKS:

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.
CONSULTING GROUND-WATER GEOLOGISTS
55 WEST STATE STREET
WESTPORT, CONNECTICUT

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DESCRIPTION	THICK- NESS (FEET)	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Falls Plant</u>
fractures, dark gray; little			LOCATION: <u>53rd St. near Shore</u>
secondary mineralization, white	0.3	44.0	shaft WELL No <u>Shore shaft pilot hole</u>
Airlift yield on April 18 was 115			(continued)
gpm (bottom of 7 3/4-inch open			DATE COMPLETED: _____
hole) 44.5 feet of 4-inch casing			DRILLING COMPANY: _____
installed to 44 feet below grade			DRILLING METHOD: _____
and grouted to the surface. Drill-			SAMPLING METHOD: _____
ing below this depth was done by			SAMPLES: EXAMINED BY: _____
core barrel, reamed out with a			REFERENCE POINT: _____
tricone bit and air.			ELEVATION OF R. P.: _____
Dolomite, gray 3 weathered frac-			CASING: _____
tures, some very thin shale and			SCREEN- TYPE: _____
gypsum partings, vuggy, 2gpm			DIAM.: _____ SLOT NO. _____
1 quart sample taken	5.0	49.0	SETTING: _____
Dolomite, gray, massive; two wea-			PUMPING TEST: DATE: _____
thered fracture zones; sulfur-			DURATION: _____
our smell; static water level			STATIC WATER LEVEL: _____
4/25 AM, 10.3 feet below grade,			PUMPING WATER LEVEL: _____
approximately 20 gpm. took 1			YIELD: _____
quart sample	5.0	54.0	REMARKS: _____
Dolomite, gray, gypsum partings and			
nodules, vuggy; only fracture			
zone appears around 55 feet-55.5			
feet Approx. 40 gpm, took 1 quart			
sample (when reaming the well			
with the 4inch rock bit, the			
(continued)			

WESTPORT, CONNECTICUT

Year	Number of cases	Number of deaths	Number of cases per 100,000 population	Number of deaths per 100,000 population
1990	1,000	100	1.0	0.1
1991	1,100	110	1.1	0.11
1992	1,200	120	1.2	0.12
1993	1,300	130	1.3	0.13
1994	1,400	140	1.4	0.14
1995	1,500	150	1.5	0.15
1996	1,600	160	1.6	0.16
1997	1,700	170	1.7	0.17
1998	1,800	180	1.8	0.18
1999	1,900	190	1.9	0.19
2000	2,000	200	2.0	0.20
2001	2,100	210	2.1	0.21
2002	2,200	220	2.2	0.22
2003	2,300	230	2.3	0.23
2004	2,400	240	2.4	0.24
2005	2,500	250	2.5	0.25
2006	2,600	260	2.6	0.26
2007	2,700	270	2.7	0.27
2008	2,800	280	2.8	0.28
2009	2,900	290	2.9	0.29
2010	3,000	300	3.0	0.30
2011	3,100	310	3.1	0.31
2012	3,200	320	3.2	0.32
2013	3,300	330	3.3	0.33
2014	3,400	340	3.4	0.34
2015	3,500	350	3.5	0.35
2016	3,600	360	3.6	0.36
2017	3,700	370	3.7	0.37
2018	3,800	380	3.8	0.38
2019	3,900	390	3.9	0.39
2020	4,000	400	4.0	0.40

WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS
72 DANBURY ROAD
WILTON, CT. 06897

PAGE 1 OF 3 PAGES

DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: <u>Hooker Chemical and Plastics Corp. Niagara Plant</u>
Dolomite, light gray; rounded pieces; lost 4 ft plug, 13.5 feet to 17.5. this section marked #3 "Top"			LOCATION: <u>Niagara River</u>
Dolomite, light gray, 20 horizontal fractures; very small cavities	23 ¹ / ₂	20.5 ¹ / ₂	WELL NO. <u>River Boring A</u>
Dolomite, light gray; 3 horizontal fractures on weathered surfaces	27	21.80	DATE COMPLETED: <u>1949</u>
Dolomite, light gray; 16 horizontal fractures on weathered surfaces; thin bedded	43	23.25	DRILLING COMPANY: <u>Sprague & Henwood, Inc.</u>
Dolomite, light gray; 1 horizontal fracture on weathered surface; thin bedded	53	24.66	DRILLING METHOD: <u>Information not readily available</u>
Dolomite, light gray; 1 horizontal fracture	55	25.00	SAMPLING METHOD: <u>2/</u>
Dolomite, light gray; 3 horizontal fractures	61	26.00	SAMPLES EXAMINED BY: <u>J. Naso</u>
Dolomite, light; 26 horizontal frac- tures; thin bedded	87	29.17	REFERENCE POINT: <u>River Bottom (1949)</u>
Dolomite, light gray; 1 horizontal fracture; thin bedded; on bedding planes	89	29.50	ELEVATION OF R. P.: <u>551.4</u>
Dolomite, light gray; 5 horizontal fractures, thin bedded	95	30.42	CASING: <u>2/</u>
Dolomite, light gray; 15 horizontal fractures; thin bedded	111	32.66	SCREEN TYPE: <u>2/</u>
			DIAM.: <u>2/</u> SLOT NO. <u>2/</u>
			SETTING: <u>2/</u>
			PUMPING TEST DATE: <u>2/</u>
			DURATION: <u>2/</u>
			STATIC WATER LEVEL: <u>2/</u>
			PUMPING WATER LEVEL: <u>2/</u>
			YIELD: <u>2/</u>
			REMARKS:
			1/ 23= Core section number 20.5= Depth of sample
			2/ Possibly found in engi- neering report by Greely & Hansen, Inc. for City of Niagara Falls, New York

WELL LOG

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CONSULTING GROUND-WATER GEOLOGISTS

72 DANBURY ROAD
WILTON, CT. 06897

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DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Plant</u>
Dolomite, light gray; 1 horizontal			LOCATION: <u>Niagara River</u>
fractures; thin bedded	113	33.08	WELL NO.: <u>River Boring A (contd)</u>
Dolomite, light gray; 11 horizontal			DATE COMPLETED: _____
fractures; thin bedded	125	34.48	DRILLING COMPANY: _____
Dolomite, light gray; 1 horizontal			DRILLING METHOD: _____
fracture, thin bedded	127	34.83	SAMPLING METHOD: _____
Dolomite, light gray; no fractures,			SAMPLES: EXAMINED BY: _____
thin bedded	128	35.17	REFERENCE POINT: _____
Dolomite, light gray; 2 horizontal			ELEVATION OF R. P.: _____
fractures; thin bedded	131	35.75	CASING: _____
Dolomite, light gray; 15 horizontal			SCREEN- TYPE: _____
fractures; thin bedded	147	37.50	DIAM.: _____ SLOT NO. _____
marked as limestone; lost.	149	?	SETTING: _____
Dolomite, light gray; 2 horizontal			PUMPING TEST: DATE: _____
fractures; thin bedded	152	38.48	DURATION: _____
Dolomite, light gray; 3 fractures			STATIC WATER LEVEL: _____
at $\pm 45^{\circ}$ from horizontal, no connec-			PUMPING WATER LEVEL: _____
tion	155	38.83	YIELD: _____
Dolomite, light gray; 3 horizontal			REMARKS:
fractures	160	39.66	
Dolomite, light gray; 7 horizontal			
fractures	169	40.83	
Dolomite, light gray; 17 horizontal			
fractures	188	43.48	
Dolomite, light gray; 1 horizontal			
fracture	192	46.58	

(continued)

WELL LOG

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DESCRIPTION	Section	DEPTH (FEET)	OWNER: Hooker Chemical and Plastics Corp. Niagara Plant
Dolomite, light gray; 2 horizontal fractures	195	48.00	LOCATION: Niagara River
Dolomite, light gray; 1 horizontal fracture	197	50.75	WELL No.: River Boring A (contd.)
Dolomite, light gray; 1 horizontal fracture	198	51.00	DATE COMPLETED:
Dolomite, light gray; no fracture	200	51.66	DRILLING COMPANY:
Dolomite, light gray; no fracture	202	53.25	DRILLING METHOD:
Dolomite, light gray; 3 horizontal fractures	203	53.75	SAMPLING METHOD:
Limestone, lost	209	54.92	SAMPLES EXAMINED BY:
Dolomite, light gray; 1 horizontal fracture, vuggy	211	55.25	REFERENCE POINT:
Dolomite, light gray; 1 horizontal fracture, shale crenulation	212	55.66	ELEVATION OF R. P.:
Dolomite, light gray; no fracture	214	56.25	CASING:
Dolomite, light gray; 1 horizontal fracture	216	56.83	SCREEN TYPE:
Dolomite, light gray; no fracture	217	58.00	DIAM. SLOT NO.
Dolomite, light gray; no fracture	218	59.5	SETTING:
Dolomite, light gray; no fracture; vuggy	219	59.75	PUMPING TEST DATE:
Dolomite, light gray; 1 horizontal fracture	221	60.58	DURATION:
Dolomite, light gray; no fracture	222	60.83	STATIC WATER LEVEL:
Dolomite, light gray; no fracture	223	62.92	PUMPING WATER LEVEL:
			YIELD:
			REMARKS:

WELL LOG

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DESCRIPTION	Section	DEPTH (FEET) <u>1/</u>	OWNER: <u>Hooker Chemical and Plastic Corp.</u> <u>Niagara Falls Plant</u>
Dolomite, light gray; 12 horizontal fractures	13	12.5	LOCATION: <u>Niagara River</u>
Dolomite, light gray; 3 horizontal fractures	19	13.0	WELL NO.: <u>River Boring B</u>
Dolomite, light gray; 6 horizontal fractures	30	14.5	DATE COMPLETED: <u>1949</u>
Dolomite, light gray; 3 horizontal fractures	34	15.0	DRILLING COMPANY: <u>Sprague & Henwood, Inc</u> Information not readily available
Limestone, white; 48 horizontal fractures	87	20.83	DRILLING METHOD: <u>available</u>
Dolomite, light gray; 10 horizontal fractures	101	22.33	SAMPLING METHOD: <u>2/</u>
Dolomite, light gray; gypsum layer; 3 horizontal fractures	104	22.83	SAMPLES EXAMINED BY: <u>J. Naso</u>
Dolomite, light gray; gypsum layer; 3 horizontal fractures	114	24.25	REFERENCE POINT: <u>River bottom (1949)</u>
Dolomite, light gray; shale partings; 10 horizontal fractures	130	26.83	ELEVATION OF R. P.: <u>549.0</u>
Dolomite, light gray; shale partings, 1 horizontal fracture	131	27.25	CASING: <u>2/</u>
Dolomite, light gray; shale partings, 1 horizontal fracture	133	27.66	SCREEN TYPE: <u>2/</u>
Dolomite, light gray; gypsum present; 12 horizontal fractures	146	28.83	DIAM.: <u>2/</u> SLOT NO. <u>2/</u>
Dolomite, light gray; gypsum present, 6 horizontal fractures	152	29.75	SETTING: <u>2/</u>
(continued)			PUMPING TEST DATE: <u>2/</u>
			DURATION: <u>2/</u>
			STATIC WATER LEVEL: <u>2/</u>
			PUMPING WATER LEVEL: <u>2/</u>
			YIELD: <u>2/</u>
			REMARKS: <u>1/ 19 = Core section number</u> <u>13.0 = Depth of sample</u> <u>2/ Possibly found in engineering report by Greely & Hansen, Inc. for City of Niagara Falls, NY</u>

WELL LOG

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DESCRIPTION	Section	DEPTH (FEET)	OWNER
			Hooker Chemicals and Plastics Corp. Niagara Plant
Dolomite, light gray; gypsum present; 3 horizontal fractures	156	30.50	LOCATION: Niagara River
Dolomite, light gray; gypsum present; 2 horizontal fractures	158	31.00	WELL NO.: River boring B (cont'l.)
Dolomite, light gray; gypsum present; 1 horizontal fracture	160	31.50	DATE COMPLETED: 1949
Dolomite, light gray; gypsum present; 1 horizontal fracture	163	31.66	DRILLING COMPANY:
Dolomite, light gray; gypsum present; 2 horizontal fractures	166	32.5	DRILLING METHOD:
Dolomite, light gray; gypsum present; 1 horizontal fracture	168	33.0	SAMPLING METHOD:
Dolomite, light gray; gypsum present; 14 horizontal fractures	183	35.0	SAMPLES EXAMINED BY:
Dolomite, light gray; gypsum present; 6 horizontal fractures	189	35.83	REFERENCE POINT:
Dolomite, light gray; gypsum present; 1 horizontal fracture	192	36.66	ELEVATION OF R. P.:
Dolomite, light gray; gypsum present; no fractures	193	37.00	CASING:
Dolomite, light gray; gypsum present; 1 horizontal fracture	196	37.83	SCREEN TYPE:
Dolomite, light gray; gypsum present; no horizontal fractures	197	38.50	DIAM.: SLOT NO.:
Dolomite, light gray; limestone present; no fractures	198	38.66	SETTING:
			PUMPING TEST: DATE:
			DURATION:
			STATIC WATER LEVEL:
			PUMPING WATER LEVEL:
			YIELD:
			REMARKS:

WELL LOG

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DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Plant</u>
Dolomite, light gray; no fractures	199	39.0	LOCATION: <u>Niagara River</u>
Dolomite, light gray; gypsum present; 1 horizontal fracture	201	39.66	WELL NO.: <u>River Boring B (cont</u>
Dolomite, light gray; no fractures	202	40.1	DATE COMPLETED: _____
Dolomite, light gray; 5 horizontal fractures	205	41.0	DRILLING COMPANY: _____
Dolomite, light gray; 1 horizontal fracture	206	41.33	DRILLING METHOD: _____
Dolomite, light gray; 1 horizontal fracture	210	42.66	SAMPLING METHOD: _____
Dolomite, light gray; 1 horizontal fracture	211	47.5	SAMPLES EXAMINED BY: _____
Dolomite, light gray; fossil fragments 1 horizontal fracture	214	48.33- 50.00	REFERENCE POINT: _____
Dolomite, light gray; 1 horizontal fracture	216	50.33- 51.37	ELEVATION OF R. P.: _____
Dolomite, light gray; 1 horizontal fracture	217	51.5	CASING: _____
Dolomite, light gray; no fractures	221	52.66	SCREEN TYPE: _____
Dolomite, light gray; no fractures	222	53.33	DIAM.: _____ SLOT NO. _____
Dolomite, light gray; no fractures	223	53.83	SETTING: _____
Dolomite, light gray; no fractures	224	54.00	PUMPING TEST DATE: _____
Dolomite, light gray; no fractures	226	54.5- 56.33	DURATION: _____
Dolomite, light gray; 1 angular frac- ture $\pm 45^{\circ}$	227	56.33 57.33	STATIC WATER LEVEL: _____
Dolomite, light gray; no fractures	228	57.66	PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

72 DANBURY ROAD
WILTON, CT. 06897

DESCRIPTION

Section

DEPTH
F EET

OWNER: Hooker Chemicals and
Plastics Corp.
Niagara Plant

LOCATION: Niagara River

WELL No. River Boring B (contd

DATE COMPLETED: 1949

**DRILLING
COMPANY:**

DRILLING METHOD:

SAMPLING METHOD:

SAMPLES:
EXAMINED BY:

REFERENCE
POINT: _____

**ELEVATION
OF R. P. J.**

CASING:

SCREEN: _____
TYPE: _____

DIAM. _____ SLOT No _____

SETTING:

PUMPING TEST:
DATE: _____

DURATION:

**STATIC WATER
LEVEL**.....

**PUMPING WATER
LEVEL**.....

Yield:

REMARKS:

WELL LOG

LEGGETTE, BRASHEARS & GRAHAM, INC.

CONSULTING GROUND-WATER GEOLOGISTS

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WILTON, CT. 06897

PAGE 1 OF 3 PAGES

DESCRIPTION	Section	DEPTH (FEET) 1/	OWNER: Hooker Chemicals and Plastics Corp. Niagara Plant
Limestone, lost	1	27.83	LOCATION: Niagara River
Limestone, lost	8	28.66	WELL No.: River Boring C
Limestone, lost	37	31.17	DATE COMPLETED: 1949
Dolomite, light gray; 12 horizontal fractures	57	33.75	DRILLING COMPANY: Sprague & Henwood, Inc Information not readily available
Dolomite, light gray; 4 horizontal fractures	62	34.50	SAMPLING METHOD: 2/
Dolomite, light gray; gypsum present; 14 horizontal fractures	77	36.17	SAMPLES EXAMINED BY: J. Naso
Dolomite, light gray; 1 horizontal fracture	80	36.75	REFERENCE POINT: River Bottom (1949)
Lost	82	37.08	ELEVATION OF R. P.: 561.0
Dolomite, light gray; 5 horizontal fractures	136	43.00	CASING: 2/
Dolomite, light gray; 1/2 of core calcium carbonate; 1 horizontal fracture	137	43.17	SCREEN TYPE: 2/
Dolomite, light gray; 1/2 of core calcium carbonate; 5 horizontal fractures	142	44.0	DIAM.: 2/ SLOT No. 2/
Dolomite, light gray; 1 horizontal fracture	144	44.5	SETTING: 2/
Dolomite, light gray; 2 horizontal fractures	147	45.0	PUMPING TEST: 2/
Dolomite, light gray; 1 horizontal fracture	151	45.66	DATE: 2/
Dolomite, light gray; 14 horizontal fractures	172	48.0	DURATION: 2/
(continued)			STATIC WATER LEVEL: 2/
			PUMPING WATER LEVEL: 2/
			YIELD: 2/
			REMARKS: 1/ 23 = Core section number 33.75 = Depth of sample 2/ possibly found in engineering report by Greel & Hansen, Inc. for City of Niagara Falls, NY

WELL LOG

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WILTON, CT. 06897

PAGE 2 OF 3 PAGES

DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Plant</u>
Dolomite, light gray; 5 horizontal fractures	179	48.66	LOCATION: <u>Niagara River</u>
Dolomite, light gray; 6 horizontal fractures	185	49.33	WELL NO.: <u>River Boring C (cont)</u>
Dolomite, light gray; no horizontal fractures	186	49.66	DATE COMPLETED: _____
Dolomite, light gray; 13 horizontal fractures	202	51.25	DRILLING COMPANY: _____
Dolomite, light gray; 2 horizontal fractures	206	51.92	DRILLING METHOD: _____
Dolomite, light gray; 7 horizontal fractures	214	53.25	SAMPLING METHOD: _____
Dolomite, light gray; 2 horizontal fractures	216	53.75	SAMPLES EXAMINED BY: _____
Dolomite, light gray; no fractures	217	54.17	REFERENCE POINT: _____
Dolomite, light gray; 6 horizontal fractures	226	55.33	ELEVATION OF R. P.: _____
Dolomite, light gray; no fractures	227	55.66	CASING: _____
Dolomite, light gray; no fractures	228	56.58	SCREEN- TYPE: _____
Dolomite, light gray; 1 horizontal fracture	231	57.08	DIAM.: _____ SLOT NO. _____
Dolomite, light gray; no fracture	232	57.5	SETTING: _____
Dolomite, light gray; 3 horizontal fractures	237	58.33	PUMPING TEST: DATE: _____
Dolomite, light gray; no fractures	238	58.58	DURATION: _____
Dolomite, light gray; no fractures	239	59.0	STATIC WATER LEVEL: _____
			PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

(Continued)

WELL LOG

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WILTON, CT. 06897

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DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: Hooker Chemicals and Plastics Corp. Niagara Plant
Dolomite, light gray; 1 horizontal fracture	241	59.48	LOCATION: Niagara River
Dolomite, light gray; 2 horizontal fractures	244	60.17	WELL No. River Boring C (contd.) DATE COMPLETED: 1949
Dolomite, light gray; 1 horizontal fracture	247	60.83	DRILLING COMPANY: DRILLING METHOD:
Dolomite, light gray; no fractures	248	61.92	SAMPLING METHOD:
Dolomite, light gray; no fractures	249	62.66	SAMPLES EXAMINED BY:
Dolomite, light gray; no fractures	250	64.65	REFERENCE POINT:
Dolomite, light gray; no fractures	251	64.92	ELEVATION OF R. P.: CASING:
Dolomite, light gray; no fractures	252	65.17	SCREEN TYPE:
Dolomite, light gray; no fractures	253	65.50	DIAM. SLOT No.
Dolomite, light gray; no fractures	254	65.66	SETTING:
Dolomite, light gray; no fractures	255	66.00	PUMPING TEST DATE:
Dolomite, light gray; no fractures	256	66.33	DURATION:
Dolomite, light gray; no fractures	257	66.66	STATIC WATER LEVEL:
Dolomite, light gray; no fractures	258	67.50	PUMPING WATER LEVEL:
Dolomite, light gray; no fractures	259	67.66	YIELD:
Dolomite, light gray; no fractures	260	68.5	REMARKS:
Dolomite, light gray; limestone	262	68.75	
Dolomite, light gray; limestone	263	69.17	
Dolomite, light gray; limestone	265	69.58	
Dolomite, light gray; limestone	266	71.0	

WELL LOG

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DESCRIPTION	Section	DEPTH FEET	
Incomplete core data for sections 1, 5 and 12 to a depth of 12.25 (sec. 12)			OWNER: Hooker Chemicals and Plastics Corp. Niagara Plant
Dolomite, light gray; 4 horizontal fractures	18	12.83	LOCATION: Niagara River WELL No.: River Boring D DATE COMPLETED: 1949 DRILLING COMPANY: Sprague & Henwood, Inc. DRILLING METHOD: Information not read available SAMPLING METHOD: 2/ SAMPLE EXAMINED BY: J. Naso
Dolomite, light gray; 3 horizontal fractures	21	13.33	REFERENCE POINT: River Bottom (19 ELEVATION OF R. F.: 543.5 CASING: 2/ SCREEN TYPE: 2/ DIAM.: 2/ SLOT No. 2/ SETTING: 2/ PUMPING TEST: 2/ DATE: 2/ DURATION: 2/ STATIC WATER LEVEL: 2/ PUMPING WATER LEVEL: 2/ YIELD: 2/
Lost limestone section	22	13.58	
Dolomite, light gray; 2 horizontal fractures	26	14.17	
Dolomite, light gray; 4 horizontal fractures	29	14.75	
Dolomite, light gray; 2 horizontal fractures	32	15.25	
Dolomite, light gray; limestone; 16 horizontal fractures	49	17.58	
Dolomite, light gray; 2 horizontal fractures	53	18.33	
Dolomite, light gray; no fractures	54	18.66	
Lost limestone plug	55	19.00	
Dolomite, light gray; 2 horizontal fractures	58	19.33	REMARKS: 1/ 21 = Core section number 13.33 = Depth of sample
Dolomite, light gray; 2 horizontal fractures	61	19.83	2/ Possibly found in engineering report by Greely & Hansen, Inc. for City of Niagara Falls, NY
Dolomite, light gray; 12 horizontal fractures	74	21.66	
(continued)			

WELL LOG

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DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: <u>Hooker Chemicals and Plastics Corp. Niagara Plant</u>
Dolomite, light gray; 1 horizontal fracture	76	22.17	LOCATION: <u>Niagara River</u>
Dolomite, light gray; 2 horizontal fractures	79	22.75	WELL No.: <u>River Boring D (contd)</u> DATE COMPLETED: <u>1949</u>
Dolomite, light gray; no fractures	80	23.00	DRILLING COMPANY: _____
Dolomite, light gray; no fractures	81	23.25	DRILLING METHOD: _____
Dolomite, light gray; no fractures	82	23.58	SAMPLING METHOD: _____
Dolomite, light gray; 5 horizontal fractures, lost 1 inch limestone plug	90	25.00	SAMPLES EXAMINED BY: _____
Dolomite, light gray; 11 horizontal fractures	102	26.58	REFERENCE POINT: _____
Dolomite, light gray; 7 horizontal fractures	113	27.91	ELEVATION OF R. P.: _____
Dolomite, light gray; 1 angular fracture	116	28.5	CASING: _____
Dolomite, light gray; 3 horizontal fractures	123	29.5	SCREEN TYPE: _____
Dolomite, light gray; no fractures	124	29.75	DIAM.: _____ SLOT NO. _____
Dolomite, light gray; 3 horizontal fractures	128	30.58	SETTING: _____
Dolomite, light gray; 3 horizontal fractures	132	31.25	PUMPING TEST DATE: _____
Dolomite, light gray; 2 horizontal fractures	135	31.92	DURATION: _____
Dolomite, light gray; 2 horizontal			STATIC WATER LEVEL: _____
			PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

WELL LOG

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WILTON, CT. 06897

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DESCRIPTION	Sec- tion	DEPTH (FEET)	OWNER: <u>Hooker Chemical and Plastic Corp. Niagara Plant</u>
Dolomite, light gray; 10 horizontal fractures	154	34.42	LOCATION: <u>Niagara River</u>
Dolomite, light gray; 2 horizontal fractures	156	34.92	WELL NO.: <u>River Boring D (cont'd)</u>
Dolomite, light gray; 15 horizontal fractures	173	36.58	DATE COMPLETED: _____
Dolomite, light gray; no fractures	174	36.83	DRILLING COMPANY: _____
Dolomite, light gray; no fractures	175	37.00	DRILLING METHOD: _____
Dolomite, light gray; 1 horizontal fracture	177	37.58	SAMPLING METHOD: _____
Dolomite, light gray; no fractures	180	38.00	SAMPLES EXAMINED BY: _____
Dolomite, light gray; 1 horizontal fracture	183	38.5	REFERENCE POINT: _____
Dolomite, light gray; no fractures	184	39.0	ELEVATION OF R. F.: _____
Dolomite, light gray; no fractures	185	39.08	CASING: _____
Dolomite, light gray; no fractures	186	39.33	SCREEN TYPE: _____
Dolomite, light gray; 4 horizontal fractures	191	40.17	DIAM.: _____ SLOT NO. _____
Dolomite, light gray; 7 horizontal fractures	197	41.00	SETTING: _____
Dolomite, light gray; no fractures	198	41.50	PUMPING TEST DATE: _____
Dolomite, light gray; no fractures	199	41.75	DURATION: _____
Dolomite, light gray; 1 angular fracture	200	42.42	STATIC WATER LEVEL: _____
Dolomite, light gray; 3 horizontal fractures	204	43.25	PUMPING WATER LEVEL: _____
			YIELD: _____
			REMARKS: _____

72 DANBURY ROAD
WILTON, CT. 06897

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APPENDIX F

MINERALOGICAL ANALYSES

BY DAVID J. RUSSELL, Ph.D. - MARCH 10, 1980

Clay Mineralogy of Samples 79C01231 B-18 S-5 and 79C01231 B-13 S-15

Methods

The samples were disaggregated in deionised water using mechanical and ultrasonic agitation. The suspensions produced were subjected to centrifugal size separation, according to standard methods, to obtain the less than two micron fraction. It was found, however, that there was negligible amounts of clay in the sample 79C01231 B-13 S-15. For sample 79C01231 B-18 S-5 a portion of the suspension of clay particles was taken and sedimented on an unglazed porous tile by suction. This produces an oriented aggregate of clay platelets, enhancing the diagnostic x-ray diffraction reflections from basal spacings of the (00L) type. The clay tile was air dried and run on the x-ray diffraction machine (a Phillips PW1050 vertical goniometer with Phillips PW1011 generator) from $20^{\circ}2\theta$ to $30^{\circ}2\theta$. Further runs of $20^{\circ}2\theta$ to $15^{\circ}2\theta$ were made after saturating the clay with ethylene glycol to detect any expanding, montmorillonite-like minerals and heating to 350°C .

Sample B-13 S-15 consisted mainly of silt, sand and rock fragments. A sample was taken of the silt and sandy parts of the material and was smeared across a plate to obtain a randomly oriented specimen allowing detection of all mineral phases. This was air dried and run at very low ratemeter settings, to detect any clay minerals in the coarser fractions. It was then run at higher ratemeter settings to allow detection and clearer demonstration of the presence of non-clay minerals. The x-ray diffraction traces produced are attached.

Results

Sample B-13 S-15: As stated, negligible clay size particles were obtained from this sample. There were no clay minerals detectable in the coarser fractions (see chart A). No distinct peaks are observable; the broad hump of reflections is probably due to reflections from the mounting tile. The non-clay minerals present in the silt and sand fractions (chart B) are, in decreasing order of importance;

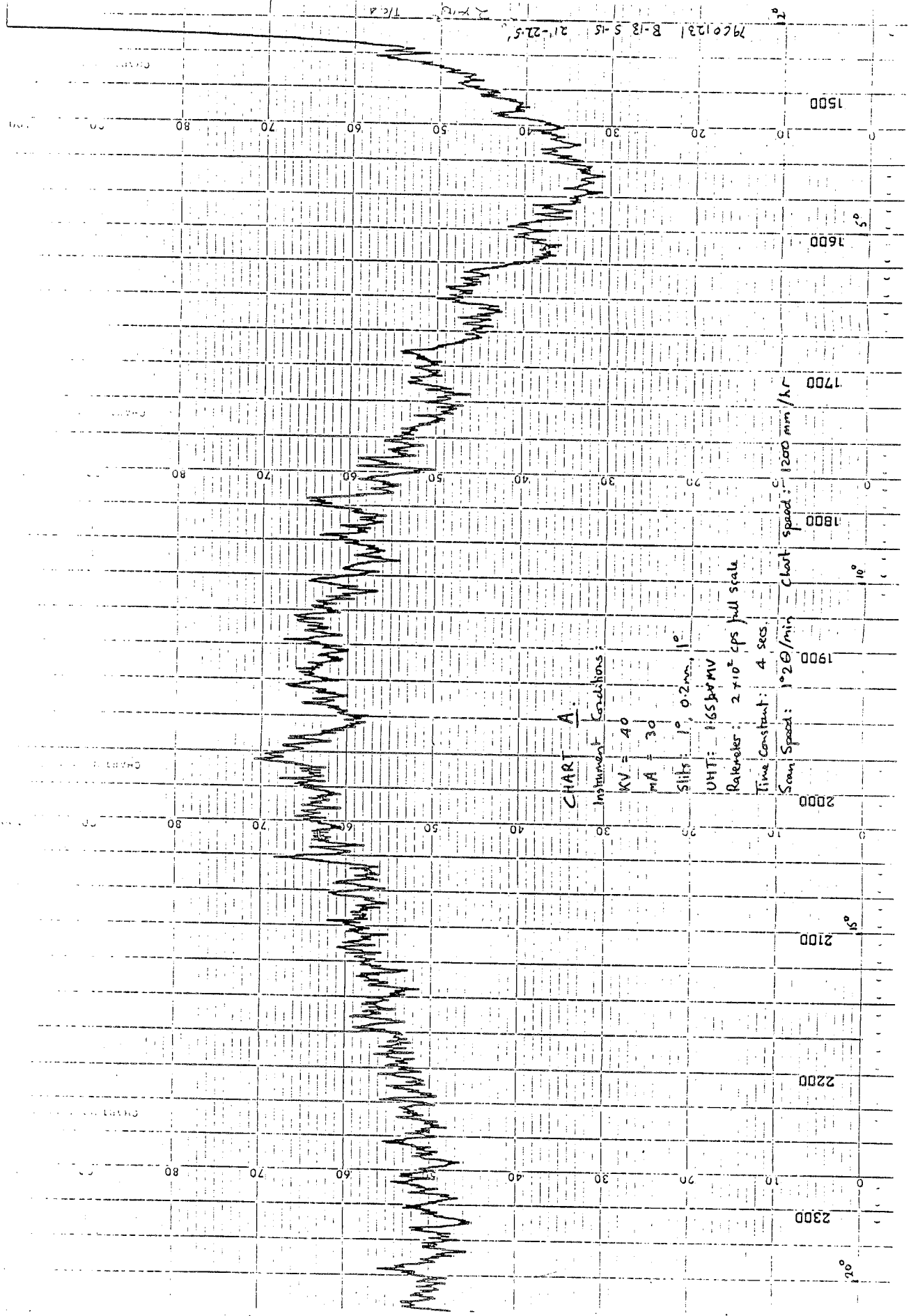


CHART A

Instrument Conditions:

KV = 40

mA = 30

Slits: 1°, 0.2mm, 1°

UHT: 1.65 kV MV

Rateometer: 2 x 10² cps full scale

Time Constant: 4 sec.

Scan Speed: 1°20'/min Chart Speed: 1200 mm/KV

1500 1600 1700 1800 1900 2000 2100 2200 2300

0° 5° 10°

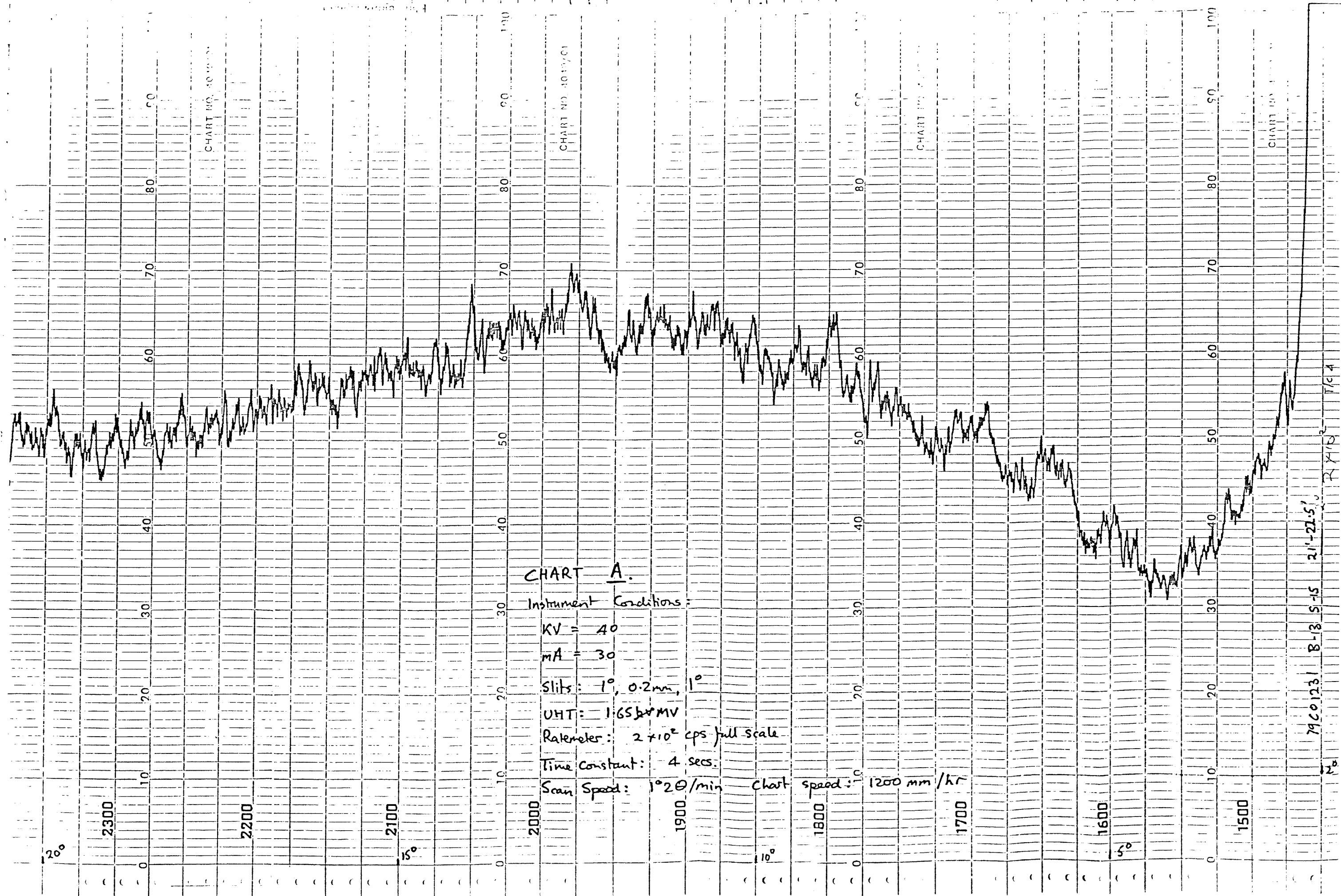


CHART A.

Instrument Conditions:

KV = 40

mA = 30

Slits: 1° , 0.2mm, 1°

UHT: 1.65 ~~2~~ MV

Rateometer: 2×10^2 cps full scale

Time Constant: 4 secs.

Scan Speed: $1^\circ 2\theta/\text{min}$ Chart speed: 1200 mm/hr

79001231 8-13 5-15 21'-21.5'

21'0" 21'4"

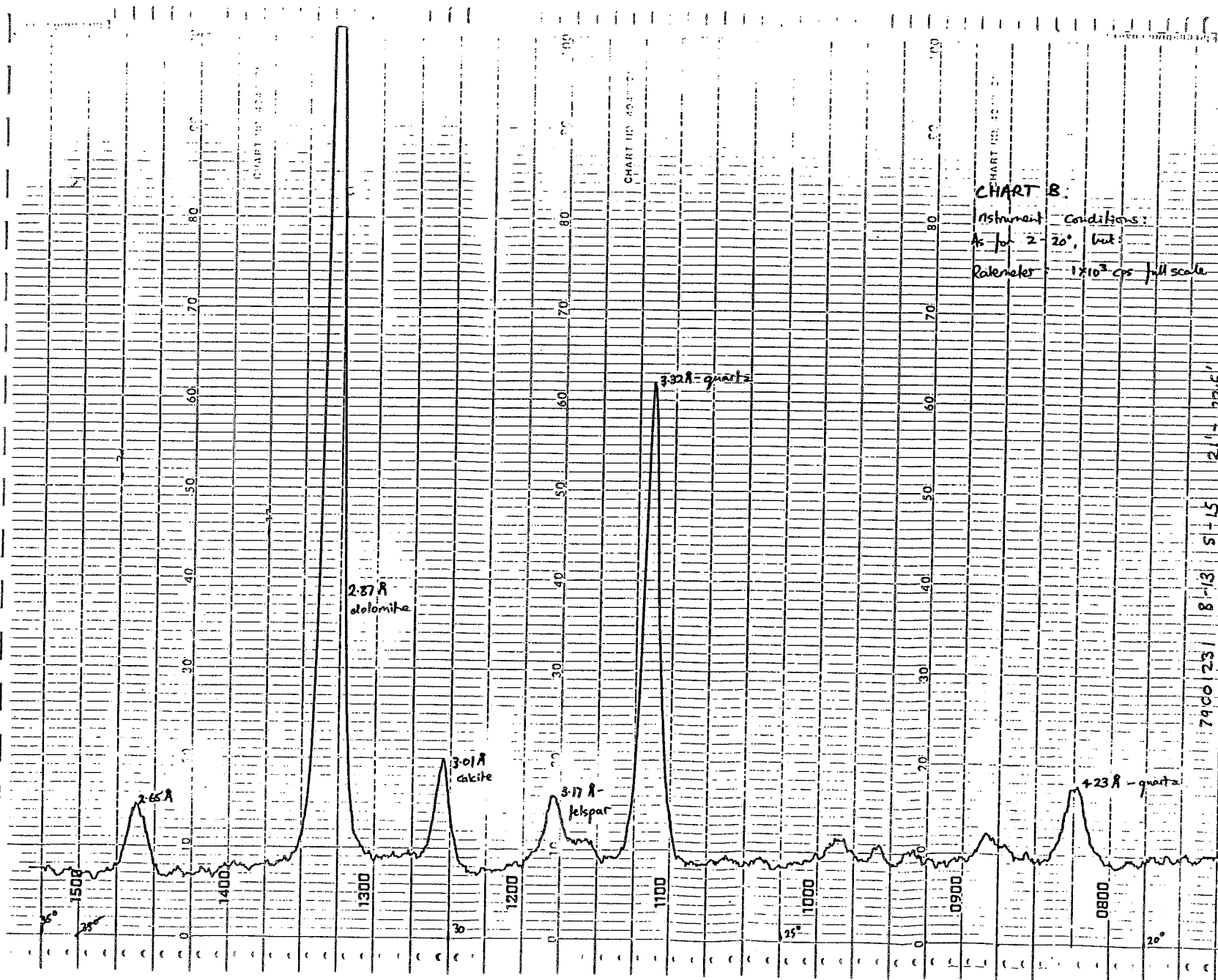
20

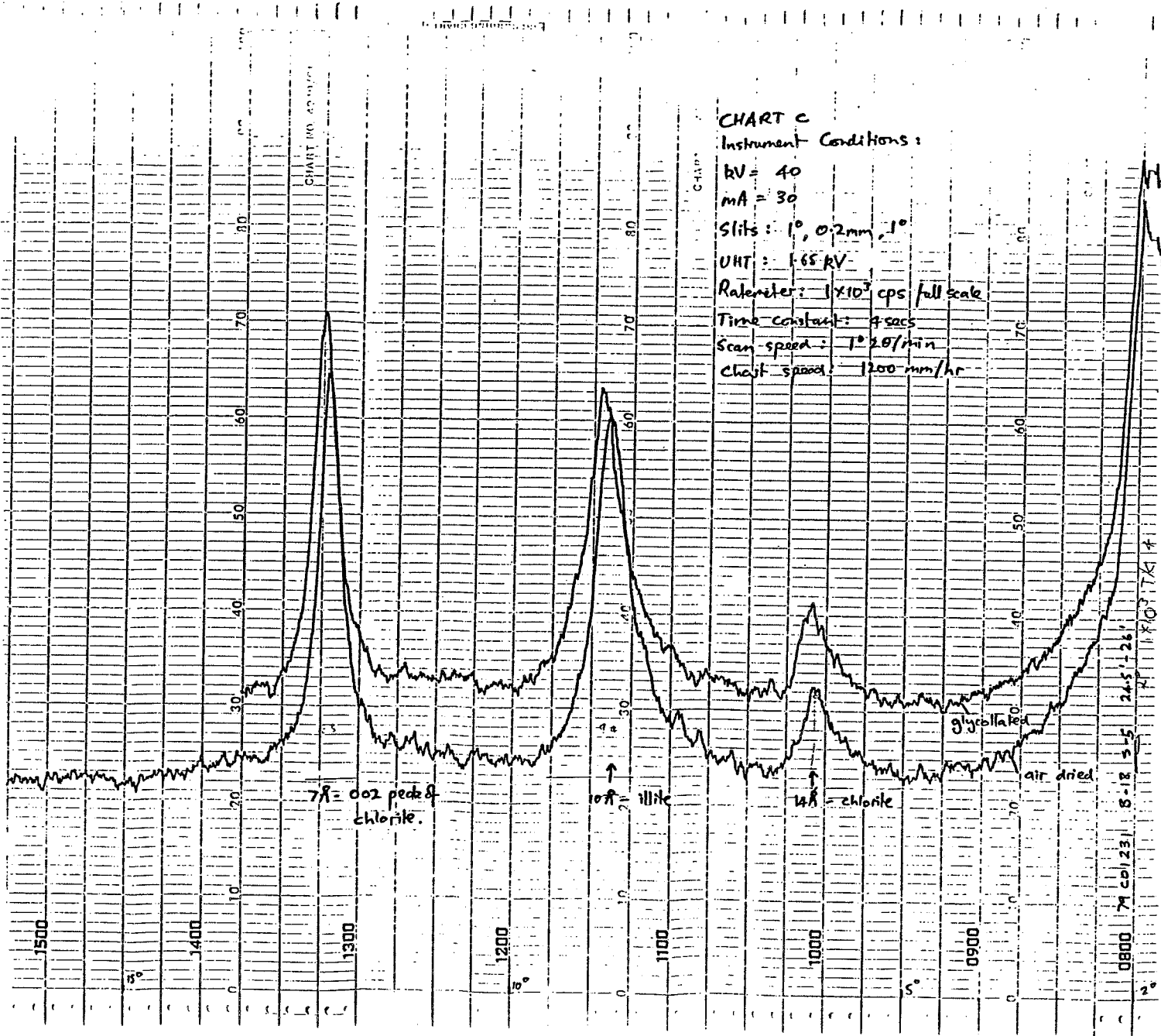
dolomite, quartz, calcite, feldspars.

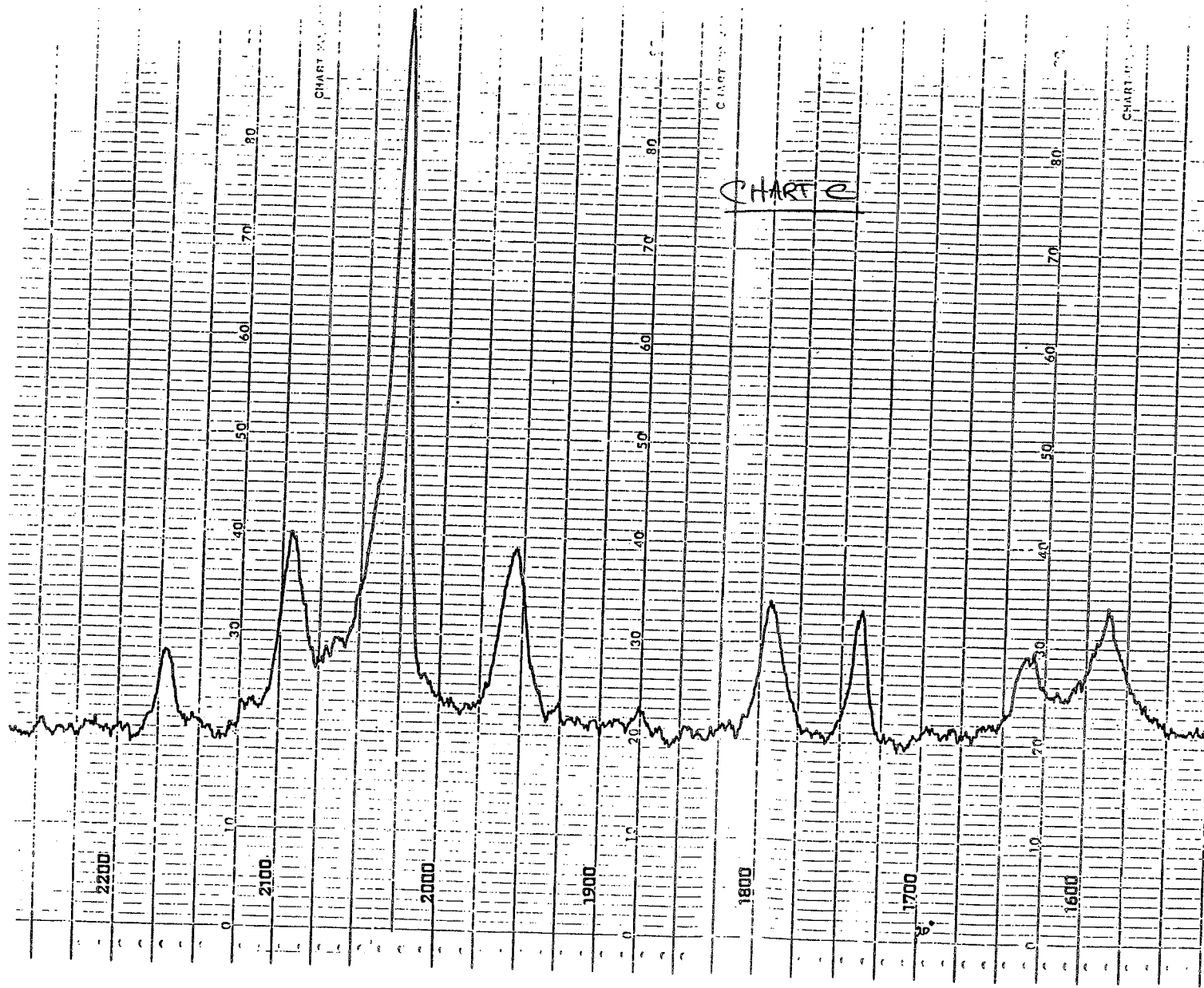
These are determined by reference to the A.S.T.M. powder index file.

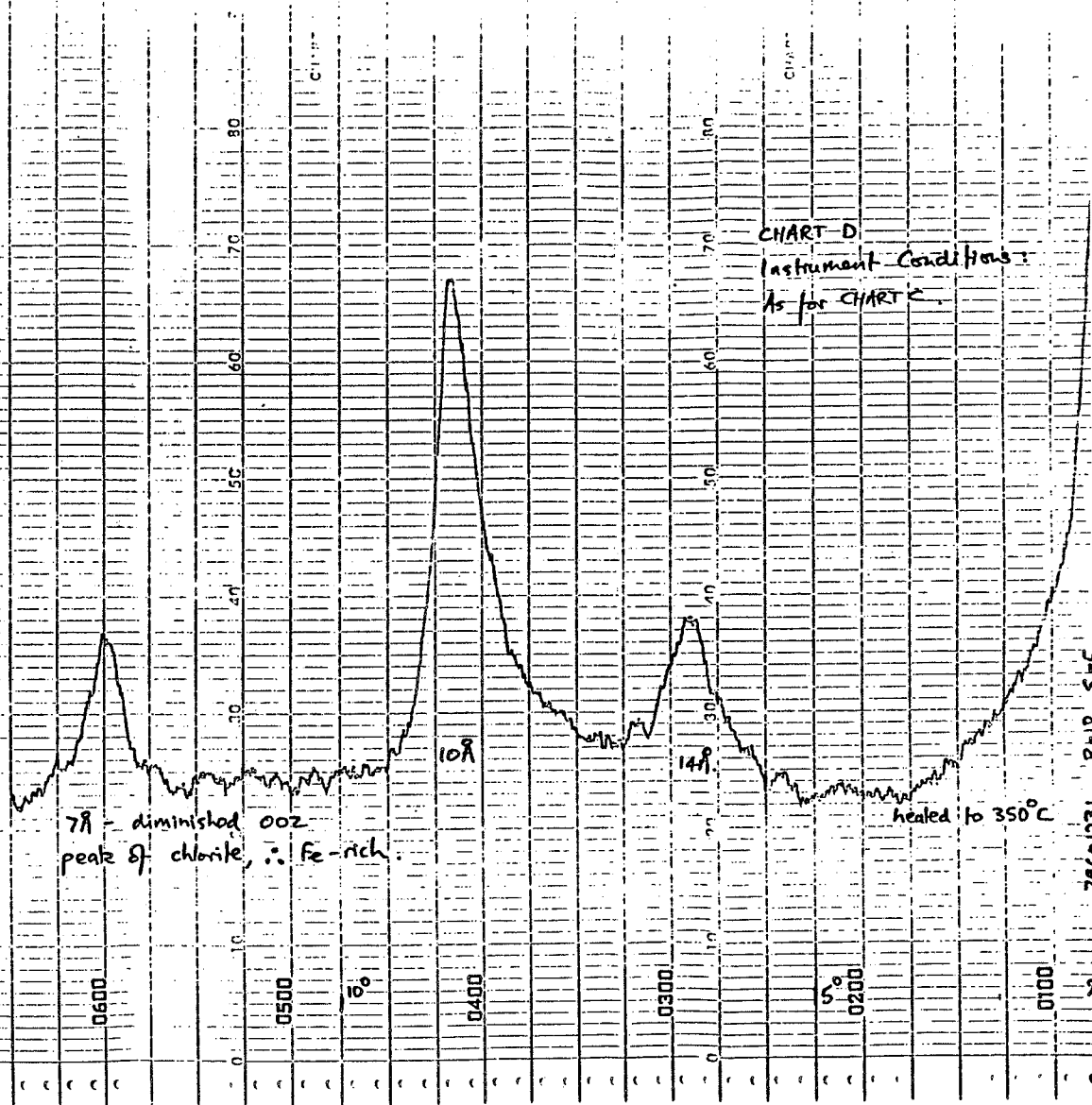
Note that exact quantification of the proportions of these minerals is not possible using x-ray diffraction.

Sample B-18 S-5: The clay mineralogy of this sample is fairly simple, being illite and chlorite. These are characterised by reflections of $10\text{\AA}$ and $14\text{\AA}$ respectively (chart C). Neither of these minerals react to glycolation, demonstrating their non-expansive nature. Upon heating to 350°C ., the 002 peak of chlorite at $7\text{\AA}$ decreases in intensity. This is indicative of iron-rich chlorite. However, since the $7\text{\AA}$ peak did not disappear entirely, the possibility of the existence of kaolinite in the sample cannot be ruled out, since it has its first order (i.e. 001) peak at that point. If present, it is a very minor constituent. Again, exact quantification of the clay mineralogy is not possible using the relatively simple x-ray techniques employed here. However, it is likely that, given the relative sizes of the peaks shown in chart C, there are approximately equal proportions of illite and chlorite in the clay fraction.









APPENDIX G

PUMPING TEST RESULTS FOR THE "S" AREA
TEST RECOVERY WELLS FROM PROGRESS REPORTS 5 & 6,
SHALLOW GROUNDWATER QUALITY INVESTIGATION
BY LEGGETTE, BRASHEARS & GRAHAM INC. - SEPTEMBER 1979

PROGRESS REPORT 5
SHALLOW GROUND-WATER
QUALITY INVESTIGATION
HOOKER CHEMICALS
AND PLASTICS CORPORATION
NIAGARA FALLS, NEW YORK PLANT

Prepared for
Whiteman, Osterman and Hanna
September 1979

Leggette, Brashears & Graham, Inc.
Consulting Ground-Water Geologists
55 West State Street
Westport, CT 06880

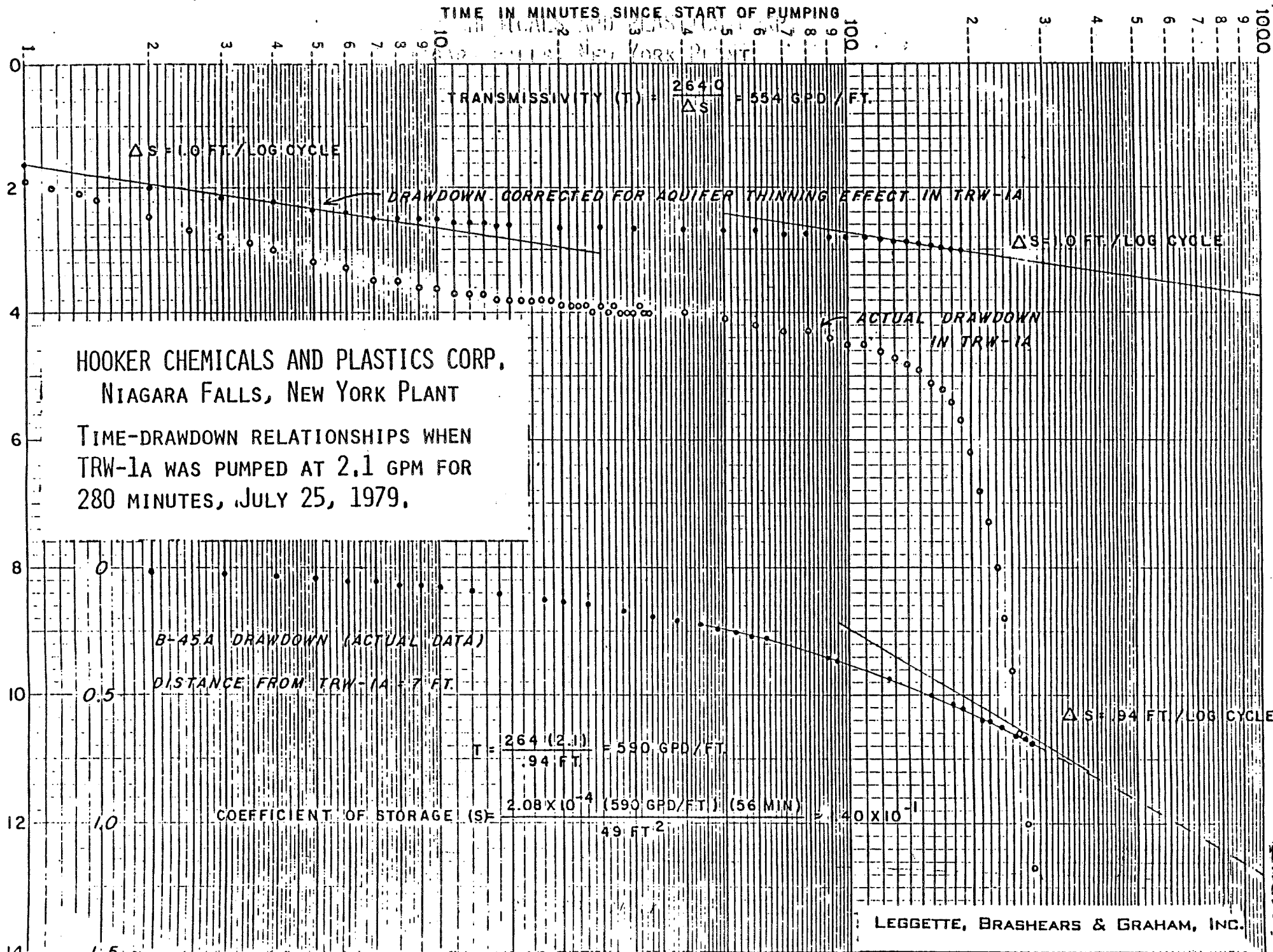
In a pumping test run under water-table conditions, sediments are dewatered and the thickness of the saturated materials decreases, which in turn causes greater drawdown than would occur under fully saturated conditions. Figure 3 shows the actual field data for drawdown in TRW-1a and the data which have been corrected to compensate for the aquifer thinning effect (upper curve). The lower curve is the actual drawdown in well B-45a, which was the only observation well exhibiting measurable drawdown. It was not necessary to correct these data for aquifer thinning because of the relatively small actual drawdown. The transmissivity as computed from the upper curve is 554 gallons per day per foot (gpd/ft) and 590 gpd/ft for wells TRW-1a and B-45a respectively. The coefficient of storage, which can be computed with confidence only with data from an observation well, is 1.40×10^{-1} , a dimensionless coefficient. In this setting coefficient of storage may be equated with specific yield.

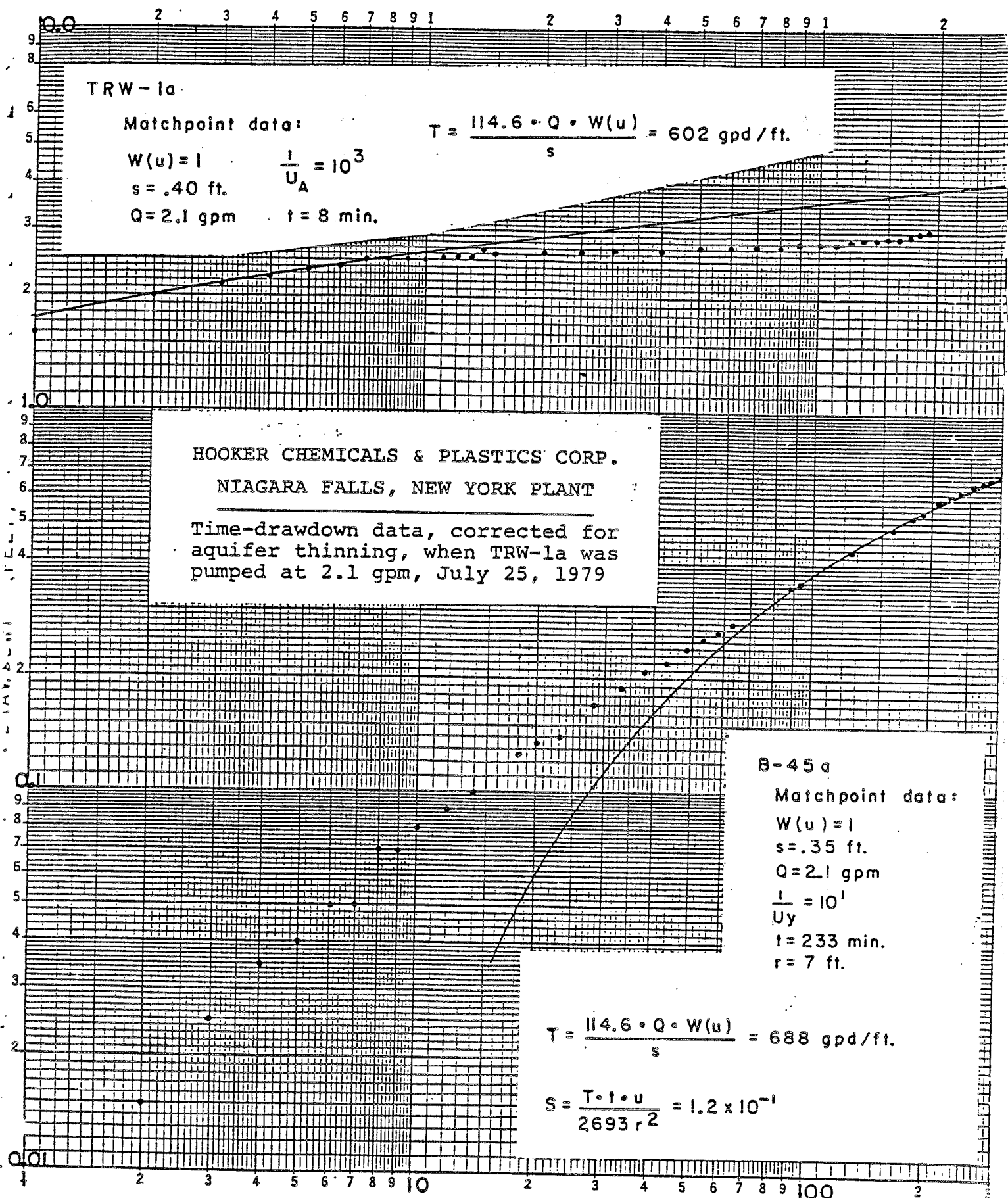
Figure 4 is a graph of the drawdown versus time, both plotted logarithmically. This method of aquifer analysis employs the use of a type curve, and was used to verify the semi-logarithmic approach.

The following table summarizes the results for the different methods employed:

Method	Well #	Transmissivity (gpd/ft)	Coefficient of storage (Dimensionless)
Time-drawdown (semi-log)	TRW-1a	554	
	B-45a	590	1.40×10^{-1}
Time-drawdown (log-log)	TRW-1a	602	
	B-45a	688	1.20×10^{-1}
Average		609 gpd/ft	1.30×10^{-1}
Permeability = $\frac{\text{Transmissivity}}{\text{Saturated thickness}} = 100 \text{ gpd/ft}^2$			

TIME IN MINUTES SINCE START OF PUMPING





TIME IN MINUTES SINCE START OF PUMPING

PROGRESS REPORT 6
SHALLOW GROUND-WATER
QUALITY INVESTIGATION
HOOKER CHEMICALS AND PLASTICS
CORPORATION
NIAGARA FALLS, NEW YORK PLANT

Prepared for
Whiteman, Osterman & Hanna
November 1979

Leggette, Brashears & Graham, Inc.
Consulting Ground Water Geologists
72 Danbury Road
Wilton, CT 06897

Test Results

It is readily apparent from the hydrographs that water-level drawdown in the bedrock aquifer, as the result of pumping at TRW-1, occurred for less than the first 12 hours of the pumping test. Thereafter, ground-water levels stabilized and showed only the response to river fluctuations as had been the case prior to the test. The stabilized drawdowns at individual monitor wells are plotted against their distances from the pumping well to illustrate the drawdown-distance relationship for the aquifer. This is shown on figure 14. To use this graph, a distance from the source of pumping, at which the drawdown is desired, is selected along the logarithmic scale. Move vertically downward until the distance line intersects the drawdown-distance curve. Then move horizontally to the arithmetic scale to read the amount of drawdown.

As can be seen by the scatter of data points, the curve is an average but is computed by regression analysis. For this analysis data points for B-17 and B-19 are eliminated because they appear to be anomalous. The graph can be used only for stabilized drawdown when pumping at the source is at a rate of 105 gpm.

Test Analysis

Graphs showing drawdown with time since the start of pumping are presented in figures 15-20. Data points for these curves are calculated by superposing normal river water-level responses at individual wells over the actual fluctuations measured during the test. The data are necessarily rough because of the approximations used to represent what would have been normal ground-water response to river-level variations. In addition, drawdown due to pumping at TRW-1 was on the same order of magnitude as the amplitude of the sinesoidal curve of river fluctuation. The aquifer parameters calculated from the time-drawdown curves and from the drawdown-distance curve are as follows:

<u>Well</u>	<u>Transmissivity (gallons/day/ft)</u>	<u>Storage Coefficient (Dimensionless)</u>
B-17	19,700	9.5×10^{-3}
B-18	19,100	3.9×10^{-3}
CW-9	15,500	8.5×10^{-4}
SS-2	34,200	8.6×10^{-3}
CW-1	31,000	1.9×10^{-4}
CW-5	42,000	1.6×10^{-3}
SS-1	22,300	1.9×10^{-4}
B-16	27,900	2.4×10^{-4}
<u>CW-13</u>	<u>21,800</u>	<u>2.7×10^{-4}</u>
Average	30,900	2.8×10^{-3}
Drawdown-distance	32,400	1.1×10^{-3}

It is apparent that there is generally good agreement between the average of the time-drawdown values and the distance draw-down values.

The drawdown-distance relationship can be used to design the well spacing in a barrier well system.

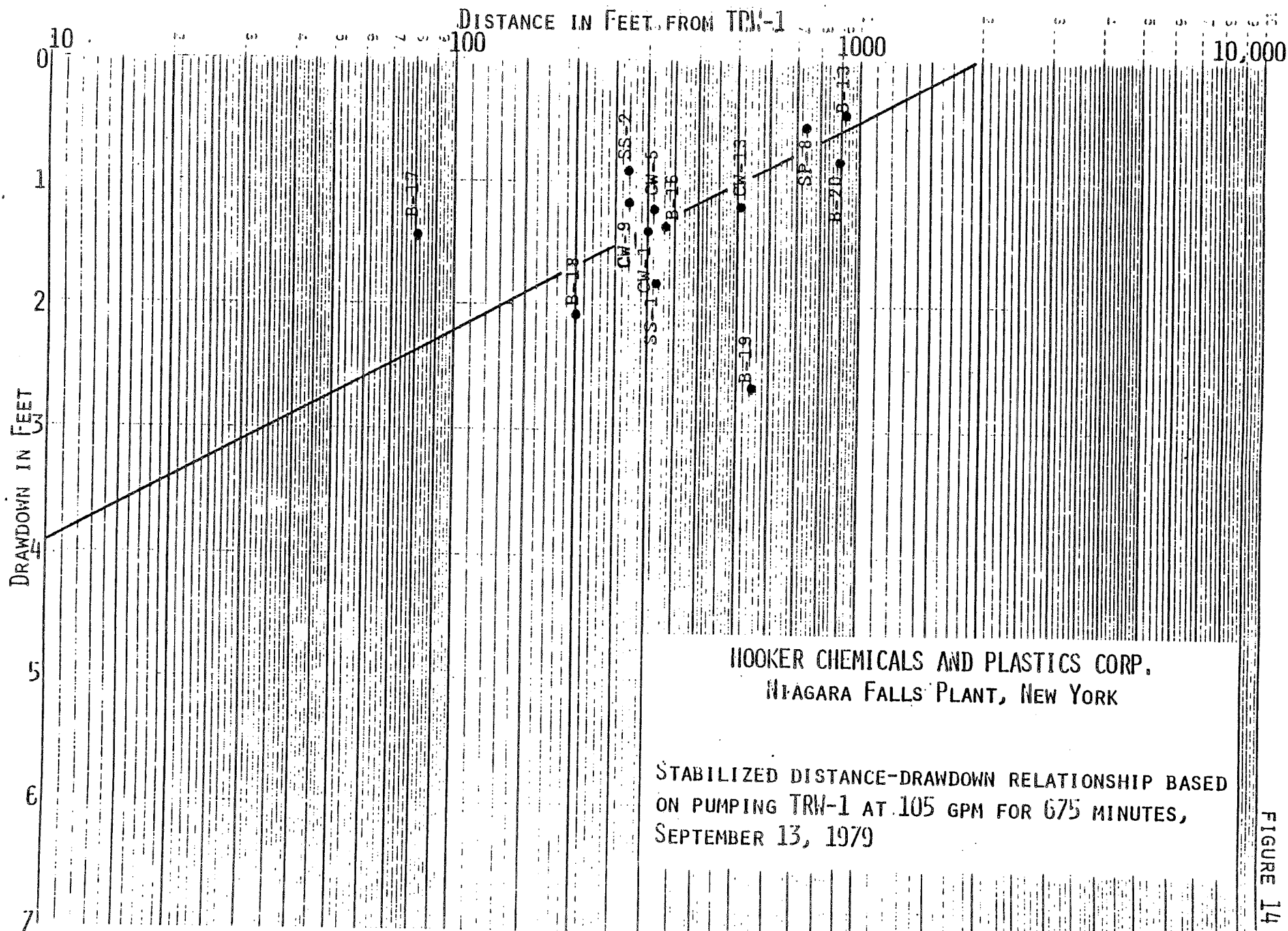


FIGURE 14

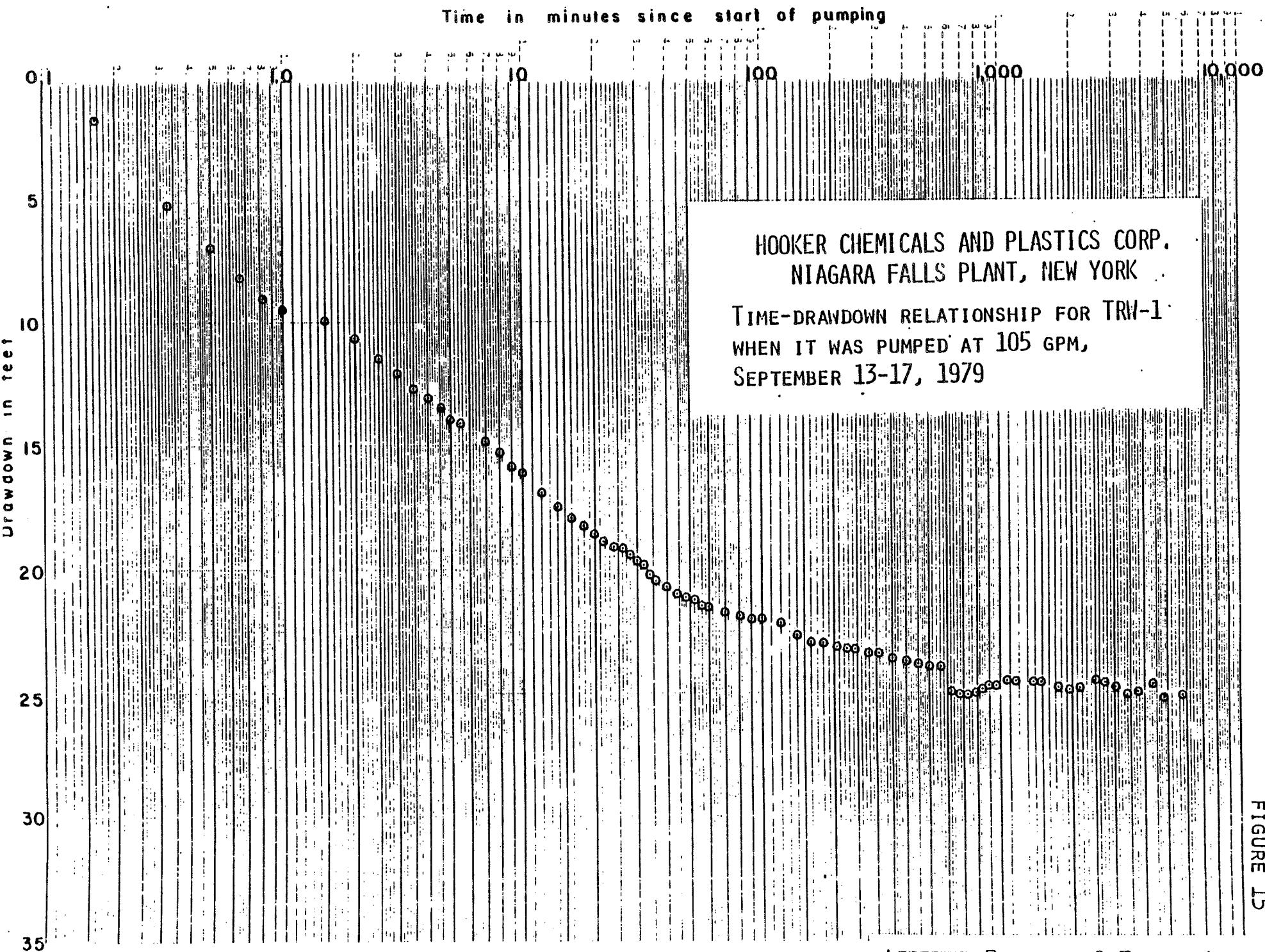
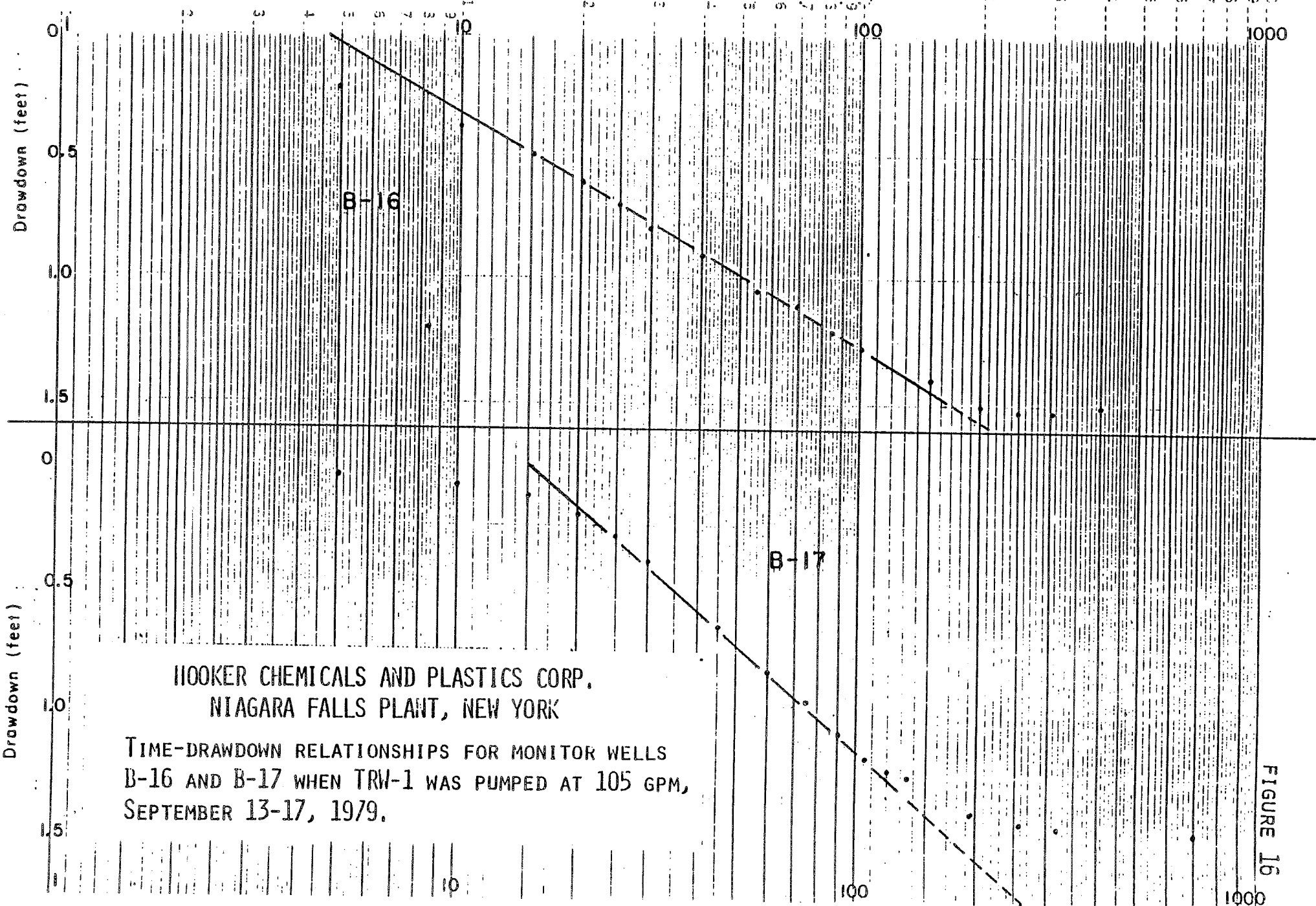


FIGURE 15

Time since start of pumping (minutes)

5492



HOOVER CHEMICALS AND PLASTICS CORP.
NIAGARA FALLS PLANT, NEW YORK

TIME-DRAWDOWN RELATIONSHIPS FOR MONITOR WELLS
B-16 AND B-17 WHEN TRW-1 WAS PUMPED AT 105 GPM,
SEPTEMBER 13-17, 1979.

FIGURE 16

Time since start of pumping (minutes)

LEGGETTE, BRASHEARS & GRAHAM, INC.

Time since start of pumping (minutes) 6 5492

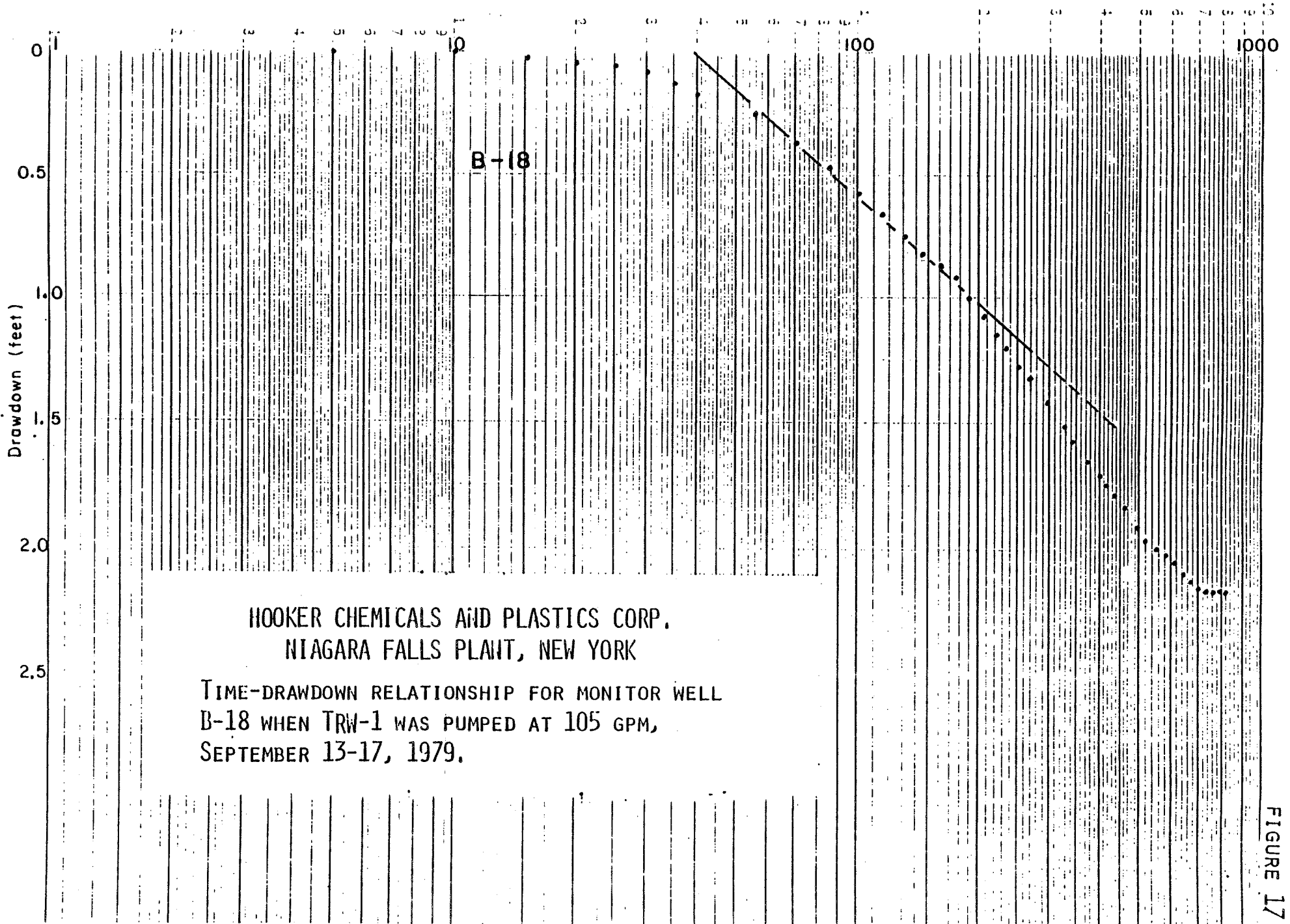
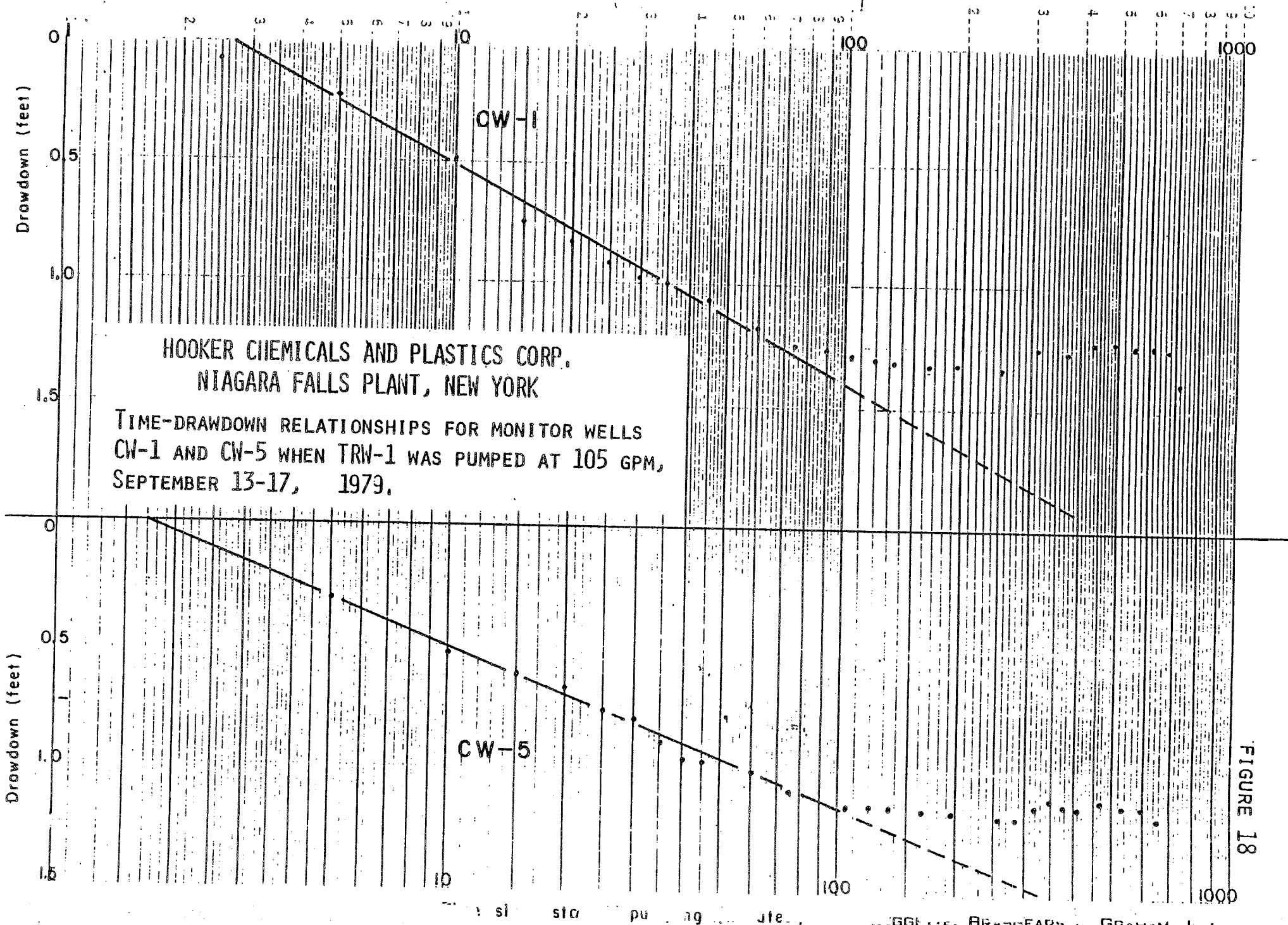
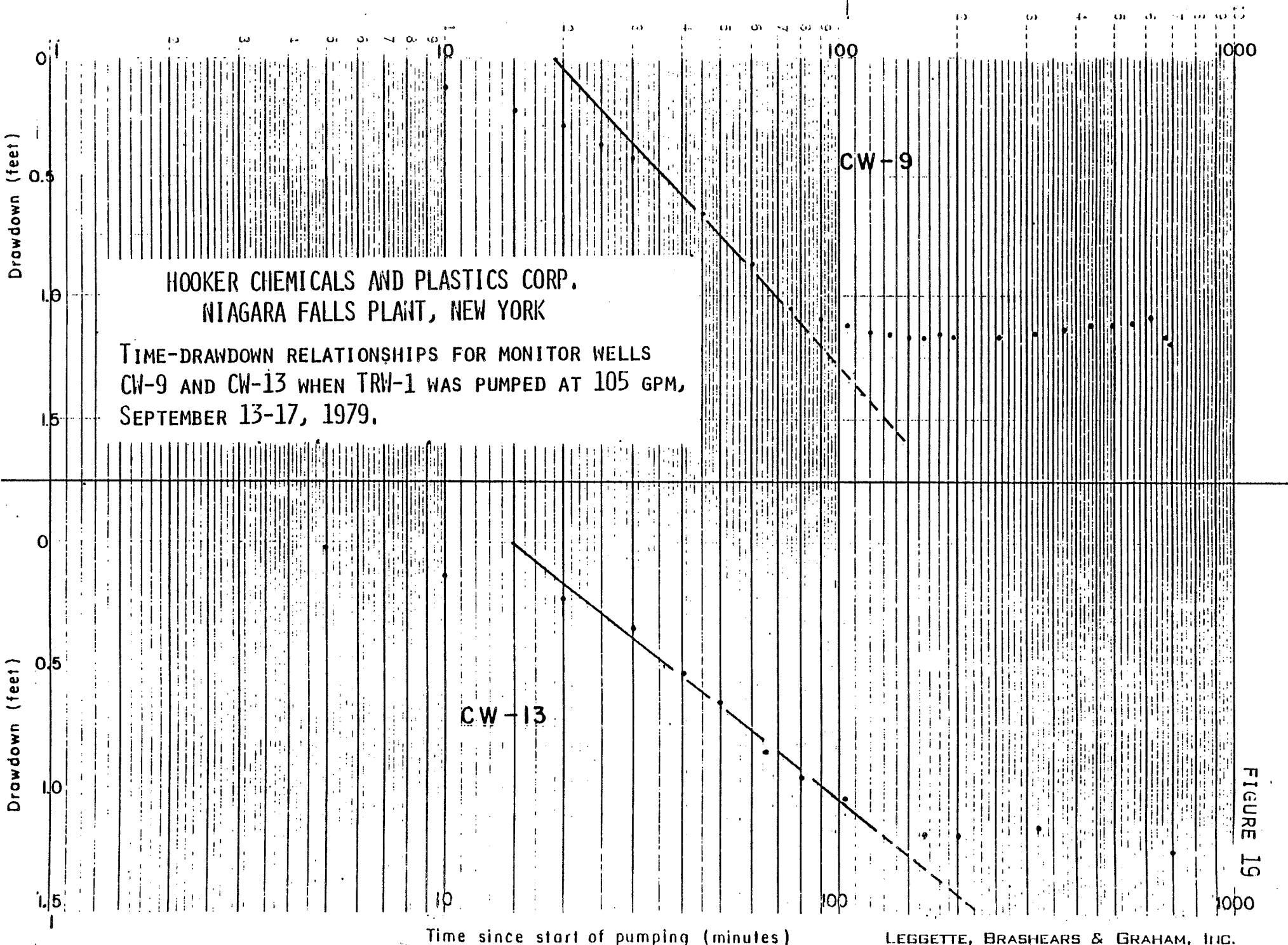
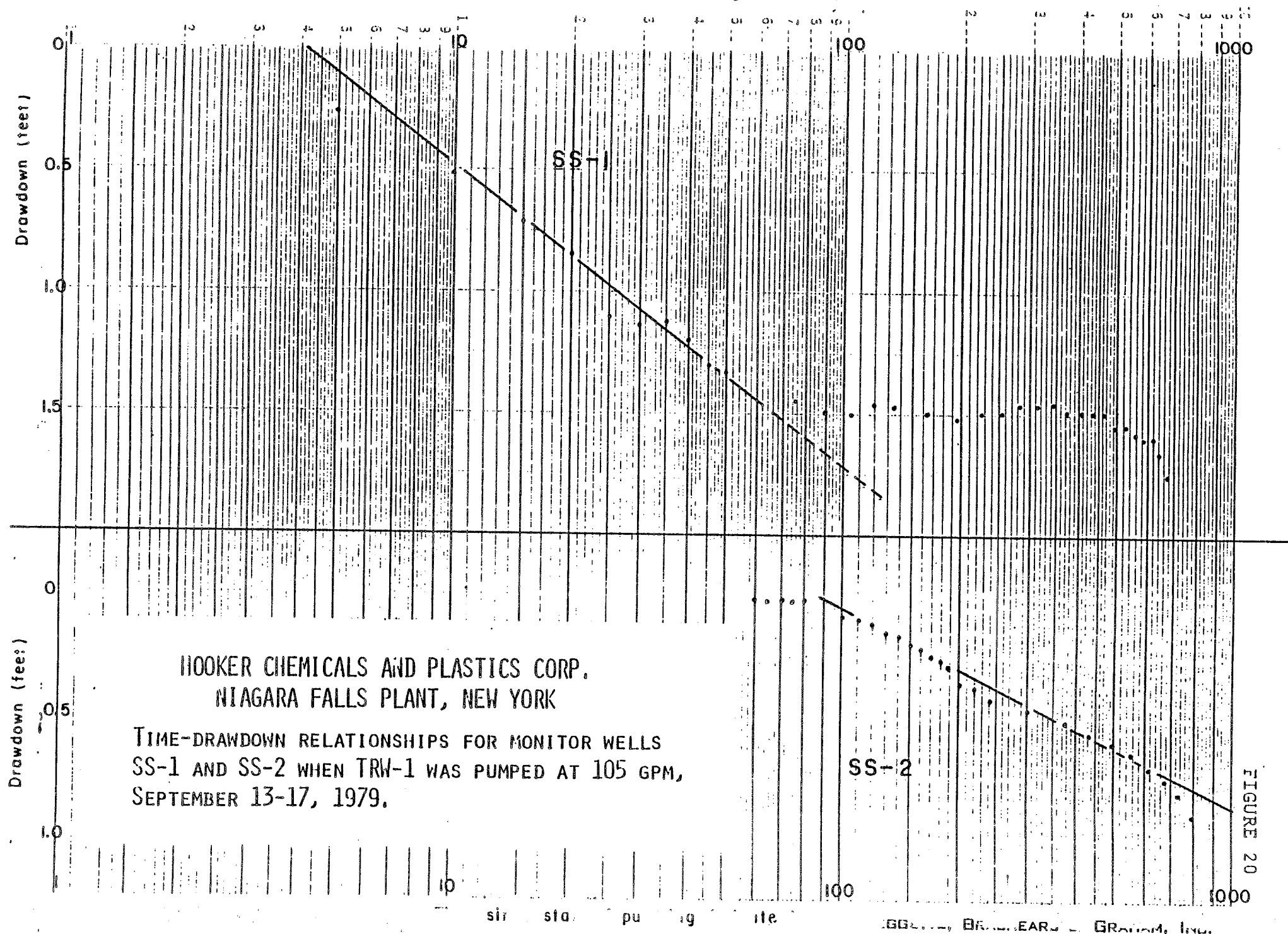


FIGURE 17







APPENDIX H

PERMEABILITY ASSESSMENTS FROM GROUNDWATER FLOW
IN THE OVERBURDEN AQUIFER, HOOKER CHEMICALS
& PLASTICS CORP., NIAGARA FALLS, NEW YORK
BY LEGGETTE, BRASHEARS & GRAHAM INC. - JUNE 27, 1982

DRAFT

GROUND-WATER FLOW IN THE
OVERBURDEN AQUIFER
HOOKER CHEMICALS AND PLASTICS CORP.
NIAGARA FALLS, NEW YORK

Prepared For
Hooker Chemicals and Plastics Corp.

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HOOKER CHEMICALS AND PLASTICS CORP.
 NIAGARA FALLS, NEW YORK PLANT

Permeability Assessments Based on Slug Tests,
 Geologic Logs, and Pumping Performance

Well #	Transmissivity ^{1/} (gpd/ft)	Permeability ^{2/} (gpd/ft ²)	Yield ^{3/} (gpm)	Aquifer material ^{4/}	Comments ^{5/}
B-1a	31.7	6.7	24-hour recovery	Fill; silt and clay.	Fair match
B-2a	1.6	.55	.25	Clayey silt	Poor match; may be effected by adjacent outfall
B-3a	4.2	1.2	1	Mixed fill	Tight formation; good match
B-4a			8	Broken rock fill	Very permeable; recovery too rapid for analysis.
B-5a	539.9	98.2	.5	Coarse fill	May be effected by abandoned sewer line; good match.
B-6a			.75	Mixed fill; silt	Buried
B-7a	264.3	18.2	1.75	Silt; sand; cinders	Good match
B-8a	195.2	12.2	.5	Silt; fine sand	Good match
B-9a			.5	Mixed fill	Destroyed
B-10a	72.5	11.3	.2	Mixed fill (upper) Fine sand (lower)	Poor match
B-11a			3	Coarse fill (upper) Fine sand & silt (lower)	Destroyed; high permeability.
B-12a			.5	Mixed fill (upper) Fine sand (lower)	Destroyed
B-13a			12	Mixed fill (upper) Fine sand (lower)	Very permeable, recovery too rapid for analysis.

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B-14a			1	Mixed fill	Rapid recovery; poor data.
B-14b	2.1	.13	.15	Very fine sand	Good match.
B-15a	36.3	1.9	.5	Mixed fill (upper) Very fine sand (lower)	Good match.
B-16a	618.9	95.2	5	Coarse fill (upper) Very fine sand (lower)	Good match.
B-17a	230.7	38.5	.5	Mixed fill (upper) Very fine sand (lower)	Good late data match.
B-18a	576.7	41.2	5	Silty fill	Fair data.
B-19a	120.8	33.6	2	Fill of stones, silt, sand.	Good match.
B-20a	.94	.9	.15	Silt	Late data match only.
B-21a	40.9	6.0	1	Silt	Good match.
B-22a	37.3	8.9	.5	Silt	Late data match only.
B-23a	52.9	10.6	.2	Silty clay; sand	Fair match.
B-24a			.15	Clayey silt; sand	Buried.
B-25a	8.8	1.7	.25	Sand and silt	Poor Match
B-26a	9.4	2.6	.07	Clayey silt	Early data match only.
B-27a	84.6	15.4		Mixed fill	Early data match only.
B-28a	38.4	12.4	.07	Silt; fine sand	Good match.
B-29a			8-hour recovery	Clayey silt	Dry at time of testing.

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 Geologic Logs, and Pumping Performance

Well #	Transmissivity ^{1/} (gpd/ft)	Permeability ^{2/} (gpd/ft ²)	Yield ^{3/} (gpm)	Aquifer material ^{4/}	Comments ^{5/}
B-30a	31.7	13.8	.15	Silt; fine sand	Good match.
B-31a	29.5	7.2	.03	Clayey silt	Early data match only.
B-32a			4	Coarse fill	Buried.
B-33a	769.0	187.6	.15	Mixed fill; fine sand	Poor data.
B-34a			1	Silty sand	Very slow recovery, no match.
B-35a			6	Silt; fine sand	Very permeable; recovery too rapid for analysis.
B-36a	42.3	3.5	.25	Layers of fine sand; silt & clay	Late data match only.
B-37a	33.4	5.6	.25	Fine sand; silt	Good match.
B-38a	667.8	128.4	1	Coarse fill	Fair match.
B-39a	551.7	74.1	1.5	Coarse fill, silty clay	Good match.
B-40a	3.9	1.3	.5	Silt	Poor match.
B-40b			.25	Till	No recovery; no match possible.
B-41a			.3	Mixed fill; silty clay	Buried.
B-42a	16.4	3.1	.2	Silt	Good match.
B-43a			.7	Mixed fill	Buried
B-44a	5.1	1.2	.1	Silt	Late data match only.
B-45a	373.2	53.3	2.5	Mixed fill; fine sand; clay	Good match.
B-46a	1268.8	173.3	.5	Mixed fill	Good match.
B-47a	68.6	17.1	.25	Coarse fill (upper) Fine sand (lower)	Fair match.

HOOKER CHEMICALS AND PLASTICS CORP.
 NIAGARA FALLS, NEW YORK PLANT

Permeability Assessments Based on Slug Tests,
 Geologic Logs, and Pumping Performance

Well #	Transmissivity ^{1/} (gpd/ft)	Permeability ^{2/} (gpd/ft ²)	Yield ^{3/} (gpm)	Aquifer material ^{4/}	Comments ^{5/}
CW-1a			.5	Coarse fill	Recovery too rapid for analysis.
CW-1b	149.3	14.9	.5	Very fine sand	May reflect downward leakage.
CW-2a	87.5	6.4	3.5	Sand; silt; gravel (upper) Fine sand (lower)	Fair match.
CW-3a	76.9	14.2	7.5	Silt, some gravel	Poor data; rapid recovery
CW-4a	66.8	39.7	1	Silt	Good match.
CW-6a			2.5	Fine fill	No data
CW-6b	1.03	.08	3-gallons per day	Fine sand and silt	Good match.
CW-7a	63.4	5.6	3	Silt, clayey; cinders & brick	Late data match only.
CW-8a	769.0	36.6	2.5	Fine to medium sand & silt	Good match.
CW-9a	13.7	1.04	2.5	Sandy silt	Good match.
CW-10a	149.3	10.3	2	Mixed fill; fine sand	Good match, little data
CW-11a	45.3	2.5	7	Mixed fill	Poor data; long term pumping test: P=100
CW-13a	36.3	3.2	.25	Fine fill	Late data match only.
OW-6S-80	.46	.04		Fine fill	Poor data; very slow recovery.
SP-1a	149.3	16.3	1.25	Shot rock; fine sand	Late data match only.
SP-2a	133.6	14.7	.7	Shot rock; fine sand	Good match.
SP-3a				Shot rock; medium sand	Not tested because of phosphorous.
SP-4a	22.5	1.8	.25	Shot rock; fine sand	Good match.

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Well #	Transmissivity ^{1/} (gpd/ft)	Permeability ^{2/} (gpd/ft ²)	Yield ^{3/} (gpm)	Aquifer material ^{4/}	Comments ^{5/}
SP-5a			5	Shot rock	Recovery too rapid.
SP-6a			7	Shot rock	Recovery too rapid.
SP-7a			10	Shot rock	Recovery too rapid.
SP-8a	.48	.02		Shot rock	Good match, but data may be effected by nature of fluids in the well.

- 1/ Transmissivity: The ability of a one-foot wide, fully penetrating section of the aquifer to yield water, in gallons per day per foot, under unit hydraulic gradient.
- 2/ Permeability: Transmissivity divided by the saturated thickness of the aquifer, giving potential flow in gallons per day per square foot of material, under unit hydraulic gradient.
- 3/ Yield: Short term yield as determined by suction pumping.
- 4/ Aquifer Material: Based on geologic logs, simplified for comparison.
- 5/ Comments: Good, fair, and poor match refers to how well the observed data fit the set of type curves used for the analysis.

APPENDIX I

WATER LEVEL ELEVATIONS, MONITORING WELLS, NIAGARA PLANT

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Project No. 979-626
Well Casings Surveyed
July 15-17, 1980

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	10/11/79 to 10/15/79	10/16/79 to 10/18/79	11/6/79 to 11/8/79	11/13/79 to 11/14/79	11/20/79 to 11/27/79	1/29/80 to 1/31/80	2/5/80 to 2/7/80
WELL NO.		WATER ELEVATION						
1	572.35	552.01	552.31	550.40	550.29	551.06	549.59	549.76
1A	572.91	570.47	570.20	569.61	569.99	568.98	569.31	568.80
2	570.85	552.10	552.38	550.48	550.32	551.01	549.72	549.90
2A	571.08	--	563.48	562.68	562.99	563.12	562.94	562.53
3	568.16	552.62	552.75	550.68	550.63	551.23	550.12	550.11
3A	568.17	566.35	566.24	566.03	566.16	566.06	565.52	565.26
4	569.72	552.98	552.98	550.74	550.71	551.16	550.19	550.12
4A	569.21	565.98	565.89	565.63	565.73	565.75	565.74	565.71
5	569.11	553.11	552.94	550.89	550.87	551.25	550.18	550.86
5A	569.29	--	564.30	564.02	564.15	564.28	564.16	563.97
6	568.60	552.71	551.89	549.72	550.67	550.12	549.22	550.09
7	571.08	554.81	554.90	552.84	552.97	553.33	551.59	551.50
7A	572.06	567.77	567.53	568.98	566.98	569.68	568.29	564.73
8	569.49	554.00	554.09	552.13	552.02	552.42	551.47	551.39
8A	569.59	566.94	567.31	565.67	566.09	566.01	565.61	566.47
9	570.91	555.20	555.22	553.83	553.76	554.07	553.32	553.11
9A	570.61	567.07	567.07	567.05	567.07	567.07	- P L U G G E D -	
10	569.99	559.43	559.35	558.76	558.68	558.83	558.39	558.05
10A	569.04	--	566.26	565.94	566.27	566.23	565.69	565.94
11	568.50	560.76	560.64	560.20	560.05	560.22	559.66	559.20
11A	568.48	--	563.36	562.64		- M I S S I N G -		
12	569.92	560.83	560.62	560.33	560.17	- M I S S I N G -		
12A	569.98	562.95	563.64	561.82	562.10	- M I S S I N G -		
13	568.44	560.92	560.76	560.43	560.25	560.44	559.78	559.48
13A	568.08	565.45	565.23	564.16	564.94	564.40	563.97	563.57
14A	573.05	--	565.49	565.26	565.38	565.36	565.38	565.21
14B	572.78	564.63	564.86	564.03	564.46	564.08	563.23	562.96
15A	573.54	--	564.59	564.35	564.49	564.43	564.57	564.13
16	572.27	560.91	--	560.79	560.55	560.80	560.21	560.31
16A	571.64	562.90	560.55	562.71	562.78	562.80	563.16	564.97
17	573.01	560.86	561.92	560.66	560.36	560.69	560.16	560.22
17A	573.83	565.66	565.11	565.65	565.82	565.76	565.55	565.45
18	573.46	560.82	560.96	560.36	560.16	560.47	559.92	559.98
18A	574.55	567.15	567.19	566.80	566.89	566.88	566.95	566.66
19	571.11	561.11	560.80	560.22	560.14	560.39	559.84	559.95
19A	571.50	--	566.20	565.85	565.96	565.94	566.16	565.89
20	571.78	--	559.76	559.00	558.90	558.98	558.52	558.33
20A	572.06	--	565.14	564.42	564.71	564.44	566.88	566.09
21	573.01	554.62	554.76	553.39	553.42	553.66	554.42	553.95
21A	572.79	569.33	569.13	568.84	568.87	568.64	568.15	567.72
22	572.73	--	568.02	566.68	567.87	567.86	563.72	561.77
22A	572.62	568.06	569.79	567.66	570.32	569.79	567.70	567.24
23	571.91	553.48	553.11	551.95	551.77	551.92	551.41	551.36
23A	572.40	571.78	570.61	570.16	570.46	570.32	570.00	569.20
24	573.30	--	--	548.81	548.93	548.49	548.42	548.36
24A	572.99	--	--	--	--	--	--	--

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Project No. 979-626
Well Casings Surveyed
July 15-17, 1980

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/18/80	6/24/80 to 6/25/80	6/30/80 to 7/1/80	7/15/80 to 7/17/80	7/18/80	7/28/80	8/14/80 to 8/15/80
WELL NO.		WATER ELEVATION						
1	572.35	549.26	550.60	550.69	550.88	550.46	551.07	551.26
1A	572.91	570.31	569.80	569.81	568.81	568.66	568.96	569.84
2	570.85	549.43	550.76	550.83	551.11	550.74	551.33	--
2A	571.08	562.09	563.79	563.88	563.27	563.14	563.41	--
3	568.16	549.71	550.99	551.06	551.36	551.03	551.59	551.95
3A	568.17	565.82	565.78	565.72	565.66	565.65	565.74	565.75
4	569.72	549.64	550.98	551.05	551.48	551.00	551.58	551.73
4A	569.21	566.08	566.04	565.95	566.14	565.80	567.42	566.68
5	569.11	550.13	--	--	551.78	551.64	551.89	552.03
5A	569.29	564.25	564.84	565.01	564.23	564.15	564.40	565.06
6	568.60	--	--	--	551.57	551.09	551.66	551.81
7	571.08	551.33	552.76	552.89	553.17	552.76	553.44	553.75
7A	572.06	566.33	567.16	564.91	565.76	565.75	567.17	567.29
8	569.49	551.44	551.77	552.42	552.75	552.39	552.89	553.10
8A	569.59	565.79	566.42	566.23	566.01	565.65	566.79	566.55
9	570.91	553.17	554.27	554.39	554.59	554.34	554.69	555.01
9A	570.61	- P	L U	G E	D -			
10	569.99	558.05	558.86	558.96	558.97	558.94	559.16	559.71
10A	569.04	566.82	566.26	566.19	566.09	565.88	566.06	566.20
11	568.50	559.29	559.94	560.37	560.28	560.28	560.51	561.04
11A	568.48		- M	I S S	I N G	-		
12	569.92		- M	I S S	I N G	-		
12A	569.98		- M	I S S	I N G	-		
13	568.44	559.39	560.47	560.67	560.51	560.64	560.73	561.35
13A	568.08	565.80	565.95	564.42	563.89	563.76	564.54	564.88
14A	573.05	564.41	565.37	565.35	565.01	564.97	565.47	564.87
14B	572.78	563.18	564.43	564.34	563.66	563.46	563.86	564.51
15A	573.54	563.66	564.34	564.31	564.05	563.88	563.87	563.91
16	572.27	559.94	563.51	561.21	561.07	561.07	561.11	561.59
16A	571.64	562.76	560.41	562.76	562.71	562.63	562.71	561.76
17	573.01	559.88	561.01	561.01	560.85	561.03	561.06	561.35
17A	573.83	565.40	565.80	565.82	565.90	565.61	565.67	565.98
18	573.46	559.62	560.80	560.99	560.68	560.83	560.91	561.25
18A	574.55	567.24	567.23	567.54	567.04	566.89	567.03	567.13
19	571.11	--	560.82	560.95	560.53	560.96	560.67	561.04
19A	571.50	565.84	566.49	566.42	566.07	566.08	566.23	566.12
20	571.78	558.04	559.11	559.13	559.44	559.19	559.33	559.67
20A	572.06	570.97	565.35	565.03	564.24	564.20	564.73	564.90
21	573.01	552.83	555.27	555.08	555.38	555.09	555.43	555.96
21A	572.79	--	572.07	572.06	572.12	572.12	572.68	572.43
22	572.73	--	--	--	559.23	559.23	--	559.49
22A	572.62	--	--	--	567.71	567.66	567.95	568.07
23	571.91	--	552.48	--	552.64	552.21	552.77	552.92
23A	572.40	570.07	570.48	--	570.16	569.99	570.37	570.46
24	573.30	--	--	--	549.96	549.82	550.46	550.20
24A	572.99	--	--	--	--	--	550.57	--

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

WELL MONITORING PROGRAM
DRINKING WATER TREATMENT PLANT

Elevations based on Hooker datum.

DATE	WELL CASING ELEV.	3/18/80	6/24/80 to 6/25/80	6/30/80 to 7/1/80	7/15/80 to 7/17/80	7/18/80	7/28/80	8/14/80 to 8/15/80
WELL NO.		WATER ELEVATION						
OW1S-80	579.88	566.13	566.34	566.69	566.69	566.54	566.81	566.54
OW2S-80	577.36	562.97	563.17	563.42	563.14	563.63	563.09	563.13
OW3S-80	575.97	563.92	564.30	564.71	564.52	564.52	564.83	564.78
OW4S-80	574.92	554.38	553.97	553.98	553.97	553.99	553.99	553.97
OW5S-80	582.49	570.29	568.80	570.12	570.04	569.88	570.06	568.90
OW6S-80	574.69	565.79	566.40	566.58	566.13	566.05	566.34	566.46
OW7S-80	582.48	568.81	568.71	568.99	568.93	568.73	568.88	570.06
OW8S-80	573.04	561.93	562.01	562.10	562.08	561.78	561.93	561.96
OW9S-80	572.97	563.11	562.77	562.85	562.79	562.78	562.73	562.82
SP-4A	573.25	--	561.77	562.30	--	--	--	562.44
SP-8	569.56	--	560.97	560.85	561.05	560.81	560.96	561.24
SP-8A	570.00	561.53	561.35	561.37	560.98	561.35	562.72	562.17
SP-9	573.55							560.98
SP-9A	573.30							562.36
SS1	570.31							
SS2	570.27							

A, B = Overburden Installation (i.e. 13-bedrock well, 13A=overburden well).

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum.

DATE	WELL CASING ELEV.	8/22/80 to 8/25/80	3/11/81 to 3/12/81	5/7/81 to 5/8/81	6/1/81 to 6/3/81	8/12/81 to 8/13/81	12/16/81 to 12/18/81	2/17/82 to 2/23/82
WELL NO.		WATER ELEVATION						
1	572.35	551.63	549.49	552.54	550.88	550.51	549.66	552.89
1A	572.91	569.25	569.79	569.95	569.79	570.09	569.16	569.96
2	570.85	--	544.92	551.29	551.52	551.16	551.64	549.96
2A	571.08	-	M I S	S I N G	-			
3	568.16	551.97	550.25	551.87	551.50	551.68	549.97	Buried
3A	568.17	565.85	565.74	565.75	565.97	565.73	565.90	Buried
4	569.72	551.95	550.19	551.38	551.54	551.38	549.95	551.61
4A	569.21	566.67	--	564.78	564.81	564.70	564.33	564.72
5	569.11	552.99	550.70	551.93	551.86	551.78	560.13	551.70
5A	569.29	564.58	565.64	565.33	565.79	565.73	565.27	566.21
6	568.60	552.00	550.28	551.56	551.64	551.34	560.00	551.50
7	571.08	553.81	551.43	552.98	553.21	553.02	551.21	552.65
7A	572.06	566.08	566.81	567.20	567.38	566.93	566.25	566.81
8	569.49	553.27	561.53	551.81	551.93	552.17	551.89	552.12
8A	569.59	566.46	566.64	566.60	567.15	566.61	566.07	566.97
9	570.91	555.30	553.28	554.21	554.58	554.55	553.14	554.46
9A	570.61	-	P L	U G G	E D	-		
10	569.99	559.71	558.70	559.04	559.51	559.49	558.14	558.33
10A	569.04	565.94	566.89	566.66	566.75	566.39	566.73	567.13
11	568.50	561.14	559.83	- M I	S S I N G	-		
11A	568.48	-	M I S	S I N G	-			
12	569.92	-	M I S	S I N G	-			
12A	569.98	-	M I S	S I N G	-			
13	568.44	561.16	560.07	560.23	560.46	561.33	- MISSING -	
13A	568.08	564.29	--	564.64	564.86	564.68	- MISSING -	
14A	573.05	564.80	--	--	--	564.48	565.61	565.26
14B	572.78	564.02	564.64	564.05	564.07	564.17	560.59	563.45
15A	573.54	563.78	564.78	564.23	564.28	563.77	564.50	563.88
16	572.27	561.48	560.55	560.64	561.33	561.64	560.23	560.12
16A	571.64	561.87	563.79	563.05	562.96	562.54	562.62	563.15
17	573.01	561.41	560.53	560.56	561.47	561.91	560.21	560.42
17A	573.83	565.57	566.06	565.51	565.57	565.29	565.31	565.58
18	573.46	561.26	560.18	560.38	560.40	560.96	559.99	560.38
18A	574.55	567.26	567.91	567.26	567.37	567.12	567.26	567.88
19	571.11	561.11	560.16	560.26	560.91	561.31	559.68	559.60
19A	571.50	566.07	566.60	566.67	566.33	565.82	566.01	565.75
20	571.78	559.73	559.03	559.18	559.52	559.62	559.76	559.79
20A	572.06	564.47	567.15	567.36	565.11	565.16	565.48	567.48
21	573.01	555.69	553.94	554.79	554.98	554.82	554.93	554.56
21A	572.79	572.06	572.29	--	572.61	571.99	572.44	572.46
22	572.73	-	P L U	G G	E D	-		
22A	572.62	567.94	--	568.22	568.16	567.80	567.96	567.33
23	571.91	552.97	--	569.75	553.08	552.44	551.85	551.58
23A	572.40	570.29	570.97	553.02	570.51	570.56	570.30	570.15
24	573.30	550.60	- M I S	S I N G	-			
24A	572.99	-	M I S	S I N G	-			

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

WELL MONITORING PROGRAM
DRINKING WATER TREATMENT PLANT

Elevations based on Hooker datum.

DATE	WELL CASING ELEV.	8/22/80 to 8/25/80	10/29/80	11/4/80	11/11/80			
WELL NO.		WATER ELEVATION						
OW1S-80	579.88	566.43			565.23			
OW2S-80	577.36	562.89			563.15			
OW3S-80	575.97	564.73			564.92			
OW4S-80	574.92	553.97			554.21			
OW5S-80	582.49	569.90			570.07			
OW6S-80	574.69	566.23			566.13			
OW7S-80	582.48	568.93			568.40			
OW8S-80	573.04	562.00			561.59			
OW9S-80	572.97	562.82			563.09			
SP-4A	573.25	562.37			561.96			
SP-8	569.56	561.38			560.39			
SP-8A	570.00	562.14			562.45			
SP-9	573.55	560.89			560.19			
SP 9A	573.30	562.74			—			
SS1			—	561.34	564.38			
SS2			561.09	560.61	560.40			

A, B = Overburden Installation (i.e. 13-bedrock well, 13A=overburden well).

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	5/11/82 to 5/12/82	8/4/82 to 8/5/82	9/28/82 to 9/29/82	12/20/82 to 12/22/82	1/19/83	1/25/83 to 1/26/82	2/22/83 to 2/25/83
WELL NO.	WELL CASING ELEV.	WATER ELEVATION						
1	572.71*	550.82	551.39	552.55	549.87		549.37	549.36
1A	572.56*	569.38	569.04	569.91	570.38		570.58	569.81
2	570.85	551.79	552.31	552.63	550.57		549.95	549.70
2A	571.08	-	D E S	T R O	Y E D			
3	568.16	551.86	552.16	552.78	550.96		550.20	550.09
3A	568.17	565.98	565.75	565.75	565.75		565.72	565.70
4	569.72	552.03	552.45	553.00	551.04		565.39	550.06
4A	569.21	564.91	565.31	565.14	564.88		549.69	564.81
5	569.11	552.04	552.58	553.27	551.02		550.49	549.87
5A	569.29	565.77	565.87	565.07	565.76		565.90	565.62
6	568.60	Buried	552.66	552.76	550.89		550.44	549.98
7	571.08	552.95	553.68	553.86	551.85		550.87	550.97
7A	572.06	566.98	567.49	567.44	566.97		566.88	566.45
8	569.49	554.75	554.63	554.73	554.83		554.79	554.71
8A	569.59	566.93	567.59	567.06	566.75		566.67	566.30
9	570.91	555.09	556.14	555.66	554.21		554.02	553.77
9A	570.61	-	P L	J G G	E D			
10	569.99	559.48	559.90	559.75	558.71		558.28	558.40
10A	569.04	567.05	567.53	566.98	567.04		566.92	567.11
11	568.50	-	D E S	T R O	Y E D			
11A	568.48	-	D E S	T R O	Y E D			
12	569.92	-	D E S	T R O	Y E D			
12A	569.98	-	D E S	T R O	Y E D			
13	568.44	-	D E S	T R O	Y E D			
13A	568.08	-	D E S	T R O	E D			
14A	573.05	565.57	565.40	565.13	565.82	565.70		565.55
14B	572.78	559.76	558.88	560.24	560.04	564.00		554.17
15A	573.54	564.87	563.88	563.35	564.73	565.13		564.95
16	572.27	561.68	561.37	561.63	560.55	560.14		560.24
16A	571.64	563.30	562.73	562.55	563.39	562.89		562.70
17	573.01	561.53	561.37	561.53	560.58	560.06		560.18
17A	573.83	565.68	565.63	565.24	565.49	565.48		565.49
18	573.46	561.03	561.03	561.05	560.63	560.36		560.19
18A	574.55	568.13	567.62	566.92	567.11	567.27		567.13
19	571.11	560.70	561.39	561.34	560.25	559.78		559.92
19A	571.50	566.44	566.02	565.77	566.00	565.92		565.89
20	571.78	559.39	559.50	559.89	559.92		559.45	558.54
20A	572.06	566.83	568.08	568.98	566.20		566.55	564.82
21	573.01	554.94	554.92	555.25	554.98		554.77	554.30
21A	572.79	572.69	572.68	572.69	572.79		572.79	572.79
22	572.73	572.58	-	P L U	G G E D			
22A	572.62	568.35	568.17	568.12	568.82		568.30	568.22
23	571.91	552.89	553.17	553.14	552.30		551.88	551.80
23A	572.40	570.67	570.91	570.78	570.54		570.19	570.79
24	573.30	-	P A V	E D O	V E R			
24A	572.99	-	P A V	E D O	V E R			

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

*New top of casing elevation February, 1983.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/29/83 to 3/31/83	5/17/83	7/12/83 to 7/14/83	9/13/83 to 9/15/83	12/19/83 to 12/22/83	4/9/84 to 4/10/84	
WELL NO.		WATER ELEVATION						
1	572.71*	549.46	548.25	550.88	549.26	550.36	550.94	
1A	572.56*	570.50	569.12	569.31	568.65	--	DESTROYED	
2	570.85	549.81	550.49	551.34	551.84	550.44	550.93	
2A	571.08	-	D E S	T R O	Y E D	-		
3	568.16	549.89	550.80	551.54	552.02	550.56	551.16	
3A	568.17	565.94	565.71	565.62	565.59	565.53	565.94	
4	569.72	549.90	550.92	551.62	552.17	550.56	551.06	
4A	569.21	564.58	565.02	564.55	565.40	565.55	565.56	
5	569.11	550.71	551.18	551.86	552.97	554.05	552.04	
5A	569.29	566.00	566.00	567.44	565.78	566.83	567.04	
6	568.60	--	--	--	--	--	DAMAGED	
7	571.08	553.86	551.68	552.83	553.28	551.60	551.88	
7A	572.06	567.74	566.60	565.87	566.63	567.32	567.66	
8	569.49	554.40	554.20	554.08	554.02	553.76	558.99	
8A	569.59	567.22	566.31	566.04	566.59	566.89	567.29	
9	570.91	553.80	555.73	555.50	556.28	555.71	556.34	
9A	570.61	-	P L	U G G	E D	-		
10	569.99	558.31	559.24	559.49	559.61	559.05	559.25	
10A	569.04	566.21	569.27	566.82	566.71	566.70	566.98	
11	568.50	-	D E S	T R O	Y E D	-		
11A	568.48	-	D E S	T R O	Y E D	-		
12	569.92	-	D E S	T R O	Y E D	-		
12A	569.98	-	D E S	T R O	Y E D	-		
13	568.44	-	D E S	T R O	Y E D	-		
13A	568.08	--	--	--	--	--		
14A	573.05	565.75	566.02	565.63	565.19	frozen	566.49	
14B	572.78	557.19	558.75	559.00	561.53	frozen	558.20	
15A	573.54	566.03	565.90	564.23	563.86	566.80	566.93	
16	572.27	560.27	560.43	561.10	561.65	560.93	560.85	
16A	571.64	563.26	563.29	562.80	562.63	564.08	564.14	
17	573.01	560.21	560.57	561.21	561.62	560.86	560.81	
17A	573.83	565.77	565.46	565.28	565.32	565.95	565.98	
18	573.46	560.13	560.51	561.04	561.08	561.16	560.54	
18A	574.55	567.69	567.40	567.02	566.87	567.87	568.07	
19	571.11	559.82	560.52	561.16	561.15	560.51	561.07	
19A	571.50	566.40	566.11	565.67	565.56	566.60	566.84	
20	571.78	558.60	558.75	559.10	559.90	559.54	560.12	
20A	572.06	568.48	566.10	571.34	565.22	566.17	568.62	
21	573.01	554.11	554.36	554.50	554.87	554.41	554.69	
21A	572.79	572.79	572.79	572.79	572.79	frozen	571.98	
22	572.73	-	P L	U G G	E D	-		
22A	572.62	569.42	568.32	567.78	567.50	frozen	570.51	
23	571.91	551.40	552.04	552.74	552.78	552.18	552.76	
23A	572.40	570.63	570.46	570.54	570.56	570.24	571.23	
24	573.30	-	P A V	E D	O V E R	-		
24A	572.99	-	P A V	E D	O V E R	-		

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
*New top of casing elevation February, 1983.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	10/11/79 to 10/15/79	10/16/79 to 10/18/79	11/6/79 to 11/8/79	11/13/79 to 11/14/79	11/20/79 to 11/27/79	1/29/80 to 1/31/80	2/5/80 to 2/7/80
WELL NO.		WATER ELEVATION						
25	570.83	551.03	551.10	549.26	549.26	549.84	548.69	--
25A	570.97	569.46	569.21	569.20	569.20	569.09	568.89	--
26	571.38	552.80	553.07	551.30	550.90	551.67	550.43	549.99
26A	570.91	566.57	566.16	566.33	566.29	566.18	565.96	565.59
27	571.42	553.81	553.69	--	--	--	550.36	551.35
27A	571.43	--	566.41	--	--	--	566.13	565.93
28	569.88	547.96	548.04	548.32	549.61	549.87	545.47	545.87
28A	570.02	559.35	567.56	567.34	567.30	567.16	566.62	566.24
29	570.46	554.89	554.55	553.31	553.12	--	552.48	552.50
29A	570.53	--	564.50	564.17	565.10	--	--	--
30	571.48	559.61	553.85	552.25	552.25	552.42	551.75	551.74
30A	571.48	--	567.31	567.15	567.18	567.09	566.76	566.49
31	571.61	--	--	--	--	--	569.09	--
31A	571.87	570.22	570.23	569.35	569.64	569.55	--	568.90
32	568.37	560.81	560.59	560.31	560.12	560.30	--	--
32A	568.32	563.46	563.43	562.99	563.09	562.89	--	--
33A	570.28	565.56	565.68	565.12	565.25	565.23	565.18	565.13
34	569.68	560.09	559.87	559.23	558.98	559.20	558.55	--
34A	569.34	565.62	565.71	564.11	565.05	564.99	565.04	--
35A	569.16	--	566.40	566.26	566.34	566.31	566.48	566.43
36A	576.82	--	567.50	567.58	567.52	567.47	567.50	567.28
37A	571.70	--	569.93	569.06	569.73	569.48	568.94	568.07
38A	572.09	--	571.69	--	--	571.80	571.46	571.02
39A	571.65	--	--	--	571.50	571.33	--	--
40	571.92	553.34	553.50	552.03	552.01	552.33	551.40	551.51
40A	571.69	--	567.06	567.22	567.11	567.00	566.77	566.68
40B	571.85	562.26	562.35	562.28	562.25	562.04	558.51	559.24
41	571.68	--	--	--	--	--	--	--
41A			- M I	S S	I N G	-		
42A	572.49	569.85	569.41	567.10	568.05	567.86	566.38	565.53
43A	571.90		- M I	S S	I N G	-		
44A	572.98	--	565.98	565.45	566.25	566.03	565.80	565.41
45A	574.47	566.08	566.08	565.77	565.94	565.89	565.90	565.76
46A	573.29	567.16	567.16	566.73	566.93	566.81	566.85	566.57
47A	574.78	564.30	564.30	564.08	564.20	564.15	564.49	564.24
53	571.62							
54	570.02							
55	571.57							
56	571.49							
57	571.73							
58	569.78							
59	569.70							
61	570.93							
62	571.36							
64	570.25							
65	569.20							

NOTE: Wells 53 through 137 installed July, 1980.

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
Wells 53 through 137 are overburden installations.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/18/80	6/24/80 to 6/25/80	6/30/80 to 7/1/80	7/15/80 to 7/17/80	7/18/80	7/28/80	8/14/80 to 8/15/80
WELL NO.		WATER ELEVATION						
25	570.83	548.45	550.02	550.30	550.00	550.31	550.57	550.37
25A	570.97	569.82	569.34	569.31	568.55	568.46	568.94	569.18
26	571.38	550.11	551.05	551.16	551.10	550.90	--	--
26A	570.91	566.27	567.13	566.67	566.35	566.20	--	--
27	571.42	549.13	552.34	552.39	552.54	552.48	552.73	553.03
27A	571.43	--	567.03	566.79	567.22	567.29	567.67	567.65
28	569.88	--	--	557.98	558.58	558.58	--	558.83
28A	570.02	567.18	--	567.34	567.43	567.32	567.04	569.20
29	570.46	552.03	--	--	551.42	553.09	--	--
29A	570.53	568.98	--	564.99	564.80	564.83	--	--
30	571.48	--	552.82	552.78	553.14	552.84	553.30	553.32
30A	571.48	567.93	567.30	567.22	566.96	566.89	567.27	567.35
31	571.61	--	554.67	555.00	554.70	554.50	557.50	571.61
31A	571.87	570.19	569.81	569.44	569.38	569.34	569.91	569.86
32	568.37	--	--	--	--	--	--	--
32A	568.32	--	--	--	--	--	--	--
33A	570.28	565.43	--	--	--	--	--	--
34	569.68	558.23	559.32	559.34	559.44	559.36	559.53	559.79
34A	569.34	565.66	565.57	565.42	565.13	565.11	565.28	565.18
35A	569.16	565.83	566.69	566.71	566.57	566.56	566.66	567.07
36A	576.82	567.09	567.59	567.66	567.56	567.42	567.68	567.84
37A	571.70	569.52	569.04	568.81	568.31	568.28	568.44	568.88
38A	572.09	--	571.64	571.49	571.38	571.44	571.97	571.99
39A	571.65	--	571.65	--	571.21	571.17	- P L U G G E D	
40	571.92	550.98	552.07	552.07	552.36	552.05	552.69	552.73
40A	571.69	567.22	566.92	566.71	566.66	566.55	566.76	566.93
40B	571.85	555.55	555.91	557.90	559.68	559.65	560.49	561.55
41	571.68	--	--	--	--	--	--	550.00
41A			- M I	S S	I N G	-		
42A	572.49	568.58	568.63	568.34	567.67	566.84	567.92	568.83
43A	571.90		- M I	S S	I N G	-		
44A	572.98	567.56	565.30	565.26	565.11	564.59	566.17	565.57
45A	574.47	565.79	566.09	566.10	565.94	565.83	566.02	566.08
46A	573.29	566.41	567.11	567.07	566.86	566.84	566.92	567.01
47A	574.78	564.19	564.43	564.37	564.20	564.08	564.22	564.30
53	571.62				566.51	566.32	566.79	566.88
54	570.02				566.96	566.95	567.28	567.19
55	571.57				566.84	566.76	567.04	567.21
56	571.49				566.85	566.68	567.21	567.56
57	571.73				566.75	566.64	568.92	567.43
58	569.78				567.00	566.99	567.12	567.19
59	569.70				566.94	566.96	567.04	567.13
61	570.93				565.05	564.71	565.05	--
62	571.36				565.03	565.41	565.85	565.51
64	570.25				564.22	563.63	564.36	565.59
65	569.20				563.88	563.88	564.30	564.98

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
Wells 53 through 137 are overburden installations.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	8/22/80 to 8/25/80	3/11/81 to 3/12/81	5/7/81 to 5/8/81	6/1/81 to 6/3/81	8/12/81 to 8/13/81	12/16/81 to 12/18/81	2/17/82 to 2/23/82
WELL NO.	WELL CASING ELEV.	WATER ELEVATION						
25	570.83	550.80	549.42	548.63	550.18	549.83	549.50	549.26
25A	570.97	568.84	569.51	569.47	569.45	569.51	559.64	569.82
26	571.38	552.08	543.53	551.57	555.94	551.30	551.03	550.72
26A	570.91	566.44	566.37	566.40	567.59	566.86	566.93	566.62
27	571.42	553.37	551.43	552.64	552.53	553.43	553.03	552.47
27A	571.43	567.68	--	--	566.71	566.93	566.30	566.18
28	569.88	561.89	569.10	--	546.86	556.66	563.61	562.35
28A	570.02	569.12	568.05	566.62	567.21	566.66	567.00	567.19
29	570.46	553.99	--	553.03	553.14	553.48	552.80	552.71
29A	570.53	Dry	--	--	Dry	Dry	- PLUGGED -	
30	571.48	553.69	552.20	552.95	553.60	553.31	552.15	552.01
30A	571.48	566.94	567.81	567.54	567.49	567.09	568.19	569.90
31	571.61	567.08	--	--	557.32	Dry	--	557.20
31A	571.87	569.54	570.48	569.25	567.44	569.62	--	Destroyed
32	568.37	-	M I S	I N G	-			
32A	568.32	-	M I S	I N G	-			
33A	570.28	--	--	--	--	565.48	565.00	565.41
34	569.68	559.82	558.86	561.80	559.62	559.96	558.41	559.43
34A	569.34	565.01	565.32	565.58	565.69	565.33	565.30	565.91
35A	569.16	566.88	--	566.54	566.18	566.59	565.97	566.21
36A	576.82	567.61	568.22	567.62	567.60	567.34	567.76	567.57
37A	571.70	568.39	569.83	569.31	569.19	569.03	569.66	Flooded
38A	572.09	571.97	571.72	571.52	571.80	571.61	571.74	572.21
39A	571.65	--	--	--	571.38	570.65	570.34	570.24
40	571.92	553.16	551.52	552.21	552.93	552.56	551.90	551.53
40A	571.69	566.66	566.76	567.81	566.24	567.07	566.77	567.40
40B	571.85	561.86	562.11	561.65	562.70	562.14	562.50	562.77
41	571.68	550.34	547.65	--	553.54	548.68	549.67	549.10
41A	-	-	M I S	I N G	-			
42A	572.49	567.69	-	N I S S	I N G	-		
43A	571.90	--	--	--	569.60	569.55	568.55	Buried
44A	572.98	564.61	--	564.01	565.52	564.88	565.58	566.46
45A	574.47	566.17	566.47	565.88	565.94	--	565.76	Plugged
46A	573.29	566.79	--	567.00	567.07	--	566.80	Buried
47A	574.78	564.44	565.10	564.49	564.55	564.05	564.22	564.74
53	571.62	566.24	566.92	566.93	566.72	566.62	565.87	566.79
54	570.02	567.21	567.55	567.25	567.66	567.12	567.40	567.61
55	571.57	567.03	567.42	567.34	567.08	567.05	--	567.66
56	571.49	566.93	567.43	567.33	567.00	566.88	566.91	565.87
57	571.73	566.74	567.34	567.23	567.55	566.62	566.38	565.86
58	569.78	567.08	566.84	566.79	567.00	567.48	567.37	567.29
59	569.70	567.00	566.67	566.42	566.83	567.10	566.66	567.01
61	570.93	-	W E L	I B R	O K E	-		
62	571.36	565.64	564.58	564.66	564.74	564.47	564.42	564.87
64	570.25	564.04	564.85	564.57	565.49	565.34	564.31	566.30
65	569.20	564.37	564.78	563.80	565.38	565.29	563.60	566.33

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
Wells 53 through 137 are overburden installations.

WELL MONITORING PROGRAM
NIAGARA PLANT

SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	5/11/82 to 5/12/82	8/4/82 to 8/5/82	9/28/82 to 9/29/82	12/20/82 to 12/22/82	1/19/83	1/25/83 to 1/26/83	2/22/83 to 2/25/83
WELL NO.		WATER ELEVATION						
25	570.83	550.76	551.24	551.80	549.97		549.45	549.19
25A	570.97	569.95	569.83	569.68	569.98		570.01	570.08
26	571.38	551.42	551.76	552.78	551.29		550.24	549.90
26A	570.91	566.62	566.81	566.82	566.36		567.30	566.34
27	571.42	552.42	552.95	553.85	553.66		552.41	551.93
27A	571.43	566.33	567.51	567.23	566.73		566.70	566.94
28	569.88	559.05	556.04	556.29	555.93		556.51	556.55
28A	570.02	567.29	567.06	567.06	567.13		567.32	567.31
29	570.46	553.40	554.05	554.46	553.18		552.56	552.44
29A	570.53		-	P L U	G G E D	-		
30	571.48	553.56	554.01	554.17	552.77		552.02	552.15
30A	571.48	567.42	569.22	568.20	569.26		568.82	567.73
31	571.61		-	D E S	T R O Y	E D -		
31A	571.87	569.71	570.02	569.83	569.99		570.32	569.89
32	568.37		-	D E S	T R O Y	E D -		
32A	568.32		-	D E S	T R O Y	E D -		
33A	570.28	--	--	565.42	565.40		565.40	565.44
34	569.68	559.60	559.97	559.91	559.23		558.81	558.62
34A	569.34	565.60	565.75	565.36	565.68		565.30	565.49
35A	569.16	566.94	566.56	566.37	566.06		565.97	566.04
36A	576.82	568.35	567.71	567.35	567.84		567.96	558.89
37A	571.70	570.27	--	569.01	569.17		569.74	569.98
38A	572.09	571.59	571.91	571.69	572.09		frozen	571.56
39A	571.65	570.70	570.46	571.24	Flooded		571.38	571.35
40	571.92	552.57	553.22	554.00	552.31		551.92	551.54
40A	571.69	568.91	566.77	566.61	567.03		567.36	567.15
40B	571.85	562.75	563.08	563.20	562.58		562.35	562.39
41	571.68	550.53	551.44	551.02	550.40		549.95	550.26
41A			-	D E S	T R O Y	E D -		
42A	572.49	--	569.37	569.34	568.17	567.34		567.09
43A	571.90	Buried	--	568.87	568.81	568.64		568.83
44A	572.98	566.01	564.86	565.02	565.80	565.73		566.07
45A	574.47	566.24	566.13	565.74	566.02	566.10		566.02
46A	573.29	567.56	566.96	566.65	567.10	567.00		567.06
47A	574.78	564.64	564.35	563.89	564.53	564.61		564.59
53	571.62	566.79	566.58	566.41	566.19	565.93		566.25
54	570.02	566.55	567.39	567.57	567.74	567.34		567.12
55	571.57	567.83	566.94	566.95	567.53	567.71		567.25
56	571.49	567.10	566.57	566.13	567.46	566.48		566.56
57	571.73	566.96	566.62	566.47	567.95		566.49	566.45
58	569.78	567.29	567.12	567.31	567.58		567.70	567.88
59	569.70	567.03	567.54	567.44	567.70		567.65	568.02
61	570.93		-	W E L L	B E N T	-		
62	571.36	564.77	565.19	565.10	564.67		564.88	564.71
64	570.21*	565.36	565.87	565.05	564.37		564.68	563.66
65	569.20	565.13	565.34	564.26	563.69		frozen	563.12

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
Wells 53 through 137 are overburden installations.

*New top of casing elevation February, 1983.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/29/83 to 3/31/83	5/17/83	7/12/83 to 7/14/83	9/13/83 to 9/15/83	12/19/83 to 12/22/83	4/9/84 to 4/10/84	
WELL NO.		WATER ELEVATION						
25	570.83	549.07	549.69	550.42	550.83	549.60	550.51	
25A	570.97	570.07	569.74	569.00	569.64	570.39	569.89	
26	571.38	549.84	550.42	551.25	551.82	Frozen	552.37	
26A	570.91	567.11	566.65	566.72	566.85	Frozen	567.16	
27	571.42	551.93	552.27	552.63	553.47	552.01	552.32	
27A	571.43	566.89	566.79	567.12	567.69	566.59	566.63	
28	569.88	555.31	554.88	553.46	556.11	555.44	554.88	
28A	570.02	567.56	567.45	567.30	567.33	567.05	567.52	
29	570.46	--	--	553.61	554.24	- P A V E D	O V E R -	
29A	570.53		-	P L U G G E D	-			
30	571.48	551.85	552.44	553.25	553.53	552.40	553.33	
30A	571.48	568.72	567.19	566.60	566.87	567.97	568.33	
31	571.61		-	D E S T R O Y E D	-			
31A	571.87	569.50	--	--	--	--		
32	568.37		-	D E S T R O Y E D	-			
32A	568.32		-	D E S T R O Y E D	-			
33A	570.28	565.64	565.83	565.97	565.34	565.58	565.99	
34	569.68	558.36	--	--	--	--	DESTROYED	
34A	569.34	565.73	--	--	--	--	DESTROYED	
35A	569.16	566.40	565.90	566.13	566.21	Frozen	566.52	
36A	576.82	568.29	568.14	567.82	567.58	568.59	568.41	
37A	571.70	570.32	569.93	567.78	568.75	570.28	570.59	
38A	572.09	571.47	571.19	570.71	571.11	571.79	571.38	
39A	571.65	571.46	571.23	570.98	571.12	Frozen	571.11	
40	571.92	551.24	552.17	552.70	553.14	552.22	551.45	
40A	571.69	567.19	567.23	566.84	566.69	566.94	566.98	
40B	571.85	562.10	561.74	561.51	563.06	562.40	562.51	
41	571.68	550.04	549.69	549.89	550.34	550.10	550.78	
41A			-	D E S T R O Y E D	-			
42A	572.49	569.20	567.67	567.00	567.13	--	569.51	
43A	571.90	569.56	568.83	568.59	568.49	569.58	570.05	
44A	572.98	567.91	566.91	564.56	564.27	567.38	568.69	
45A	574.47	566.37	566.13	565.94	565.85	566.47	566.44	
46A	573.29	567.62	567.15	565.90	566.81	567.69	567.79	
47A	574.78	564.95	564.61	564.30	564.21	565.01	565.10	
53	571.62	567.01	566.14	565.95	565.94	566.90	567.22	
54	570.02	567.49	567.76	567.11	567.22	567.73	567.27	
55	571.57	567.87	567.43	566.97	566.78	Flooded	567.72	
56	571.49	567.82	566.81	566.16	566.31	Frozen	568.07	
57	571.73	568.63	566.79	566.17	566.17	567.88	567.53	
58	569.78	567.98	567.89	567.92	567.73	568.24	568.13	
59	569.70	567.92	567.86	567.76	567.76	Frozen	567.83	
61	570.93		-	W E L L B E N T	-			
62	571.36	564.94	564.81	564.74	564.81	564.86	565.06	
64	570.21*	565.59	564.24	567.23	564.71	- D E S T R O Y E D	-	
65	569.20	565.42	564.69	567.48	565.23	566.63	567.16	

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

Wells 53 through 137 are overburden installations.

*New top of casing elevation February, 1983.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/18/80	6/24/80 to 6/25/80	6/30/80 to 7/1/80	7/15/80 to 7/17/80	7/18/80	7/28/80	8/14/80 to 8/15/80
WELL NO.		WATER ELEVATIONS						
67	571.20				Dry	Dry	Dry	--
68	568.76				566.08	565.88	566.52	567.67
73	569.36				566.28	566.16	567.34	566.98
74	569.32				566.08	566.01	567.39	567.21
75	572.36				565.95	565.74	567.29	567.44
83	568.22				565.19	564.97	567.19	564.53
84	568.80				565.53	565.59	565.74	565.84
89	572.29				564.97	564.92	565.26	565.47
93	572.64				570.29	570.12	570.42	570.21
94	572.32				567.81	567.76	567.82	567.76
95	572.00				565.98	565.98	566.06	566.14
96	575.98				567.14	566.97	568.43	569.37
97	573.25				567.71	566.89	567.94	567.80
98	573.20				569.68	569.51	570.02	569.84
105	572.39				571.16	571.16	571.18	571.27
107	573.31				570.57	570.62	570.46	570.61
109	572.13				568.85	569.05	568.97	568.22
110	572.23				567.55	567.40	568.52	568.22
111	572.28				567.97	567.88	568.30	568.52
112	574.89				568.01	567.91	568.42	568.84
113	571.16				564.79	564.83	565.58	565.97
116	570.61				566.28	565.99	566.33	566.52
117	570.72				566.23	566.17	566.40	566.57
118	571.27				566.50	566.49	566.74	566.72
121	572.30				568.66	568.76	568.66	568.79
122	571.25				Dry	Dry	Dry	Missing
124	570.37				Dry	Dry	561.61	Missing
136	571.70				568.41	568.24	567.92	569.04
137	571.28				567.85	567.72	568.41	568.55
OW 1S-80	579.88	566.13	566.34	566.69	566.69	566.54	566.81	566.54
OW 2S-80	577.36	562.97	563.17	563.42	563.14	563.63	563.09	563.13
OW 3S-80	575.97	563.92	564.30	564.71	564.52	564.52	564.83	564.78
OW 4S-80	574.92	554.38	553.97	553.98	553.97	553.99	553.99	553.97
OW 5S-80	582.49	570.29	568.80	570.12	570.04	569.88	570.06	568.90
OW 6S-80	574.69	565.79	566.40	566.58	566.13	566.05	566.34	566.46
OW 7S-80	582.48	568.81	568.71	568.99	568.93	568.73	568.88	570.06
OW 8S-80	573.04	561.93	562.01	562.10	562.08	561.78	561.93	561.96
OW 9S-80	572.97	563.11	562.77	562.85	562.79	562.78	562.73	562.82
NOTE: Wells OW 1S-80 through OW 9S-80 installed February, 1980.								

Wells OW 1S-80 through OW 9S-80 are overburden installations

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	8/22/80 to 8/25/80	3/11/81 to 3/12/81	5/7/81 to 5/8/81	6/1/81 to 6/3/81	8/12/81 to 8/13/81	12/16/81 to 12/18/81	2/17/82 to 2/23/82
WELL NO.		WATER ELEVATIONS						
67	571.20	Dry	562.58	562.61	562.61	562.64	563.24	563.50
68	568.76	566.60	--	566.00	566.72	566.50	--	566.26
73	569.36	566.73	566.83	566.46	566.99	566.70	566.34	566.53
74	569.32	566.56	566.84	566.87	563.85	566.67	568.13	567.66
75	572.36	566.33	566.87	567.13	567.20	566.82	- WELL BENT -	
83	568.22	564.59	565.01	565.32	565.74	565.78	- DESTROYED -	
84	568.80	565.35	565.93	565.82	566.34	565.82	- DESTROYED -	
89	572.29	565.20	566.02	565.35	565.37	565.37	564.86	564.50
93	572.64	570.06	570.13	570.48	570.52	569.74	568.95	569.23
94	572.32	567.79	568.01	566.28	565.70	564.38	565.49	567.76
95	572.00	565.90	564.40	566.22	565.66	565.62	565.53	566.11
96	575.98	572.37	568.45	568.88	568.14	568.85	568.88	570.17
97	573.25	567.65	566.37	568.88	568.70	568.73	569.48	569.40
98	573.20	565.20	571.05	570.76	571.10	571.00	571.37	571.33
105	572.39	571.29	--	570.47	570.37	571.43	--	MISSING
107	573.31	570.43	--	--	569.21	568.58	570.84	571.15
109	572.13	--	569.16	569.27	569.49	568.94	568.94	569.28
110	572.23	567.91	566.72	567.36	566.03	565.29	565.54	568.12
111	572.28	568.31	568.04	568.33	568.09	568.22	568.05	567.75
112	574.89	568.48	568.42	--	568.44	568.49	- WELL BENT -	
113	571.16	565.99	564.09	568.40	568.70	568.58	568.31	567.80
116	570.61	566.19	565.72	565.80	566.09	565.66	566.05	566.60
117	570.72	566.22	566.52	566.00	566.64	566.07	565.74	566.71
118	571.27	566.54	-	W E L L	B R O K E N	-		
121	572.30	568.62	569.30	569.31	569.37	568.98	568.91	569.49
122	571.25	--	--	--	564.89	569.77	567.31	567.32
124	570.37	--	--	--	561.49	562.97	561.50	Flooded
136	571.70	568.72	568.35	568.51	568.54	568.95	568.16	568.84
137	571.28	568.24	567.91	568.05	568.19	568.38	568.26	568.73
OW 1S-80	579.88	566.43	566.10	564.45	566.32	566.11	566.49	566.45
OW 2S-80	577.36	562.89	563.77	562.87	562.88	562.65	563.03	563.02
OW 3S-80	575.97	564.73	564.28	563.45	563.85	564.16	564.30	563.74
OW 4S-80	574.92	553.97	553.94	553.78	553.78	553.80	553.53	553.67
OW 5S-80	582.49	569.90	570.12	568.06	568.10	569.49	571.04	570.60
OW 6S-80	574.69	566.23	566.86	566.24	566.21	566.25	565.84	565.86
OW 7S-80	582.48	568.93	568.84	568.21	568.21	568.77	569.75	569.34
OW 8S-80	573.04	562.00	562.56	561.83	561.87	561.89	561.65	561.75
OW 9S-80	572.97	562.82	561.02	562.74	562.78	562.63	562.79	562.87

Wells OW 1S-80 through OW 9S-80 are overburden installations

WELL MONITORING PROGRAM
 NIAGARA PLANT
 SPDES Program

Elevations based on Hooker datum.

DATE	WELL CASING ELEV.	6/1/81 to 6/2/81	8/12/81 to 8/13/81	12/16/81 to 12/18/81	2/17/82 to 2/23/82			
WELL NO.		WATER ELEVATION						
150	569.53	563.12	564.30	565.78	566.20			
151	568.36	564.58	564.75	564.42	564.66			
154	572.36	-	W E L L	D E S T R	D Y E D	-		
156	571.15	564.32	564.87	567.98	568.49			
157	571.09	567.32	568.44	567.26	568.01			
158	570.73	565.31	568.91	568.88	568.30			
159	571.39	567.11	566.03	567.40	567.36			
160	571.56	567.34	568.44	568.42	567.75			
165	570.03	Dry	Dry	Dry	Dry			

These wells installed May, 1981.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Project No. 979-626
Well Casings Surveyed
July 15-17, 1980

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	5/11/82 to 5/12/82	8/4/82 to 8/5/82	9/28/82 to 9/29/82	12/20/82 to 12/22/82	1/19/83	1/25/83 to 1/26/83	2/22/83 to 2/25/83
WELL NO.		WATER ELEVATIONS						
67	571.82*	564.26	563.42	563.45	563.51		563.55	564.15
68	569.38*	566.96	565.56	565.38	565.46		564.63	565.64
73	569.36	566.88	566.91	567.24	566.75		--	566.86
74	569.32							
75	572.19*		567.70	567.38	567.73	E D -	566.82	566.46
83	568.22							
84	568.80							
89	572.29	565.28	565.39	565.35	565.34	565.15		565.27
93	572.64	568.00	570.30	569.76	569.95		570.04	570.06
94	572.32	569.98	568.04	567.36	567.87		567.62	567.37
95	572.00	565.99	565.83	565.79	565.66		565.78	565.68
96	575.98	568.38	568.74	569.65	569.52		569.43	568.46
97	573.25	569.27	569.36	569.50	569.67		569.29	569.54
98	573.20	571.03	571.61	570.83	571.00		570.76	570.97
105	572.39							
107	573.31	570.80	570.20	570.44	571.66	P A V E D O V E R -	571.31	571.28
109	572.13	569.78	569.39	569.20	569.23		569.38	569.66
110	572.23	566.01	565.53	565.89	567.38		567.48	567.43
111	572.28	568.18	568.41	568.59	568.08		567.97	567.49
112	574.89							
113	571.16	567.74	567.49	566.49	566.13	W E L L B E N T -	567.77	566.93
116	570.61	566.31	565.44	566.23	566.76		566.39	566.55
117	570.72	566.95	566.59	566.34	566.55		566.71	566.91
118	571.27							
121	572.30	569.03	569.17	568.17	569.29	D E S T R O Y E D -	568.67	568.77
122	571.25	566.38	567.08	565.83	566.07		Plugged	564.92
124	570.37	561.52	562.60	561.46	561.99		561.36	561.59
136	571.70	568.77	568.78	568.92	568.64		568.59	568.52
137	571.28	568.35	567.89	568.16	568.41		568.57	568.25
150	569.53	566.05	565.86	565.85	566.00		566.02	566.09
151	568.36	564.86	565.49	565.33	565.00		564.95	564.87
154	572.36							
156	571.15	568.88	568.94	570.07	570.21	D E S T R O Y E D -	570.23	570.35
157	571.09	567.24	568.25	567.93	567.94		567.72	567.29
158	570.73	568.22	568.47	567.47	567.39		568.55	568.17
159	571.39	567.17	567.20	567.65	567.84		567.76	567.62
160	571.56	568.29	566.86	566.36	567.07		568.71	568.64
165	570.03	565.44	564.73	Dry	Dry		Plugged	--

Wells OW 1S-80 through OW 9S-80 are overburden installations
*New top of casing elevation February, 1983.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/29/83 to 3/28/83	5/17/83	7/12/83 to 7/14/83	9/13/83 to 9/15/83	12/19/83 to 12/22/83	4/9/84 to 4/10/84	
WELL NO.		WATER ELEVATIONS						
67	571.82*	564.16	564.18	564.13	564.14	564.17	564.28	
68	569.38*	566.60	--	--	--	--	DESTROYED	
73	569.36	567.31	566.53	566.36	566.42	566.82	566.82	
74	569.32		-	D E S	T R O Y	E D -		
75	572.19*	565.16	565.94	565.38	565.82	566.59	566.87	
83	568.22		-	D E S	T R O Y	E D -		
84	568.80		-	D E S	T R O Y	E D -		
89	572.29	565.85	565.44	565.34	565.26	565.59	565.85	
93	572.64	570.60	569.66	568.89	569.34	--	570.14	
94	572.32	568.21	567.33	566.87	567.12	567.52	567.99	
95	572.00	566.23	565.38	565.38	565.59	565.96	566.18	
96	575.98	569.81	567.80	567.32	567.70	569.68	569.57	
97	573.25	569.79	569.11	568.91	569.62	569.62	569.65	
98	573.20	571.21	570.79	570.95	571.48	Frozen	571.13	
105	572.39		-	P A V	E D O	V E R		
107	573.31	571.29	571.31	571.31	571.32	571.47	571.44	
109	572.13	569.56	570.20	570.27	570.01	570.98	570.04	
110	572.23	567.42	567.30	567.63	567.73	568.64	567.07	
111	572.28	568.59	568.07	568.03	567.96	568.13	568.46	
112	574.89		-	D E S T R O Y E D				
113	571.16	567.07	566.96	566.85	566.11	Frozen	568.45	
116	570.61	566.75	566.15	566.12	565.67	566.13	566.19	
117	570.72	567.07	566.73	566.63	566.24	565.72	565.20	
118	571.27		-	D E S	T R O Y	E D -		
121	572.30	569.41	569.12	568.94	568.83	569.36	571.39	
122	571.25	568.06	566.04	566.73	565.64	568.23	568.71	
124	570.37	562.61	562.28	562.06	561.92	Flooded	562.54	
136	571.70	569.20	568.46	568.45	568.37	Plugged	569.28	
137	571.28	568.98	568.65	568.45	568.05	Frozen	--	
150	569.53	566.07	566.10	566.18	566.36	566.84	567.53	
151	568.36	565.24	564.97	565.16	565.33	565.38	565.61	
154	572.36		-	D E S	T R O Y	E D -		
156	571.15	570.44	570.51	570.53	570.62	570.73	570.64	
157	571.09	568.29	567.29	568.79	567.78	Frozen	568.25	
158	570.73	568.41	568.61	568.07	568.83	568.98	569.13	
159	571.39	568.27	567.53	567.63	567.73	Frozen	--	
160	571.56	568.16	568.22	567.73	568.45	Frozen	568.98	
165	570.03	Dry	--	--	--	--	DESTROYED	

Wells OW 1S-80 through OW 9S-80 are overburden installations
*New top of casing elevation February, 1983.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	10/11/79 to 10/15/79	10/16/79 to 10/18/79	11/6/79 to 11/8/79	11/13/79 to 11/14/79	11/20/79 to 11/27/79	1/29/80 to 1/31/80	2/5/80 to 2/7/80
WELL NO.		WATER ELEVATION						
CW 1	570.56	560.85	561.48	560.80	560.77	562.13	559.88	--
CW 1A	569.40	--	562.88	562.51	562.53	562.57	563.06	562.92
CW 1B	569.71	562.84	563.02	562.65	562.67	562.75	563.12	563.01
CW 2A	570.03	565.84	565.96	565.56	565.66	565.54	565.78	566.62
CW 3A	570.75	567.56	567.06	567.09	567.06	567.20	566.29	566.00
CW 4A	570.62	--	566.59	566.28	566.34	566.43	565.89	565.61
CW 5	575.63	561.70	561.73	561.07	560.72	562.08	560.10	560.82
CW 6	574.85	561.67	561.28	560.78	560.67	562.11	560.12	560.75
CW 6A	574.95	--	565.35	565.00	565.10	565.11	565.43	565.26
CW 6B	574.36	565.47	565.67	565.49	565.51	565.42	565.43	565.30
CW 7	570.19	561.45	561.19	560.55	560.30	561.23	559.96	560.59
CW 7A	570.13	569.52	569.52	569.47	570.23	569.38	568.77	568.37
CW 8A	576.77	563.42	563.51	563.28	563.38	563.33	563.55	563.49
CW 9	571.68	561.59	561.30	560.69	560.58	562.03	560.05	560.68
CW 9A	571.76	567.64	567.66	567.41	567.75	567.93	567.05	566.75
CW 10	576.43	563.09	563.13	560.79	560.68	562.11	559.57	559.75
CW 10A	576.42	561.70	561.18	562.90	562.89	563.06	563.74	562.63
CW 11	574.23	561.63	561.73	561.06	560.70	561.93	560.13	560.71
CW 11A	573.92	570.10	565.64	565.18	565.59	565.64	566.62	566.42
CW 13	572.97	--	561.26	560.73	560.62	561.95	560.08	560.67
CW 13A	572.73	--	565.08	564.56	565.07	564.82	566.22	565.87
SP 1A	571.36	557.68	556.85	556.13	556.31	556.52	556.02	556.02
SP 2A	572.94	562.04	562.17	561.68	561.75	561.30	561.98	561.95
SP 3A	573.34	-	H O S	P H O	R O U	-		
SP 4A	573.25	562.18	563.15	561.85	561.91	563.29	562.00	562.29
SP 5	568.68	554.30	554.32	552.17	552.12	553.74	551.43	551.57
SP 5A	568.29	554.41	554.39	552.33	552.25	553.90	551.50	551.77
SP 6	568.01	554.61	554.57	552.55	552.46	554.15	551.69	552.04
SP 6A	567.61	554.56	554.55	552.51	552.43	554.11	551.70	551.96
SP 7	572.64	561.83	561.93	560.45	560.42	561.98	560.09	560.49
SP 7A	572.54	560.68	560.76	561.60	561.60	563.35	561.77	562.24
SP 8	569.56	560.88	560.95	560.63	560.60	562.15	560.16	560.64
SP 8A	570.00	561.27	561.36	561.43	561.41	562.76	561.78	562.33
SP 9	573.55							
SP 9A	573.30							

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
SP 9 and SP 9A installed August, 1980.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	3/18/80	6/24/80 to 6/25/80	6/30/80 to 7/1/80	7/15/80 to 7/17/80	7/18/80	7/28/80	8/14/80 to 8/15/80
WELL NO.		WATER ELEVATION						
CW 1	570.56	--	561.04	560.69	561.38	560.80	560.95	560.88
CW 1A	569.40	--	562.77	562.69	562.70	562.61	562.59	562.66
CW 1B	569.71	562.71	562.89	562.81	562.72	562.70	562.70	562.77
CW 2A	570.03	--	565.69	565.63	565.46	565.38	565.46	565.54
CW 3A	570.75	--	567.20	567.23	566.72	566.64	567.22	567.34
CW 4A	570.62	566.43	566.19	566.20	565.82	565.69	565.99	566.20
CW 5	575.63	559.41	560.79	558.88	561.37	560.97	560.96	561.01
CW 6	574.85	559.92	560.82	560.88	561.35	560.90	561.03	561.11
CW 6A	574.95	565.01	565.34	565.31	565.22	565.26	565.23	565.26
CW 6B	574.36	565.03	566.15	565.44	565.27	565.20	565.68	565.73
CW 7	570.19	559.78	560.62	560.64	561.07	560.72	560.74	560.76
CW 7A	570.13	569.54	568.67	568.69	569.68	568.94	569.37	569.38
CW 8A	576.77	563.42	563.36	563.28	563.30	563.21	563.24	563.30
CW 9	571.68	559.90	560.77	560.77	561.23	561.36	561.00	561.14
CW 9A	571.76	566.73	566.92	566.81	561.58	566.54	566.94	567.08
CW 10	576.43	559.94	560.85	560.84	561.37	560.92	560.93	561.81
CW 10A	576.42	563.68	563.10	562.99	562.87	562.80	562.91	562.92
CW 11	574.23	559.87	560.71	560.79	561.24	561.10	--	561.36
CW 11A	573.92	--	564.56	564.49	564.46	564.37	565.50	564.94
CW 13	572.97	--	560.79	560.80	561.21	560.98	561.01	561.10
CW 13A	572.73	--	564.62	564.07	563.87	563.81	--	--
SP 1A	571.36	--	556.52	556.34	557.30	556.33	--	556.69
SP 2A	572.94	--	561.99	561.91	561.98	561.97	562.09	562.19
SP 3A	573.34	- P	H O S	P H O	H O U S	-	--	562.44
SP 4A	573.25	--	561.77	562.30	--	--	--	562.44
SP 5	568.68	--	552.41	552.49	552.62	552.50	553.05	553.44
SP 5A	568.29	--	552.52	552.68	552.84	552.66	553.46	553.59
SP 6	568.01	551.17	552.75	551.88	553.03	552.88	553.37	553.77
SP 6A	567.61	551.12	552.71	552.84	552.96	552.82	553.36	553.83
SP 7	572.64	559.75	560.73	560.69	560.86	560.63	560.82	561.13
SP 7A	572.54	561.32	561.90	561.95	562.01	561.85	561.75	561.95
SP 8	569.56	--	560.97	560.85	561.05	560.81	560.96	561.24
SP 8A	570.00	561.53	561.35	561.37	560.98	561.35	562.72	562.17
SP 9	573.55							560.98
SP 9A	573.30							562.36

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
SP 9 and SP 9A installed August, 1980.

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	8/22/80 to 8/25/80	3/11/81 to 3/12/81	5/7/81 to 5/8/81	6/1/81 to 6/3/81	8/12/81 to 8/13/81	12/16/81 to 12/18/81	2/17/82 to 2/23/82
WELL NO.		WATER ELEVATION						
CW 1	570.56	561.35	560.62				--	--
CW 1A	569.40	562.59	565.42				562.39	563.11
CW 1B	569.71	563.20	563.41				562.48	563.03
CW 2A	570.03	565.50	566.25				565.34	566.12
CW 3A	570.75	566.84	567.35				566.87	567.00
CW 4A	570.62	565.59	566.89				566.17	566.59
CW 5	575.63	561.45	560.69				559.97	560.64
CW 6	574.85	561.22	560.70				559.96	560.44
CW 6A	574.95	565.04	--				565.08	565.03
CW 6B	574.36	565.20	566.99				565.26	566.08
CW 7	570.19	561.05	560.51				559.84	560.26
CW 7A	570.13	568.44	569.16				564.40	569.83
CW 8A	576.77	563.19	563.80				563.11	563.80
CW 9	571.68	561.17	--				559.87	560.27
CW 9A	571.76	566.64	--				567.45	566.95
CW 10	576.43	561.20	560.73				559.98	560.35
CW 10A	576.42	563.02	563.61				562.62	563.76
CW 11	574.23	561.58	561.01				560.31	560.46
CW 11A	573.92	566.17	566.93				565.57	566.15
CW 13	572.97	561.19	560.81				559.91	560.31
CW 13A	572.73	563.98	566.21				565.79	566.54
SP 1A	571.36	556.66	556.14	556.56	556.43	556.63	557.34	557.17
SP 2A	572.94	562.18	562.02	562.21	562.43	562.37	561.57	562.04
SP 3A	573.34	-	H O S	P H O	R O U	S -		
SP 4A	573.25	562.37	562.14	562.21	562.43	562.42	562.23	562.08
SP 5	568.68	553.63	551.08	552.75	553.11	552.73	550.95	551.93
SP 5A	568.29	553.67	551.41	552.65	553.37	552.92	550.15	Frozen
SP 6	568.01	553.94	552.01	552.86	553.48	553.05	551.24	551.18
SP 6A	567.61	554.11	551.58	552.63	553.65	553.13	551.28	552.08
SP 7	572.64	561.14	560.09	560.46	562.35	560.76	560.00	560.23
SP 7A	572.54	562.01	561.92	561.90	560.95	562.50	561.35	561.42
SP 8	569.56	561.38	560.53	560.64	561.28	561.70	560.13	560.37
SP 8A	570.00	562.14	562.59	562.23	562.42	563.02	563.59	563.08
SP 9	573.55	560.89	560.01	560.09	560.78	562.15	560.36	560.56
SP 9A	573.30	562.74	WELL FLOODED			563.38	565.62	566.55

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

WELL MONITORING PROGRAM
NIAGARA PLANT
SPDES Program

Elevations based on Hooker datum

DATE	WELL CASING ELEV.	5/11/82 to 5/12/82	8/4/82 to 8/5/82	9/28/82 to 9/29/82	12/20/82 to 12/22/82			
WELL NO.		WATER ELEVATION						
CW 1	570.56	561.05	561.61	561.42	560.69			
CW 1A	569.40	563.27	563.70	562.38	562.73			
CW 1B	569.71	563.42	562.87	562.53	562.85			
CW 2A	570.03	565.94	565.38	565.42	565.60			
CW 3A	570.75	567.25	567.08	567.11	567.34			
CW 4A	570.62	566.23	565.20	565.62	566.58			
CW 5	575.63	561.69	561.39	561.29	561.01			
CW 6	574.85	561.59	561.35	561.36	560.75			
CW 6A	574.95	565.47	564.77	564.29	565.07			
CW 6B	574.36	565.98	565.10	564.60	564.43			
CW 7	570.19	561.14	561.29	561.21	560.83			
CW 7A	570.13	569.13	568.26	569.23	569.42			
CW 8A	576.77	563.68	563.25	562.93	563.44			
CW 9	571.68	561.52	561.34	561.28	560.73			
CW 9A	571.76	567.37	566.38	565.64	567.95			
CW 10	576.43	561.62	561.43	561.29	560.79			
CW 10A	576.42	563.73	562.91	562.56	562.91			
CW 11	574.23	561.26	561.39	561.44	560.88			
CW 11A	573.92	566.28	563.85	563.89	565.95			
CW 13	572.97	562.21	561.30	561.30	560.76			
CW 13A	572.73	565.82	565.04	--	568.23			
SP 1A	571.36	556.62	556.66	556.90	557.31			
SP 2A	572.94	562.01	562.58	562.45	562.09			
SP 3A	573.34	-	P H O S	P H O	R O U			
SP 4A	573.25	562.32	562.45	562.64	562.72			
SP 5	568.68	553.08	553.68	554.01	552.21			
SP 5A	568.29	Flooded	554.00	554.48	552.42			
SP 6	568.01	553.49	554.07	554.59	552.55			
SP 6A	567.61	553.45	554.11	554.49	552.51			
SP 7	572.64	560.50	561.37	562.17	560.29			
SP 7A	572.54	561.77	562.06	561.40	561.44			
SP 8	569.56	560.99	561.56	561.37	560.28			
SP 8A	570.00	562.73	562.24	561.91	561.57			
SP 9	573.55	560.73	560.80	561.02	560.77			
SP 9A	573.30	564.73	567.85	567.63	561.87			
OW 1S-80	579.88	566.56	567.04	566.65	566.93			
OW 2S-80	577.36	563.34	562.85	562.37	562.58			
OW 3S-80	575.97	563.78	564.28	564.53	564.52			
OW 4S-80	574.92	569.21	565.29	565.20	565.39			
OW 5S-80	582.49	570.15	570.48	570.65	570.96			
OW 6S-80	574.69	566.31	566.20	566.19	566.38			
OW 7S-80	582.48	569.30	569.50	569.36	570.01			
OW 8S-80	573.04	562.12	561.78	561.44	561.85			
OW 9S-80	572.97	562.86	562.87	562.90	562.94			

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
Wells OW 1S-80 through OW 9S-80 are overburden installations.

Project No. 979-626
Well Casings Surveyed
July 15-17, 1980

WELL MONITORING PROGRAM
NIAGARA PLANT

Elevation based on Hooker datum.

DATE	WELL CASING ELEV.	1/25/83 to 1/26/83	2/22/83 to 2/25/83	3/29/83 to 3/31/83	5/17/83	7/12/83 to 7/14/83	9/13/83 to 9/15/83	12/19/83 to 12/22/83
WELL NO.		WATER ELEVATION						
SP 1A	571.36	556.99	556.58	556.67	556.56	556.53	556.74	557.46
SP 2A	572.94	561.61	561.57	561.90	562.23	562.35	562.21	562.54
SP 3A	573.34		-	P H O S	P H O	R O U	S	
SP 4A	573.25	562.36	561.89	561.94	561.99	561.96	562.01	562.43
SP 5	568.68	551.38	551.10	550.77	552.16	553.01	554.01	551.67
SP 5A	568.29	551.60	551.40	551.10	552.31	553.35	554.21	551.93
SP 6	568.01	551.80	551.56	551.26	552.46	553.43	554.33	552.06
SP 6A	567.61	551.76	551.52	556.22	552.51	553.46	554.34	552.07
SP 7	572.64	559.97	560.02	560.09	560.55	560.91	561.12	561.76
SP 7A	572.54	561.27	561.44	561.24	561.75	562.26	561.59	561.71
SP 8	569.56	560.05	560.15	560.93	560.53	561.39	561.03	560.64
SP 8A	570.00	561.90	561.86	562.02	562.51	562.41	562.15	562.75
SP 9	573.55	562.18	562.65	559.61	562.41	563.38	562.41	561.35
SP 9A	573.30	559.49	559.50	565.18	559.78	560.45	560.88	564.34

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

Project No. -979-626
Well Casings Surveyed
July 15-17, 1980
(B- Wells Jan. 24, 1983)

WELL MONITORING PROGRAM
NIAGARA PLANT

Elevation based on Hooker datum.

DATE	WELL CASING ELEV.	1/19/83	2/22/83 to 2/25/83	3/29/83 to 3/31/83	5/17/83	7/12/83 to 7/14/83	9/13/83 to 9/15/83	12/19/83 to 12/22/83
WELL NO.		WATER ELEVATION						
CW 1	570.56	560.22	560.35	560.11	560.77	561.60	561.11	560.78
CW 1A	569.40	562.73	559.39	563.04	563.10	562.17	562.49	562.44
CW 1B	569.71	562.87	562.85	563.23	563.31	562.86	562.67	564.05
CW 2A	570.03	565.79	565.65	566.32	566.03	565.28	565.00	566.53
CW 3A	570.75	566.83	567.53	568.39	567.08	566.47	566.52	567.30
CW 4A	570.62	566.04	566.22	567.29	566.26	565.34	565.11	567.08
CW 5	575.63	560.39	560.41	560.44	560.78	560.92	561.34	560.23
CW 6	574.85	560.36	560.34	560.39	560.87	561.42	561.25	560.05
CW 6A	574.95	565.24	565.06	565.73	565.72	564.79	564.45	566.48
CW 6B	574.36	565.09	565.17	565.77	565.89	566.07	565.42	566.10
CW 7	570.19	560.24	560.21	560.29	560.82	561.16	561.17	560.03
CW 7A	570.13	569.21	569.36	569.45	569.00	568.16	568.37	569.29
CW 8A	576.77	563.43	563.41	563.97	563.65	563.18	563.09	564.44
CW 9	571.68	560.30	560.31	560.36	560.81	561.31	561.20	560.08
CW 9A	571.76	567.41	567.59	568.79	567.75	566.60	566.24	567.32
CW 10	576.43	560.38	560.33	560.39	560.85	561.37	561.25	560.05
CW 10A	576.42	563.00	563.07	563.66	563.38	562.86	562.61	564.01
CW 11	574.23	560.30	560.31	560.40	560.87	565.01	561.21	560.11
CW 11A	573.92	565.66	565.72	567.77	566.26	560.97	564.44	567.89
CW 13	572.97	560.30	560.27	560.33	560.87	561.30	561.11	560.18
CW 13A	572.73	564.87	565.36	567.03	565.49	565.70	565.99	568.14
B-1	575.60	562.35	562.36	562.57	562.69	562.43	562.31	562.87
B-2	575.83	562.64	562.60	562.97	562.96	562.50	562.36	563.59
B-3	571.59	561.61	561.91	561.91	562.06	562.09	562.23	562.61
B-4	574.02	561.24	561.30	561.80	562.01	562.13	562.07	562.52
B-5	576.18	569.22	569.49	571.43	569.10	565.04	563.48	570.89
B-6	574.68	562.24	562.22	562.43	562.65	562.41	562.28	562.76
B-7	575.47	562.32	561.66	561.97	562.37	561.89	561.77	562.13
B-8	573.92	561.82	561.66	561.63	561.76	561.67	562.21	562.53
B-9	571.63	564.35	564.52	564.86	564.46	Buried	--	--
B-10	575.92	559.93	560.89	561.38	561.97	561.90	561.06	559.77
B-11	575.77	569.31	569.38	571.09	568.45	566.02	565.21	570.54
B-12	576.62	562.68	562.77	--	562.94	562.56	562.44	563.33
OW 1S-80	579.88	566.95	567.50	567.07	567.41	567.49	567.10	567.84
OW 2S-80	577.36	562.83	563.01	562.69	562.95	562.70	562.42	563.61
OW 3S-80	575.97	564.51	564.29	564.08	563.93	564.12	564.44	564.83
OW 4S-80	574.92	565.23	564.63	564.95	564.87	564.82	564.60	565.18
OW 5S-80	582.49	571.06	571.24	567.75	570.54	570.83	570.97	571.57
OW 6S-80	574.69	567.11	566.03	566.87	566.33	565.97	566.08	566.89
OW 7S-80	582.48	569.87	570.11	569.67	569.83	569.96	569.81	570.04
OW 8S-80	573.04	561.51	561.96	561.98	562.13	561.91	561.67	562.49
OW 9S-80	572.97	562.98	562.95	562.94	562.96	562.95	563.00	563.07

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
Wells OW 1S-80 through OW 9S-80 are overburden installations.

Project No. 979-626
 Well Casings Surveyed
 July 15-17, 1980
 (B- Wells Jan. 24, 1983)

WELL MONITORING PROGRAM
 NIAGARA PLANT

Elevation based on Hooker datum.

DATE	WELL CASING ELEV.	4/9/84 to 4/10/84						
WELL NO.		WATER ELEVATION						
CW 1	570.56	560.88						
CW 1A	569.40	564.07						
CW 1B	569.71	564.21						
CW 2A	570.03	566.94						
CW 3A	570.75	567.66						
CW 4A	570.62	567.47						
CW 5	575.63	560.87						
CW 6	574.85	560.90						
CW 6A	574.95	566.96						
CW 6B	574.36	566.36						
CW 7	570.19	560.77						
CW 7A	570.13	569.43						
CW 8A	576.77	564.69						
CW 9	571.68	560.83						
CW 9A	571.76	568.75						
CW 10	576.43	560.87						
CW 10A	576.42	564.49						
CW 11	574.23	560.71						
CW 11A	573.92	568.50						
CW 13	572.97	560.86						
CW 13A	572.73	569.54						
B-1	575.60	563.18						
B-2	575.83	563.65						
B-3	571.59	562.29						
B-4	574.02							
B-5	576.18	571.14						
B-6	574.68	563.08						
B-7	575.47	561.98						
B-8	573.92	562.24						
B-9	571.63							
B-10	575.92	560.59						
B-11	575.77	570.69						
B-12	576.62	564.68						
OW 1S-80	579.88	566.88						
OW 2S-80	577.36	563.42						
OW 3S-80	575.97	564.25						
OW 4S-80	574.92	565.26						
OW 5S-80	582.49	568.79						
OW 6S-80	574.69	567.12						
OW 7S-80	582.48	569.73						
OW 8S-80	573.04	562.48						
OW 9S-80	572.97	563.03						

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).
 Wells OW 1S-80 through OW 9S-80 are overburden installations.

Project No. 979-626
Well Casings Surveyed
July 15-17, 1980

WELL MONITORING PROGRAM
NIAGARA PLANT

Elevation based on Hooker datum.

DATE	WELL CASING ELEV.	4/9/84 to 4/10/84						
WELL NO.		WATER ELEVATION						
SP 1A	571.36	557.42	P H O S P H O R O U S -					
SP 2A	572.94	562.32						
SP 3A	573.34							
SP 4A	573.25	562.29						
SP 5	568.68	552.50						
SP 5A	568.29	552.75						
SP 6	568.01	552.92						
SP 6A	567.61	553.82						
SP 7	572.64	560.79						
SP 7A	572.54	562.11						
SP 8	569.56	560.80						
SP 8A	570.00	562.58						
SP 9	573.55	558.59						
SP 9A	573.30	560.30						

A, B = Overburden Installation (i.e. 20 = bedrock well, 20A = overburden well).

APPENDIX J

BEDROCK GROUTING IN THE VICINITY OF S-AREA LANDFILL,

PASNY PROJECT

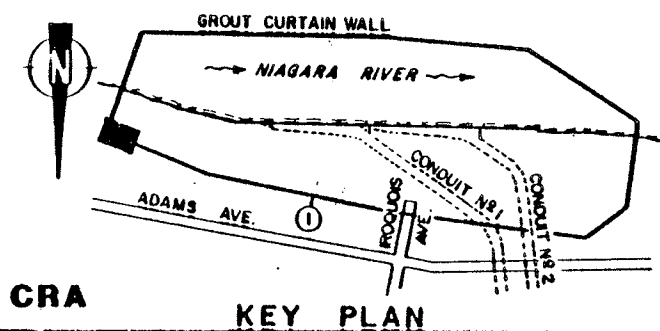
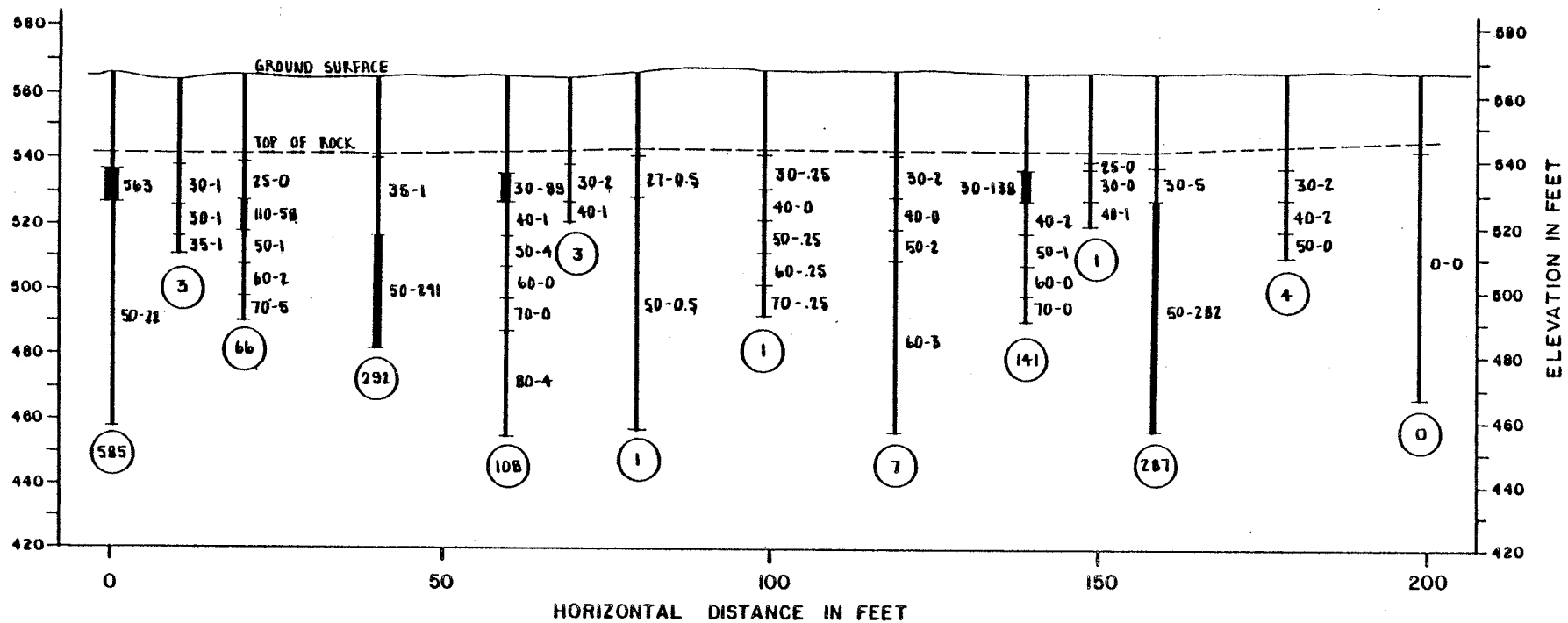
BY CONESTOGA-ROVERS & ASSOCIATES LIMITED - MAY 30, 1983

BEDROCK GROUTING IN THE VICINITY OF
S-AREA LANDFILL
PASNY PROJECT

Prepared for:
Wald, Harkrader & Ross
May 30, 1983

1.0 INTRODUCTION

The enclosed report describes the grouting program undertaken at the Niagara Plant site during the construction of the PASNY project.



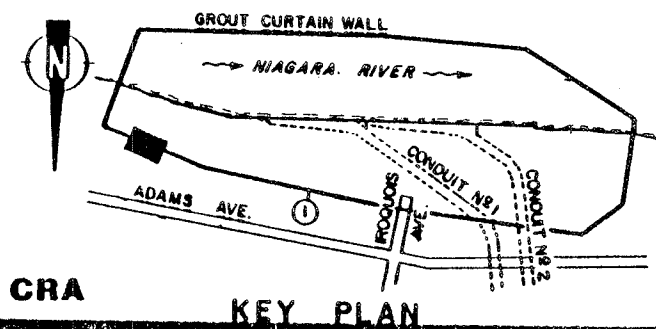
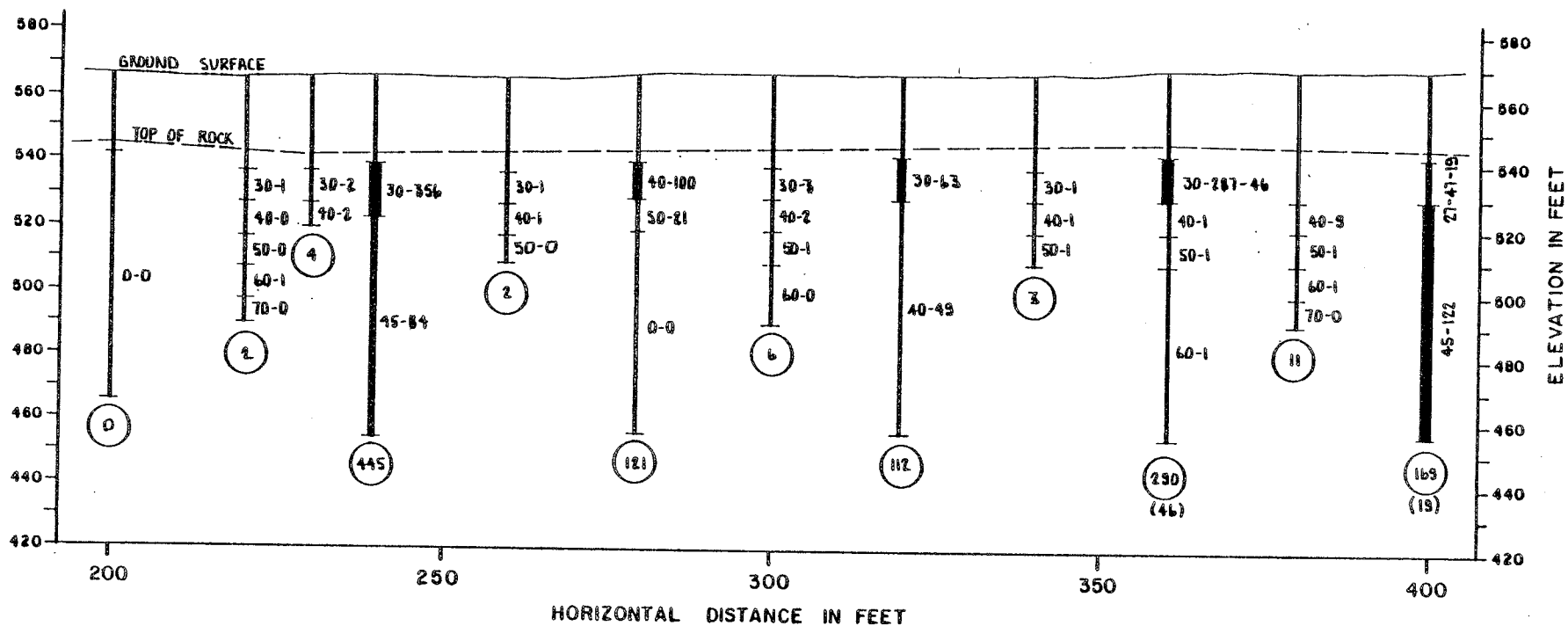
LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

figure 1

GROUTING

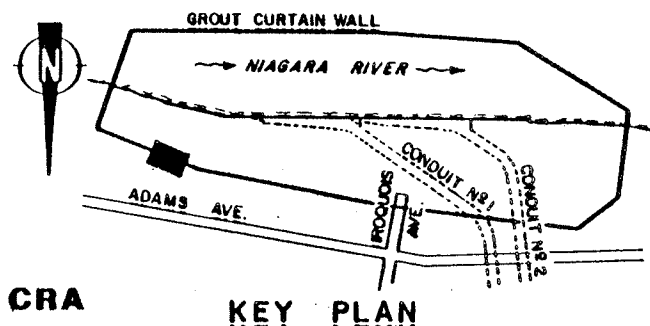
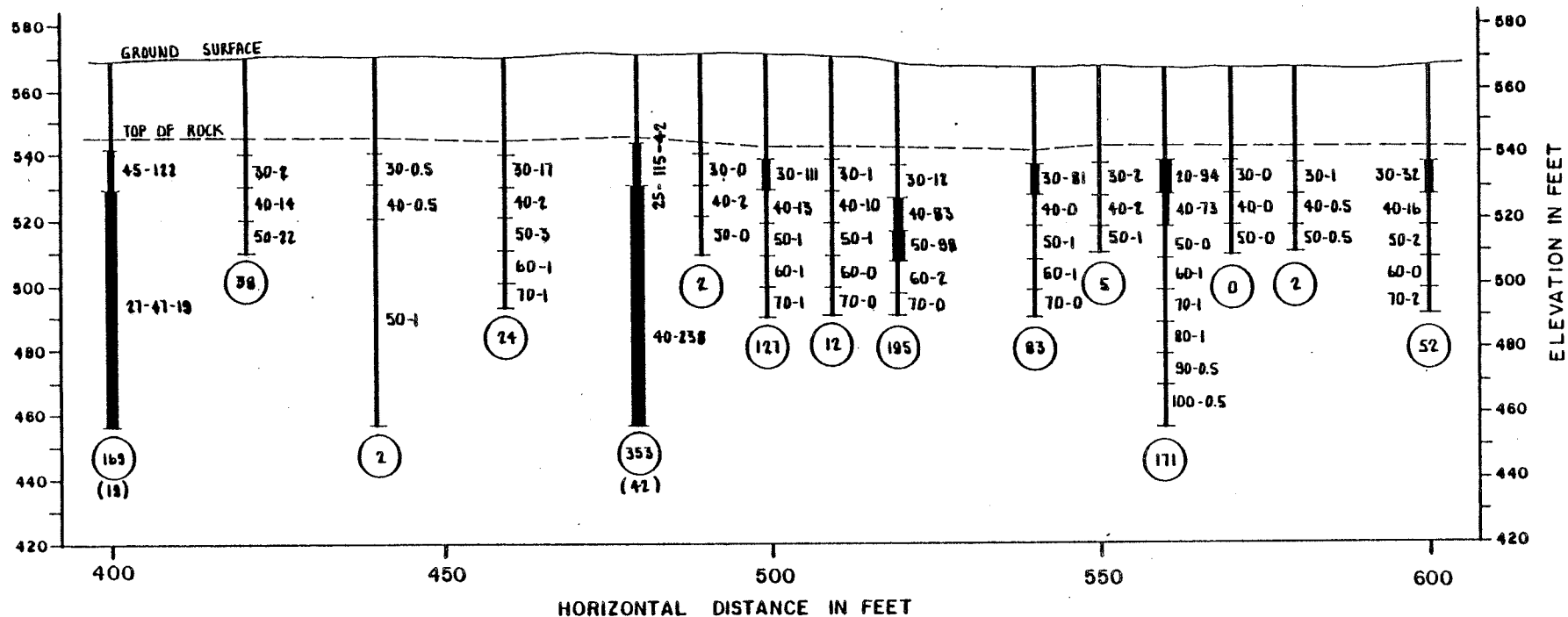
GROUT CURTAIN WALL



LEGEND

- 70-110-5 SAND USED - cu. ft.
- SACKS CEMENT -
- PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USE - cu. ft.

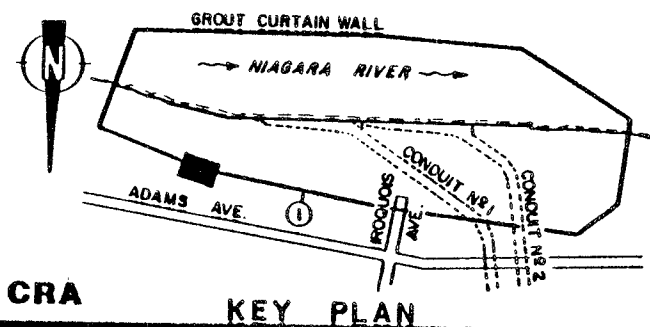
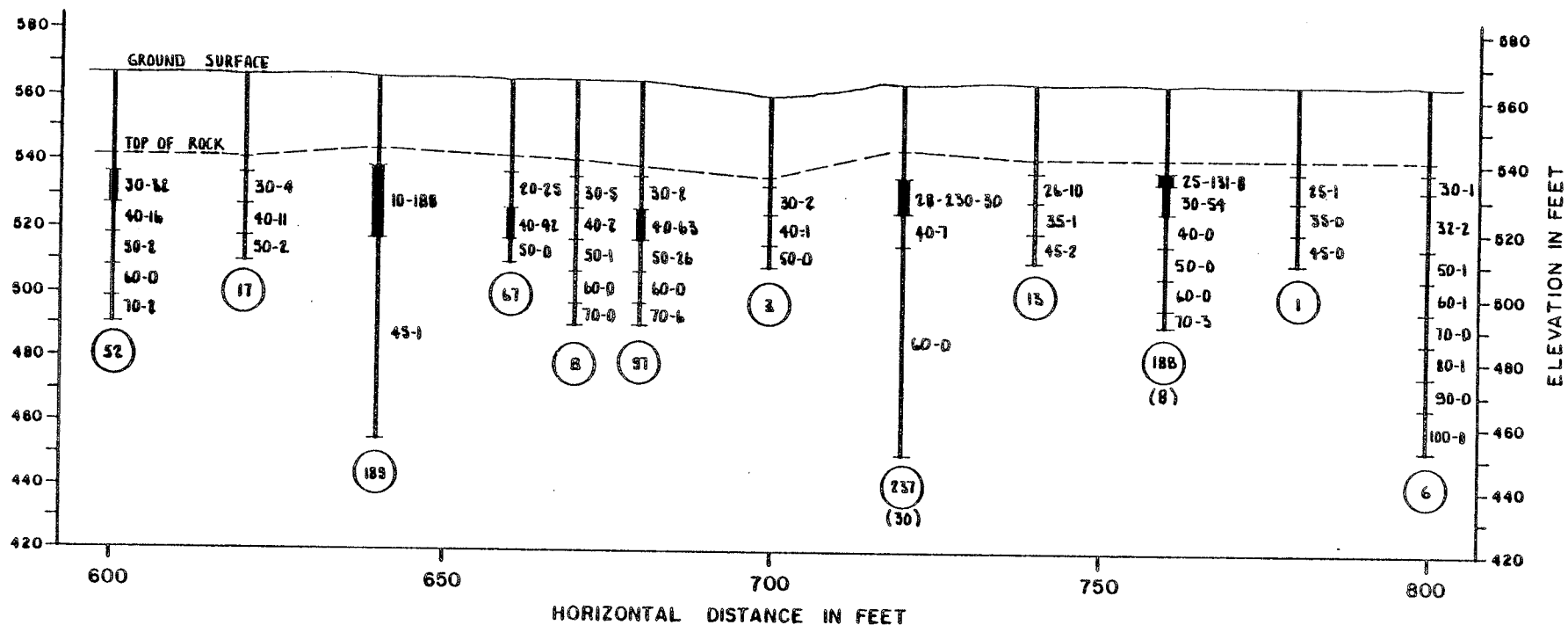
figure 2
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

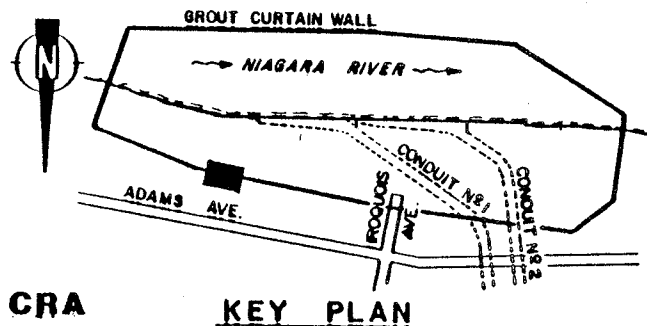
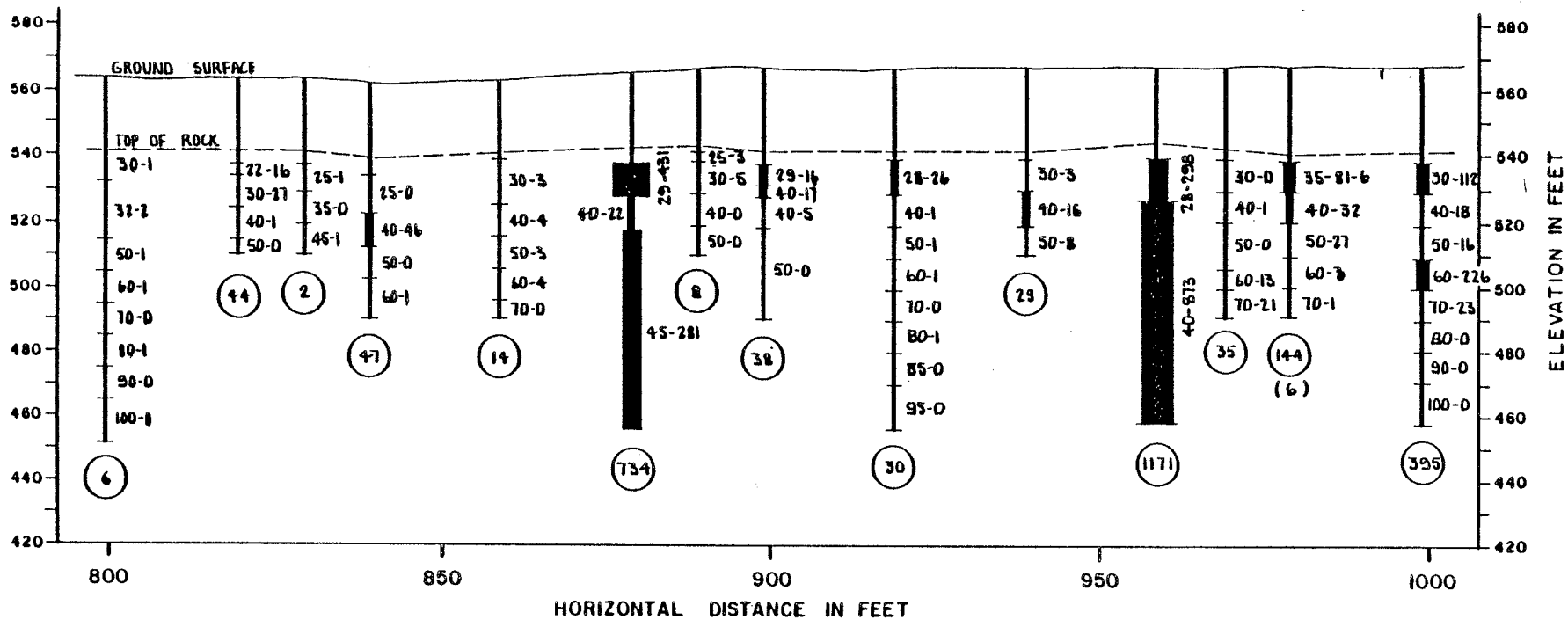
figure 3
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (167) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

figure 4
 GROUTING
 GROUT CURTAIN WALL

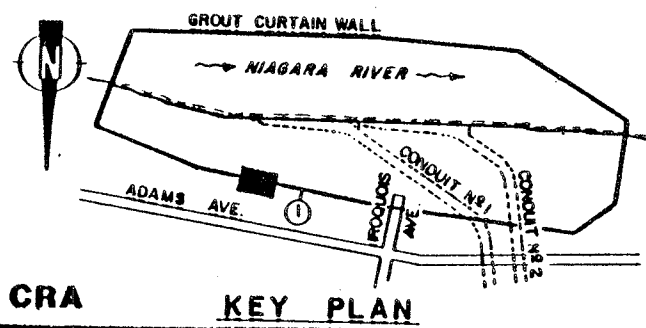
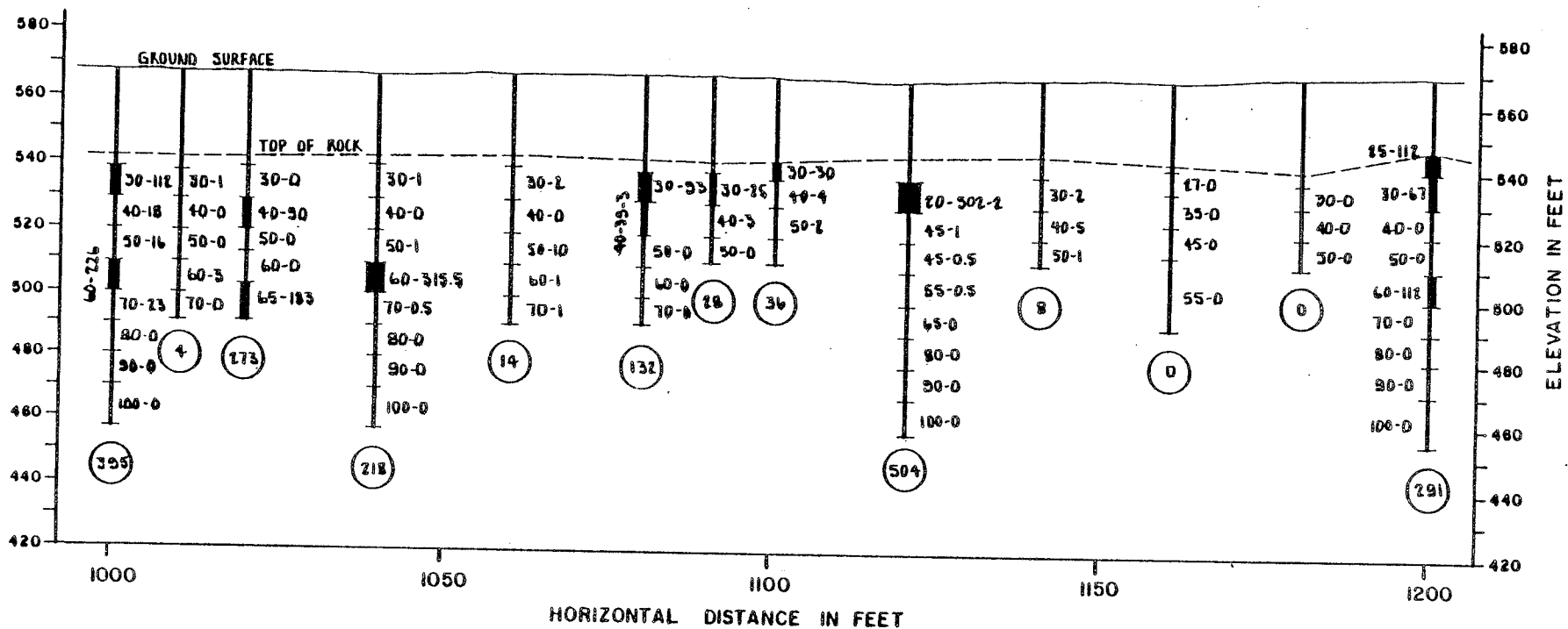


LEGEND

70-110-5
 SAND USED - cu. ft.
 SACKS CEMENT
 PRESSURE - p.s.i.

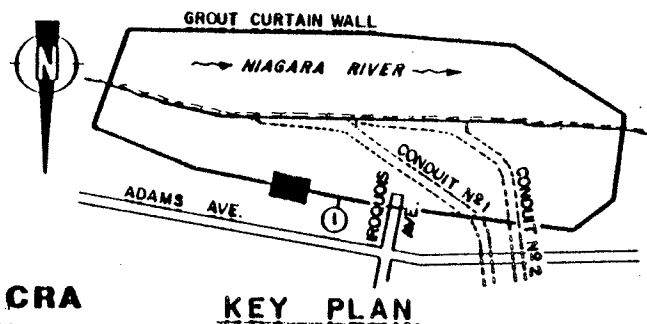
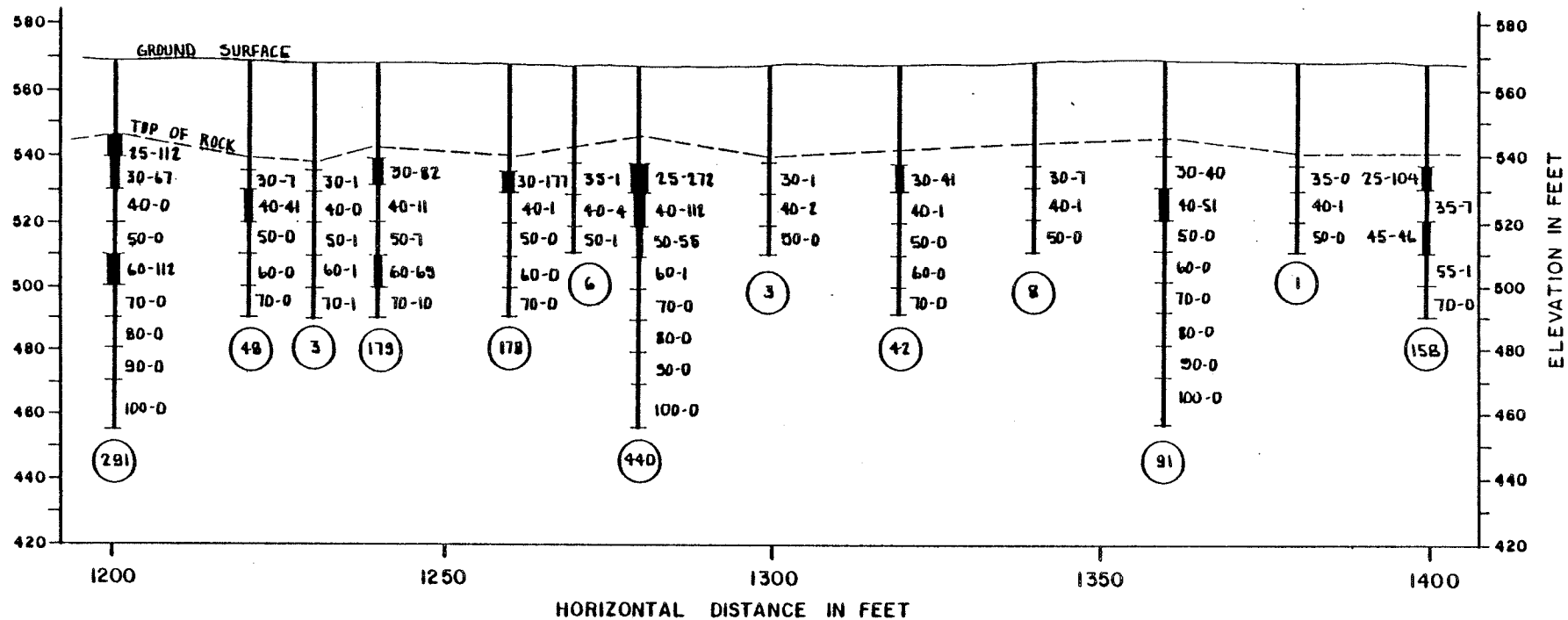
(III) TOTAL SACKS CEMENT USED
 (5) TOTAL SAND USED - cu. ft.

figure 5
 GROUTING
 GROUT CURTAIN WALL



- LEGEND**
- 70-110-5 SAND USED - cu. ft.
 - SACKS CEMENT
 - PRESSURE - p.s.i.
 - (126) TOTAL SACKS CEMENT USED
 - (5) TOTAL SAND USED - cu. ft.

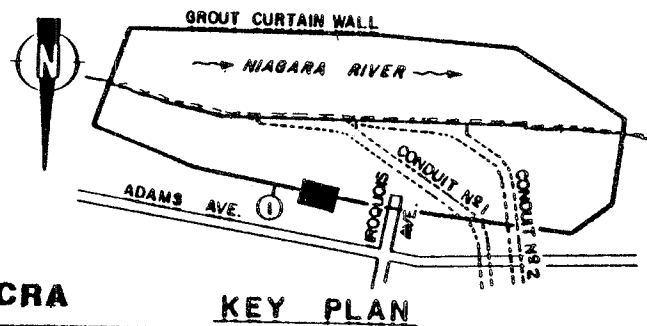
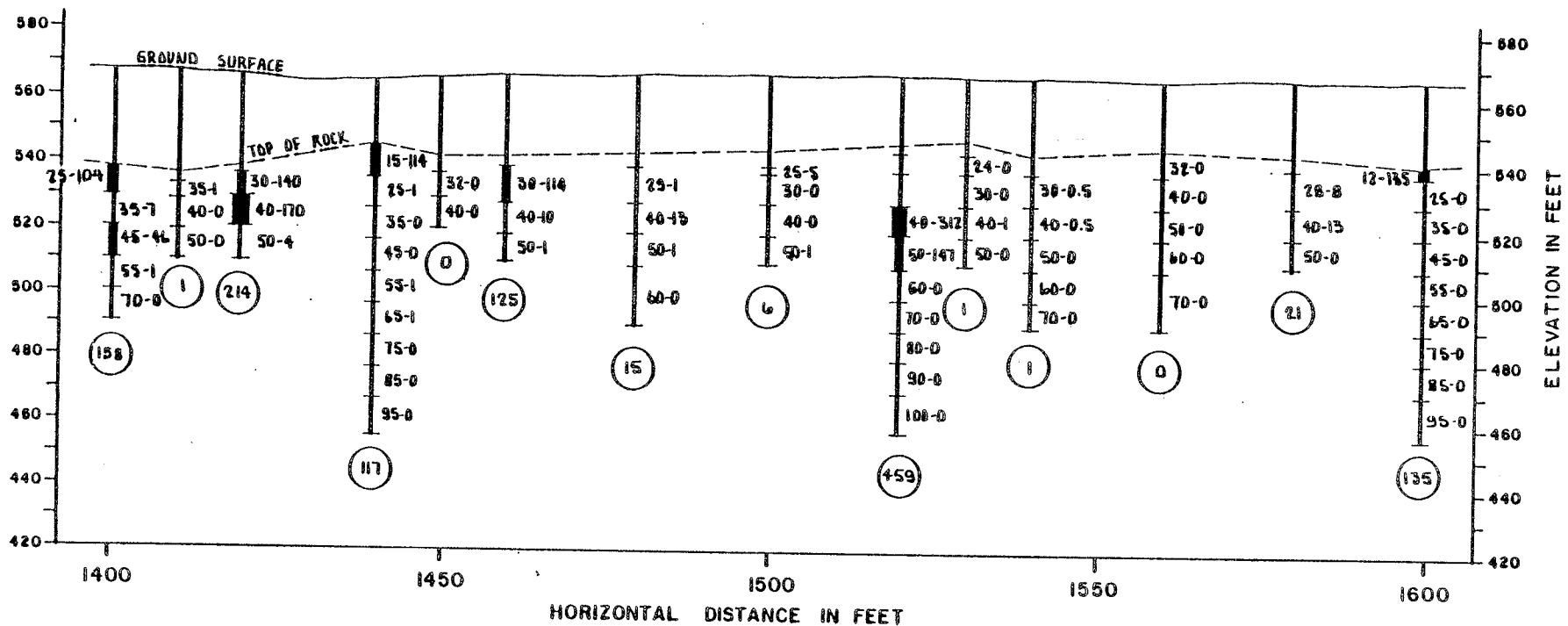
figure 6
 GROUTING
 GROUT CURTAIN WALL



LEGEND

- 70-110-5 SAND USED - cu. ft.
- SACK CEMENT
- PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

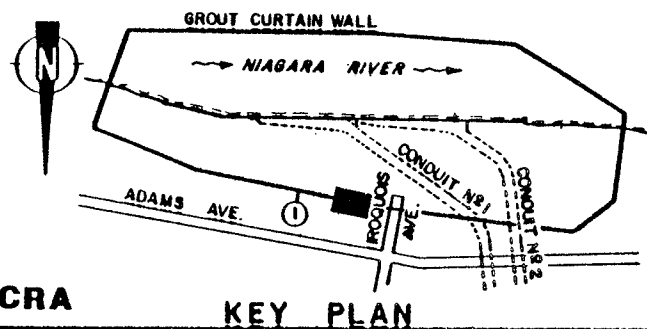
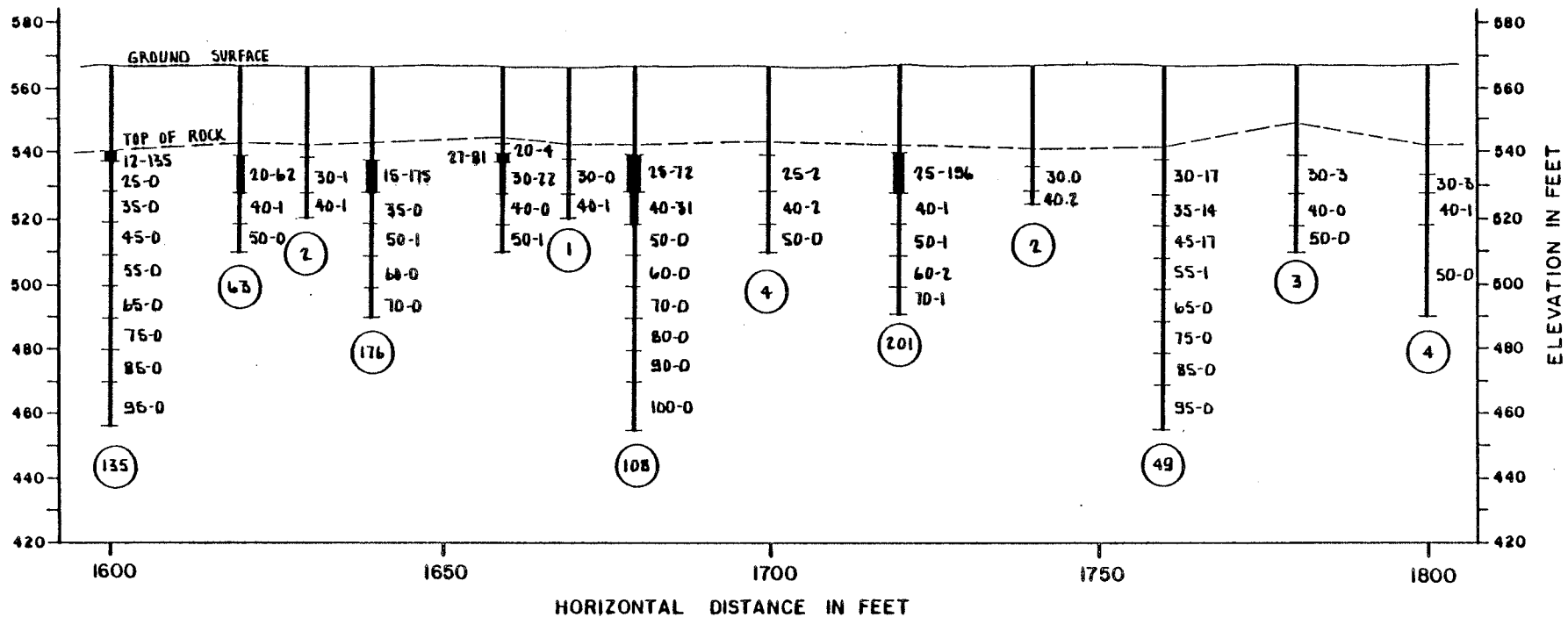
figure 7
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5 SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (116) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

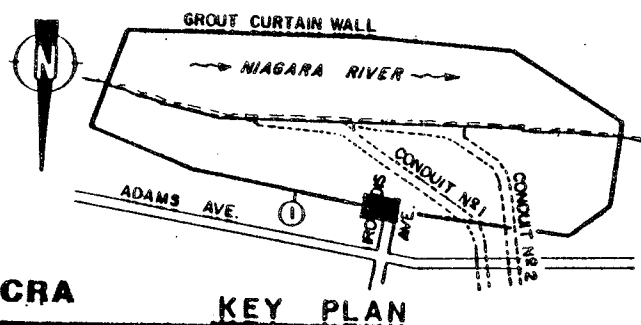
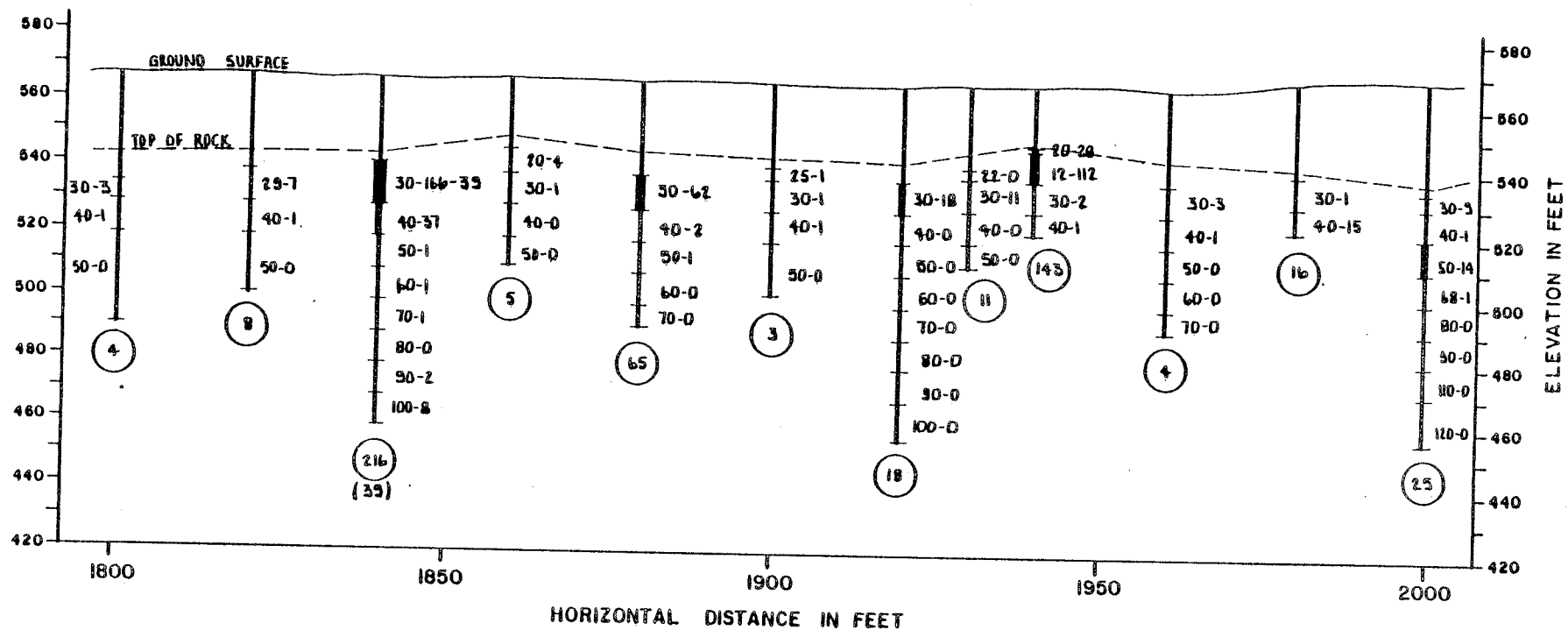
figure 8
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (115) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

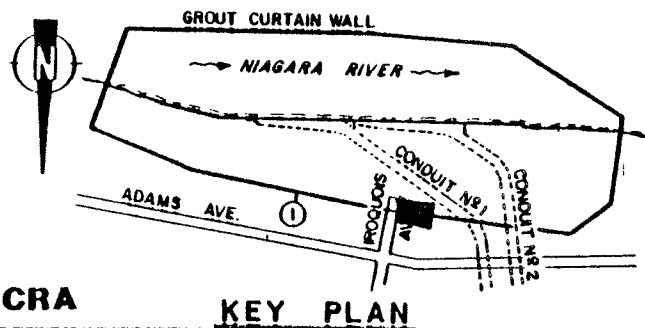
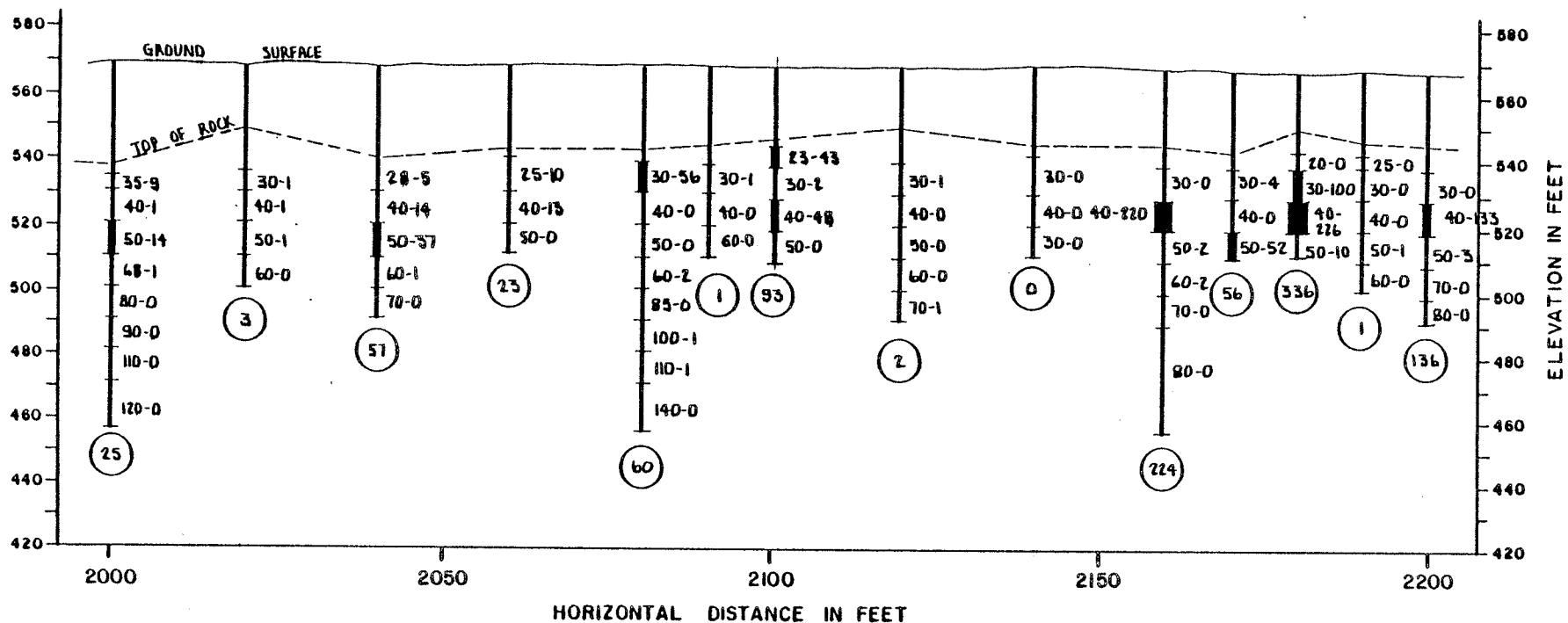
figure 9
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

figure 10
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
 - SACKS CEMENT
 - PRESSURE - p.s.i.
- (110) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

figure 11
GROUTING
GROUT CURTAIN WALL

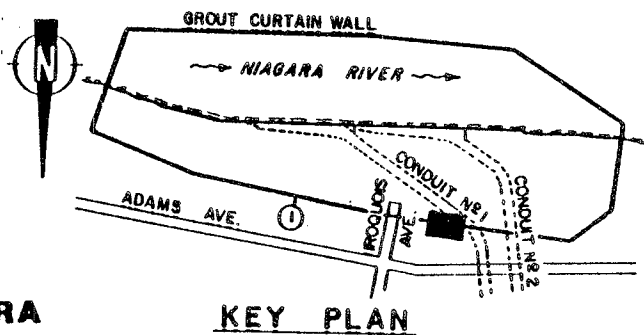
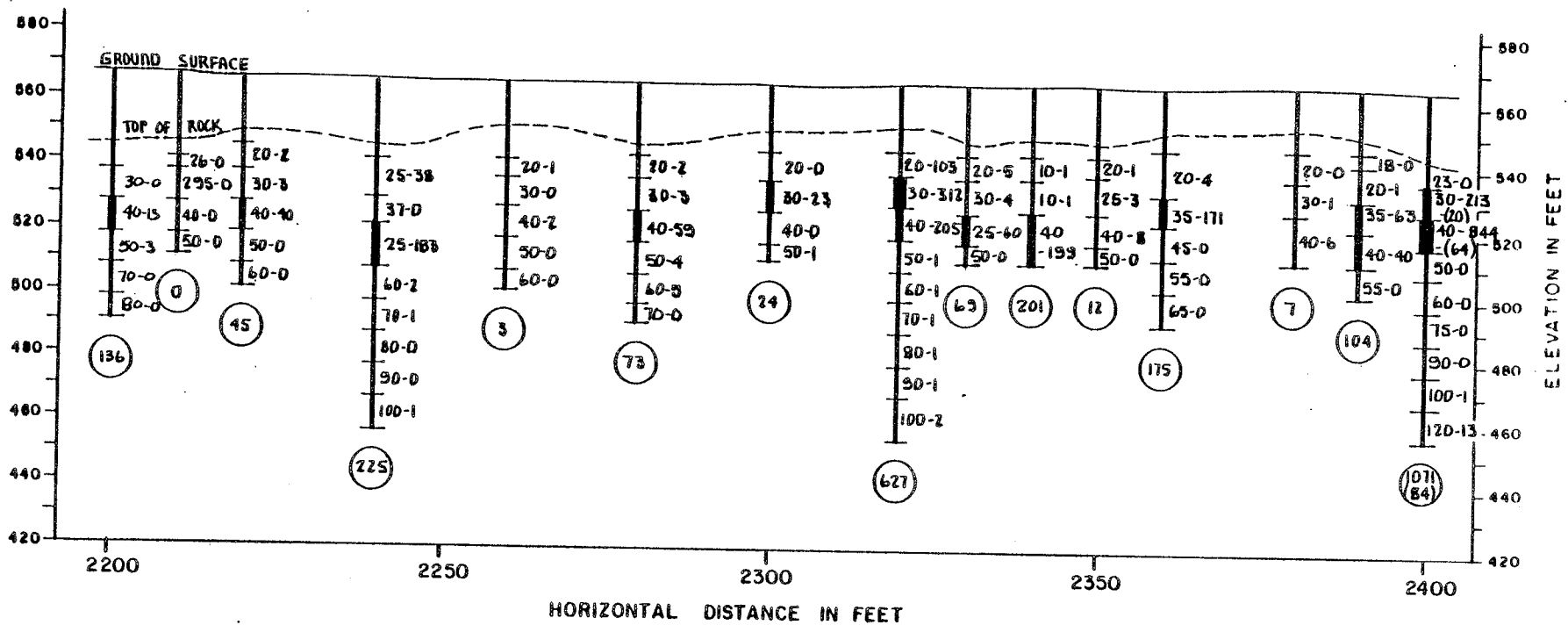


figure 12
GROUTING
GROUT CURTAIN WALL

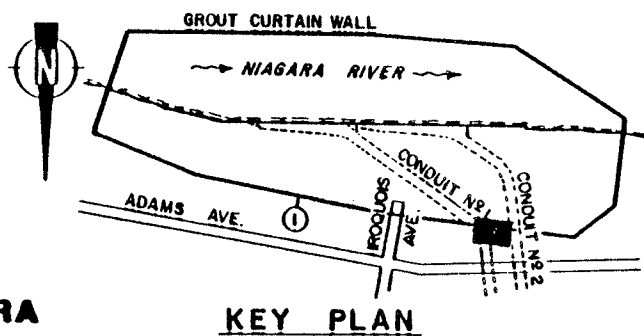
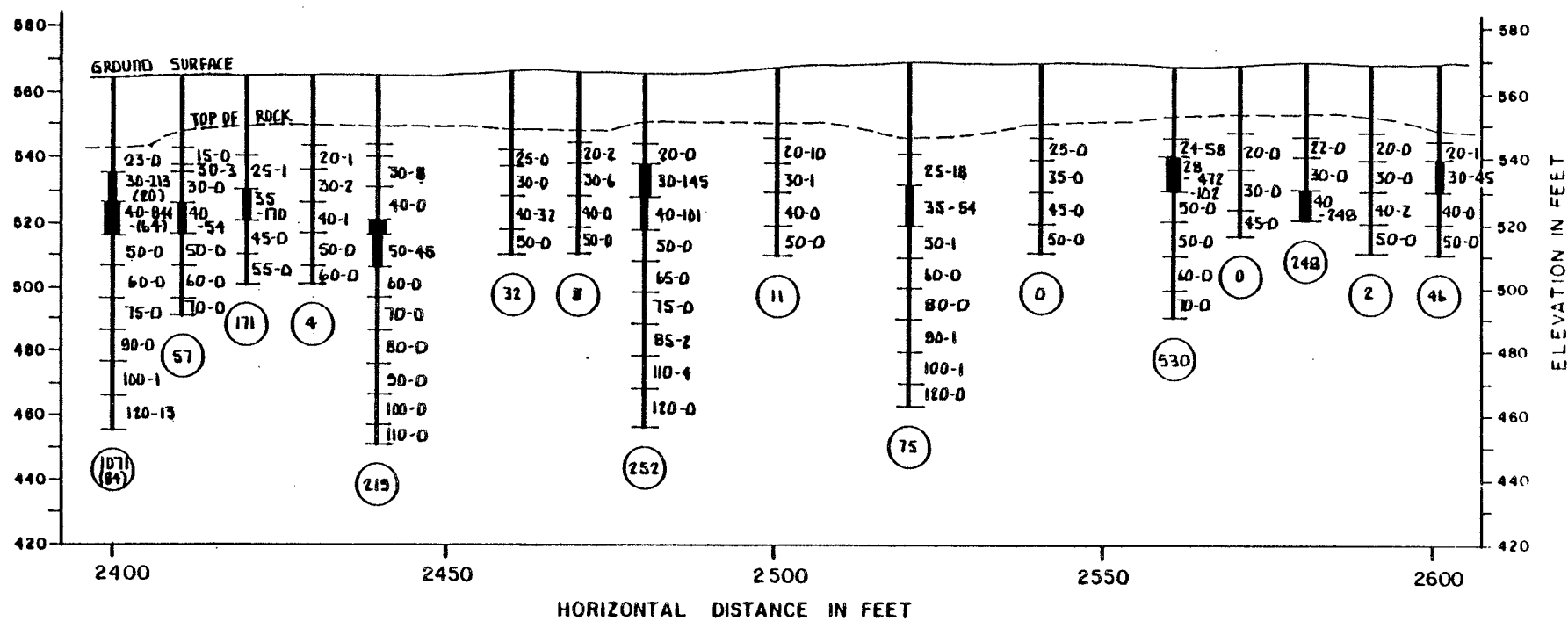


figure 13
GROUTING
GROUT CURTAIN WALL

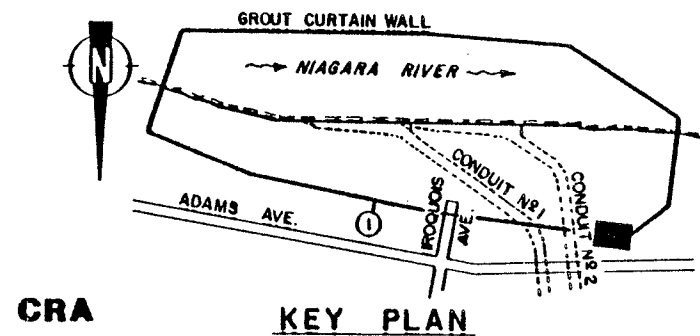
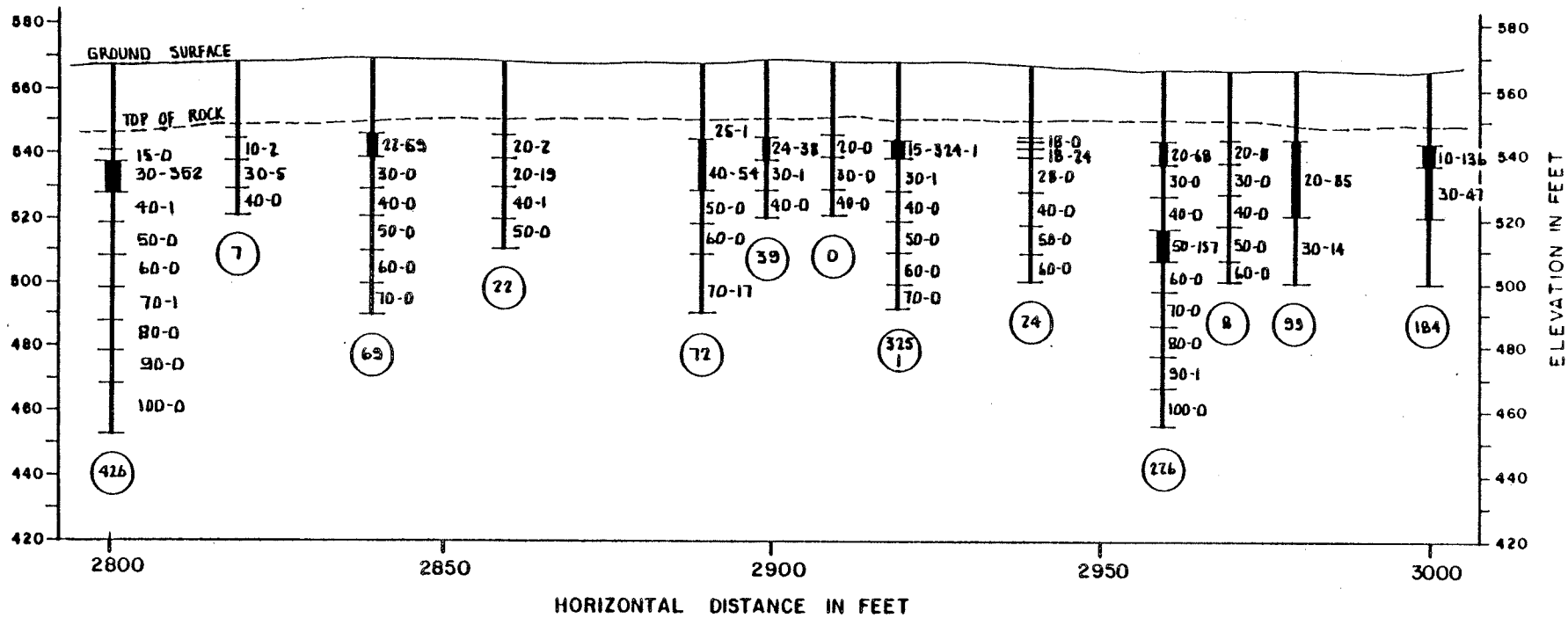


figure 15
GROUTING
GROUT CURTAIN WALL

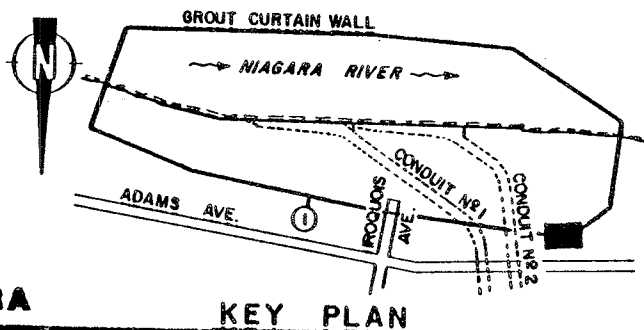
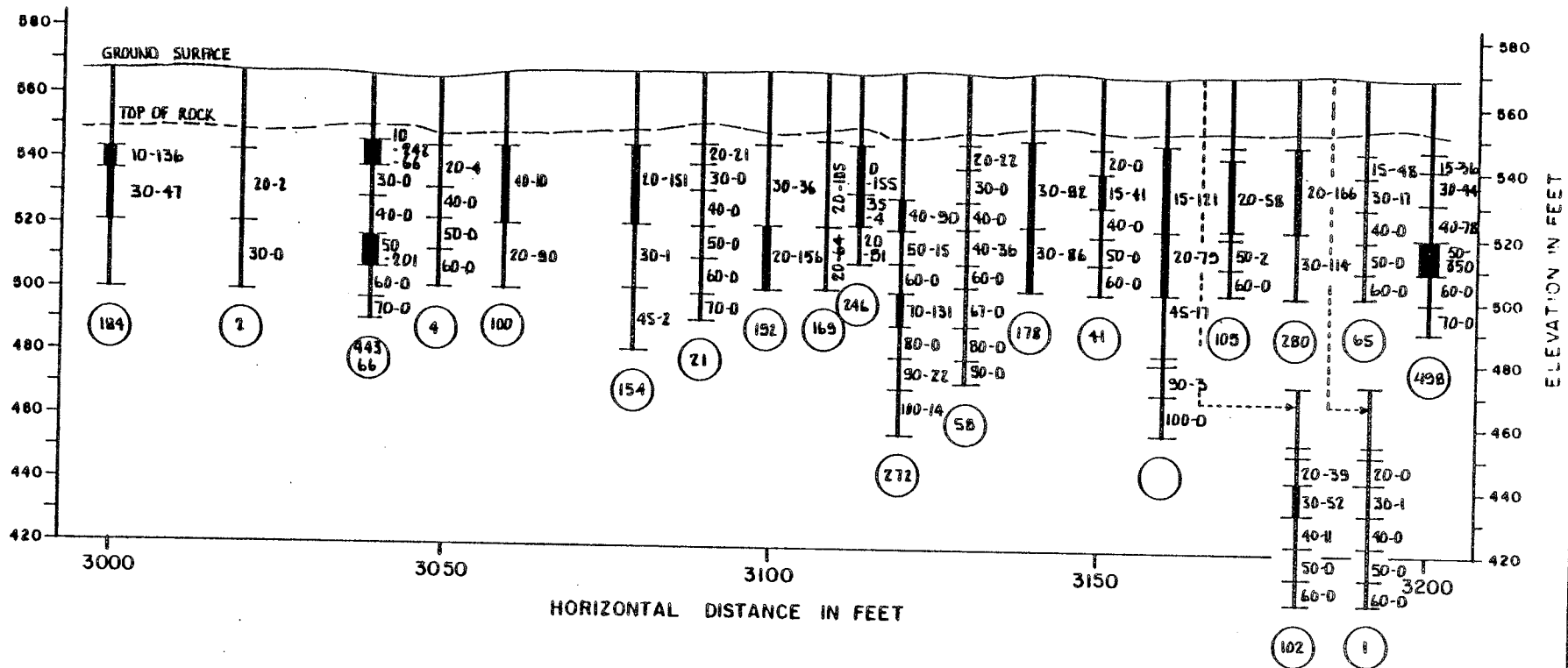


figure 16
GRROUTING
GRROUT CURTAIN WALL

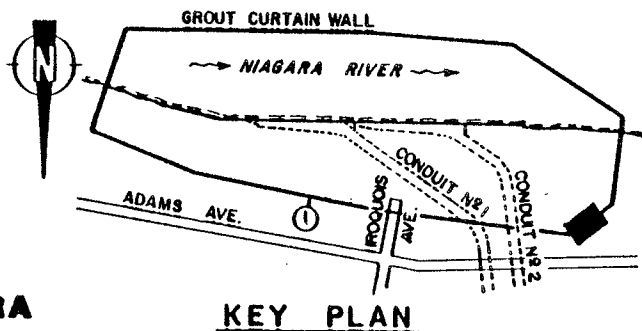
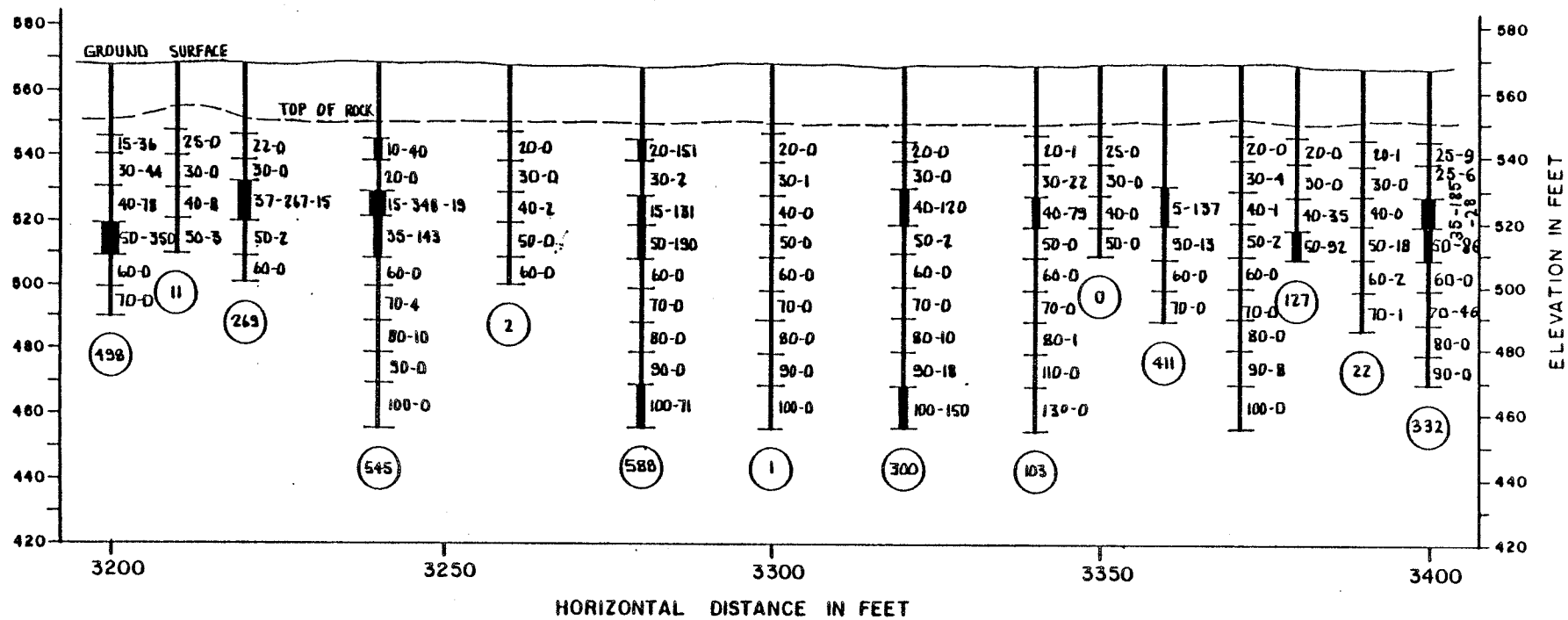
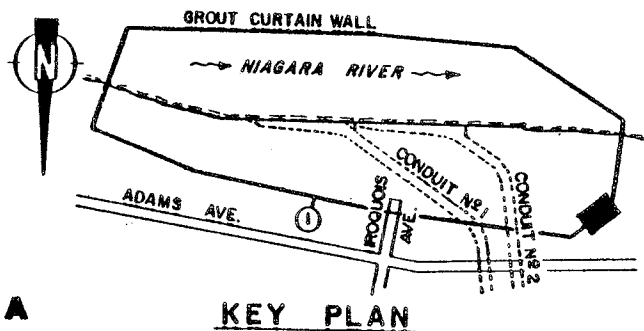
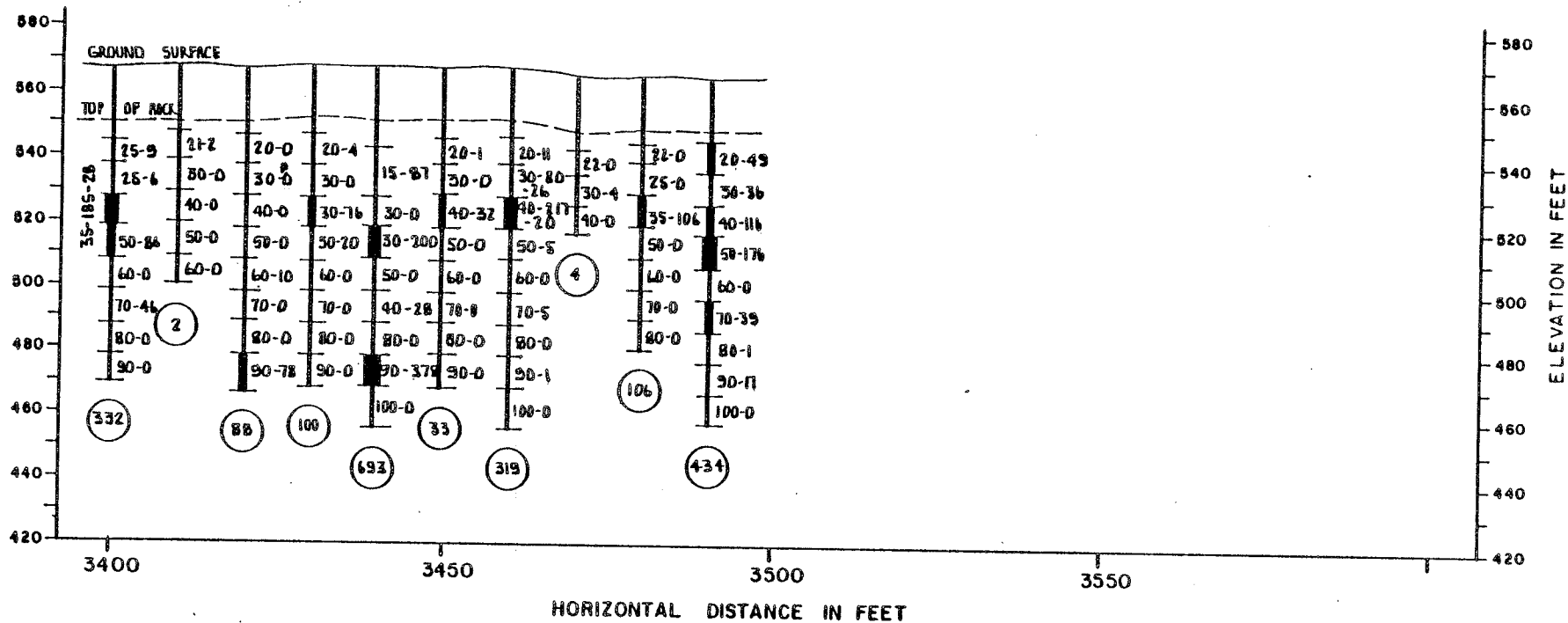
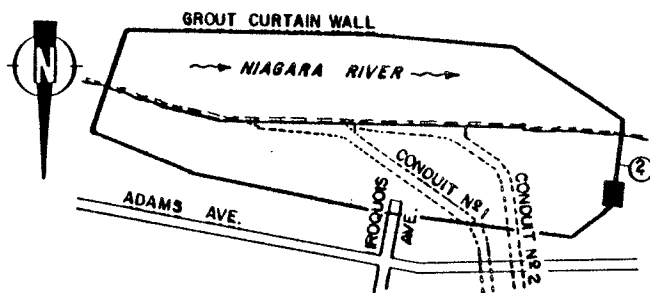


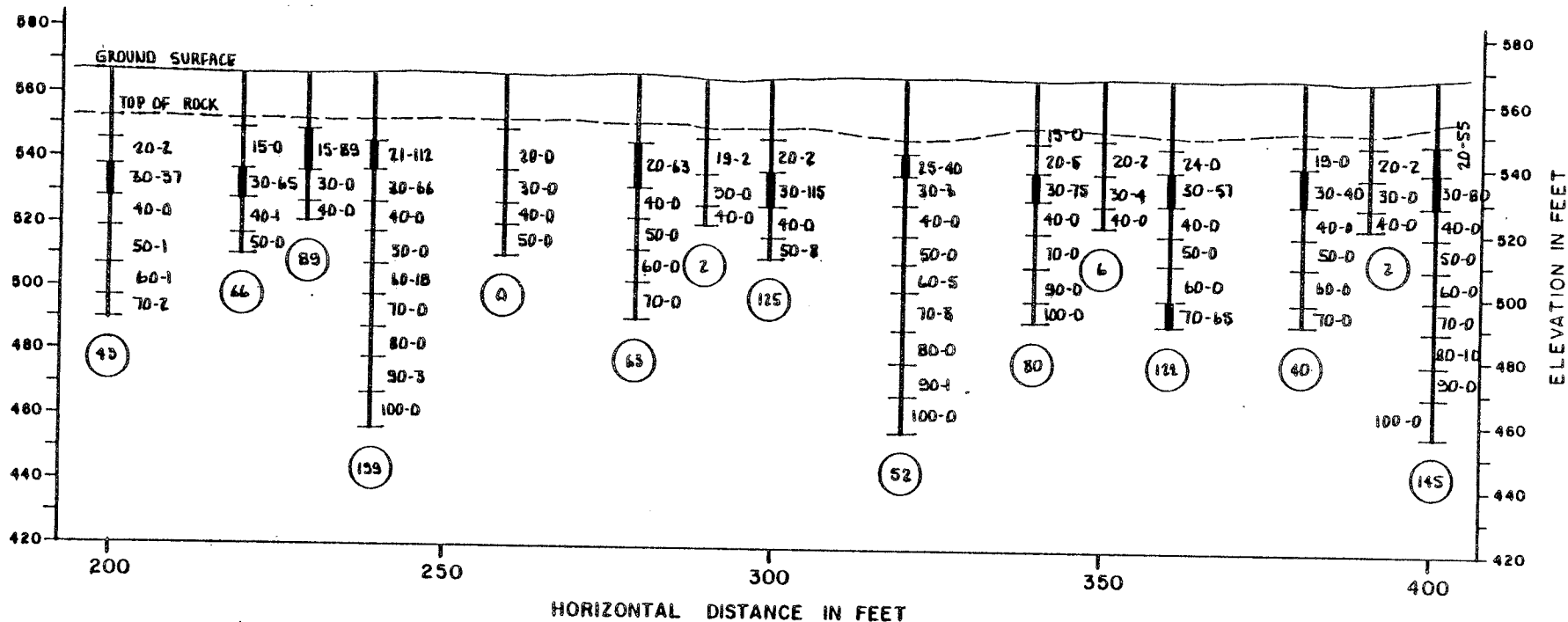
figure 17
GROUTING
GROUT CURTAIN WALL

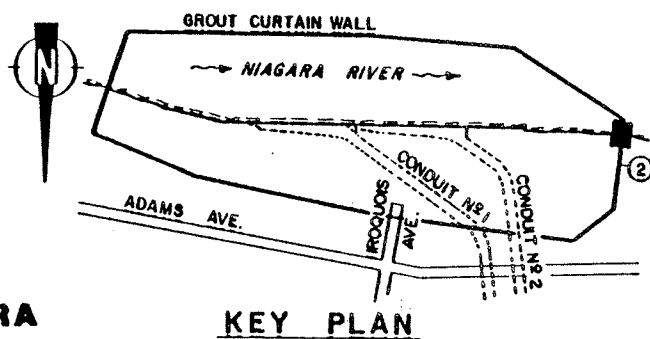
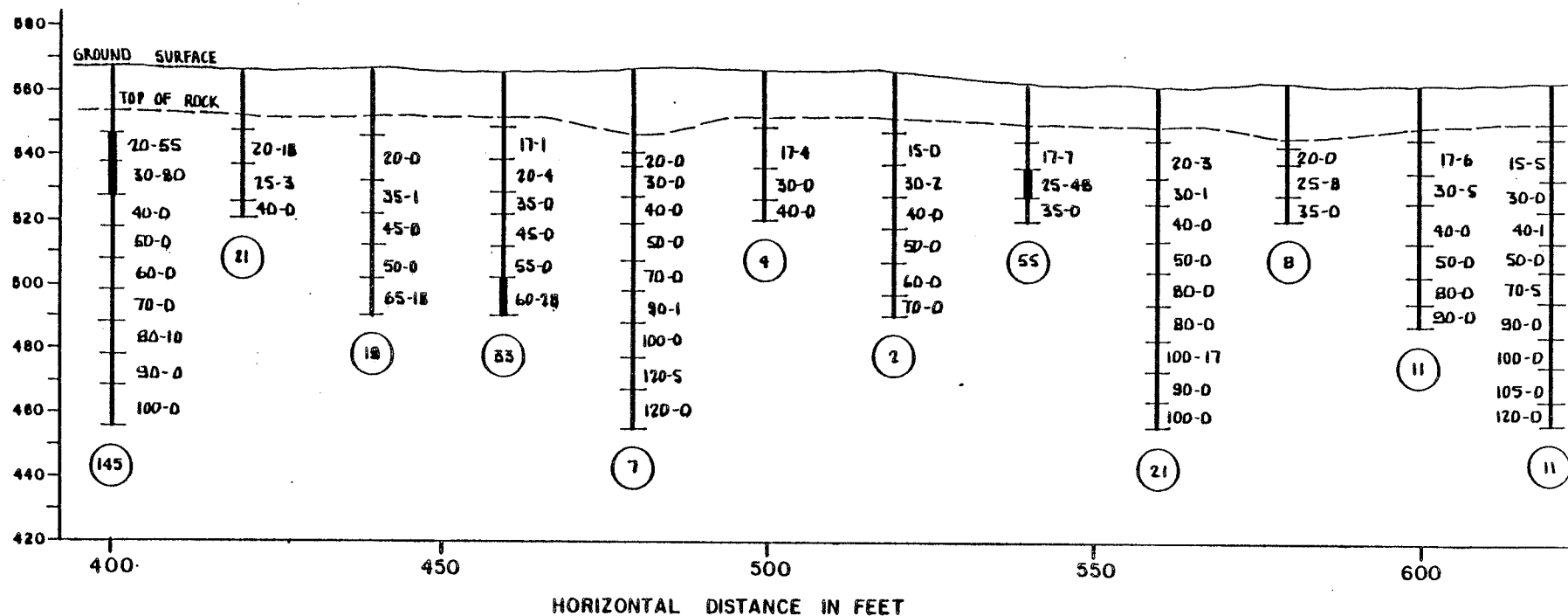


CRA

figure 18
GROUTING
GROUT CURTAIN WALL





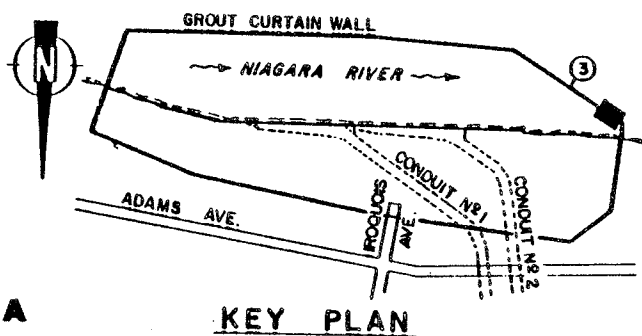
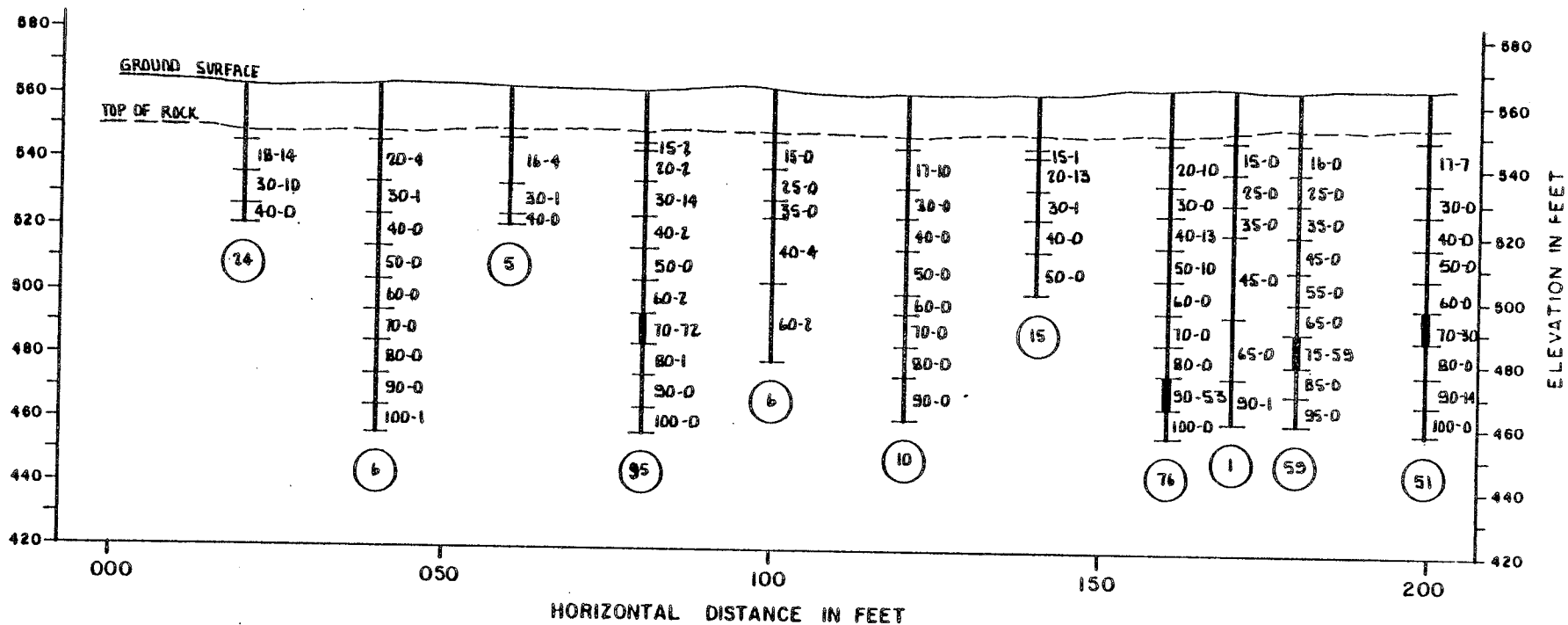


LEGEND

70-110-5
 SAND USED - cu. ft.
 SACKS CEMENT
 PRESSURE - p.s.i.

(126) TOTAL SACKS CEMENT USED
 (5) TOTAL SAND USED - cu. ft.

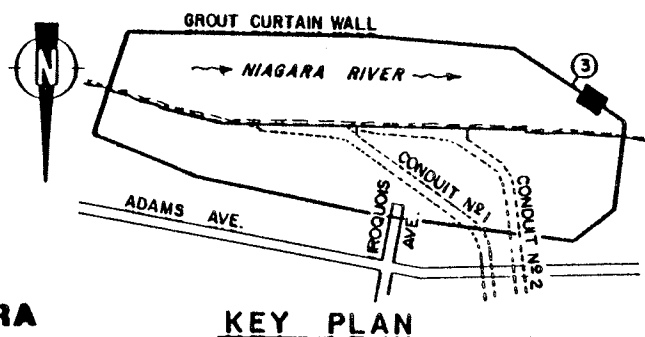
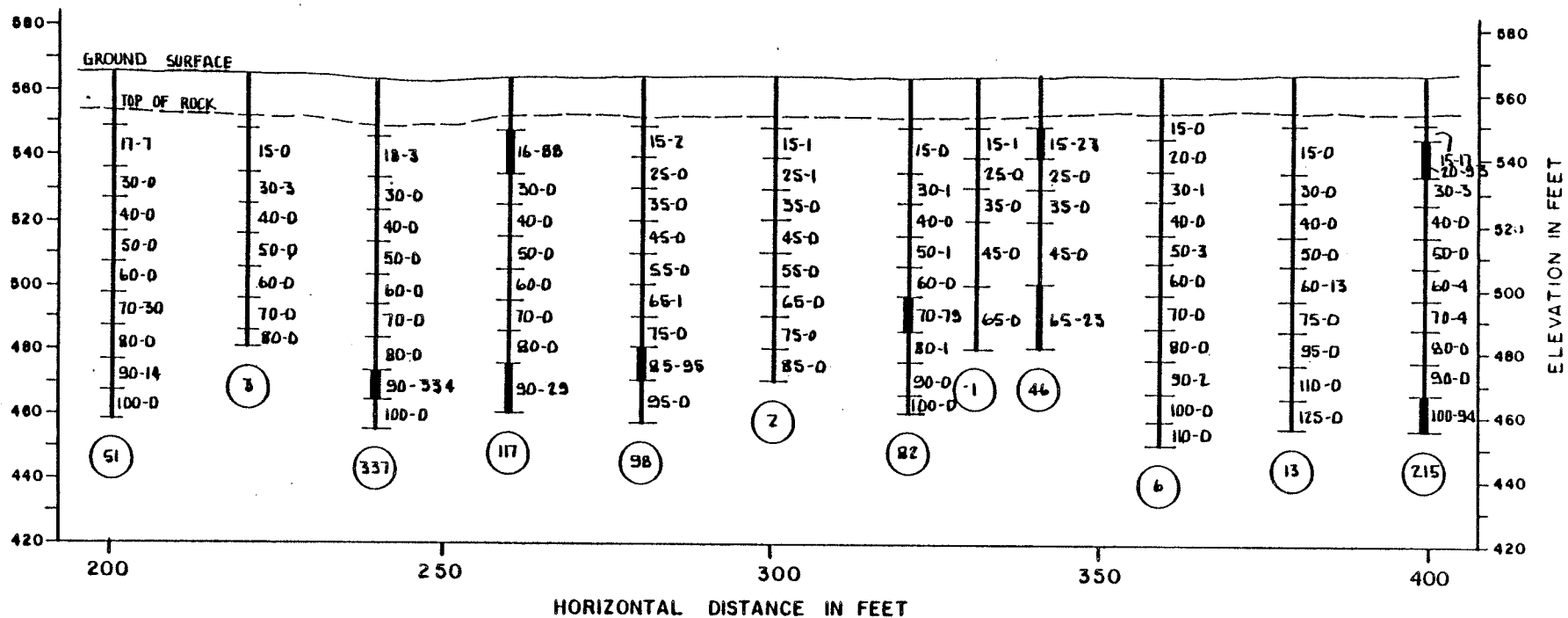
figure 21
 GROUTING
 GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (110) TOTAL SACKS CEMENT USED
- (51) TOTAL SAND USED - cu. ft.

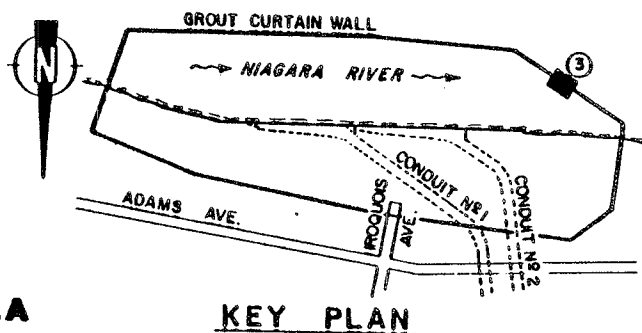
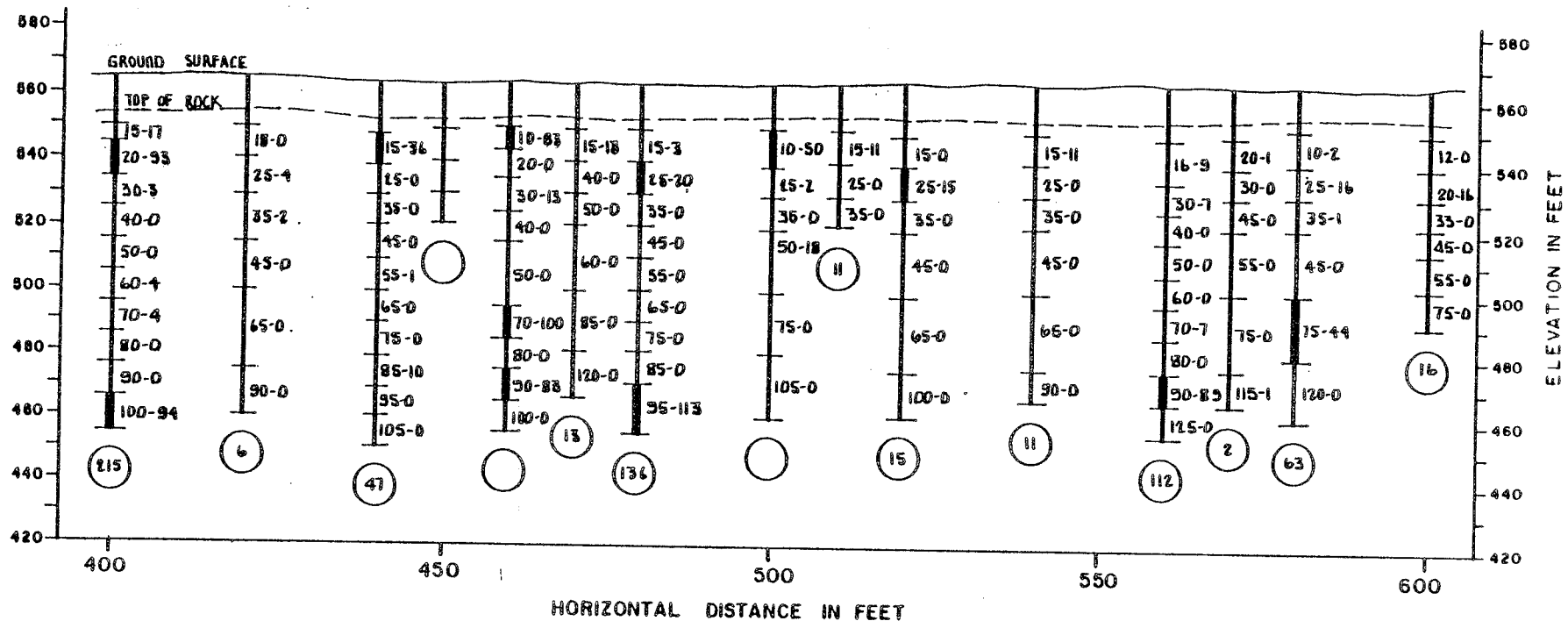
figure 22
GROUTING
GROUT CURTAIN WALL



LEGEND

- 78-110-5 SAND USED - cu. ft.
- SACKS CEMENT -
- PRESSURE - p.s.i.
- (116) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USE - cu. ft.

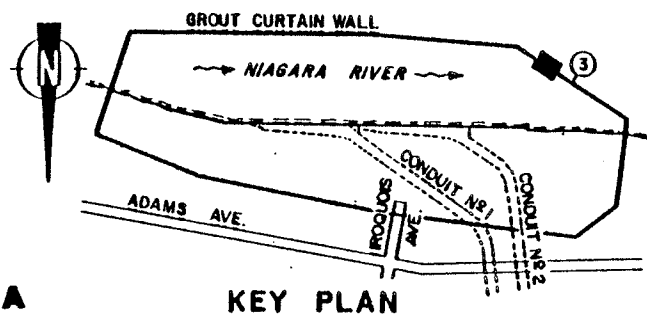
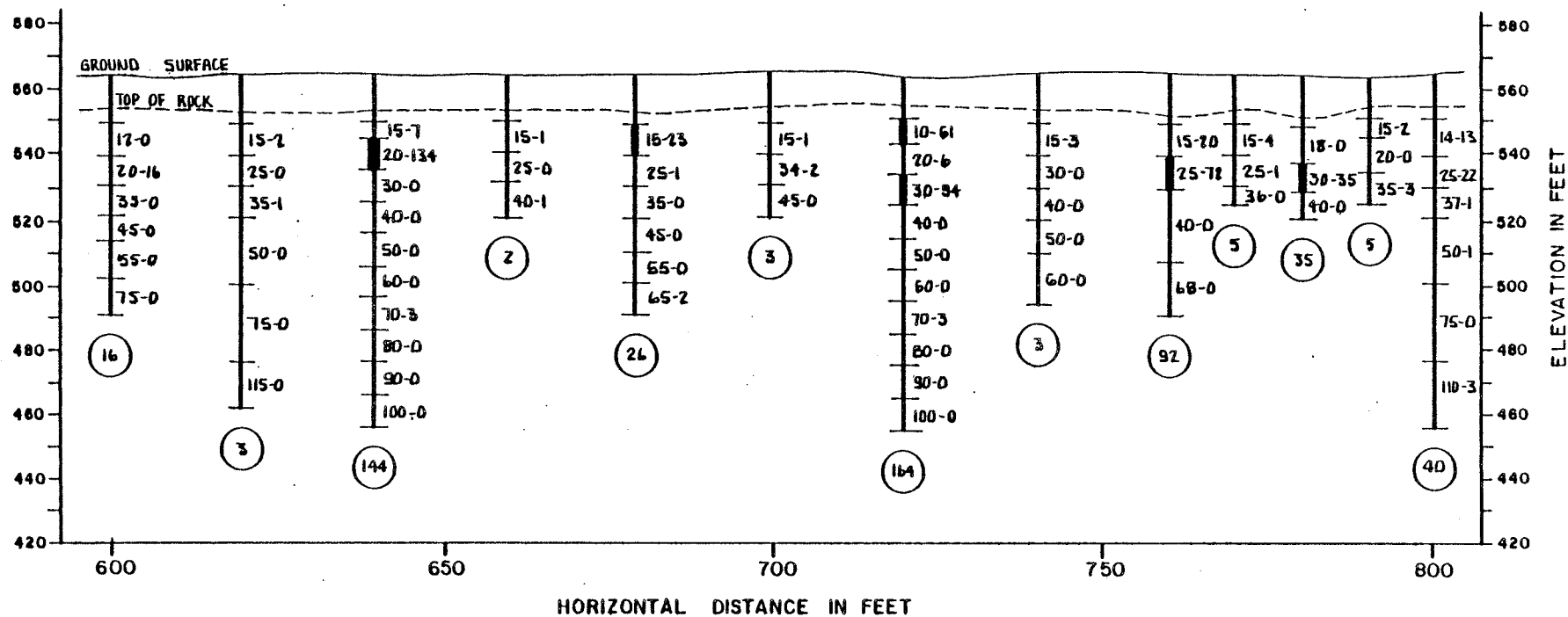
figure 23
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5 SAND USED - cu. ft.
- 126 SACKS CEMENT
- (5) PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

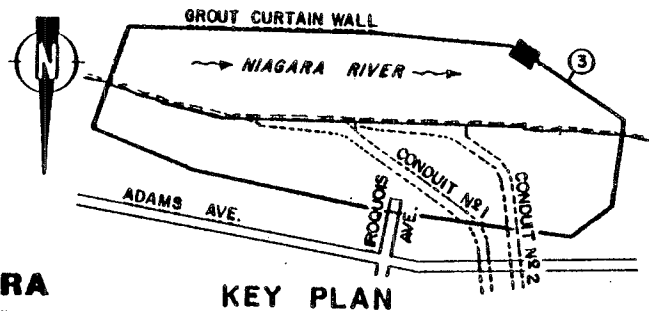
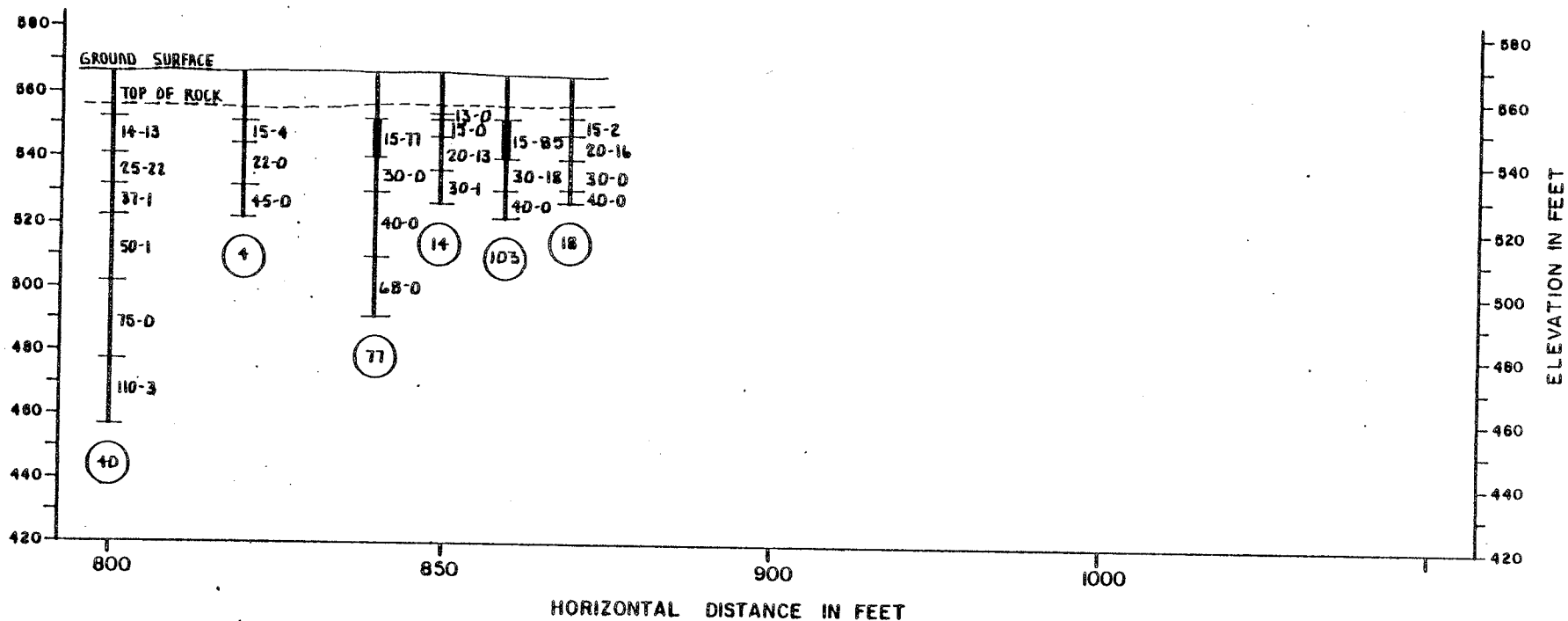
figure 24
GROUTING
GROUT CURTAIN WALL



LEGEND

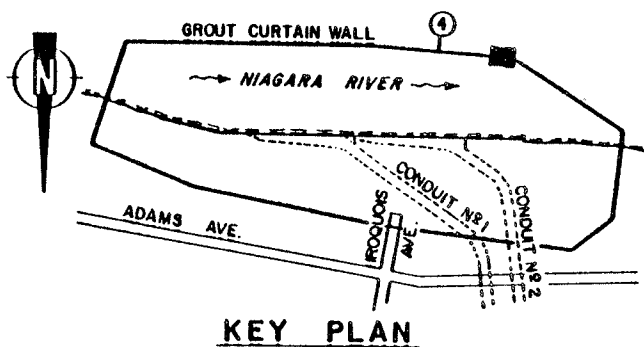
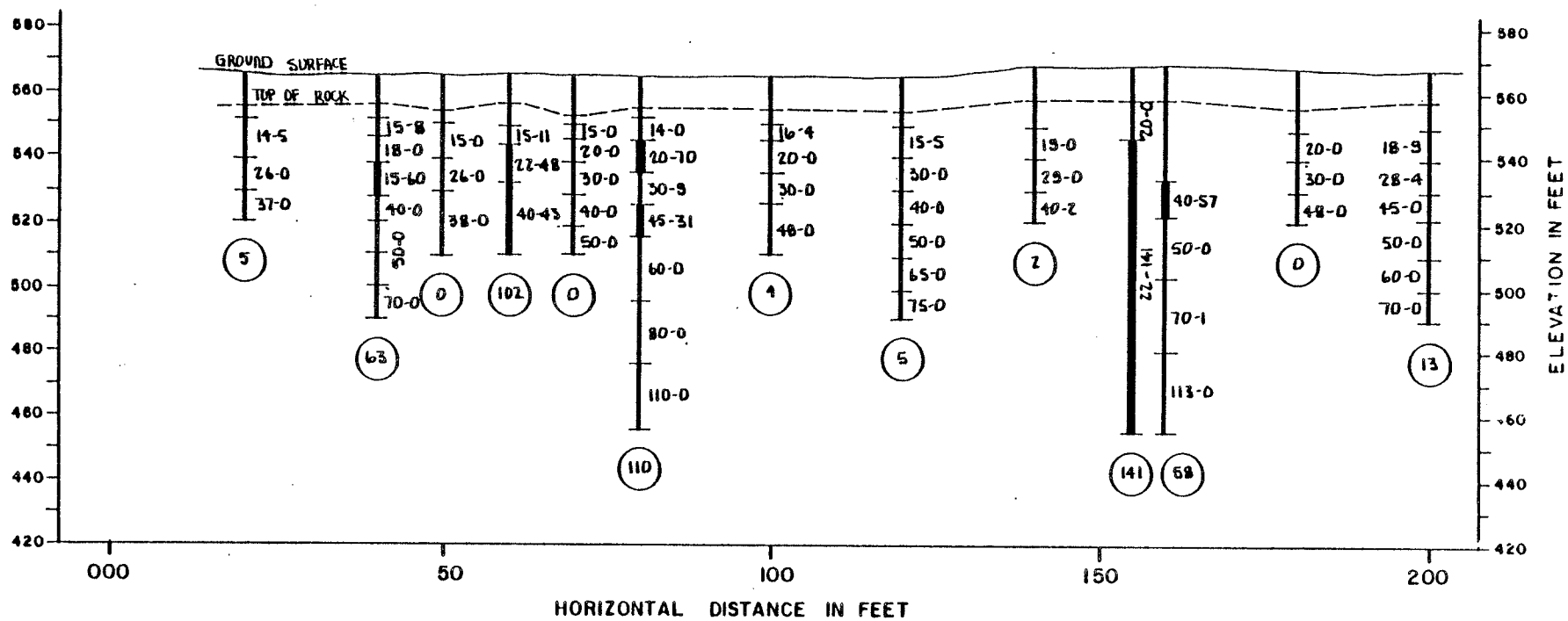
- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (124) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

figure 25
GROUTING
GROUT CURTAIN WALL



- LEGEND**
- 70-10-5
 - SAND USED (CU. FT.)
 - SACKS CEMENT
 - PRESSURE (P.S.I.)
 - (126) TOTAL SACKS CEMENT USED
 - (5) TOTAL SAND USED (CU. FT.)

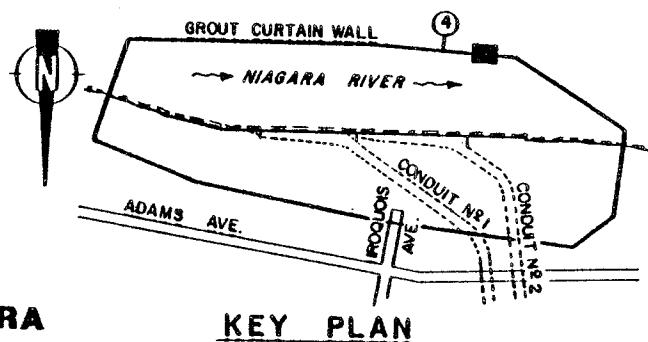
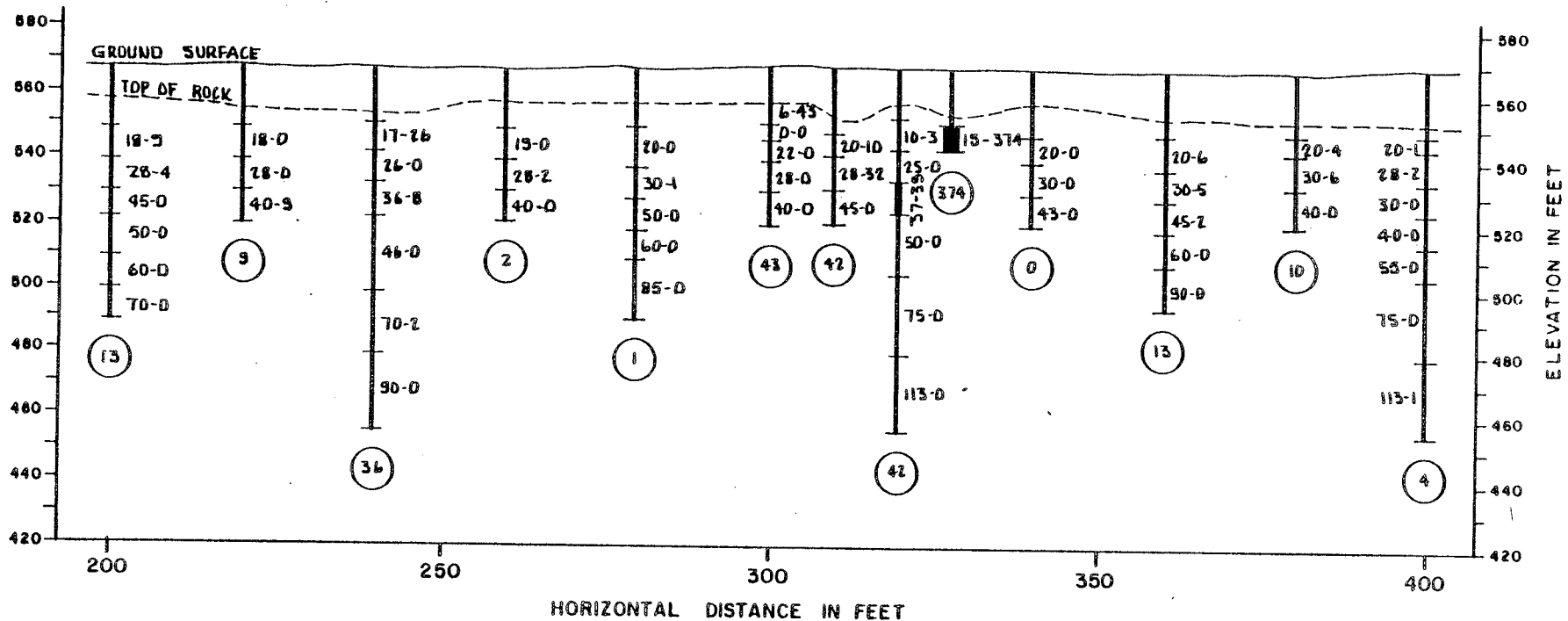
figure 26
GROUTING
GROUT CURTAIN WALL



LEGEND

- 10-110-5 SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (110) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

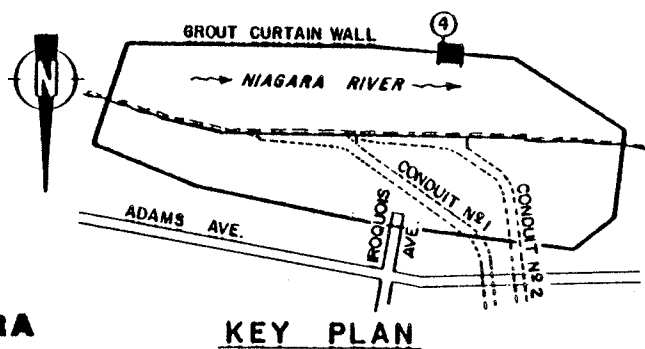
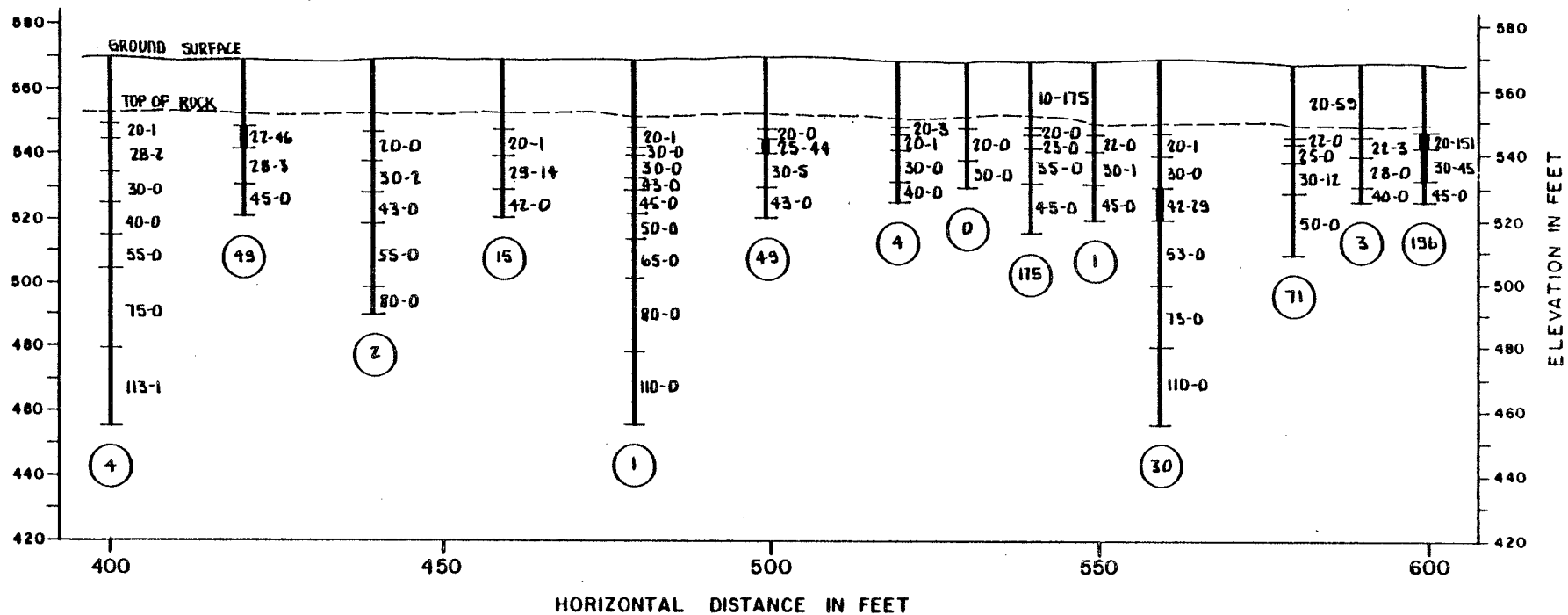
figure 27
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (167) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

figure 28
GROUTING
GROUT CURTAIN WALL

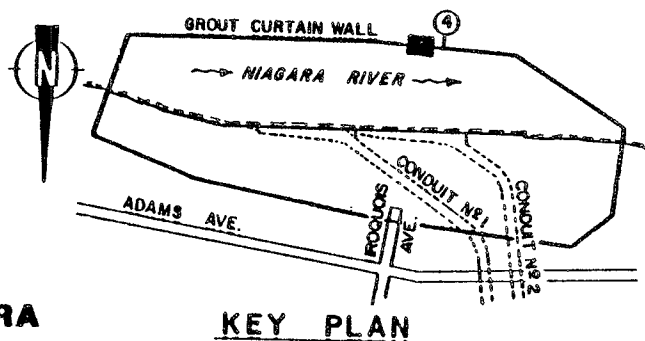
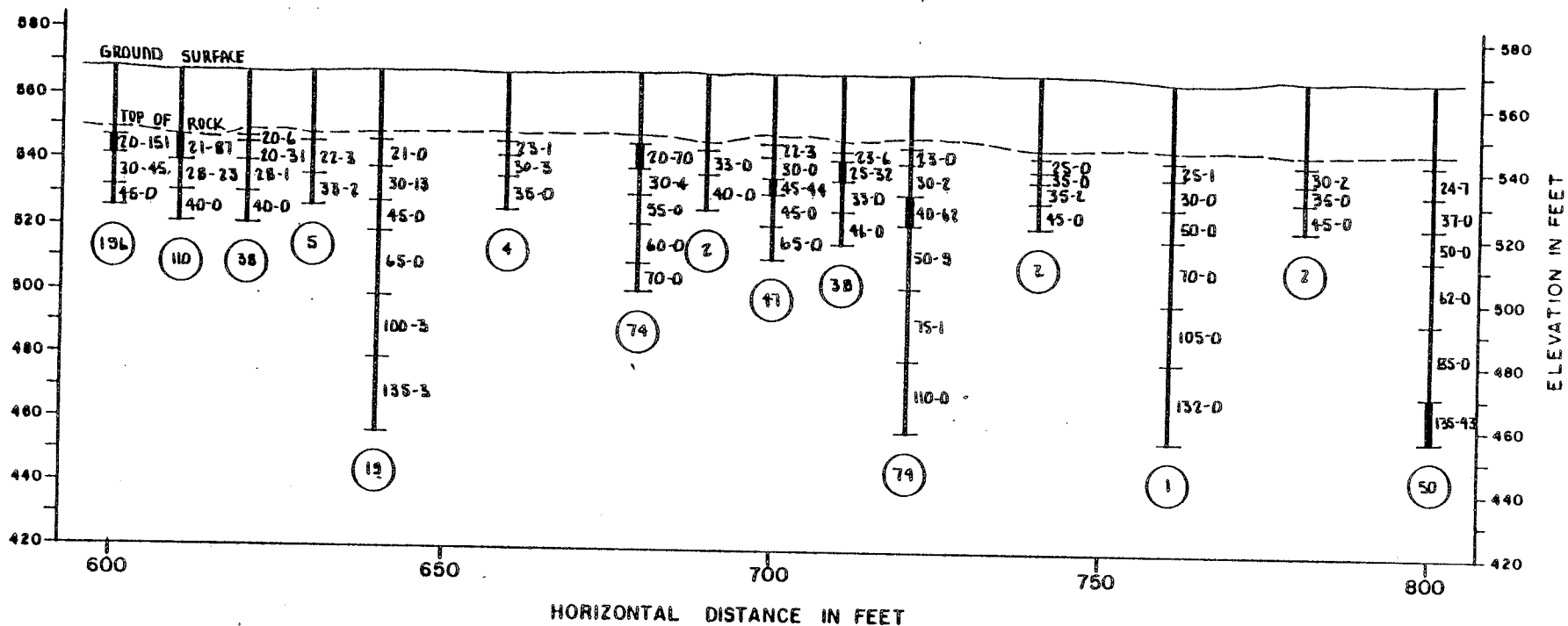


LEGEND

70-110-S
 SAND USED - cu. ft.
 SACKS CEMENT
 PRESSURE - p.s.i.

(115) TOTAL SACKS CEMENT USED
 (3) TOTAL SAND USED - cu. ft.

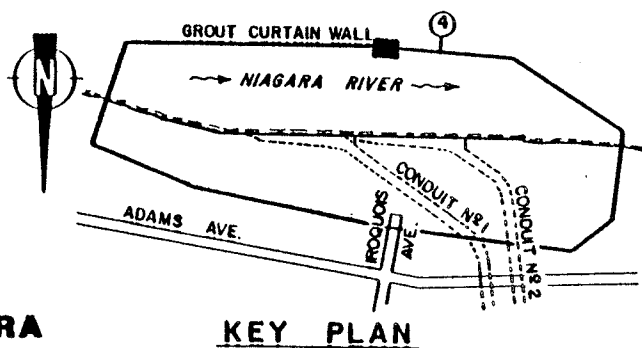
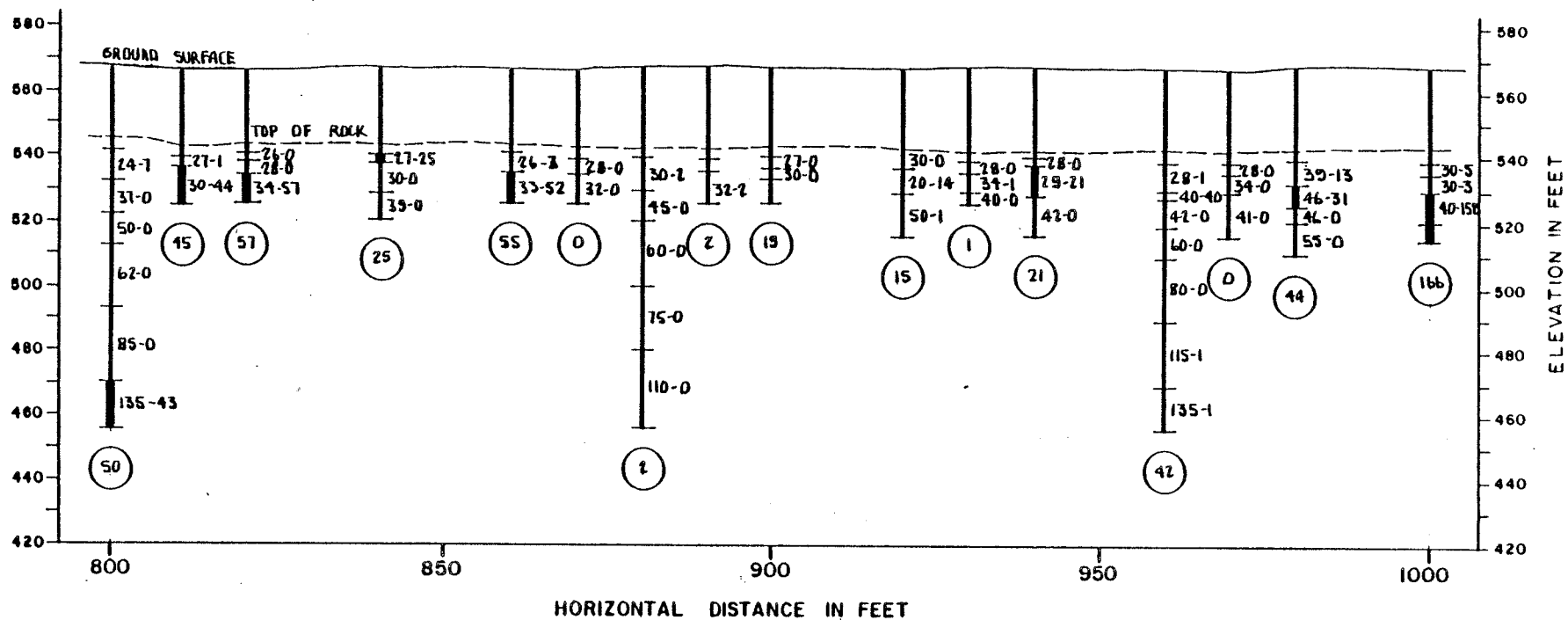
figure 29
 GROUTING
 GROUT CURTAIN WALL



LEGEND

- 70-110-S
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

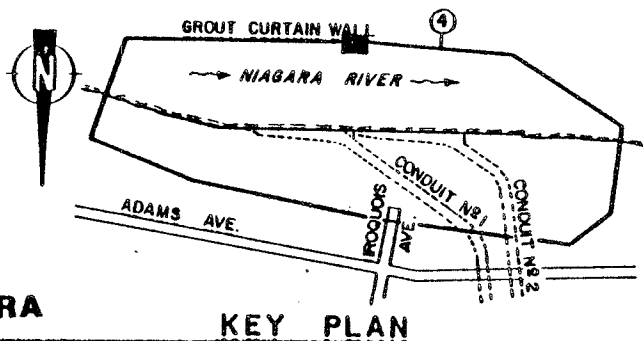
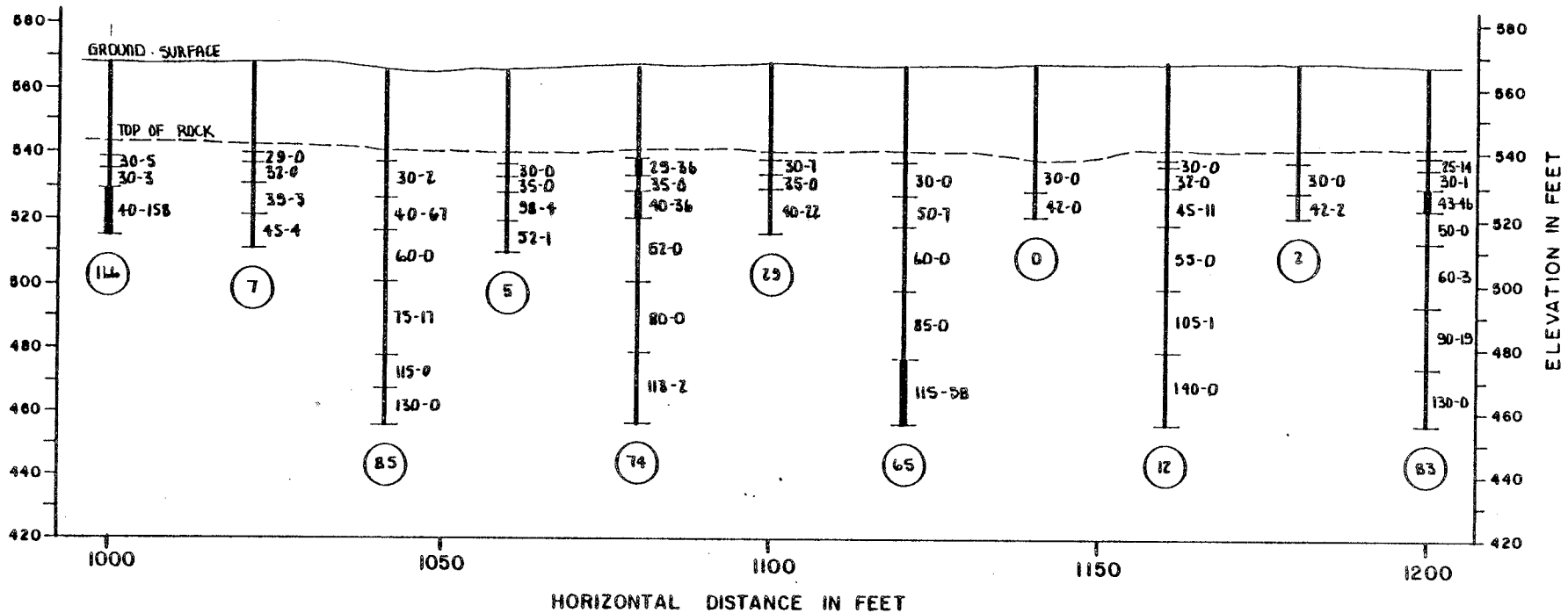
figure 30
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (110) TOTAL SACKS CEMENT USED
- (15.5) TOTAL SAND USED - cu. ft.

figure 31
GROUTING
GROUT CURTAIN WALL

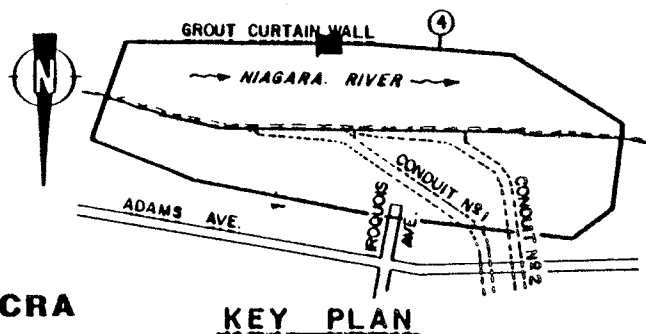
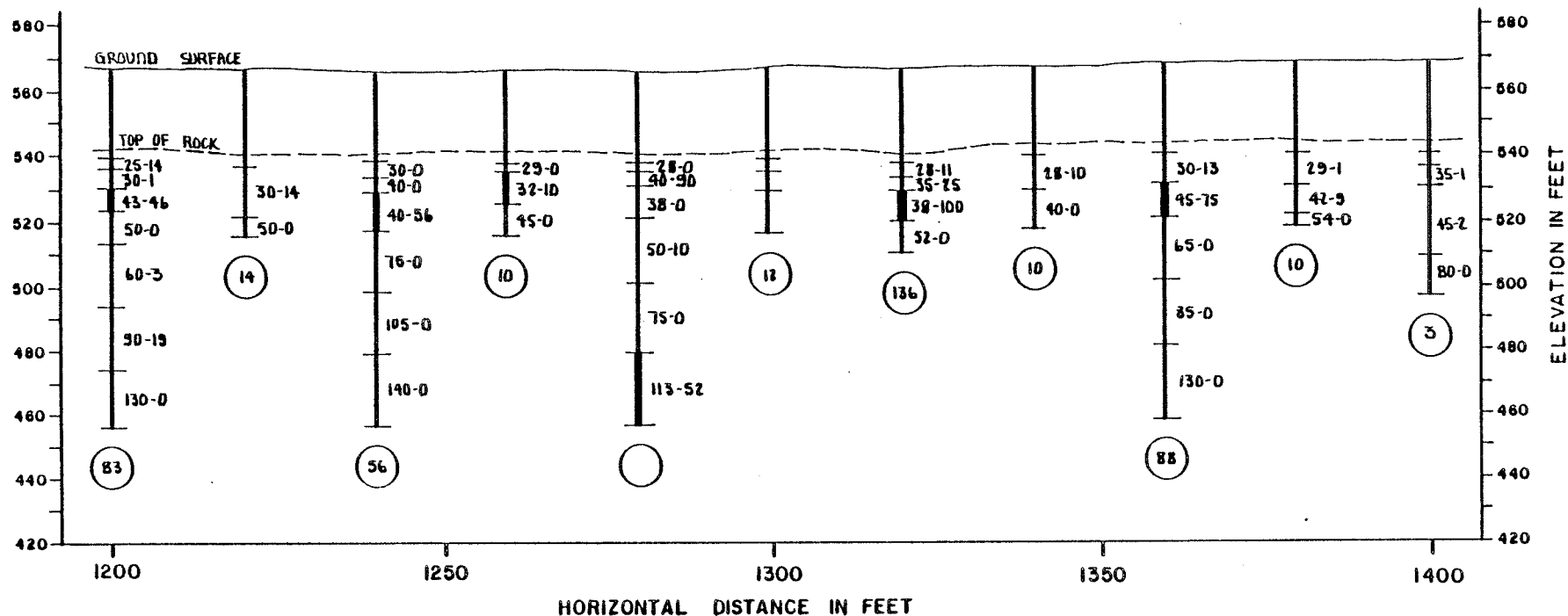


LEGEND

70-110-5
 L SAND USED - cu. ft.
 L SACKS CEMENT
 L PRESSURE - p.s.i.

(126) TOTAL SACKS CEMENT USED
 (5) TOTAL SAND USED - cu. ft.

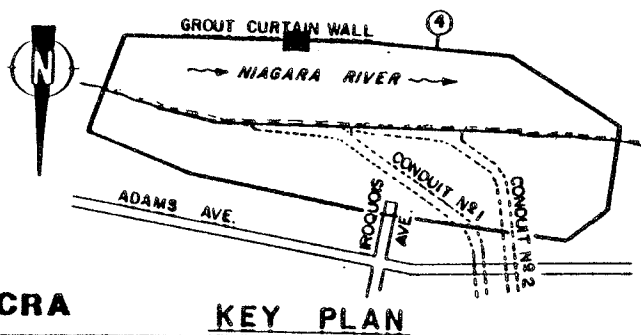
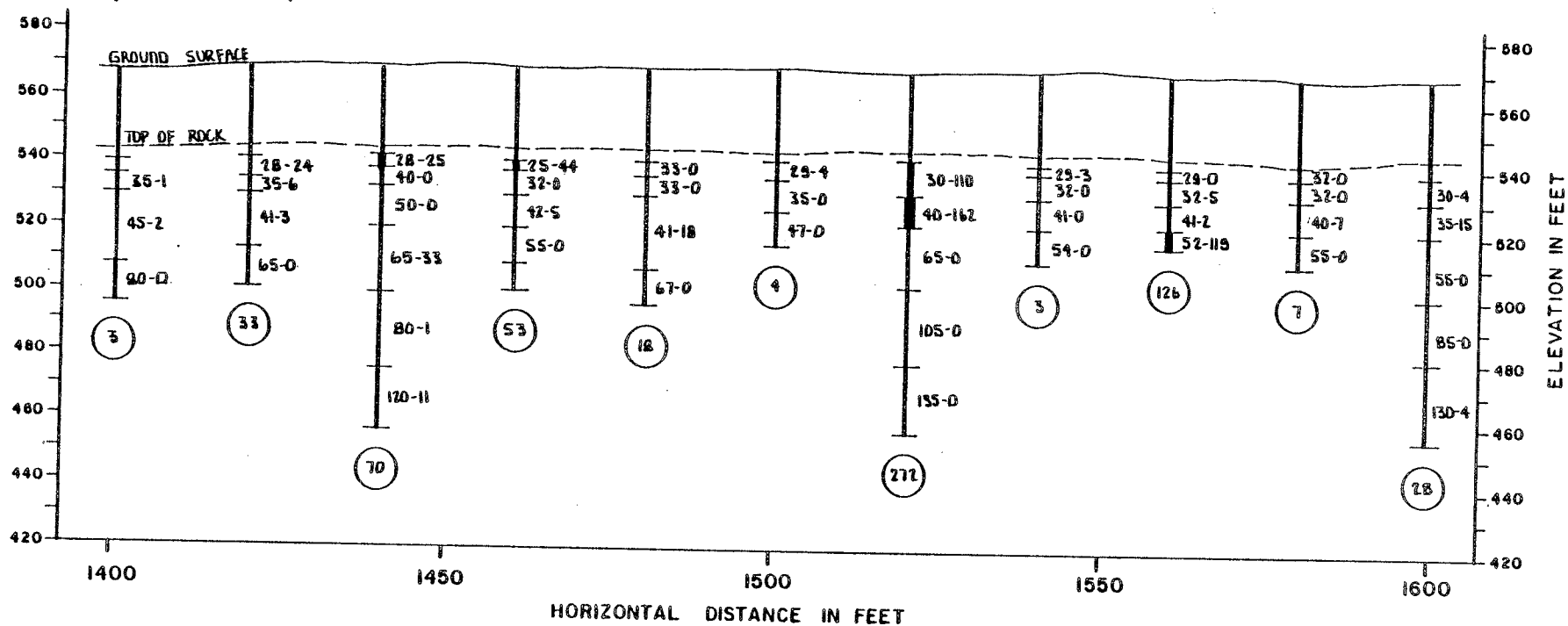
figure 32
 GROUTING
 GROUT CURTAIN WALL



LEGEND

- 70-110-S SAND USED - cu. ft.
- 116 SACKS CEMENT
- 116 PRESSURE - p.s.i.
- (116) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

figure 33
GROUTING
GROUT CURTAIN WALL



LEGEND

70-110-S

SAND USED - cu. ft.

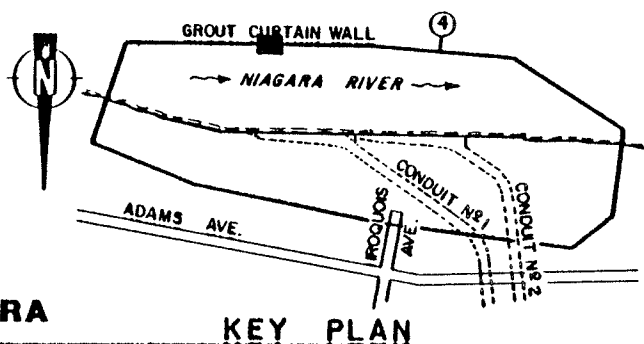
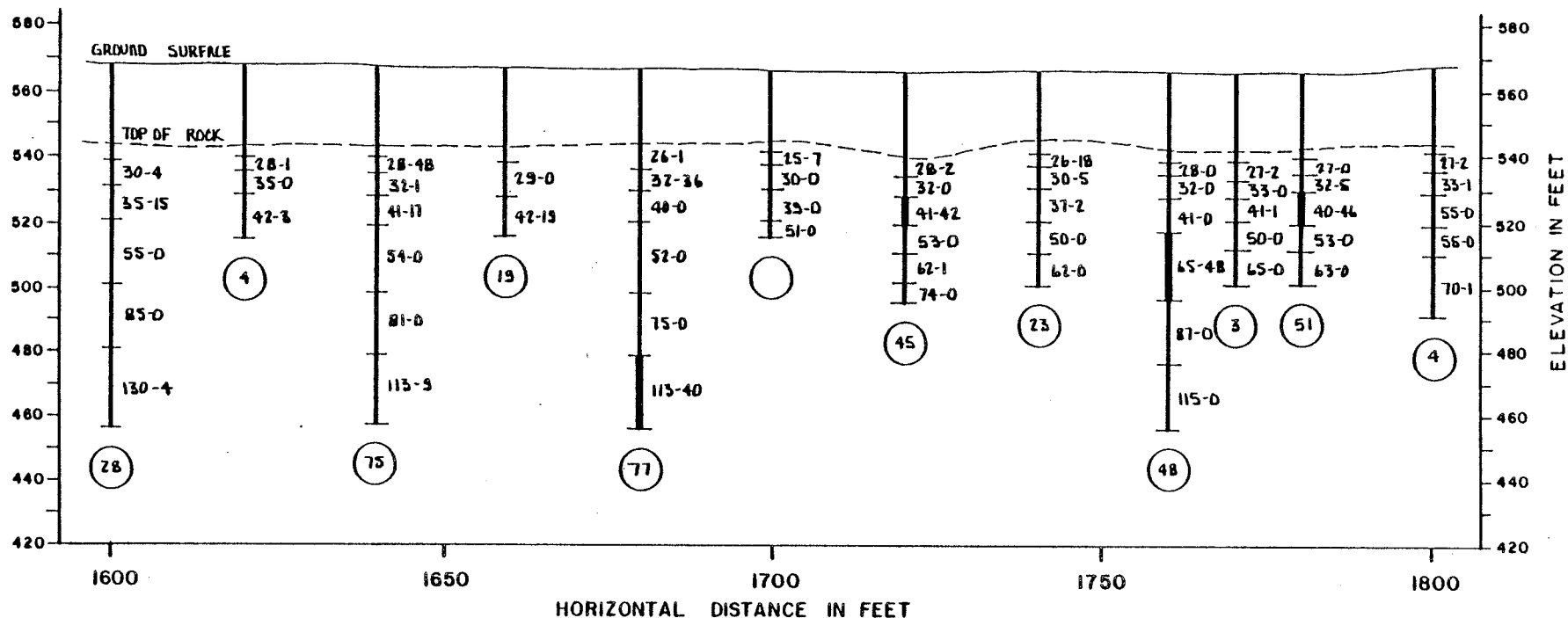
SACKS CEMENT

PRESSURE - p.s.i.

115 TOTAL SACKS CEMENT USED

(S) TOTAL SAND USED - cu. ft.

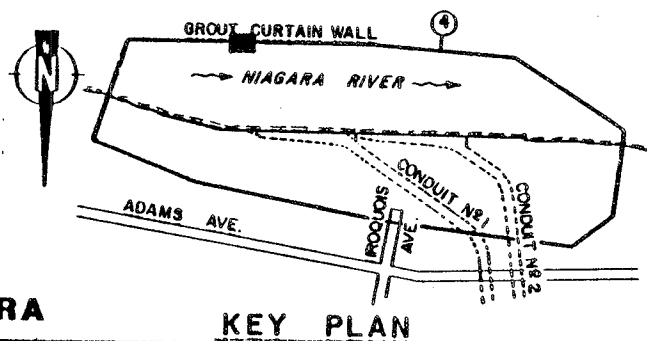
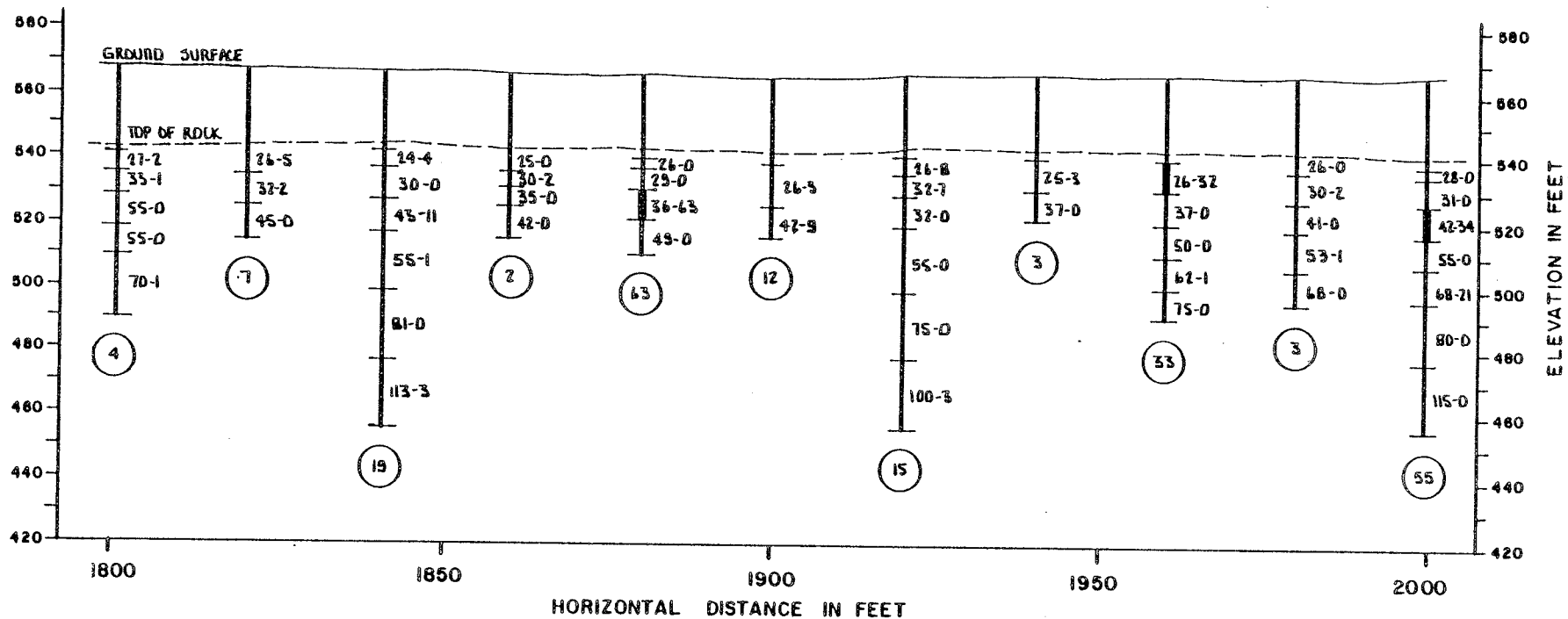
figure 34
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5 SAND USED - cu. ft.
- SACKS CEMENT
- PRESSURE - p.s.i.
- (167) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED - cu. ft.

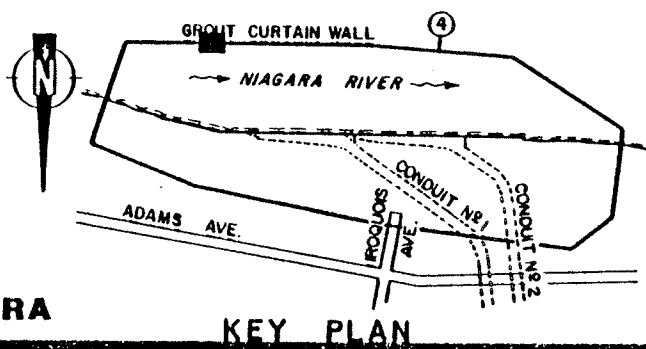
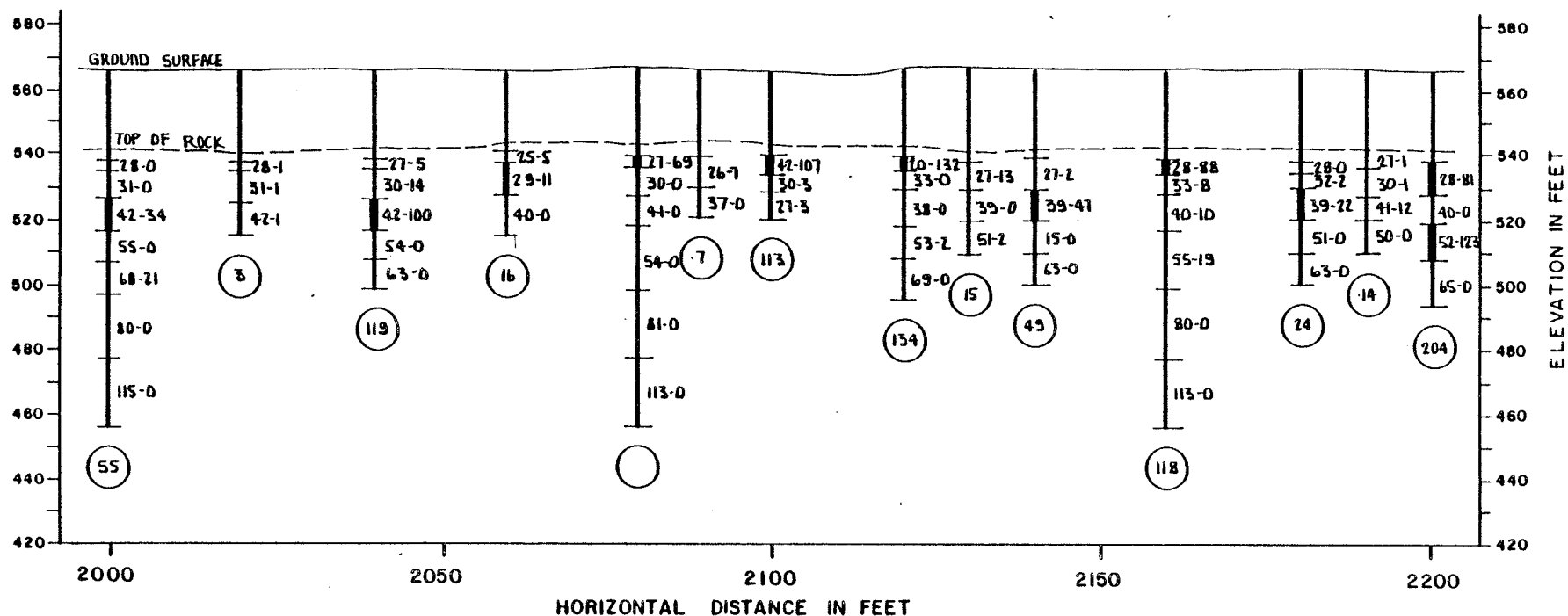
figure 35
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-3 SAND USED - cu. ft.
- 126 SACKS CEMENT -
- (5) PRESSURE - p.s.i.
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USE - cu. ft.

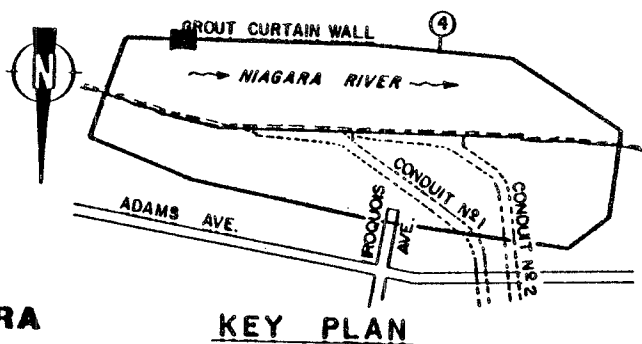
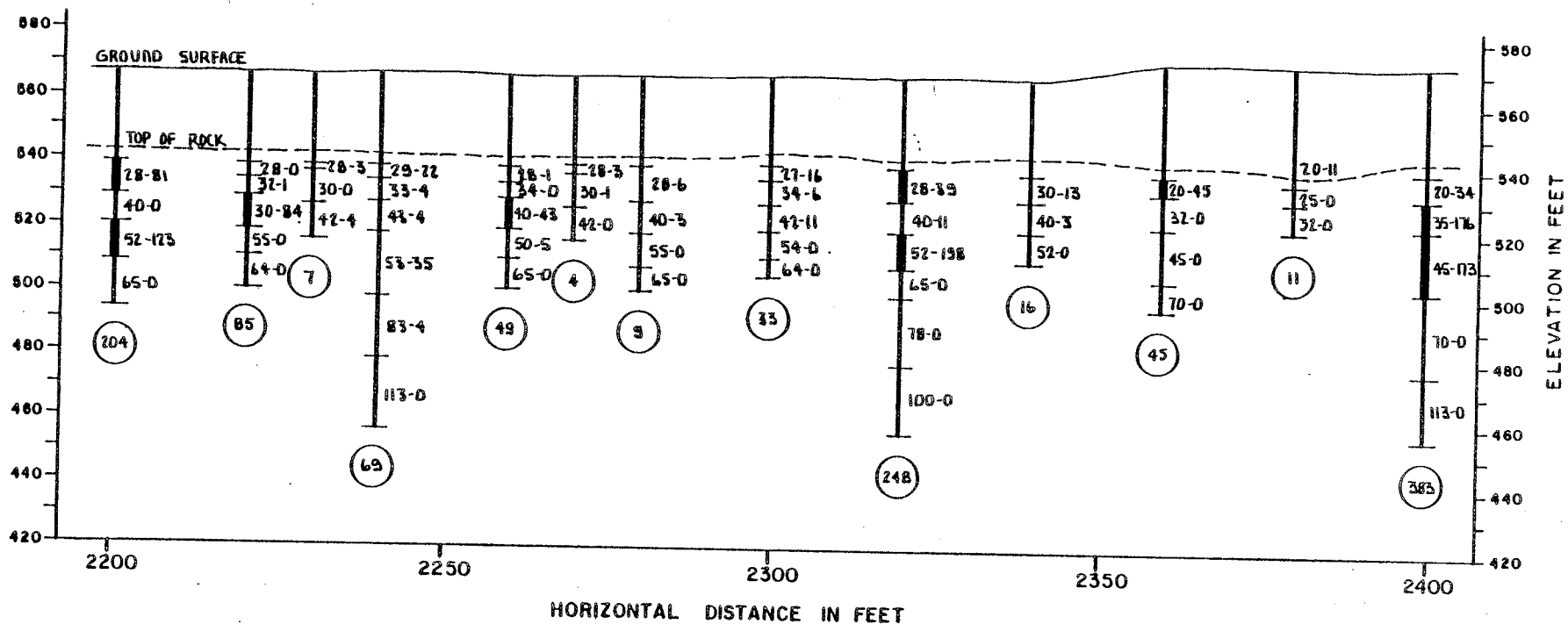
figure 36
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5 SAND USED - cu. ft.
- 116 SACKS CEMENT
- 115 PRESSURE - p.s.i.
- 116 TOTAL SACKS CEMENT USED
- 115 TOTAL SAND USED - cu. ft.

figure 37
GROUTING
GROUT CURTAIN WALL

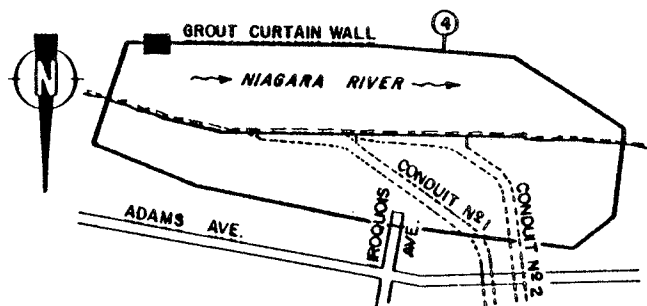
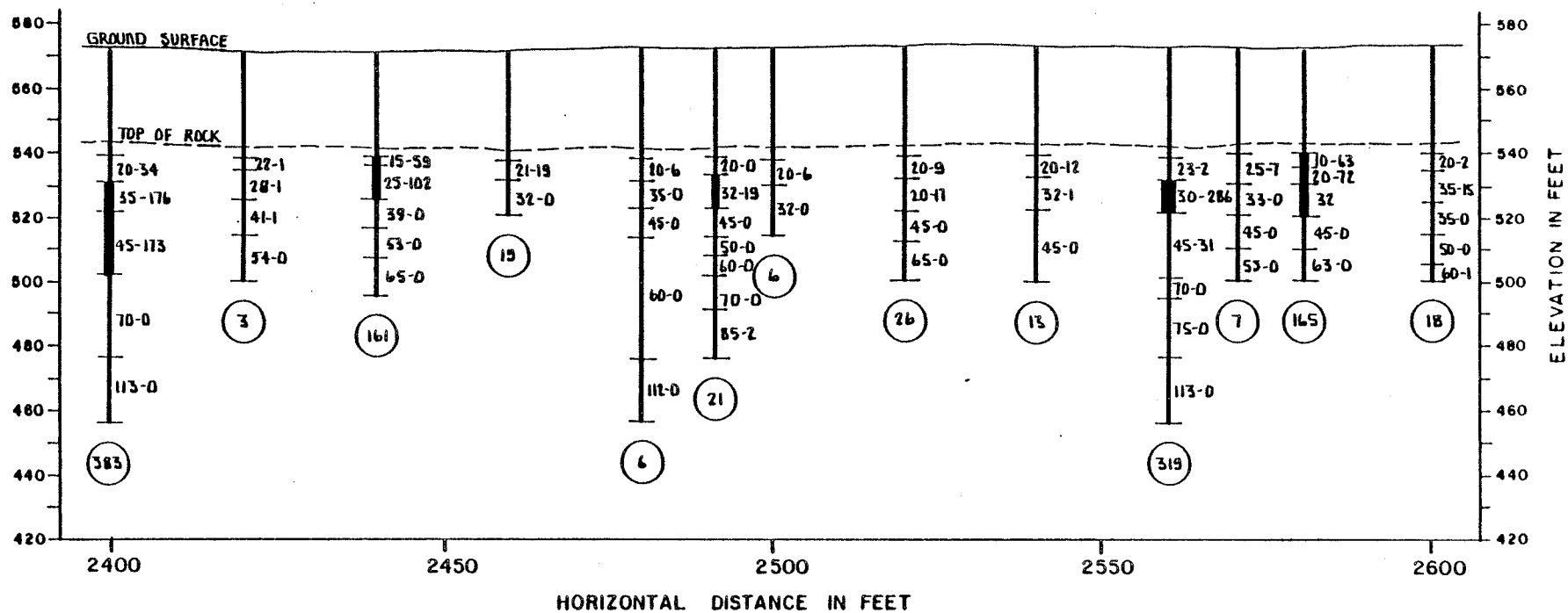


LEGEND

70-110-6
 SAND USED - cu ft.
 SACKS CEMENT
 PRESSURE - p.s.i.

(126) TOTAL SACKS CEMENT USED
 (5) TOTAL SAND USED - cu ft.

figure 38
 GROUTING
 GROUT CURTAIN WALL



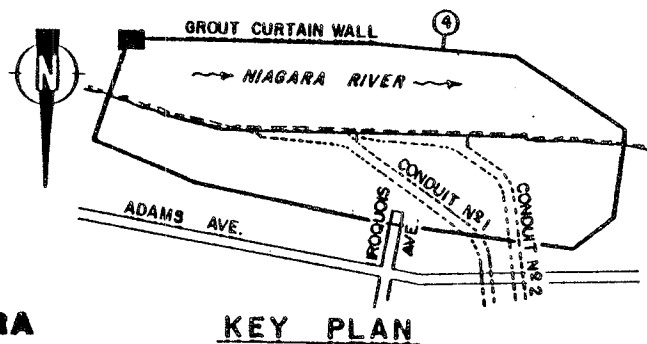
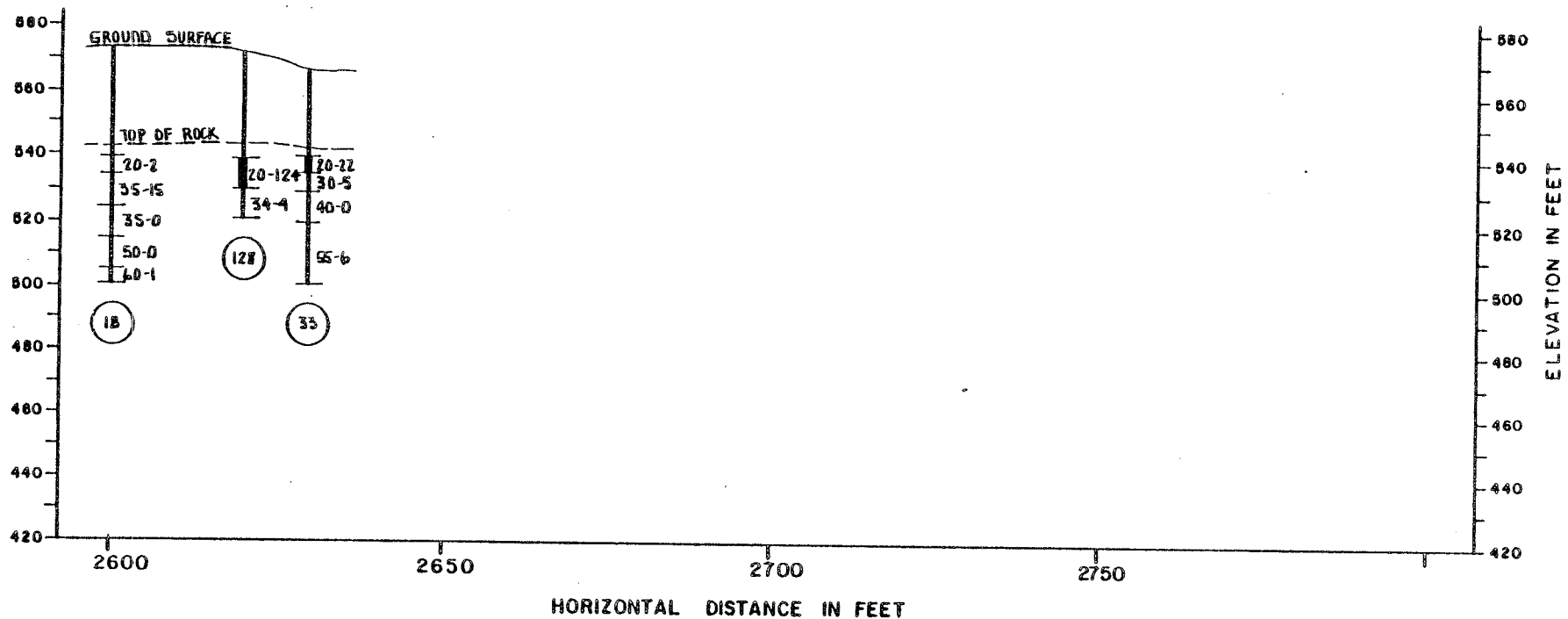
LEGEND

70-110-5
 SAND USED - cu. ft.
 SACKS CEMENT
 PRESSURE - p.s.i.

(115) TOTAL SACKS CEMENT USED

(5) TOTAL SAND USED - cu. ft.

figure 39
 GROUTING
 GROUT CURTAIN WALL



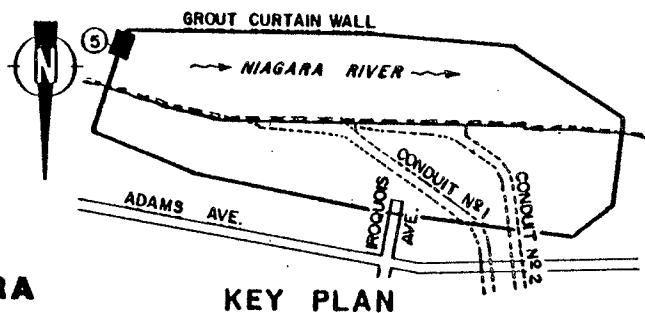
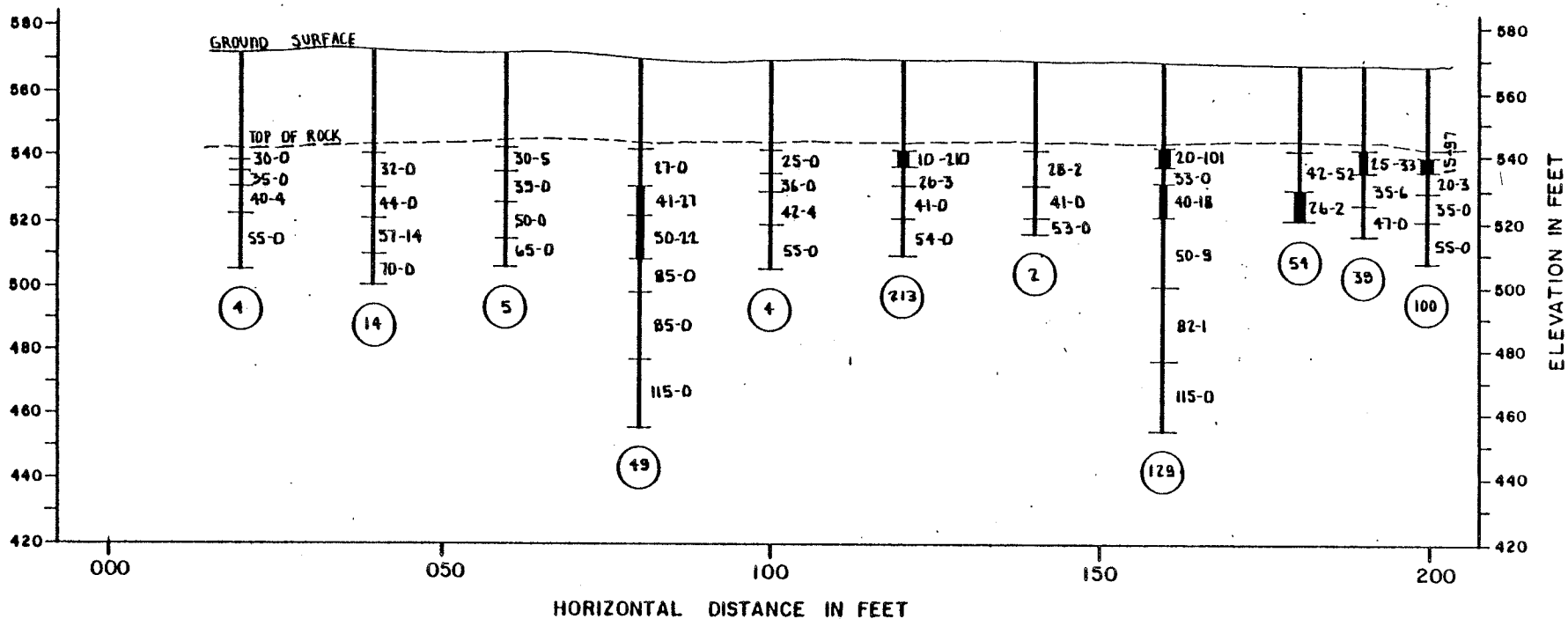
LEGEND

10-110-5
 SAND USED - cu. ft.
 SACKS CEMENT
 PRESSURE - p.s.i.

(18) TOTAL SACKS CEMENT USED
 (35) TOTAL SAND USED - cu. ft.

figure 40
 GROUTING
 GROUT CURTAIN WALL

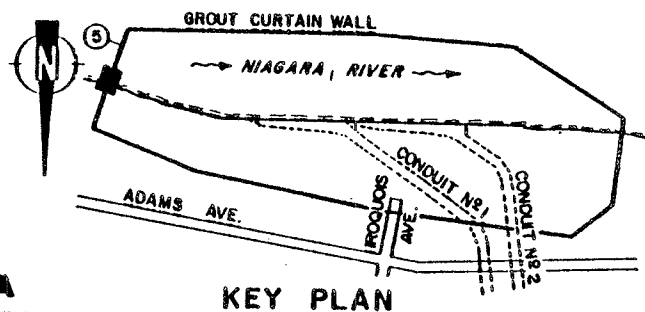
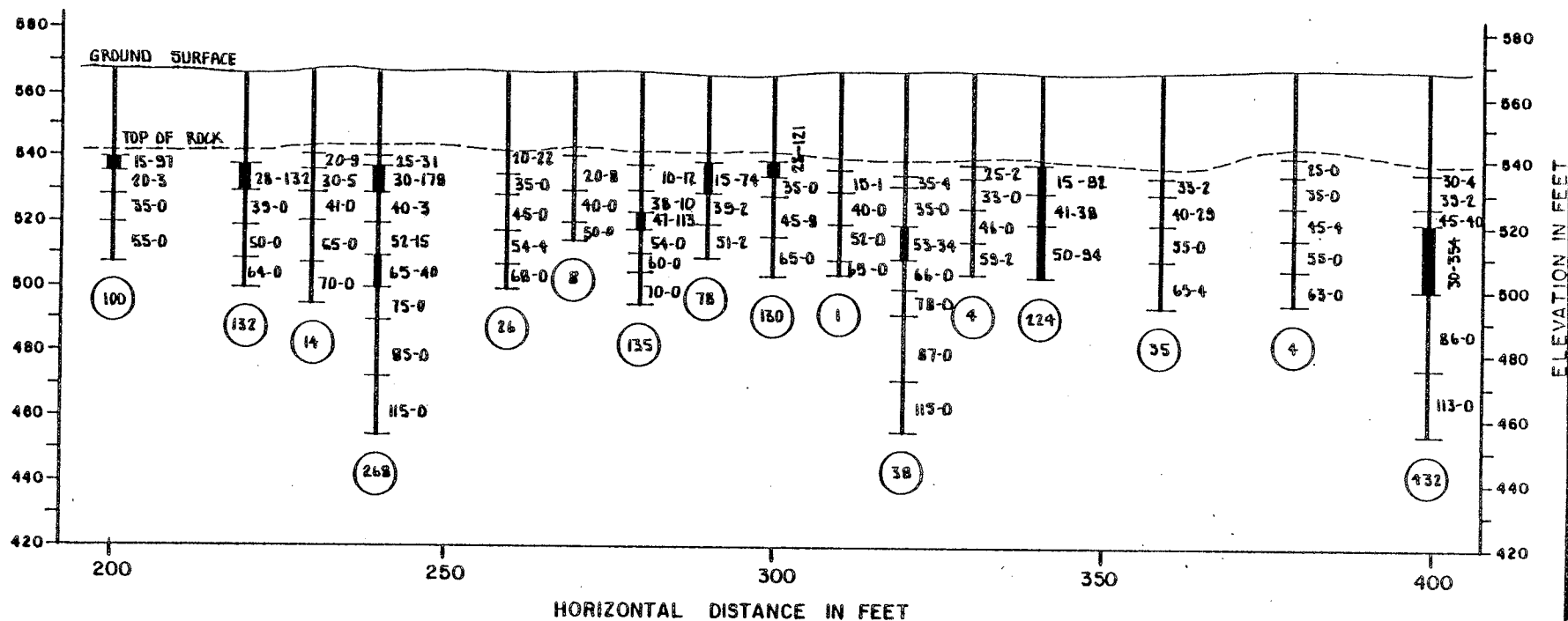
CRA



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

figure 41
GROUTING
GROUT CURTAIN WALL



LEGEND

70-10-5

SAND USED (CU. FT.)

SACKS CEMENT

PRESSURE (P.S.I.)

(126)

TOTAL SACKS CEMENT USED

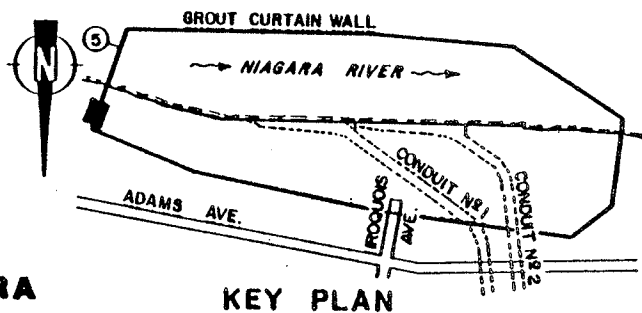
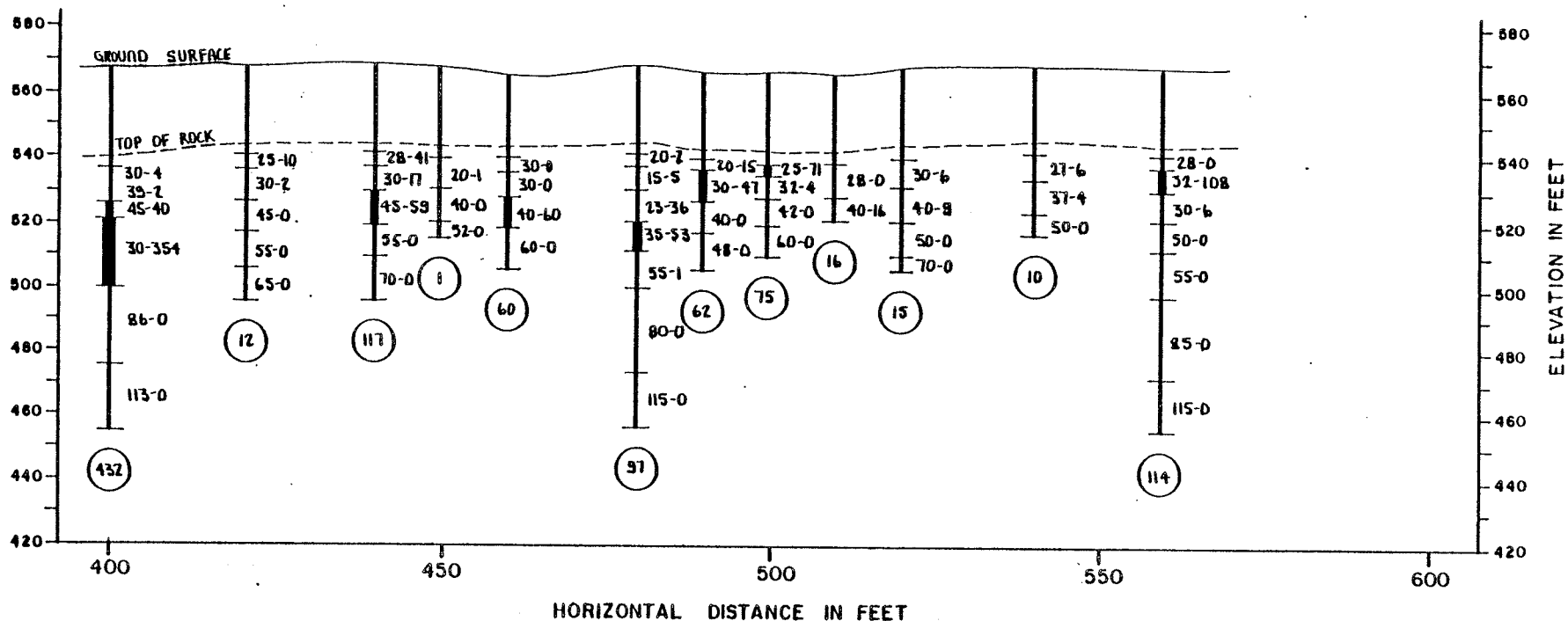
(5)

TOTAL SAND USED (CU. FT.)

figure 42

GROUTING

GROUT CURTAIN WALL



LEGEND

70-10-5

— SAND USED (CU. FT.)
— SACKS CEMENT
— PRESSURE (P.S.I.)

(126)

TOTAL SACKS CEMENT USED

(5) TOTAL SAND USED (CU. FT.)

figure 43
GROUTING
GROUT CURTAIN WALL

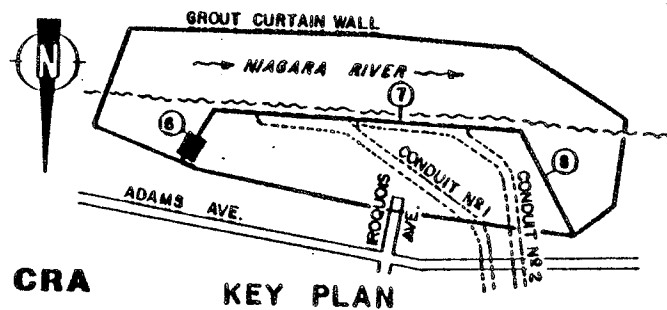
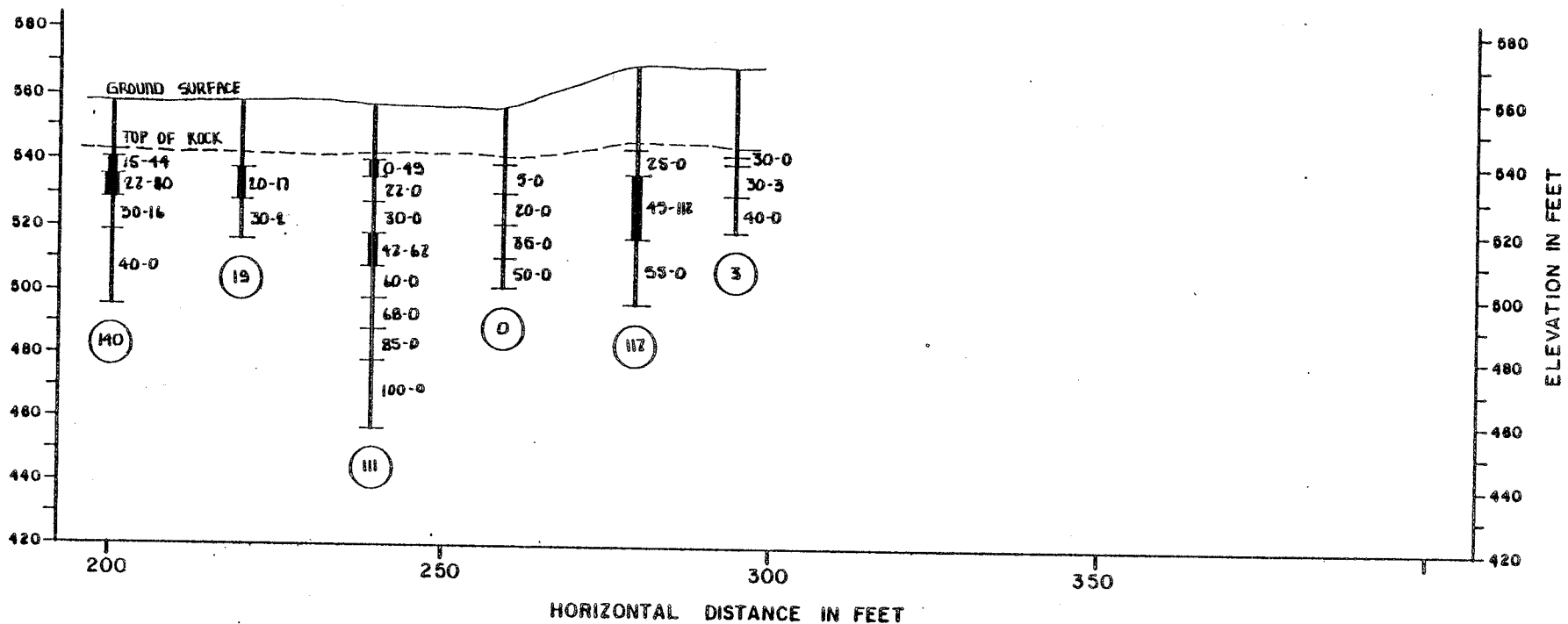
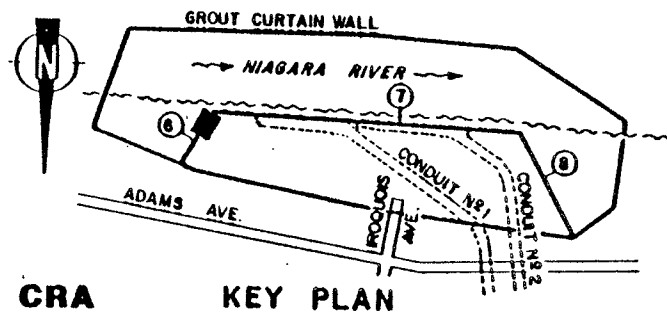
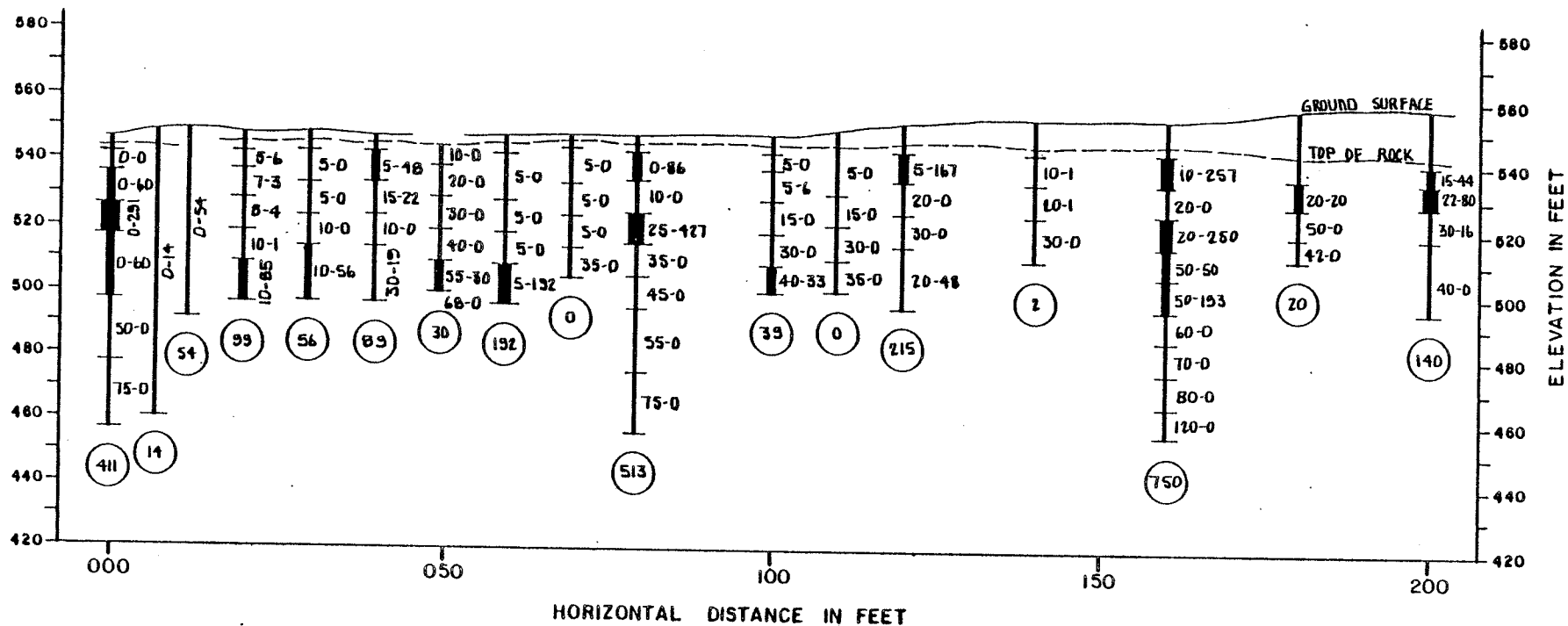


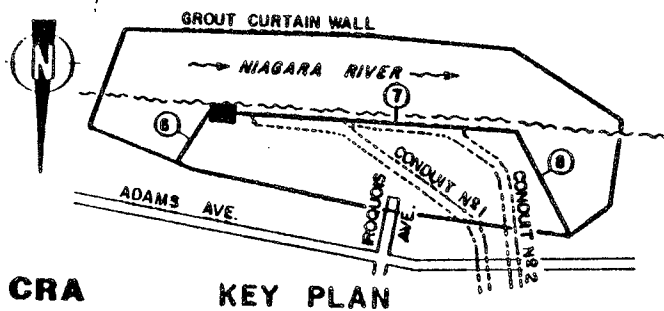
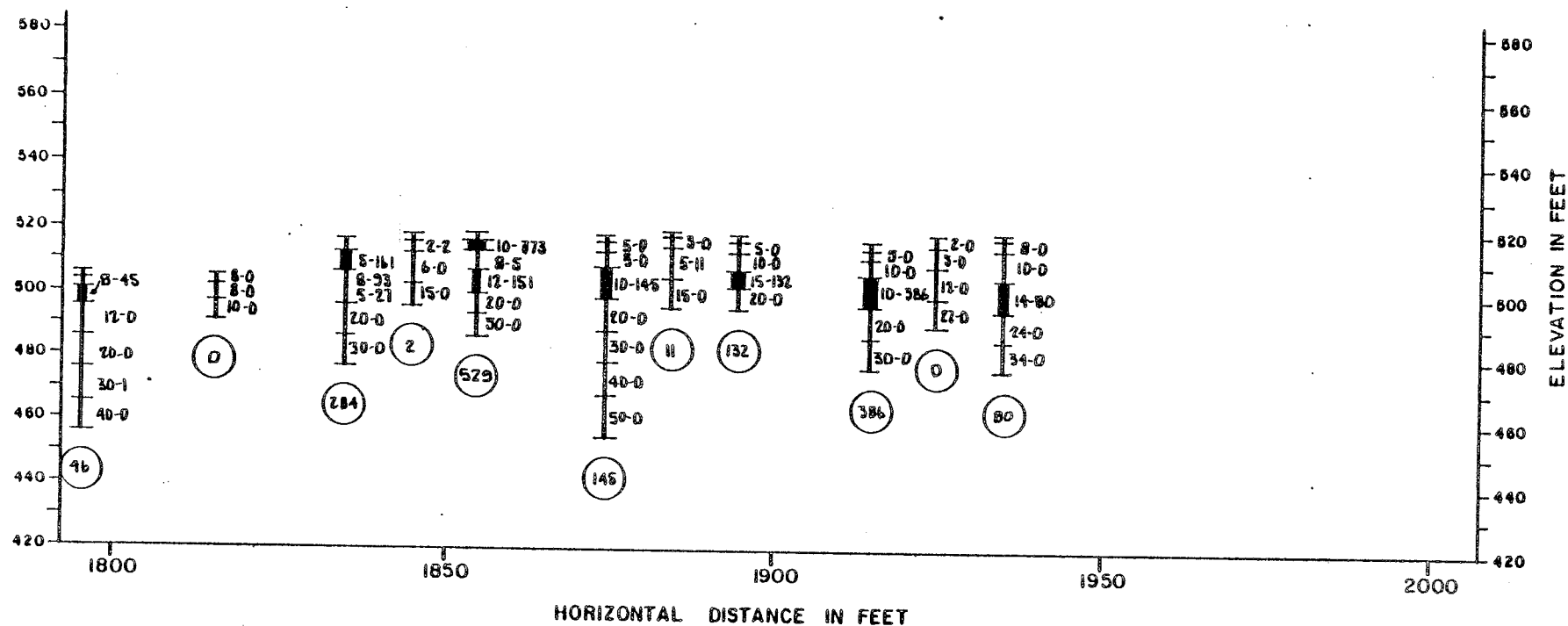
figure 44
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- BAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL BAND USED (CU. FT.)

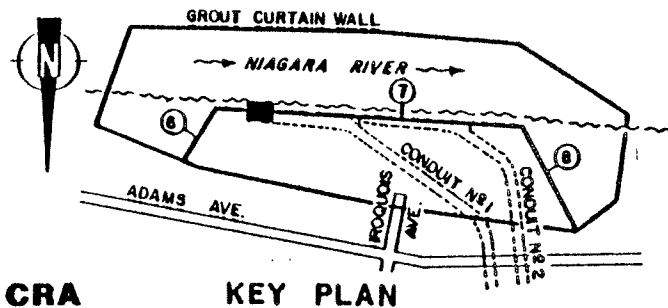
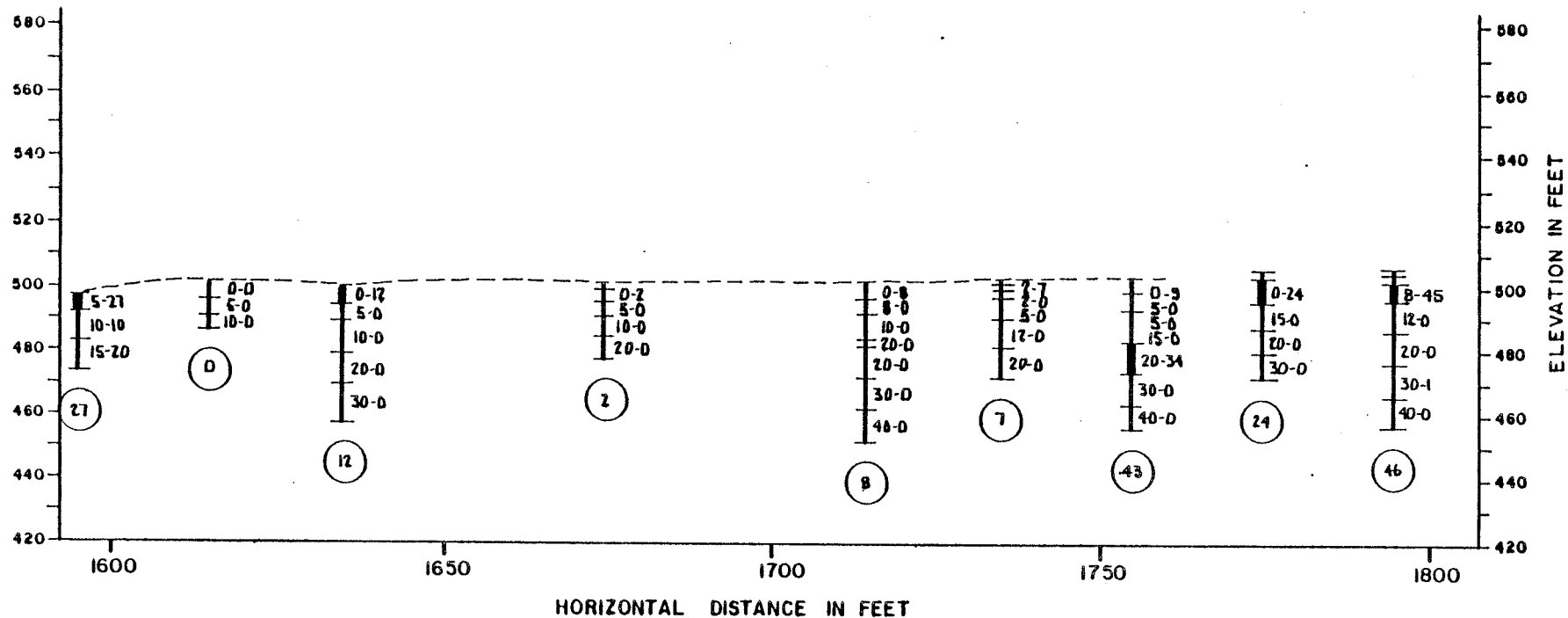
figure 45
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

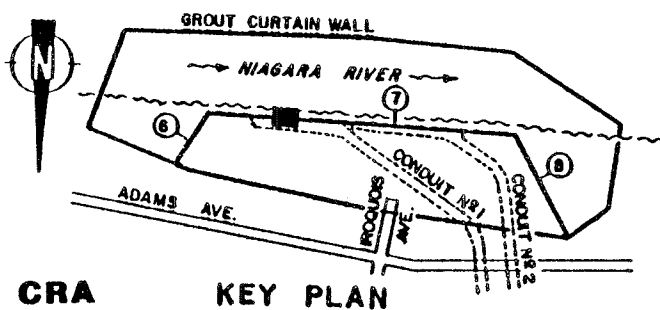
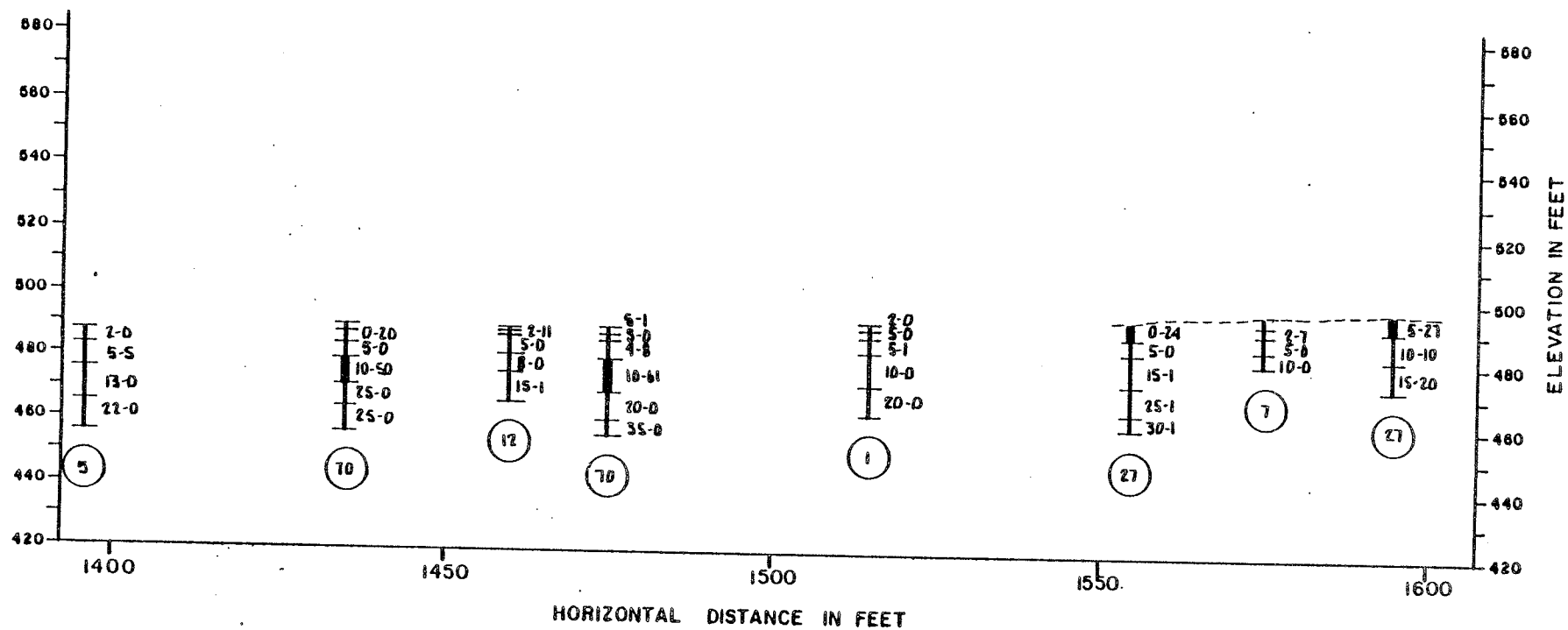
figure 46
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

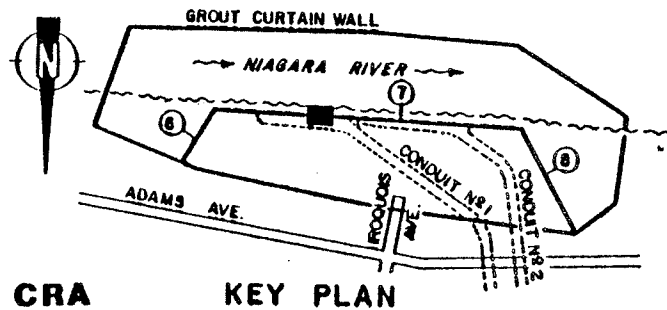
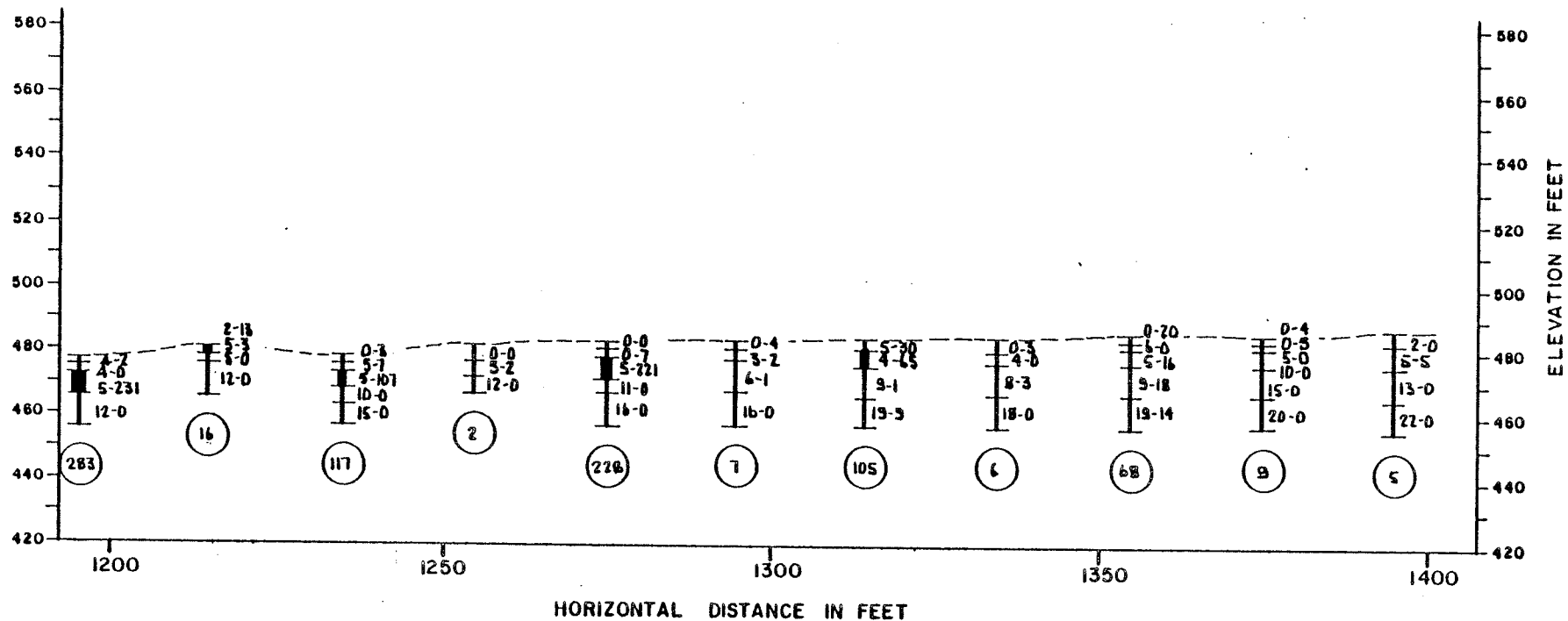
figure 47
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

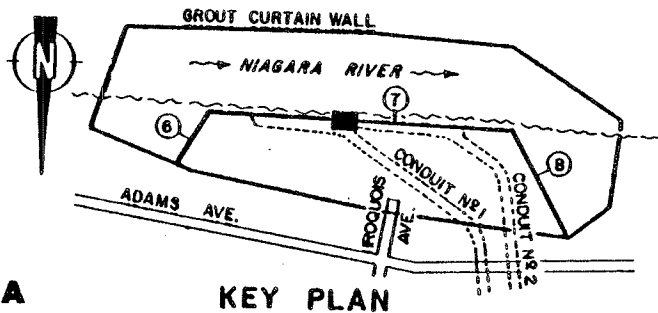
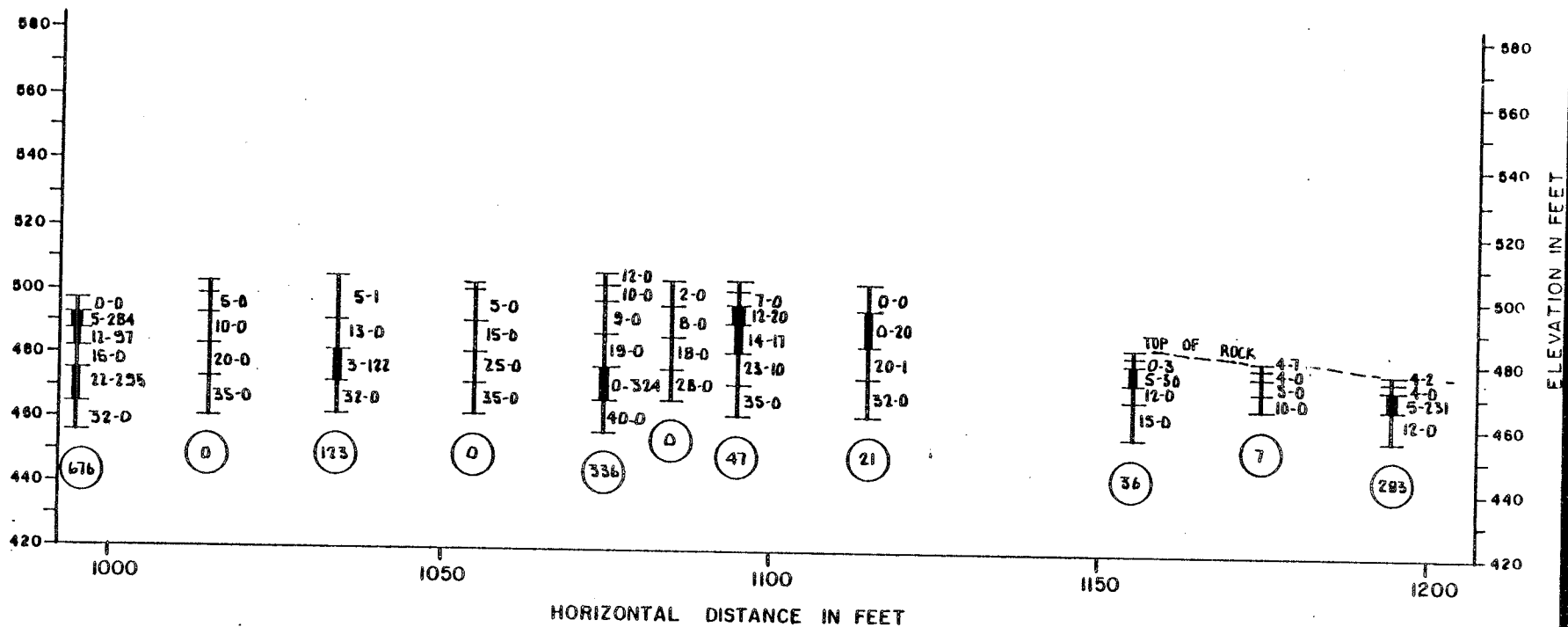
figure 48
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
 - SACKS CEMENT
 - PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

figure 49
GROUTING
GROUT CURTAIN WALL



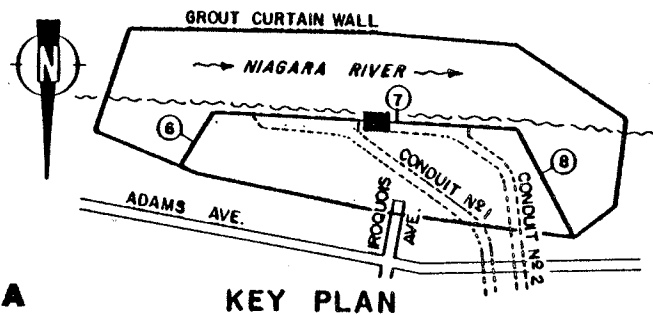
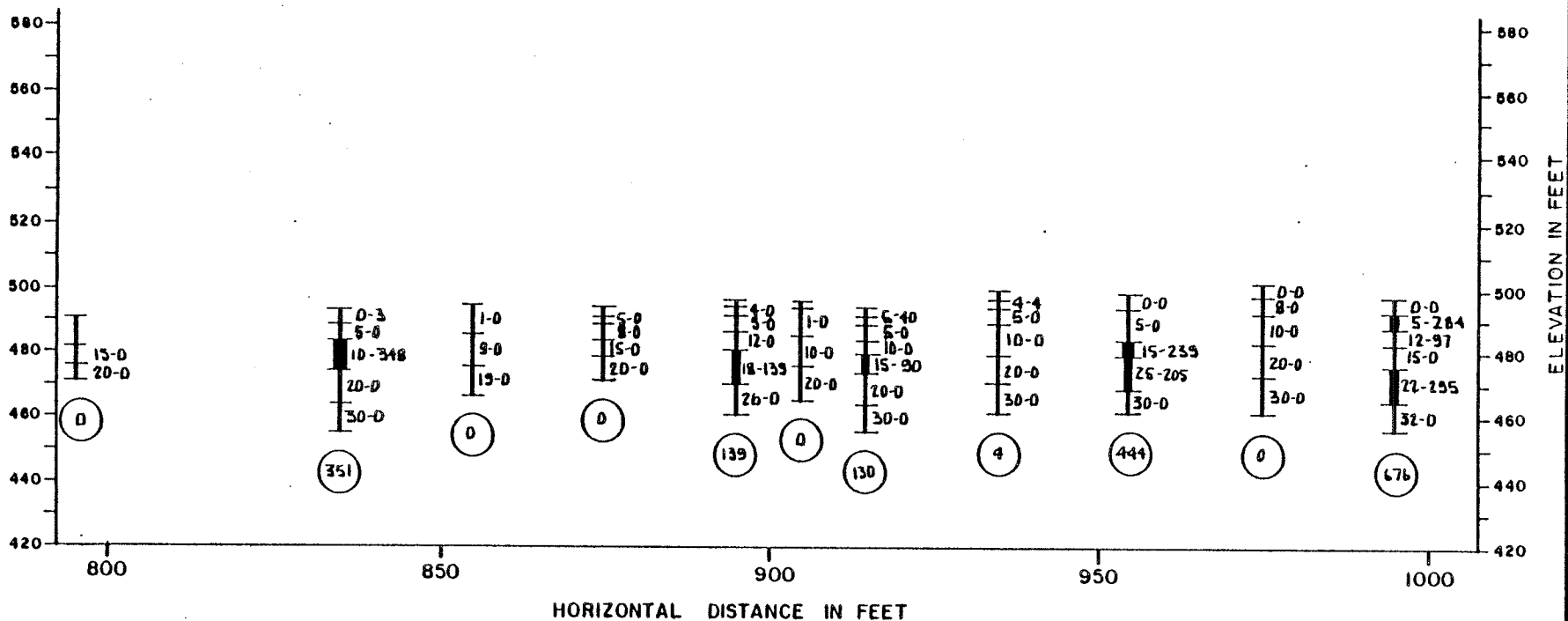
LEGEND

70-10-5

— BAND USED (CU. FT.)
 — SACKS CEMENT
 — PRESSURE (P.S.I.)

(126) TOTAL SACKS CEMENT USED
 (5) TOTAL SAND USED (CU. FT.)

figure 50
 GROUTING
 GROUT CURTAIN WALL

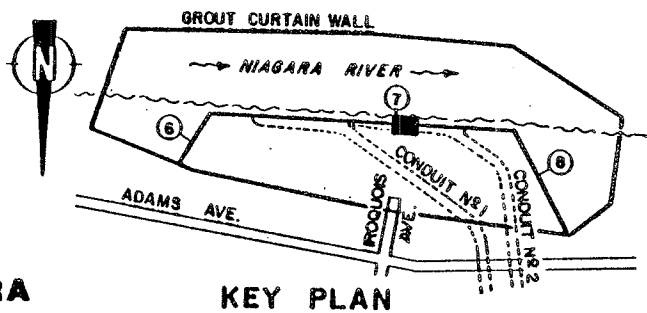
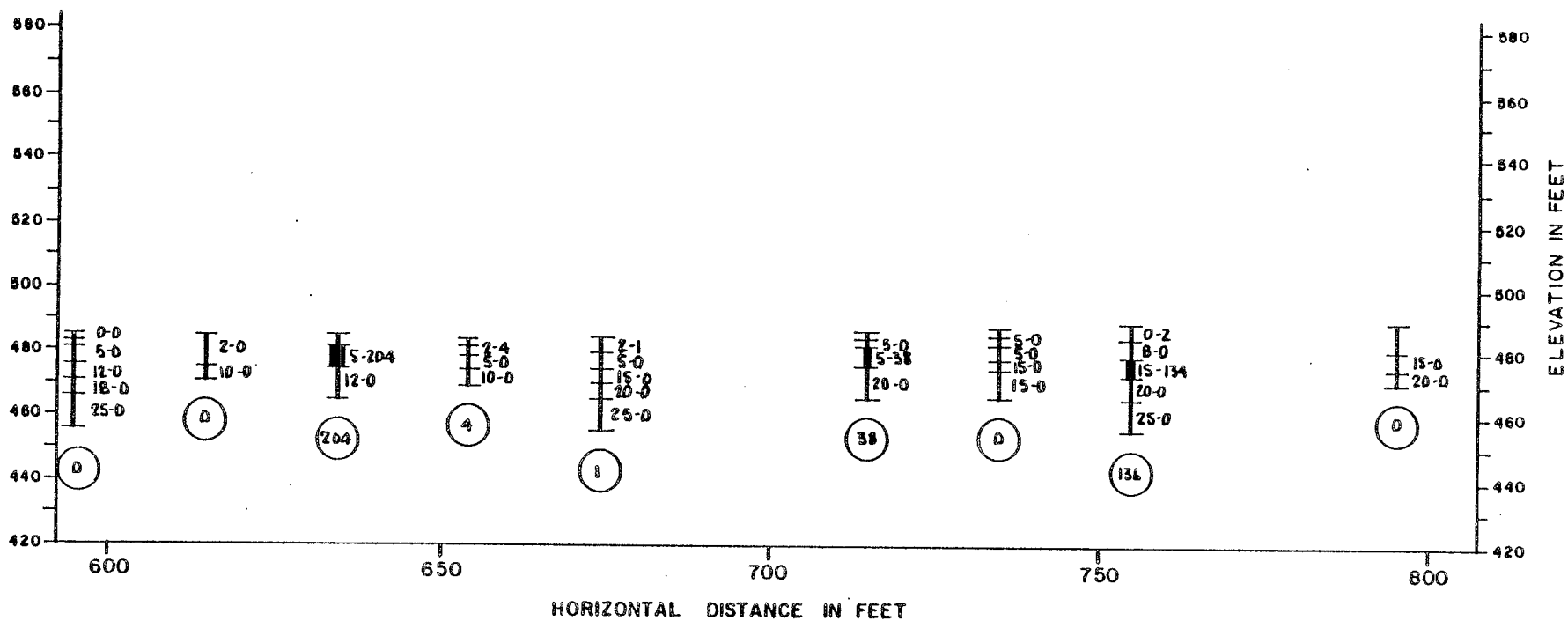


LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

figure 51
GROUTING
GROUT CURTAIN WALL

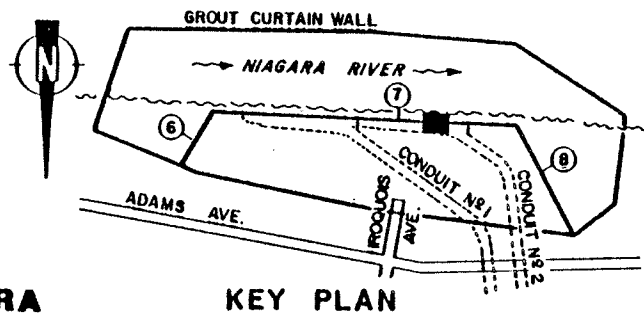
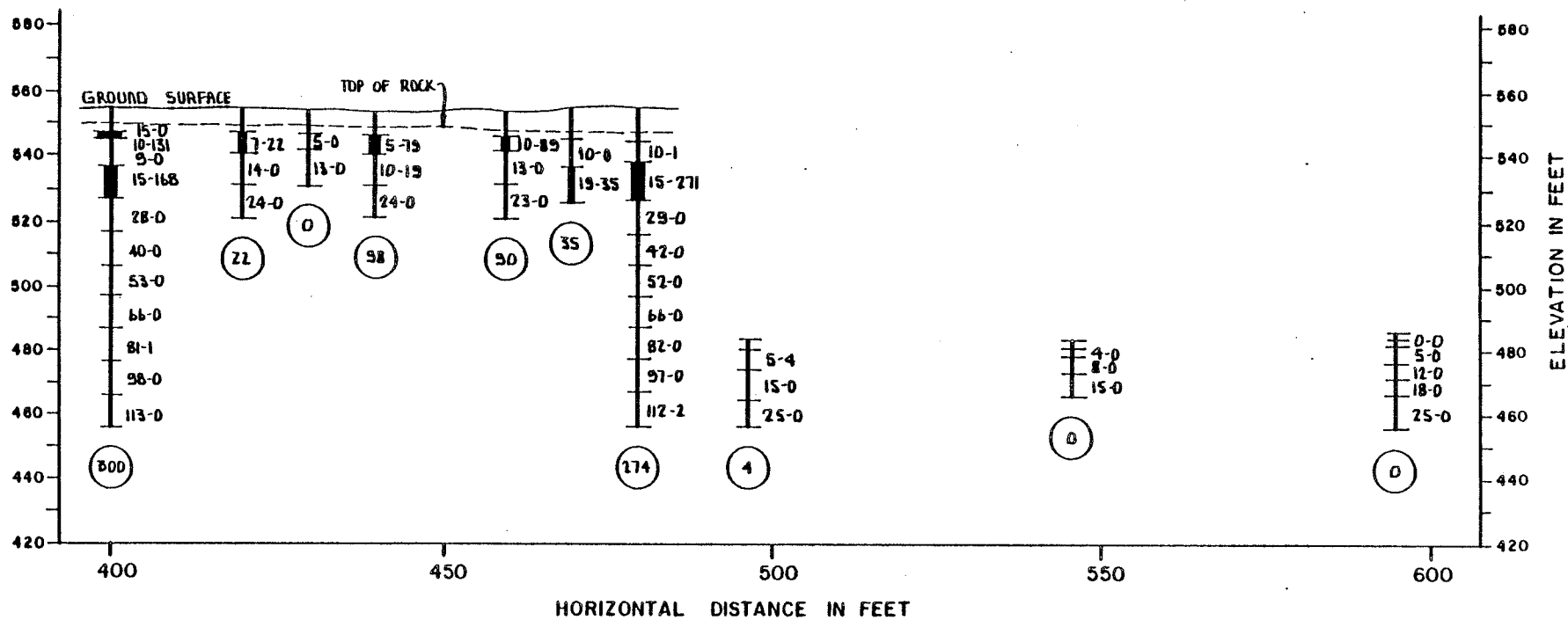
CRA



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

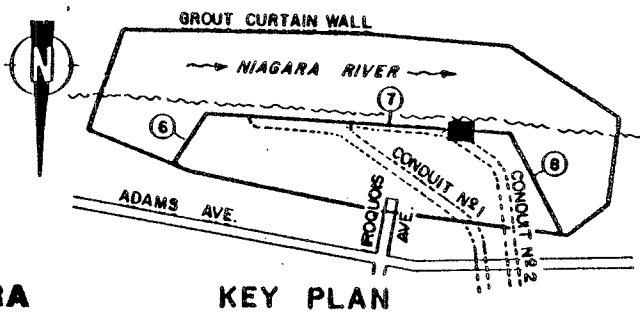
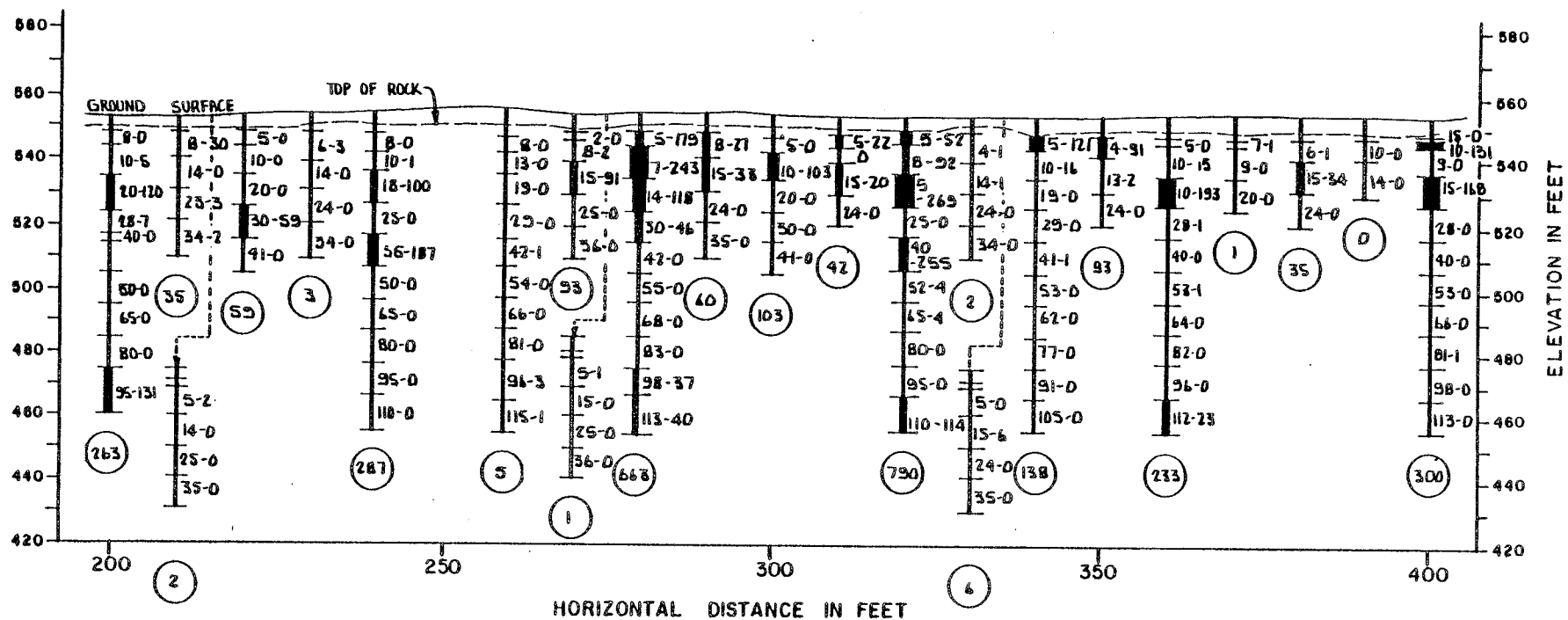
figure 52
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-110-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

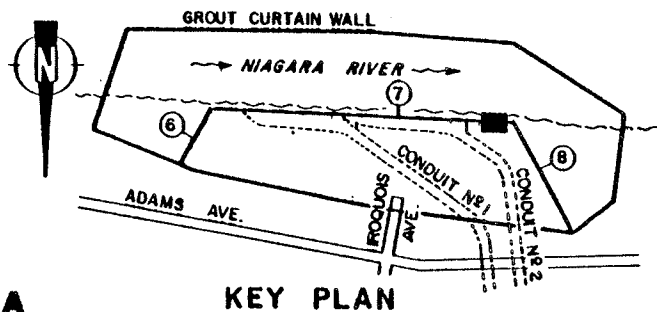
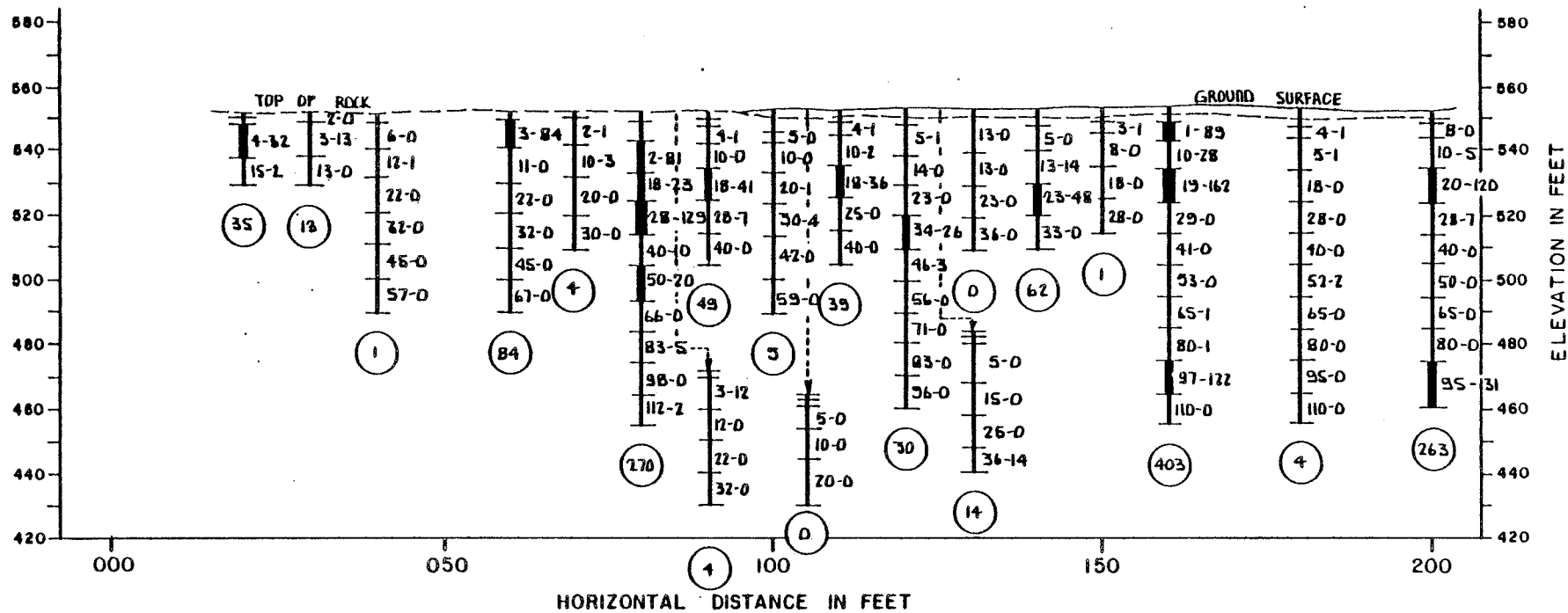
figure 53
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

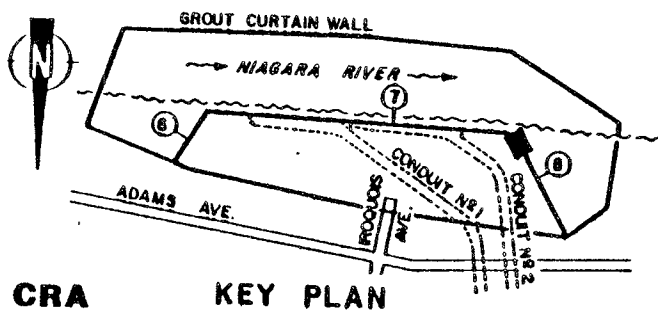
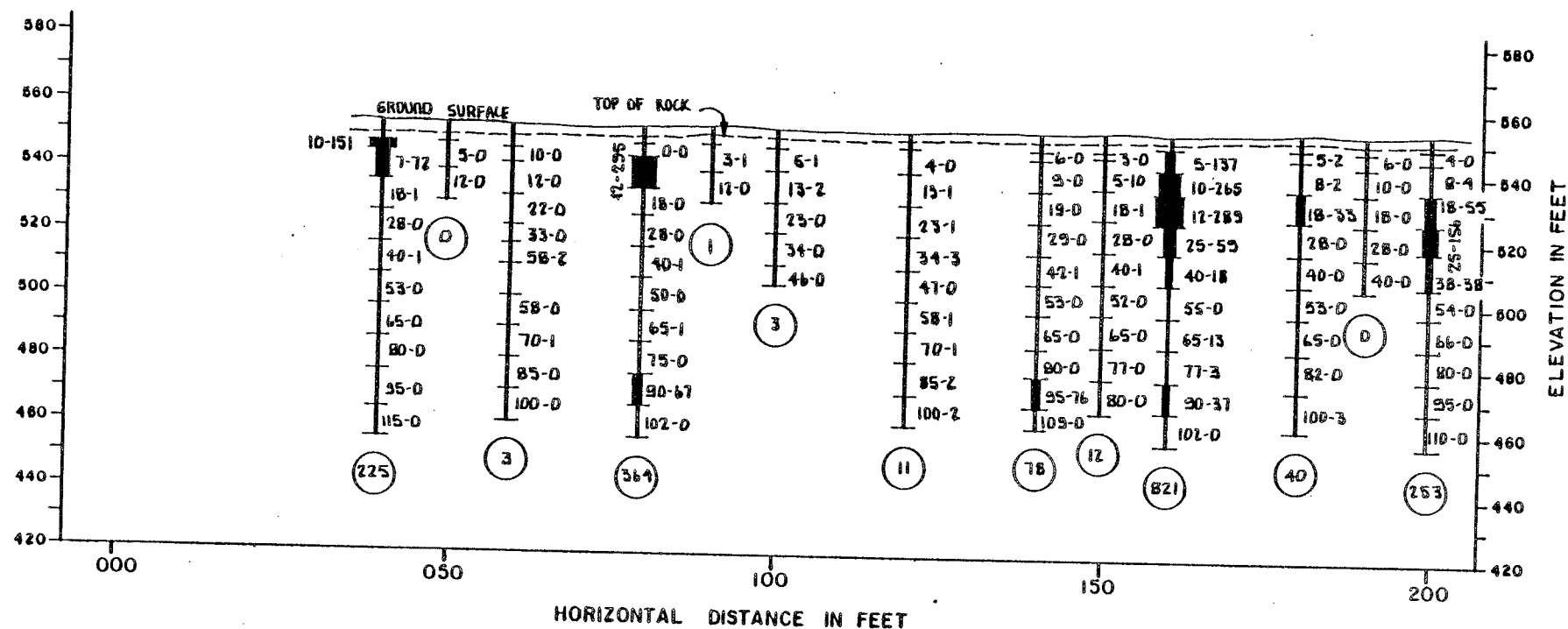
figure 54
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

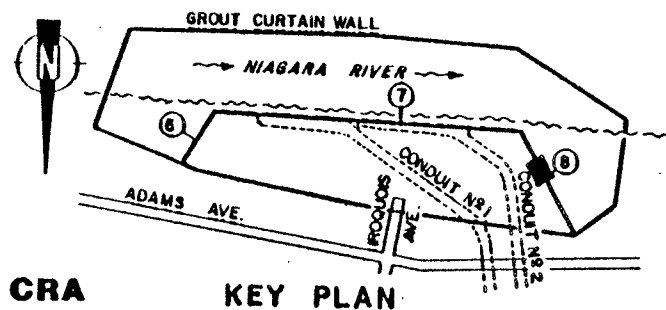
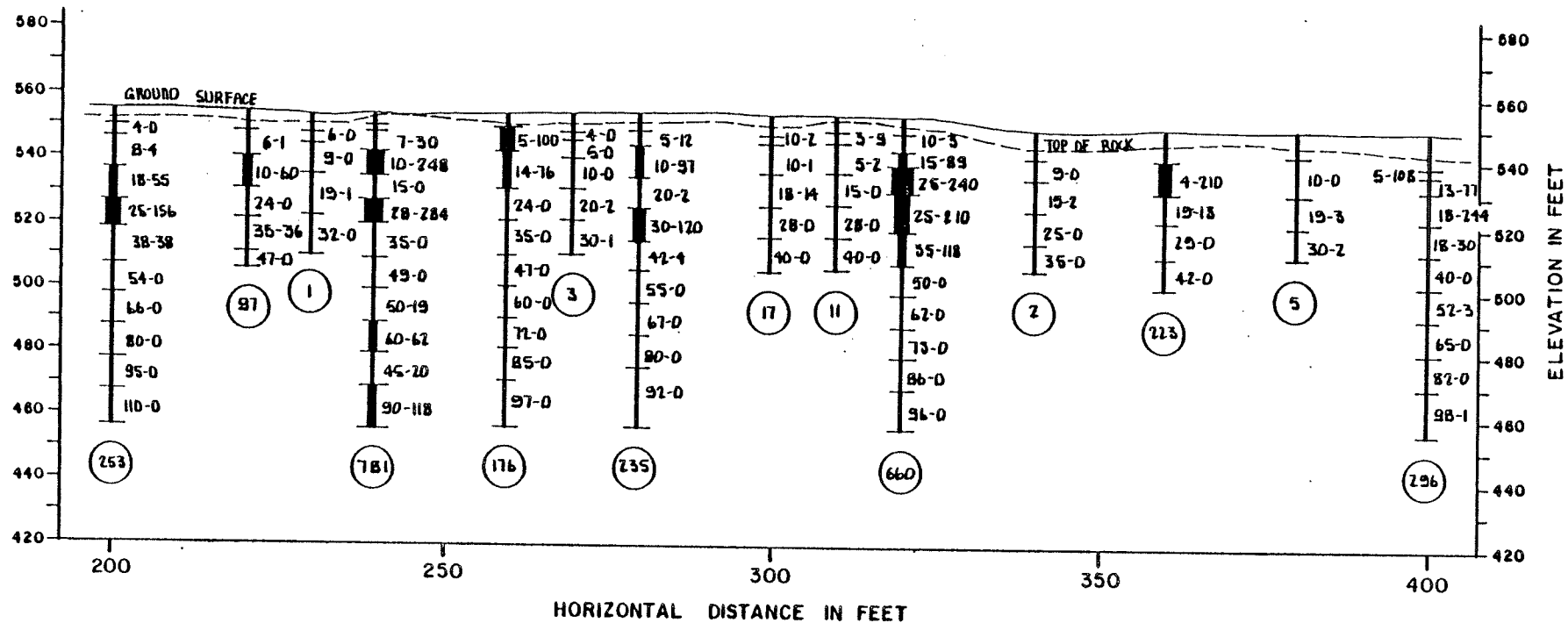
figure 55
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5 SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

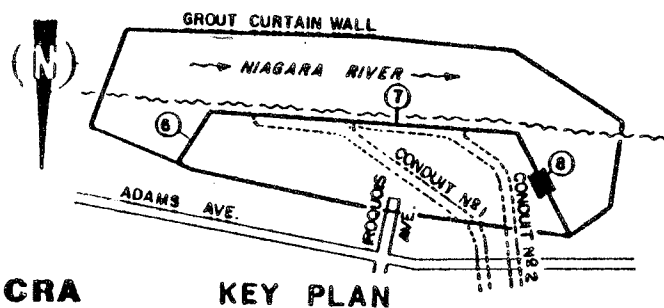
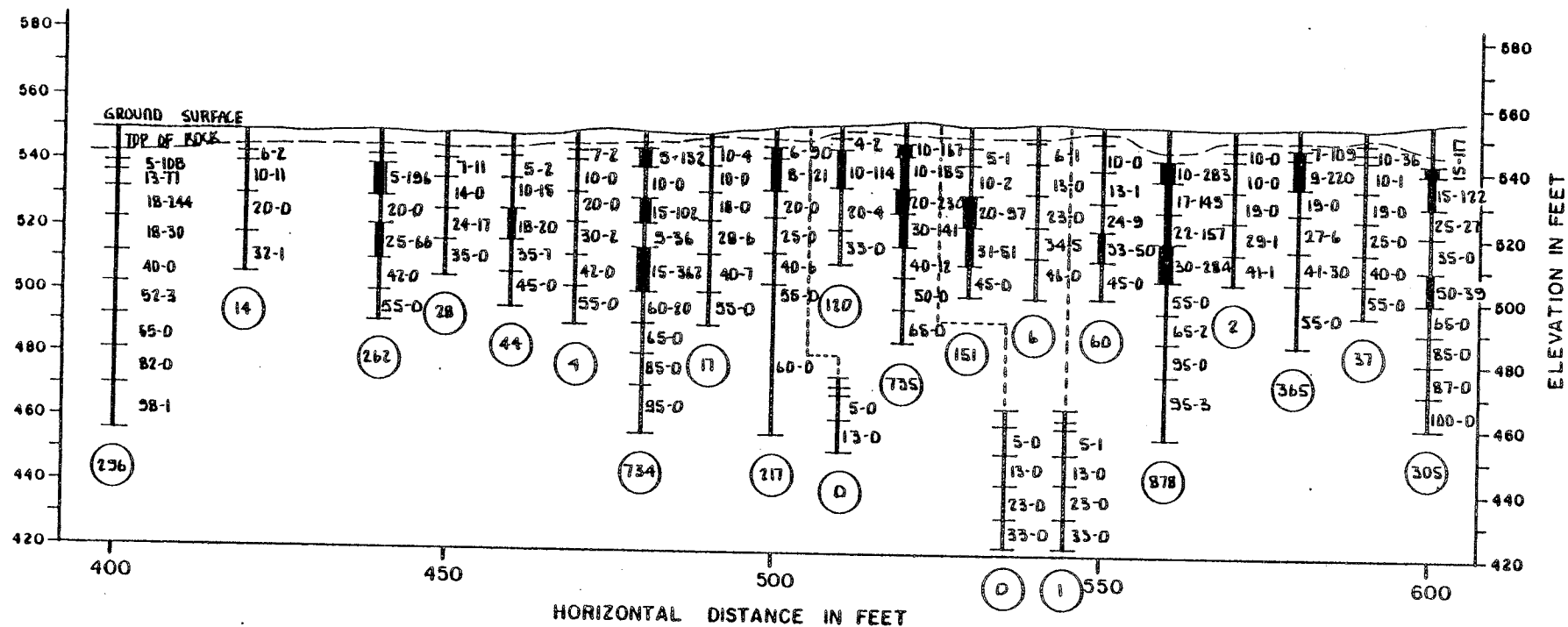
figure 56
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

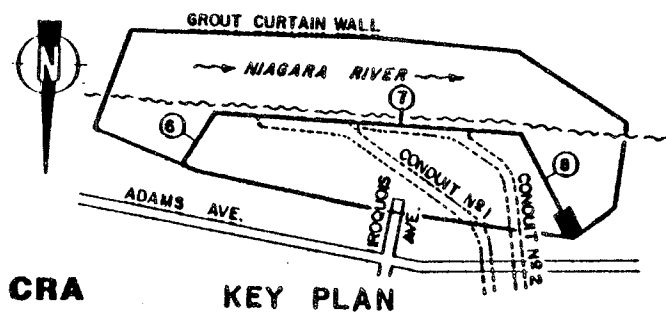
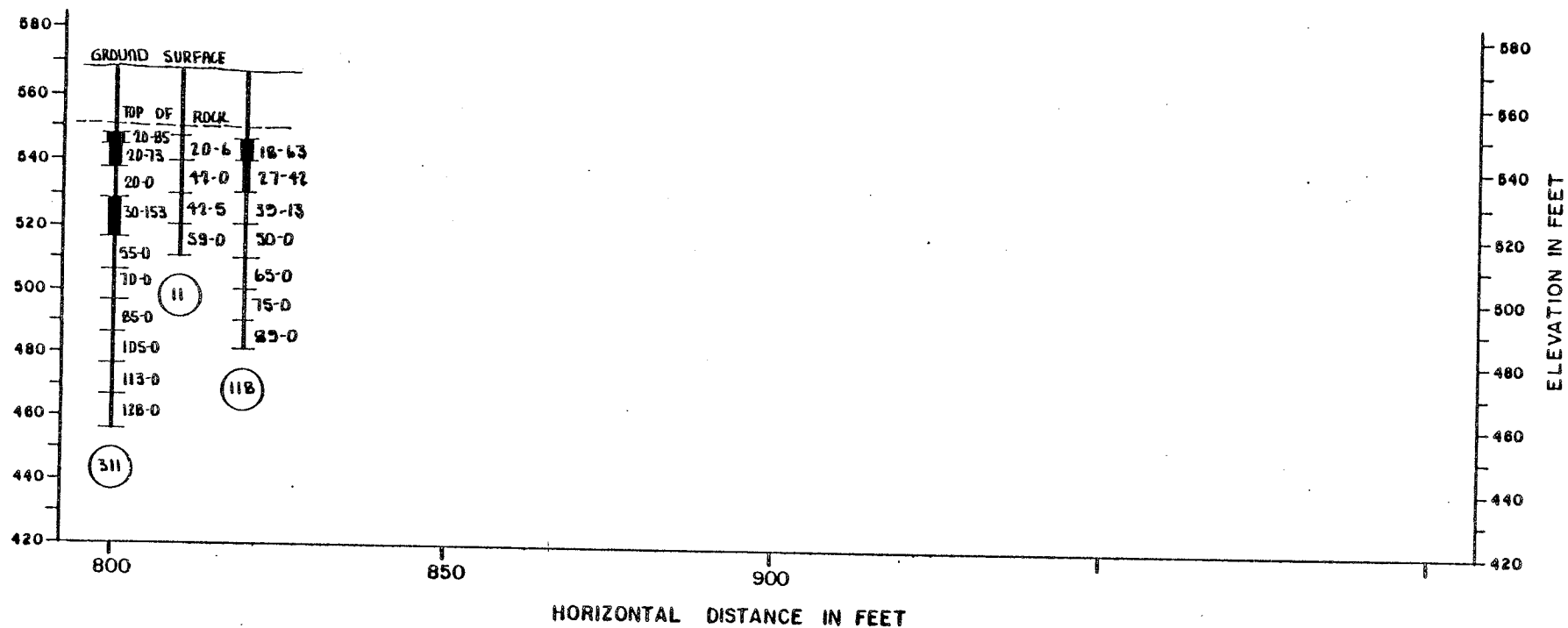
figure 57
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-5
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

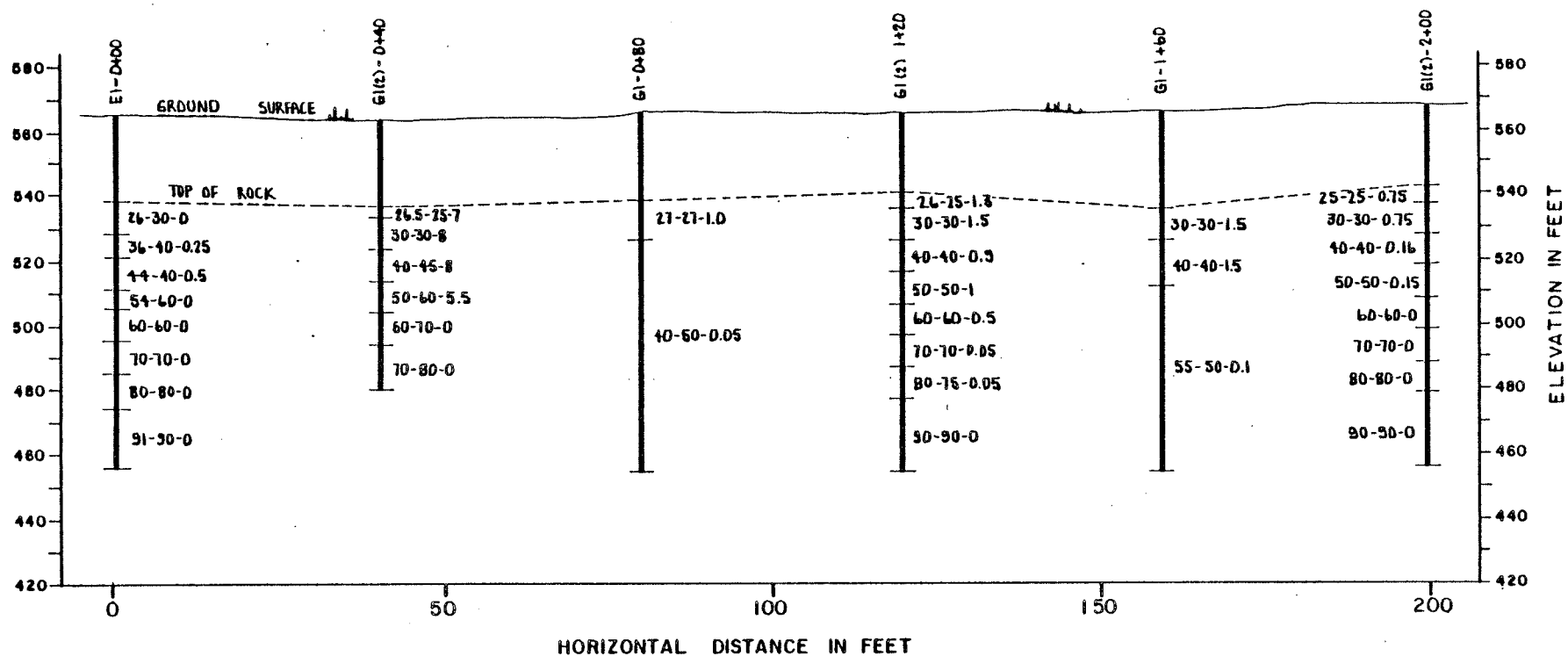
figure 58
GROUTING
GROUT CURTAIN WALL



LEGEND

- 70-10-6
- SAND USED (CU. FT.)
- SACKS CEMENT
- PRESSURE (P.S.I.)
- (126) TOTAL SACKS CEMENT USED
- (5) TOTAL SAND USED (CU. FT.)

figure 60
GROUTING
GROUT CURTAIN WALL



LEGEND

70-10-2.0
 TAKE - c.f.m.
 PRESSURE - p.s.i.
 PACKER DEPTH - ft.

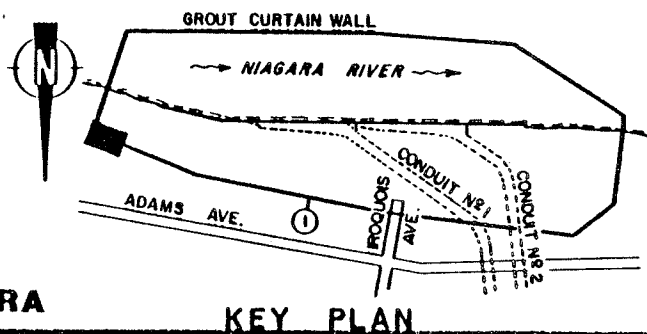


figure 61
 DRILLING AND PRESSURE TESTING
 GROUT CURTAIN WALL

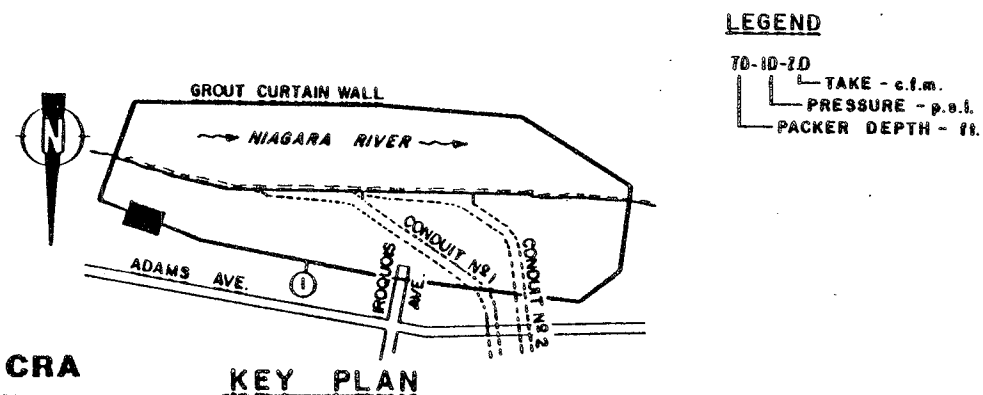
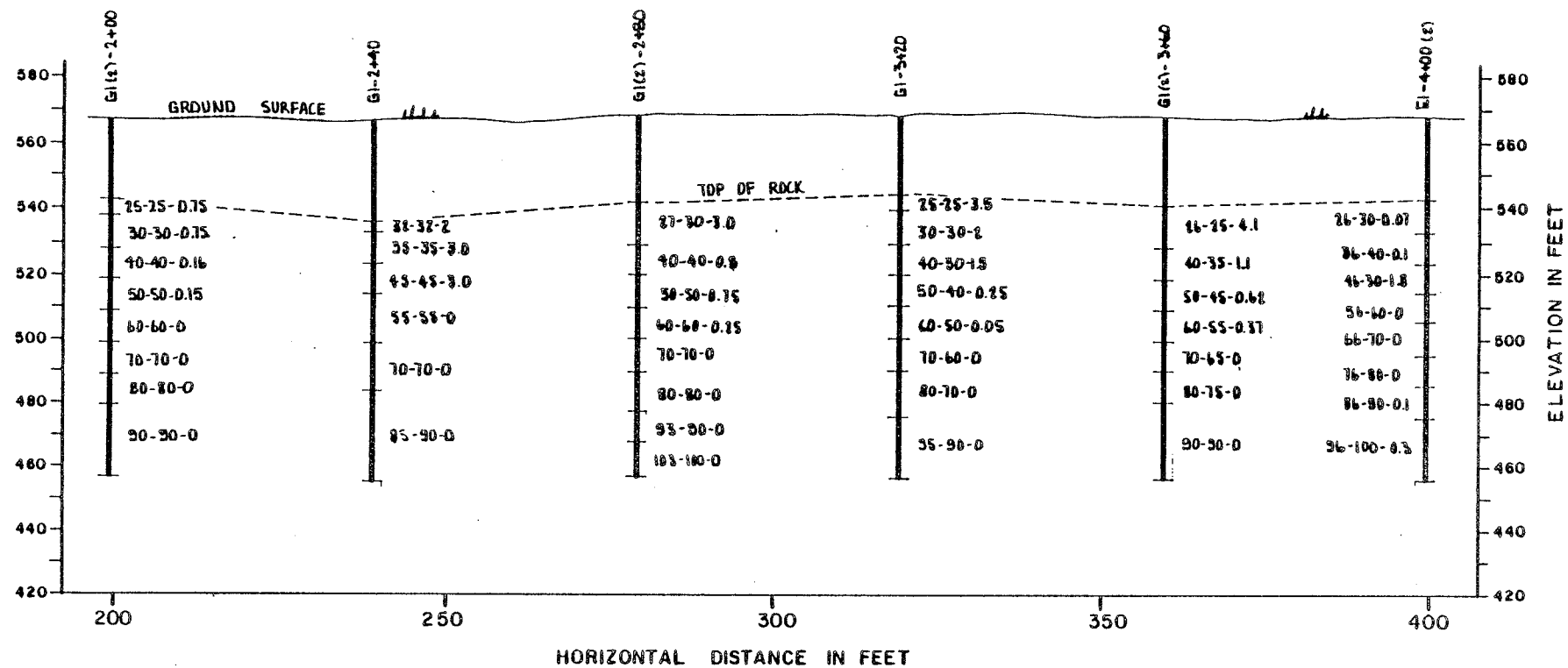
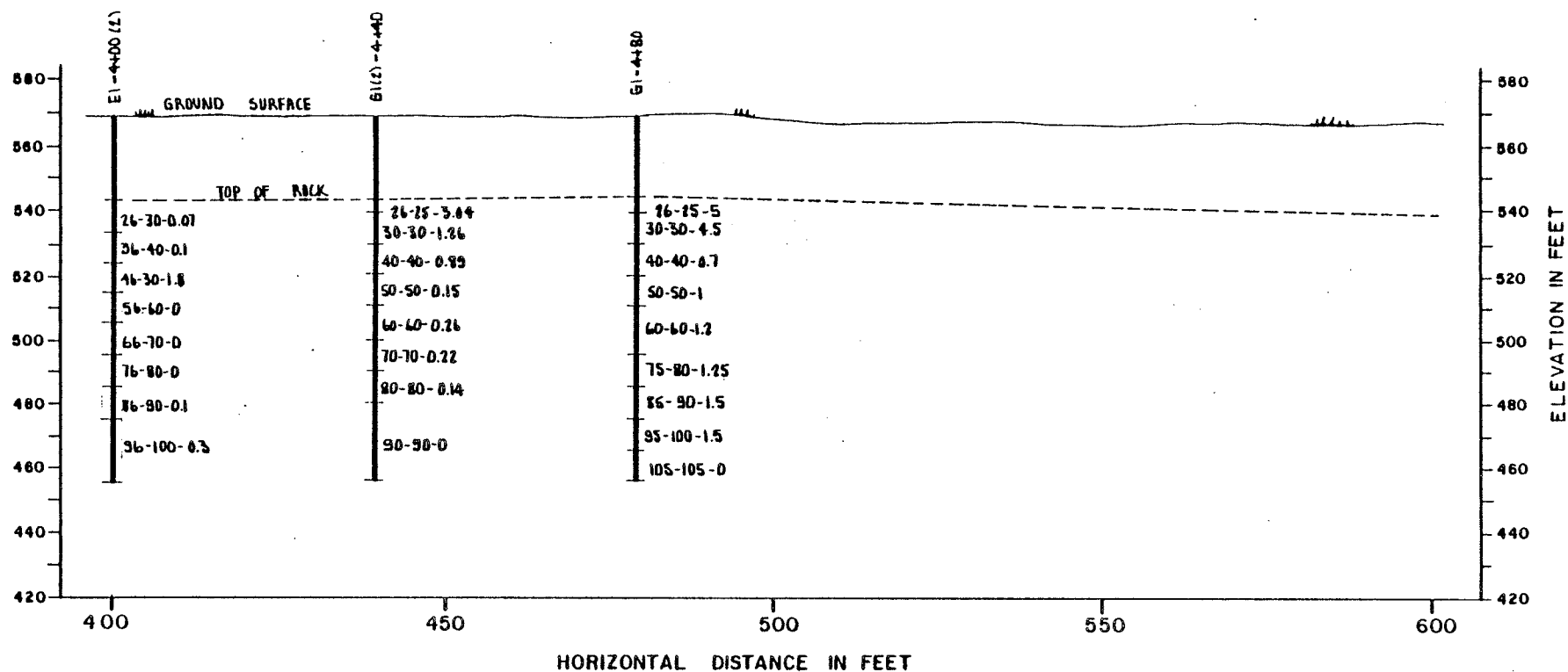


figure 62
 DRILLING AND PRESSURE TESTING
 GROUT CURTAIN WALL



LEGEND

70-10-2.0
 TAKE - c.f.m.
 PRESSURE - p.s.i.
 PACKER DEPTH - ft.

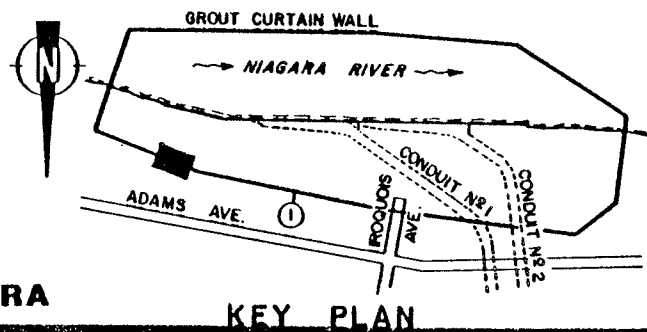
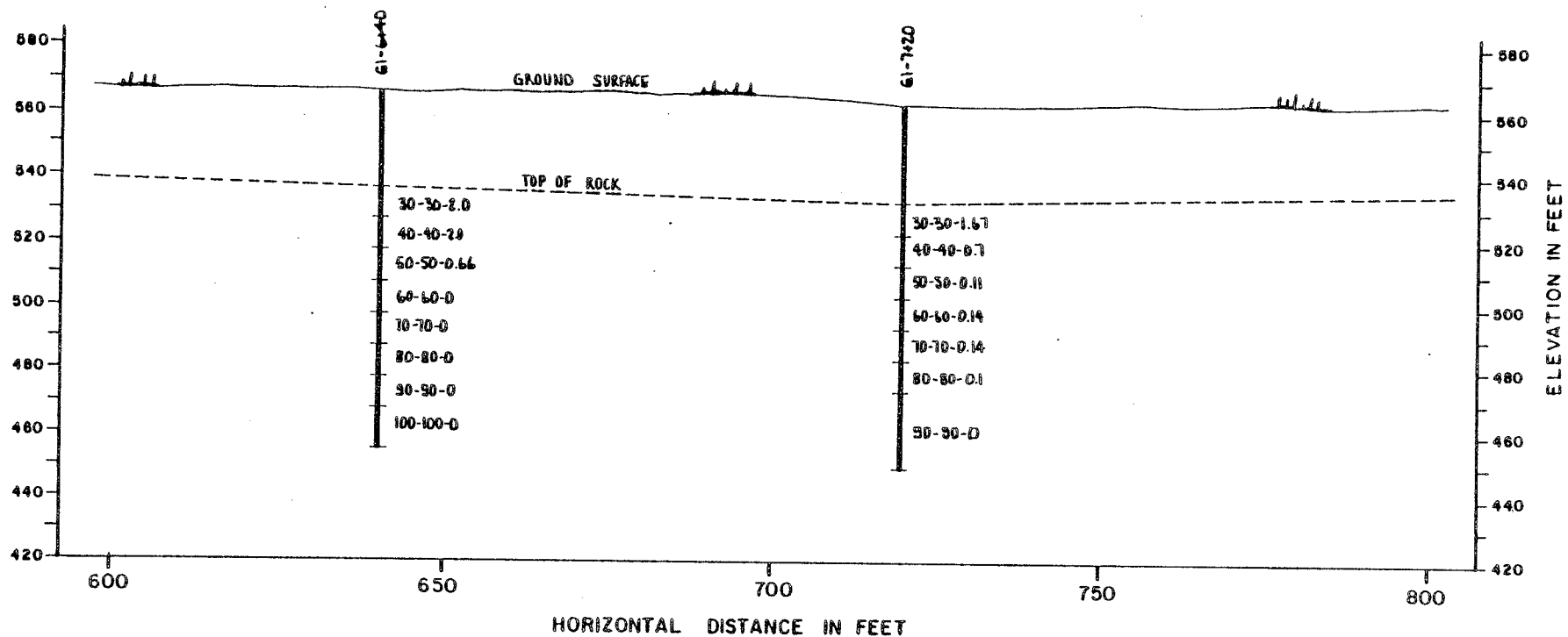


figure 63
 DRILLING AND PRESSURE TESTING
 GROUT CURTAIN WALL



LEGEND

70-10-2.0
 TAKE - c.f.m.
 PRESSURE - p.s.i.
 PACKER DEPTH - ft.

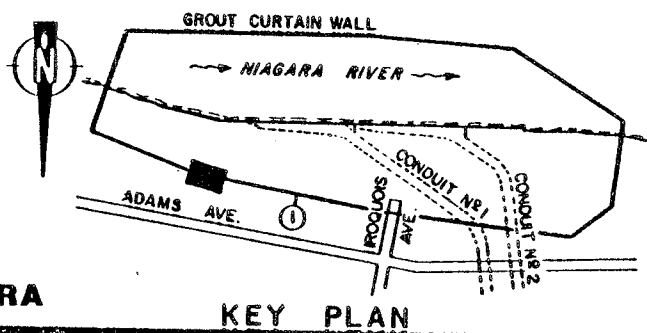
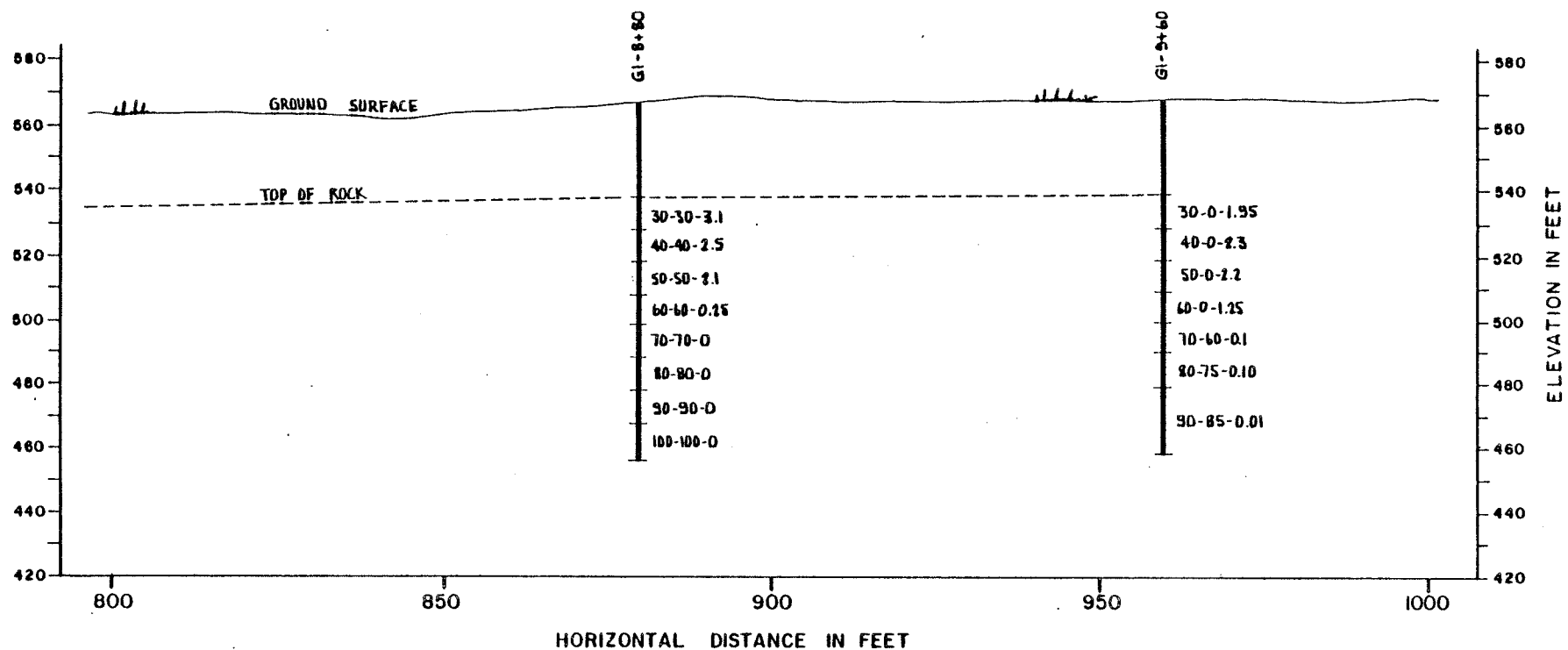


figure 64
 DRILLING AND PRESSURE TESTING
 GROUT CURTAIN WALL



LEGEND

70-10-2.0
 TAKE - c.f.m.
 PRESSURE - p.s.i.
 PACKER DEPTH - ft.

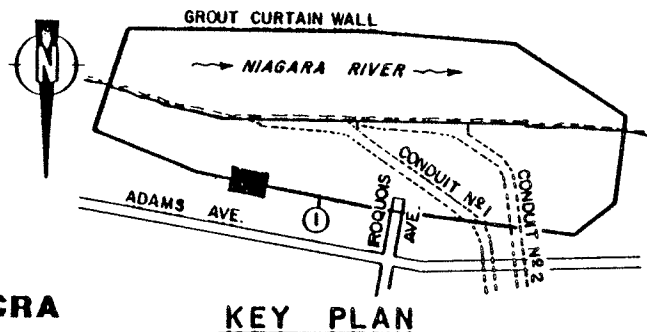
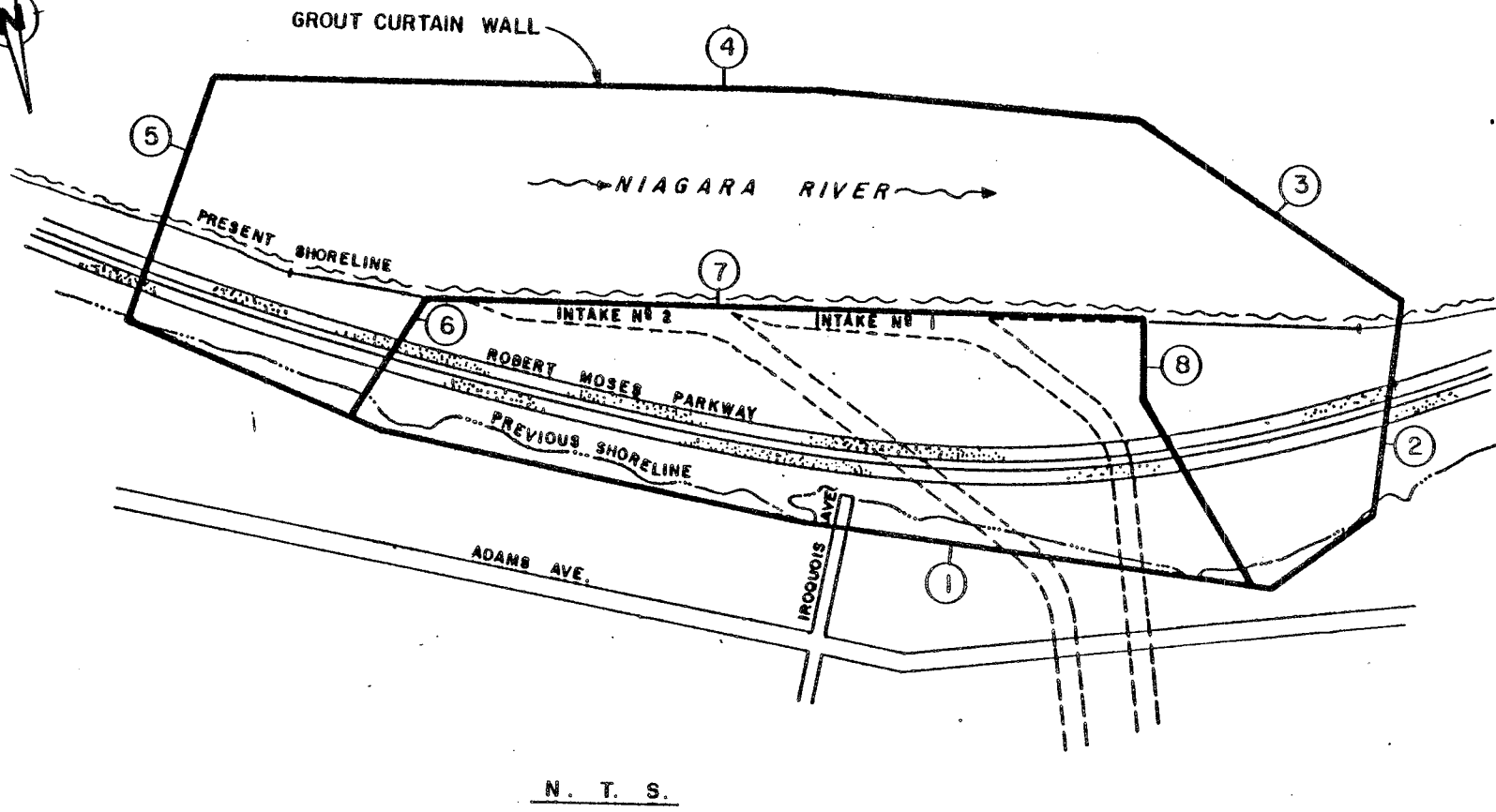


figure 65
 DRILLING AND PRESSURE TESTING
 GROUT CURTAIN WALL

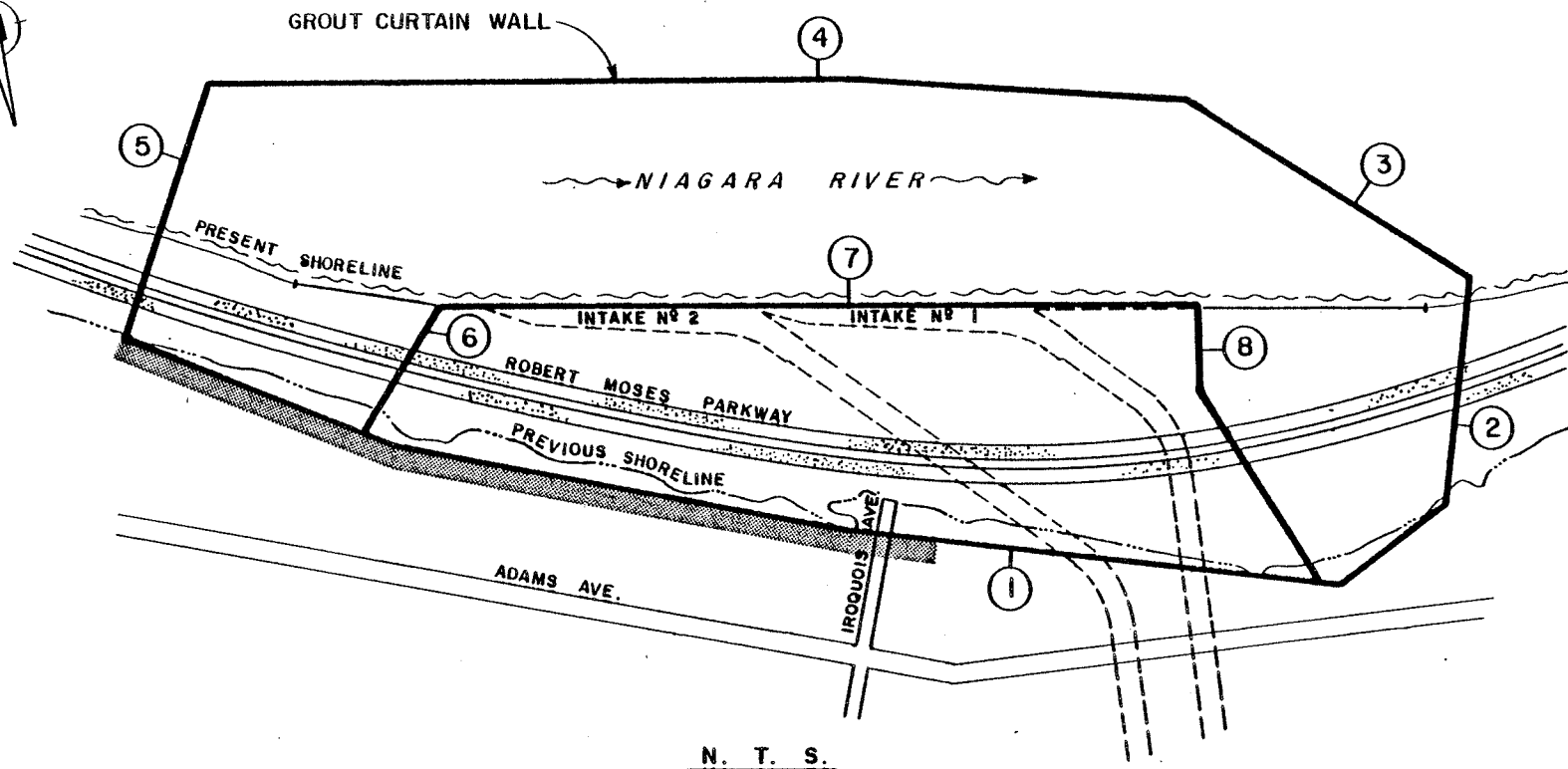


LEGEND

- ① GROUT CURTAIN WALL SECTION

MAP I
GROUTING
KEY PLAN
GROUT CURTAIN WALL

CRA



LEGEND

 PORTION OF GROUT CURTAIN WALL PRESSURE TESTED DURING DRILLING

 PORTION OF GROUT CURTAIN WALL NOT PRESSURE TESTED

 GROUT CURTAIN WALL SECTION

MAP 2

DRILLING AND PRESSURE TESTING
KEY PLAN
GROUT CURTAIN WALL

CRA

