3729.031

Report

49185

Remedial Investigation

Richardson Hill Road Municipal Landfill
Sidney, New York

Revised: March 1997

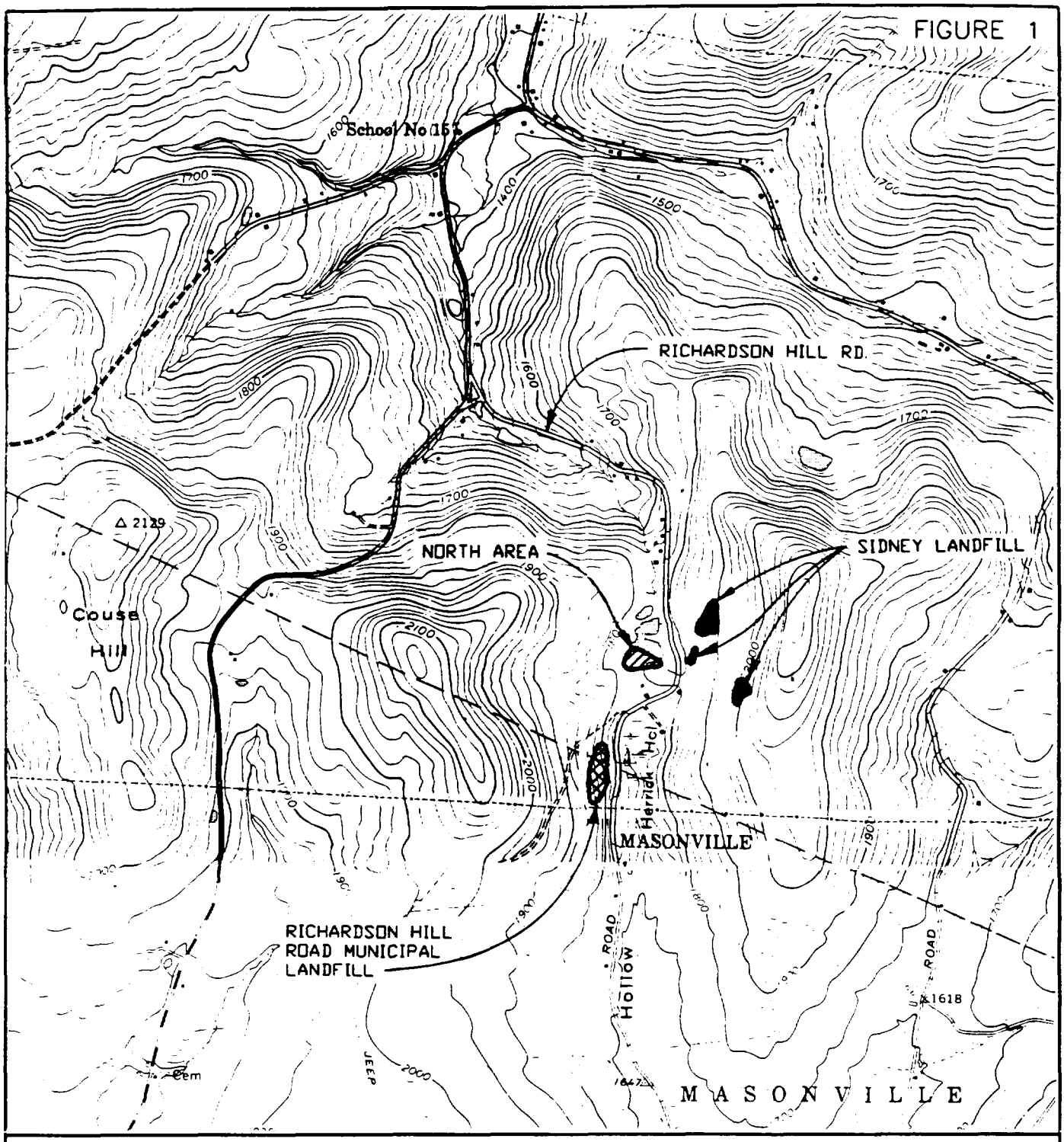
5000 Brittonfield Parkway
P.O. Box 4873
Syracuse, New York 13221

49185

302039

FIGURES

302040



RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SITE LOCATION MAP

0 2000 4000

SCALE IN FEET

ADAPTED FROM U.S.G.S. TROUT CREEK N.Y., WALTON WEST N.Y., UNADILLA N.Y., AND FRANKLIN N.Y. 7.5 MIN.QUADRANGLES

7/24/92

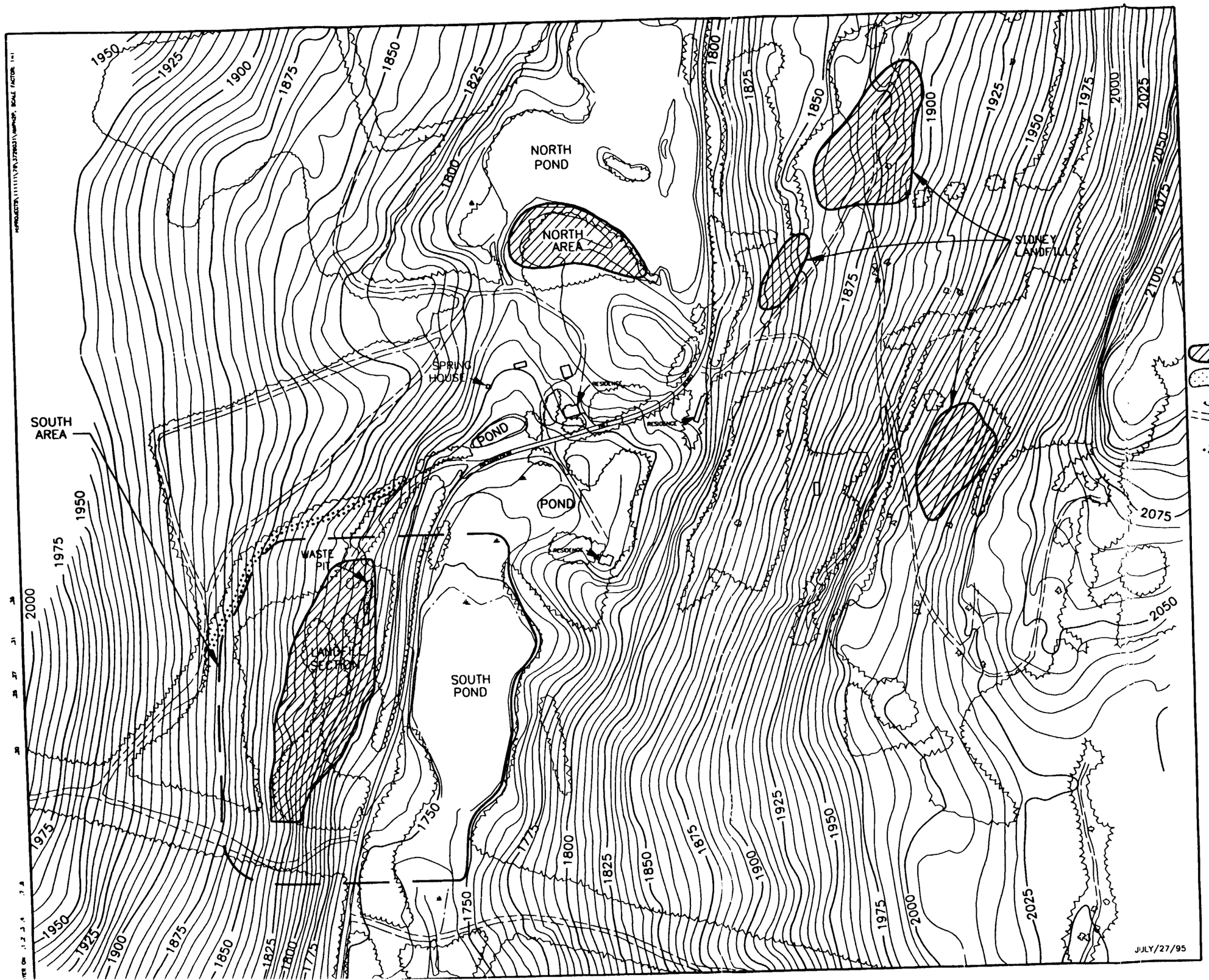
3729 015 876

8.5X11

302041

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 2



LEGEND

- LANDFILL SECTION
- WASTE PIT AREA
- TREE LINE
- ROADWAY
- ROAD ADJACENT STONE WALL
- WASTE PIT INVESTIGATION AREA

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SITE MAP

0 300 600

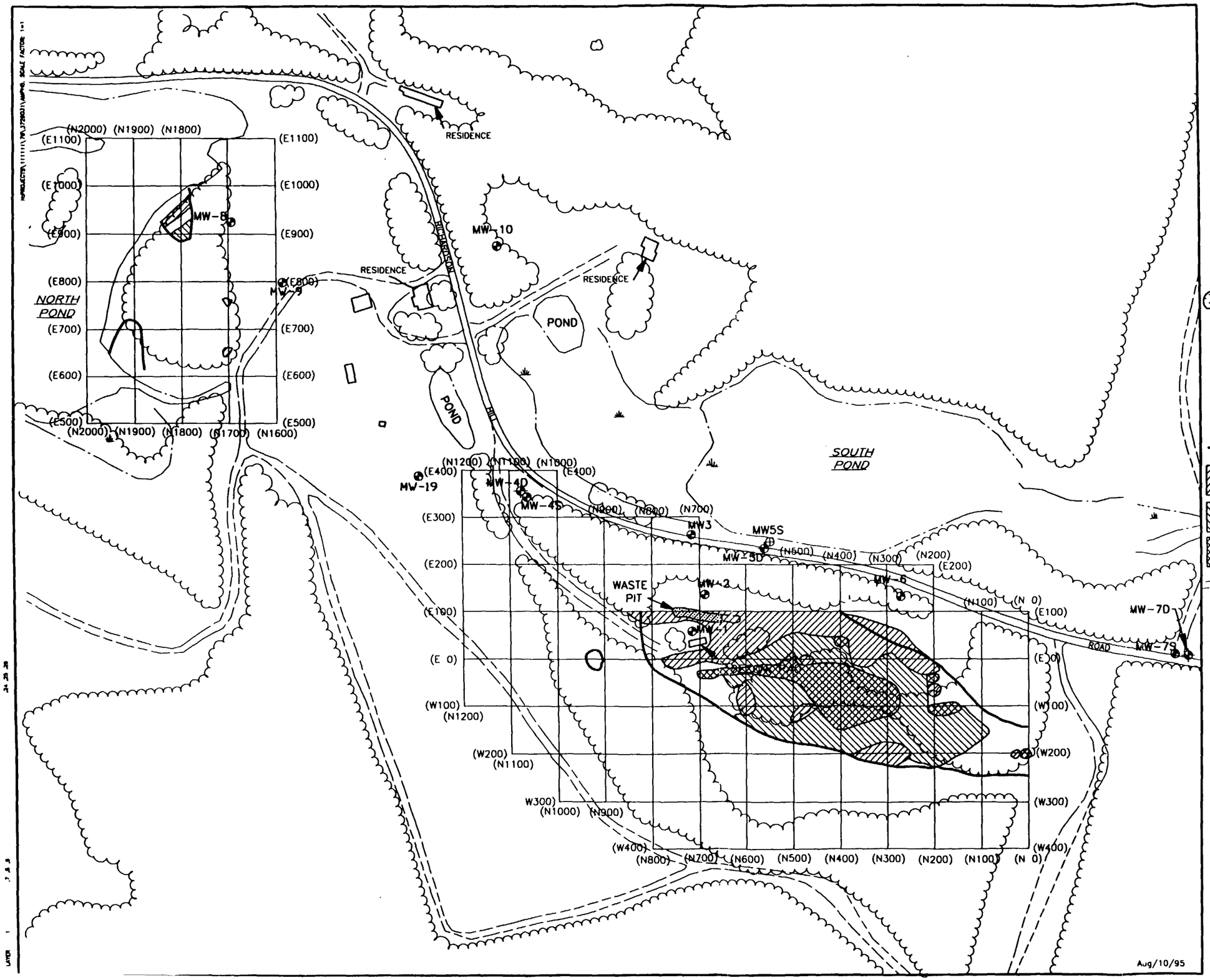
APPROX. SCALE IN FEET

3729.031-09F

302042

ENGINEERS, INC.
Syracuse, New York

FIGURE 3



LEGEND

- TREE LINE
- WASTE PIT AREA
- MW3 OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- FORMER MONITORING WELL LOCATION
- LIMITS OF BURIED FILL DETERMINED USING EM-31 (QUADRATURE PHASE)
- -970 TO 400 GAMMAS BELOW AND ABOVE REGIONAL MAGNETIC FIELD
- 800 TO 1500 GAMMAS ABOVE REGIONAL MAGNETIC FIELD
- 1500 TO 5097 GAMMAS ABOVE REGIONAL MAGNETIC FIELD
- ROADWAY
- ROAD ADJACENT STONE WALL

NOTE: REGIONAL MAGNETIC FIELD ASSUMED 55000 GAMMAS

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

GEOPHYSICAL SURVEY DATA
EM-31 (QUADRATURE PHASE)
AND PROTON MAGNETOMETER

302043

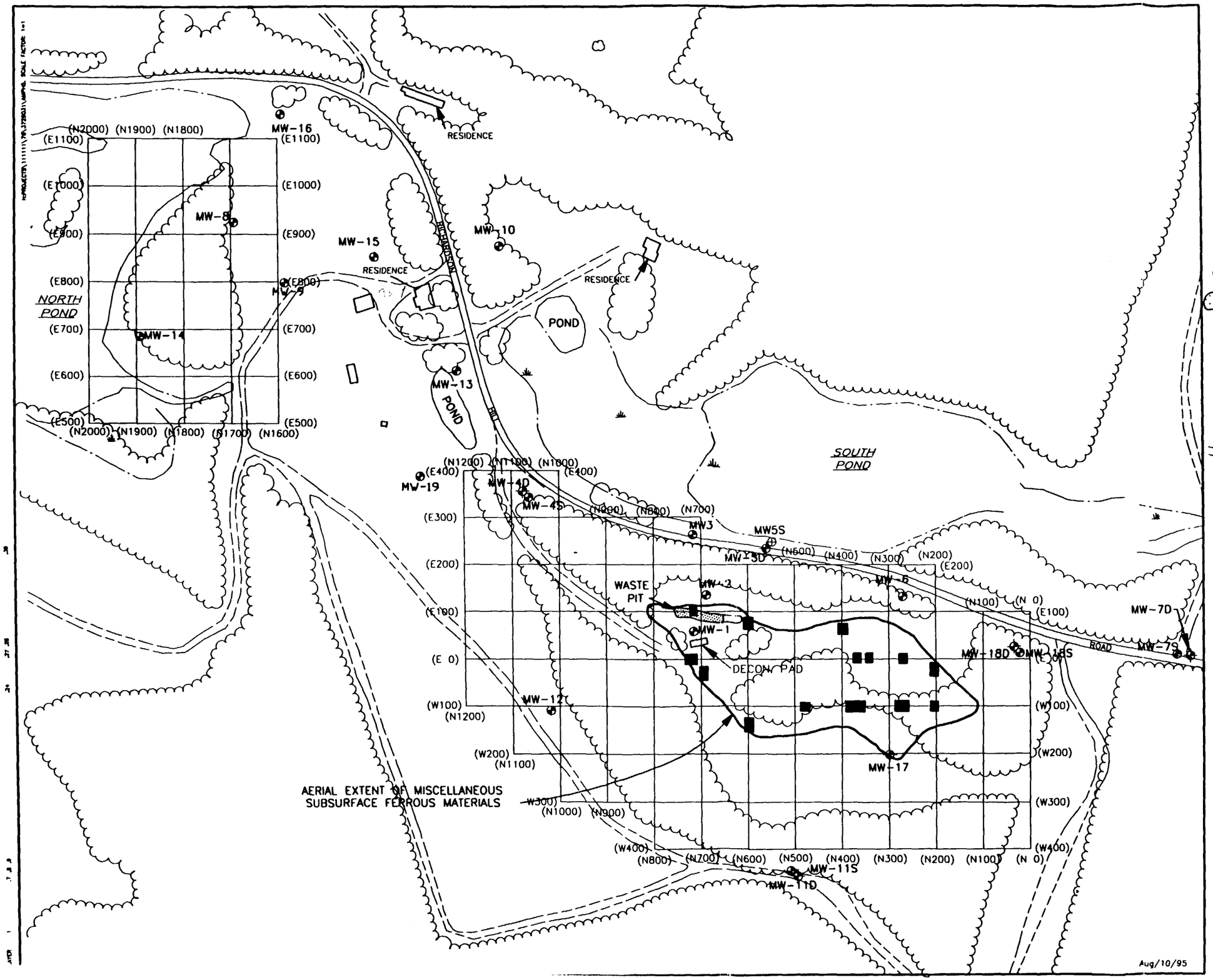
0 200 400

SCALE IN FEET

3729.031-31F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

FIGURE 4



LEGEND

- TREE LINE
- WASTE PIT AREA
- MW3 OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- FORMER MONITORING WELL LOCATION
- LOCATION OF IDENTIFIED SUBSURFACE FERROUS MATERIAL
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

GEOPHYSICAL SURVEY DATA
EM-31 (IN-PHASE MODE)

302044

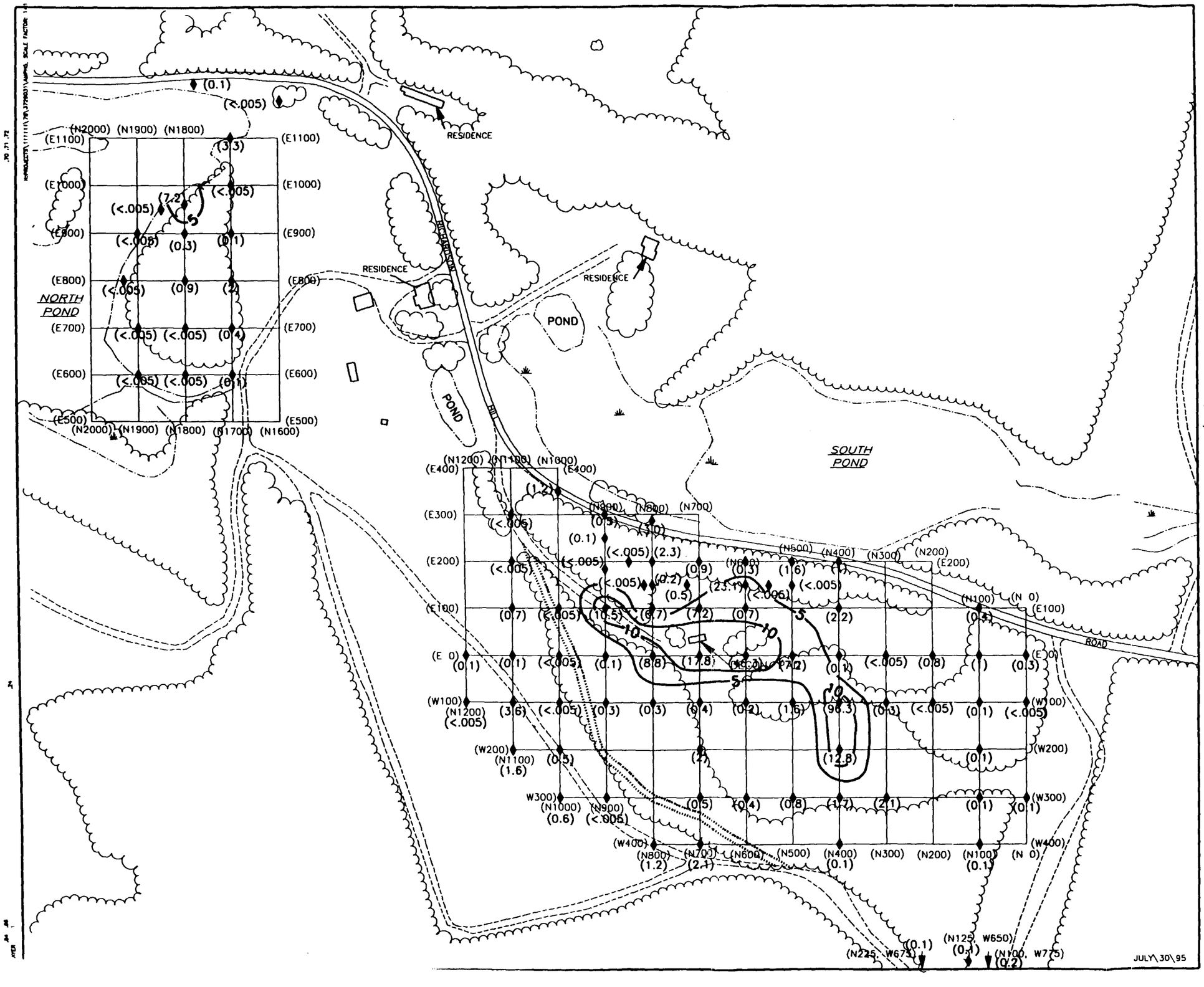
0 200 400

SCALE IN FEET

3729.031-32F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 5



LEGEND

- TREE LINE
- (7.2) TOTAL VOC CONCENTRATION IN ppm
- ♦ SOIL VAPOR SAMPLING POINT
- TOTAL VOC CONTOURS 5 AND 10 ppm
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SOIL VAPOR SURVEY RESULTS

302045

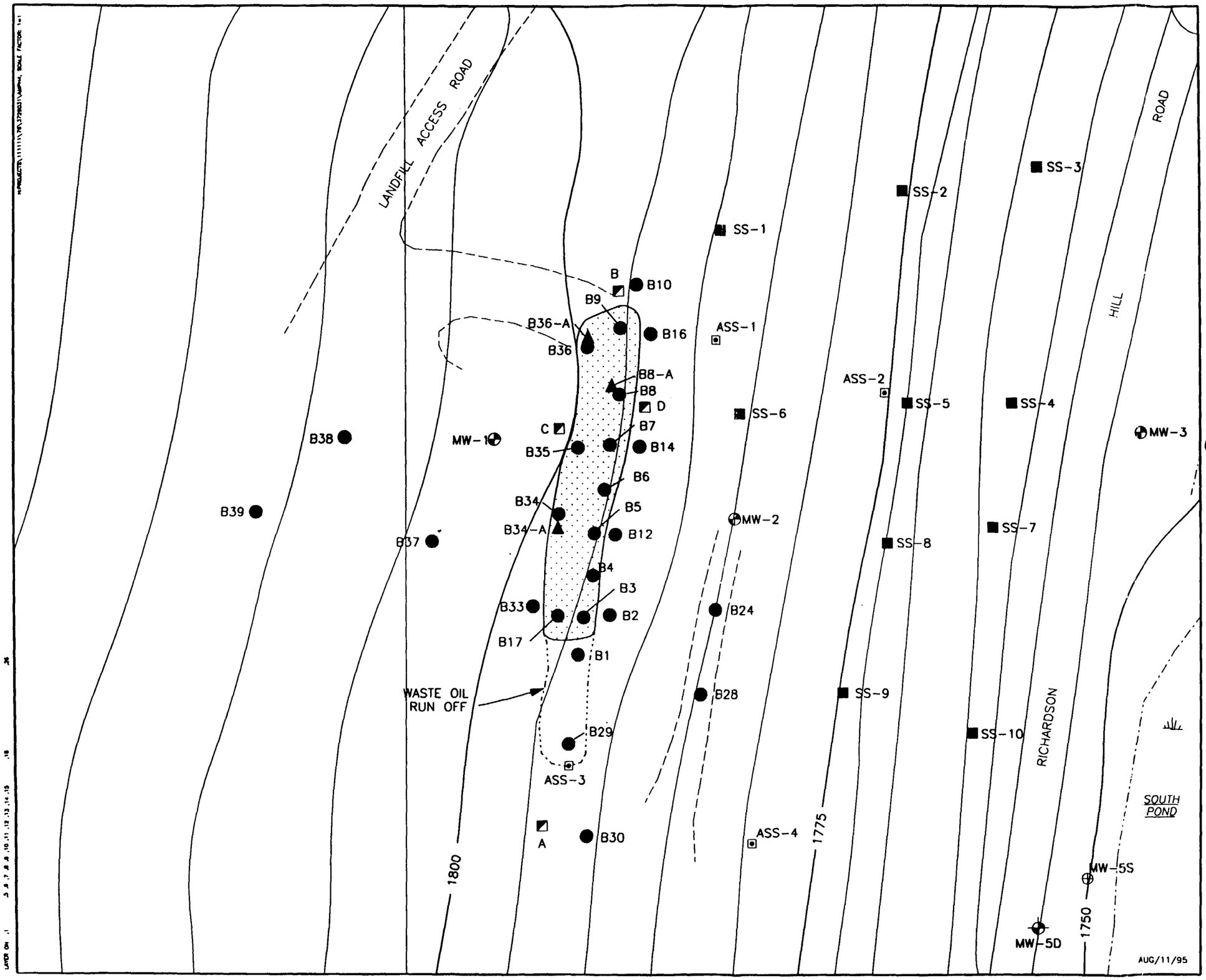
0 200 400

SCALE IN FEET

3729.031-33F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

FIGURE 6



LEGEND

- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- FORMER MONITORING WELL LOCATION
- SURFACE SOIL SAMPLE LOCATION
- BORING LOCATION
- TCL SAMPLE LOCATION
- WASTE PIT AREA
- AIR MONITORING LOCATIONS
- ASS-1 SRI SURFACE SOIL SAMPLE LOCATIONS

NOTE:

- TCL SOIL SAMPLES WERE ALSO COLLECTED IN BORING B6 AND B7

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

WASTE OIL PIT
CHARACTERIZATION MAP

302046

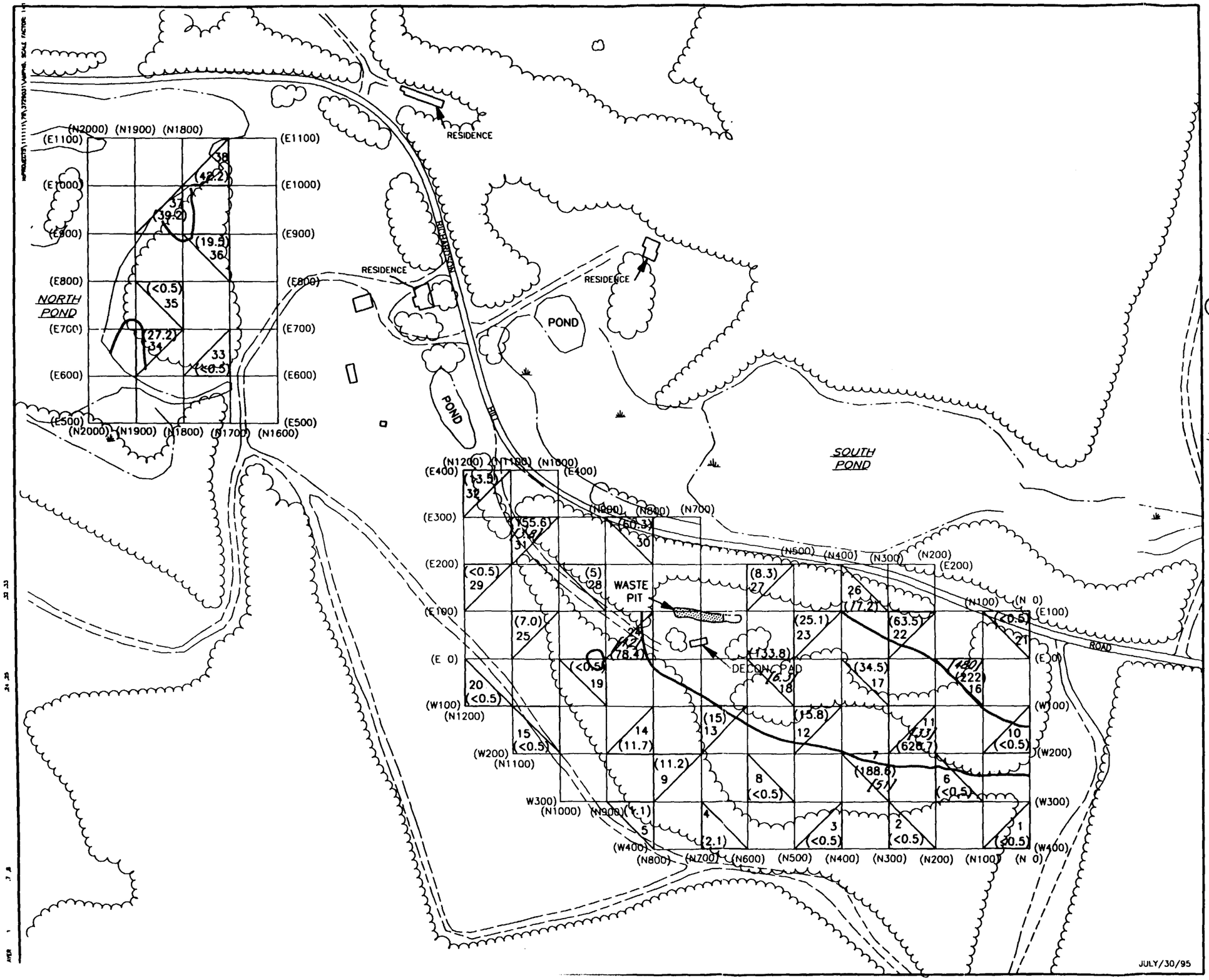
0 30 60

APPROX. SCALE IN FEET

3729.031-029F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 7



LEGEND

- TREE LINE
- WASTE PIT AREA
- SURFACE SOIL COMPOSITE SAMPLING AREA
- (<0.5) PCB 1248 SCREENING CONCENTRATION (PPM)
- [51] PCB 1248 LABORATORY CONCENTRATION (PPM)
- ROADWAY
- ROAD ADJACENT STONE WALL
- LIMITS OF BURIED FILL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE
302047

SURFACE SOIL PCB CONCENTRATIONS (IN FIELD SCREENING AND LABORATORY RESULTS)

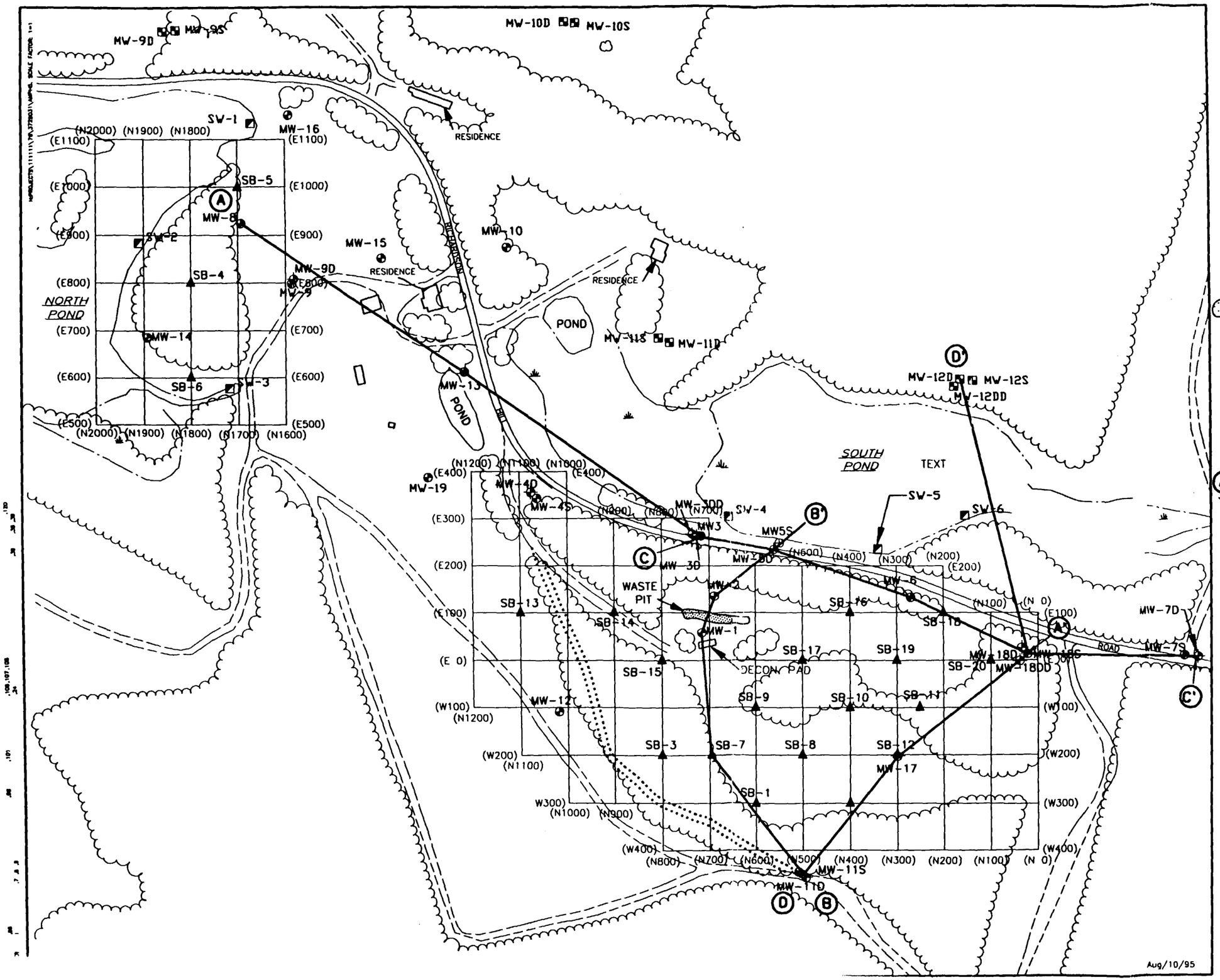
0 200 400

SCALE IN FEET

3729.031-34F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

FIGURE 8



LEGEND

- TREE LINE
- WASTE PIT AREA
- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- SOIL BORING
- STILLING WELL
- FORMER MONITORING WELL LOCATION
- A–A' GEOLOGIC CROSS SECTIONS
- ROAD ADJACENT STONE WALL
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

MONITORING WELL
AND SOIL BORING
LOCATION MAP

302048

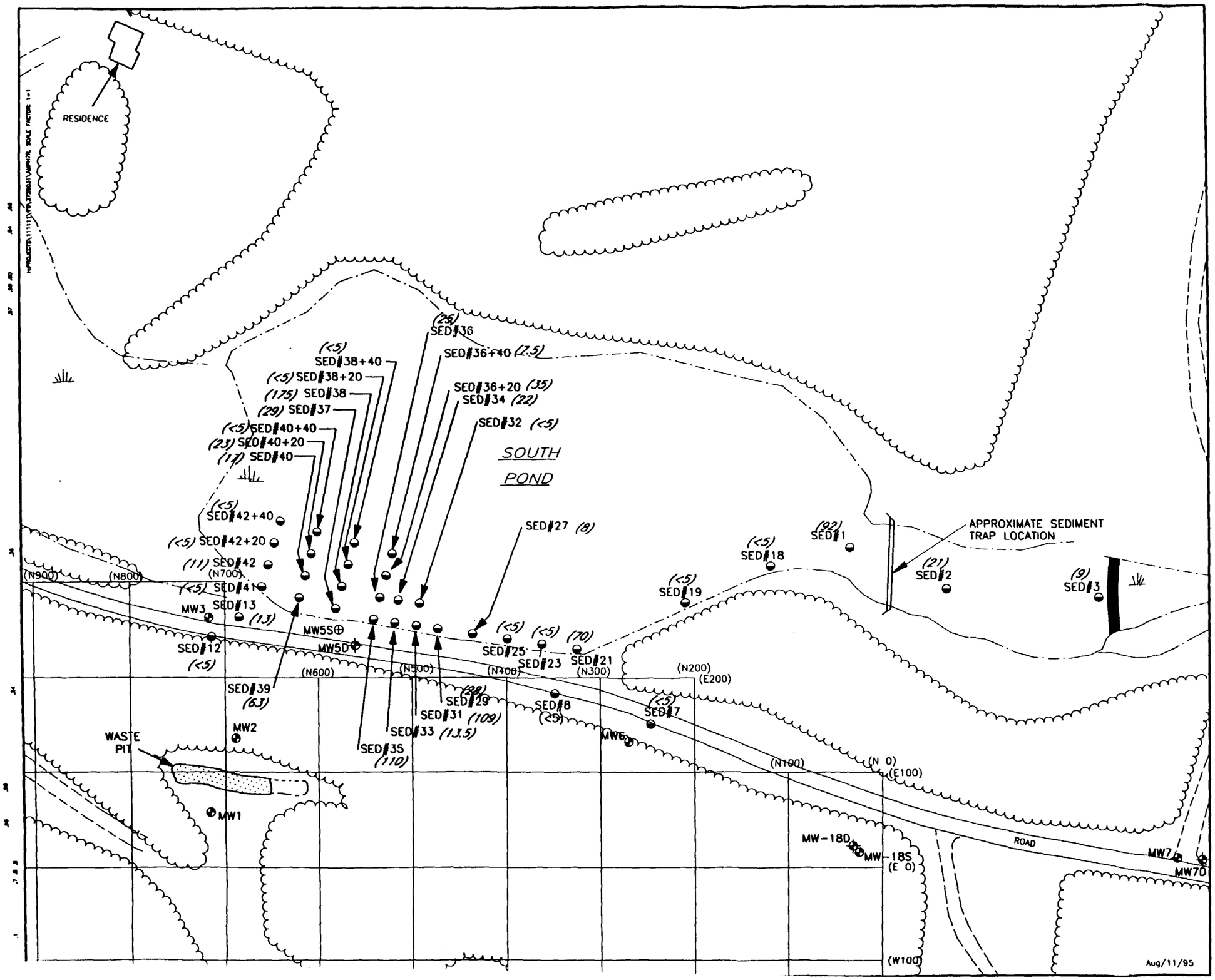
0 200 400

SCALE IN FEET

3729.031-26F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 9



LEGEND

- TREE LINE
- MW7 OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- FORMER MONITORING WELL LOCATION
- SED#40 APPROXIMATE SEDIMENT SAMPLING LOCATION
- (17) PCB CONCENTRATION IN ppm
- TIERS

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SEDIMENT PCB SCREENING
SOUTH POND SAMPLING
LOCATION

302049

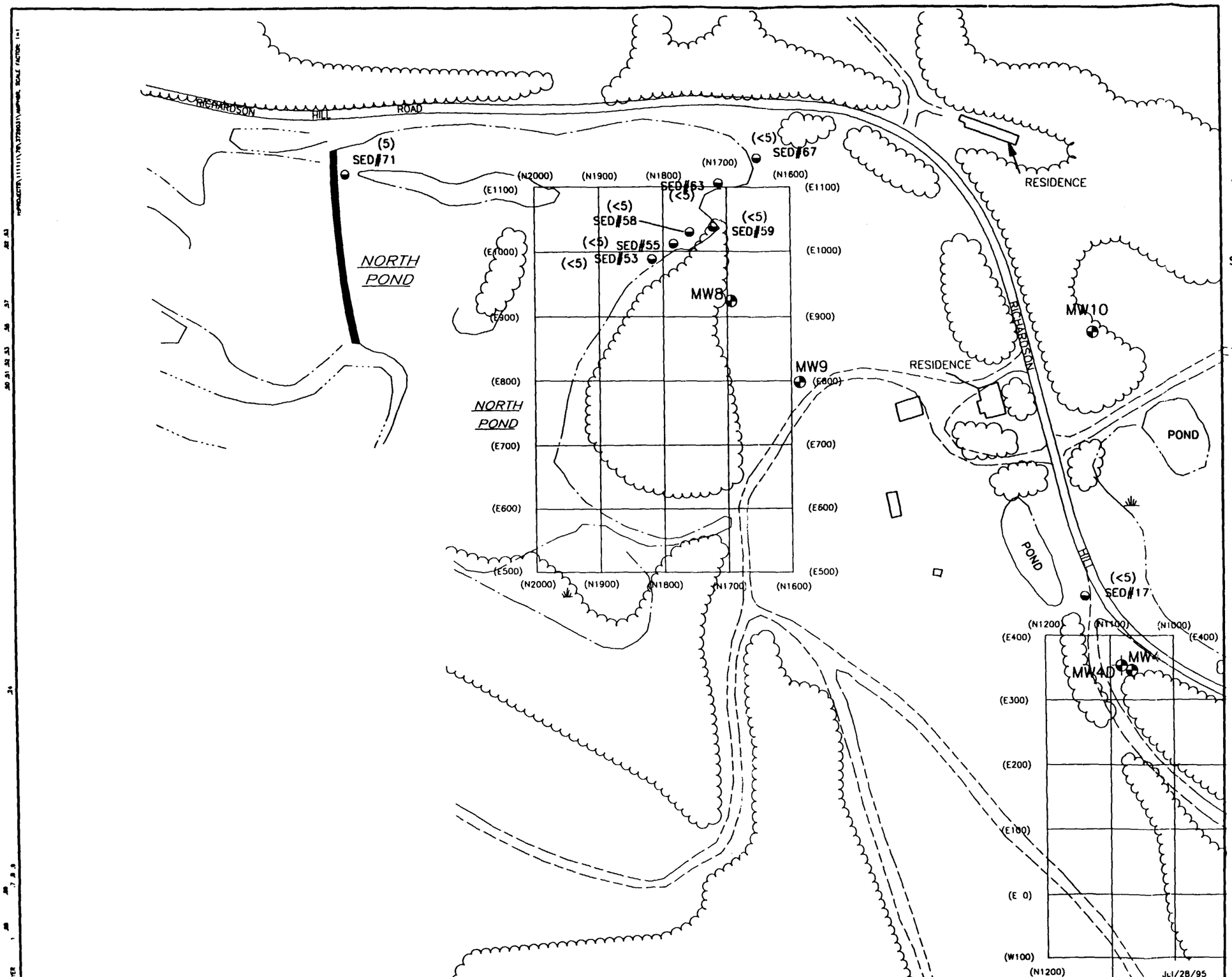
0 100 200

SCALE IN FEET

3729.031-27F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 10



LEGEND

- TREE LINE
- MW9 — OVERRBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- SED#59 — APPROXIMATE SEDIMENT SAMPLING LOCATION
- (5) — PCB CONCENTRATION IN ppm
- TIERS
- ROADWAY

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SEDIMENT PCB SCREENING
NORTH POND SAMPLING
LOCATIONS

302050

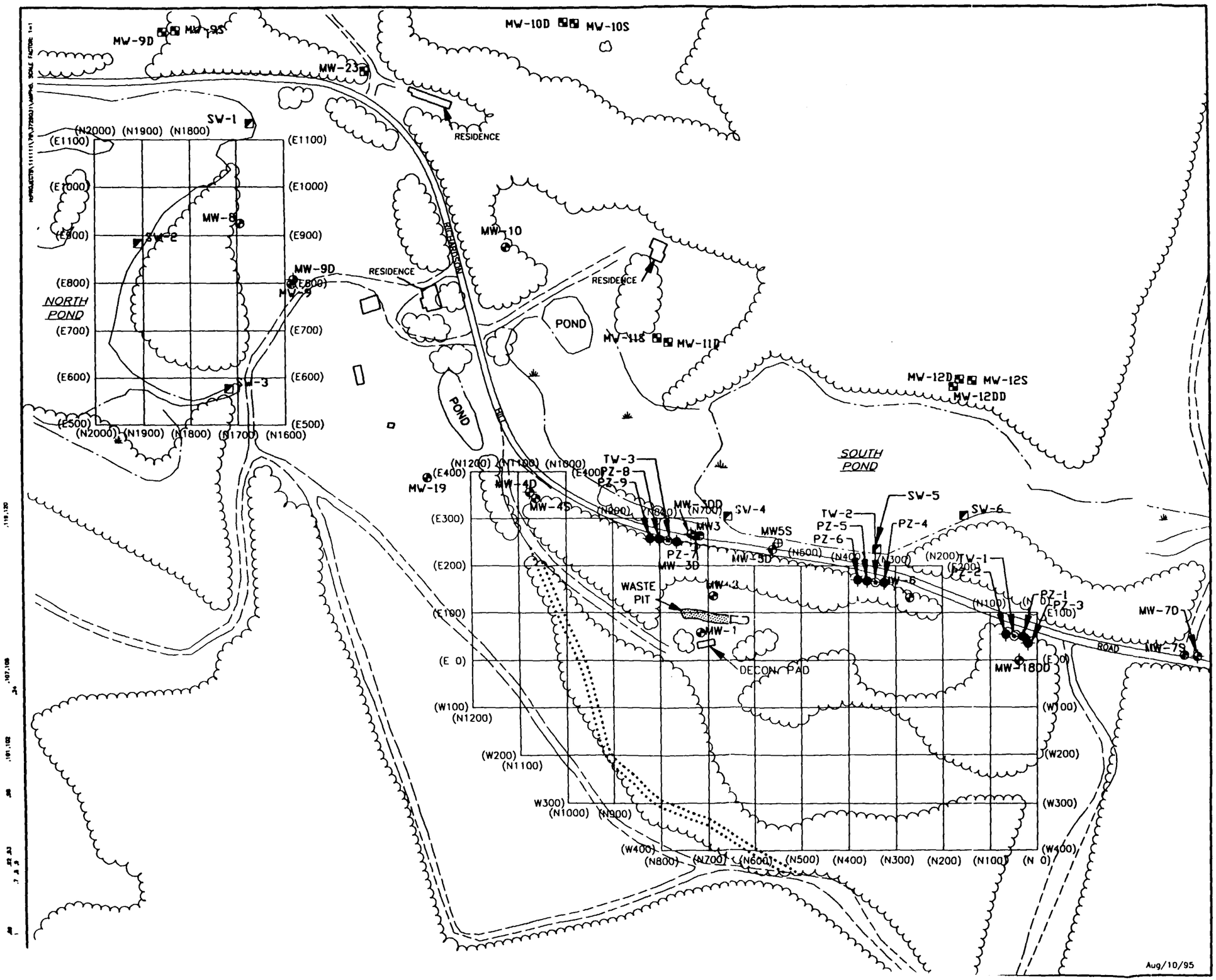
150 0 150

SCALE IN FEET

3729.031-28F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 11



LEGEND

- TREE LINE
- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- PIEZOMETER LOCATION
- TEST WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- STILLING WELL
- FORMER MONITORING WELL LOCATION
- WASTE PIT AREA
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

WELL LOCATION MAP

302051

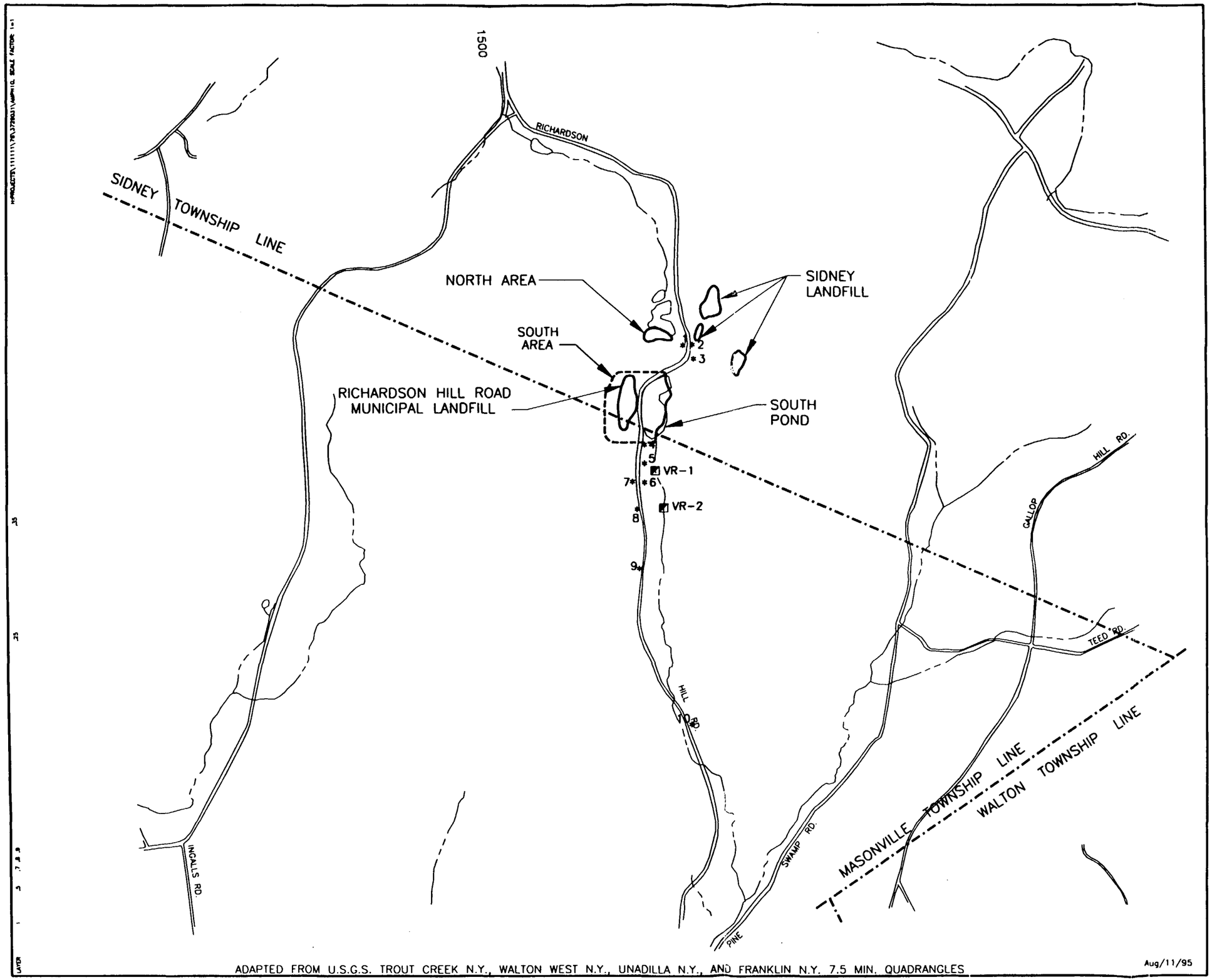
0 200 400

SCALE IN FEET

3729.031-07F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

FIGURE 12



LEGEND

- * HOUSE/MOBILE HOME
- ◪ STREAM FLOW MEASUREMENT STATION

HOMEOWNER NAMES

- *1 SPIZZIRI
- *2 WHITEHURST
- *3 WYATT
- *4 S. SMITH
- *5 ABANDONED
- *6 COUTAVOS
- *7 A. MULDER
- *8 VERPAULT
- *9 UNKNOWN
- *10 F. HANES

RICHARDSON HILL ROAD MUNICIPAL LANDFILL SITE

RESIDENCES WITHIN 1-MILE DOWNSTREAM OF THE RICHARDSON HILL ROAD MUNICIPAL LANDFILL

302052

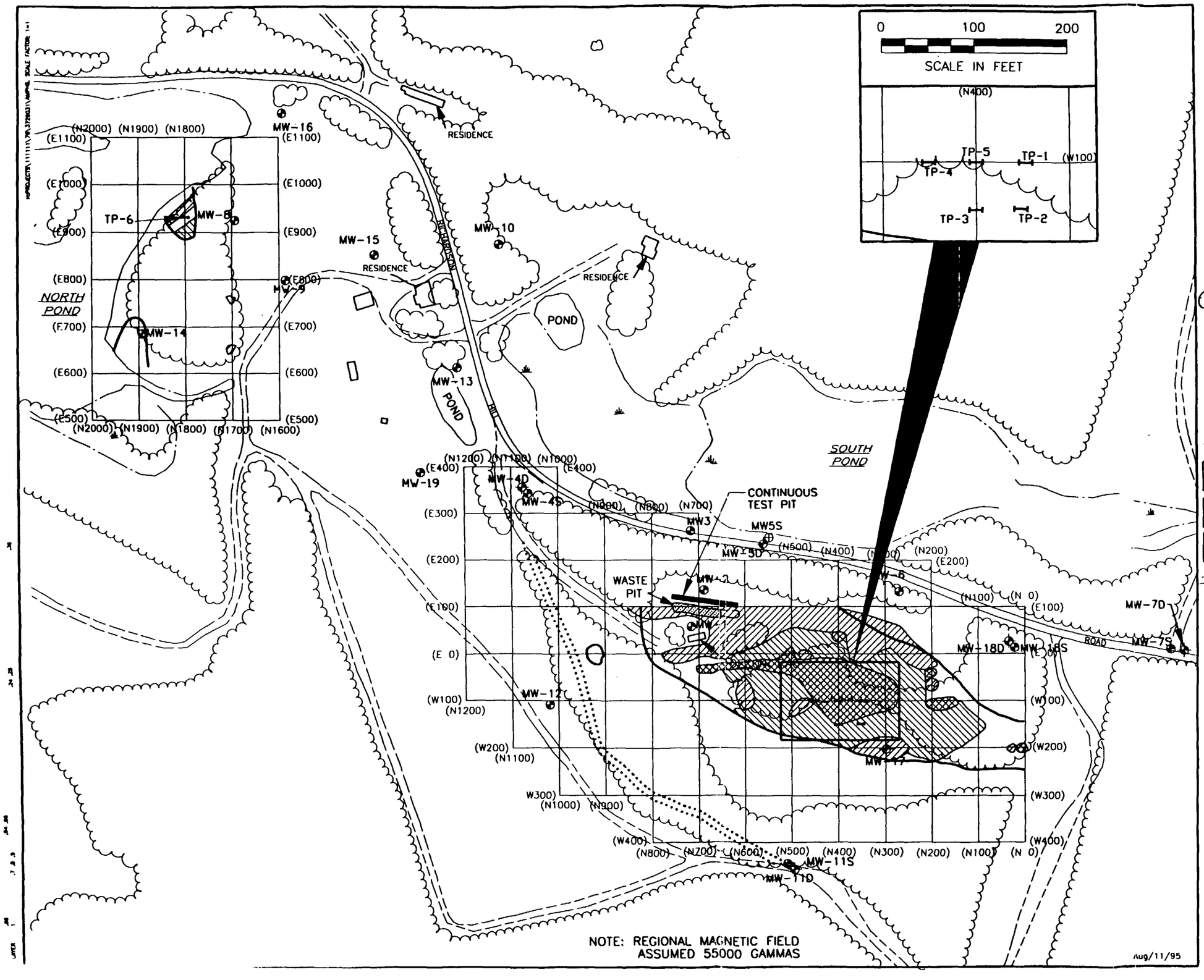
1500 0 1500

SCALE IN FEET

3729.031-30F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 13



LEGEND

- TREE LINE
- WASTE PIT AREA
- MW3 OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- FORMER MONITORING WELL LOCATION
- LIMITS OF BURIED FILL DETERMINED USING EM-31 (QUADRATURE PHASE)
- -970 TO 400 GAMMAS BELOW AND ABOVE REGIONAL MAGNETIC FIELD
- 800 TO 1500 GAMMAS ABOVE REGIONAL MAGNETIC FIELD
- 1500 TO 5097 GAMMAS ABOVE REGIONAL MAGNETIC FIELD
- ROADWAY
- TEST PIT LOCATIONS
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

TEST PIT EXCAVATIONS
LOCATION MAP

302053

0 200 400
SCALE IN FEET

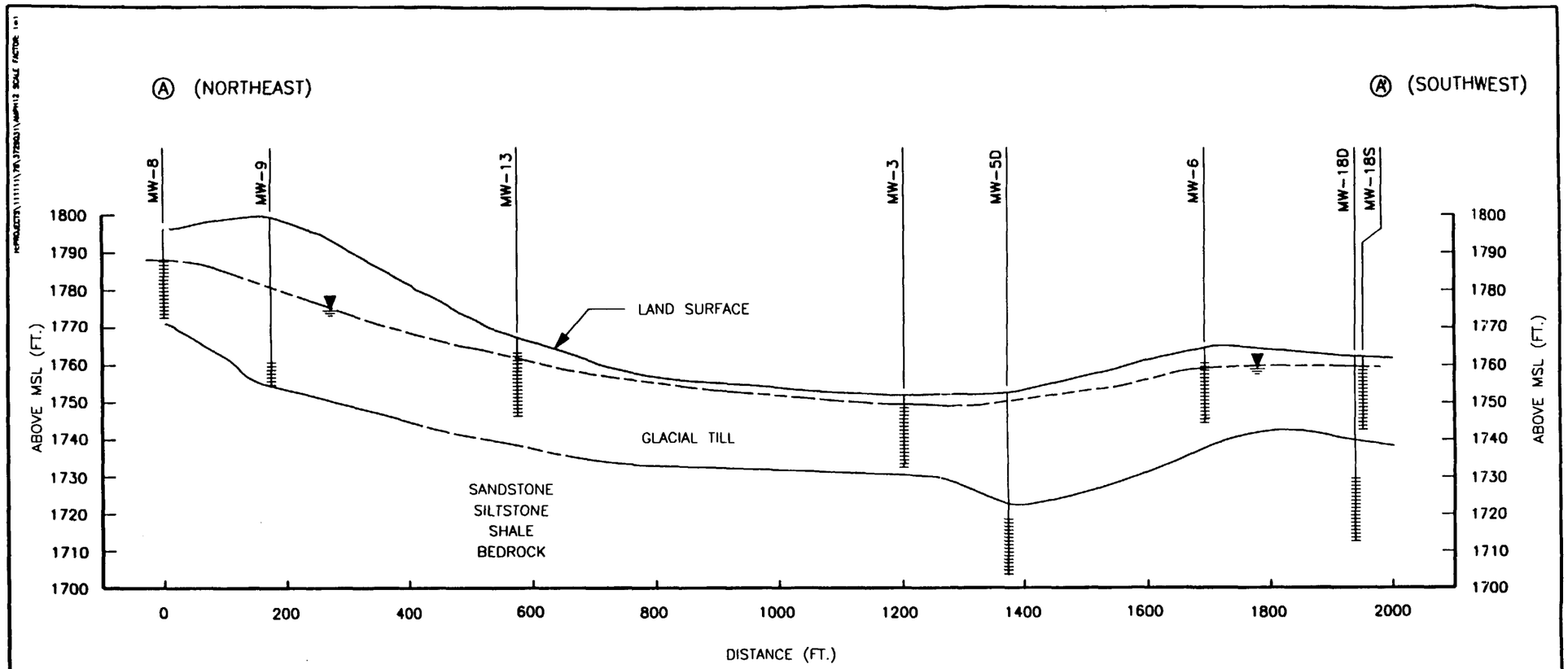
3729.031-35F

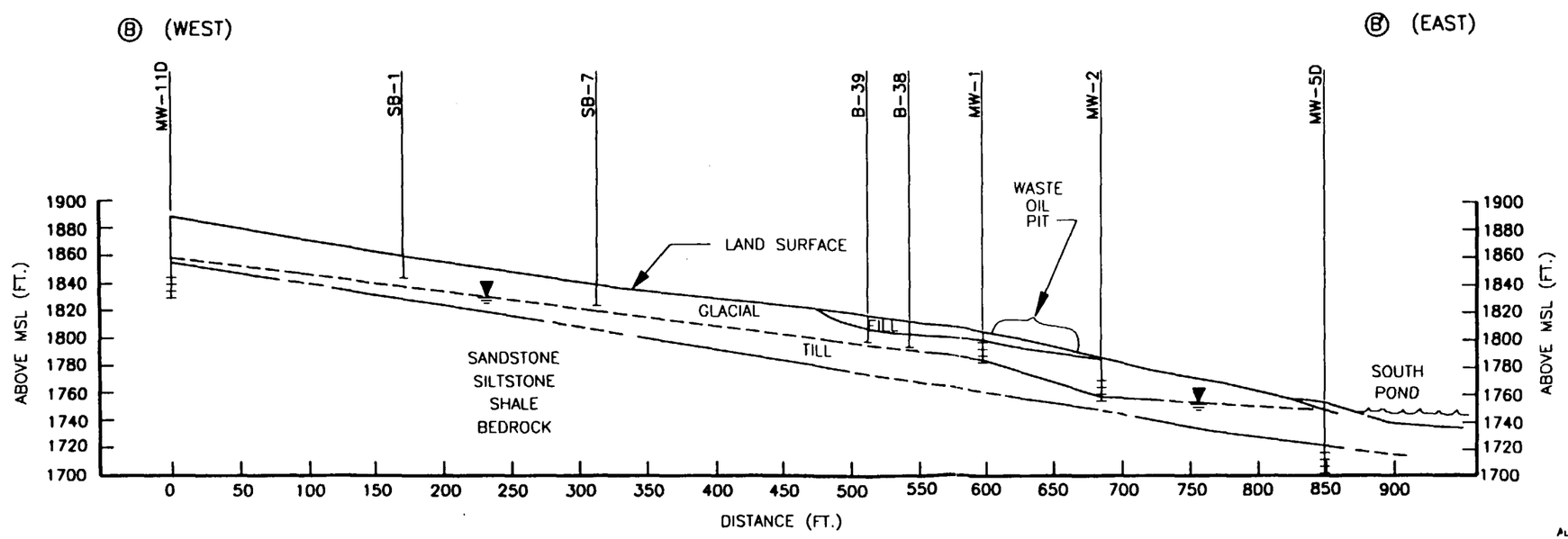
O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 14

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

GEOLOGIC CROSS SECTIONS
A – A'
B – B'





Aug/04/95

LEGEND

MONITORING WELL

SOIL BORING

WATER LEVEL ELEVATION
(DASHED WHERE INFERRED)

A – A'
VERTICAL EXAGGERATION IS 6X

200 0 200
HORIZONTAL SCALE IN FEET

B – B'

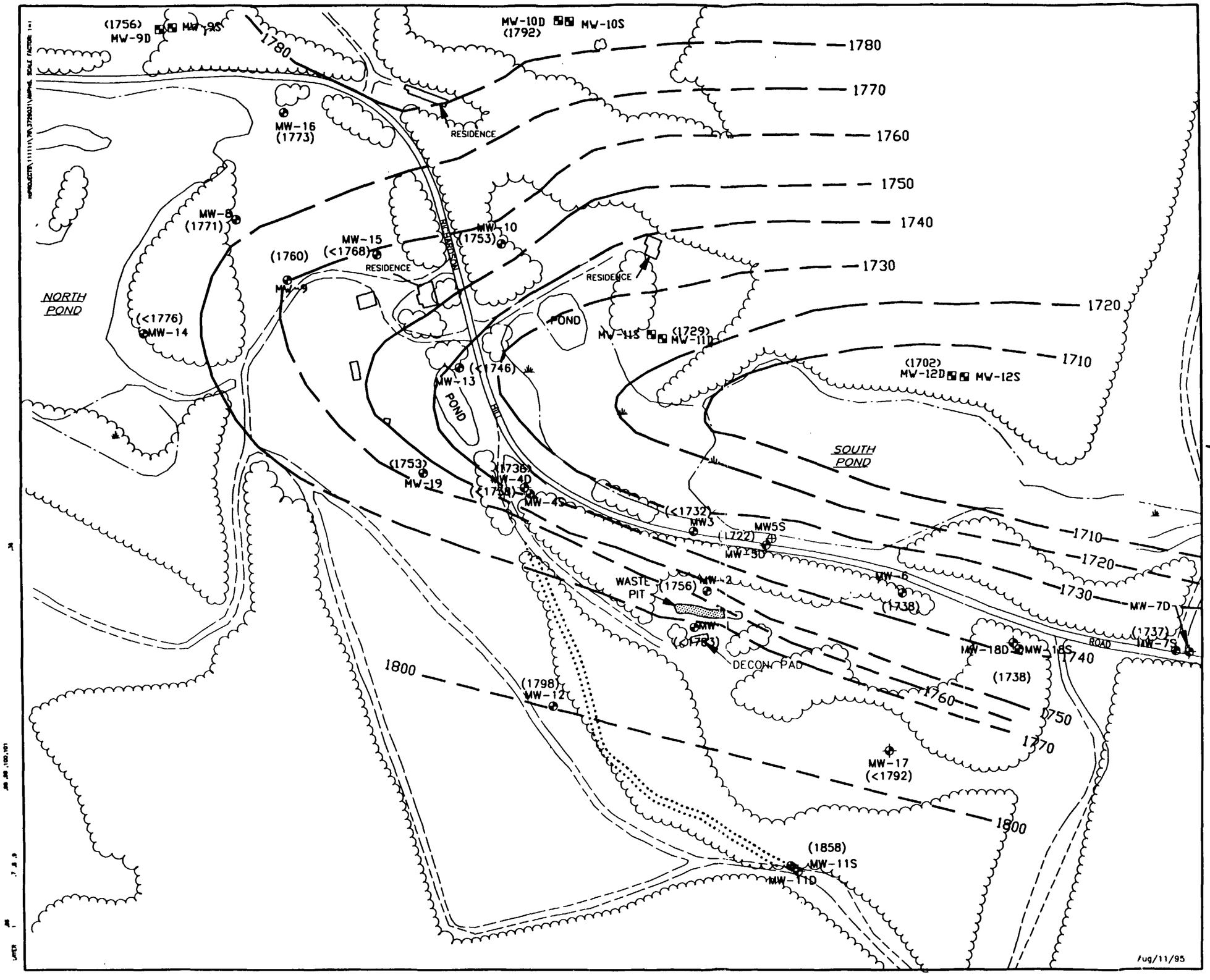
302054

100 0 100
HORIZONTAL SCALE IN FEET

3729.031-36F

O'BRIEN & GERE
ENGINEERS, INC.

FIGURE 15



LEGEND

- TREE LINE
- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- FORMER MONITORING WELL LOCATION
- (1756) BEDROCK ELEVATION
- BEDROCK CONTOUR
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

BEDROCK SURFACE
CONTOUR MAP

302055

0 200 400

SCALE IN FEET

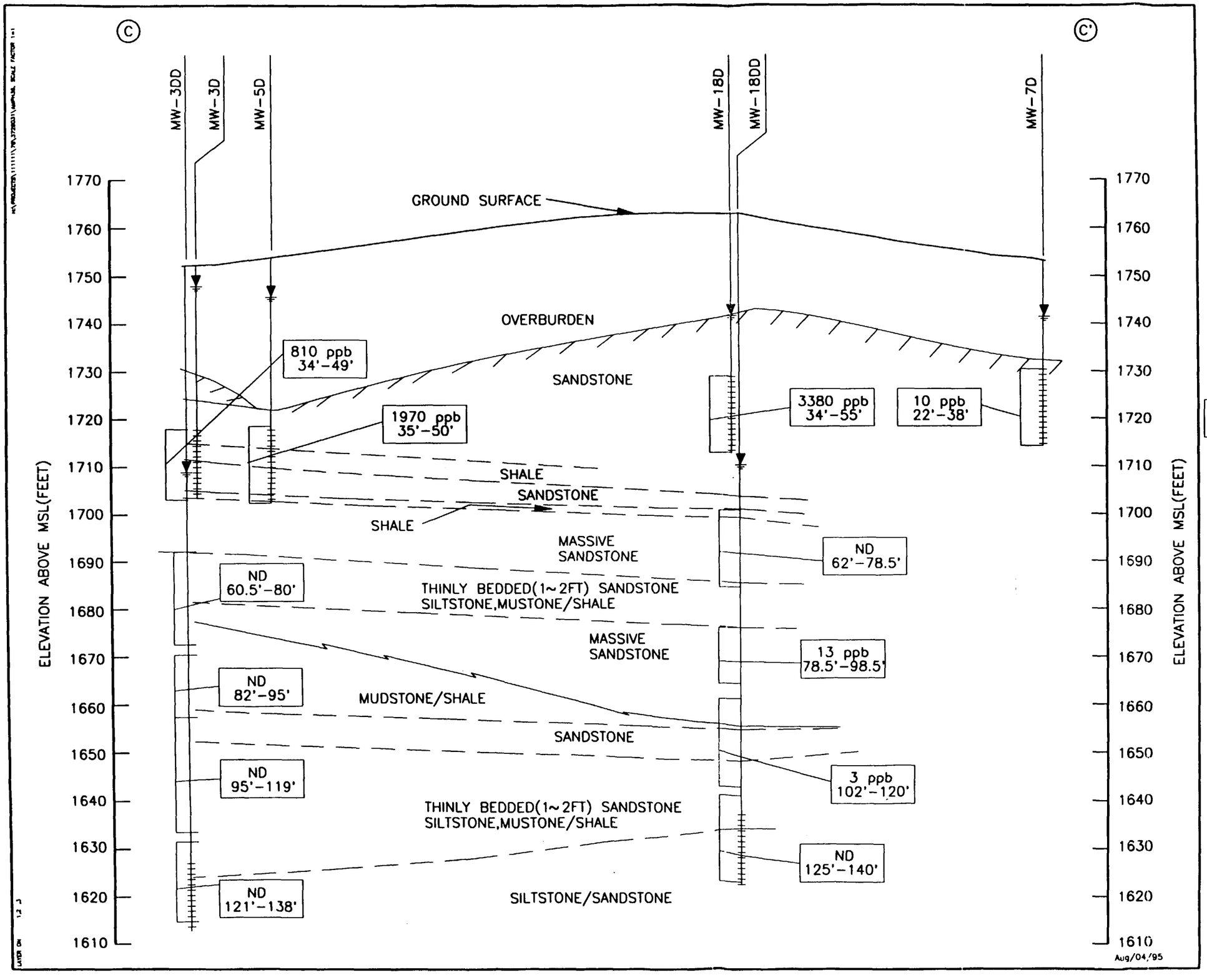
3729.031-11F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 16

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

HYDROGEOLOGIC CROSS SECTION C–C'



LEGEND

- MONITORING WELL SCREENED INTERVAL
- GROUND WATER ELEVATION (2/27/95)
- 3380 ppb 34'-55' — CONCENTRATION / DEPTH INTERVAL
- PACKER TEST INTERVAL

NOTE:
1).VERTICAL EXAGGERATION IS 6X.
2). TOTAL VOC CONCENTRATION (ppb)

302056

120 0 120
APPROX. HORIZ. SCALE IN FEET

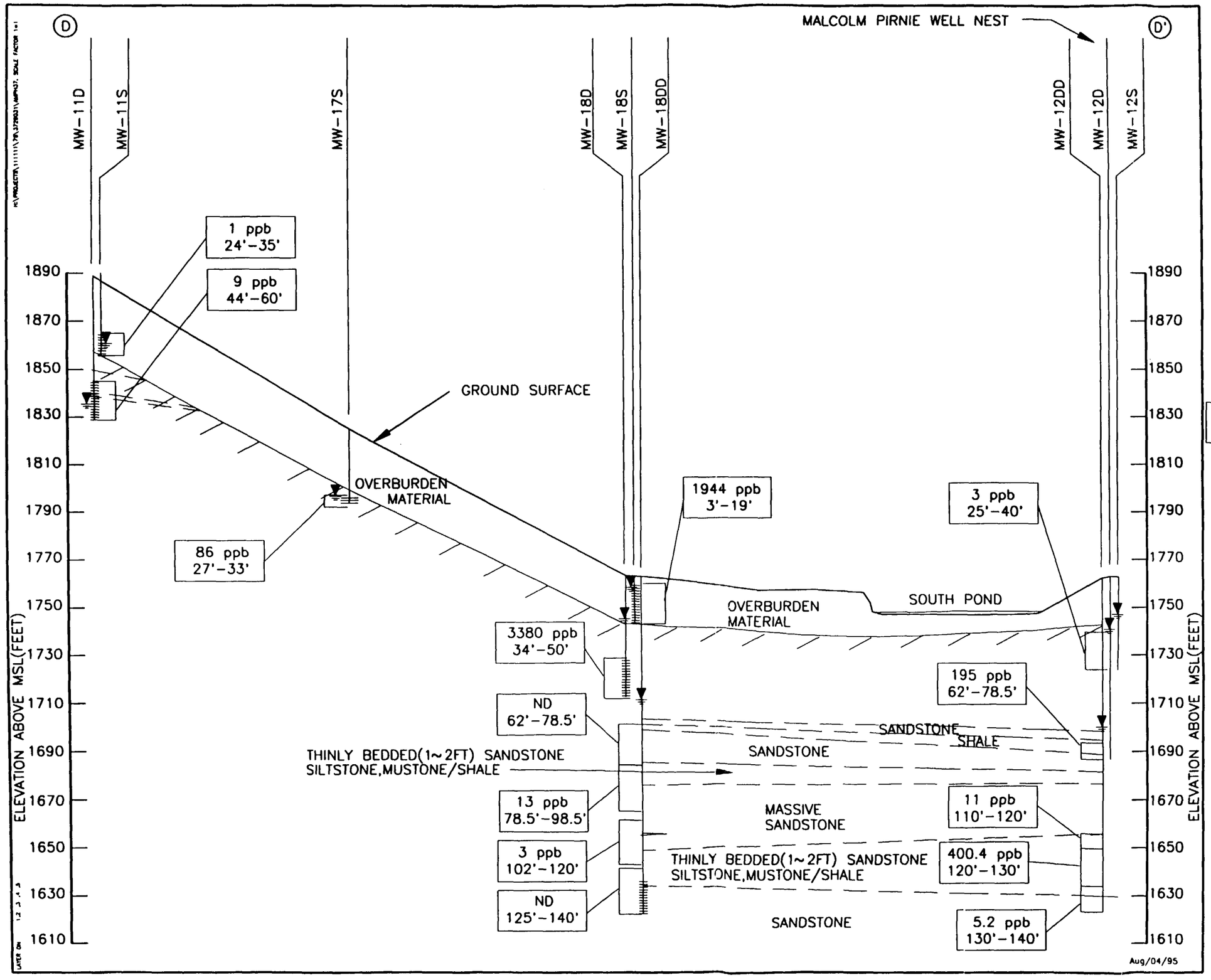
3729.031-09F

O'BRIEN & GERE ENGINEERS,INC.

FIGURE 17

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

HYDROGEOLOGIC CROSS SECTION D–D'



LEGEND

- MONITORING WELL SCREENED INTERVAL
- GROUND WATER ELEVATION (2/27/95)
- 3 ppb 25'-40' — CONCENTRATION / DEPTH INTERVAL
- PACKER TEST INTERVAL

NOTE:
1). VERTICAL EXAGGERATION IS 3X.
2). TOTAL VOC CONCENTRATION (ppb)

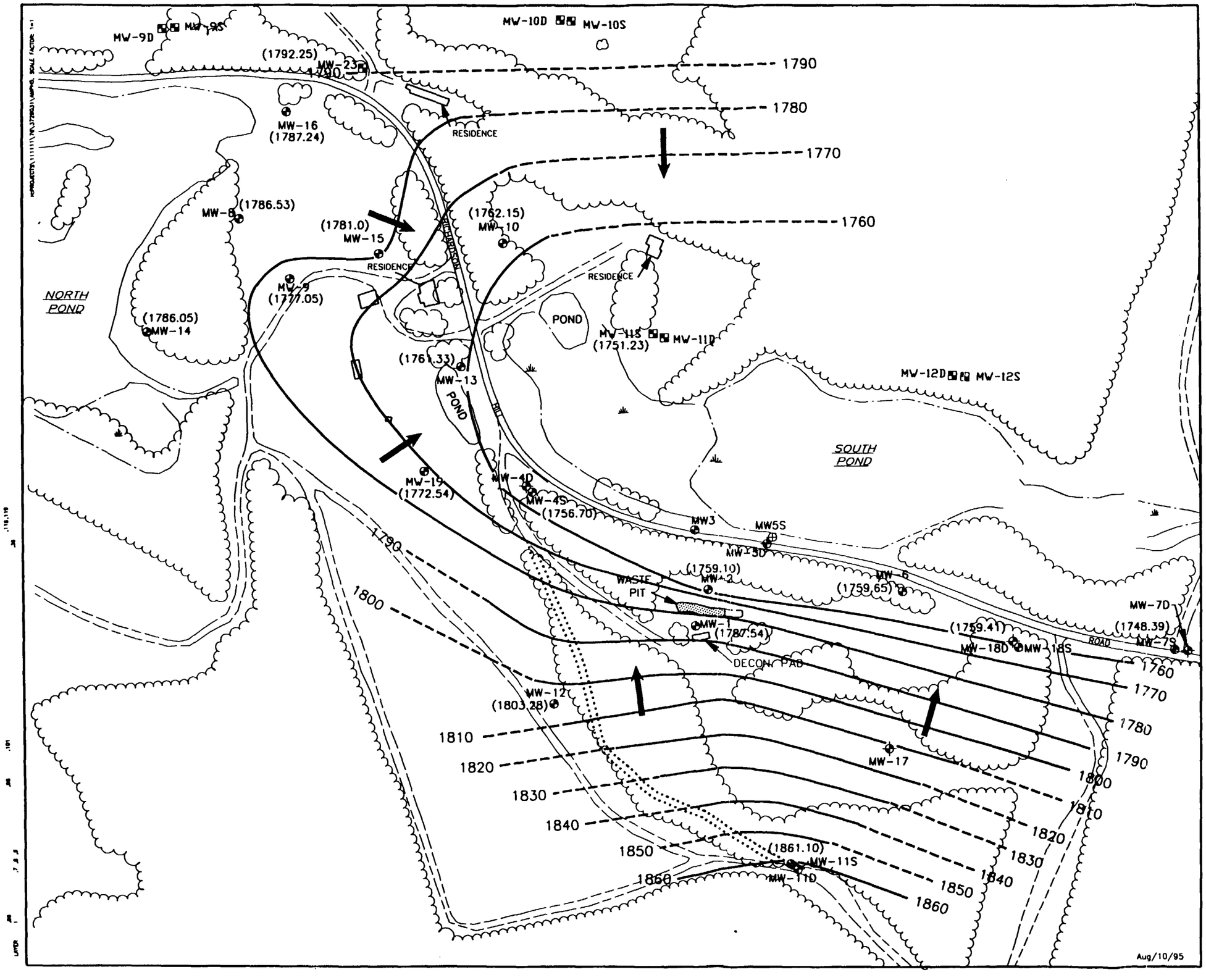
302057

120 0 120
APPROX. HORIZ. SCALE IN FEET

3729.031-08F

O'BRIEN & GERE ENGINEERS, INC.

FIGURE 18



LEGEND

- TREE LINE
- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- FORMER MONITORING WELL LOCATION
- WASTE PIT AREA
- ROADWAY
- ROAD ADJACENT STONE WALL
- (1759.41) GROUND WATER ELEVATION
- 1760 GROUND WATER ELEVATION CONTOUR LINE (DASHED WHERE INFERRED)
- GROUND WATER FLOW DIRECTION

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

OVERBURDEN GROUND WATER
ELEVATION MAP
(2/27/95)

302058

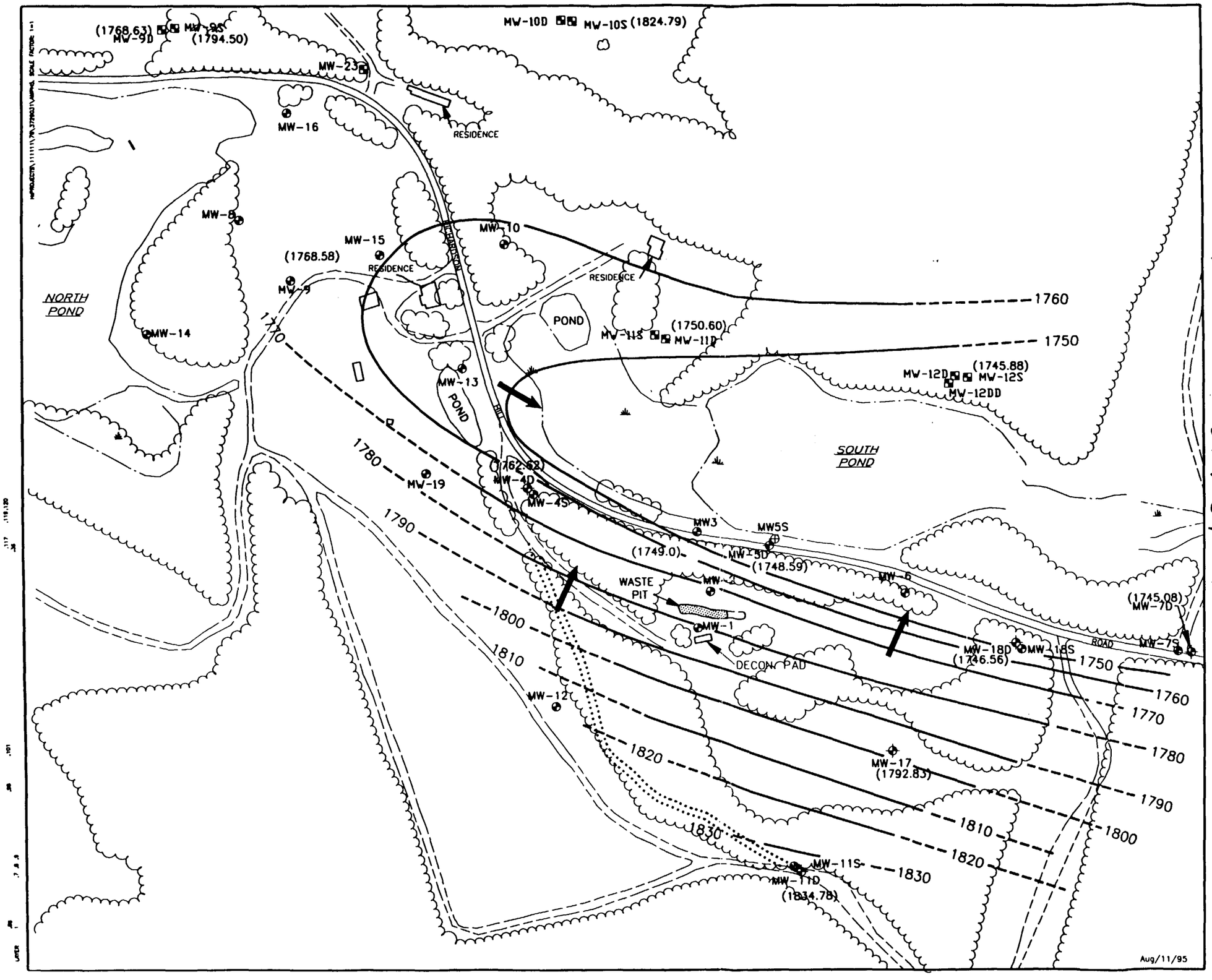
0 200 400

SCALE IN FEET

3729.031-06F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 19



LEGEND

- TREE LINE
- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- FORMER MONITORING WELL LOCATION
- WASTE PIT AREA
- ROADWAY
- ROAD ADJACENT STONE WALL
- (1745.88) GROUND WATER ELEVATION
- 1770 GROUND WATER ELEVATION CONTOUR LINE (DASHED WHERE INFERRED)
- GROUND WATER FLOW DIRECTION

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SHALLOW BEDROCK
GROUND WATER
ELEVATION MAP
2/27/95

302059

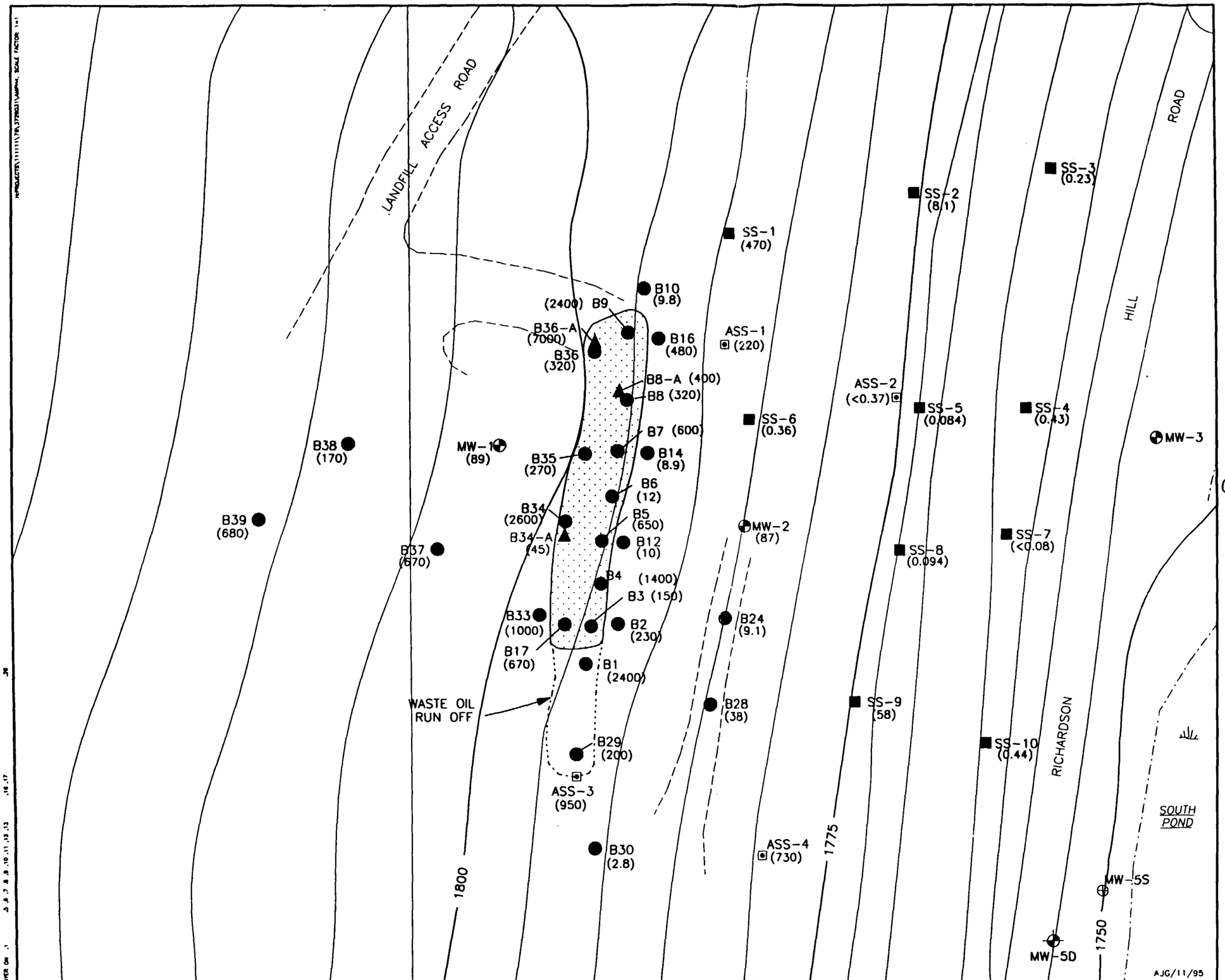
0 200 400

SCALE IN FEET

3729.031-05F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 20



LEGEND

- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- SURFACE SOIL SAMPLE LOCATION
- BORING LOCATION
- TCL SAMPLE LOCATION
- FORMER MONITORING WELL LOCATION
- ASS-2 SRI SURFACE SOIL SAMPLE LOCATIONS
- WASTE PIT AREA
- (9.8) PCB CONCENTRATIONS (ppm)

NOTE:

- * TCL SOIL SAMPLES WERE ALSO COLLECTED IN BORING B6 AND B7
- ** SOIL BORINGS COMPLETED AS MONITORING WELLS

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SURFACE SOIL AND
SUBSURFACE SOIL WASTE OIL PIT
PCB CONCENTRATIONS

302060

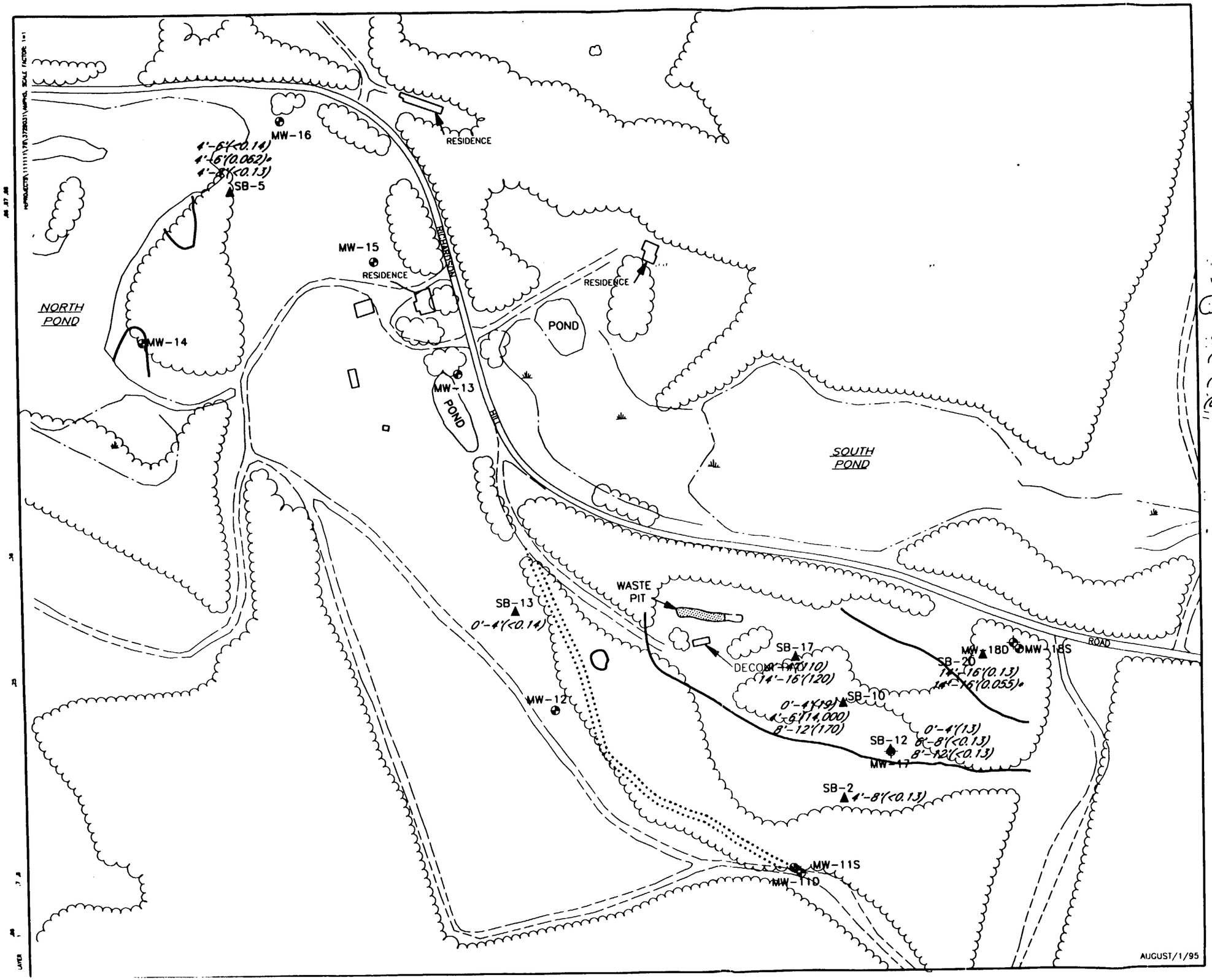
0 30 60

APPROX. SCALE IN FEET

3729.031-25F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 21



LEGEND

- TREE LINE
- WASTE PIT AREA
- SB-5 ▲ SOIL BORING
- (4'-6') DEPTH OF CONCENTRATION
- (<0.14) PCB 1248 CONCENTRATION (ppm)
- (0.062)* PCB 1254 CONCENTRATION (ppm)
- ROADWAY
- ROAD ADJACENT STONE WALL
- LIMITS OF BURIED FILL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS AT
SOIL BORING LOCATIONS
11/5-15/90

302061

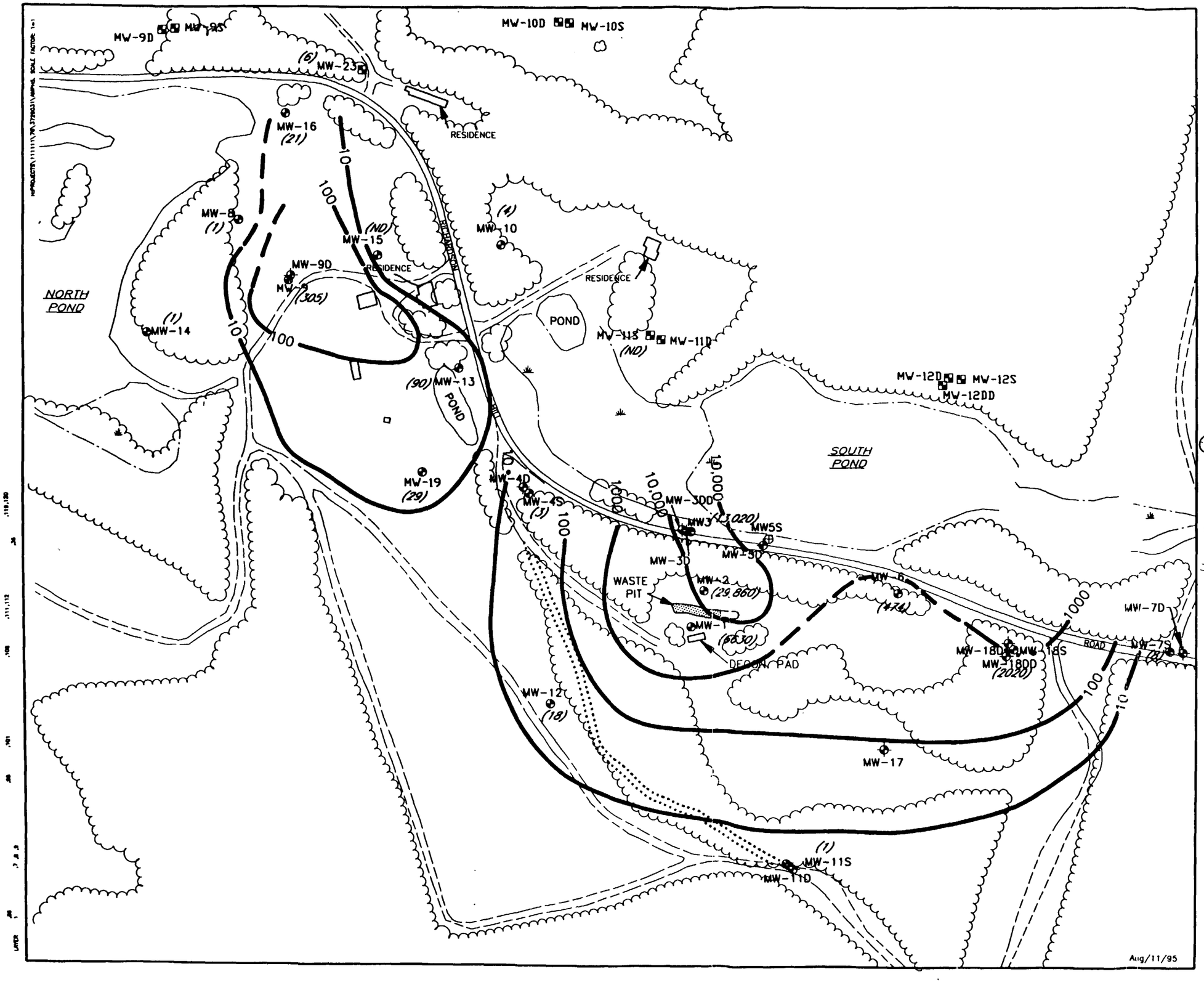
0 200 400

SCALE IN FEET

3729.031-10F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 22



LEGEND

- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- FORMER MONITORING WELL LOCATION
- TREE LINE
- WASTE PIT AREA
- (29) TOTAL VOLATILE ORGANIC CONSTITUENT VALUE (ppb)
- (ND) NOT DETECTED
- 10 TOTAL VOC CONCENTRATION ISOCONTOURS (DASHED WHERE INFERRED)
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

TOTAL VOC CONCENTRATIONS
IN OVERBURDEN
GROUND WATER
12/94

302062

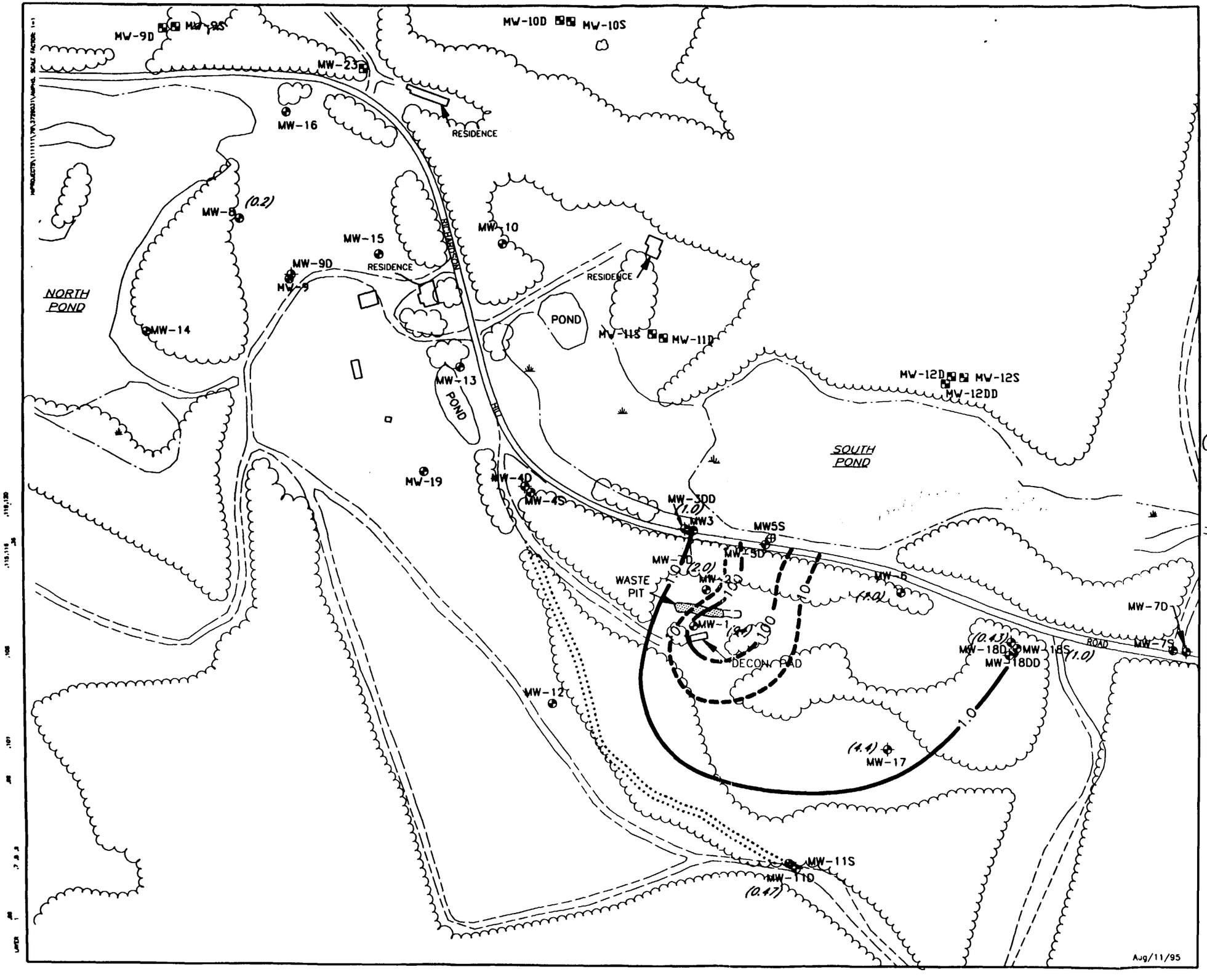
0 200 400

SCALE IN FEET

3729.031-04F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 23



LEGEND

- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- FORMER MONITORING WELL LOCATION
- TREE LINE
- WASTE PIT AREA
- (10) PCB CONCENTRATION VALUE (ppb)
- 10 PCB CONCENTRATION ISOCONTOURS (DASHED WHERE INFERRED)
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS
IN GROUND WATER
12/94

302063

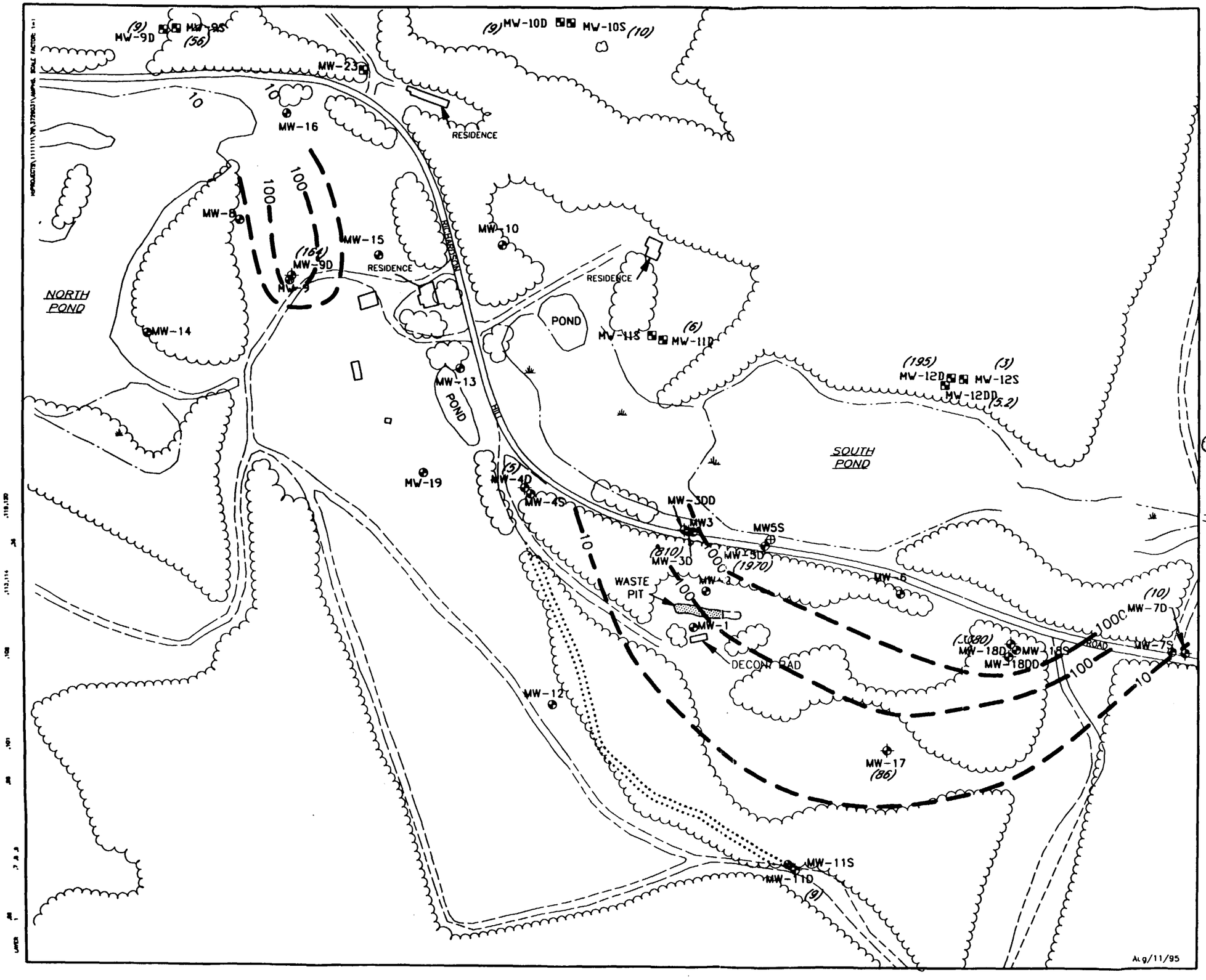
0 200 400

SCALE IN FEET

3729.031-02F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 24



LEGEND

- OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- MONITORING WELL LOCATION (INSTALLED BY MALCOLM PIRNIE)
- FORMER MONITORING WELL LOCATION
- TREE LINE
- WASTE PIT AREA
- (6) VOLATILE ORGANIC CONSTITUENT VALUE (ppb)
- 10 VOC CONCENTRATION ISOCONTOURS
- ROADWAY
- ROAD ADJACENT STONE WALL

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

VOC CONCENTRATIONS
IN SHALLOW BEDROCK
GROUND WATER
12/94

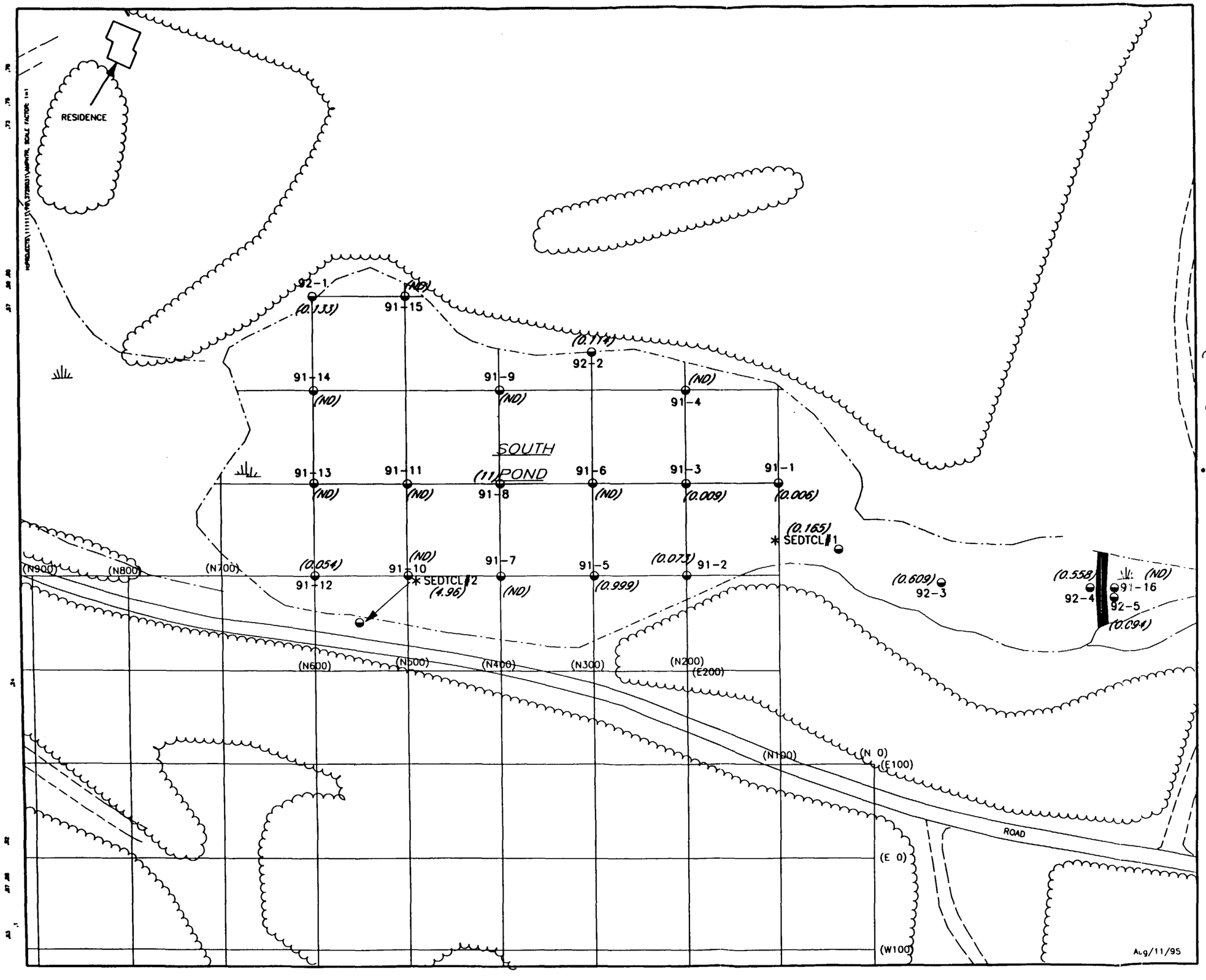
0 200 400
SCALE IN FEET

3729.031 – 03F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

302064

FIGURE 25



LEGEND

TREE LINE

APPROXIMATE SEDIMENT SAMPLING LOCATION

(0.025) SEDIMENT SAMPLE CONCENTRATIONS IN ppm

TIERS

•SEDTCL#1 DATA COLLECTED (12/90)

91-2 DATA COLLECTED (12/91)

92-1 DATA COLLECTED (9/92)

(ND) NOT DETECTED

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

TOTAL VOLATILE ORGANIC CONSTITUENTS IN SEDIMENT SAMPLING LOCATIONS (SOUTH POND)

0 100 200

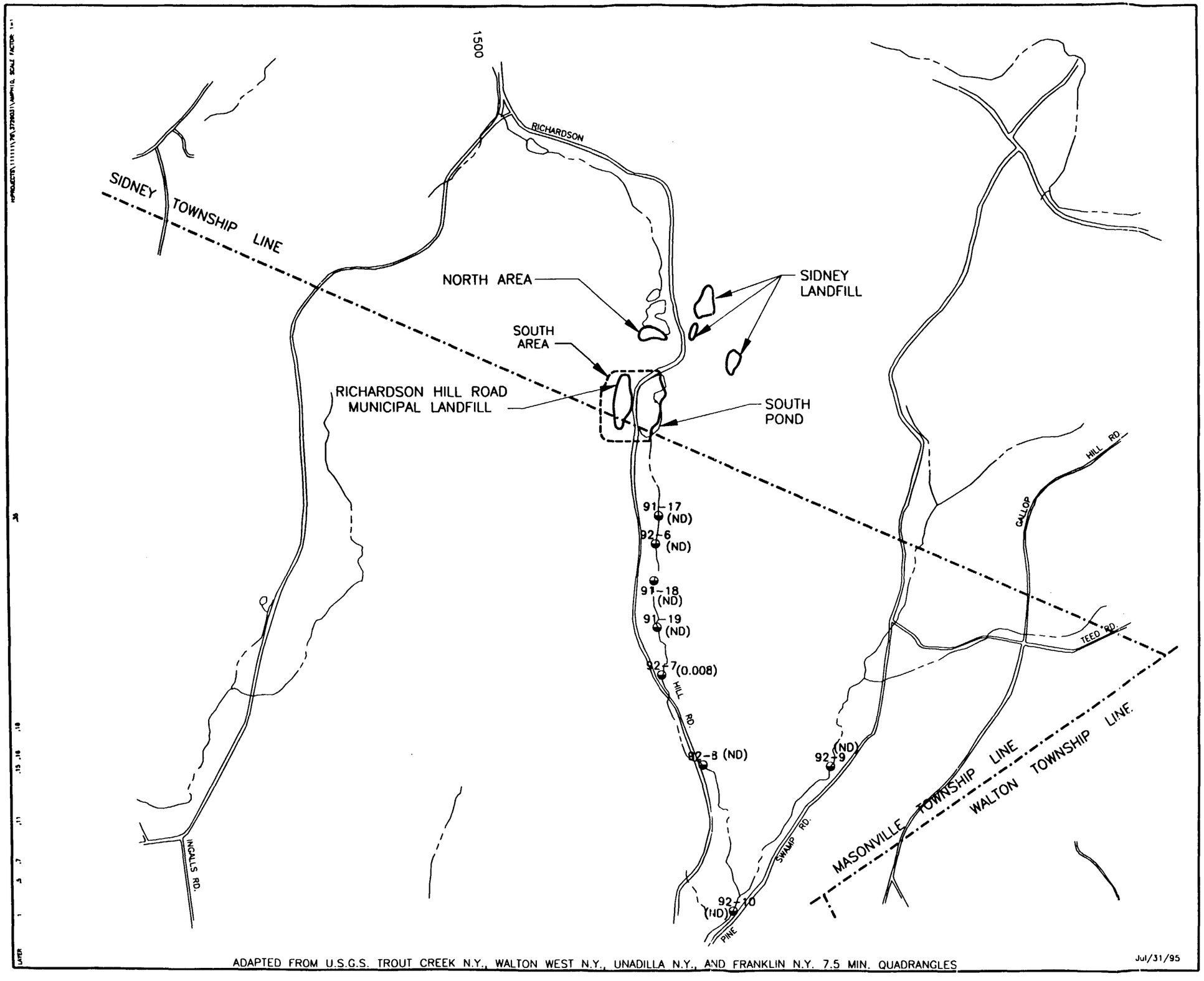
SCALE IN FEET

3729.031-20F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

302065

FIGURE 26



ADAPTED FROM U.S.G.S. TROUT CREEK N.Y., WALTON WEST N.Y., UNADILLA N.Y., AND FRANKLIN N.Y. 7.5 MIN. QUADRANGLES

Jul/31/95

LEGEND

- ◒ APPROXIMATE SEDIMENT SAMPLE LOCATION
- (0.008) SEDIMENT SAMPLE CONCENTRATION IN (ppm)
- 91-17 ◒ DATA COLLECTED (12/91)
- 92-6 ◒ DATA COLLECTED (9/92)
- (ND) NOT DETECTED

RICHARDSON HILL ROAD MUNICIPAL LANDFILL SITE

TOTAL VOLATILE ORGANIC CONSTITUENTS IN SEDIMENT DOWNSTREAM OF THE SOUTH POND

1500 0 1500

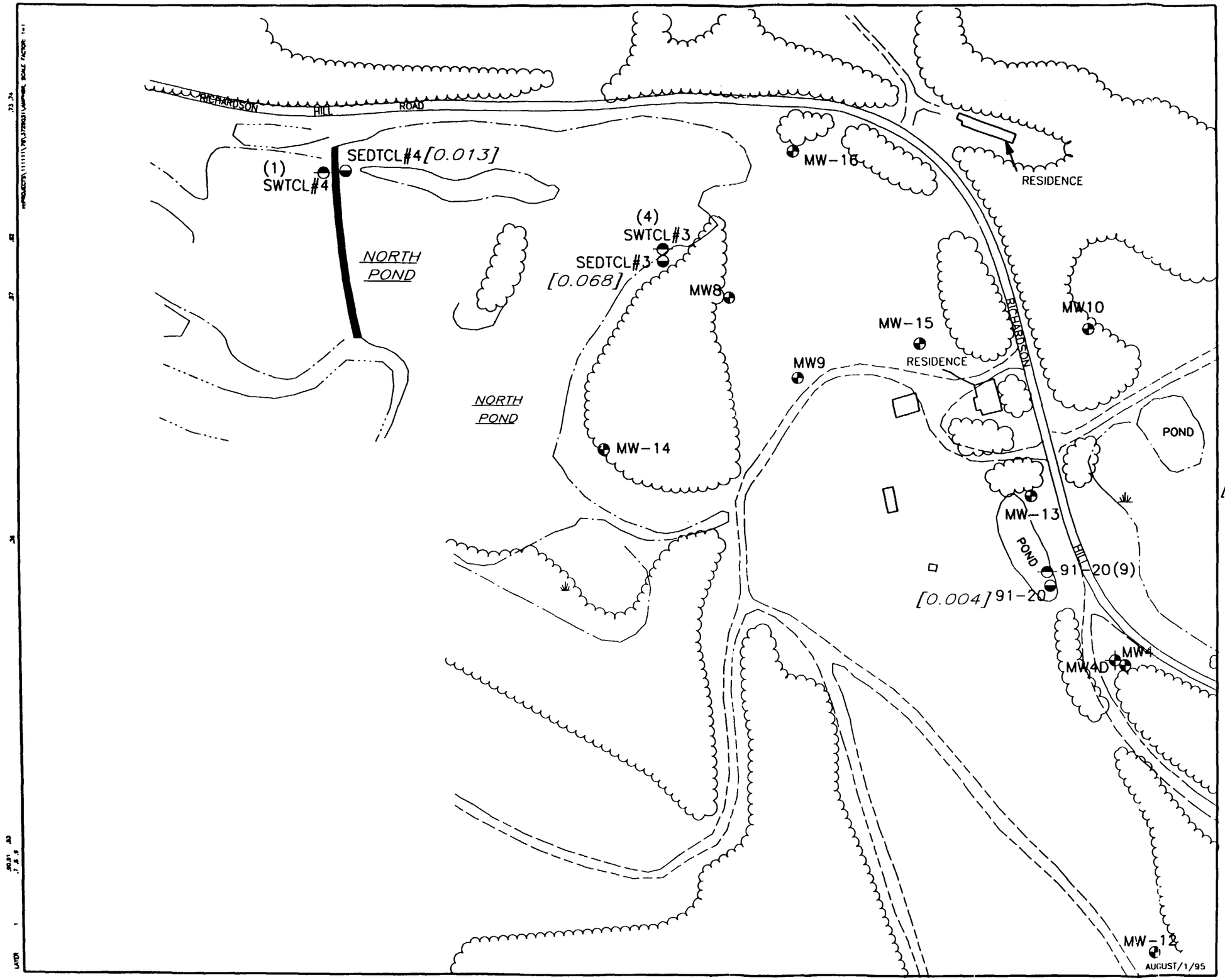
SCALE IN FEET

3729.031-21F

O'BRIEN & GERE ENGINEERS, INC.

302066

FIGURE 27



LEGEND

- TREE LINE
- MW9 OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- APPROXIMATE SURFACE WATER SAMPLING LOCATION
- APPROXIMATE SEDIMENT SAMPLING LOCATION
- (1) VOC CONCENTRATION IN ppb (SURFACE WATER)
- [0.013] VOC CONCENTRATION IN ppm (SEDIMENT)
- TIERS

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

TOTAL VOLATILE ORGANIC CONSTITUENTS IN SURFACE WATER AND SEDIMENTS (NORTH POND)

150 0 150

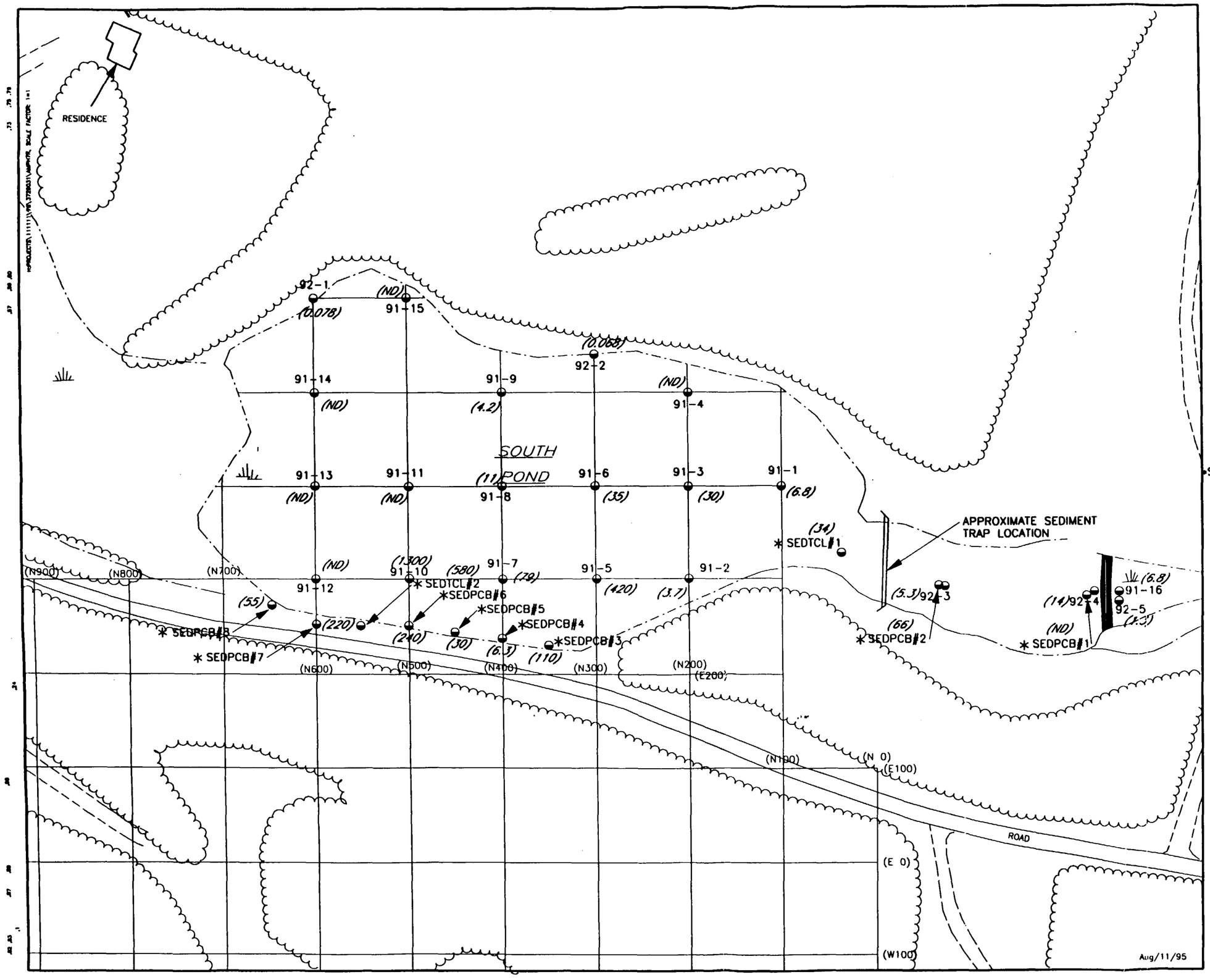
SCALE IN FEET

3729.031-22F

O'BRIEN & GERE ENGINEERS, INC.

302067

FIGURE 28



LEGEND

- APPROXIMATE SEDIMENT
- APPROXIMATE SEDIMENT SAMPLING LOCATION
- (35) SEDIMENT SAMPLE CONCENTRATIONS IN ppm
- TIERS
- SEDTCL#4 DATA COLLECTED (12/90)
- 91-2 DATA COLLECTED (12/91)
- 92-1 DATA COLLECTED (9/92)
- (ND) NOT DETECTED

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS IN SEDIMENT (SOUTH POND)

0 100 200

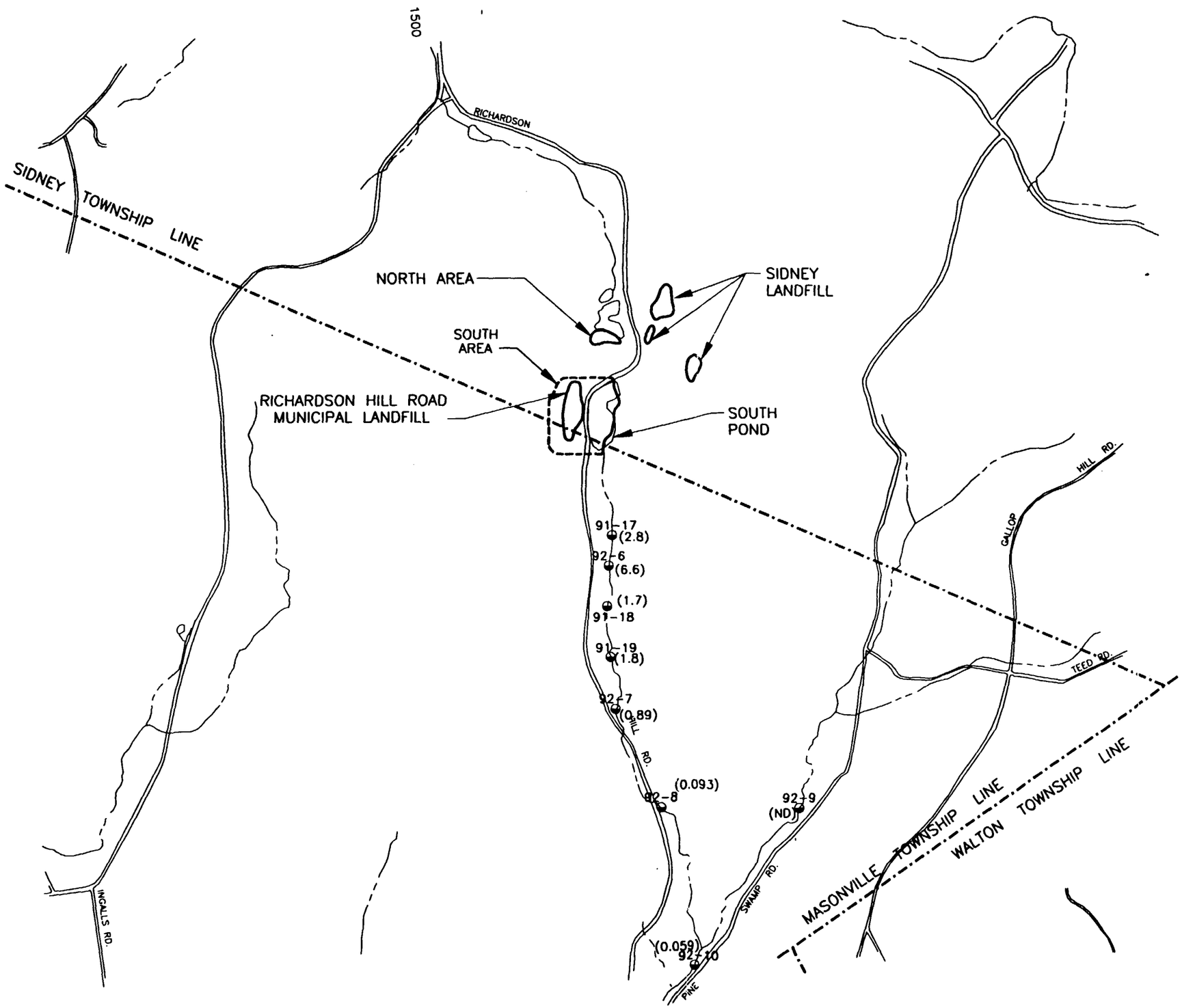
SCALE IN FEET

3729.031-11F

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

302068

FIGURE 29



ADAPTED FROM U.S.G.S. TROUT CREEK N.Y., WALTON WEST N.Y., UNADILLA N.Y., AND FRANKLIN N.Y. 7.5 MIN. QUADRANGLES

Jul/31/95

LEGEND

◒	APPROXIMATE SEDIMENT SAMPLE LOCATION
(16)	SEDIMENT SAMPLE CONCENTRATION IN ppm
91-17 ◒	DATA COLLECTED (12/91)
92-6 ◒	DATA COLLECTED (9/92)
(ND)	NOT DETECTED

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS IN SEDIMENT DOWNSTREAM OF THE SOUTH POND

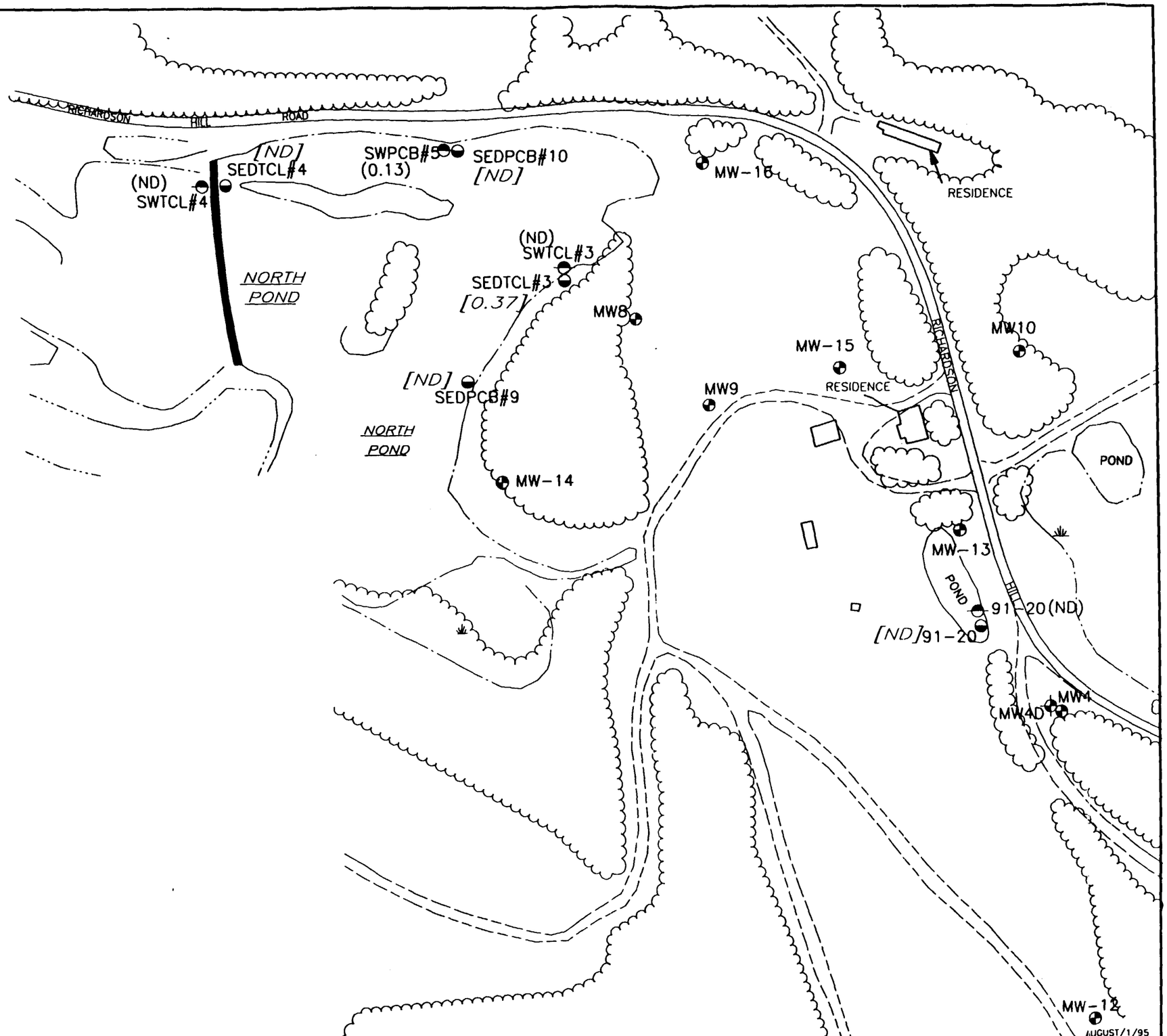
1500 0 1500
SCALE IN FEET

3729.031-12F

O'BRIEN & GERE ENGINEERS, INC.

302069

FIGURE 30



LEGEND

- TREE LINE
- MW9 OVERBURDEN WELL LOCATION
- BEDROCK MONITORING WELL LOCATION
- APPROXIMATE SURFACE WATER SAMPLING LOCATION
- APPROXIMATE SEDIMENT SAMPLING LOCATION
- (0.13) PCB CONCENTRATION IN ppb (SURFACE WATER)
- [0.37] PCB CONCENTRATION IN ppm (SEDIMENT)
- TIERS
- [ND] NOT DETECTED

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS IN SURFACE WATER AND SEDIMENTS (NORTH POND)

150 0 150

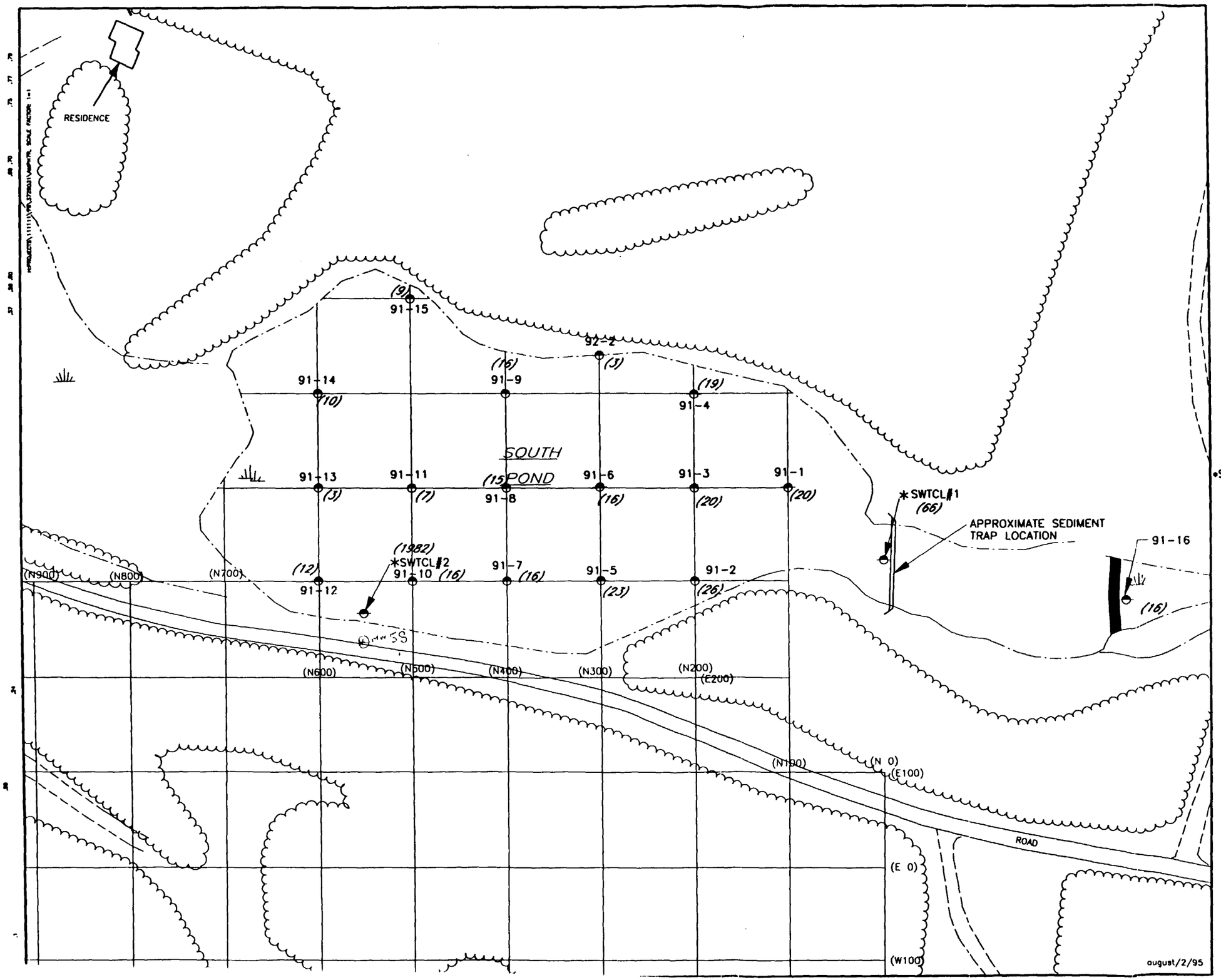
SCALE IN FEET

3729.031-13F

O'BRIEN & GERE ENGINEERS, INC.

302070

FIGURE 31



LEGEND

- TREE LINE
- APPROXIMATE SURFACE WATER SAMPLING LOCATION
- (16) SURFACE WATER CONCENTRATIONS IN ppb
- TIERS
- •SWTCL#1 DATA COLLECTED (12/90)
- 91-1 DATA COLLECTED (12/91)
- 92-1 DATA COLLECTED (9/92)

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

TOTAL VOLATILE ORGANIC CONSTITUENTS IN SURFACE WATER (SOUTH POND)

0 100 200

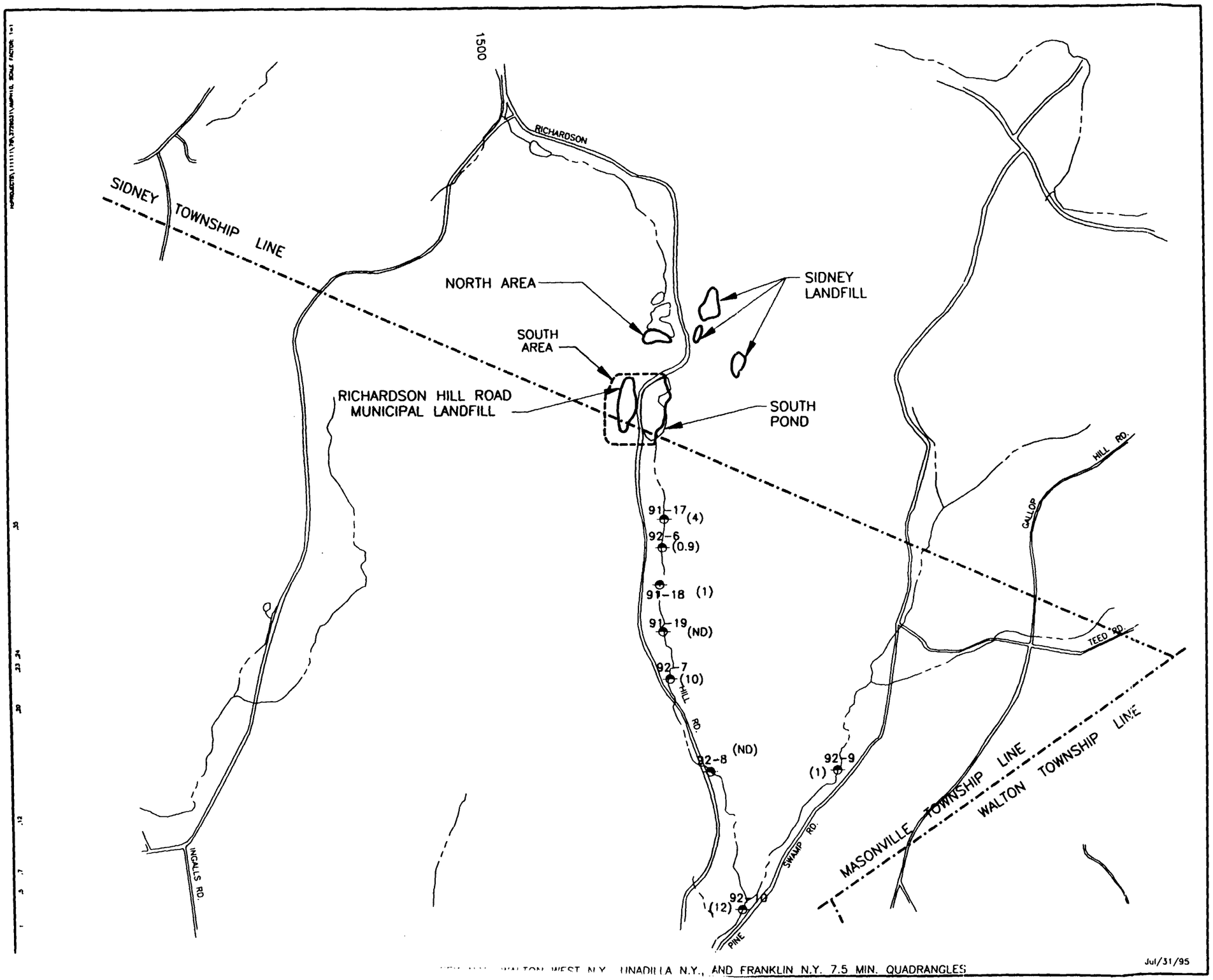
SCALE IN FEET

3729.031-14F

302071

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

FIGURE 32



LEGEND

- APPROXIMATE SURFACE WATER SAMPLE LOCATION
- (12) SURFACE WATER SAMPLE CONCENTRATIONS IN (ppb)
- 91-17 DATA COLLECTED (12/91)
- 92-6 DATA COLLECTED (9/92)
- (ND) NOT DETECTED

RICHARDSON HILL ROAD MUNICIPAL LANDFILL SITE

TOTAL VOLATILE ORGANIC CONSTITUENTS IN SURFACE WATER DOWNSTREAM OF THE SOUTH POND

1500 0 1500

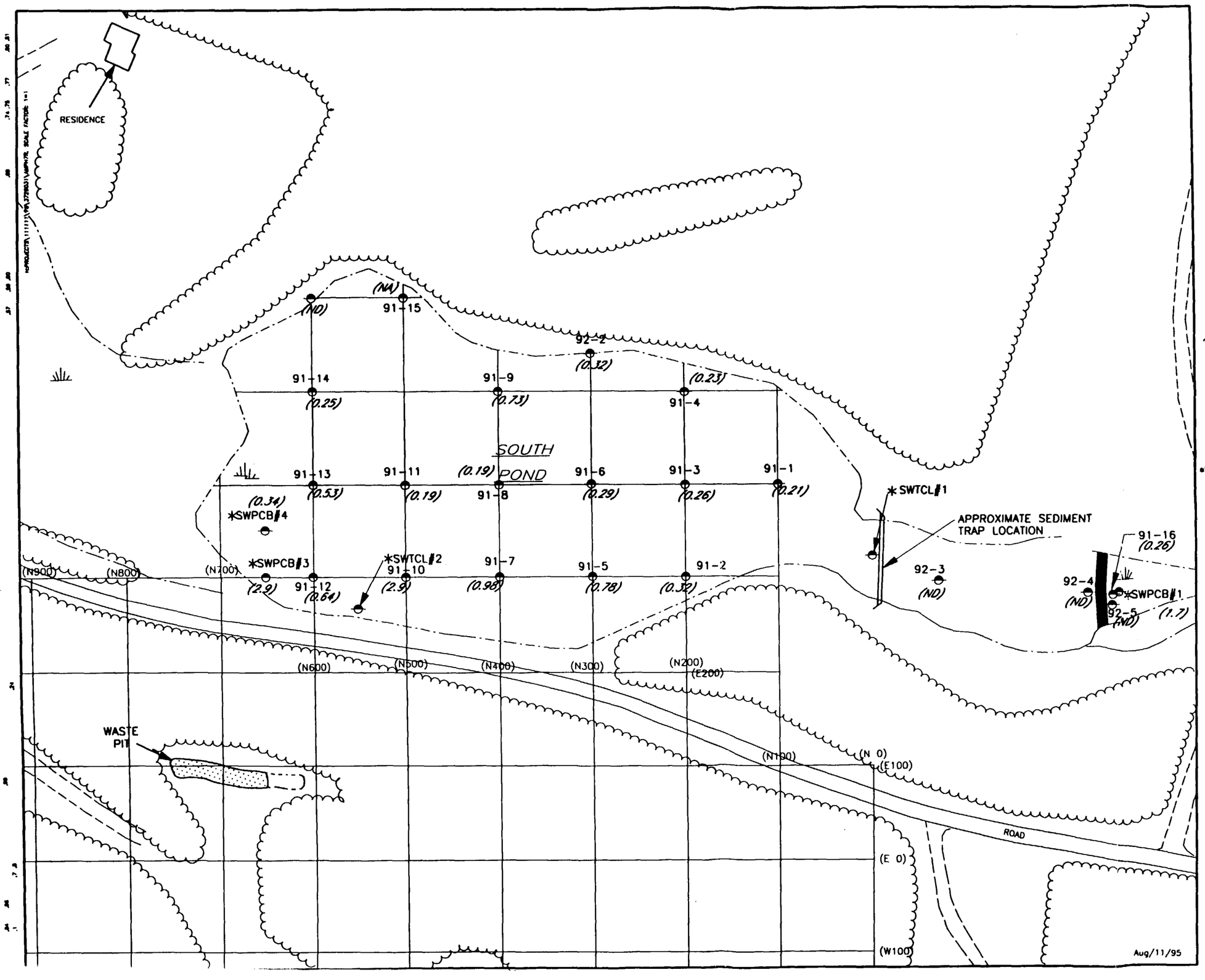
SCALE IN FEET

3729.031-15F

O'BRIEN & GERE ENGINEERS, INC.

302072

FIGURE 33



LEGEND

- TREE LINE
- APPROXIMATE SURFACE WATER SAMPLING LOCATION
- (.98) SURFACE WATER CONCENTRATIONS IN ppb
- TIERS
- •SWTCL#1 DATA COLLECTED (12/90)
- 91-1 DATA COLLECTED (12/91)
- 92-1 DATA COLLECTED (9/92)
- (NA) NOT ANALYZED
- (ND) NOT DETECTED

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS IN SURFACE WATER (SOUTH POND)

0 100 200

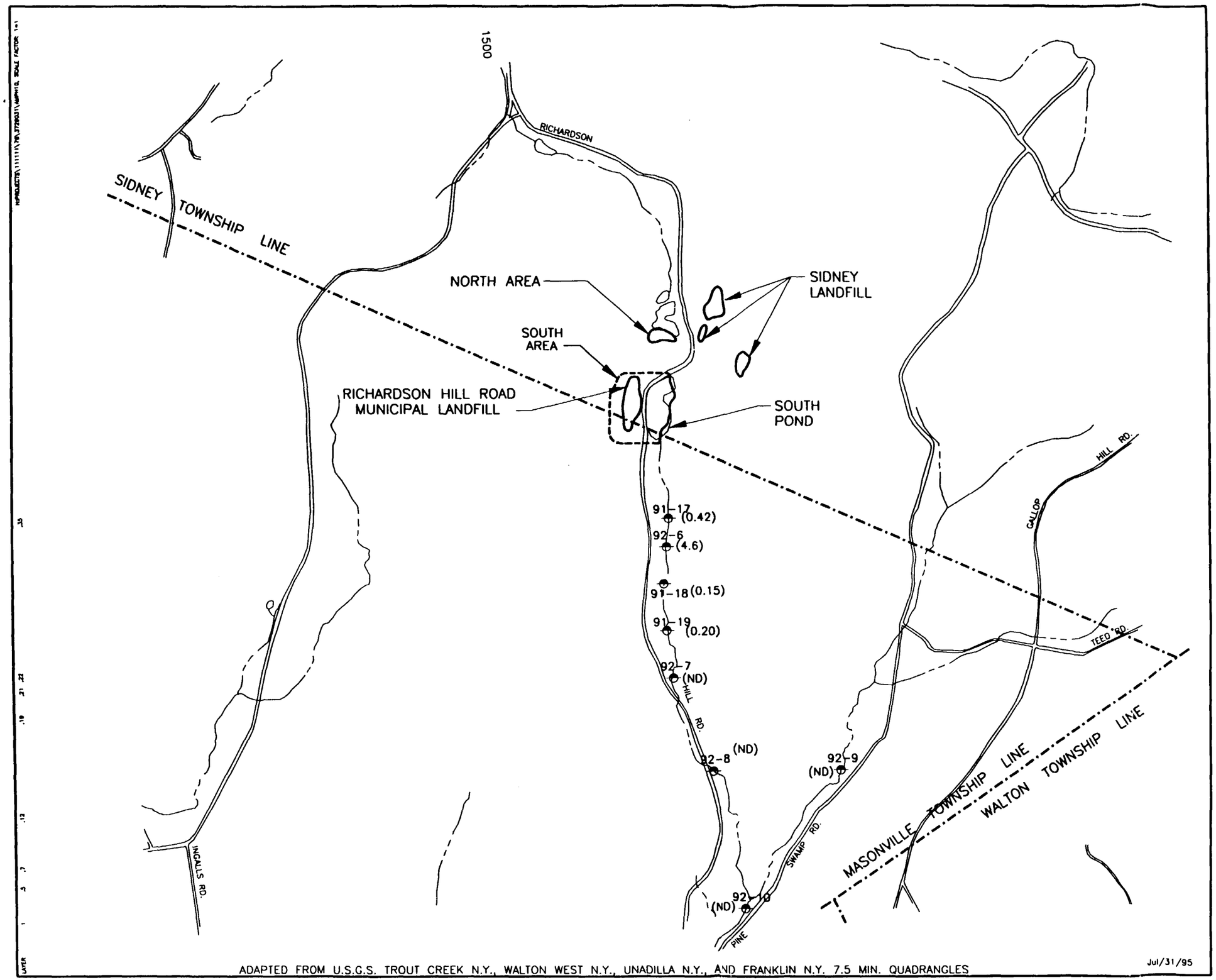
SCALE IN FEET

3729.031-16F

302073

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

FIGURE 34



ADAPTED FROM U.S.G.S. TROUT CREEK N.Y., WALTON WEST N.Y., UNADILLA N.Y., AND FRANKLIN N.Y. 7.5 MIN. QUADRANGLES

Jul/31/95

LEGEND

- APPROXIMATE SURFACE WATER SAMPLE LOCATION
- (0.42) SURFACE WATER CONCENTRATIONS IN (ppb)
- 91-17 DATA COLLECTED (12/91)
- 92-6 DATA COLLECTED (9/92)
- (ND) NOT DETECTED

RICHARDSON HILL ROAD MUNICIPAL LANDFILL SITE

PCB CONCENTRATIONS IN SURFACE WATER DOWNSTREAM OF THE SOUTH POND

1500 0 1500

SCALE IN FEET

3729.031-17F

O'BRIEN & GERE ENGINEERS, INC.

302074

FIGURE 35

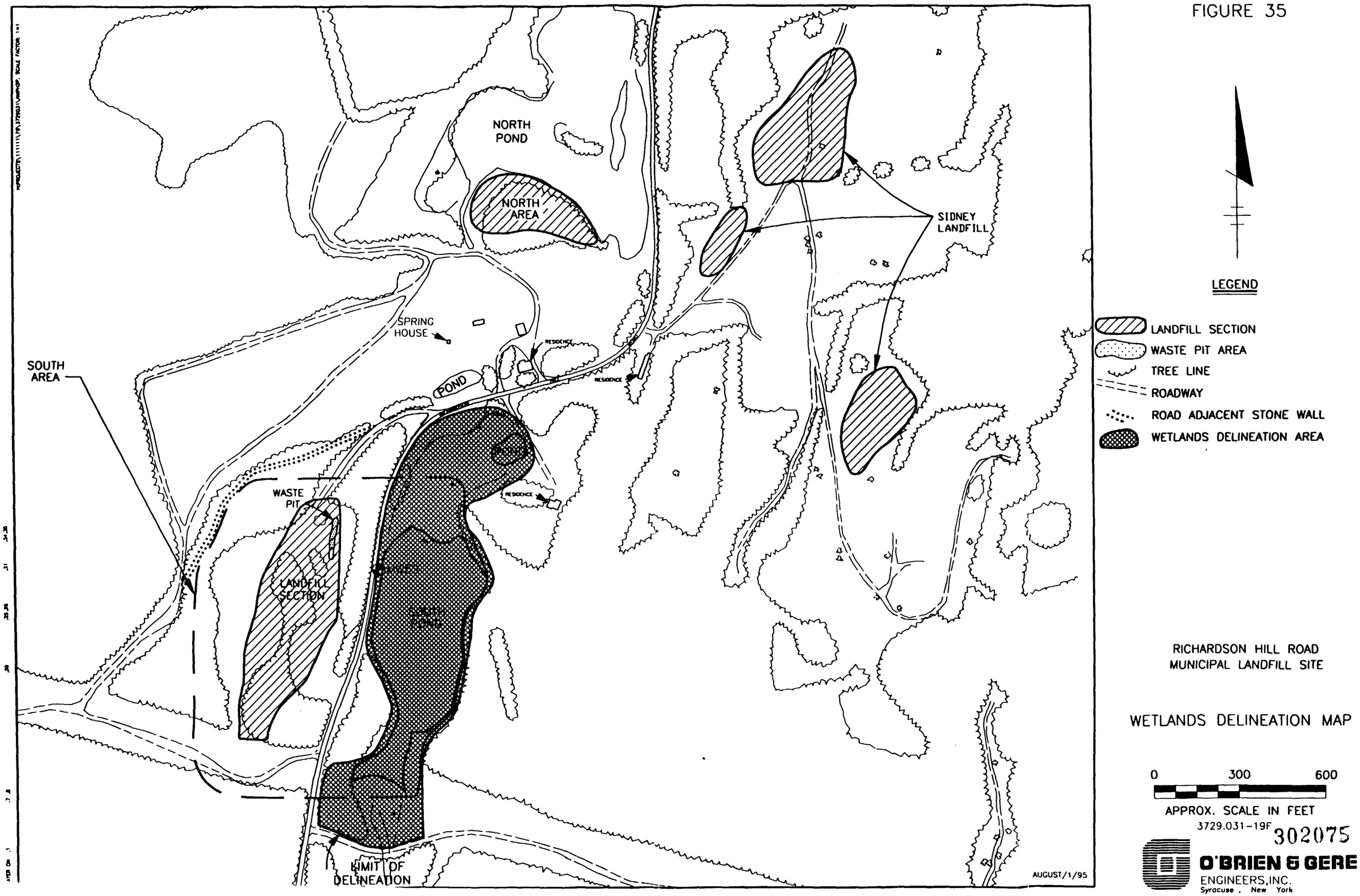
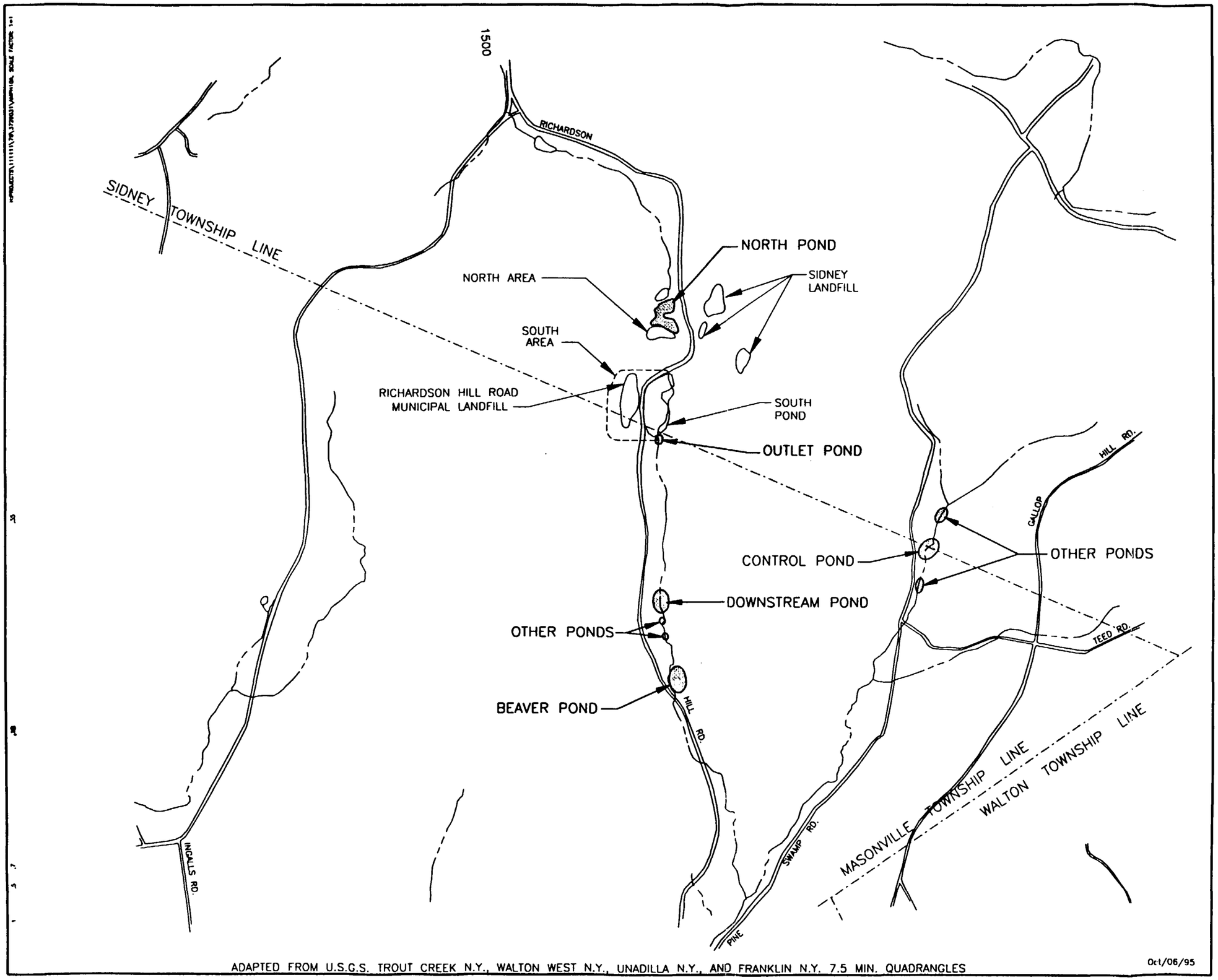

NORTH POND
NORTH AREA
SIDNEY LANDFILL
SPRING HOUSE
RESIDENCE
RESIDENCE
RESIDENCE
POND
SOUTH AREA
WASTE PIT
LANDFILL SECTION
LIMIT OF DELINEATION
AUGUST/1/95
LEGEND
LANDFILL SECTION
WASTE PIT AREA
TREE LINE
ROADWAY
ROAD ADJACENT STONE WALL
WETLANDS DELINEATION AREA
RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE
WETLANDS DELINEATION MAP
0
300
600
APPROX. SCALE IN FEET
3729.031-19F
302075
O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 36



ADAPTED FROM U.S.G.S. TROUT CREEK N.Y., WALTON WEST N.Y., UNADILLA N.Y., AND FRANKLIN N.Y. 7.5 MIN. QUADRANGLES

Oct/06/95

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

LOCATIONS OF SAMPLED SURFACE WATER BODIES

NOT TO SCALE

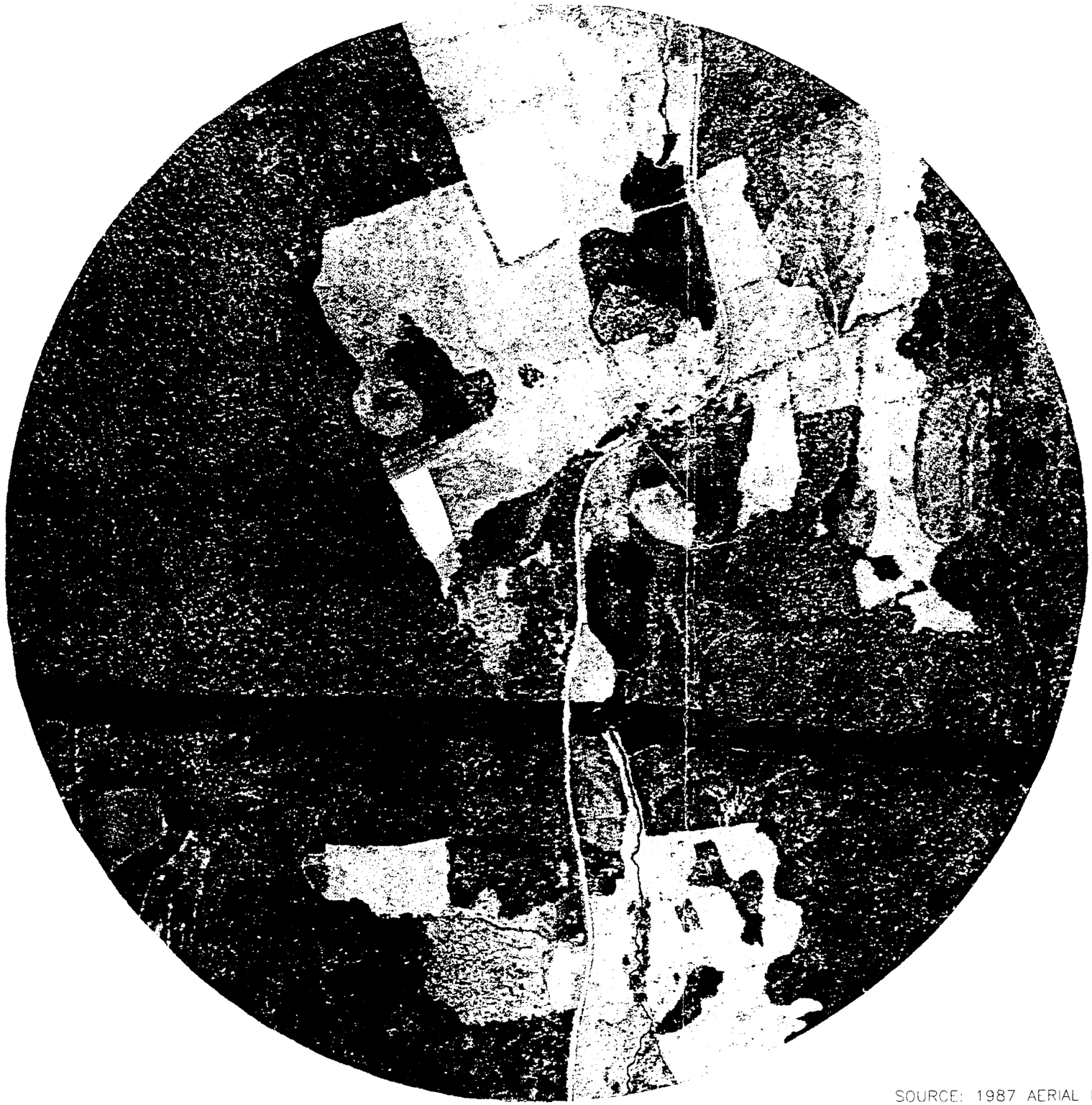
3729.028

302076

O'BRIEN & GERE ENGINEERS, INC.

H:\PROJECTS\12345-09\MISC\3729-F1

FIGURE 37



SOURCE: 1987 AERIAL PHOTOGRAPH.

LEGEND

- TREE LINE
- MIXED HARDWOOD FOREST
- SUCCESSIONAL OLD FIELD/ SHRUBLAND
- CROPLAND
- PINE PLANTATION
- MOWED PATHWAY
- LANDFILL
- OTHER CULTURAL
- WETLAND
- OPEN WATER
- STREAM (Exaggerated Scale)

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

COVERTYPE MAP

0 600 1200

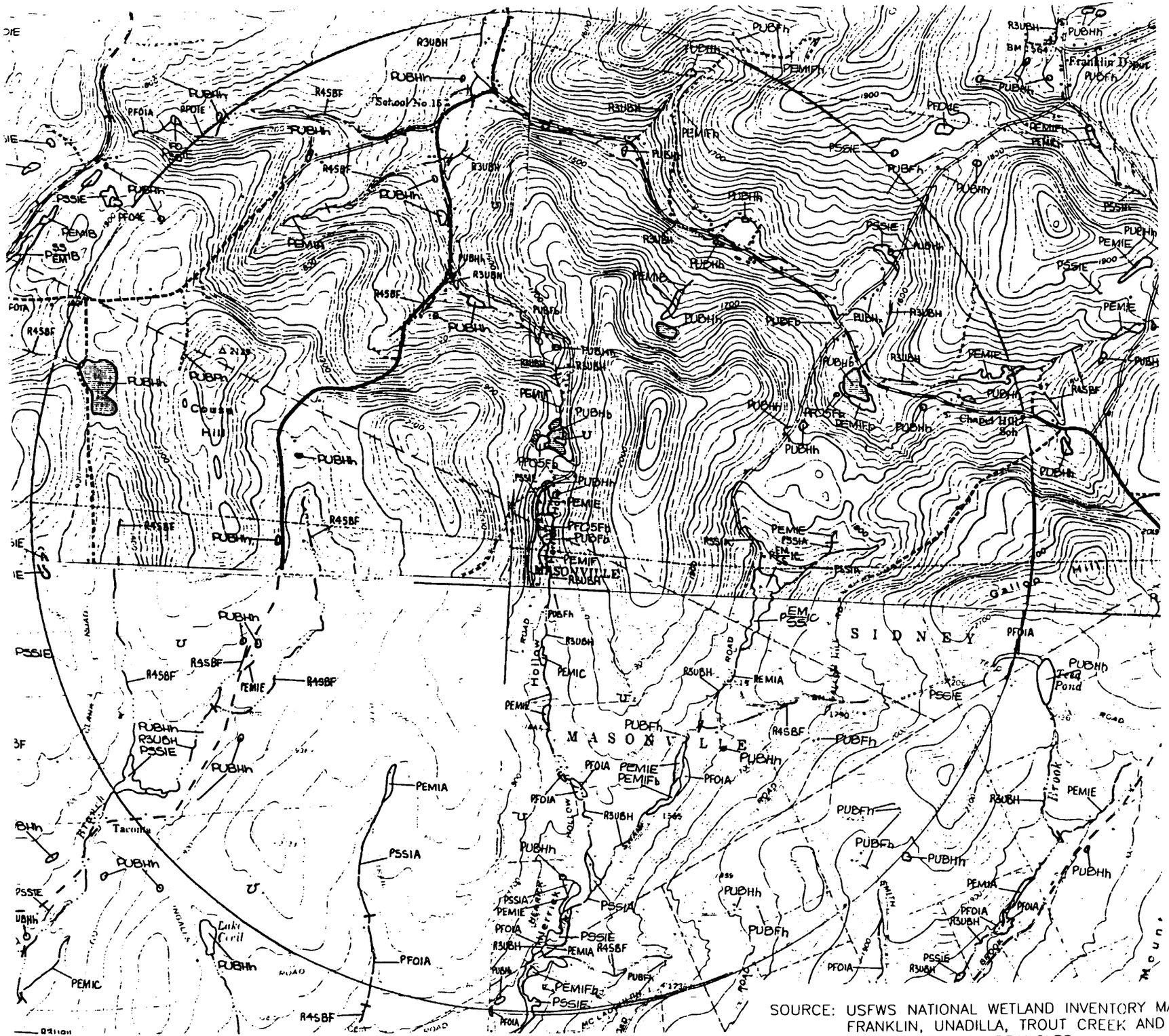
APPROX. SCALE IN FEET

3729.028 302077

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

FIGURE 38

H:\PROJECTS\12345-09\MISC\3729-F3



SOURCE: USFWS NATIONAL WETLAND INVENTORY MAPS FRANKLIN, UNADILLA, TROUT CREEK AND WALTON WEST QUADRANGLES.

LEGEND

PF01A — NWI WETLAND

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

NATIONAL WETLAND INVENTORY MAP

0 1800 3600

APPROX. SCALE IN FEET

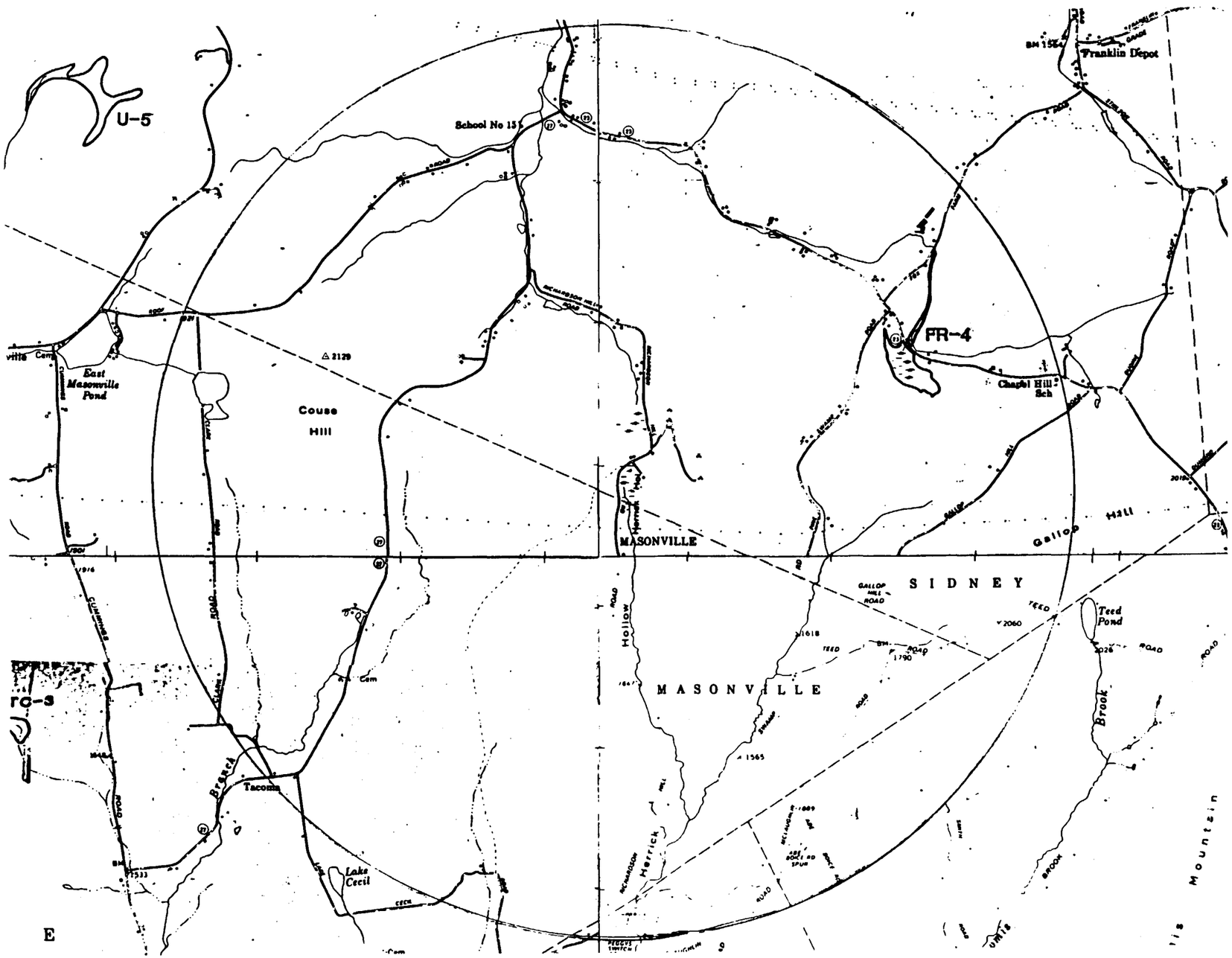
3729.028

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

302078

H:\PROJECTS\12345-09\MISC\3729-F2

FIGURE 39



SOURCE: NYSDEC FRESHWATER WETLANDS MAPS FRANKLIN, UNADILLA, TROUT CREEK AND WALTON WEST QUADRANGLES.

LEGEND

FR-4 — NEW YORK STATE FRESHWATER WETLAND BOUNDARY

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

NEW YORK STATE FRESHWATER WETLANDS

0 1500 3000

APPROX. SCALE IN FEET

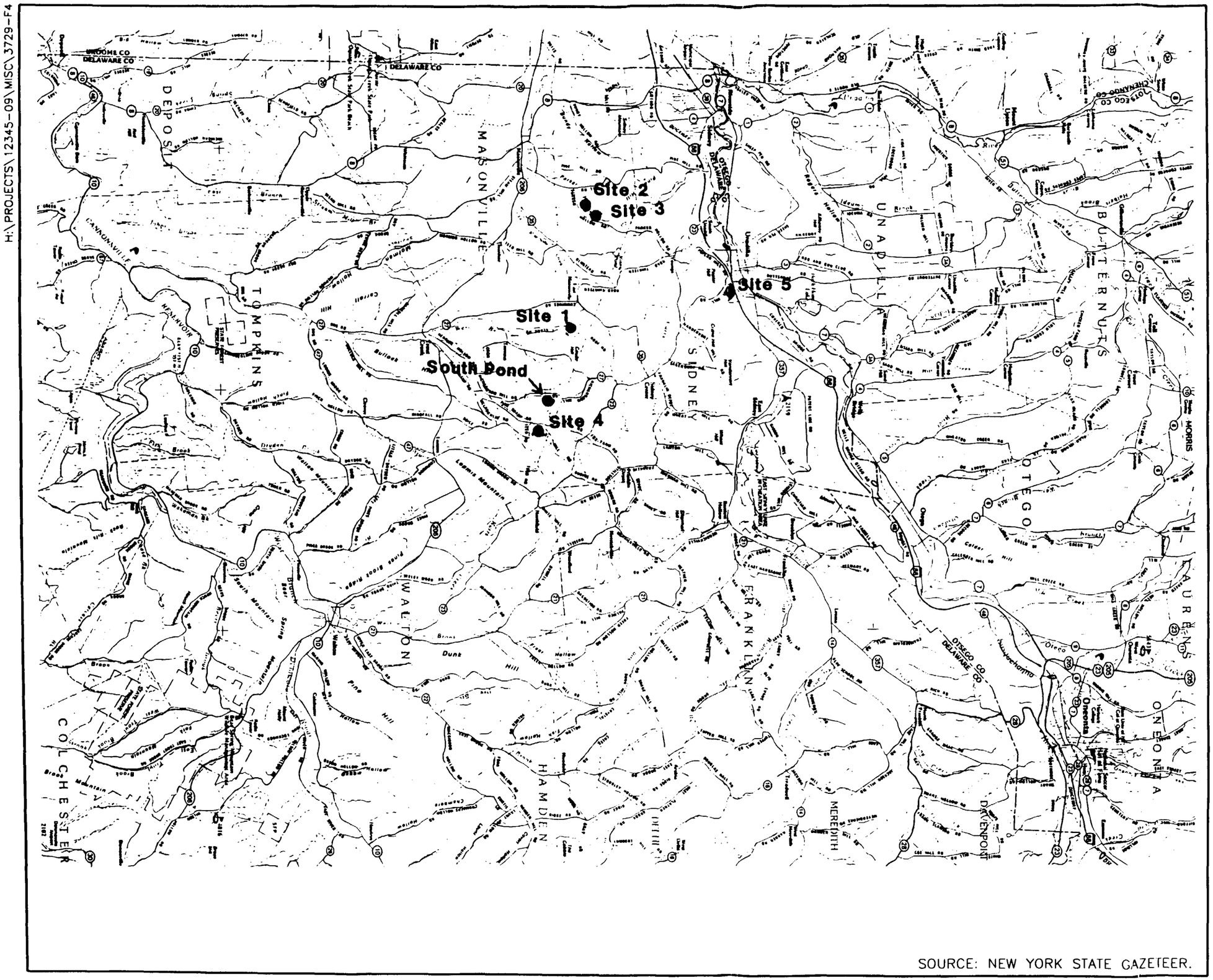
3729.028

O'BRIEN & GERE ENGINEERS, INC.
Syracuse, New York

302079

H:\PROJECTS\12345-09\MISC\3729-F4

FIGURE 40



SOURCE: NEW YORK STATE GAZETEER.

LEGEND

● REFERENCE SITE LOCATION

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

REFERENCE SITE LOCATION MAP

0 150000 300000

APPROX. SCALE IN FEET

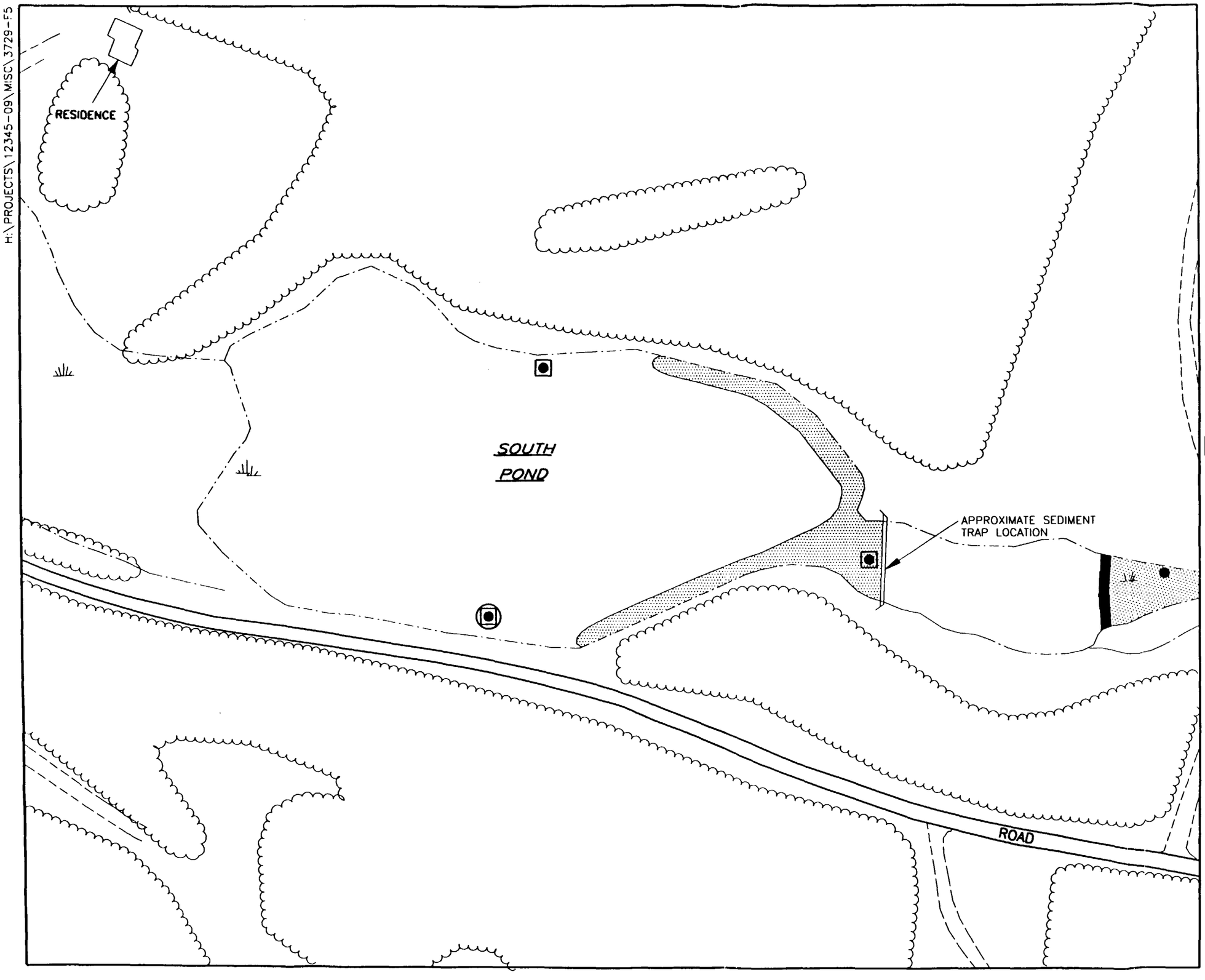
3729.028

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

302060

FIGURE 41

H:\PROJECTS\12345-09\MISC\3729-F5



LEGEND

- TREE LINE
- LOCATION OF SURFACE WATER & SEDIMENT SAMPLING & CAGED FISH STUDIES.
- WATER BIOASSAY SAMPLING
- SEDIMENT TOXICITY TEST SAMPLING
- BIOTA SAMPLING LOCATION
- TIER

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SITE SAMPLING LOCATION MAP

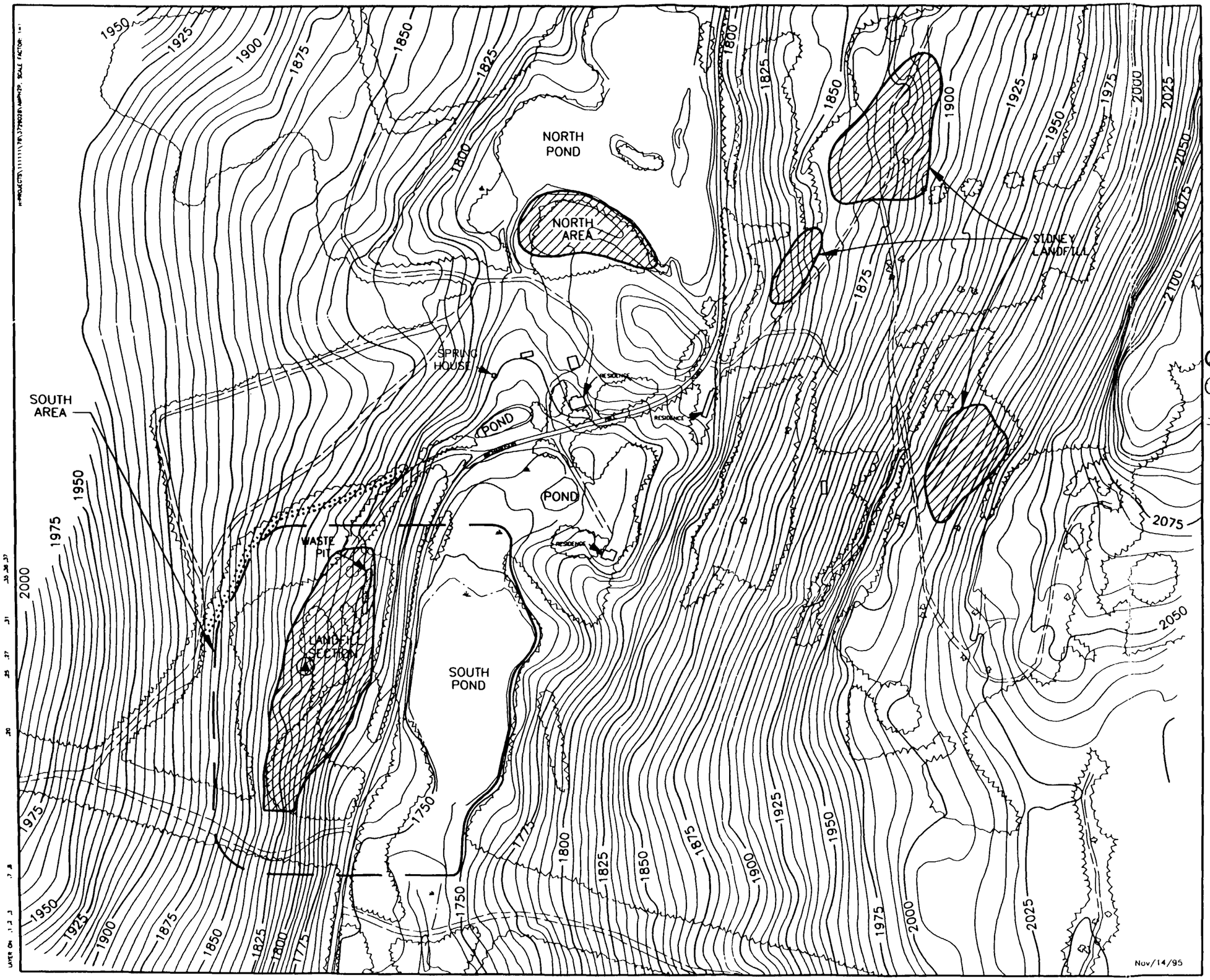
0 100 200
SCALE IN FEET

3729.028

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

302081

FIGURE 42



LEGEND

- LANDFILL SECTION
- WASTE PIT AREA
- TREE LINE
- ROADWAY
- ROAD ADJACENT STONE WALL
- SURFACE SOIL AND EARTHWORM SAMPLING LOCATION

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

SURFACE SOIL AND
EARTHWORM SAMPLING LOCATION

0 300 600

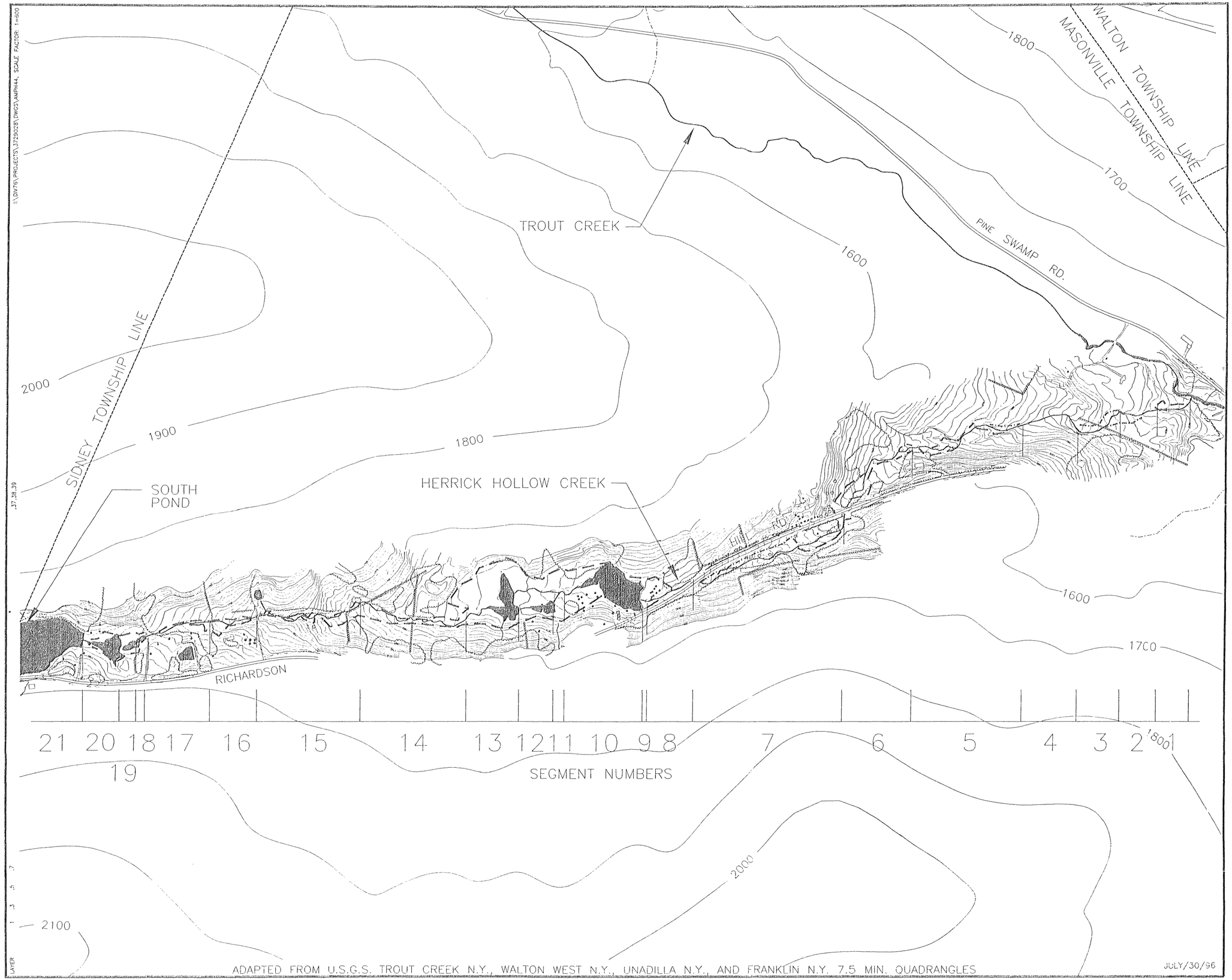
APPROX. SCALE IN FEET

3729.028-03F

O'BRIEN & GERE
ENGINEERS, INC.
Syracuse, New York

302082

FIGURE 43



LEGEND

- TOWNSHIP LINE
- STREAM
- SEGMENT LOCATION
- PALUSTRINE WETLAND LIMITS
- FLOODPLAIN LIMITS
- STONE FENCE

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

DOWNSTREAM SEGMENT LOCATIONS AND WETLAND /FLOODPLAIN LIMITS

600 0 600

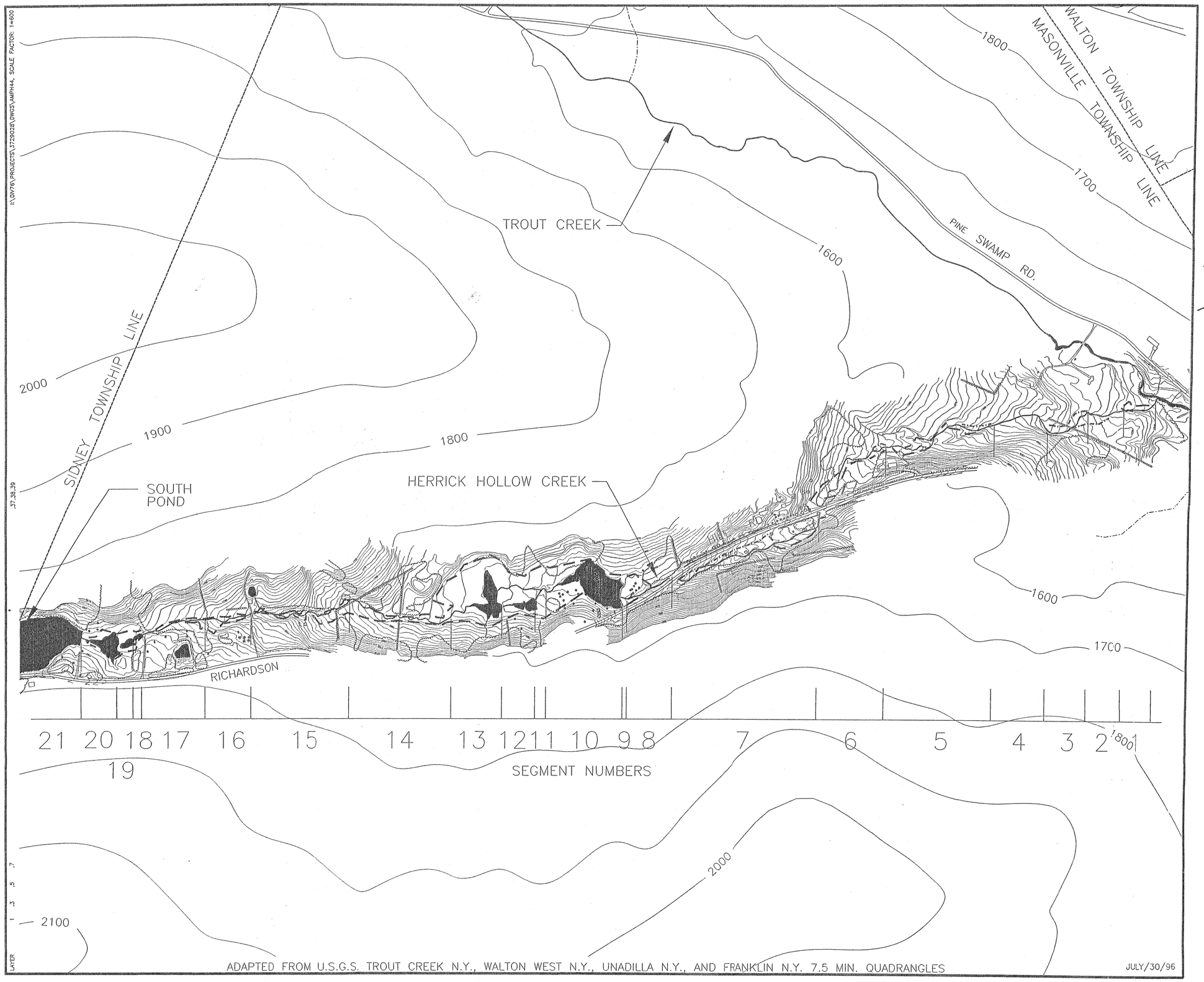
APPROXIMATE SCALE IN FEET

3729.028-006

O'BRIEN & GERE ENGINEERS, INC.

302080

FIGURE 43



LEGEND

- TOWNSHIP LINE
- STREAM
- SEGMENT LOCATION
- PALUSTRINE WETLAND LIMITS
- FLOODPLAIN LIMITS
- STONE FENCE

RICHARDSON HILL ROAD
MUNICIPAL LANDFILL SITE

DOWNSTREAM SEGMENT LOCATIONS AND WETLAND /FLOODPLAIN LIMITS

600 0 600

APPROXIMATE SCALE IN FEET

3729.028-006

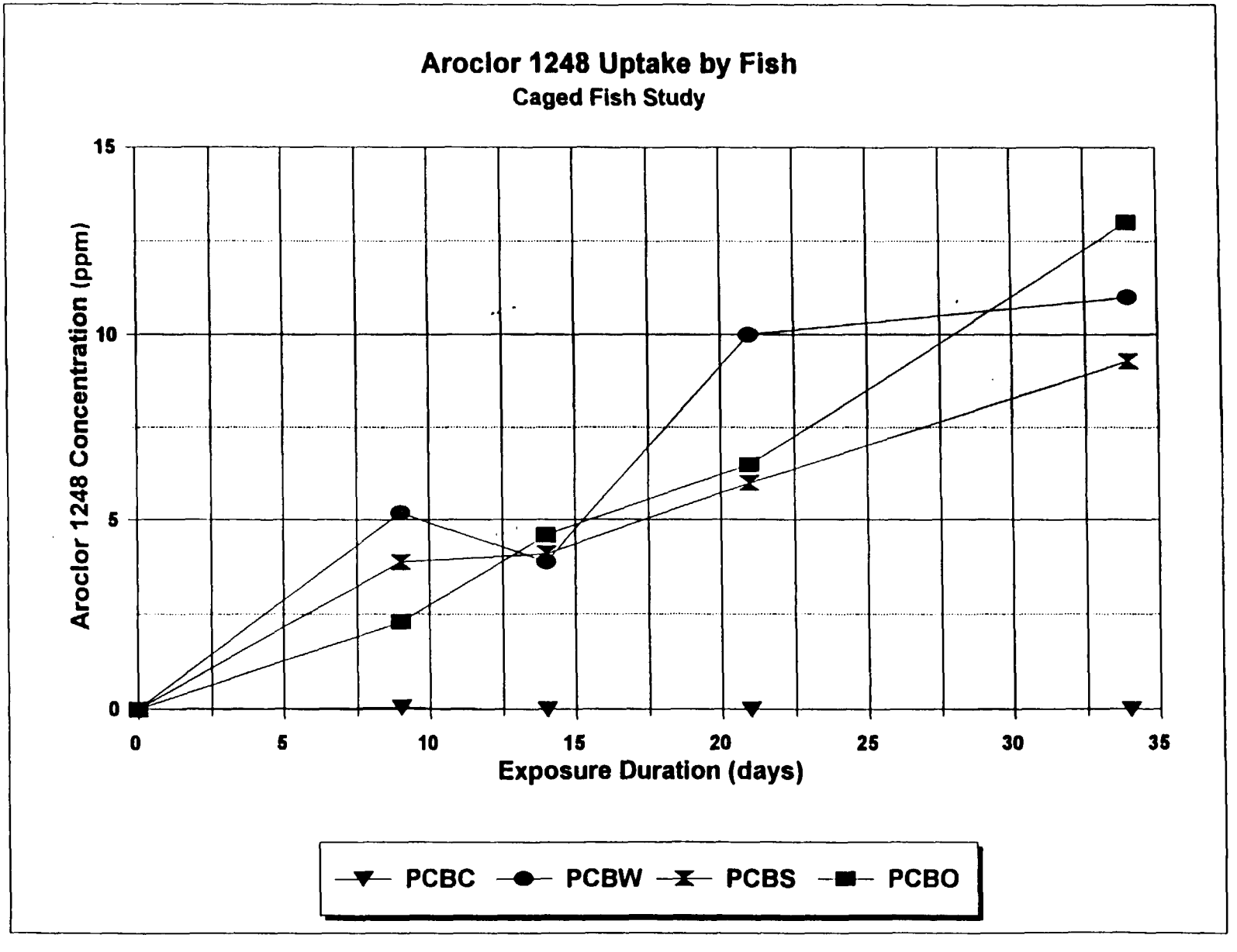
O'BRIEN & GERE ENGINEERS, INC.

302083

Figure 44

Richardson Hill Road Municipal Landfill Site

O'Brien & Gere Engineers, Inc.



302084

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APPENDICES

302085

APPENDICES

Remedial Investigation

Richardson Hill Road Municipal Landfill
Sidney, New York

August 1995

O'BRIEN & GERE
ENGINEERS, INC.

302086

APPENDIX A

GEOPHYSICAL SURVEY DATA

302087

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
TRAVERSE LINE M-17 TO R-17		
M-17	11.5	60
M-17 + 20	19.5	614
M-17 + 40	(0	461
M-17 + 60	(0	1147
M-17 + 80	3.2	798
N-17	3.4	428
N-17 + 20	(0	685
N-17 + 40	(0	1707
N-17 + 60	7.2	366
N-17 + 80	6.4	505
O-17	6.2	587
O-17 + 20	6.4	644
O-17 + 40	6.4	652
O-17 + 60	6.6	662
O-17 + 80	6.4	677
P-17	6.6	679
P-17 + 20	6.9-7.0	685
P-17 + 40	6.6	684
P-17 + 60	6.4	705
P-17 + 80	6.2	692
Q-17	6.1	704
Q-17 + 20	6.2	700
Q-17 + 40	6.6	717
Q-17 + 60	2.0	712
Q-17 + 80	6.6	689
R-17	6.4	697
TRAVERSE LINE M-17 TO M-12		
M-17	11.0	-28
M-17 + 20	15.0	-314
M-17 + 40	11.0	-19
M-17 + 60	(0	399
M-17 + 80	(0	687
M-16	7.8	456
M-16 + 20	7.2	330
M-16 + 40	8.2	319
M-16 + 60	8.2	306
M-16 + 80	7.2	339
M-15	7.2	335
M-15 + 20	7.0	299
M-15 + 40	6.7	278
M-15 + 60	7.7	306
M-15 + 80	8.0	382
M-14	8.0	428
M-14 + 20	8.0	448
M-14 + 40	7.5	504
M-14 + 60	8.9	495
M-14 + 80	7.8	539
M-13	8.8	566
M-13 + 20	9.8	469
M-13 + 40	11.0	699
M-13 + 60	8.5	788
M-13 + 80	8.8	639

302088

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
M-12	6.8	683
TRAVERSE LINE M-17 TO M-21		
M-17	12.0	253
M-17 + 20	0-0.2	553
M-17 + 40	13.0	464
M-17 + 60	1.3	1331
M-17 + 80	2.6	704
M-18	8.2	-669
M-18 + 20	1.1	275
M-18 + 40	4.0	353
M-18 + 60	4.8	530
M-18 + 80	5.4	635
M-19	5.6	711
M-19 + 20	5.3	728
M-19 + 40	5.3	744
M-19 + 60	7.2	789
M-19 + 80	7.4	727
M-20	2.8	749
M-20 + 20	6.6	769
M-20 + 40	6.0	769
M-20 + 60	6.2	771
M-20 + 80	6.2	777
M-21	6.2	767
M-21 + 20	6.0	777
M-21 + 40	6.2	776
M-21 + 60	6.0	775
TRAVERSE LINE P-20 TO P-10		
P-20	4.2	622
P-20 + 20	4.1	627
P-20 + 40	4.2	621
P-20 + 60	4.0	617
P-20 + 80	3.2	595
P-19	4.4	587
P-19 + 20	4.3	594
P-19 + 40	5.0	572
P-19 + 60	4.6	618
P-19 + 80	4.2	603
P-18	4.2	591
P-18 + 20	4.6	588
P-18 + 40	4.6	584
P-18 + 60	4.6	607
P-18 + 80	4.4	591
P-17	4.6	597
P-17 + 20	5.0	592
P-17 + 40	5.2	584
P-17 + 60	5.0	583
P-17 + 80	5.2	572
P-16	5.0	570

302089

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
P-16 + 20	4.6	561
P-16 + 40	4.4	550
P-16 + 60	4.4	551
P-16 + 80	4.4	518
P-15	4.8	511
P-15 + 20	5.1	492
P-15 + 40	5.3	474
P-15 + 60	5.0	460
P-15 + 80	5.2	467
P-14	5.5	440
P-14 + 20	5.7	444
P-14 + 40	6.0	406
P-14 + 60	6.9	312
P-14 + 80	14.0	-449
P-13	9.0	196
P-13 + 20	12.0	62
P-13 + 40	3.5	204
P-13 + 60	8.8	851
P-13 + 80	4.2	834
P-12	<0	1009
P-12 + 20	<0	1023
P-12 + 40	<0	922
P-12 + 60	<0	613
P-12 + 80	<0	505
P-11	<0	556
P-11 + 20	0-1.7	490
P-11 + 40	7.1	477
P-11 + 60	4.7	577
P-11 + 80	<0	319
P-10	<0	1203
TRAVERSE LINE R-16 TO M-16		
R-16	5.0	653
R-16 + 20	4.7	661
R-16 + 40	4.8	644
R-16 + 60	4.0	653
R-16 + 80	4.3	641
Q-16	4.0	657
Q-16 + 20	4.0	651
Q-16 + 40	4.4	641
Q-16 + 60	4.4	650
Q-16 + 80	5.0	607
P-16	4.9	605
P-16 + 20	4.8	588
P-16 + 40	5.4	550
P-16 + 60	5.6	459
P-16 + 80	<0	850
O-16	2.6-2.8	183
O-16 + 20	<0	304

302090

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
O-16 + 40	<0	188
O-16 + 60	<0	1128
O-16 + 80	<0	2057
N-16	<0	981
N-16 + 20	10.5	22
N-16 + 40	18.0	-336
N-16 + 60	<0	324
N-16 + 80	0.1-2.4	213
M-16	7.0-9.0	416
TRAVERSE LINE M-15 TO R-15		
M-15	5.8	321
M-15 + 20	6.2	-170
M-15 + 40	<0	-497
M-15 + 60	18.0	1049
M-15 + 80	18.0	1588
N-15	<0	1841
N-15 + 20	<0	1654
N-15 + 40	<0	1900
N-15 + 60	<0	1128
N-15 + 80	<0	610
O-15	<0	1377
O-15 + 20	<0	139
O-15 + 40	<0	474
O-15 + 60	5.0	318
O-15 + 80	5.2	473
P-15	4.6	552
P-15 + 20	4.1	579
P-15 + 40	4.4	597
P-15 + 60	4.0	625
P-15 + 80	4.0	624
Q-15	4.4	639
Q-15 + 20	4.6	629
Q-15 + 40	4.4	646
Q-15 + 60	4.9	649
Q-15 + 80	4.4	649
R-15	4.8	638
TRAVERSE LINE R-14 TO M-14		
R-14	4.8	669
R-14 + 20	5.0	659
R-14 + 40	4.6	675
R-14 + 60	4.4	663
R-14 + 80	4.4	656
Q-14	4.6	640
Q-14 + 20	4.4	637
Q-14 + 40	4.4	612
Q-14 + 60	4.4	613
Q-14 + 80	4.8	571
P-14	5.5	515

302091

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
P-14 + 20	7.2	404
P-14 + 40	0.5-1.9	732
P-14 + 60	<0	1709
P-14 + 80	<0	655
O-14	16.0	1552
O-14 + 20	<0	1250
O-14 + 40	11.0	1237
O-14 + 60	14.0	1592
O-14 + 80	5.0	1637
N-14	<0	991
N-14 + 20	<0	814
N-14 + 40	<0	2879
N-14 + 60	<0	-17
N-14 + 80	<0	-116
M-14	6.6	407
TRAVERSE LINE M-13 TO R-13		
M-13	7.1	576
M-13 + 20	6.4	469
M-13 + 40	4.1	312
M-13 + 60	<0	75
M-13 + 80	<0	816
N-13	<0	483
N-13 + 20	<0	1159
N-13 + 40	<0	1007
N-13 + 60	<0	1673
N-13 + 80	3.0	1423
O-13	3.2-7.0	1824
O-13 + 20	<0	2227
O-13 + 40	<0	1307
O-13 + 60	<0	678
O-13 + 80	<0	364
P-13	6.7	260
P-13 + 20	6.7	477
P-13 + 40	6.0	575
P-13 + 60	5.9	619
P-13 + 80	5.8	650
Q-13	5.8	653
Q-13 + 20	5.8	673
Q-13 + 40	5.7	675
Q-13 + 60	5.8	680
Q-13 + 80	5.8	685
R-13	5.9	687
TRAVERSE LINE R-12 TO M-12		
R-12	3.4	711
R-12 + 20	3.4	687
R-12 + 40	3.4	710
R-12 + 60	3.4	721
R-12 + 80	3.6	709

302092

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
Q-12	3.6	705
Q-12 + 20	3.8	709
Q-12 + 40	3.6	660
Q-12 + 60	4.0	659
Q-12 + 80	6.0	521
P-12	(0	1247
P-12 + 20	(0	866
P-12 + 40	(0	1404
P-12 + 60	3.6-4.2	1418
P-12 + 80	(0	1222
O-12	(0	1875
O-12 + 20	(0	542
O-12 + 40	(0	-9
O-12 + 60	(0	2234
O-12 + 80	11.0	47
N-12	7.0-8.0	561
N-12 + 20	7.6	557
N-12 + 40	6.8	636
N-12 + 60	6.8	657
N-12 + 80	7.6	661
M-12	3.0	700
TRAVERSE LINE N-11 TO R-11		
N-11	8.0	663
N-11 + 20	7.0	662
N-11 + 40	7.4	615
N-11 + 60	6.4	580
N-11 + 80	6.2	585
O-11	5.3	633
O-11 + 20	3.5	657
O-11 + 40	5.4	891
O-11 + 60	5.4	934
O-11 + 80	5.8	664
P-11	(0	824
P-11 + 20	(0	881
P-11 + 40	5.8	690
P-11 + 60	5.6	684
P-11 + 80	5.4	718
Q-11	5.4	697
Q-11 + 20	5.4	722
Q-11 + 40	5.0	694
Q-11 + 60	5.4	719
Q-11 + 80	5.4	738
R-11	5.6	765
TRAVERSE LINE M-18 TO Q-18		
M-18	(0	-970
M-18 + 20	(0	1365
M-18 + 40	3.0	518
M-18 + 60	4.8	533

302093

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
M-18 + 80	2.2	585
N-18	4.2	618
N-18 + 20	(0	648
N-18 + 40	4.8	552
N-18 + 60	3.8	649
N-18 + 80	4.0	647
O-18	4.2	653
O-18 + 20	4.5	667
O-18 + 40	4.8	663
O-18 + 60	4.8	669
O-18 + 80	4.6	669
P-18	4.4	691
P-18 + 20	4.2	673
P-18 + 40	4.4	678
P-18 + 60	4.2	675
P-18 + 80	4.8	672
Q-18	6.0	663
TRAVERSE LINE P-19 TO M-19		
P-19	4.4	692
P-19 + 20	3.8	695
P-19 + 40	4.0	703
P-19 + 60	4.8	700
P-19 + 80	4.4	693
O-19	4.0	688
O-19 + 20	4.0	686
O-19 + 40	4.2	696
O-19 + 60	4.1	697
O-19 + 80	4.0	702
N-19	4.4	736
N-19 + 20	3.2	574
N-19 + 40	4.4	715
N-19 + 60	4.8	686
N-19 + 80	4.6	671
M-19	4.6	641
TRAVERSE LINE M-20 TO O-20		
M-20	4.8	664
M-20 + 20	4.6	683
M-20 + 40	4.2	692
M-20 + 60	4.2	674
M-20 + 80	4.3	688
N-20	4.2	691
N-20 + 20	4.2	682
N-20 + 40	4.4	693
N-20 + 60	4.2	678
N-20 + 80	4.2	688
O-20	4.0	687
TRAVERSE LINE M-17 TO L-17 + 40		
M-17	10.5	50

302094

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
M-17 + 20	<2.8	481
M-17 + 40	5.8	484
M-17 + 60	4.4	540
M-17 + 80	4.4	621
L-17	4.6	680
L-17 + 20	5.1	696
L-17 + 40	11.5	793
TRAVERSE LINE N-20 TO N-11		
N-20	5.8	626
N-20 + 20	5.0	644
N-20 + 40	7.2	544
N-20 + 60	<0	340
N-20 + 80	<0	571
N-19	6.2	677
N-19 + 20	6.2	640
N-19 + 40	6.2	619
N-19 + 60	5.7	442
N-19 + 80	4.4	555
N-18	6.0	548
N-18 + 20	6.4	555
N-18 + 40	7.0	425
N-18 + 60	<0	-708
N-18 + 80	<0	-353
N-17	1.1-1.4	346
N-17 + 20	<0	791
N-17 + 40	<0	33
N-17 + 60	<0	72
N-17 + 80	17.0	894
N-16	<0	900
N-16 + 20	<0	1059
N-16 + 40	2.0-2.9	1015
N-16 + 60	<0	1333
N-16 + 80	<0	1771
N-15	<0	1581
N-15 + 20	<0	606
N-15 + 40	0.1-2.0	29
N-15 + 60	<0	1218
N-15 + 80	4.4	941
N-14	<0	949
N-14 + 20	<0	1373
N-14 + 40	<0	-189
N-14 + 60	<0	377
N-14 + 80	<0	428
N-13	<0	324
N-13 + 20	<0	815
N-13 + 40	<0	401
N-13 + 60	3.8	-15
N-13 + 80	<0	172

302095

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
N-12	8.4	504
N-12 + 20	8.8	433
N-12 + 40	8.5-9.0	440
N-12 + 60	9.0	562
N-12 + 80	9.6	531
N-11	8.2	573
TRAVERSE LINE 0-11 TO 0-19		
0-11	5.5	616
0-11 + 20	<0	815
0-11 + 40	<0	1299
0-11 + 60	<0	2298
0-11 + 80	<0	1872
0-12	<0	1688
0-12 + 20	9.4	1253
0-12 + 40	13.0	305
0-12 + 60	13.0	1196
0-12 + 80	<0	1999
0-13	<0	1812
0-13 + 20	16.5	2242
0-13 + 40	13.5	2166
0-13 + 60	<0	5097
0-13 + 80	9.6	1607
0-14	13.0	1570
0-14 + 20	14.0	1573
0-14 + 40	17.0	306
0-14 + 60	<0	417
0-14 + 80	<0	932
0-15	<0	1516
0-15 + 20	<0	809
0-15 + 40	<0	1009
0-15 + 60	<0	498
0-15 + 80	<0	322
0-16	4.4	251
0-16 + 20	<0	561
0-16 + 40	<0	551
0-16 + 60	4.5	481
0-16 + 80	4.3	556
0-17	4.3	608
0-17 + 20	4.3	634
0-17 + 40	4.2	697
0-17 + 60	4.8	712
0-17 + 80	4.4	713
0-18	4.2	715
0-18 + 20	4.0	736
0-18 + 40	3.9	732
0-18 + 60	3.8	731
0-18 + 80	3.8	738
0-19	3.9	743

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GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
TRAVERSE LINE F-26 TO F-29		
F-26	5.6	707
F-26 + 20	5.4	732
F-26 + 40	5.2	724
F-26 + 60	5.2	743
F-26 + 80	5.2	735
F-27	4.8	692
F-27 + 20	4.8	747
F-27 + 40	4.8	748
F-27 + 60	4.6	750
F-27 + 80	4.7	744
F-28	4.8	740
F-28 + 20	4.8	736
F-28 + 40	5.4	718
F-28 + 60	4.3	731
F-28 + 80	5.3	706
F-29	5.4	727
TRAVERSE LINE F-29 TOWARD E-29		
F-29	5.4	—
F-29 + 20	5.4	686
F-29 + 40	5.6	666
F-29 + 60	6.6	650
TRAVERSE LINE F-29 TO G-29 + 60		
F-29	5.3	—
F-29 + 20	5.6	637
F-29 + 40	6.1	573
F-29 + 60	5.3	531
F-29 + 80	0.2-0.8	692
G-29	6.0	711
G-29 + 20	7.2	493
G-29 + 40	<0	435
G-29 + 60	<0	702
TRAVERSE LINE F-28 TO E-28 + 80		
F-28	4.8	705
F-28 + 20	4.9	693
F-28 + 40	5.2	715
F-28 + 60	4.8	790
F-28 + 80	7.2	749
E-28	<0	870
E-28 + 20	<0	1075
E-28 + 40	16.0	478
E-28 + 60	13.0	310
E-28 + 80	<0	138
TRAVERSE LINE F-28 TO H-28		
F-28	4.7	657
F-28 + 20	4.8	678
F-28 + 40	4.8	659
F-28 + 60	4.5	710

302097

GEOPHYSICAL SURVEY DATA
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

	EM-31 (QUAD. PHASE)	PROTON MAGNETOMETER (VALUE ABOVE OR BELOW 55,000 GAMMAS)
F-28 + 80	5.4	670
G-28	5.4	679
G-28 + 20	4.8	684
G-28 + 40	4.8	688
G-28 + 60	5.2	668
G-28 + 80	5.4	663
H-28	6.0	671
TRAVERSE LINE F-27 TO D-27 + 60		
F-27	4.8	635
F-27 + 20	5.0	686
F-27 + 40	5.0	706
F-27 + 60	4.8	686
F-27 + 80	5.4	697
E-27	5.4	688
E-27 + 20	5.8	653
E-27 + 40	6.4	677
E-27 + 60	4.8	724
E-27 + 80	5.8	722
D-27	5.8	700
D-27 + 20	6.2	695
D-27 + 40	7.0	689
D-27 + 60	7.6	694
TRAVERSE LINE F-27 TO H-27		
F-27	4.6	624
F-27 + 20	6.7	577
F-27 + 40	2.6	830
F-27 + 60	5.2	630
F-27 + 80	5.5	629
G-27	5.4	564
G-27 + 20	5.8	630
G-27 + 40	4.8	196
G-27 + 60	6.6	548
G-27 + 80	6.4	602
H-27	8.4	633

APPENDIX B

GROUND PENETRATING RADAR SURVEY FINAL REPORT

302099

FINAL REPORT

GROUND-PENETRATING RADAR SURVEY

RICHARDSON HILL ROAD MUNICIPAL LANDFILL AND NORTH AREA

Prepared for:

O'BRIEN & GERE ENGINEERS, INC.

Syracuse, New York

Report No. 316-92

June 30, 1992

DETECTION SCIENCES, INC.
496 HEALD ROAD
CARLISLE, MASSACHUSETTS 01741
Phone: (508) 369-7999 FAX: (508) 264-9680

302100

DETECTION SCIENCES, INC. EASTERN DIVISION
496 HEALD ROAD CARLISLE, MASSACHUSETTS 01741 (508) 369-7999
TELEX: 495-2806
FAX: (508) 264-9680

FINAL REPORT

GROUND-PENETRATING RADAR SURVEY

RICHARDSON HILL ROAD MUNICIPAL LANDFILL AND NORTH AREA SIDNEY, NEW YORK

Prepared for:

O'BRIEN & GERE ENGINEERS, INC.
5000 Brittonfield Parkway
Syracuse, New York 13221

Report No. 316-92

June 30, 1992

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INTRODUCTION AND SUMMARY

On May 28, 1992, Detection Sciences, Inc. performed a ground-penetrating radar (GPR) survey at the Richardson Hill Road Municipal Landfill, Sidney, New York. The survey was performed in accordance with O'Brien & Gere Engineers, Inc. Agreement for Services dated March 1, 1988, File No. 3068.005. The field work was performed under the supervision of Mr. Dennis R. Theoret, C.P.G., of O'Brien & Gere.

The survey utilized the high-performance ground-penetrating radar equipment we have developed over the past twelve years. Starting with a commercial GSSI SIR System-8 purchased in 1980, we have incorporated various proprietary design modifications that have increased the penetration depth by nearly an order of magnitude, with comparable improvements in the clarity and resolution of the radar records.

The purpose of the ground-penetrating radar survey was to investigate anomalies in the magnetic fields at two former landfill sites to determine if any concentrations of drums had been buried on site. The survey investigated the Richardson Hill Road Municipal Landfill, and a smaller landfill to the north that is designated as the North Area.

The survey utilized the survey grids established on site by O'Brien & Gere in accordance with the O'Brien & Gere WORK PLANS dated March 1992. The survey grid has principal grid stations located at intervals of 100 feet. Radar survey lines were laid out in a "star" pattern positioned over the magnetic anomalies. At the Richardson Hill Road Municipal Landfill, the star pattern was centered at grid station N400, W100. At the North Area, the star pattern was centered at grid station N1800, E900. The "footprint" of each survey line covers a path nearly 5 feet wide at the surface of the ground, becoming progressively wider with greater depth. (The radar beam spreads about 20° on either side, or approximately 40° total beam angle measured from side-to-side.)

The survey was run with a 120 MHz radar antenna hand-pulled over the surface of the ground. A survey van set up as a mobile laboratory carried all the electronic controls, power supplies and recording equipment. The radar instrument was set to probe to a depth of 24 feet.

Within the area covered by the radar survey, we do not observe any radar anomalies that would indicate the presence of a concentration of buried drums.

The radar data shows two locations on the Richardson Hill Road Municipal Landfill that indicate the presence of non-ionic liquids in pore space of the soil. The locations of the radar survey lines and the radar anomalies within the Richardson Hill Road Municipal Landfill are shown on Drawing Number 316-92-01, titled "RADAR SURVEY MAP, RICHARDSON HILL ROAD MUNICIPAL LANDFILL". The location of the radar survey lines within the North Area is shown on Drawing Number 316-92-02, titled "RADAR SURVEY MAP, NORTH AREA". For convenience, the grid coordinates of the radar anomalies are tabulated in **Table I**, titled "GRID COORDINATES OF RADAR ANOMALIES, RICHARDSON HILL ROAD MUNICIPAL LANDFILL". No radar anomalies were found in the North Area; however, a location for a test pit to provide a representative sample of the fill material in this area is shown on Drawing Number 316-92-02 and is listed in **Table II**, titled "GRID COORDINATES OF PROPOSED TEST PITS".

DESCRIPTION OF THE SURVEY

For most ground-penetrating radar survey work, the radar antenna is towed by a vehicle that is set up as a mobile laboratory to carry all the electronic controls, power supplies and recording equipment. For this site, where we used a star-shaped pattern of coverage rather than a rectilinear grid, we elected to manually pull the 120 MHz radar antenna over the ground. **Figure 1** shows the 120 MHz radar antenna being-hand pulled by the operator. A van parked close to the survey lines held all the electronic support equipment. A scanning chart-recorder provided a hard-copy display of the radar data, as shown in **Figure 2.** All the radar data were tape-recorded for subsequent laboratory analysis and interpretation. (These magnetic tapes are permanently stored in our project archives.)

Using an electronically generated time window, the radar system was calibrated to display a total depth of 24 feet. The radar graphic charts that displayed the real-time data in the field are 6 inches in height, with a vertical scale factor of 1 inch = 4 feet. Upon returning to the laboratory, the tape-recorded data was played back to generate expanded-scale radar graphic charts that are 12 inches in height, having a vertical scale factor of 1 inch = 2 feet. These expanded-scale charts were used for the interpretation and analysis of the radar data.

A surveyor's tape laid along the ground was used to establish the grid locations. Each 5-foot grid station was recorded as a "tick-mark" along the top of the radar vertical-profile chart by means of a manually operated event-marker switch mounted on the handle of the radar antenna. This method of using a surveyor's tape and electronically recording grid locations makes it possible to maintain ground position accuracy to a tolerance of about ±1 foot.

GPR Survey Grid

The survey was based on the survey grids established on site by O'Brien & Gere in accordance with the O'Brien & Gere WORK PLANS dated March 1992. The principal grid stations are established at intervals of 100 feet. Starting from a center point, the radar survey lines were laid out in an 8-point "star" pattern designed to investigate the magnetic anomalies that had been previously found at the two sites. The center point of the GPR survey at the Richardson Hill Road Municipal Landfill was located at N400, W100. The center point of the GPR survey at the North Area was located at N1800, E900. At both locations, the 8-point star search pattern extended for a distance of 100 feet from the center point, running along the principal grid lines as well as fanning out at an angle of 45 degrees with respect to the principal grid lines.

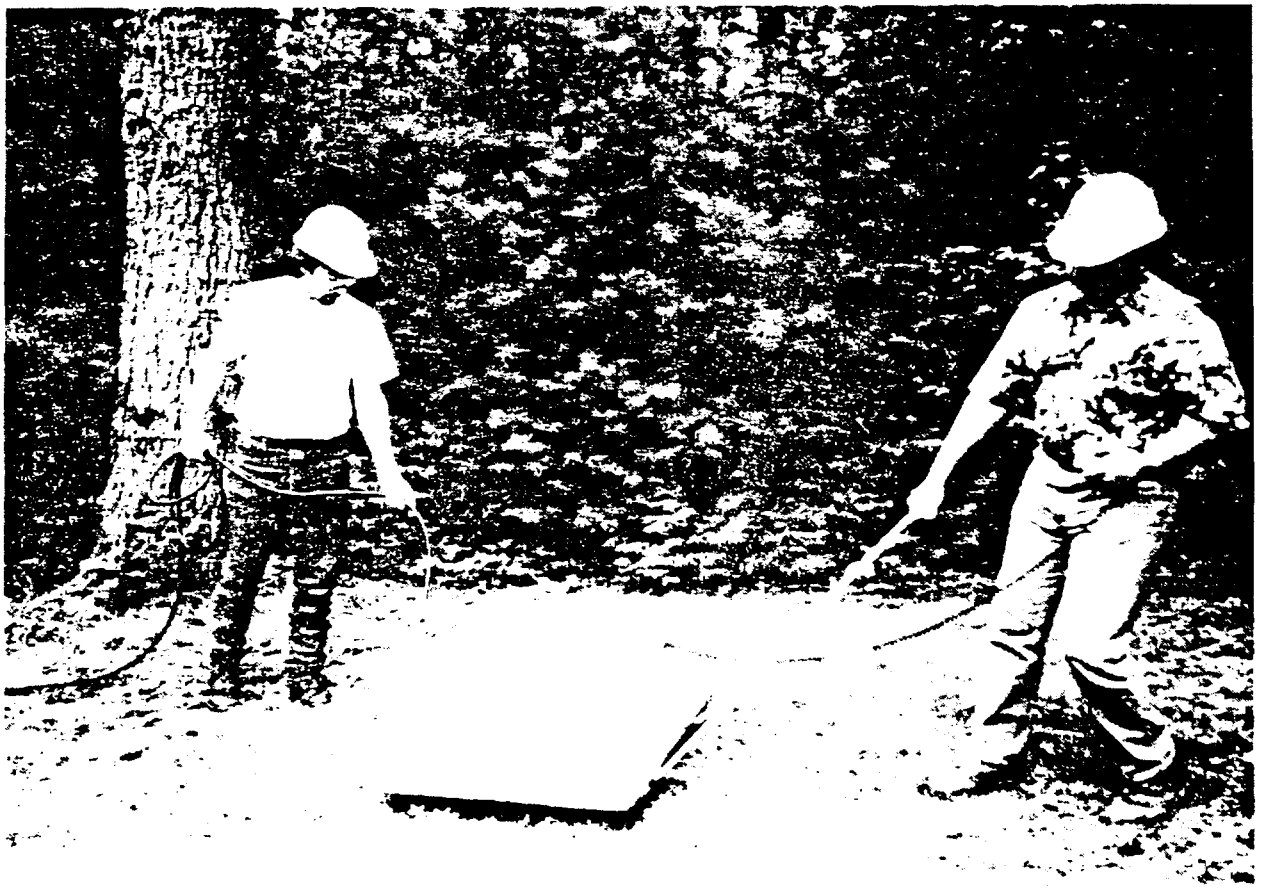

Figure 1.

120 MHz RADAR ANTENNA

The operator is guiding the deep-penetrating 120 MHz radar antenna along the surface of the ground. The operator has an event-marker switch to electronically annotate the ground locations on the radar charts. Extending to the left is the coaxial cable assembly (100 feet in length) which connects the radar antenna to the radar controls, power supplies, tape recorder and the graphics recording equipment.

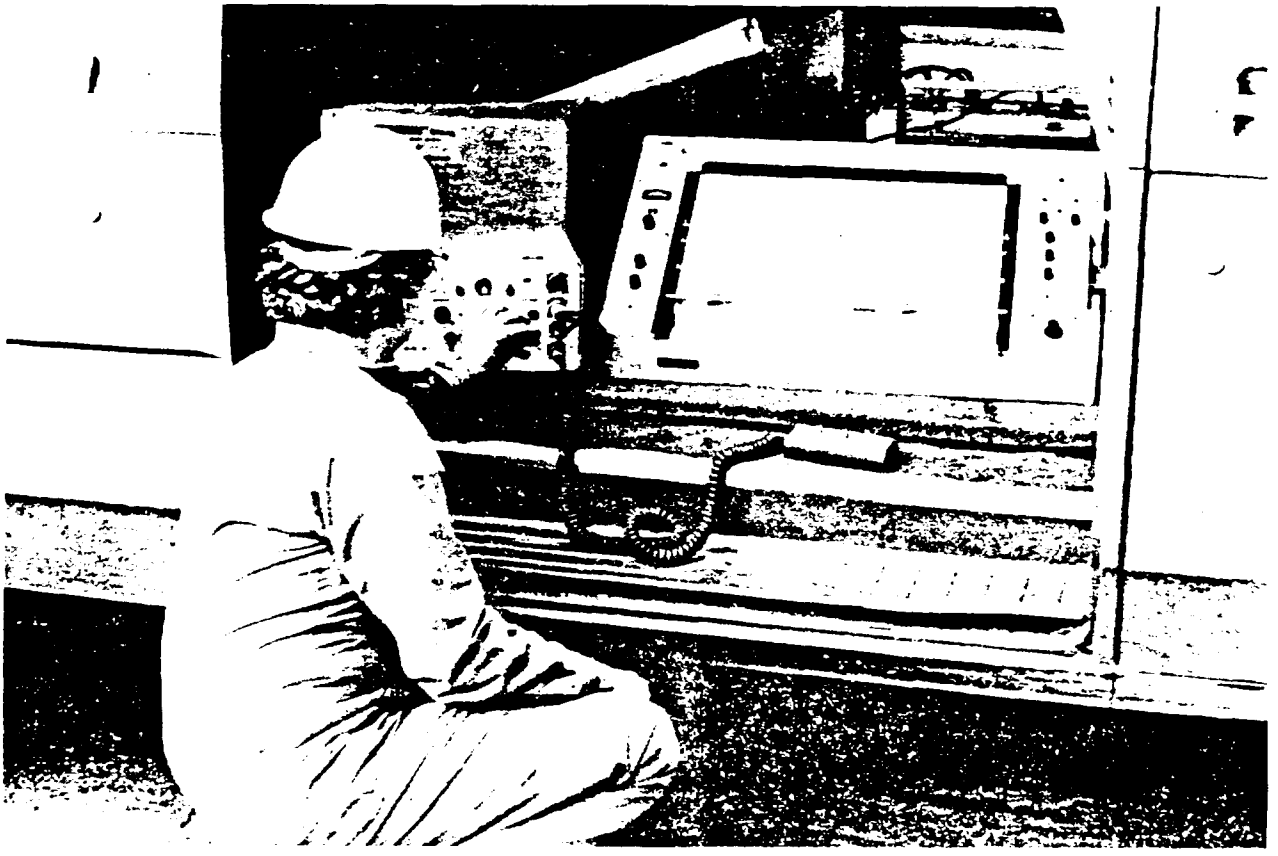

Figure 2.

CHART RECORDER AND RADAR CONTROLS

The EPC scanning chart recorder (right foreground) produces the hard-copy vertical-profile radar records. All data is tape-recorded on the four-channel Hewlett-Packard instrumentation tape recorder (rear left). The radar control unit (left foreground) also provides the operator with a CRT display. The power supply (right background) provides a.c. electrical power for the system.

METHODOLOGY

The use of ground-penetrating radar to locate hazardous waste has been well established over the past decade.[1,2] Historically, ground-penetrating radar has been concerned with echo-location techniques to locate buried objects or geological strata. The instrument works much like a marine "Fish-Finder," except that ground-penetrating radar uses radio waves instead of sound waves. Detection Sciences has also pioneered other aspects ground-penetrating radar. There are four fundamental types of investigation: 1) observation of discrete objects buried below the surface of the ground; 2) observation of changes in the physical properties of the soil caused by the presence of contamination; 3) observation of the disruption of the natural horizons, or layering, of the soil; and, 4) observation that none of these conditions are present in the ground. The latter observation is not trivial; it establishes that natural background conditions are present in the ground with no significant contamination or any evidence of an excavation or burial.

The physical properties to which the radar responds are the dielectric constant and the electrical conductivity. The electrical conductivity determines the attenuation, or rate of signal loss, as the radar wave (radio wave) penetrates the ground. Any liquids that ionize, such as acids, bases, or salt solutions, increase the electrical conductivity of the host material. This increase can be observed as a lighter-than-normal contrast with respect to uncontaminated soils.

The dielectric constant determines the velocity of the radar wave as it propagates into the ground. The abrupt change in the dielectric constant from layer to layer determines the strength of the radar reflections. Non-ionic liquids, such as petroleum products, solvents, pesticides and organic chemicals modify the dielectric constant of the host material, producing darker-than-normal contrast with respect to uncontaminated soils.

The burial of a discrete object produces a characteristic radar signature resulting from the geometry of the wide-beam radar antenna passing over the buried object. This characteristic signature is an inverted hyperbola, or upward pointing "comet" on the radar record, and is the means by which discrete objects may be identified. **Figure 3** shows how the beam geometry generates the hyperbola signature. A small object ("point target") generates a true hyperbola. A larger target, such as a flat-top storage tank, generates a flat-top reflection with distinct hyperbolic "edge effects." Each end of a flat-top tank is observed as one half of a hyperbola. A cylindrical tank, on the other hand, generates a single stretched, or extended, hyperbola. Conversely, where no buried target exists, we see no hyperbolas in the radar record. An underground tank search, therefore, is largely a matter of looking for stretched or flat-top hyperbolas in the radar record. For each radar vertical profile that crosses over the underground tank, the lateral extent of the hyperbola signature is plotted on a map in plan view. When the plotting is completed, the lateral extent of all the individual hyperbolas shows the outline of the buried tank.

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1 Stanfill, D.F. III and McMillan, K.S., "Inspection of Hazardous Waste Sites Using Ground-Penetrating Radar (GPR)," *Proc. National Conference on Hazardous Waste and Environmental Emergencies*, p. 244-249, Hazardous Materials Control Research Institute (H.M.C.R.I.), Cincinnati, OH, May, 1985.

2 Stanfill, D.F. III and McMillan, K.S., "Radar-Mapping of Gasoline and Other Hydrocarbons in the Ground", *Proc. 6th National Conference on Management of Uncontrolled Hazardous Waste Sites*, p. 269-274, Hazardous Materials Control Research Institute (H.M.C.R.I.), Washington, D.C., November, 1985.

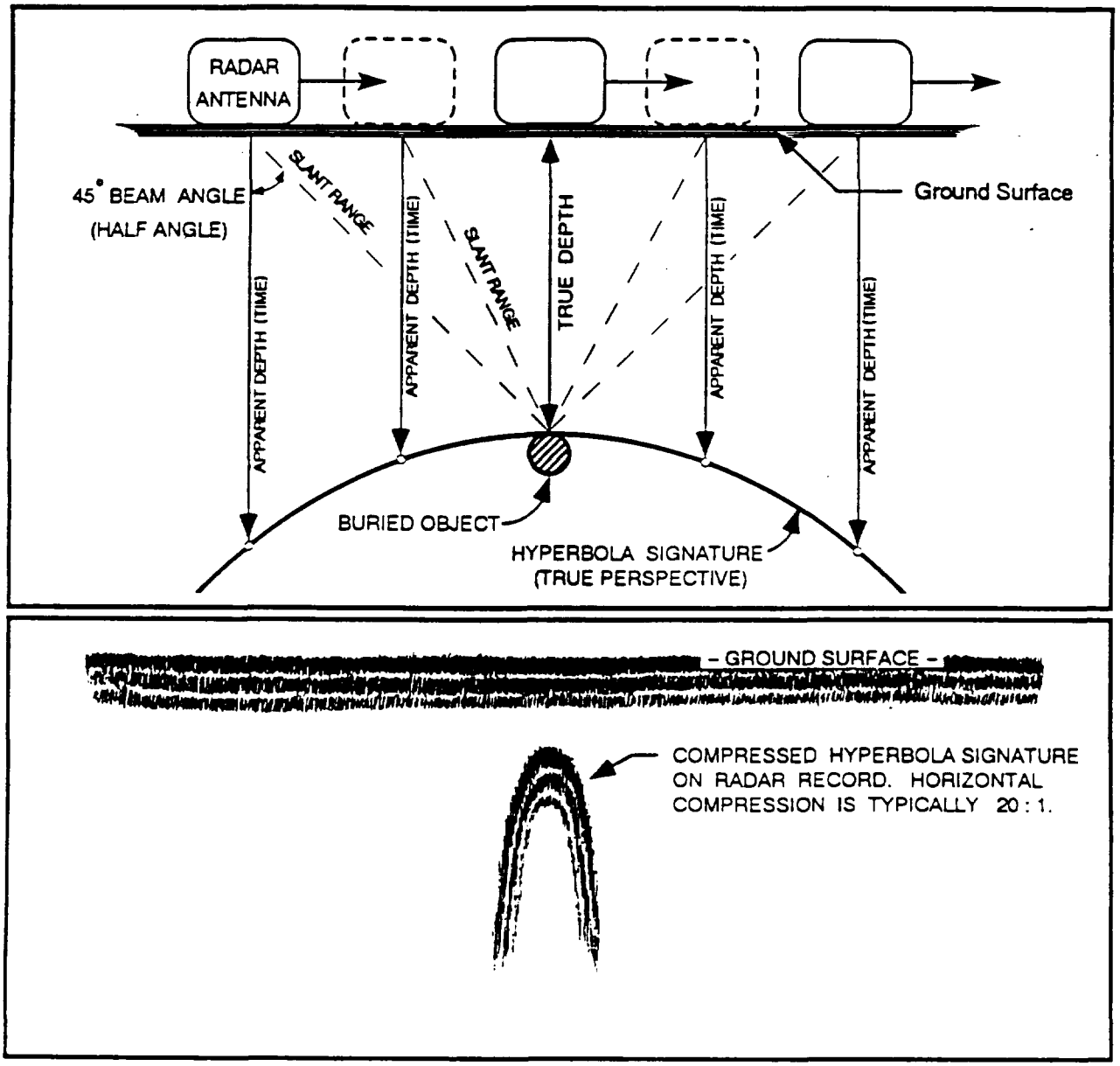


Figure 3.

HYPERBOLA SIGNATURE

Buried objects are characterized by their hyperbola signature. As the radar antenna moves across the ground (upper drawing), the radar beam picks up a buried object about 45° ahead of the antenna, continuing to view the object until it is about 45° behind the antenna. The echoes from the buried object trace out a hyperbola. On the radar graphic record (lower drawing), the hyperbola is horizontally compressed (typically about 20:1).

METHODOLOGY (Cont.)

Drum Signatures

The ability of the radar to locate a buried drum is based on the size and shape of the buried target. The drum must be intact to be recognizable as a drum; otherwise, a crushed drum can only be identified as buried scrap metal. An intact drum produces a geometrically symmetrical hyperbola signature, as illustrated in Figure 3. Buried pipes or other objects having cylindrical geometry also produce a geometrically symmetrical hyperbola. By examining the size of the observed hyperbolas we can rule out small objects and relatively large objects. An occasional or sporadic observation of a suspicious hyperbola is not as much a concern as a cluster of hyperbolas. The criteria by which we identify the burial of a significant quantity of buried drums is to look for a cluster of closely packed hyperbolas all having the size of a drum. The observation of such a closely packed cluster would be sufficient reason to call for the excavation of the suspect area.

Isolated Drums

The 120 MHz radar antenna used for this survey has a "footprint" nearly 5 feet wide at the surface of the ground. The radar beam becomes progressively wider as it penetrates into the ground. If we were to run parallel survey line spaced 5 feet apart, we would achieve 100 percent volumetric inspection of the subsurface materials. A more widely spaced search pattern, such as running survey lines at intervals of 10 or 20 feet, can reduce the cost of the survey and provide a statistically valid method for assessing site conditions. Running survey lines at an interval of 10 feet, for example, provides a 50 percent sample of a site. An interval of 20 feet provides a 25 percent sample. When using any sampling method, however, it is possible that isolated drums could be located in the areas not covered by the radar survey lines.

If there is a cluster of drums extending over a significant distance, it is likely that one or more radar lines would pass over the cluster. For example, a search pattern consisting of parallel lines spaced 10 feet apart would leave a narrow strip less than 5 feet wide that would not be observed with the radar. Unless the drums were buried in a narrow trench that was almost exactly aligned with the radar survey lines (an unlikely occurrence), the drums would be observed on one or both of the lines straddling the trench. For a star pattern, there is a decreasing probability of detection in relation to the distance from the center of the star. The probability of detection increases, however, with the size of the cluster. Thus, an 8-point star pattern run over relatively short distances (no more than 100 feet) is an efficient way to sample a specific location.

Experience has also shown that a relatively large percentage of individual drum-like signatures will prove to be objects other than a drum. Hot water heaters, a roll of metal fencing, a piece of corrugated drain pipe, etc., all produce hyperbolas about the size of a drum. To be conservative, therefore, we would call for the excavation of *any* target suspected of being a drum.

Buried Scrap Metal

Buried scrap metal produces characteristic radar signatures that an experienced operator can easily identify as buried metal. Because crushed drums do not produce the characteristic hyperbola signature, they appear to the radar as buried metal. Experience gained in more than a decade of performing GPR surveys on hazardous waste sites and landfills, including Superfund sites, has shown a propensity on the part of site operators to crush drums before burial. For this reason, the presence of buried scrap metal could possibly include crushed drums. If an intact drum were found among crushed drums, it would probably be identified as a drum. Otherwise, crushed drums appear to the radar to be nothing more than scrap metal. When a concentration of buried metal is detected, therefore, it is our policy to call for the excavation the buried metal if there is reason to suspect that the buried metal may contain crushed drums.

PRINCIPLES OF OPERATION

The ground-penetrating radar system is an echo-location system that emits a brief impulse of radio energy lasting only a few billionths of a second. The time it takes for the radar echoes to return to the radar antenna corresponds to the depth below the surface. By recording these depth-dependent echoes on a scanning time-based chart recorder, a vertical profile of the ground is generated. This vertical profile shows the longitudinal distribution of subsurface strata and other features over which the radar antenna has passed.

Velocity and Depth

The radar impulse travels into the ground at an average speed of about 40 percent of the speed of light. The exact speed depends on the nature of the material through which the impulse is traveling. The slowest medium is water, where the speed is about 11 percent of the speed of light. The fastest material is dry sand, where the speed is about 50 percent of the speed of light. In air, such as an underground cavity, the radar impulse travels almost exactly at the speed of light, taking one nanosecond (one billionth of a second) to travel one foot.

The ground-penetrating radar equipment is designed to measure and display the time-based echoes down to a fraction of a nanosecond. To convert to depth, it is necessary to know the exact velocity of the radar impulse as it travels through the ground. Over the past decade, Detection Sciences has developed a proprietary database of the radar velocities of various materials. With this database we are able to electronically calibrate the radar system within about 1 percent of local depth. Borings, test trenches and the common point method (a time-based geometric triangulation method) can also be used to depth-calibrate the radar. The ultimate limit of accuracy is determined by lateral variations in soil moisture content and the inhomogeneity of soil materials. Because of these limits, we have come to rely on electronic calibration. This method has proven to be at least as good as, or better than, the accuracy of depth measurements based on soil borings.

Subsurface Reflections

At the interface of two materials, the radar impulse typically undergoes an abrupt change in velocity. It is this change in velocity that causes some of the radar energy to be reflected back to the surface of the ground where it is detected by the antenna. The amount of energy that is reflected, or the reflection coefficient, depends on the contrast between the two materials; i.e., the difference between their respective radar velocities. Because the radar velocity is proportional to the inverse square root of the dielectric constant, the fundamental parameter to which the radar is responding is the difference in the dielectric constants at the reflecting surface.

All materials with the exception of metals are relatively transparent to the passage of radar energy. Metals reflect all the energy striking their surface; buried metal objects like pipes or metal containers are therefore excellent targets. The fact that most materials are relatively transparent means that the radar impulse can continue to send back reflection after reflection as it propagates downward into the ground, thus revealing the various subsurface strata and profiles.

Subsurface Materials

In effect, the radar functions as a "difference meter" by drawing a boundary at the interface of two different materials. The "texture" of the radar reflections also vary with different type of materials. With experience it is possible to interpret the radar reflections to accurately identify common subsurface materials such as clay, peat, glacial till, and bedrock. Certain special situations, such as ionic chemicals, non-ionic chemicals, and gasoline in the soil that are also relatively easy to identify. Other situations such as interspersed layers of organic silt, silty sands, etc., are impossible to identify without direct visual inspection by means of a test trench or core sample.

Use of Borings

The radar can be "calibrated" by using available boring logs to identify the types of subsurface materials. The best strategy is to first perform the radar survey and then use the radar data to specify the locations for a few strategically placed borings. Although borings are useful for direct physical examination of subsurface materials and for confirming suspected low-density zones, the use of radar can largely supplant the use of borings. In this regard, it is useful to think of the radar system as a means of making a continuous profile of "electronic borings" spaced 1 to 3 inches apart. Each radar impulse and its successive train of echoes constitute a single scan, or sounding. At a rate of 52 vertical soundings per second, the radar is capable of generating millions of "electronic boreholes" in the course of a day. Using radar in conjunction with a few diagnostic borings is more economical than a complete schedule of borings. Radar also provides continuous subsurface profiles that are much more accurate than having to interpolate between borings.

Penetration Depth

The penetration depth of the radar system depends on the operating frequency and the electrical conductivity of the ground. For shallow penetration of a few feet, the optimum choice is an operating frequency of 600 MHz. This small, lightweight antenna can penetrate to a depth of about 5 feet under the most adverse ground conditions, and as much as 25 to 30 feet under good conditions. "Adverse" refers to highly conductive materials having a resistivity of less than 10 ohm-meters. "Good" radar conditions are resistivities of several hundred ohm-meters or more.

Shifting to a lower operating frequency provides greater penetration, the improvement being the square root of the ratio of the respective wavelength. An operating frequency of 120 MHz is a good general-purpose frequency for reaching depths that are beyond the capability of the 600 MHz antenna. We routinely use this antenna to probe to a depth of 48 feet. The 48-foot depth setting provides a convenient vertical scale of 1 inch = 4 feet on the 12-inch vertical profile strip charts. In general, we tend to work in multiples of 12 feet so that the vertical scale factor on 12-inch charts will correspond to a convenient engineering scale (instead of using arbitrary time-based scales that have long been the custom in this field).

Although lower-frequency antennas provide greater depth of penetration, there is a corresponding loss of detail, or spatial resolution, due to the longer wavelength. The optimum is to use as high an operating frequency as possible consistent with the depth requirements, thus providing the best possible detail under the operating conditions. The useful range of ground-penetrating radar frequencies is limited to about 10 MHz at the lower end, up to a maximum of about 1200 MHz (1.2 GHz) at the upper end. The penetration of the 1.2 GHz antenna is limited to a few inches. The 10 MHz antenna can penetrate hundreds of feet into the ground but the corresponding loss of detail limits its usefulness to large features such as geologic strata. Fortunately, the most demanding spatial resolution requirements are usually small, near-surface targets such as wire reinforcing-mesh in concrete or the shallow burial of electric wires. The more deeply buried targets are nearly always larger objects such as sewer pipes or storm drains.

The discussion regarding penetration depth assumes that all antennas have the same power. The penetration depth at any given frequency can be improved with increased power, but the improvement suffers from inverse-square losses as a function of depth, so that a quantum jump in power is necessary to gain any significant improvement. For this reason, Detection Sciences, Inc. has focused its research efforts on improving the sensitivity of the radar receiver and reducing the internal noise of the receiver. These efforts have paid off by increasing the penetration depth of our equipment by about a factor of 5 compared to standard, commercially available systems. This improved capability allows Detection Sciences, Inc. to obtain data under conditions that were previously impossible for ground-penetrating radar.

RADAR EQUIPMENT

The radar equipment consists of a custom-modified GSSI SIR System-8 Subsurface Interface Radar. **Detection Sciences** has developed proprietary circuit designs and other proprietary modifications that have increased the depth of penetration by nearly an order of magnitude compared to the original commercial equipment purchased in 1980. There are also corresponding improvements in spatial resolution and the clarity of the radar records. A major advantage of our modified radar system is its ability to penetrate clay and work in other difficult environments that have high electrical conductivity (ionic materials) where it would otherwise be impossible to obtain data with an ordinary, unmodified radar system.

All data is tape-recorded on a Hewlett-Packard Model 3964A Instrumentation Tape Recorder. These magnetic data tapes are kept in permanent storage in our archives. The radar graphic charts ("hard-copy" charts) consist of vertical-profile strip charts generated on a scanning graphic chart recorder. To facilitate analysis, the radar graphic charts, or strip charts, are calibrated with a vertical scale showing feet of depth (rather than using arbitrary time scales for vertical depth). The specific list of radar equipment is:

CONTROL UNIT. The control unit is a custom-modified GSSI Model 4800. This unit contains the bulk of all the radar electronics and system controls, and has an oscilloscope that shows the amplitude of each radar impulse and its corresponding echoes.

MOTOROLA MODEL M68MM01A MONOBOARD MICROCOMPUTER. The microcomputer has real-time processing capability for background removal, digital filtering, running averages, stacking and other radar signal-processing algorithms.

HEWLETT-PACKARD MODEL 3964A TAPE RECORDER. This high quality, four-channel instrumentation tape recorder provides master tapes of all data recorded in the field.

EPC LABORATORIES, INC. MODEL 2200S CHART RECORDER. This high-resolution electrostatic scanning chart recorder generates 12-inch hard-copy radar graphic charts (vertical profiles) which are used to interpret the radar data.

EPC LABORATORIES, INC. MODEL 8700 CHART RECORDER. Our high-speed thermal scanning chart recorder can generate hard-copy radar graphic charts (vertical profiles) to facilitate "live" interpretation in real time in the field.

RADAR ANTENNA UNITS. The custom-designed radar antennas have proprietary high-performance electronic circuits. The antennas operate at different frequencies; the depth requirements determine the operating frequency selected for the survey.
[ ] 900 MHz [ ] 600 MHz [ ] 300 MHz [X] 120 MHz [ ] 80 MHz [ ] 10 MHz

TRIPPE 550VA SOLID STATE INVERTER. This power supply unit provides 120 volt ac power as well as 12 volt dc power for operating all field equipment from the survey vehicle's electrical system.

REMOTE STOP/START UNIT. The remote stop/start feature allows the operator to control the radar system from the antenna location.

ODOMETER WHEEL ASSEMBLY. The custom-built, 20-inch diameter "fifth wheel" odometer attached to the rear bumper of the survey vehicle provides automatic logging of 5-foot increments traveled along the survey path. Each 5-foot increment is recorded as a "tick mark" along the top of the radar chart.

SUPPORT EQUIPMENT. The various support equipment includes the Microcomputer Control Box, the Remote Control/Marker Unit, Hand-held Marker Unit, towing sled, towing harness and miscellaneous electrical cables and connectors.

RESULTS OF THE SURVEY

Buried Drums

The radar data showed no evidence of the hyperbola signatures that are characteristic of intact drums. In particular, there are no tightly spaced clusters of hyperbola signatures that would be characteristic of a cache of buried drums. Lacking any radar evidence of intact drums buried on the site, it is possible that drums were originally delivered to the landfill and crushed, the liquid contents having been poured out or lost when the drums were crushed and buried. If this were the case, the liquid contents could migrate down into the ground water. If any significant quantity of hazardous leachate has migrated into the ground water, monitoring wells should reveal this problem.

Radar Anomalies

The radar data shows two locations on the Richardson Hill Road Municipal Landfill that indicate the presence of non-ionic liquids in the pore space of the soil. For convenience, the grid coordinates of the radar anomalies are tabulated in **Table I**, titled "GRID COORDINATES OF RADAR ANOMALIES, RICHARDSON HILL ROAD MUNICIPAL LANDFILL". Locations for proposed test pits are tabulated in **Table II**, titled "GRID COORDINATES OF PROPOSED TEST PITS". The locations of the radar survey lines within the Richardson Hill Road Municipal Landfill and the location of the non-ionic radar anomalies are shown on Drawing Number **316-92-01**, titled "RADAR SURVEY MAP, RICHARDSON HILL ROAD MUNICIPAL LANDFILL". The locations of the radar survey lines within the North Area are shown on Drawing Number **316-92-02**, titled "RADAR SURVEY MAP, NORTH AREA". No radar anomalies were found in the North Area, however, a location for a test pit to provide a representative sample of the fill material in this area is listed in Table II, and is shown on Drawing Number 316-92-02.

Benign Areas

Most of the areas covered by the radar survey showed nothing abnormal. The areas that are devoid of any evidence of a burial are designated as "benign."

The fact that nothing abnormal was observed in the benign areas should not be viewed as lack of evidence. The ability of the radar system to locate anomalies in both of the areas shows that the radar system is capable of finding an anomaly should one exist. In areas where no anomaly is observed, therefore, the lack of an anomaly can be viewed as positive evidence that no anomaly exists in the area.

Table I.

GRID COORDINATES OF RADAR ANOMALIES
RICHARDSON HILL ROAD MUNICIPAL LANDFILL

Survey Line	Start of Anomaly	End of Anomaly	Type of Anomaly
#5	47' from center point	60' from center point	Non-Ionic
#7	68' from center point	74' from center point	Non-Ionic

Table II.

GRID COORDINATES OF PROPOSED TEST PITS

Survey Line	Survey Area	Location of Test Pit
#5	Richardson Hill Road	53' from center point
#7	Richardson Hill Road	71' from center point
#12	North Area	45' from center point

CONCLUSIONS

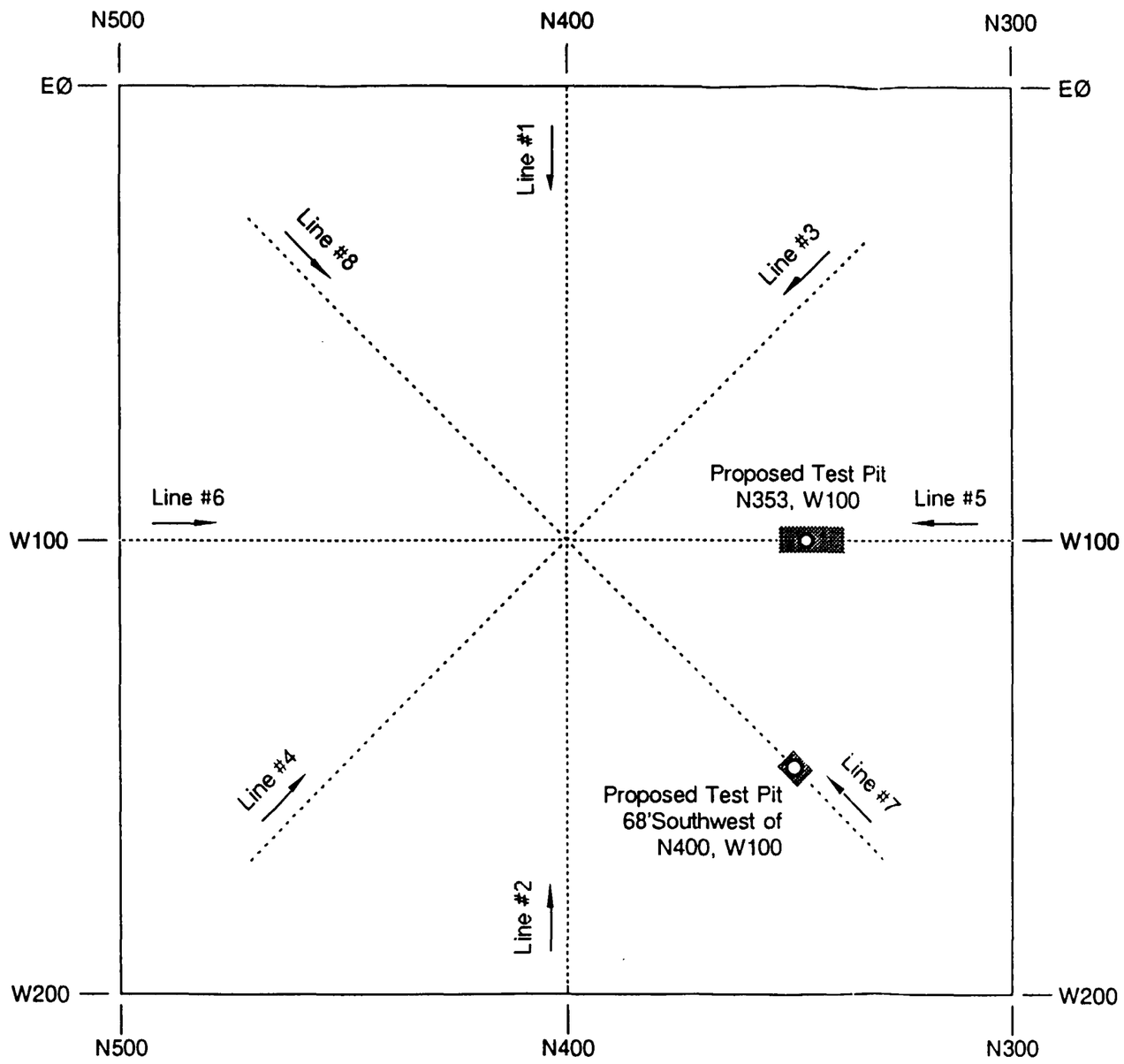
Test Pits

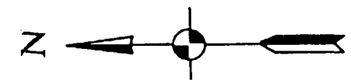
Because we did not find any tightly clustered hyperbola signatures that would suggest the burial of a cache of drums, we find no reason to make any excavations for the purpose of investigating buried drums. This conclusion is drawn from field experience gained in twelve years of performing ground-penetrating radar surveys on hazardous waste sites.

A cluster of crushed drums appears to the radar as a concentration of scrap metal. It is our policy, therefore, to take a conservative approach and recommend backhoe excavation whenever we find a concentration of scrap metal. No such concentration of scrap metal suggestive of crushed drums was observed on this radar survey.

There are, however, two locations that indicate the presence of non-ionic liquids in the pore space of the soil. Test pits or core samples at these locations (Table II) should reveal the specific cause of the non-ionic radar signatures.

No radar anomalies were found in the North Area; however, a location has been selected which would provide a representative sample of the fill material (Table II).





Legend

- Grid Line
- Radar Survey Line
- Radar Anomaly
- Location of Test Pit

Scale:

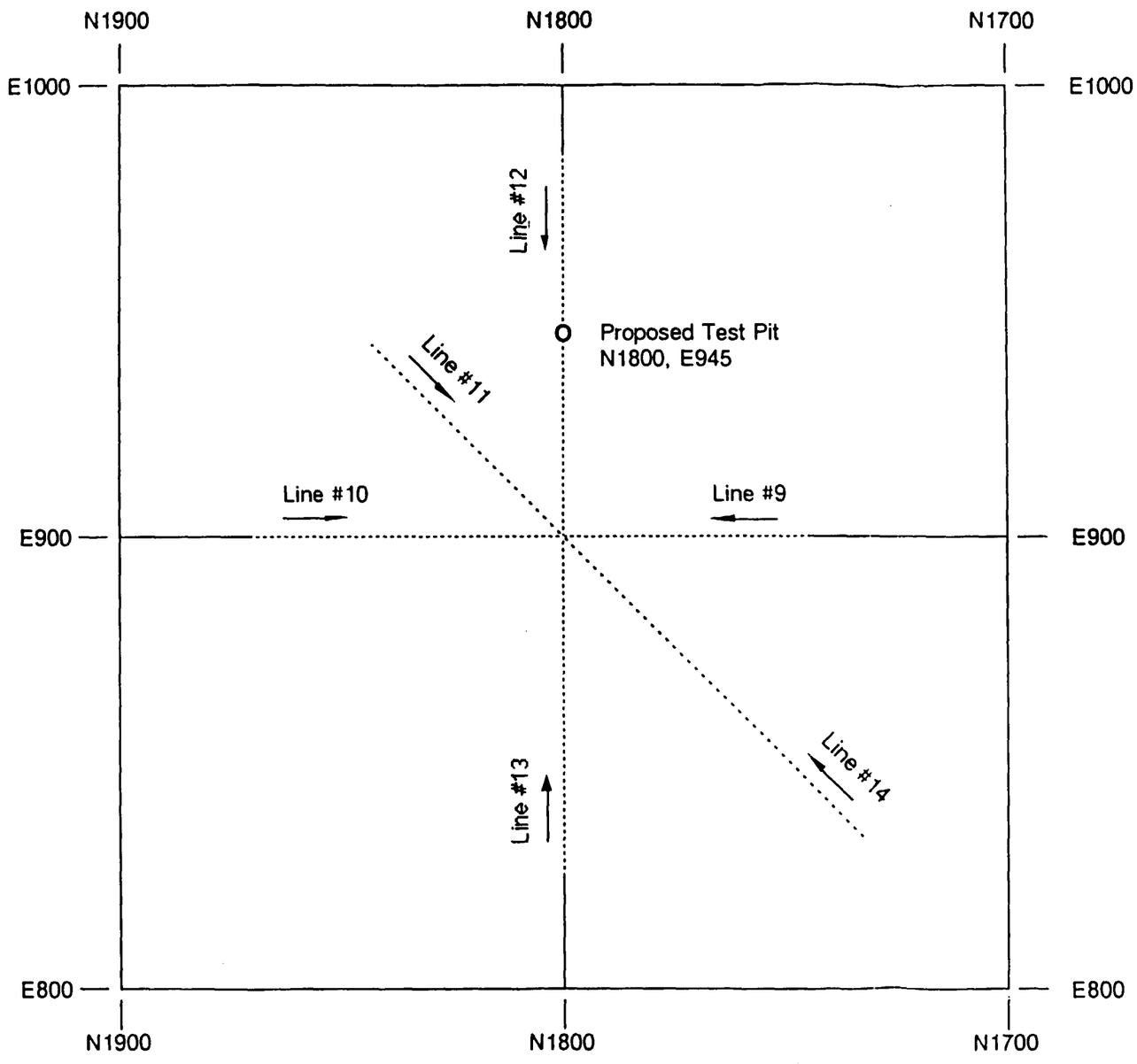
— RADAR SURVEY MAP —

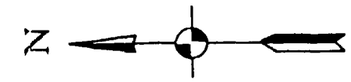
RICHARDSON HILL ROAD LANDFILL
SIDNEY, NEW YORK

DETECTION SCIENCES, INC.
496 Heald Road, Carlisle, MA 01741

Date: May 28, 1992 | Drawing No.: 316-92-01

302117





Legend

- Grid Line
- Radar Survey Line
- Radar Anomaly
- Location of Test Pit

Scale:

— RADAR SURVEY MAP —

NORTH AREA
SIDNEY, NEW YORK

DETECTION SCIENCES, INC.
496 Heald Road, Carlisle, MA 01741

Date: May 28, 1992 | Drawing No.: 316-92-02

302118

APPENDIX C

SOIL BORING LOGS AND WELL CONSTRUCTION DIAGRAMS

D'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-1 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid Q 16
Ground Elevation:
Dates: Started: 11/2/90 Ended: 11/2/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	4-11-	2'/2'	27	Brown, damp, very fine to fine SAND, some silt, little fine to medium gravel, trace organic debris						
			16-15									
	2	2-4'	18-28-	2'/2'	60	Damp, dark to medium brown, very fine to fine SAND, little silt, trace fine to medium gravel, trace clay						
			32-24									
	3	4-6'	9-19-	2'/2'	47	Same as above						
5			28-34									
	4	6-8'	38-50/0.4	1'/0.8'	---	Damp, dark to medium brown, very fine to fine SAND, some medium to coarse gravel, little silt, trace clay						
	5	8-10'	19-50/0.4	1'/0.8'	---	Same as above						
10	6	10-12'	38-29-	2'/2'	61	Damp, dark to medium brown to brownish gray, very fine to medium SAND, little silt, little medium to coarse gravel, trace clay						
			32-33									
	7	12-14'	28-50/0.1	0.7/0.6'	---	Same as above						
	8	14-16'	32-34-	1.4/1.4'	---	Same as above						
15			50/0.4				15.4'					
						Bottom of boring 15.4 ft.						

SB1.KJF

302120

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-2 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid Q 14 Ground Elevation: Dates: Started: 11/5/90	Ended: 11/5/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	5-13-	2'/2'	38	Damp, grayish brown to brown, very fine to fine, medium SAND, little silt, little fine to medium gravel, trace organics						
			25-32									
	2	2-4'	24-20-	2'/2'	63	Same as above						
			43-35									
	3	4-6'	23-24-	2'/2'	45	Dark brown to reddish brown, very fine to fine SAND, some silt, little clay, trace fine to medium gravel						
5			21-23									
	4	6-8'	32-34-	2'/2'	67	Damp, brown to grayish brown, very fine to fine SAND, some silt, trace clay, trace fine to medium gravel						
			33-35									
	5	8-10'	9-19-	2'/2'	45	Damp, dark to medium brown, very fine to fine SAND, little silt and clay, trace fine to medium gravel						
			26-28									
10	6	10-12'	14-26-	2'/2'	49	Same as above						
			23-58									
	7	12-14'	50/2	2'/0.1'	---	No recovery, small fragment of greenish gray sandstone (~0.5" thick)						
	8	14-16'	14-50/0.4	1'/1'	---		14.9'					
15						Bottom of boring 14.9 ft.						

SB2.KJF

302121

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-3 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid P 18 Ground Elevation: Dates: Started: 11/5/90	Ended: 11/5/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
0	1	0-2'	5-5-6-13	2'/0.9'	11	Blackish brown to brown, damp, very fine to fine SAND, some silt, trace clay, trace organics (plant stems, roots), trace fine gravel						
	2	2-4'	16-17-18-20	2'/2'	31	Dark to medium brown, damp, very fine to fine SAND, some silt, trace clay, trace organics, trace fine gravel						
	3	4-6'	11-18-18-22	2'/2'	36	Same as above						
5												
	4	6-8'	47-41-27-34	2'/2'	68	Damp to moist, dark to medium brown, very fine to fine SAND and SILT, trace clay, trace fine to medium gravel						
	5	8-10'	45-46-33-43	2'/2'	79	Damp, dark to medium brown, very fine to medium SAND, little silt, trace clay, trace fine to medium gravel						
10	6	10-12'	36-40-50/0.4	1.4/1.8'	—	Same as above						
	7	12-14'	13-27-21-20	2'/2'	48	Damp, dark to medium brown to reddish brown very fine to medium SAND and SILT, little clay, trace fine to medium gravel						
	8	14-16'	24-53-50/0.3	1.2'/1'	—	Damp, brown to golden brown, very fine to fine SAND and SILT, trace clay, trace fine gravel						
15						Bottom of boring 15.2 ft.	15.2'					

SB3.KJF

302122

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-4 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid F 28 (North area)
Ground Elevation:
Dates: Started: 11/6/90 Ended: 11/6/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	26-46-	2'/0.9'	63	Damp, medium brown, very fine to fine SAND SILT, trace clay, trace fine to medium gravel, trace organics						
			17-6									
	2	2-4'	7-11-	2'/2'	39	Same as above						
			28-45									
	3	4-6'	45-50/0.3	0.9/0.8'	---	Damp, dark to medium brown to grayish brown fine SAND, some silt, trace clay, trace fine to medium gravel, trace organics						
5												
	4	6-8'	50/0.4	1'/0.6'	---	Damp, medium brown, very fine to fine SAND, little silt, trace clay, trace fine gravel						
	5	8-10'	40-50/0.1	0.7/0.5	---	Same as above						
10	6	10-12'	29-50/0.3	0.9/0.5'	---	Poor recovery, large fragments of greenish gray SANDSTONE, then same as above, turning wet at bottom of spoon						
	7	12-14'	15-50/0.4	1'/0.5'	---	Wet, brown SILT, some very fine sand, trace fine to medium gravel, large fragment of sandstone						
	8	14-16'	6-26-	2'/0.4'	63	Same as above						
15			37-41									
						Bottom of boring 16 ft.	16.0'					

SB4.KJF

302123

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-5 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid D 27 (North area)
Ground Elevation:
Dates: Started: 11/6/90 Ended: 11/6/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	1-2-2-2	2'/1.3'	4	Light to medium brown, moist, very fine to fine SAND and SILT, trace clay, trace fine sand, trace organics						
	2	2-4'	33-50/0.4	1'/1.5'	---	Dark to medium brown, moist, very fine to fine SAND, some silt, trace clay, trace fine to medium gravel						
	3	4-6'	25-39-	1.9/0.7'	79	Boulder from 2.9-4.8' Dark to medium brown to reddish brown, very fine to medium SAND and SILT, little clay, fragments of dark gray siltstone and shale						
5			40-50/0.4									
	4	6-8'	40-50/0.4	1'/0.7'	---	Dark brown, wet, very fine to fine SAND and SILT, little clay, several large fragments of both greenish gray sandstone and dark gray shale						
	5	8-10'	28-38-	2'/1.3'	79	Dark brown to reddish brown, wet, SILT, some very fine to fine sand, some clay, little fine to medium gravel						
			41-48									
10	6	10-12'	12-28-	2'/0.6'	50	Same as above						
			22-20									
	7	12-14'	23-27-	1.9/0.9'	60	Dark to medium brown, fine to medium SAND, some silt, little clay, large fragments of silty shale and greenish gray sandstone						
			33-50/0.4									
	8	14-16'	12-24-	1.3/0.8'	---	Same as above						
15			33-50/0.4			Bottom of boring 15.3 ft.	15.3'					

SB5.KJF

302124

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-6 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid H 28 (North area) Ground Elevation: Dates: Started: 11/6/90 Ended: 11/6/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	2-3-5-7	2'/2'	8	Brown, damp, very fine to fine SAND, some silt, trace fine to medium gravel, trace organics						
	2	2-4'	11-38-	1.3/0.2'	---	Poor recovery with large fragments of green gray sandstone, some damp, brown, very fine to fine SAND and SILT						
			50/0.3									
	3	4-6'	38-40-	2'/2'	71	Dark to medium brown, damp, fine to medium SAND, some silt, trace clay, trace fine to medium gravel						
5			31-39									
	4	6-8'	42-50/0.4	1'/2'	---	Same as above						
	5	8-10'	18-23-	2'/2'	48	Dark to medium brown, very fine to fine SAND and SILT, trace clay, trace fine to medium gravel						
			25-29									
10	6	10-12'	13-33-	2'/2'	63	Same as above						
			30-27									
	7	12-14'	50/0.3	0.3/0.3'	---	Dark brown, damp, very fine to fine SAND and SILT, little clay, trace fine to medium gravel, large greenish gray sandstone fragments						
	8	14-16'	49-50/0.3	0.9/0.5	---	Same as above	14.8'					
15						Bottom of boring 14.8 ft.						

SB6.KJF

302125

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-7 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid P 17
Ground Elevation:
Dates: Started: 11/7/90 Ended: 11/7/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	4-10-	2'/2'	24	Dark to medium brown, damp, very fine to fine SAND, some silt, little clay, little fine to medium gravel, trace organics						
			14-19									
	2	2-4'	35-37-	2'/2'	65	Same as above						
			28-35									
	3	4-6'	12-21-	2'/2'	54	Dark to medium brown, damp, very fine to fine SAND, some silt, little clay, trace fine gravel						
5			33-36									
	4	6-8'	23-29-	2'/2'	63	Dark to medium to reddish brown, very fine to medium SAND and SILT, little clay, trace fine to medium gravel						
			34-24									
	5	8-10'	12-13-	1.8'/1'	30	Medium brown to golden brown, very fine to medium SAND and SILT, little clay, trace fine to medium gravel						
			17-50/0.4									
10	6	10-12'	----	----	---	No recovery - spoon refusal on boulder						
	7	12-14'	29-33-	2'/2'	60	Medium brown, damp, fine to medium SAND, little silt, trace clay, trace fine gravel, large sandstone fragment						
			27-29									
	8	14-16'	24-46-	1.6/1.1'	95	Brown to grayish brown, medium SAND, little silt, trace clay, trace medium gravel						
15			49-50/0.1				15.6'					
						Bottom of boring 15.6 ft.						

SB7.KJF

302126

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-8 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid P 15 Ground Elevation: Dates: Started: 11/7/90 Ended: 11/7/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	4-7-15-14	2'/2'	22	Dark to medium brown, damp to moist, very fine to fine SAND, little silt, trace clay trace organics						
	2	2-4'	11-25-21-29	2'/2'	46	Same as above						
5	3	4-6'	21-27-21-20	2'/2'	48	Dark to medium brown, damp, fine to medium SAND and SILT, little clay, trace to medium gravel						
	4	6-8'	15-25-23-22	2'/2'	48	Dark to medium brown, very fine to fine SAND, little silt, trace clay, trace fine to medium gravel						
	5	8-10'	21-16-15-22	2'/2'	31	Same as above						
10	6	10-12'	18-50/0.4	1'/1.9'	—	Dark to medium brown, very fine to fine SAND, some silt, little clay, trace fine to medium gravel, large greenish gray sandstone fragments						
	7	12-14'	48-42-50/0.1	1.1/0.6'	—	Dark to medium brown, damp, very fine to medium SAND, little silt, trace clay, trace fine to medium gravel, small fragments of red-brown shale and green-gray sandstone						
15	8	14-16'	29-50/0.4	1'/1'	—	Dark to medium brown, damp, fine to medium SAND, little silt, little medium gravel, orange-yellow deposits of silt mixed with sand	14.9'					

Bottom of boring 14.9 ft.

SB8.KJF

302127

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-9 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid o 16
Ground Elevation:
Dates: Started: 11/7/90 Ended: 11/7/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	5-11-9-6	2'/2'	20	Dark to medium brown, very fine to fine SAND, some silt, little clay, mottled golden fine sand and dark brown to black silt						
	2	2-4'	9-10-11-12	2'/1.1'	21	Same as above						
	3	4-6'	2-7-3-4	2'/2'	10	Yellow-brown to brown, moist to wet, very fine to medium SAND, some silt, trace clay, trace fine to medium gravel						
5												
	4	6-8'	15-25-33-35	2'/2'	58	Dark to medium to golden brown and greenish gray, fine to medium SAND and SILT, little clay, little fine to medium gravel						
	5	8-10'	50/0.4	0.4/0.3'	---	Same as above						
10	6	10-12'	17-17-12-18	2'/1'	29	Dark to medium brown to greenish gray, moist to wet, very fine to fine SAND and SILT, little fine to medium gravel, trace clay						
	7	12-14'	11-18-28-35	2'/0.8'	46	Same as above						
	8	14-16'	38-45-50/0.2	1.2/0.4'	---	Poor recovery. Dark to medium brown, fine to medium SAND, little silt, trace clay, large fragments of greenish gray sandstone	15.2'					
15						Bottom of boring 15.2 ft.						

SB9.KJF

302128

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-10 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
DBG Geologist: Mark J. Roma

Boring Location: Grid 0 14
Ground Elevation:
Dates: Started: 11/8/90 Ended: 11/8/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	3-4-7-9	2'/1.8'	11	Damp, dark brown to gray, very fine to fine SAND, some silt,						
	2	2-4'	12-9-8-7	2'/0.1'	17	Poor to no recovery (trash)						
	3	4-6'	3-2-2-3	2'/2'	4	Damp, dark brown, fine SAND and SILT, trace clay, trace fine to medium gravel (trash)						
5												
	4	6-8'	2-2-2-2	2'/2'	4	Same as above						
	5	8-10'	2-2-3-3	2'/0.6'	5	Dark grayish brown to black, moist, very fine to fine SAND and SILT, little clay, trace fine gravel (trash)						
10	6	10-12'	2-3-5-7	2'/2'	8	Same as above						
	7	12-14'	7-9- 12-13	2'/0'	21	No recovery						
	8	14-16'	8-12- 54-48	2'/0.1'	66	Dark grayish brown to black, very fine to fine SAND and SILT (trash)						
15												
						Bottom of boring 16.0 ft.						

(NO composite samples for 12-16')

SB10.KJF

302129

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-11 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: 51' North of Grid O 12 Ground Elevation: Dates: Started: 11/8/90 Ended: 11/8/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	2-2-3-3	2'/0.9'	5	Moist to wet, dark to medium brown, very fine to fine SAND, some silt, little fine gravel, trace organics						
	2	2-4'	2-3-2-5	2'/2'	5	Moist to wet, dark to medium brown to gray, fine SAND and SILT, little clay, (little trash)						
	3	4-6'	7-5-3-3	2'/0.8'	8	Wet, brick red to brown, fine to medium SAND, little silt (trash)						
5												
	4	6-8'	2-1-1-2	2'/1'	2	Same as above						
	5	8-10'	1-9-3-6	2'/0.3'	12	Damp, dark to medium brown, very fine to fine SAND, some silt, trace fine to medium gravel, (trace trash)						
10	6	10-12'	3-4-4-6	2'/0.3'	8	Same as above						
	7	12-14'	7-12- 9-14	2'/0.15'	21	Poor recovery, dark brown to brick red to black, very fine to medium SAND and SILT little clay, trace medium gravel (little trash)						
	8	14-16'	7-6-7-7	2'/2'	13	Same as above						
15												
						Bottom of boring 16.0 ft.						

SB11.KJF

302130

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-12 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid P 13
Ground Elevation:
Dates: Started: 11/8/90 Ended: 11/8/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks#
0	1	0-2'	7-12-	2'/1.9'	46	Dark brown to brown, very fine to fine SAND and SILT, trace fine to medium gravel						
			34-25									
	2	2-4'	22-50/0.4	1'/1'	—	Same with large fragments of sandstone						
	3	4-6'	13-17-	2'/2'	34	Damp to moist, dark to medium brown, very fine to fine SAND, some silt, little clay, little very fine to fine gravel						
5			17-30									
	4	6-8'	20-25-	2'/1'	46	Damp, olive green SILT and CLAY, some fine gravel, little fragments of greenish gray sandstone						
			21-21									
	5	8-10'	10-16-	2'/2'	36	Medium to dark reddish brown, very fine to fine SAND and SILT, some olive green clay, little fine gravel						
			20-22									
10	6	10-12'	13-19-	1.4'/1'	—	Same as above						
			50/0.4									
	7	12-14'	33-28-	2'/2'	59	Moist, dark to medium brown, very fine to fine SAND and SILT, little dark reddish brown clay, little fine gravel						
			31-22									
	8	14-16'	24-48-	2'/1.5'	81	Same as above						
15			33-25									
						Bottom of boring 16.0 ft.						

SB12.KJF

302131

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-13 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid M 21 Ground Elevation: Dates: Started: 11/9/90	Ended: 11/9/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	1-2-3-4	2'/2'	5	Damp, brown, very fine SAND and SILT, little clay, trace fine gravel, trace organics						
	2	2-4'	7-18-	2'/2'	44	Same as above						
			26-32									
	3	4-6'	23-42-	2'/0.8'	81	Damp, brown, very fine to medium SAND, some silt, little clay, large fragments of greenish sandstone, small chips of reddish brown shale						
5			39-44									
	4	6-8'	35-34-	2'/1'	52	Dark brown to greenish gray, very fine to medium SAND, some silt, little clay, trace fine to medium gravel						
			18-17									
	5	8-10'	15-13-	2'/2'	41	Dark to medium brown, fine to medium SAND and SILT, little clay, little medium gravel						
			28-21									
10	6	10-12'	21-20-	2'/2'	37	Same as above						
			17-21									
	7	12-14'	30-41-	1.9'/1'	79	Same as above						
			38-50/.4									
	8	14-16'	40-42-	2'/2'	77	Dark brown to reddish brown, fine to medium SAND, some silt, little clay, large fragments of greenish gray sandstone						
15			35-41									
						Bottom of boring 16.0 ft.						

SB13.KJF

302132

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-14 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid M 19 Ground Elevation: Dates: Started: 11/9/90	Ended: 11/9/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	7-16-	2'/1.8'	48	Damp, dark to medium brown, very fine to fine SAND, some silt, trace organics, trace fine to medium gravel						
			32-28									
	2	2-4'	36-42-	2'/2'	81	Same as above						
			39-45									
	3	4-6'	20-30-	2'/2'	65	Damp, dark to medium brown, very fine to medium SAND, some silt, little clay, trace fine to medium gravel						
5			35-29									
	4	6-8'	29-21-	2'/2'	54	Damp, medium brown, very fine SAND and SILT, little clay, trace fine to medium gravel						
			33-27									
	5	8-10'	14-19-	2'/2'	40	Same as above						
			21-29									
10	6	10-12'	18-21-	2'/2'	44	Moist to wet, dark to medium brown, fine to medium SAND, some silt and clay, trace fine to medium gravel						
			23-30									
	7	12-14'	23-27-	2'/2'	52	Moist to wet, dark to medium brown, fine to coarse SAND and SILT, little clay, trace fine to medium gravel						
			25-32									
	8	14-16'	15-12-	2'/2'	33	Same as above						
15			17-38									
						Bottom of boring 16.0 ft.						

SB14.KJF

302133

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-15 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid N 18 Ground Elevation: Dates: Started: 11/9/90	Ended: 11/9/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	6-5-7-7	2'/1.4'	12	Damp, medium brown, very fine to fine SAND and SILT, little clay, trace fine to medium gravel, trace organics, plant and roots						
	2	2-4'	6-22-	1.4'/1'	—	Damp, dark to medium brown, fine to medium SAND, some silt, little clay, trace fine to medium gravel						
			50/0.4									
	3	4-6'	26-50/0.4	1'/2'	—	Same as above						
5												
	4	6-8'	23-32-	1.7'/1'	78	Same as above						
			46-50/0.2									
	5	8-10'	29-48-	2'/2'	81	Damp, dark to medium brown to reddish brown, very fine to fine SAND and SILT, little clay, trace fine to medium gravel						
			33-50									
10	6	10-12'	32-37-	2'/2'	68	Same as above						
			31-33									
	7	12-14'	21-23-	2'/2'	45	Dark to medium brown to reddish brown, very fine to medium SAND and SILT, some clay, trace fine to medium gravel						
			22-24									
	8	14-16'	39-26-	1.2/1.2'	—	Same as above						
15			50/0.2									
						Bottom of boring 15.2 ft.						

SB15.KJF

302134

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-16 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid M 14 Ground Elevation: Dates: Started: 11/12/90	Ended: 11/12/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	6-6-15-17	2'/0.9'	21	Moist to wet, dark to medium brown, very fine to fine SAND and SILT, little clay, trace fine to medium gravel						
	2	2-4'	16-50/0.4	0.9/0.5'	—	Same as above						
	3	4-6'	12-24-	2'/1.4'	60	Wet, dark to medium brown, very fine to medium SAND, some silt and clay, large sandstone fragments						
5			36-42									
	4	6-8'	50/0.4	0.4/0.1'	—	Same as above						
	5	8-10'	50/0.4	0.4/0.2'	—	Wet, dark to medium brown, fine to medium SAND and SILT, little clay, trace fine gravel						
10	6	10-12'	28-50/0.1	0.7/0.4'	—	Same as above						
	7	12-14'	16-50/0.1	0.6/0.2'	—	Wet, dark to medium brown, very fine to fine SAND and SILT, little clay, trace fine to medium gravel						
	8	14-16'	18-29-	1.1/0.9'	—	Same as above	15.0'					
15			50/0.1			Bottom of boring 15.0 ft.						

SB16.KJF

302135

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-17 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid N 15 Ground Elevation: Dates: Started: 11/12/90	Ended: 11/12/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	1-2-1-1	2'/0.2'	3	Moist, large greenish gray SANDSTONE fragment, dark brown, very fine to fine SAND and SILT, little clay, trace organics						
	2	2-4'	1-1-2-2	2'/0.3'	3	Same but bottom of spoon hit small amount of trash						
	3	4-6'	2-3-6-9	2'/1'	9	Saturated brown fine SAND and SILT, trace clay, trace fine to medium gravel (mixed with trash)						
5												
	4	6-8'	7-6-7-9	2'/0.2'	13	Same with large sandstone fragment						
	5	8-10'	5-12- 29-39	2'/0.2'	41	Same as above without sandstone						
10	6	10-12'	8-8-12-13	2'/0.7'	21	Saturated, dark brown to brick red to yellow, fine SAND and SILT (trash)						
	7	12-14'	15-14- 17-14	2'/-.2'	31	Same as above						
	8	14-16'	20-47-	1.2/0.1'	—	Same as above	15.2'					
15			50/0.2'			Bottom of boring 15.2 ft.						

SB17.KJF

302136

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-18 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid M 12 Ground Elevation: Dates: Started: 11/12/90	Ended: 11/12/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	37-50/0.3	0.8/0.1'	---	Large sandstone fragment then, damp, dark brown, very fine to fine SAND and SILT, little organics (plant and roots), (trace surface trash)						
	2	2-4'	18-25-	2'/2'	46	Dark to medium brown to greenish gray to reddish brown, very fine to fine SAND and SILT, little clay, trace fine to medium gravel						
			21-10									
	3	4-6'	34-32-	2'/2'	61	Same but moist to wet						
5			29-33									
	4	6-8'	12-21-	2'/2'	48	Damp to wet, dark to medium brown, very fine to medium SAND, some silt, little clay, trace fine to medium gravel						
			27-78									
	5	8-10'	19-28-	2'/2'	47	Same as above						
			18-42									
10	6	10-12'	12-21-	2'/0.3'	41	Moist, dark reddish to medium brown, very fine SAND and SILT, some clay, little fine to medium gravel						
			20-31									
	7	12-14'	25-38-	1.8/0.5'	86	Same as above						
			48-50/0.3									
							15.2 '					
15						Bottom of boring 15.2 ft.						

SB18.KJF

302137

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-19 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Grid N 13 Ground Elevation: Dates: Started: 11/14/90 Ended: 11/14/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	2-3-3-2	2'/1'	6	Damp, ash to brick red, very fine to fine SAND, (with trash), some silt, trace organics, trace fine gravel						
	2	2-4'	2-14-	2'/0.2'	29	Poor recovery, same as above						
			15-26									
	3	4-6'	9-14-	2'/0.2'	30	Moist wood and glass, some fine to medium SAND, little silt, trace fine gravel						
5			16-26									
	4	6-8'	7-26-	2'/1.5'	54	Natural materials Moist, dark to medium brown, very fine to fine SAND and SILT, little clay, trace medium gravel						
			28-45									
	5	8-10'	18-42-	1.3'/1'	---	Same as above						
			50/0.3'									
10	6	10-12'	42-32-	2'/2'	56	Same as above						
			24-16									
	7	12-14'	24-16-	2'/1.8'	32	Dark brown to greenish gray, fine to medium SAND, some silt, trace clay, trace fine to medium gravel						
			16-38									
	8	14-16'	50/0.4'	0.4/0.2'	---	Same as above						
15						Bottom of boring 15.4 ft.						

SB19.KJF

302138

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. SB-20 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location: Grid N 11
Ground Elevation:
Dates: Started: 11/14/90 Ended: 11/14/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
0	1	0-2'	2-3-4-6	2'/2'	7	Damp, dark to golden brown, mottled SILT and CLAY, some very fine to fine sand, large sandstone fragments						
	2	2-4'	7-32-	2'/2'	56	Same as above						
			24-18									
	3	4-6'	9-12-	2'/2'	28	Same, with little sand						
5			16-19									
	4	6-8'	17-12-	2'/2'	25	Moist to wet, dark to reddish brown, very fine to fine SAND, some silt and clay, little fine to medium gravel						
			13-16									
	5	8-10'	5-12-	2'/2'	33	Moist, dark olive brown, fine to medium SAND, some silt, little clay, several fragments of dark gray silty shale						
			21-32									
10	6	10-12'	9-37-	2'/2'	61	Wet, dark to medium brown, very fine to medium SAND and SILT, little clay, trace fine to medium gravel						
			24-24									
	7	12-14'	16-28-	2'/2'	52	Same as above						
			24-18									
	8	14-16'	10-41-	1.3/1.1'	---	Same as above						
15			50/0.3'			Bottom of boring 15.3 ft.	15.3'					

SB20.KJF

302139

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. TCL Locations Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.476
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Ground Elevation: Dates: Started: 11/14/90 Ended:	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
TCL	#1	4-6'	3-2-3-6	2'/0.1'		Wet, dark gray to black very fine SAND and SILT, little medium gravel, (trash)						
SB 10		6-8'		2'/0.2'		Bottom of boring 8 ft.						
TCL	#2	4-6'	17-75/0.3	0.9/0.7'		Wet, dark to medium brown, very fine to fine SAND and SILT, some fine to medium gravel						
SB 5						Bottom of boring 4.8 ft.						
TCL	#3	14-16'	9-28-	1.3/0.7'		Wet, dark red brown, very fine to fine SAND and SILT, little clay, large fragments of dark red brown weathered shale						
SB 20		16-18'	60/0.3	/1'		Bottom of boring 15.3 ft.						
TCL	#4	14-16'	5-16-	2'/2'		Wet, dark gray to black and olive brown (trash) then, bottom of spoon, brown, very fine to medium SAND, some silt, little clay trace fine to medium gravel						
SB 17			21-31			Bottom of boring 16.0 ft.						
TCL	#5	6-8'	21-20-	2'/2'		Damp, olive green SILT and CLAY, some fine gravel, little fragments green gray sandstone						
SB 12			29-28			Bottom of boring 8.0 ft.						

TCL.KJF

302140

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-1 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

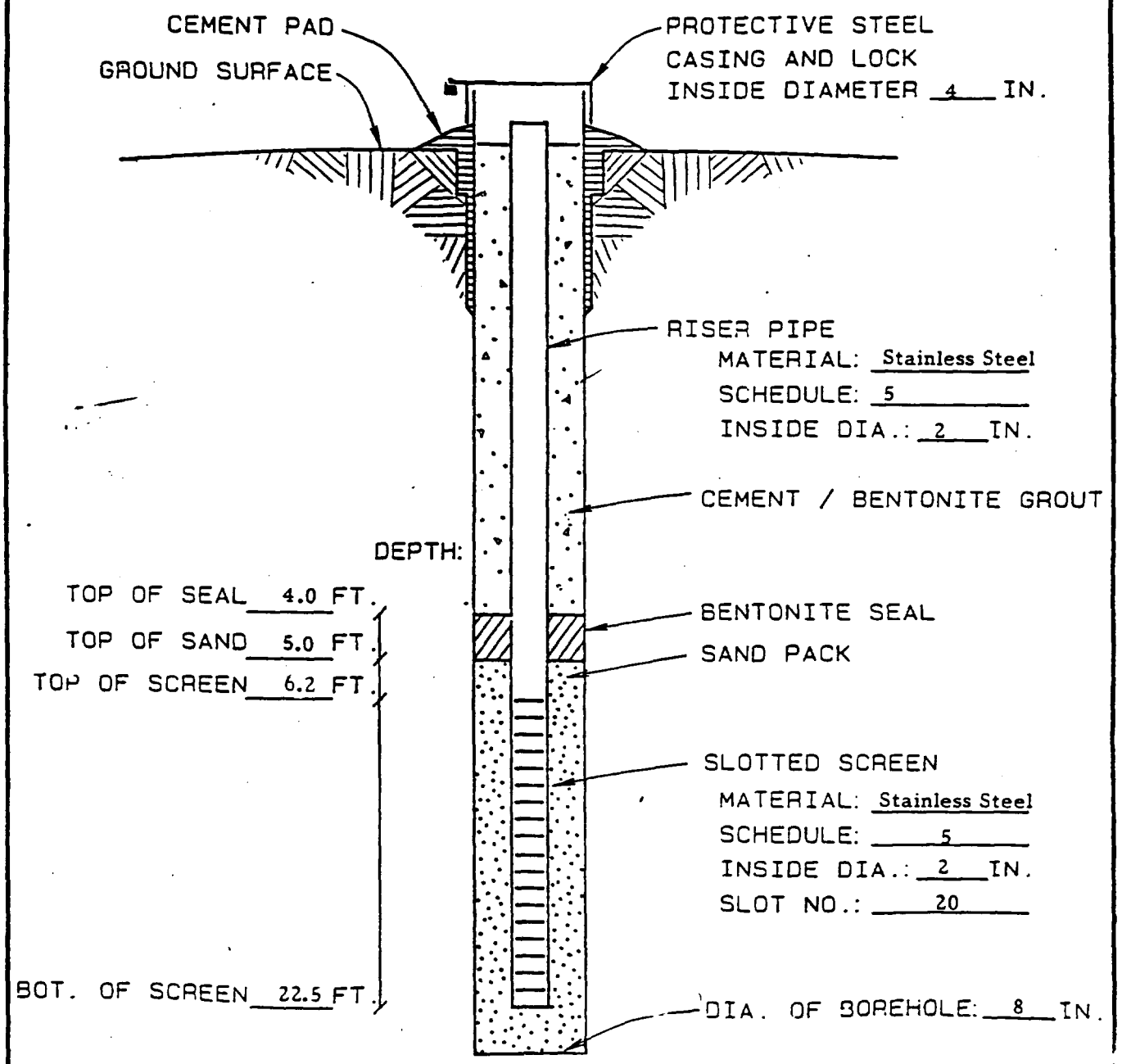
Boring Location: Upgradient from Waste Oil Pit
Ground Elevation: 1805.5 ft.
Dates: Started: 10/25/88 Ended:10/26/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2		grab		Light brown, very moist, SILT, some very fine sand and fine gravel.						
	2	2-4				Misc. FILL and saturated TRASH, some very fine sand and silt, fine gravel.						
	3	4-6				Same as above.						
5												
	4	6-8				Poor to no recovery.						
	5	8-10				Gray to reddish-brown, saturated, SILT, some very fine sand, little fine gravel, trace of clay, oily, odor present.						
10	6	10-12				Grayish-brown, moist, SILT, some very fine sand and gravel (fragments), little clay.						
	7	12-14				Same as above.						
	8	14-16				Reddish-brown to gray, moist, SILT, some very fine sand and fine to medium gravel, trace of clay.						
15												
20												
	9	21-23				Same as above.						
						BOH @ 23 ft.						

AMPHMW1.KJK
12/16/88

302141

MW-1



N.T.S.

WELL0018 R42 L1

CORIEN & GERE

302142

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-2 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

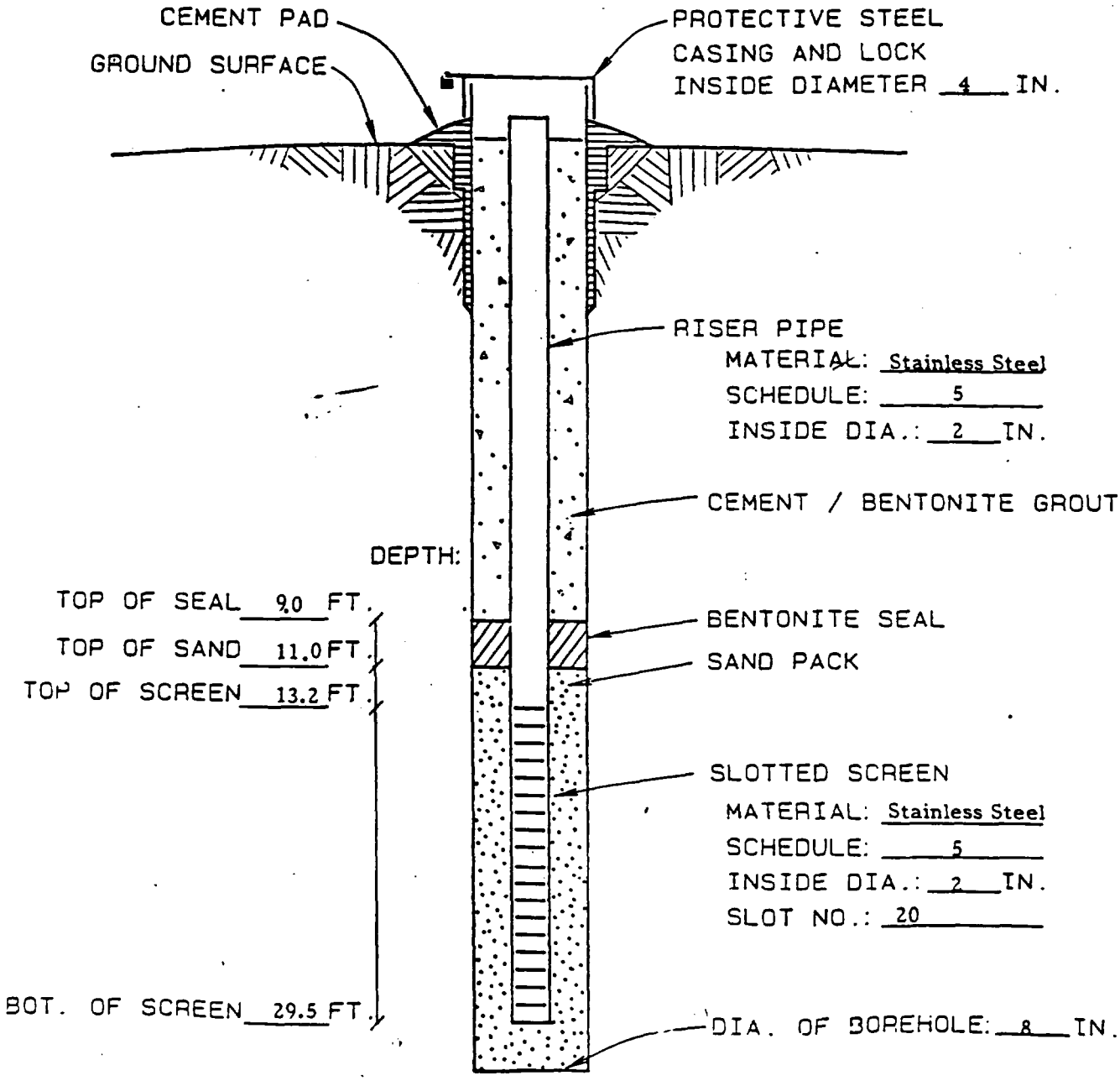
Boring Location: Down gradient of Waste Oil Pit
Ground Elevation: 1785.6 ft.
Dates: Started: 11/26/88 Ended: 11/26/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2				Reddish-brown, damp, very fine SAND, some silt and fine, medium, coarse gravel (fragments), trace of roots, plant stems.						
	2	2-4				Reddish-brown, moist, SILT, some fine gravel (fragments), little very fine sand, trace of clay.						
	3	4-6				Same as above.						
5												
	4	6-8				Gray to reddish-brown, moist to saturated fine SAND, some fine gravel, silt and trace of clay, fuel oil odor.						
	5	8-10				Same as above.						
10	6	10-12				Gray to light brown, moist to saturated, silt and fine sand, some fine, medium coarse gravel (fragments).						
	7	12-14				No recovery - Spoon refusal.						
	8	14-16				Reddish-brown to grayish-brown, damp, SILT and very fine SAND, some fine, medium, coarse gravel (fragments), trace of clay, fuel oil odor.						
15												
20	9	20-22				Reddish-brown, moist to saturated, very fine SAND and SILT, some fine medium, coarse gravel (fragments), little clay.						
25	10	25-27				Same as above. Saturated, poor recovery.						
						Auger refusal @ 29.5'	29.5'					
30												

AMPHMW2.KJK
12/16/88

302143

MW-2



N.T.S.

WELL0018 R42 L1

O'BRIEN & GERE

302144

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-3 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

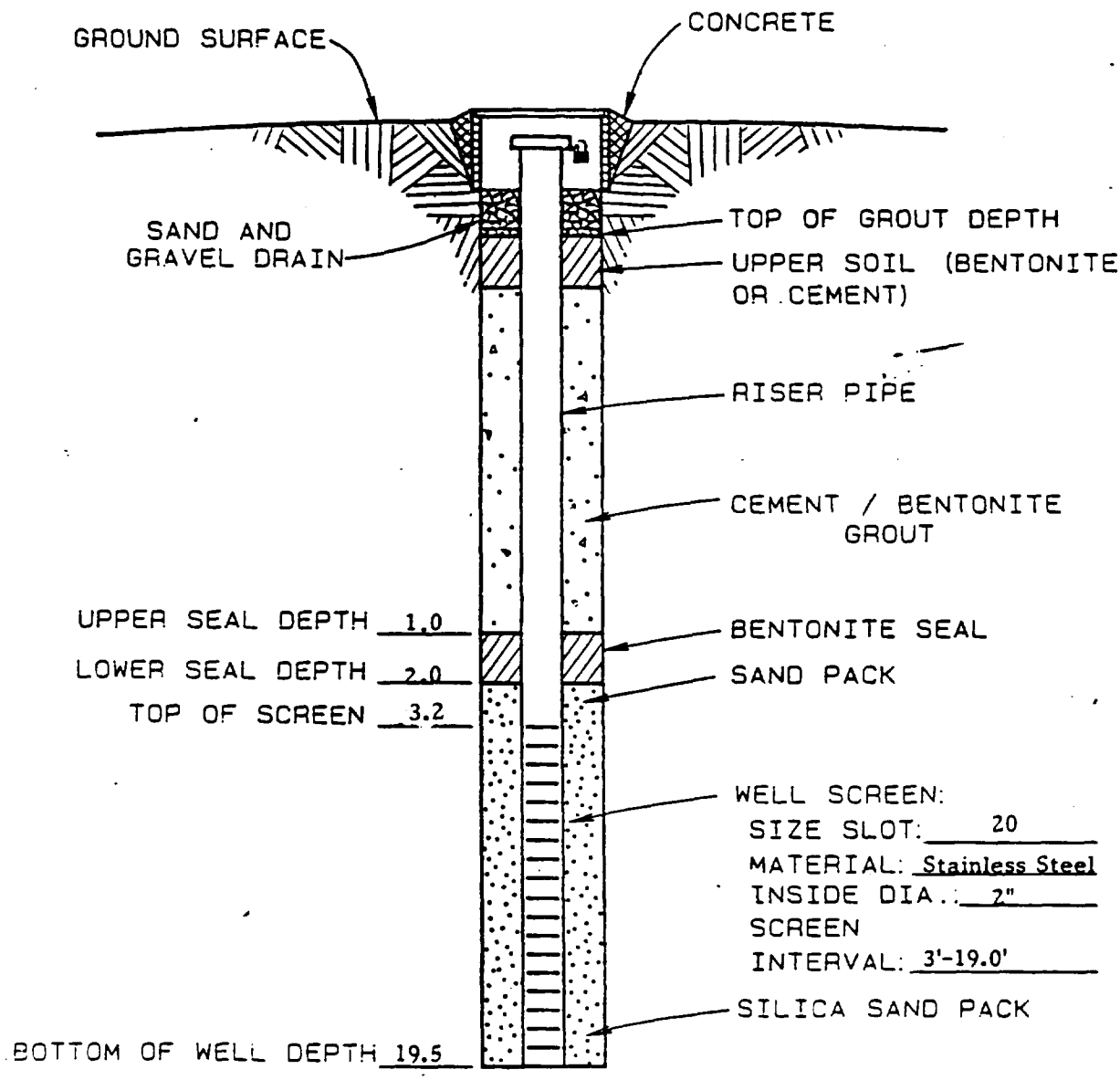
Boring Location: Along Richardson Hill Rd. between MW-4 & MW-5
Ground Elevation: 1752.4 ft.
Dates: Started: 11/7/88 Ended: 11/8/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2		Grab		Medium to dark brown, very moist, very fine to fine SAND, some silt and clay, trace of fine to medium gravel, root and plant stems						
	2	2-4		Grab		Same as above.						
	3	4-6				Medium brown, very moist to saturated very fine to fine SAND, some silt and clay, little fine, medium, coarse gravel (primarily fragments)						
5												
	4	6-8				Reddish-brown, saturated, very fine to fine SAND, some silt, little clay and fine to medium gravel, some gray and orange mottles fuel oil odor.						
10	5	8-10				Same as above.						
	6	10-12				Reddish-brown, with green, gray and orange mottles, moist, SILT, some very fine sand, little clay and fine to medium gravel, few black organic (oil) stains.						
15	7	12-14				Same as above.						
	8	14-16				Reddish-brown to gray, moist, SILT, some very fine sand, some fine, medium, coarse gravel with fragments, little clay.						
20	9	18-20				Medium to olive brown, saturated fine, medium, coarse SAND, some fine, medium. coarse gravel and silt, little clay, trace of peat						
						BOH @ 20'	20.0'					

AMPHMW3.KJK
12/16/88

302145

MW-3



NOT TO SCALE

WELL0130 R42 L1

302146

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-3D
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 1 of 1
Proj. Loc: Sidney, New York	Hammer: NA	Location:
File No.: 3729.031	Fall: NA	Start Date: 12/29/94 End Date: 12/30/94

Boring Company: ADT
Foreman: Marty Harrington
OBG Geologist: DJ Carnevale

Screen / Riser — Grout / Sand Pack / Bentonite

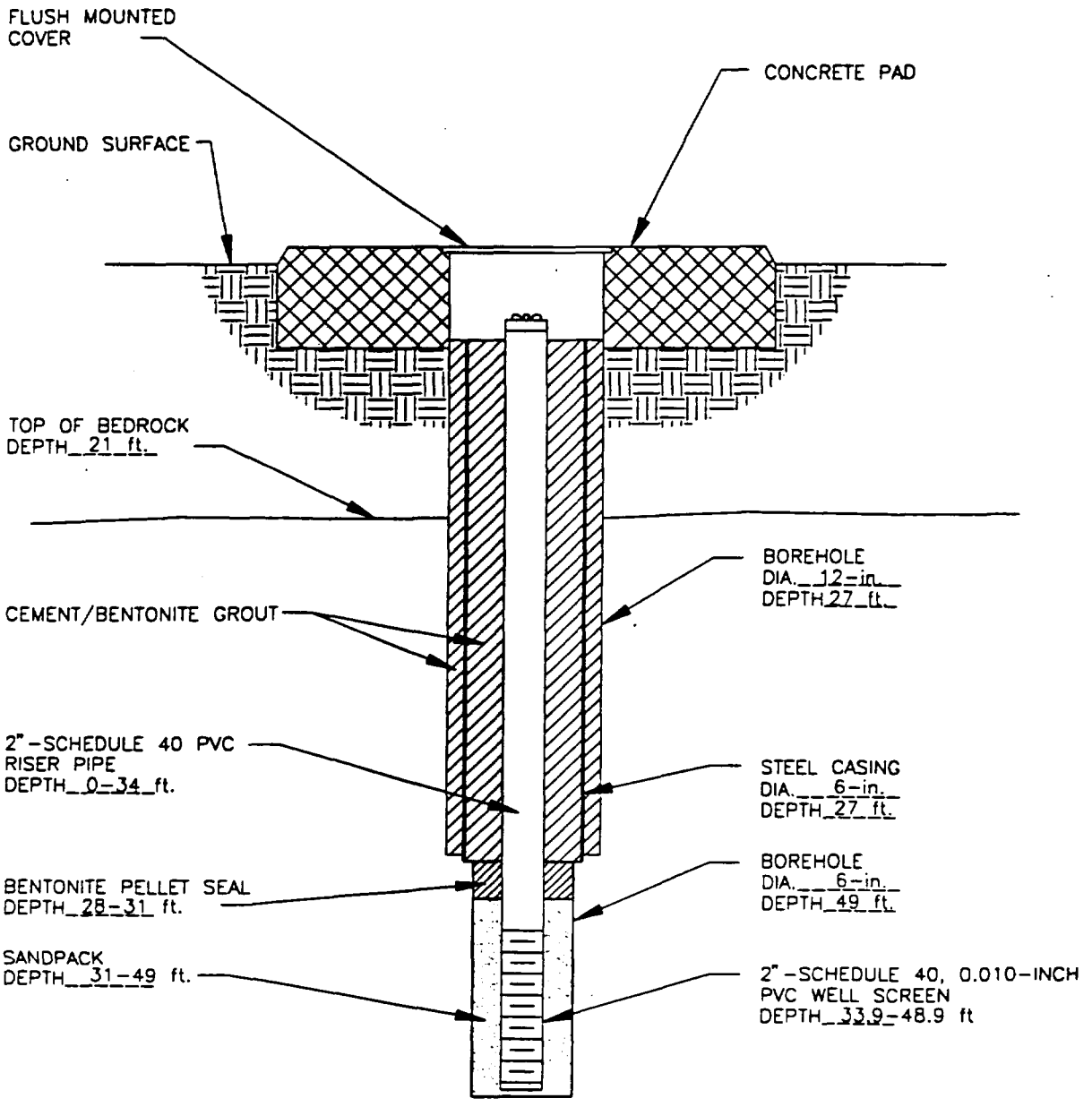
Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
0										
28	1	28-33	83%	3.0/5.0	12/29/94 Run #1	Fine grained SANDSTONE, soft (unrecovered) zone 31.5 to 32.5 ft.				
33	2	33-38	46%	2.2/5.0	12/29/94 Run #2	SANDSTONE as above, soft mudstone in end of core barrel approximately 0.2 ft.				
38	3	38-43	NA	0/5.0	12/29/94 Run #3	Recovered approximately 2.5 ft. from run #2 to 35.5 ft. Run #3 was 35.5 to 40.5 ft. but no recovery due to worn out core catcher.				
40.5	4	40.5-45.	63%	5.0/5.0	12/30/94 Run #4	Gray fine grained SANDSTONE to approximately 41.1 ft., to broken GRAVEL, red to green to gray sandstone fragments to approximately 41.3 ft., to gray SANDSTONE as above, organic seam at approximately 41.6 and 41.9 ft.				

Well completion: 0.020-in. slot screen 49.0 to 34 ft., sandpack 49.0 to 31.0 ft., bentonite 31.0 to 28.0 ft., cement/bentonite grout 28.0 ft. to grade.

302147

FIGURE

MW-3D



SUPPLEMENTAL REMEDIAL INVESTIGATION
RHRMLS
SIDNEY, NEW YORK

SHALLOW BEDROCK MONITORING WELL DIAGRAM

NOT TO SCALE

302148

FILE NO. 3729.031-

O'BRIEN & GERE

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Feb/23/95

3729.031-

LAYER ALL ON

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-3DD
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 1 of 2
Proj. Loc: Sidney, New York	Hammer: NA	Location:
File No.: 3729.031	Fall: NA	Start Date: 1/23/95 End Date: 2/9/95

Boring Company: Parratt-Wolff
Foreman: Ron Bush
OBG Geologist: DJ Carnevale

Screen / Riser — Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing
0									
60.5	1	60.5-65	90%	4.4/4.5	01/23/95 Run #1	Dark gray (N3) MUDSTONE to approximately 62.6 ft., to greenish black (5GY2/1) SANDSTONE fine grained with black organics (coal) to 65.0 ft.			
65	2	65-65.4	NA	0.4/0.4	01/23/95 Run #2	Core black at 65.35 ft., SANDSTONE as above.			
65.4	3	65.4-70	71%	4.6/4.6	01/23/95 Run #3	Dark gray (N3) SILTSTONE/MUDSTONE to approximately 67.1 ft., to greenish black (5GY2/1) fine grained SANDSTONE with black organic (coal) to approximately 68.4 ft., to SILTSTONE/MUDSTONE to 70 ft.			
70	4	70-70.7	NA	0.7/0.7	01/23/95 Run #4	Core barrel blocked at approximately 70.7 ft.			
70.7	5	70.7-75	68%	3.7/4.3	2.7/4.3 Run #5	Greenish black (5GY2/1) fine grained SANDSTONE, some organics, water producing fracture from 74.4-74.6 ft.			
75	6	75-75.5	NA	0.5/0.5	01/24/95 Run #6	Core blacked, soft shale.			
75.5	7	75.5-80	85%	3.3/4.5	01/24/95 Run #7	Dark gray (N3) SILTSTONE/MUDSTONE to 80.0 ft., rock broken at approximately 75.8 and 80.6 ft.			
80	8	80-85	98%	4.9/5.0	01/25/95 Run #8	Dark gray (N3) MUDSTONE, fracture at approximately 82.8 and 83.8 ft.			
85	9	85-90	77%	4.9/5.0	01/25/95 Run #9	Dark gray (N3) MUDSTONE/SHALE more fissil, fractures at approximately 85.5, 87.5 and 88.5 to 89.5 ft.			
90	10	90-95	52%	4.4/5.0	01/25/95 Run #10	Dark gray (N3) SHALE/MUDSTONE fractured from approximately 90.0 to 91.0 ft., very soft, clayey at 90.5 to 90.8 ft., fractured 91.5 to 91.7 ft., 93.0 to 93.4 ft. to medium light gray (N6) fine grained SANDSTONE to 95.0 ft., sandstone fractured at 45 degree from approximately 94.0 to 94.2 ft.			

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-3DD
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 2 of 2
Proj. Loc: Sidney, New York	Hammer: NA	Location:
File No.: 3729.031	Fall: NA	Start Date: 1/23/95 End Date: 2/9/95

Boring Company: Parratt-Wolff
Foreman: Ron Bush
OBG Geologist: DJ Carnevale

Screen / Riser — Grout / Sand Pack / Bentonite

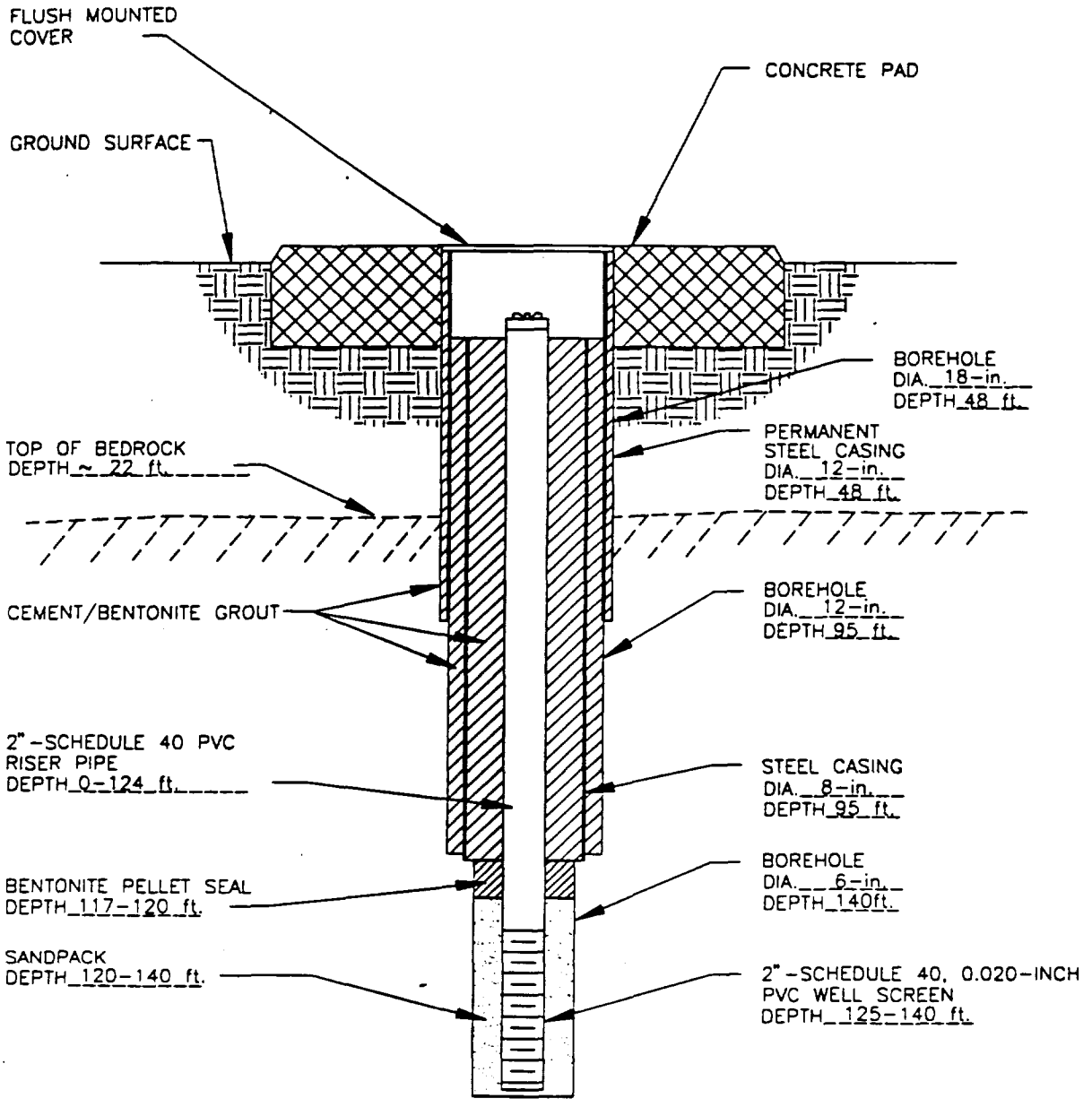
Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing
95	11	95-100	95%	4.8/5.0	02/01/95	Dark gray green (5GY4/1) fine to medium			
					Run #11	grained SANDSTONE to 100.0 ft., broken at			
						approxmately 99.1 ft. with olive brown silt			
						in break.			
100	12	100-105	98%	5.0/5.0	02/06/95	Gray SILTSTONE with quartz, well cemented,			
					Run #12	with only mechanical fractues.			
105.5	13	105.5-108.5	58%	3.0/3.0	02/07/95	Gray SILTSTONE, light, buff colored rounded			
					Run #13	clasts 0.9 to 1.1 ft., organic rich stringers			
						1.1 to 3.3 ft., many fractures parallel to			
						stringers.			
						108.0 to 119.0 - 2/7/95			
						Roller bit due to inability to recover cores.			
108	14	108-109	NA	NA	02/07/95	SANDSTONE/SILTSTONE.			
109	15	109-115	NA	NA	02/07/95	Gray/black fissile SHALE with much native			
						carbon.			
115	16	115-117.5	NA	NA	02/07/95	Gray SANDSTONE.			
117.5	17	117.5-119	NA	NA	02/07/95	Gray SHALE, less carbon than 109.0 to			
						115.0 ft.			
119	18	119-123	86%	4.0/4.0	02/09/95	Gray SILTSTONE/SHALE calcite cemented,			
					Run #14	some pyrite, few remnant fossils.			
123	19	123-128	85%	5.0/5.0	02/09/95	Gray SILTSTONE with a few thin shale beds.			
					Run #15				
128	20	128-133	93%	4.8/5.0	02/09/95	Gray SILTSTONE/fine SANDSTONE, shells and			
					Run #16	some clasts from 0.1 to 0.25 ft., 1.2 to			
						1.3 ft., 2.6 to 2.75 ft., and 3.7 to 3.8 ft.,			
						calcite cemented, appears to produce more			
						water than above.			
133	21	133-138	91%	5.2/5.0	02/09/95	Gray SILTSTONE grading to gray sandtone,			
					Run #17	carbonate cement, few carbon rich shell			
						partings, 3 fractures parallel to partings.			
139									

Well completed with screen 139.0 to 124.0 ft., sand 139.0 to 120.0 ft., pellets 120.0 to 117.0 ft., and grout 117.0 ft. to surface.

302150

FIGURE

MW-3DD



SUPPLEMENTAL REMEDIAL INVESTIGATION
RHRMLS
SIDNEY, NEW YORK

DEEP BEDROCK MONITORING WELL DIAGRAM

NOT TO SCALE

302151

FILE NO. 3729.031-

O'BRIEN & GERE

LAYERS- ALL ON 3729.031- Feb/25/95

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-4 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

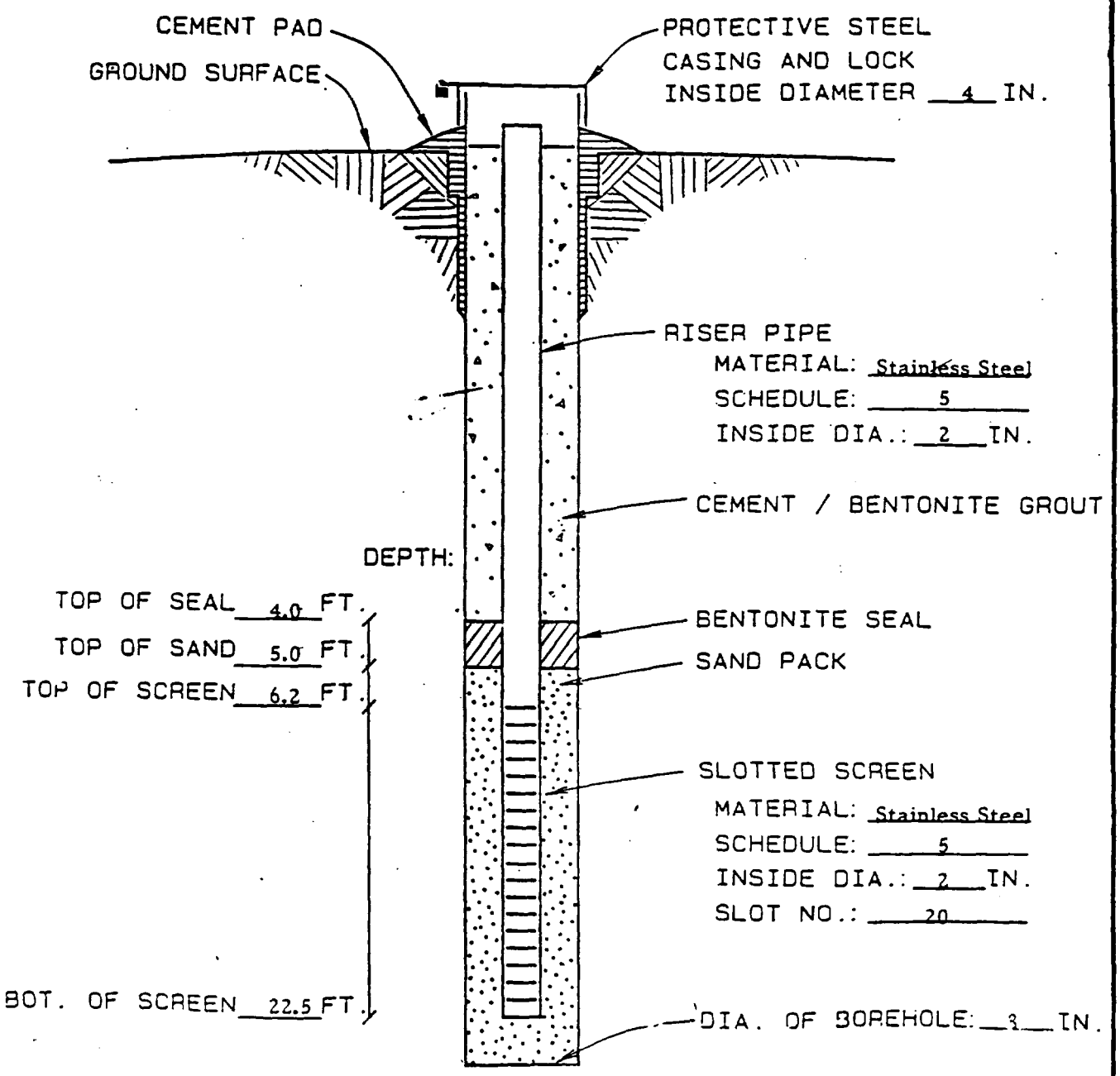
Boring Location: Along Richardson Hill Rd. @ Landfill Access Rd.
Ground Elevation: 1760.4 ft.
Dates: Started: 10/10/88 Ended:10/10/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2	4/8/17/28			Medium brown, damp, very fine to fine SAND, little silt and fine to meduim gravel, trace of clay, root and plant stems, few black and orange mottles.						
	2	2-4	20/43/ 40/ 54/4			Orange-brown, moist SILT, some medium to coarse rock fragments, little clay, very fine sand.						
5	3	4-6				Red-brown, moist, SILT and fine SAND, some fine, medium, coarse gravel, little silt, trace of clay.						
	4	6-8				Light to medium brown, moist, SILT, some very fine sand, and fine, medium, coarse gravel (fragments), trace of clay.						
	5	8-10				Same as above.						
10												
	6	10-12				Reddish-brown, very moist, SILT and very fine SAND, fine, medium, coarse gravel, trace of clay.						
	7	12-14				Light reddish-brown, saturated, fine SAND and fine, medium, coarse GRAVEL, little silt, trace of clay, few fine mottles.						
15	8	14-16				Light reddish-brown, saturated, fine to medium SAND and fine, medium, coarse GRAVEL little silt, trace of clay.						
20	9	20-22				Light-medium brown, saturated, very fine SAND and SILT, some fine, medium, coarse gravel (fragments), little clay, some red clay fragments (shale).						
						BOH @ 23 ft.						

302152

AMPHMW4.KJK
12/16/88

MW-4



N.T.S.

302153

WELL0010 A42 L1

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-4D PAGE 1 OF 1
CLIENT: Amphenol Corporation	SAMPLER: Split Spoon, Roller Bit	LOCATION:
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site FILE NO.: 3729.015	HAMMER: 140 lbs FALL: 30"	START DATE: 12/4/91 END DATE: 12/5/91
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING
0						For description to 25 ft., see log MW-4S			
2									
4									
6									
8									
10									
12									
14									
16									
18									
20									
22									
24									
						Weathered, red SHALE BEDROCK	25'		
26									
						Advanced roller bit to 47 ft. below grade			
28									
30									
32									
34									
36									
38									
40									
42									
44									
46									

302154

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-5S Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

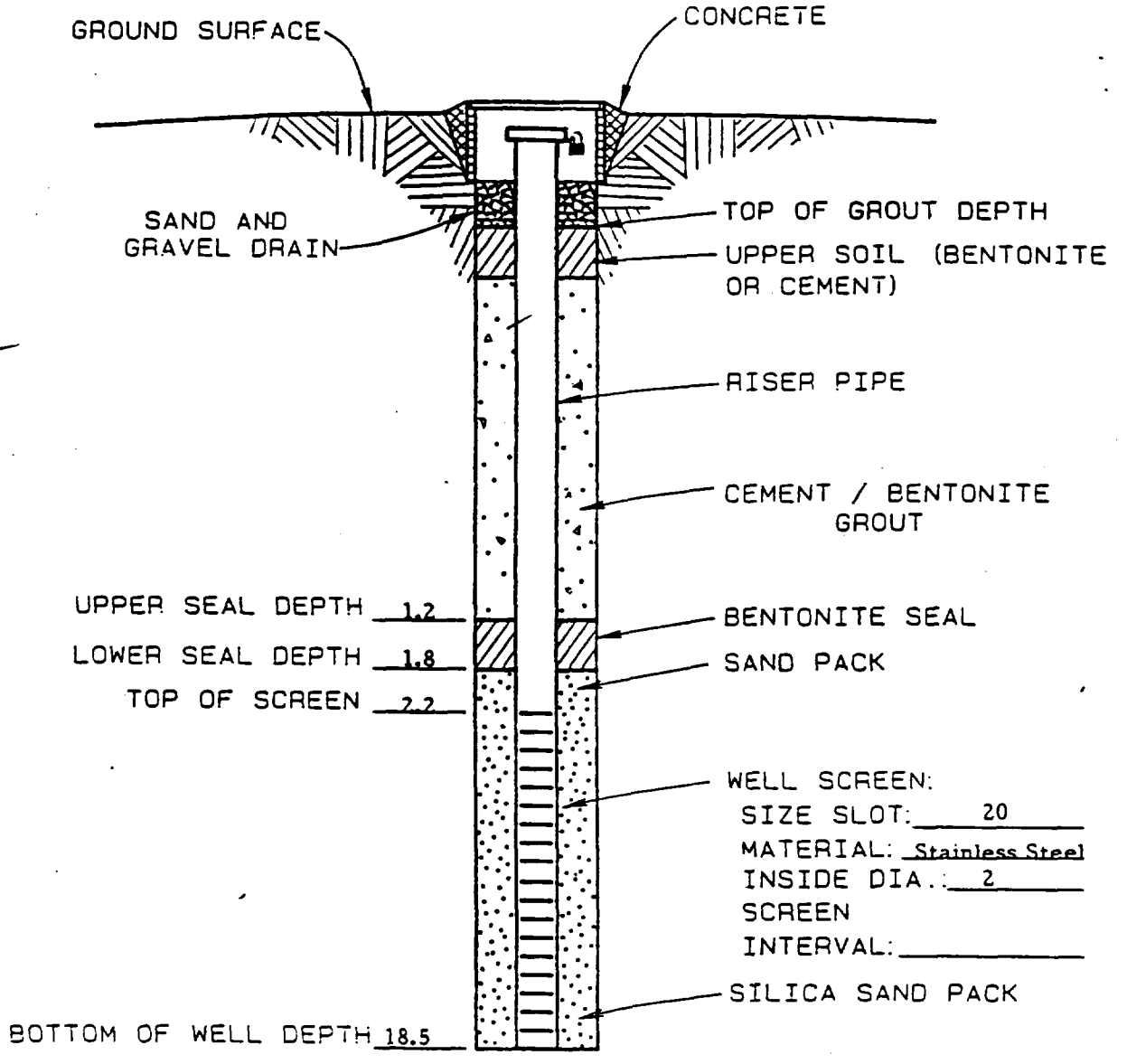
Boring Location: Along Richardson Hill Rd., adjacent to Pond
Ground Elevation: 1753.6 ft.
Dates: Started: 10/19/88 Ended: 10/21/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2				Dark brown to reddish-brown, moist, fine, medium, coarse SAND, some fine, medium, coarse gravel, little silt, trace of clay, few cinders (fill)						
	2	2-4				Same as above.						
5	3	4-6				Reddish-brown to black, very moist, fine to medium SAND, some fine, medium, coarse gravel, little silt, trace of clay, cinders						
	4	6-8				Light gray to reddish-brown, saturated fine SAND and fine, medium, coarse GRAVEL (fragments) Sample mostly broken rock fragments						
	5	8-10				Light gray to orange-brown, saturated, fine medium, coarse SAND, some fine, medium, coarse gravel and silt, trace of clay, strong petroleum odor, iron stained.						
10												
	6	10-12				Greenish-gray to reddish-brown, saturated fine SAND, some fine, medium, coarse gravel and silt, little clay, poor recovery.						
	7	12-14				Same as above.						
15												
	8	14-16				Reddish-brown, saturated, very fine SAND and SILT, fine, medium, coarse gravel, trace of clay, petroleum odor and sheen.						
20	9	20-22				No recovery. Spoon refusal.						
						BOH @ 22 ft.						

302155

AMPHMW5S.KJK
3/21/89

MW-5S



NOT TO SCALE

302156

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-5D Sheet 1 of 2
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

Boring Location: Along Richardson Hill Rd., adjacent to Pond
Ground Elevation: 1759.6 ft.
Dates: Started: 10/19/88 Ended: 10/21/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2				Dark brown to reddish-brown, moist, fine, medium, coarse SAND, some fine, medium, coarse gravel, little silt, trace of clay, few cinders (fill)						
	2	2-4				Same as above.						
5	3	4-6				Reddish-brown to black, very moist, fine to medium SAND, some fine, medium, coarse gravel, little silt, trace of clay, cinders						
	4	6-8				Light gray to reddish-brown, saturated fine SAND and fine, medium, coarse GRAVEL (fragments) Sample mostly broken rock fragments						
	5	8-10				Light gray to orange-brown, saturated, fine medium, coarse SAND, some fine, medium, coarse gravel and silt, trace of clay, strong petroleum odor, iron stained.						
10												
	6	10-12				Greenish-gray to reddish-brown, saturated fine SAND, some fine, medium, coarse gravel and silt, little clay, poor recovery.						
	7	12-14				Same as above.						
15												
	8	14-16				Reddish-brown, saturated, very fine SAND and SILT, fine, medium, coarse gravel, trace of clay, petroleum odor and sheen.						
20	9	20-22				No recovery. Spoon refusal.						

302157

AMPHMW5A.KJK
3/21/89

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-5D Sheet 2 of 2
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: HX core barrel (5') Hammer: NA Fall: NA	Ground Water Depth Date Depth Date File No.:

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

Boring Location: Along Richardson Hill Rd., Adjacent to Pond
Ground Elevation: 1753.9 ft.
Dates: Started: 10/19/88 Ended: 10/21/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Remarks
25		25-27				Greenish-gray to reddish brown, fine SAND, some fine, medium, coarse gravel, little silt, trace clay with weathered rock.						
30		30-32				Same as above.						
						Auger refusal @ 32'.						
						Gray sandstone.						
						Reddish-brown clay filled fracture - 34.8'						
35												
						39'-39.2' Fracture zone with some iron stains and mottling.						
						Dark gray shale.						
40						40.3'-40.8' Vuggy, fossiliferous, sandy shale with some marl filled voids.						
						40.8' Greenish-gray fractured shale.						
						43.8'-44.2' - 2" Fracture shale changing to medium to coarse grained gray sandstone 6" vertical clay filled (pyritized) fracture.						
45						Massive unfractured sandstone 44.2'-47'						
						Massive, medium coarse, gray sandstone to 49'.						
						Fractured from 49-49.4', changing to greenish gray to black shale. Fossiliferous, alge, etc.						
						Fractures at 49.10'-50.2'						
50						50.10' - Pyritized fracture with thin coal seam. Massize to 52.0'						
						BOH @ 52.0'						

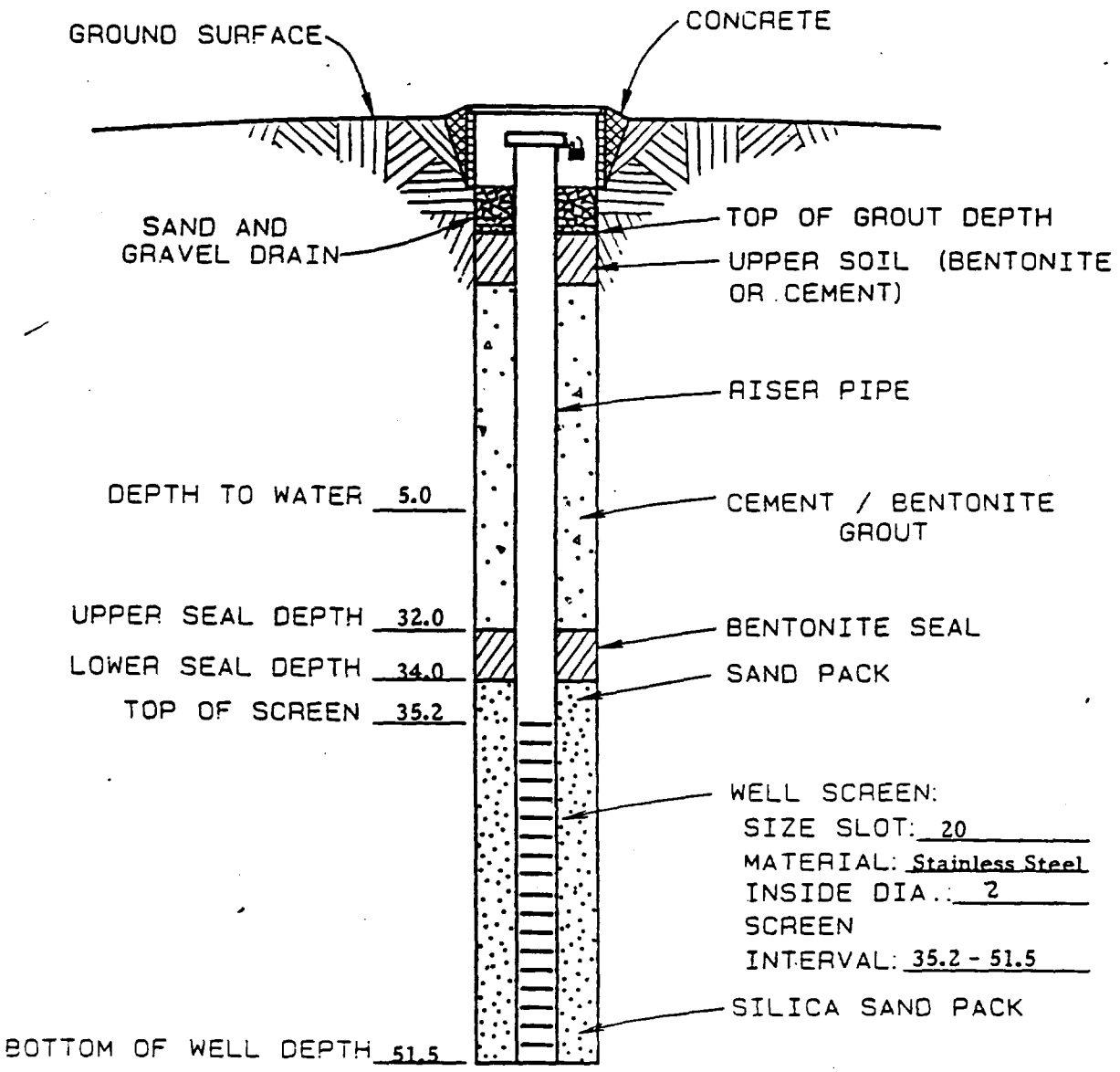
HX Core runs: #1 (32-37')
#2 (37-42')
#3 (42-47')
#4 (47-52')

302158

AMPHMW5B.KJK
3/21/89

MW-5D

(Bedrock Well)



NOT TO SCALE

302159

WELL0130 R42 L1

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-6 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

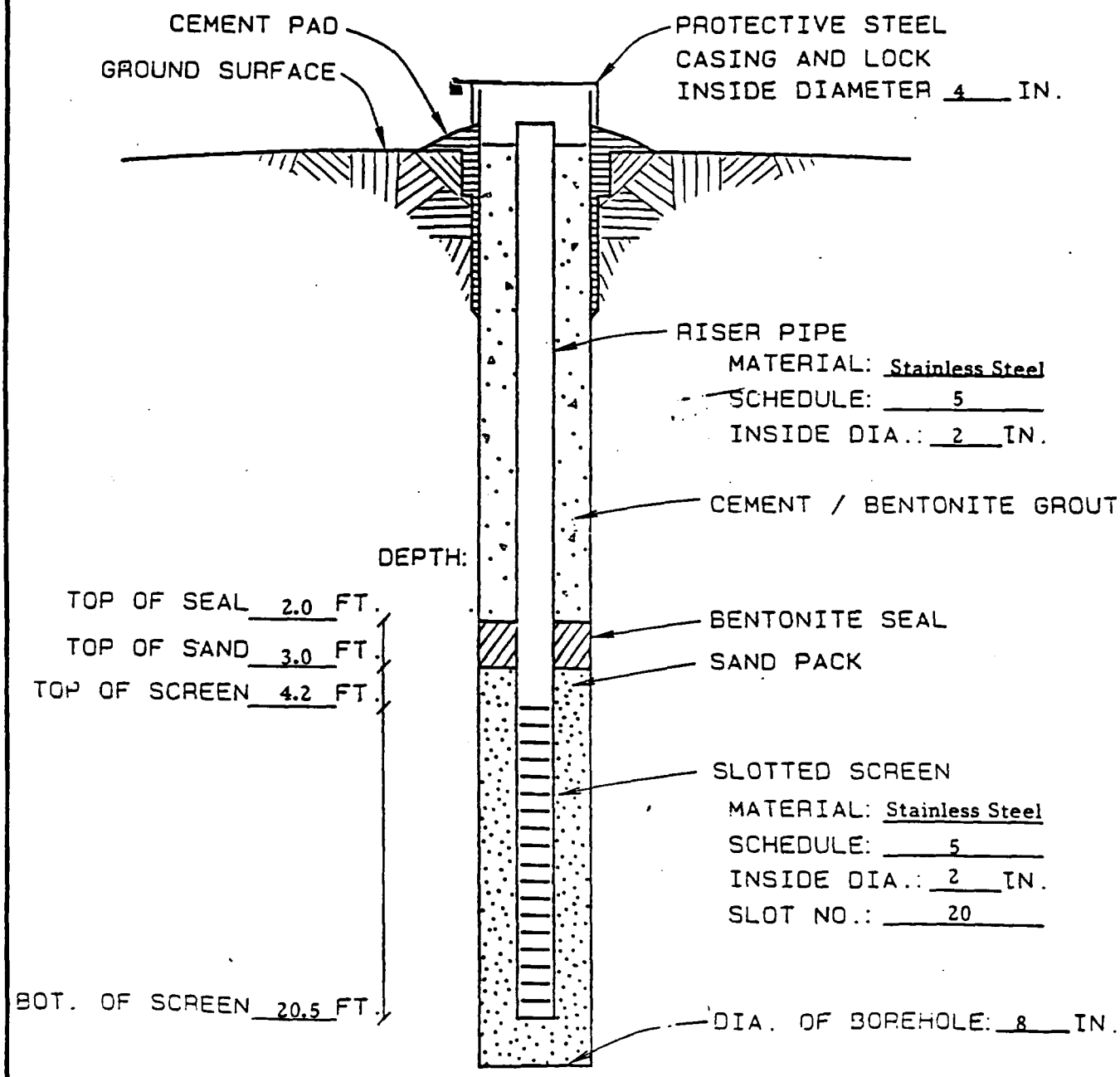
Boring Location: About 50' W. of Rich Hill Rd, between Wells 5&7.
Ground Elevation: 1765.1 ft.
Dates: Started: 10/12/88 Ended:10/12/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2		Grab		Light to dark brown, moist, fine SAND and SILT, some medium to coarse gravel (fragments) trace of clay, root and plant stems						
	2	2-4				Light to dark brown, damp, fine SAND, some fine, medium, coarse gravel (fragments), little silt, trace of clay (Sample from 2-3' then spoon refusal).						
5	3	4-6				Greenish-gray to reddish-brown, very moist to saturated, fine SILT and very fine SAND, some fine, medium, coarse gravel (fragments), trace of clay, oily sheen @ 5 ft., odor.						
	4	6-8				Reddish-brown, moist, SILT, some very fine sand and fine to medium gravel, little clay						
10	5	8-10				Medium brown to reddish-brown, very fine SAND, some silt, little fine, medium, coarse gravel, trace of clay.						
	6	10-12				Reddish-brown and grayish-brown, very moist to saturated, SILT and very fine SILT, some fine, medium, coarse gravel, little clay (petroleum odor in till fracture).						
	7	12-14				Same as above.						
15	8	14-16				Medium brown to reddish-brown, very moist to saturated (in partings), SILT and fine SAND, some fine, medium, coarse gravel (fragments), trace of clay. No noticeable odor.						
20	9	20-22				Same as above with an increase in rock fragments.						
25	10	25-26				Reddish-brown, saturated, SILT and very fine to fine SAND, some fine, medium, coarse gravel (large fragments), little clay.						
						Auger refusal @ 27.5'	27.5'					

AMPHMW6.KJK
12/16/88

302160

MW-6



N.T.S.

302161

WELL0010 R42 L1

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-7 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

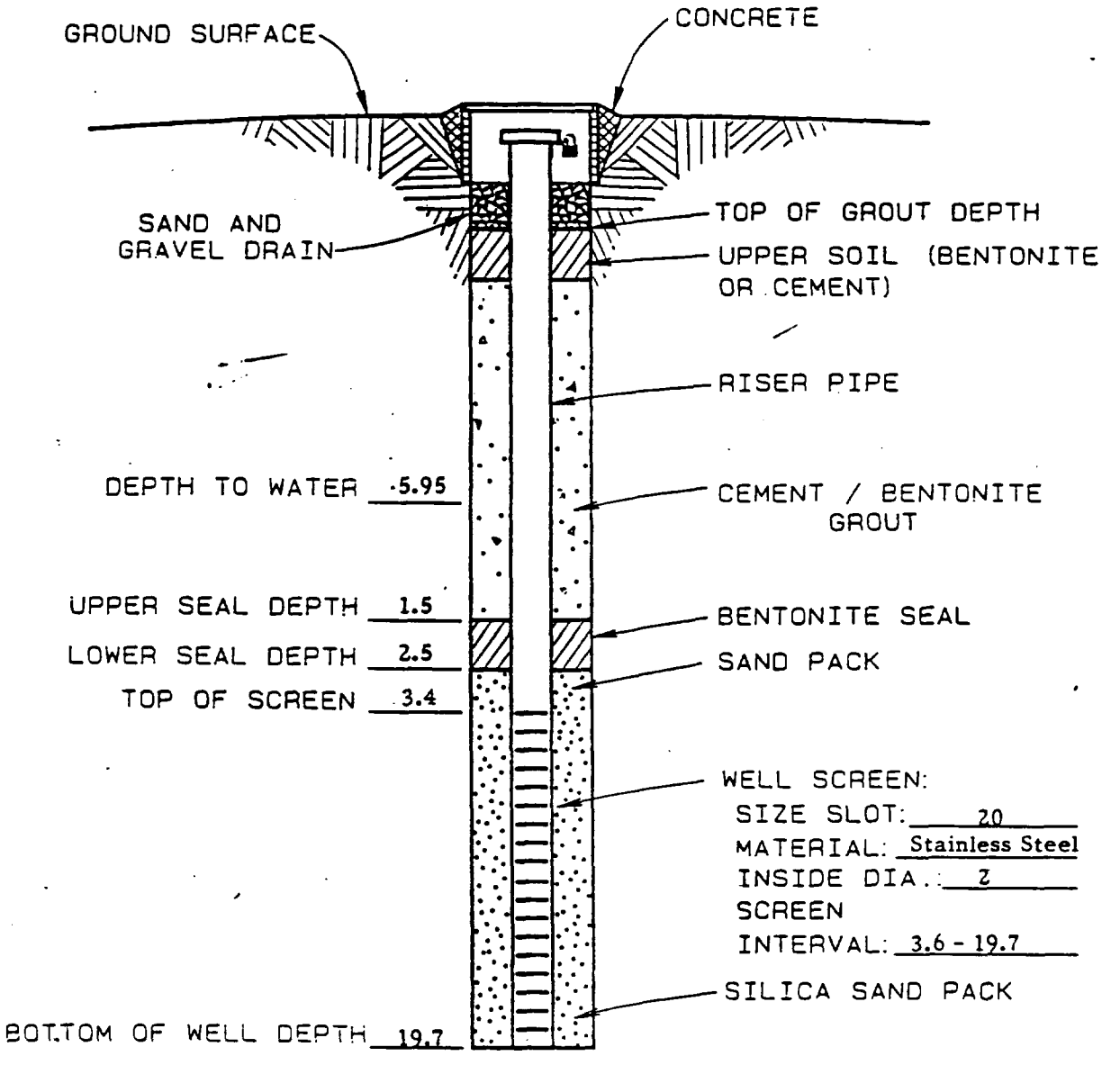
Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

Boring Location: Along Richardson Hill Rd. South of Landfill
Ground Elevation: 1754.7 ft.
Dates: Started: 10/24/88 Ended:9/29/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2				Medium brown, moist, SILT and very fine SAND, some fine, medium, coarse gravel, trace of clay.						
	2	2-4				Same as above.						
	3	4-6				Medium gray to reddish-brown, very moist to saturated, SILT and very fine SAND, fine, medium, coarse gravel.						
5												
	4	6-8				Same as above.						
	5	8-10				Light brown to red-brown, damp, very fine SAND, some fine, medium, coarse gravel (fragments) and silt, little clay.						
10	6	10-12				Same as above.						
	7	12-14				Medium gray to reddish-brown, moist to saturated, SILT and very fine SAND, some fine, medium, coarse grave, trace of clay.						
	8	14-16				Reddish-brown, saturated, fine SILT and very fine SAND, fine, medium, coarse gravel and silt, trace of clay.						
15												
20	9	20-22				Same as above with greenish-gray shale.						
						Auger refusal @ 22'						

302162 AMPHMW7.KJK 12/16/88

MW-7



NOT TO SCALE

302163

WELL0130 R42 L1

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-7D PAGE 1 OF 1
CLIENT: Amphenol Corporation	SAMPLER: Split Spoon, Roller Bit	LOCATION:
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site	HAMMER: 140 lbs	START DATE: 12/4/91 END DATE: 12/9/91
FILE NO.: 3729.015	FALL: 30"	

BORING COMPANY: Parratt-Wolff, Inc.
FOREMAN: Glenn Lansing
OBG GEOLOGIST: Paul Gottler

LEGEND: Grout; Sand Pack; Pellets; Screen; Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0						For descriptions to 18 ft., see log MW-7S				
2										
4										
6										
8										
10										
12										
14										
16										
18						BEDROCK, green-gray green, medium to fine sandstone	18'			
20						Advanced roller bit to 40 ft. below grade.				
22										
24										
26										
28										
30										
32										
34										
36										
38										
40										

302164

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-8 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

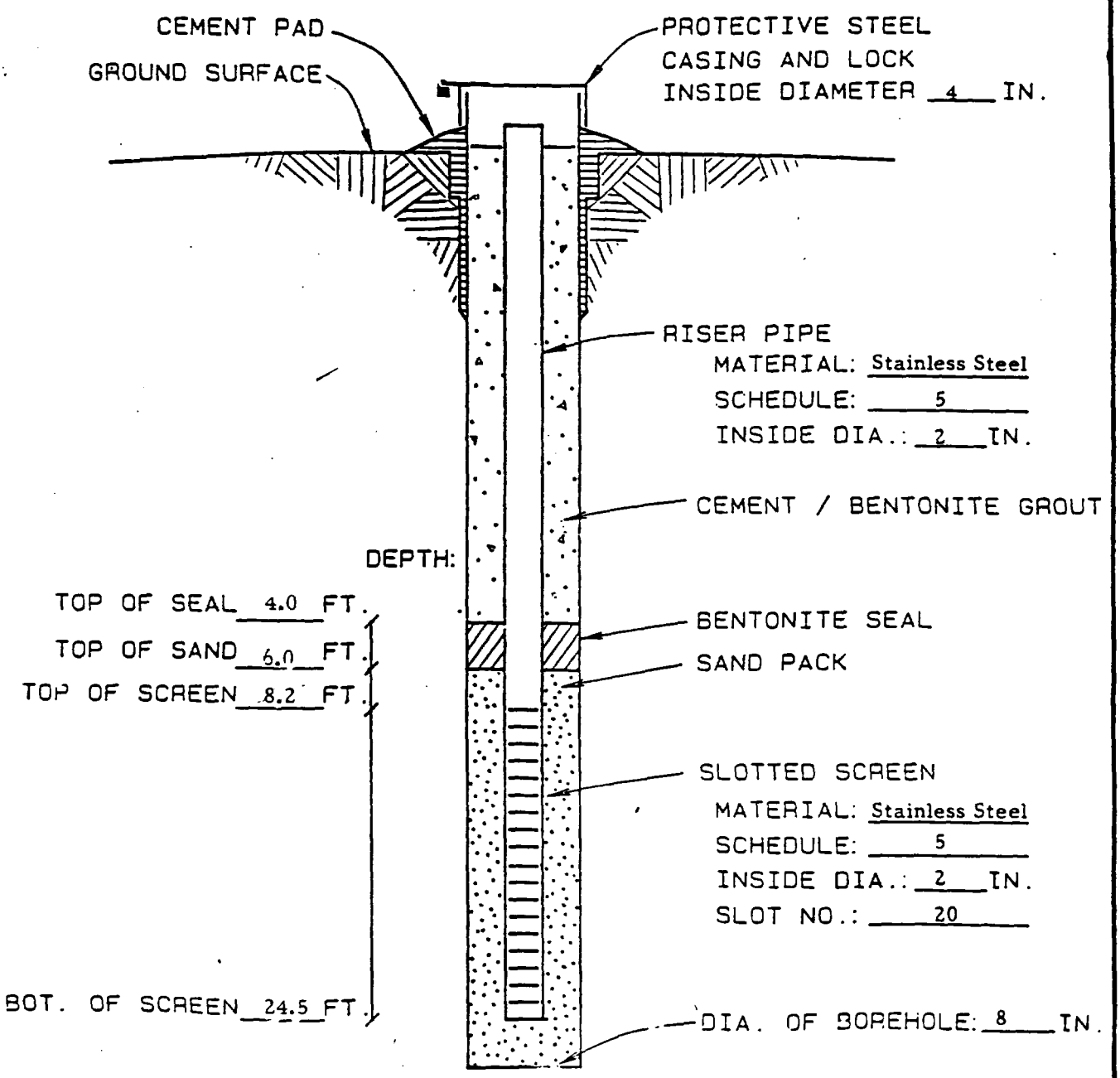
Boring Location: North Area, in abandoned borrow pit.
Ground Elevation: 1796.2 ft.
Dates: Started: 10/18/88 Ended: 10/18/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2		Grab		Reddish-brown, moist, SILT and very fine SAND, some fine, medium, coarse gravel and silt, trace of clay.						
	2	2-4				Same as above. Poor recovery.						
	3	4-6				Red-brown, dry, very fine SAND, some fine, medium, coarse gravel, little silt, trace of clay.						
5												
	4	6-8				Same as above.						
	5	8-10				Reddish-brown and gray ROCK FRAGMENTS, little fine silt and very fine sand.						
10	6	10-12				Reddish-brown, damp, SILT and very fine SAND, some fine gravel, little silt and clay.						
	7	12-14				Same as above.						
	8	14-16				Spoon refusal. No recovery.						
15												
20	9	20-22				Medium gray, saturated, SILT, little very fine sand, trace of clay.						
25						Auger refusal @ 25'						

302165

AMPHMW8.KJK
12/16/88

MW-8



N.T.S.

WELL001B R42 L1

302166

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-9 Sheet 1 of 2
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

Boring Location: On Hill behind Spizzari Property
Ground Elevation: 1799.5 ft.
Dates: Started: 10/17/88 Ended: 10/17/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2				Reddish-orange-brown damp, very fine SAND, some silt, and fine to medium gravel (fragments), few root and plant stems.						
	2	2-4				Same as above without root or plant stems.						
	3	4-6				Light to medium brown, dry, SILT and very fine SAND, some fine, medium, coarse gravel trace of clay.						
5												
	4	6-8				Light to medium brown, moist, SILT and very fine to fine SAND, some fine, medium, coarse gravel, trace of clay.						
	5	8-10				No recovery.						
10	6	10-12				Medium to reddish-brown, damp, SILT and very fine SAND, fine, medium, coarse gravel (fragments), trace of clay.						
	7	12-14				Light brown to grayish-brown, moist, SILT and very fine SAND, some fine, medium, coarse gravel, trace of clay.						
	8	14-16				Light to medium brown, damp, SILT and very fine SAND, some fine, medium, coarse, gravel (fragments), trace of clay.						
15												
20	9	20-22				Medium to reddish-brown, damp, SILT and fine to very fine SAND, some fine to medium gravel, trace of clay.						
25	10	25-27				No recovery.						

302167

AMPHMW9A.KJK
12/16/88

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-9 Sheet 2 of 2
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.:

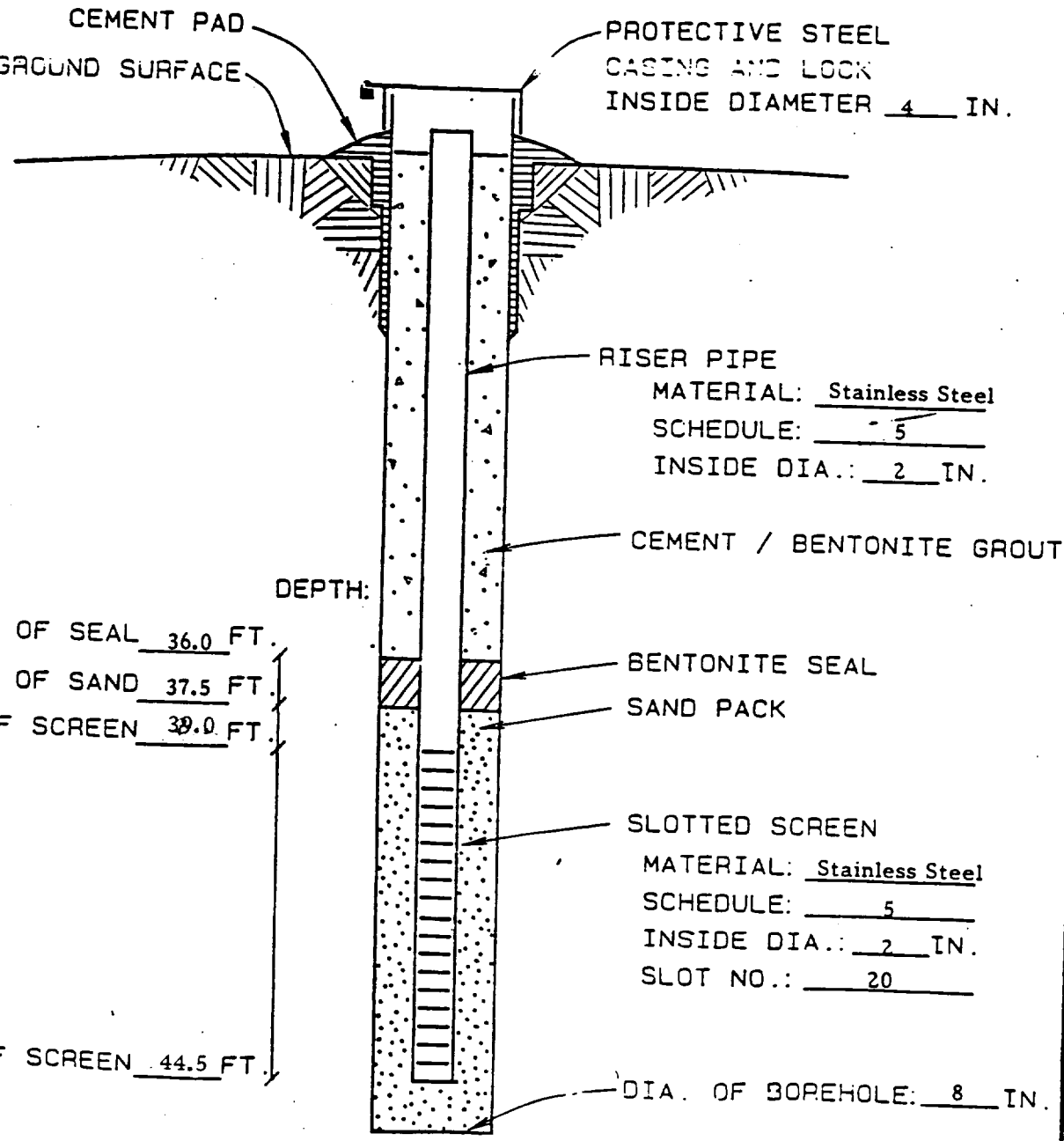
Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

Boring Location: On Hill behind Spizzari Property
Ground Elevation: 1799.5 ft.
Dates: Started: 10/17/88 Ended:10/17/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Remarks
30	11	30-32				Medium to reddish-brown, damp, SILT and very fine to fine SAND, some fine, medium, coarse gravel (fragments), trace of clay.						
35	12	35-37				No recovery.						
40	13	40-42				Reddish-brown, saturated SHALE, bedrock and little silt, clay and fine sand, weathered shale.						
						Auger refusal @ 45'	45'					

302168 AMPHMW9B.KJK 12/16/88

MW-9



N.T.S.

302169

CORIN SCERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-9D
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 1 of 1
Proj. Loc: Sidney, New York	Hammer: NA	Location:
File No.: 3729.031	Fall: NA	Start Date: 12/27/94 End Date: 12/28/94

Boring Company: ADT
Foreman: Marty Harrington
OBG Geologist: DJ Carnevale

Screen / Riser — Grout / Sand Pack / Bentonite

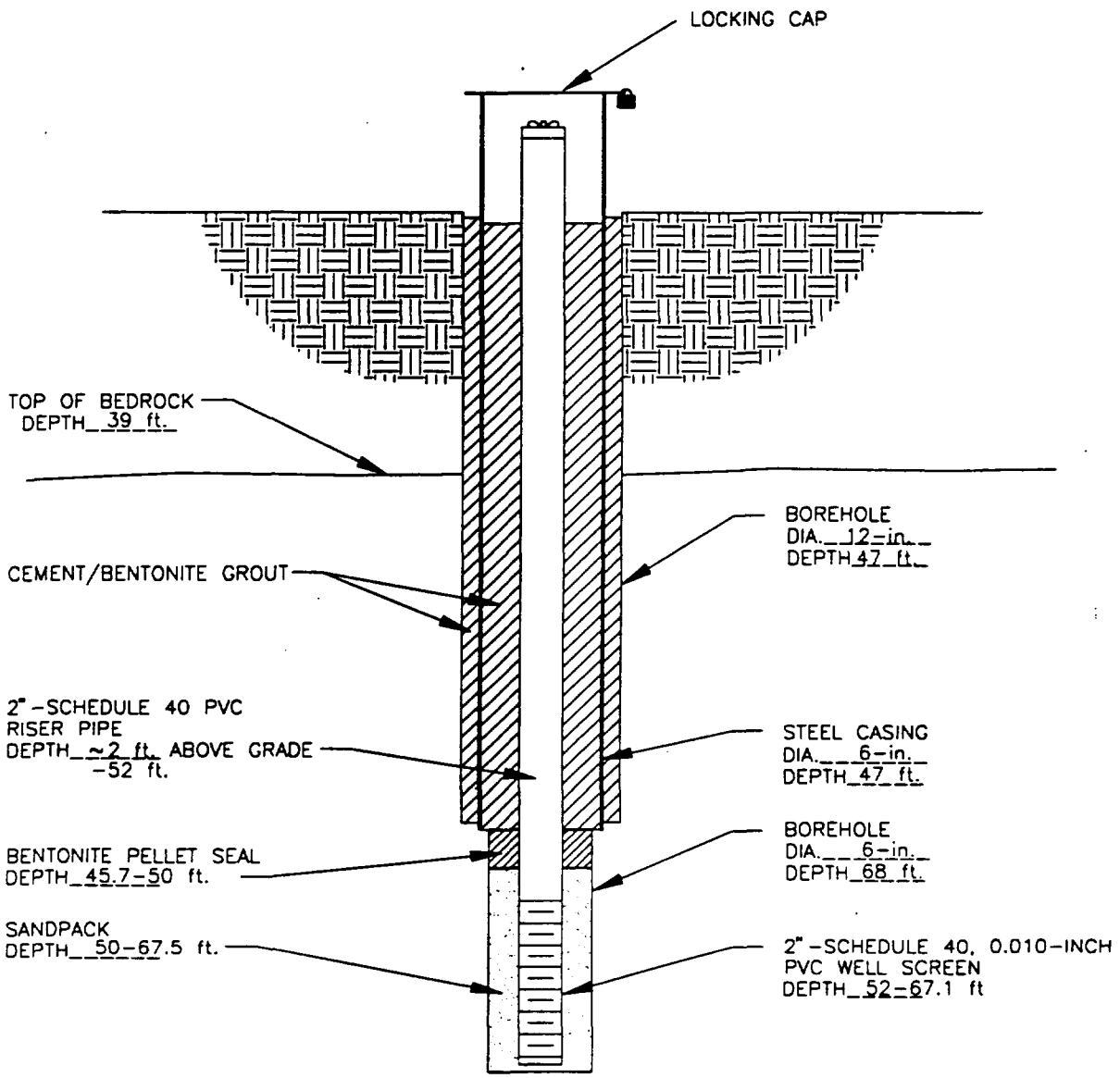
Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing	
0										
48	1	48-53	31%	4.5/5.0	12/27/94 Run #1	Dark greenish gray (5GY4/1) very fine sandy SILT STONE.				
53	2	53-58	42%	4.2/5.0	12/28/94 Run #2	Same as above to approximately 56.1 ft. to a dark yellowish brown (10YR4/2) to grayish olive (10Y4/2) fine grained SANDSTONE (subrounded qtz), sandy seams appear to be washed out.				
58	3	58-63	31%	4.5/5.0	12/28/94 Run #3	58.0 to 58.7 ft. - same as above. 58.7 to 58.8 ft. - Dark gray SILT STONE. 58.8 to 60.6 ft. - SANDSTONE as above. 60.8 to 61.0 ft. - SILT STONE as above. 61.0 to 63.0 ft. - SAND STONE as above.				
63	4	63-68		1.5/5.0	12/28/94 Run #4	SANDSTONE as above.				

Well completion: 0.020-in. slot screen 67.0 to 52.0 ft., sandpack 67.4 to 49.9 ft., bentonite 49.9 to 45.7 ft., cement/bentonite grout 45.7 ft. to grade.

302170

FIGURE

MW-9D



SUPPLEMENTAL REMEDIAL INVESTIGATION
RHRMLS
SIDNEY, NEW YORK

SHALLOW BEDROCK MONITORING WELL DIAGRAM

NOT TO SCALE

302171

FILE NO. 3729.031-

O'BRIEN & GERE

H:\PROJECTS\111111\76\AMPH41, SCALE FACTOR 1=1

Feb/25/95

3729.031-

LAYER ALL ON

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-10 Sheet 1 of 1
Project Location: Richardson Hill Municipal Landfill Site Client: Amphenol Corporation	SAMPLER Type: Split Spoon Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729-009-330

Boring Co.: Parrat-Wolff
Foreman: N. Thurston
OBG Geologist: W. J. Gabriel

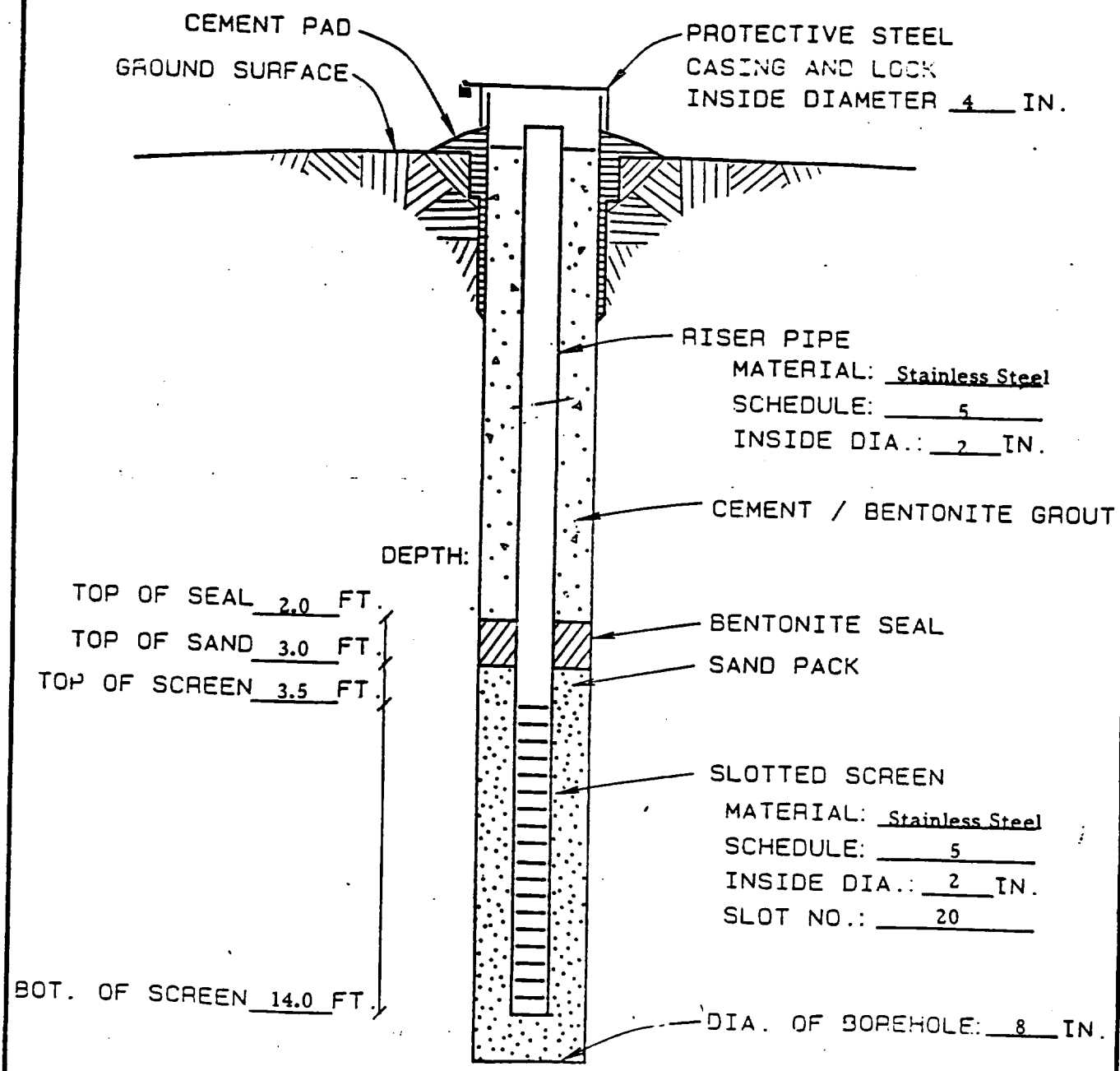
Boring Location: Wyatt property, Along Drainage Area East of Pond
Ground Elevation: 1763.3 ft.
Dates: Started: 11/18/88 Ended: 11/18/88

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Valve	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2				Reddish-brown to greenish-gray, saturated, very fine to fine SAND and SILT, little fine to medium gravel and clay, root and plant stems.						
	2	2-4				Medium gray to reddish-gray, saturated, very fine to fine SAND, some silt, little clay and fine to medium gravel.						
5	3	4-6				Reddish-brown, saturated, SILT and very fine SAND, some fine, medium, coarse gravel little clay.						
	4	6-8				Reddish-brown and grayish-brown, saturated, SILT and very fine to fine SAND, some fine, medium, coarse gravel with fragments, little clay.						
10	5	8-10				Same as above.						
	6	10-12				Reddish-brown, dry to moist, weathered SHALE.						
	7	12-14				Medium gray, weathered SANDSTONE with clay and silt filled portings.						
15						BOH @ 15 ft.						
20												

302172

AMPHMW10.KJK
12/16/88

MW-10



N.T.S.

302173

WELL0010 A42 L1

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-11S Sheet 1 of 2
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 460' west of MW-1 along landfill access road Ground Elevation: Dates: Started: 10/18/90 Ended: 10/18/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	3-3-3-5	2'/0.5'	6	Damp, dark to medium brown to orange, fine SAND, some silt, trace medium gravel, trace organics (plants, roots, and stems)					0	
	2	2-4'	3-12-22-25	2'/1'	34	Damp, dark brown, fine to very fine SAND and SILT, trace organics, fragments of light green/gray sandstone, large fragments					0	
5	3	4-6'	20-24-20-19	2'/1'	44	Damp, red/brown to olive green brown, very fine to fine SAND, little silt, trace clay, small fragments of green/gray sandstone					0	
	4	6-8'	21-25-40-33	2'/0.9'	65	Damp, dark brown, very fine to fine SAND, some silt, green/gray weathered shale, trace reddish brown silty clay					0	
	5	8-10'		2'/2'		Damp, dark to medium brown, fine SAND, some silt, trace red/brown silty clay, trace fine gravel					0	
10	6	10-12'	50/0.3 '	0.3'/0'	—	No recovery					0	
	7	12-14'	17-27-55	1.5'/1'	—	Brown to olive green, fine SAND, some silt, greenish gray sandstone					0	
15	8	14-16'	16-15	1'/1'	—	Moist, brown, fine SAND, some silt, trace clay and gravel, fragments of green/gray sandstone					0	
20	9	20-22'	40-50/0.3	0.9/0.9'	—	Damp, brown to olive green, very fine to fine SAND, some silt, large fragments of green/gray sandstone Boulder 22-23 ft.					0	
25	10	25-27'	32-50/0.2	0.8/0.8'	—	Damp, brown to olive green, fine SAND, little brown silt, sandstone fragments from small chips to 1" diameter cobbles					0	
30	11	30-32'	22-50/0.4	1'/1'	—	Same as above					0	

1MW11S.KJF

302174

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-11S Sheet 2 of 2
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576

Boring Co.: Parratt Wolff, Inc.
Foreman: Glenn Lansing
OBG Geologist: Mark J. Roma

Boring Location:
Ground Elevation:
Dates: Started: 10/18/90 Ended: 10/18/90

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
35	12	35-37'	50/0.2'	0.2/0.2'	---	Damp to moist, olive green to dark brown, weathered sandstone fragments					0	
						Bottom of boring 35.2 ft.						

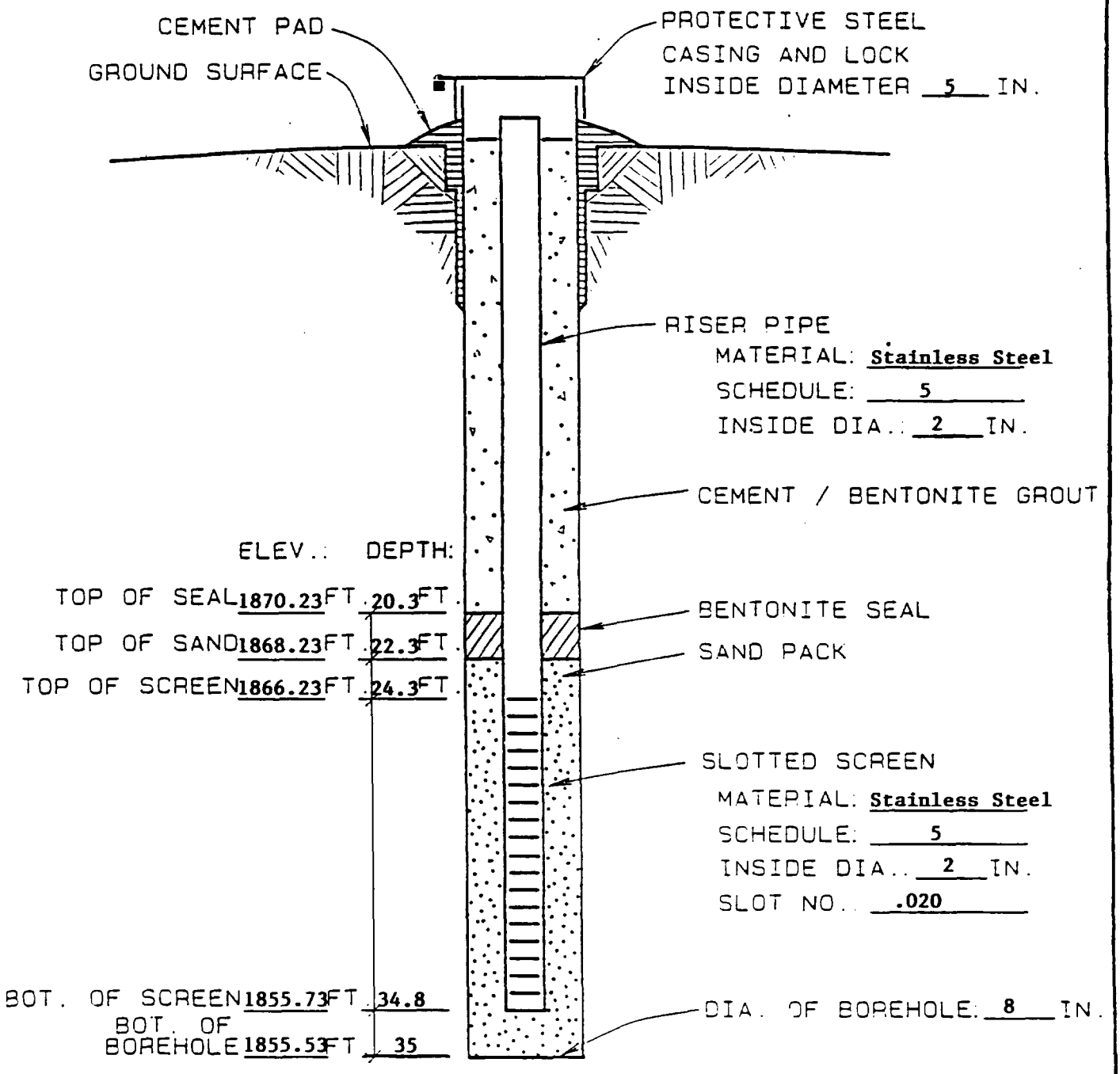
.020 stainless screen 34.5-24'
Gravel pack 35-21.8'
Bentonite 21.8-19.8'
Cement/bentonite grout 19.8-0

2MW11S.KJF

302175

FIGURE

RHRLS
Sidney, New York
MW - 11S



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302176

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-11D Page 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" & HX Core Barrell Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Top of landfill access road, approx. 10' north of MW-11S Ground Elevation: Dates: Started: 10/18/90 Ended: 10/18/90	

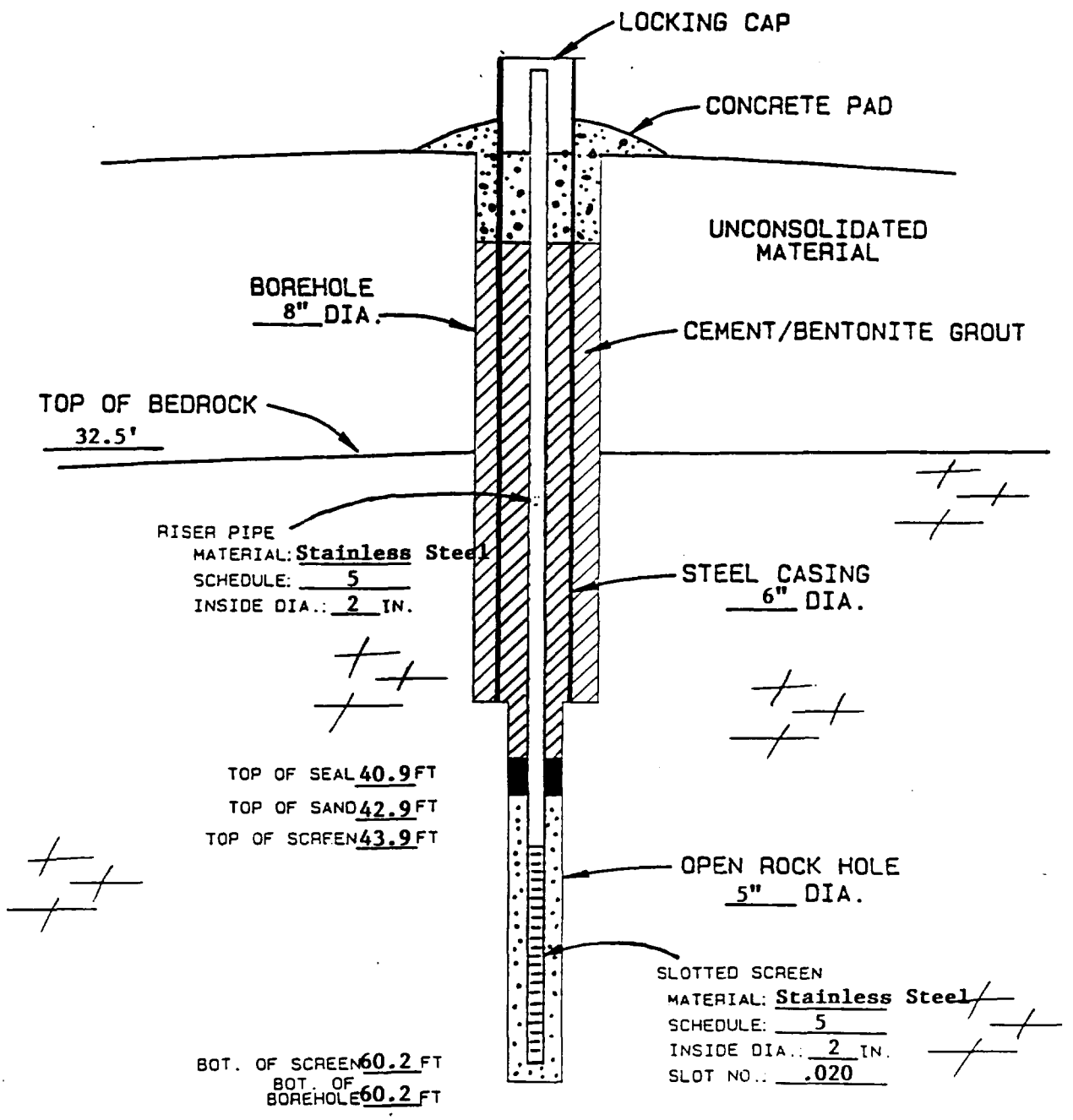
Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks#
						For depths to 32.5 ft. see Log MW-11S						
		32.5'				Top of bedrock						
35												
		35-40'				5' HX core barrell run to verify competent bedrock						
		36.7'				Fracture 37.2-37.5' Weathered zone consisting of green/gray SILT and SANDSTONE fragments, trace brown silt						
						Casing set at 40 ft.						
40		40-45'				Core #1 40-45' 0-0.7' Solid green/gray sandstone 0.7-0.95' Weathered zone with green/gray silt, sandstone and silty shale 0.95-3.6' Numerous fractures, changing to dark green/gray silty shale with golden brown crystalline residue in partings 3.6-4.6' Very fractured, dark gray silty shale, golden crystalline coating in partings						
45		45-50'				Core #2 45-50 ft. 5.25' recovery 0-0.1' Weathered zone of gray silt and clay. Remainder of core is fractured with same crystalline coating Average fractures 2-3"						
50		50-55'				Core #3 50-55 ft. 4.85' recovery 0-0.15' Fractured dark gray shale 0.15-.2' Weathered green/gray sandstone 0.2-0.8' Dark gray shale 0.8-1' Weathered zone filled with gray silt and clay with dark gray shale frags. 1-1.7' Fractured (hor. and vert.) shale 1.7-2.1 As above 2.1-3.85' Remainder of recovery is fractured dark gray shale. Fractures throughout sample have gray and brown silt and clay in partings						
55						Roller bit 55-60'						
						Bottom of boring 60 ft.						

.020 stainless steel screen 60-44'
Gravel pack 60-43'
Bentonite seal 43-41'
Cement/bentonite 41-0

302177 MW11D.KJF

FIGURE

RHRLS
Sidney, New York
MW - 11D



TYPICAL BEDROCK
MONITORING WELL
(NOT TO SCALE)

302178

O'BRIEN & GERE ENGINEERS, INC.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-12 Sheet 1 of 2
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 320' NW of MW-1 Ground Elevation: Dates: Started: 10/19/90 Ended: 10/22/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
0	1	0-2'	1-1-2-8	2'/2'	3	Damp, dark to medium brown, very fine to fine SAND, some silt, little organics (plant stems and roots)					0.2	
	2	2-4'	10-13-	2'/1.8'	31	Moist, brown, very fine SAND, some silt, little medium sand, mottled with light gray medium sand and red brown silt, trace clay					0	
			18-28									
	3	4-6'	12-24-	2'/2'	46	Damp, dark to medium brown, very fine to fine SAND and SILT, some fine gravel, same mottling as above					0	
5			22-21									
	4	6-8'	52-50/0.4	1'/0.3'	—	Dark to medium brown, weathered SANDSTONE, some silt and fine sand, trace fine gravel					0	
	5	8-10'	13-20-	2'/1'	40	Same as 4-6 ft. depth					0	
			20-31									
10	6	10-12'	8-21-	2'/1.1'	47	Same as above, deposits of fine sand, reddish brown clay, mottled appearance					0	
			26-29									
	7	12-14'	30-31-	2'/1'	67	Same as above					0	
			36-30			Boulder 14.5-15.5 ft.						
	8	14-16'	55/0.2'	0.2/0.2'		Same as above with large fragments of medium grained green/brown sandstone					0	
15												
						Boulder 17-17.5 ft.						
20	9	20-22'	9-14-	2'/2'	29	Same as above					0	
			15-23									
25	10	25-27'	21-30-	2'/1.8'	70	Damp, dark brown, very fine to fine SAND, some silt, trace fine gravel, some mottling of dark red/brown silt and clay, light green/gray medium sand, fragments of green/gray sandstone					0	
			40-42									
30	11	30-32'	9-16-	2'/1.8'	38						0	
			22-22									

1MW12.KJF

302179

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-12 Sheet 2 of 2
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 320' NW of MW-1 Ground Elevation: Dates: Started: 10/18/90 Ended: 10/18/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
						Damp, brown, very fine to medium SAND, some silt and fine gravel, little deposits of clay, same intermixed appearance						
35	12	35-37'	24-23-	1.5/1.5'	45	Same as above					1.8	
			22-50/.05			Boulder 36.5-38 ft.						
40	13	40-42'	15-50/0.3	0.9/0.5'	—	Moist, brown to green/gray, fine to medium SAND, little dark brown silt, trace fine gravel, some mottled appearance					0	
						Boulder 40.5-41.5 ft.						
	14	44'	50/0.2'	0.2/0.1'	—	Wet, green/gray weathered medium grained SANDSTONE Bottom of boring 44.0 ft.					0	

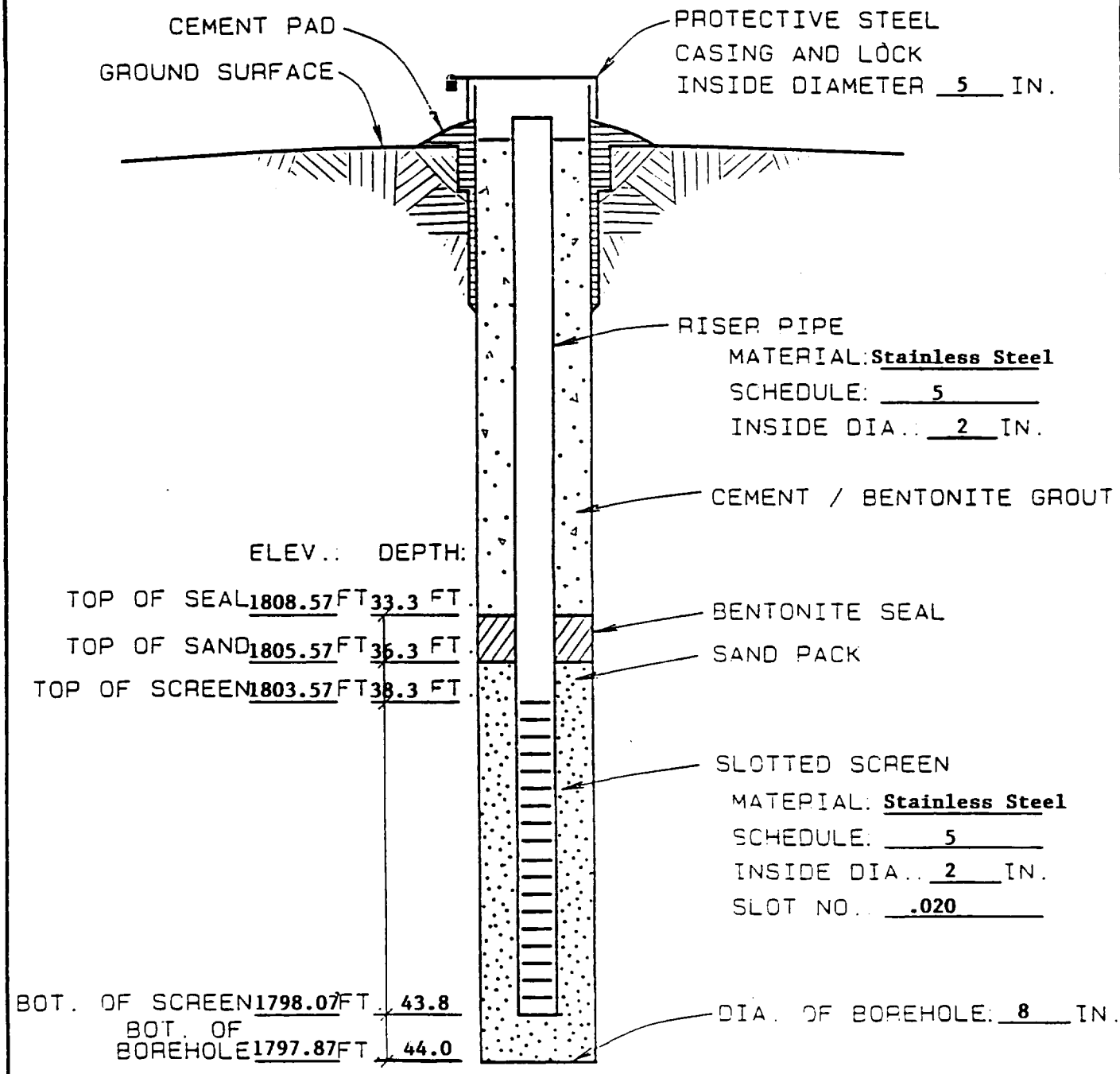
2" ID .020 slot stainless steel screen 43.5-38'
Gravel pack 44-36'
Bentonite slurry 36-33'
Cement/bentonite grout 33-0'

2MW12.KJF

302180

FIGURE

RHRLS
Sidney, New York
MW - 12



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302181

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-13 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 300' Northeast of MW-4 Ground Elevation: Dates: Started: 11/22/90 Ended: 10/22/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	2-9-6-5	2'/0.9'	15	Dark to medium brown, very fine SAND, some silt, little organic debris (plant stems and roots)					0	
	2	2-4'	5-5-5-4	2'/1.2'	10	Damp, dark brown to red/brownish orange, slightly mottled, very fine to fine SAND, some silt, trace clay and fine gravel, trace weathered sandstone fragments					0.4	
	3	4-6'	4-9-18-13	2'/1'	27	Wet, dark brown to golden, fine to medium SAND and SILT, some medium gravel					0	
5						Encountered water 5.5'						
	4	6-8'	4-9-11-23	2'/2'	20	Wet, dark brown, red/brown, golden and green/gray, very fine to fine SILT, little clay, little very fine sand, mottled trace medium gravel					0.2	
	5	8-10'	14-35-	2'/2'	64	Wet, dark brown, red/brown to green/gray, very fine to fine SAND, some silt, little clay, mottled, little medium gravel, frags. of weathered sandstone and red/brown shale					0.3	
			29-43									
10	6	10-12'	22-38-	2'/2'	69	Same as above					0.35	
			31-25									
	7	12-14'	24-37-	2'/1'	63	Wet, mottled constituents as above Bottom 6" weathered green/gray SANDSTONE and dark gray weathered shale					2.4	
			26-25									
	8	14-16'	13-50/0.4	1'/2.6'	---	Wet, red/brown, orange, green/gray SILT and CLAY, little very fine sand, trace fine to medium gravel					5.1	
15												
20	9	20-22'	18-19-	1.1/0.8'	---	Dark to medium brown, very fine SAND and SILT, trace clay, large fragments of dark gray shale					6.5	
			50/0.1									
							21.0'					
						Bottom of boring 21.0 ft.						

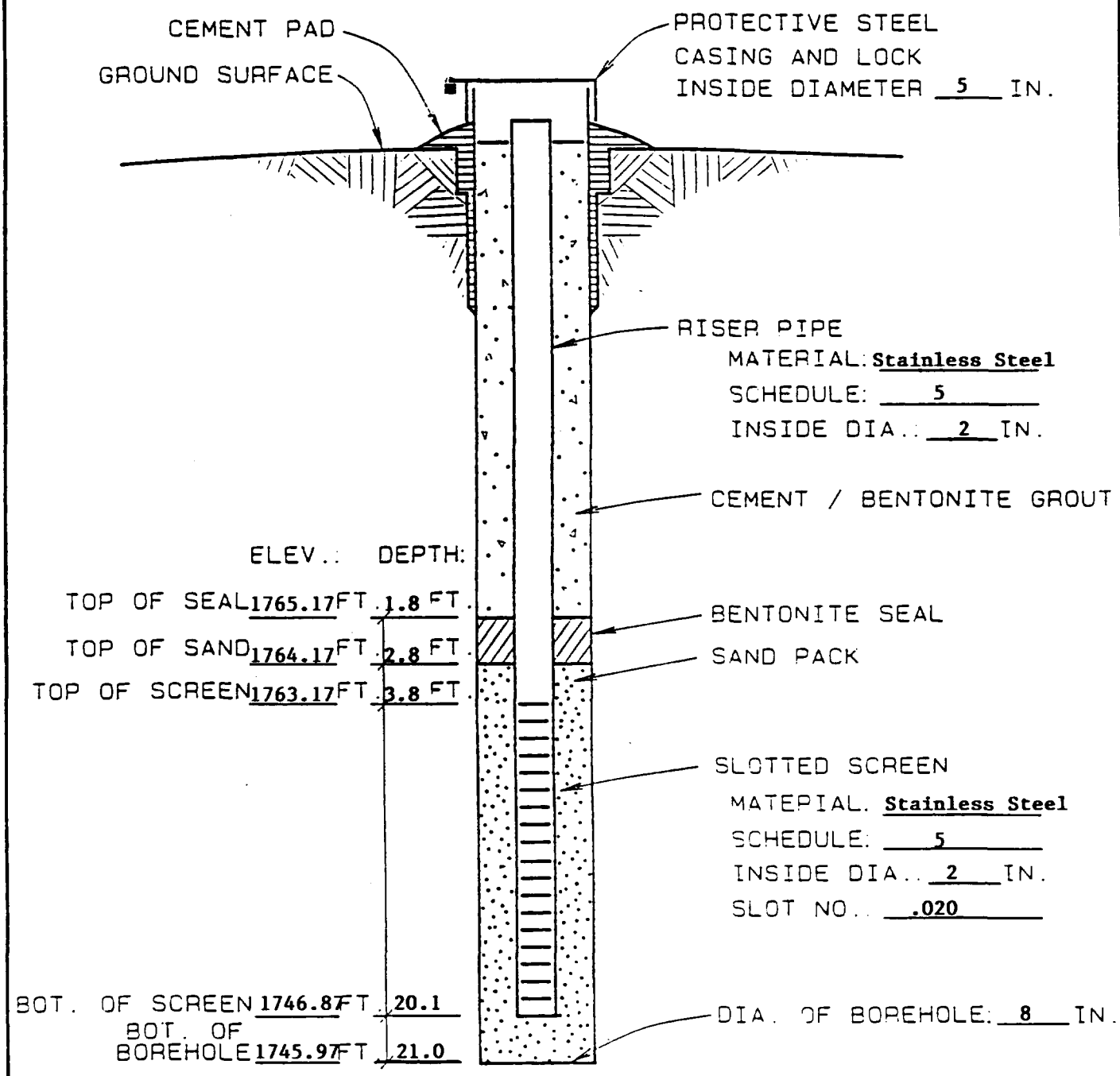
.020 slot stainless steel screen 20-4.0'
Gravel pack 20-3'
Bentonite seal 3-2'
Cement/bentonite grout 2-0

MW13.KJF

302182

FIGURE

RHRLS
Sidney, New York
MW - 13



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302180

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-14 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 320' NW of MW-8 Ground Elevation: Dates: Started: 11/23/90 Ended: 11/23/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
0	1	0-2'	3-2-15-26	2'/1'	17	Moist, medium brown SILT, trace red/brown clay, trace medium gravel, trace organics (plant stems, roots)					3.0	
	2	2-4'	39-43-	1.8/1.8'	85	Damp, dark brown to medium brown, very fine SAND and SILT, trace clay, large fragments of greenish gray sandstone and dark gray and red/brown shale fragments					1.4	
			42-50/0.4									
	3	4-6'	29-52/4	1'/1'	---	Same as above					1.4	
5						Boulder 6-7.5 ft.						
	4	6-8'	31-48-	1.5'/1'	80	Damp, dark red/brown SHALE and green brown, weathered SANDSTONE, trace silt and clay					0.6	
			32-50/0									
	5	8-10'	14-31-	2'/1.2'	75	Damp, medium brown SILT, little clay, large fragments of green/brown to gray sandstone and red/brown shale					0.5	
			44-36									
10	6	10-12'	13-19-	2'/2'	38	Wet, dark to medium brown, very fine to medium SAND, some silt, trace clay, little fine to medium gravel, mottled					1.4	
			19-25			Water encountered 11.0 ft.						
	7	12-14'	33-32-	2'/1'	60	Same as above with little clay					0.8	
			28-44									
	8	14-16'	18-24-	1.4/0.8'	---	Same as above					0.3	
15			50/0.4									
20	9	20-22'	60/0.3'	0.3/0.3'	---	Wet, medium brown SILT, some clay, little very fine to fine sand, large fragments of green gray sandstone					0.4	
						Bottom of boring 20.5 ft.	20.5'					

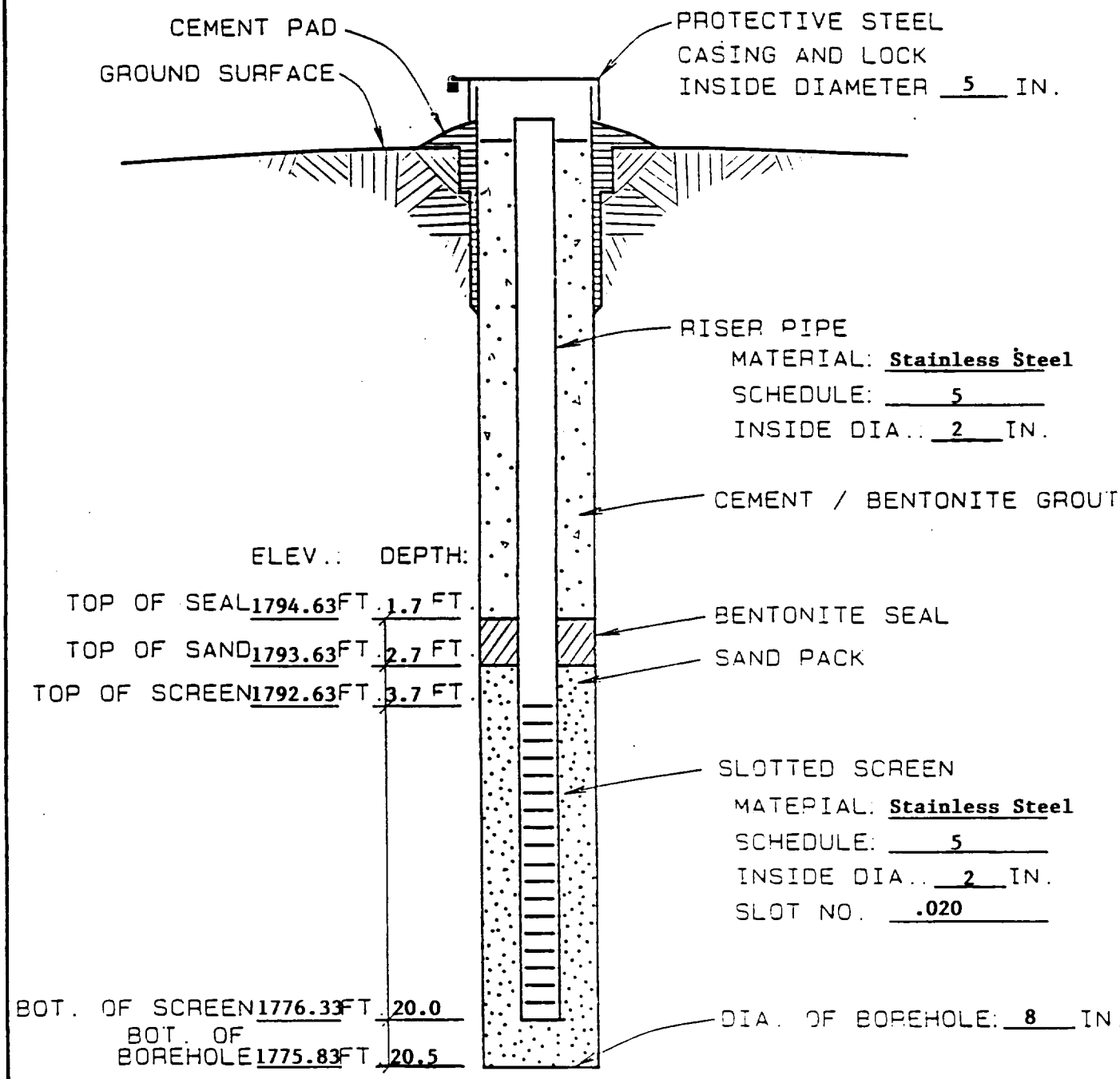
Screen 20-4.0'
Gravel 20.5-3'
Bentonite 3-2'
Grout 2-0

MW14.KJF

302184

FIGURE

RHRLS
Sidney, New York
MW - 14



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302185

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-15 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Rowa	Boring Location: Approx. 220' North of MW-10 Ground Elevation: Dates: Started: 10/23/90 Ended: 10/23/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	1-2-3-9	2'/1'	5	Moist, medium brown, very fine to fine SAND some silt, trace clay and fine gravel, little organic debris (plant stems, roots)					0.1	
	2	2-4'	8-17-	2'/1.2'	45	Moist, medium brown, very fine to fine SAND and SILT, trace clay, trace fine to medium gravel, fragments of red/brown shale and green/gray sandstone					0.3	
			28-22									
	3	4-6'	17-21-	2'/1.5'	52	Same as above, more gravel and sandstone					0	
5			31-42									
	4	6-8'	24-25-	1.4'/1'	---	Damp, dark to medium brown SILT, little clay, trace very fine sand and fine to medium gravel					0.4	
			50/0.4									
	5	8-10'	23-25-	2'/1.5'	44	Damp, medium brown, very fine to fine SAND, little silt, trace clay, mostly fragments of green/gray to brown medium grained SANDSTONE and red/brown silty shale					0.3	
			19-21									
10	6	10-12'	15-21-	2'/1'	38	Damp, dark to medium brown and red/brown, very fine to fine SAND and SILT, some rock fragments of sandstone, unconsolidated constituents have a mottled appearance					1.8	
			17-13									
	7	12-14'	17-16-	1.1'/1'	---	Water encountered 13.0'. Boulder 13.1-14.8'						
			50/0.1			Wet, mottled, dark to medium brown, very fine to medium SAND, little dark red/brown silt, trace clay and fine gravel and rock					0.4	
	8	14-16'	31-50/0.3	0.9/0.4'	---	Wet, dark to medium brown, very fine to fine SAND and SILT, little clay, trace fine gravel, mottled					0.5	
15												
20	9	20-22'	30-50/0.4	1'/1'	---	Same with large fragments of dark gray weathered shale					0.6	
	10	24-26'	59/0.4'	0.4/0.3'	---	Same as above	24.5'				1.5	
25						Bottom of boring 24.5 ft.						

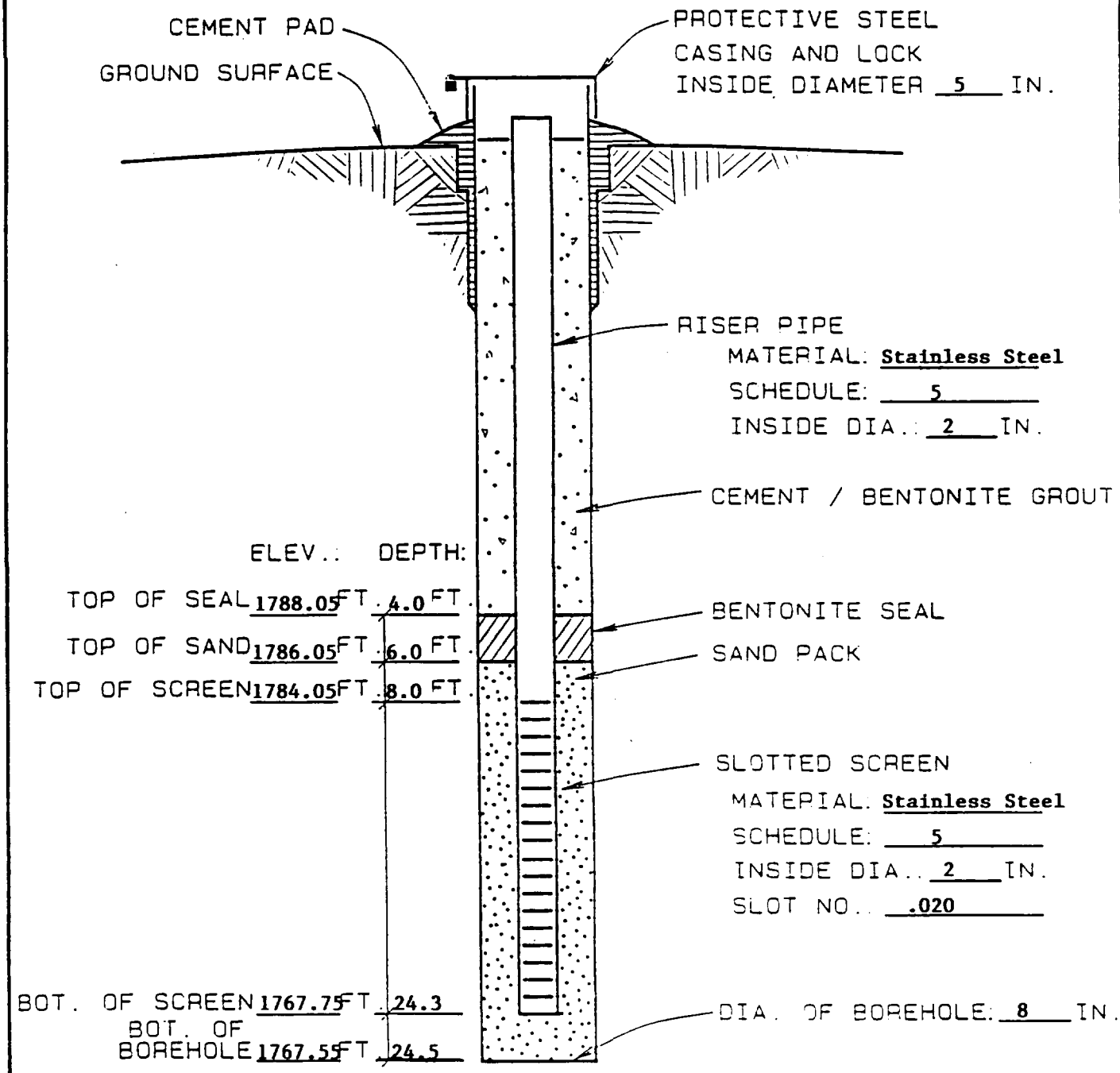
Screen 24-8'
Gravel 24.5-6'
Bentonite 6-4'
Cement/bentonite grout 4-0

MW15.KJF

302180

FIGURE

RHRLS
Sidney, New York
MW - 15



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302187

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-16 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 270' South East of MW-8 Ground Elevation: Dates: Started: 10/24/90 Ended: 10/24/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	3-5-17-6	2'/1.4'	22	Moist, dark to medium brown, very fine to fine SAND and SILT, some medium to coarse gravel, trace clay, trace organics (plant stems, roots)					0.4	
	2	2-4'	13-17-18-32	2'/1.5'	35	Same with large fragments of green/gray sandstone Water encountered 3.7 ft.					1.6	
5	3	4-6'	11-29-39-43	2'/1.8'	68	Wet, dark brown, very fine to fine SAND and SILT, trace clay, fragments of green/brown sandstone and dark red/brown shale					0	
	4	6-8'	54/0.2'	0.2/0.2'	---	Greenish gray fragments of SANDSTONE					0	
	5	8-10'	12-19-21-14	2'/1'	40	Wet, dark to medium brown, very fine to fine SAND and SILT, little fine to medium gravel, trace red/brown clay, mottled					0	
10	6	10-12'	11-15-13-16	2'/0.6'	28	Same as above					0	
	7	12-14'	7-9-13-12	2'/0.5'	22	Same as above with a 3" layer of dark gray weatherd siltstone					0	
15	8	14-16'	14-55/0.3	0.9/0.3'	---	Wet, fragments of dark gray weathered SILTSTONE, trace brown silt and very fine sand					0.2	
20	9	20-22'	50/0.2'	0.2/0.2'	---	Wet, dark red/brown weathered silty SHALE Bottom of boring 20.0 ft.	20.0'				0.1	

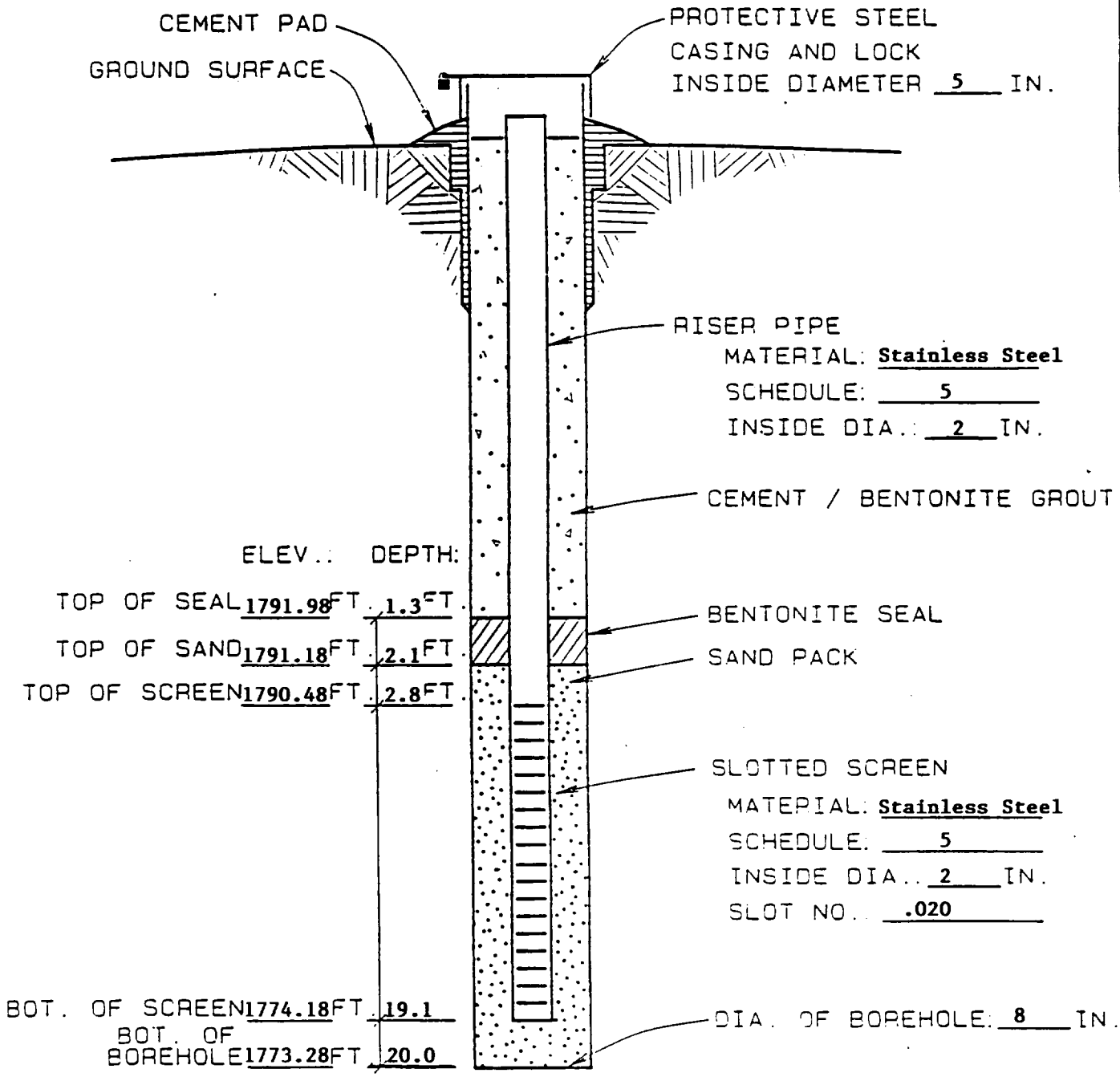
.020 slot stainless screen 19-3.0'
Gravel pack 20-2.3'
Bentonite 2.3-1.5'
Cement/grout 1.5-0

MW16.KJF

302188

FIGURE

RHRLS
Sidney, New York
MW - 16



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302189

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-17 Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 340' West of MW-6 Ground Elevation: Dates: Started: 10/24/90 Ended: 10/24/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks*
0	1	0-2'	5-12-	2'/1.1'	23	Damp, dark to medium brown, very fine SAND and SILT, little fine to medium gravel, little clay, trace organics (plant stems, roots), fragments of green/gray sandstone					1.2	
			11-10									
	2	2-4'	12-19-	2'/0.7'	40	Same with large sandstone fragments, trace red/brown weathered shale					0	
			21-13									
	3	4-6'	8-9-10-15	2'/1'	19	Moist, dark to medium brown, very fine to fine SAND and SILT, little clay, little very fine to fine gravel					0	
5												
	4	6-8'	13-16-	2'/1'	33	Damp, olive green SILT and CLAY, some fine gravel, fragments of dark green brown sandstone					0.4	
			17-24									
	5	8-10'	13-14-	2'/0.8'	33	Damp, dark to medium red brown, olive green very fine SAND and SILT, some clay, little fine gravel					1.5	
			19-17									
10	6	10-12'	14-20-	2'/0.9'	34	Same as above					0.2	
			14-15									
	7	12-14'	11-10-	2'/1'	23	Moist, dark to medium brown, very fine SAND and SILT, some dark red brown clay, little fine gravel					1.0	
			13-12									
	8	14-16'	15-22-	2'/0.8'	46	Same as above						
15			24-32									
20	9	20-22'	21-32-	1.8/0.8'	66	Damp, brown, very fine SAND and SILT, trace dark red brown clay, trace fine gravel					0.5	
			34-50/0.3									
						Boulder 24-25.5'						
25	10	25-27'	50/0.1'	0.1/0.1'	---	Large fragments of green/gray medium grained SANDSTONE						
30	11	30-32'	50/0.2'	0.2'/0	---	Same as above, small						

Screen 33.3-28.1'
Gravel 33.5-26'
Bentonite 26-24'
Cement/bentonite grout 24-0

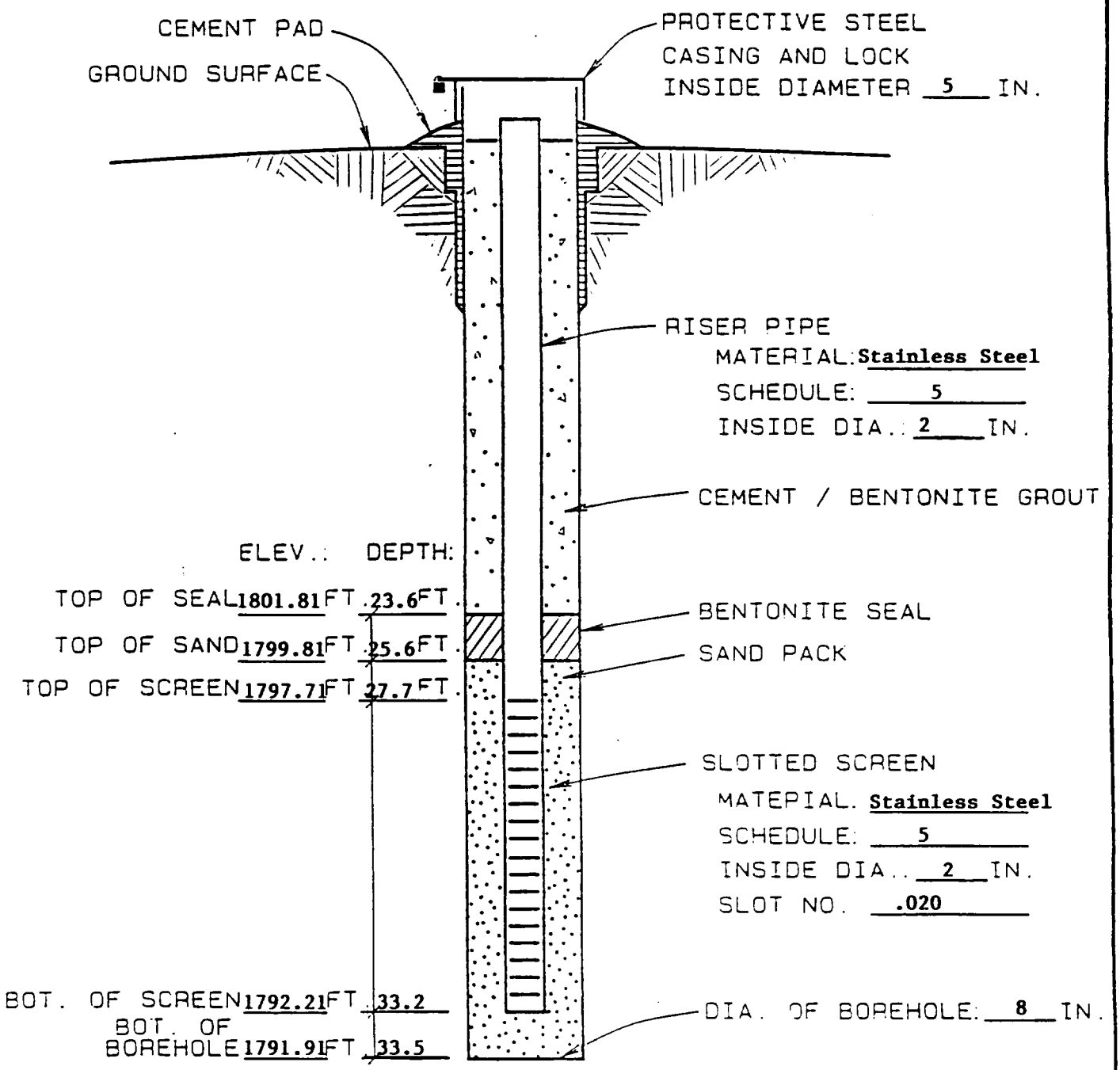
Water encountered at 32.0 ft.
Bottom of boring 33.5 ft.

MW17.KJF

302190

FIGURE

RHRLS
Sidney, New York
MW - 17



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302191

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-18s Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 350' North of MW-7 Ground Elevation: Dates: Started: 10/25/90 Ended: 10/25/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks
0	1	0-2'	6-8-16-20	2'/1.2'	24	Moist, gray brown to dark red brown SILT and CLAY, the medium to golden brown, fine to medium SAND, small fragments of green gray sandstone					3.2	
	2	2-4'	12-11-	2'/0.7'	21	Damp, dark to medium brown, very fine to fine SAND and SILT, some clay, trace fine gravel					0.25	
			10-10									
	3	4-6'	8-15-	2'/1'	39	Same, but wet, more green-gray sandstone					0	
5			24-26			Water encounterd 5.5 ft.						
	4	6-8'	15-20-	2'/0.8'	42	Moist to wet, dark to medium brown, very fine to fine SAND and SILT, little dark red brown clay, little medium to coarse gravel					0.4	
			22-18									
	5	8-10'	15-16-	2'/0.8'	39	Same with large fragments (1-2") of green gray sandstone					0.7	
			23-26									
10	6	10-12'	8-14-8-9	2'/0.5'	22	Wet, dark red-brown SILT and CLAY, some medium brown fine sand, little medium to coarse gravel					1.0	
	7	12-14'	18-12-	2'/0.5'	26	Same as above					0.5	
			14-15									
	8	14-16'	50/0.7'	0.7/0.6'	---	Wet, dark red-brown SILT and CLAY, some mottled shale					0.52	
15												
							20.0'					
20	9	20-22'	34-50/0.2	0.2/0.1'	---	Green gray fragments of weathered SANDSTONE					0.8	
						Bottom of boring 20.0 ft.						

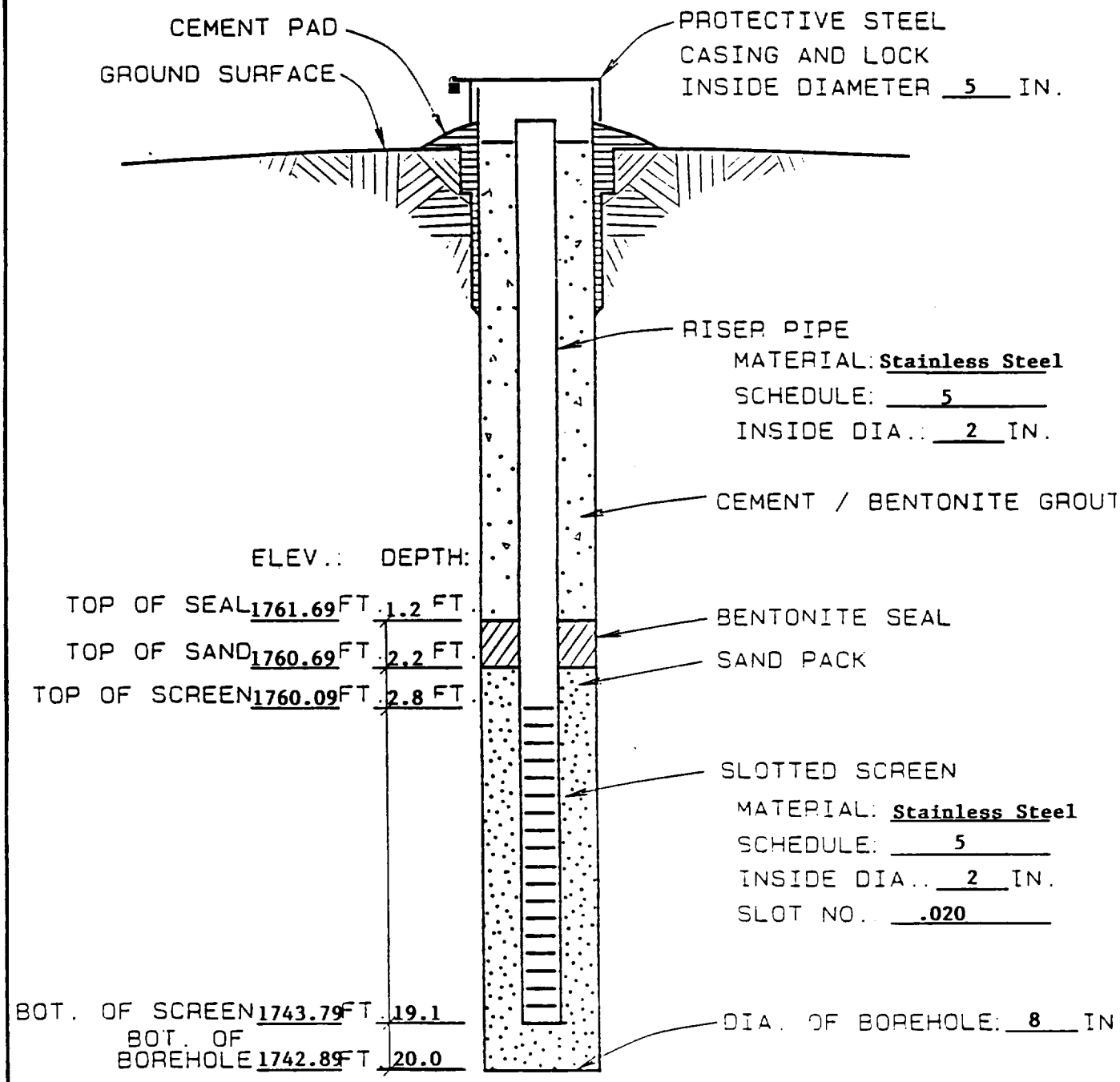
.020. slot stainless steel screen 19.1-3.1'
Gravel pack 3.1-2.5'
Bentonite seal 2.5-1.5'
Cement/Bentonite grout 1.5-0

MW18S.KJF

302192

FIGURE

RHRLS
Sidney, New York
MW - 18S



TYPICAL OVERBURDEN MONITORING WELL

N.T.S.

302193

O'BRIEN & GERE

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	Report of Boring No. MW-18D Sheet 1 of 1
Project Location: RHRLS Client: Amphenol Corporation Sidney, New York	SAMPLER Type: Split Spoon 3" Hammer: 140 lbs. Fall: 30"	Ground Water Depth Date Depth Date File No.: 3729.013.576
Boring Co.: Parratt Wolff, Inc. Foreman: Glenn Lansing OBG Geologist: Mark J. Roma	Boring Location: Approx. 340' North of MW-7 Ground Elevation: Dates: Started: 10/29/90 Ended: 11/1/90	

Depth	Sample No	Sample Depth	Blows /6"	Penetr/ Recovry	"N" Value	Sample Description	Stratum Change General Descript	Equipment Installed	Field Testing pH	Sp Cond	HNU	Rmks#
						For depths to 20 ft. See Log MW 18S						
25		25-27'	50/0.5'	0.5'/0	---	Small chips of green gray SANDSTONE						
30						Core barrel 25-30' 0.55-1 Fractured zones with brown SILT in partings 1.95 Fracture with gold/brown crystalline substance 1.95-5 Green gray SANDSTONE Casing set at 30 ft.						
35												
40												
45												
50						Roller bit to 50.0 ft. Bottom of boring 50.2 ft.	50.2'					

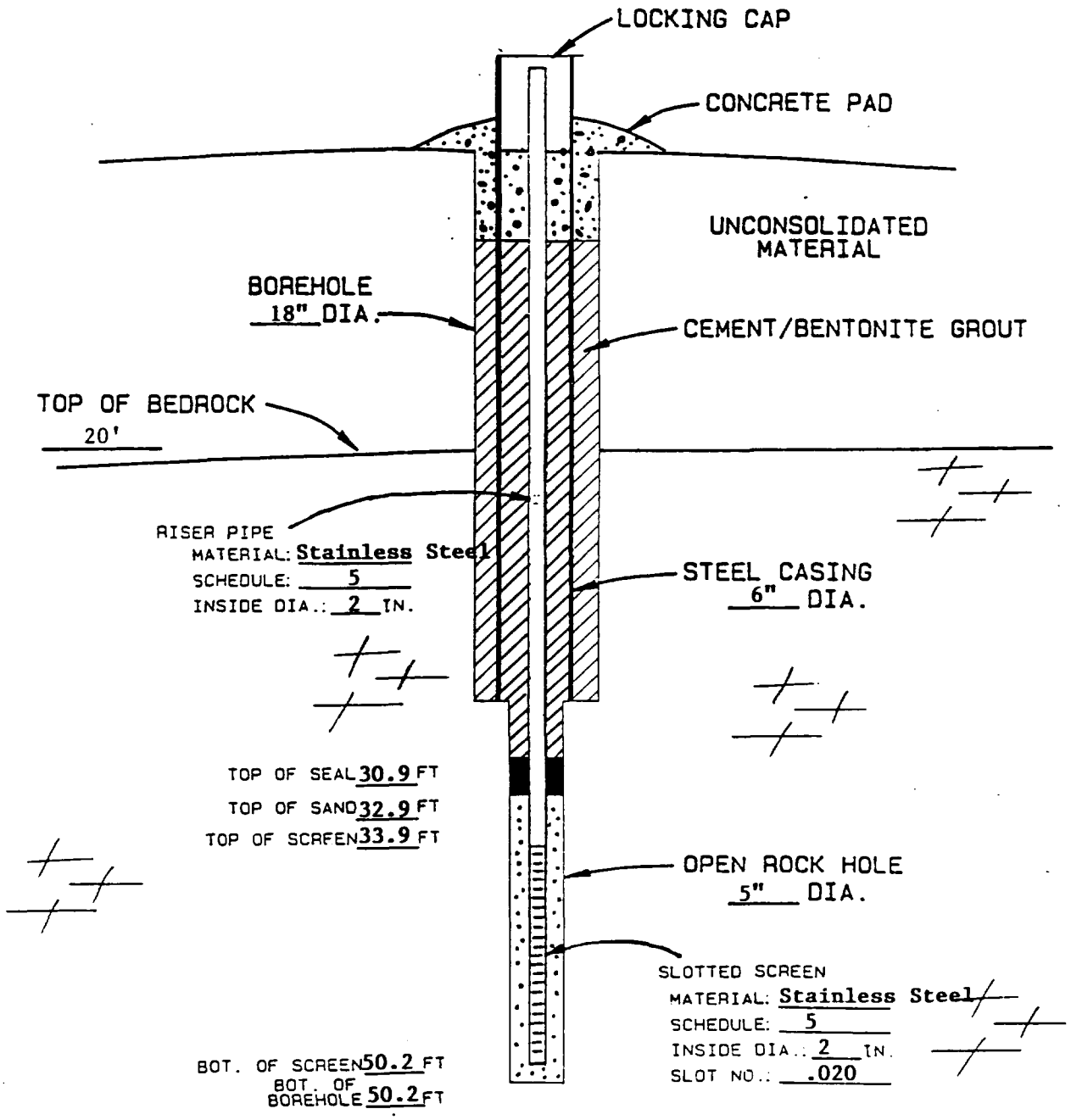
.020 slot stainless steel screen 50-34'
Gravel 50.2-33'
Bentonite 33-31'
Cement/Bentonite grout 31-0

MW18D.KJF

302194

FIGURE

RHRLS
Sidney, New York
MW - 18D



TYPICAL BEDROCK
MONITORING WELL
(NOT TO SCALE)

302195

O'BRIEN & GERE ENGINEERS, INC.

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-18DD
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 1 of 3
Location:		
Proj. Loc: Sidney, New York	Hammer: NA	Start Date: 1/18/95
File No.: 3729.031	Fall: NA	End Date: 1/31/95
Boring Company: Parratt-Wolff		Screen / Riser
Foreman: Ron Bush		Grout / Sand Pack / Bentonite
OBG Geologist: DJ Carnevale		

Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing
0									
60	1	60-63.5	70%	3.4/3.5	01/18/95 Run #1	Dark greenish gray (5GY 4/1) fine grained SANDSTONE, fracture from 60.75 to 61.0 ft., 61.9 to 62.1 ft., oxidation in fractures, fine to medium rock embedded in sandstone (conglomerate).			
63.5	2	63.5-68.5	86%	5.0/5.0	01/18/95 Run #2	Grayish black (N2), SHALE broken fracture at approximately 64.0 ft., SHALE to approximately 64.1 ft., to dark greenish gray (5GY 4/1) fine grain sandstone matrix conglomerate, fracture at approximately 64.4 ft., clay/lined, fracture at approximately 64.4 .8 ft coal and pyrite/lined fracture at approximately 67.5 ft., coal and pyrite/lined, 67.5 to 68.5 ft., coal with pyrite rims noted on outside of core.			
68.5	3	68.5-73.5	78%	4.8/5.0	01/18/95 Run #3	Dark greenish gray (5GY 4/1), fine grained SANDSTONE, vertical clay lined fracture at approximately 69.0 to 69.3 ft., grayish black (N2), coal seams very thin to 73.5 ft.			
73.5	4	73.5-78.5	95%	5.0/5.0	01/18/95 Run #4	Medium dark gray (N4) fine gray SANDSTONE to approximately 77.5 ft., some medium clasts of pyritized black organics (coal?), clay lined fractures at approximately 74.1, 75.2 and 75.8 ft., grayish black (N2) SILTSTONE to 78.5 ft.,			
78.5	5	78.5-83.5	92%	4.9/5.0	01/19/95 Run #5	Medium dark gray (N4), fine grained SANDSTONE to approximately 80.6 ft., to grayish black (N2) SILTSTONE at 80.9 ft., fractured siltstone fragments, perpendicular to core axis, siltstone to 81.0 ft., to medium gray (N5), fine grained sandstone, fracture with iron oxidation at approximately 45.0 ft. from core axis at approximately 81.4 ft.			
83.5	6	83.5-88.5	99%	5.0/5.0	01/19/95 Run #6	Medium dark gray (N4) fine grained SANDSTONE to approximately 86.9 ft., break at 86.1 ft. with coal lining, grayish black (N2) SILTSTONE (fractured) from 86.9 to 87.05 ft., SANDSTONE as above to 88.5 ft., some entrained black organic (coal?) fragments.			
88.5	7	88.5-93.5	100%	5.0/5.0	01/19/95 Run #7	Dark gray (N6) fine grained SANDSTONE with black clasts fracture at approximately 91.0 ft., with oxidation in break.			

302196

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-18DD
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 2 of 3
Proj. Loc: Sidney, New York	Hammer: NA	Location:
File No.: 3729.031	Fall: NA	Start Date: 1/18/95 End Date: 1/31/95

Boring Company: Parratt-Wolff
Foreman: Ron Bush
OBG Geologist: DJ Carnevale

Screen / Riser — Grout / Sand Pack / Bentonite

Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed		Field Testing	
93.5	8	93.5-98.5	83%	4.6/5.0	01/19/95	Medium dark gray (N4) fine grained SANDSTONE					
					Run #8	to 98.5 ft., clay lined fracture at					
						approximately 95.2 ft., fractures at 95.4 and					
						95.8 ft. contain pyrite, fractures at 96.0					
						and 96.2 ft. are oriented at approximately					
						45 degrees from core axis and contain brown					
						silt and pyrite. Black organics throughout					
						run within sandstone.					
100	9	100-105	83%	4.9/5.0	01/26/95	Medium dark gray (N4) fine grained sandstone,					
					Run #9	fracture at approximately 100.6 ft. at					
						approximately 45 degrees to core axis,					
						pyrite, coal and reddish brown silt line					
						fracture, fractures at 102.1, 102.4, 102.6,					
						103.1 and 103.9 ft., containing coal along					
						breaks, 102.1 to 103.1 ft. contains clasts of					
						shale.					
105	10	105-105.5	NA	0.5/0.5	01/26/95	Core blacked in barrel, fine grained					
					Run #10	SANDSTONE.					
105.5	11	105.5-110	87%	4.5/4.5	01/27/95	Water producing fracture at approximately					
					Run #11	108.0 ft. noted during drilling, 105.5 ft.					
						oxidized breaks, medium dark gray (N4) fine					
						grain SANDSTONE with fine to medium pale					
						yellowish brown (10YR 6/2) clay clasts to					
						approximately 107.3 ft., to fine grained					
						sandstone with dark gray (N3) organic silt					
						clasts, dark gray shale at 108.0 to 108.2 ft.					
110	12	110-115	100%	5.2/5.2	01/27/95	Dark greenish gray (5GY 4/1) fine grained					
					Run #12	sandstone to 120.0 ft. with few clay clasts,					
						1 break at approximately 114.3 ft. along clay					
						clast.					
115	13	115-120	80%	4.9/5.0	01/27/95	Grayish black (N2) MUDSTONE/SHALE to					
					Run #13	approximately 115.2 ft., to dark greenish					
						gray (5GY 4/1) SANDSTONE to approximately					
						115.6 ft., to MUDSTONE to 116.0 to					
						SANDSTONE to 117.1 ft. with very thin seams					
						of mudstone, MUDSTONE to approximately 118.					
						ft., SANDSTONE to 120.0 ft., fractured at					
						115.0 to 115.2, 115.7 to 115.9, 117.2 to					
						118.4, and 118.9 ft.					
120	14	120-125	69%	4.3/5.0	01/30/95	Dark greenish gray, fine grained SANDSTONE to					
					Run #14	approximately 121.75 ft., to grayish black					
						(N2) SHALE/MUDSTONE to approximately 123.0					
						ft., SANDSTONE to approximately 125.0 ft.					
						with thin seam of mudstone at approximately					
						123.4 to 123.5 ft., fractures at 122.1 to					
						122.3 ft., 122.8 to 123.8 ft., mainly at					
						contact of mudstone and sandstone or within					
						mudstone.					

302197

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-18DD
Client: Amphenol Corporation/RHRMLS	Sampler: NX Core	Page 3 of 3
Proj. Loc: Sidney, New York	Hammer: NA	Location:
File No.: 3729.031	Fall: NA	Start Date: 1/18/95 End Date: 1/31/95

Boring Company: Parratt-Wolff
Foreman: Ron Bush
OBG Geologist: DJ Carnevale

Screen / Riser — Grout / Sand Pack / Bentonite

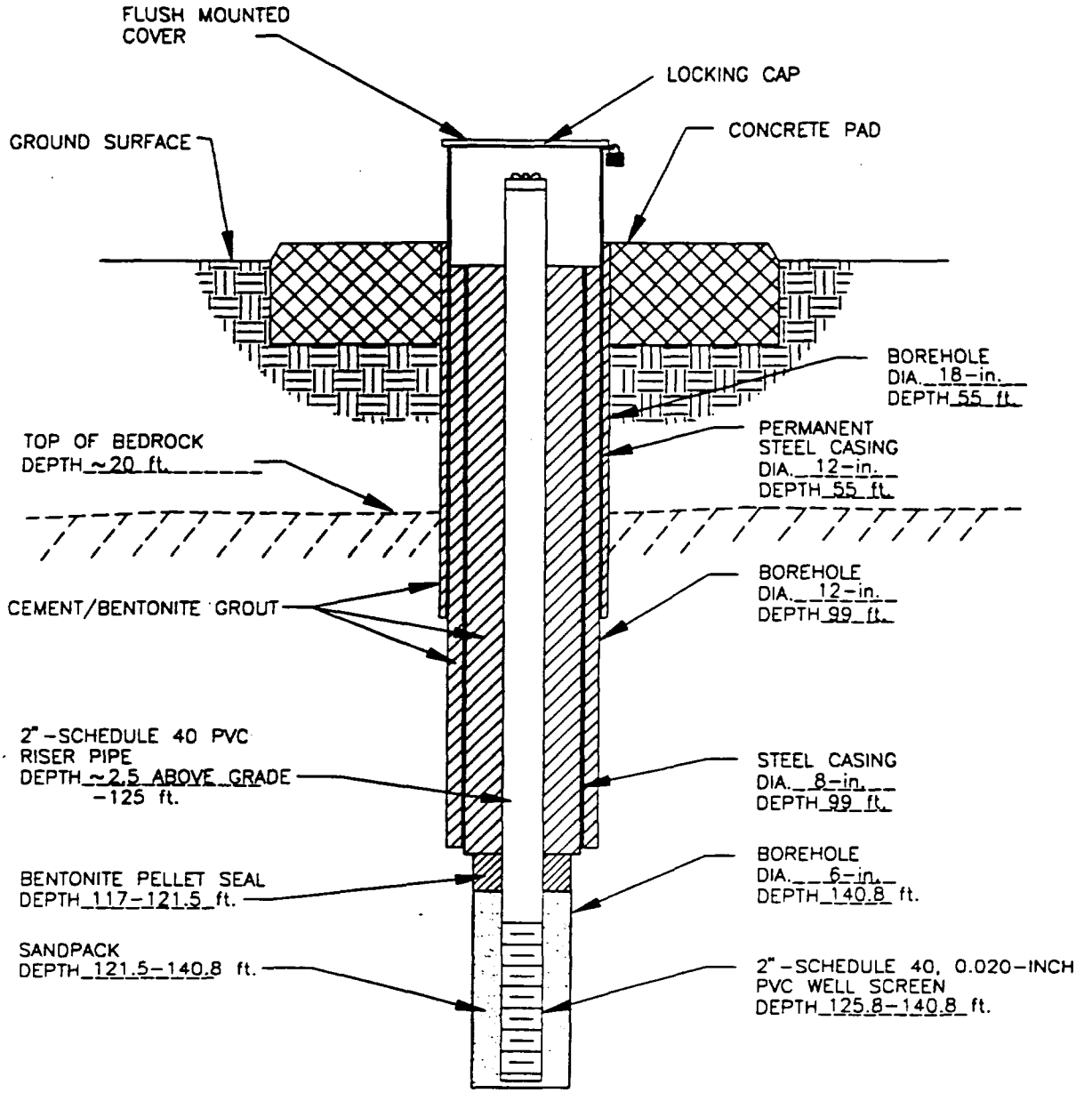
Depth Below Grade	No.	Depth (feet)	RQD	Penetr/ Recovery	Date	Sample Description	Stratum Change General Descript	Equip. Installed	Field Testing
125	15	125-130	79%	5.0/5.0	01/31/95	Grayish black (N2) MUDSTONE to 128.9 ft., to			
					Run #15	SANDSTONE to 130.0 ft., fractured from 125.2			
						to 125.6 ft., 126.0 to 126.2 ft., 127.3,			
						127.7, 128.6, and 128.8 ft., sandstone has			
						few small clasts of tan shale.			
130	16	130-135	97%	5.1/5.1	01/30/95	Dark greenish gray (5GY 4/1) fine grained			
					Run #16	SANDSTONE to 135.0 ft., fractured at 130.2			
						and 131.5 ft.			
135	17	135-140	95%	5.1/5.1	01/31/95	Dark greenish gray (5GY 4/1) fine grained			
					Rune #17	SANDSTONE to 140.0 ft., fractured at			
						approximately 136.0, 136.4, 137.5 ft. with			
						olive brown silt lining, 139.0, 139.5, 139.9 ft.			
140									
						Bottom of boring at 140.4 ft.			

Well completion: .0.020-in. screen 140.4 to 125.4 ft., sandpack 140.7 to 121.5 ft., bentonite 121.5 to 117.3 ft.

302198

FIGURE

MW-18DD



SUPPLEMENTAL REMEDIAL INVESTIGATION
RHRMLS
SIDNEY, NEW YORK

DEEP BEDROCK MONITORING WELL DIAGRAM

NOT TO SCALE

302199

FILE NO. 3729.031-

O'BRIEN & GERE

Feb/25/95

LAYERS- ALL ON

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-19 PAGE 1 OF 2
CLIENT: Amphenol Corporation	SAMPLER: Split Spoon, Automated	LOCATION: 131' SW of spring house
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site FILE NO.: 3729.015	HAMMER: 140 lbs FALL: 30"	START DATE: 12/5/91 END DATE: 12/5/91
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING HNu (ppm)
0	1	0-2	3-5-	2'/1'	19	Damp SOD to	0.2'		0
			14-16			Damp, brown-red CLAY and SILT to	0.5'		
1						Dry, gray DIAMICTON, GRAVEL with sand, little silt, trace clay, massive, clast supported			
2	2	2-4	5/0.2'	0.2'/0'	NA				NA
						Boulder at 2-3 ft.			
3							Overall Distribution 2-12 ft. 60% gravel 30% silt 7% clay 3% sand		
4	3	4-6	16-21-	2'/1.6'	47	Dry, red-brown SILT and CLAY with subround to angular, coarse to fine gravel, matrix supported			0
			26-23						
5									
6	4	6-8	16-20-	2'/1.1'	45	Dry, as above, gravel weathered gray Arkose, siltstone and gray sandstone, littl coarse to fine sand			0
			25-19						
7									
8	5	8-10	5-18-	1.4'/1'	18	Dry, as above, some purple clay			0
			50/0.4'						
9									
10	6	10-12	32-27-	2'/1.3'	60	Dry, as above, matrix red, gravel gray-green, tends toward subround			0
			33-25						
11									
12	7	12-14	18-19-	2'/1.5'	44	Dry, as above (more sand), most gravel fine to medium fine	Increased sand after 12 ft.		0
			25-31						
13									
14	8	14-16	14-24-	2'/1.4'	45	Dry, as above			0
			21-12						
15									
16	9	16-18	20-22-	2'/1.6'	46	Dry, as above (no odor/stain)			0
			24-21						
17									
18	10	18-20	15-31-	2'/1.7'	62	Damp, as above			0
			31-22						
19									

302200

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING MW-19 PAGE 2 OF 2
CLIENT: Amphenol Corporation	SAMPLER: Split Spoon, Automated	LOCATION: 131' SW of spring house
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site	HAMMER: 140 lbs	START DATE: 12/5/91 END DATE: 12/5/91
FILE NO.: 3729.015	FALL: 30"	
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING HNu (ppm)
20	11	20-22	30-19-	2'/1.7'	39	Damp, as above (faceted, medium pebbles)			0
			20-14						
21									
22	12	22-24	28-27-	2'/1.8'	56	Moist, as above (gray precipitate in fractures)			0
			29-21						
23									
24	13	24-26	43-25-	1.4'/1.4'	25	Saturated, as above			0
			65/0.4'						
25									
26	14	26-28	70-	0.7'/0.7'	70	Damp/saturated, red-dark red diamicton, GRA-			0
			50/0.2'			VEL ~60%, coarse to fine, A-axis horizontal,			
27						sand ~20%, coarse to fine, red and brown silt			
						~10%, red clay ~10% (FeO in fractures)			
28	15	28-30	48-	0.7'/0.7'	48	As above (Diamicton, massive, matrix supported)			0
			50/0.2'						
29									
30	16	30-32	20-47-	1.4'/1.1'	47	As above with increased proportion of clay			0
			50/0.4'			and silt and increasing black and green gravel			
31									
32	17	32-34	50/0.3'	0.3'/0.3'	50	As above			0
33									
34	18	34-36	31-54-	1.3'/1'	54	As above			0
			50/0.3'						
35									
36	19	36-38	44-17-	1.3'/1'	17	As above with increasing weathered red shale			0
			50/0.3'						
37									
38	20	38-40	50/0.2'	0.2'/0.2'	50	As above			0
39									
40	21	40-40.8	27-	0.8'/	27	Weathered, green SANDSTONE to	40.3'		0
			70/0.3'			Weathered, red SHALE			
41						Bottom of boring 40.8 ft.			
42									

302201

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING Test Well #1 PAGE 1 OF 1
CLIENT: Amphenol Corporation	SAMPLER: Cuttings Analyses	LOCATION:
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site FILE NO.: 3729.015	HAMMER: FALL:	START DATE: 12/12/91 END DATE: 12/13/91
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0	1	0-13				Dry, brown-gray coarse to fine, subround GRAVEL with sand and silt and little clay, facets and striations common				
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13	2	13-15				Saturated, brown GRAVEL with silt and clay, some sand				
14										
15						Dry, red-brown SHALE bedrock				
16										
17										
18										
19										
20										

302202

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING Test Well #2 PAGE 1 OF 2
CLIENT: Amphenol Corporation PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site FILE NO.: 3729.015	SAMPLER: Cuttings Analyses HAMMER: FALL:	LOCATION: W side of Richardson Hill Rd. START DATE: 12/18/91 END DATE: 12/19/91
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0	1	0-14				Dry, light brown GRAVEL with coarse to fine sand, little silt, trace clay				
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14	2	14-31				Damp to moist GRAVEL with silt, sand and clay				
15										
16										
17										
18										
19										

302203

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING Test Well #2 PAGE 2 OF 2
CLIENT: Amphenol Corporation	SAMPLER: Cuttings Analyses	LOCATION: W side of Richardson Hill Rd.
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site FILE NO.: 3729.015	HAMMER: FALL:	START DATE: 12/18/91 END DATE: 12/19/91
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
20										
21										
22										
23										
24										
25										
26										
27										
28										
29										
30										
31	3	31-34				Moist, brown-red brown GRAVEL with silt, sand and clay				
32										
33										
34						BEDROCK				
						Brown-red brown SHALE				
35										
36										
37										
38										
39										
40										

302204

O'BRIEN & GERE ENGINEERS, INC.	TEST BORING LOG	REPORT OF BORING Test Well #3 PAGE 1 OF 1
CLIENT: Amphenol Corporation	SAMPLER: Cuttings Analyses	LOCATION:
PROJECT LOCATION: Sidney, New York Richardson Hill Road Municipal Landfill Site	HAMMER:	START DATE: 12/19/91 END DATE: 12/20/91
FILE NO.: 3729.015	FALL:	
BORING COMPANY: Parratt-Wolff, Inc. FOREMAN: Glenn Lansing OBG GEOLOGIST: Paul Gottler		LEGEND: Grout, Sand Pack, Pellets, Screen, Riser

DEPTH BELOW GRADE	NO.	DEPTH (FEET)	BLOWS /6"	PENETR/ RECOVERY	"N" VALUE	SAMPLE DESCRIPTION	STRATUM CHANGE GENERAL DESCRIPT	EQUIPMENT INSTALLED	FIELD TESTING PID	FIELD TESTING HEAD-SPACE
0	1	0-5				Dry, gray GRAVEL with sand, silt and clay				
1										
2										
3										
4										
5	2	5-7	20-13-14-12	2'/1.1'	27	Damp to moist GRAVEL with coarse to fine sand, some silt, little clay, massive, matrix supported diamicton				
6										
7										
8						Boulder 8-9.5 ft.				
9										
10	3	10-12	50/0.3'	0.3'/0'	—	Boulder 10-11 ft.				
11										
12										
13	4	13-15	4-22-50/0.4'	1.4'/1.1'	22	Saturated, brown-gray, green and red, gravel rich diamicton, massive, matrix supported, matrix sand rich with some silt, little cohesive clay, some gray precipitate in fractures				
14										
15										
16										
17										
18										
19	5	19-20	50/0.4'	0.4'/0.2'	—	Saturated, green SANDSTONE cobble				
20										
21										
22										
		22.8				BEDROCK				
23						Saturated, green-gray green, medium to fine, arkosic SANDSTONE				

302205

APPENDIX D

IN SITU HYDRAULIC CONDUCTIVITY TEST LOGS

BOUWER & RICE METHOD
RHRLS, MW-1

Yo = initial drawdown (from field data plot) = 0.56 feet
t = time (from field data plot) = 2.7 min = 162 sec
Yt = drawdown (from field data plot) = 0.52 feet
rc = casing radius = 0.083 feet
L = length of intake = 5.88 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 5.88 feet
D = saturated thickness = 13.38 feet
L/rw = 17.8
A = coefficient from Bouwer & Rice curve = 2.05
B = coeeficient from Bouwer & Rice curve = 0.30

<u>Determination of ln Re/rw</u>

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{(A + B \ln ((D-H)/rw)}{L/rw}^{-1}$$

$$\ln Re/rw = \frac{(1.1)}{\ln (5.88/0.33)} + \frac{(2.05 + 0.30 \ln ((13.38-5.88)/0.33)}{17.8}^{-1}$$

$$\ln Re/rw = (0.38 + 0.17)^{-1}$$

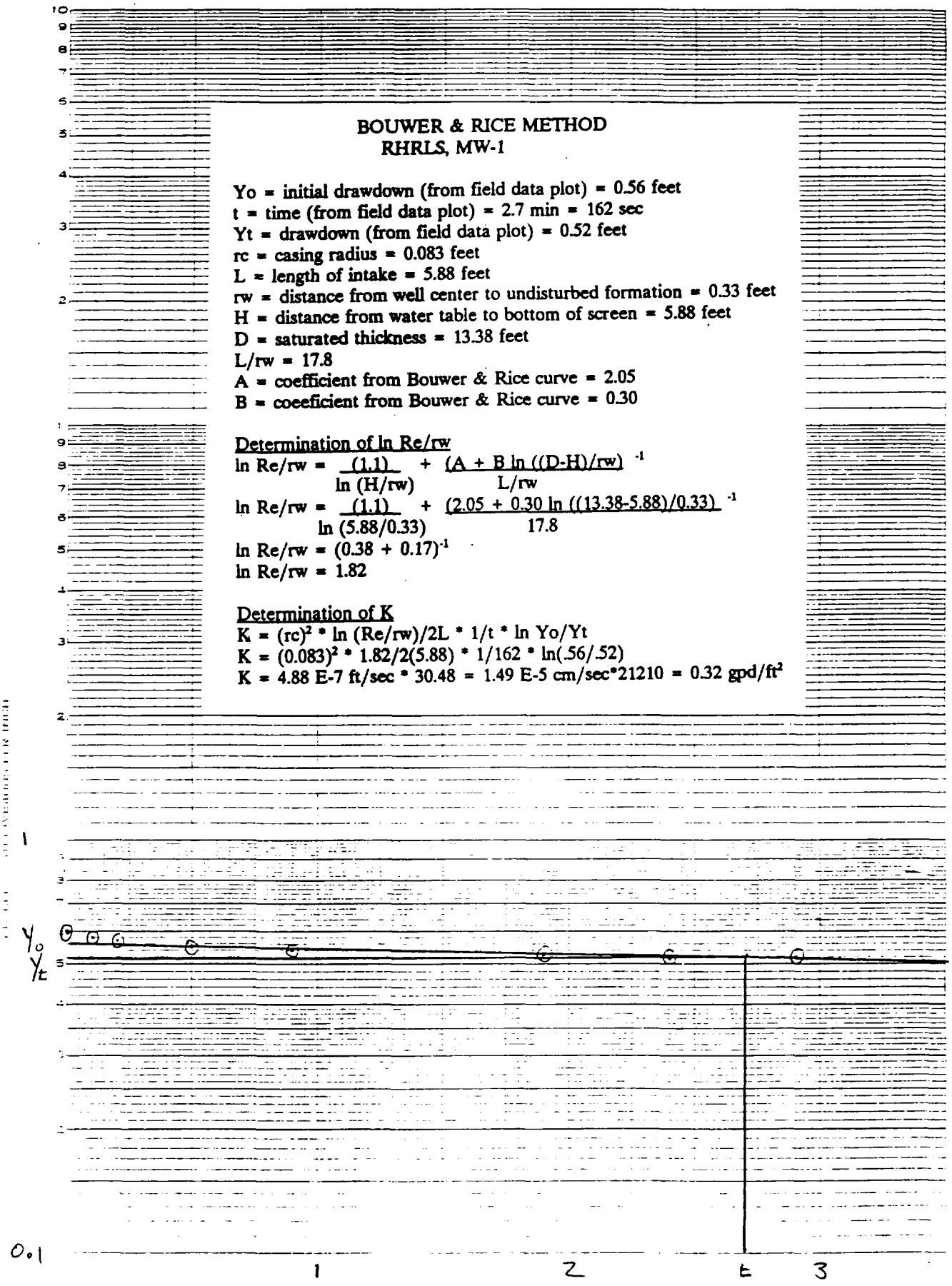
$$\ln Re/rw = 1.82$$

<u>Determination of K</u>

$$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln Yo/Yt$$

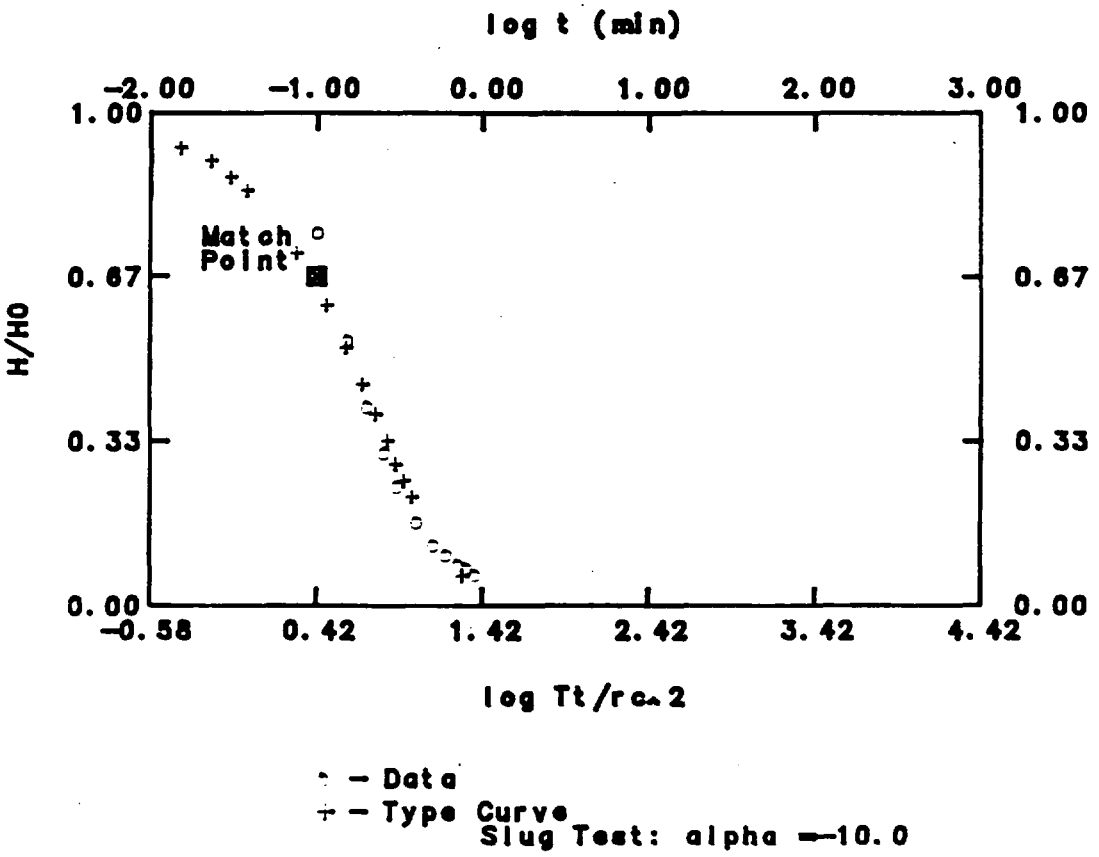
$$K = (0.083)^2 * 1.82/2(5.88) * 1/162 * \ln(.56/.52)$$

$$K = 4.88\ E\text{-}7\ ft/sec * 30.48 = 1.49\ E\text{-}5\ cm/sec*21210 = 0.32\ gpd/ft^2$$



302207

MW-3



MATCH POINT		SOLUTION	
t	= 1.000E-0001	Transmissivity	= 1.952E+0003 gpd/ft
		Hydraulic. Cond.	= 1.146E+0002 gpd/sq ft
Tt/rc^2	= 2.630E+0000	Storativity	= 6.326E-0012

WELL INFORMATION	
WELL IDENTIFICATION	: MW-3
DATE OF AQUIFER TEST	: 12/19/90
AQUIFER THICKNESS (b)	: 1.703E+0001 ft
VOLUME OF SLUG (V)	: 3.700E-0002 cu ft
EFFECTIVE RADIUS	: 3.300E-0001 ft
WELL RADIUS AT MEASURED WATER LEVELS (rc)	: 8.300E-0002 ft

302208

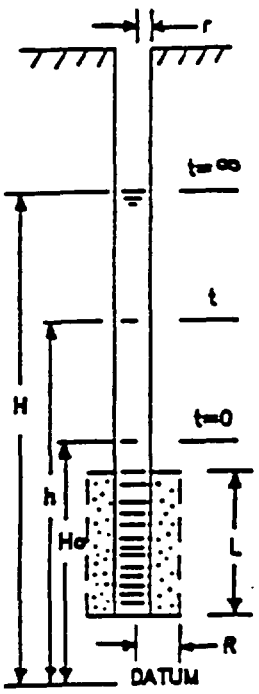
O'BRIEN & GERE

302209

IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT Richardson Hill Road Landfill
WELL NUMBER MW-4S
DATE 12/19/90

LOCATION Sidney, New York.
ELEVATION



STATIC HEAD (H) 15.92

PIPE RADIUS (r) 0.033

SCREEN RADIUS (R) 0.33

SCREEN LENGTH (L) 16.3

INITIAL HEAD (Ho) 17.71

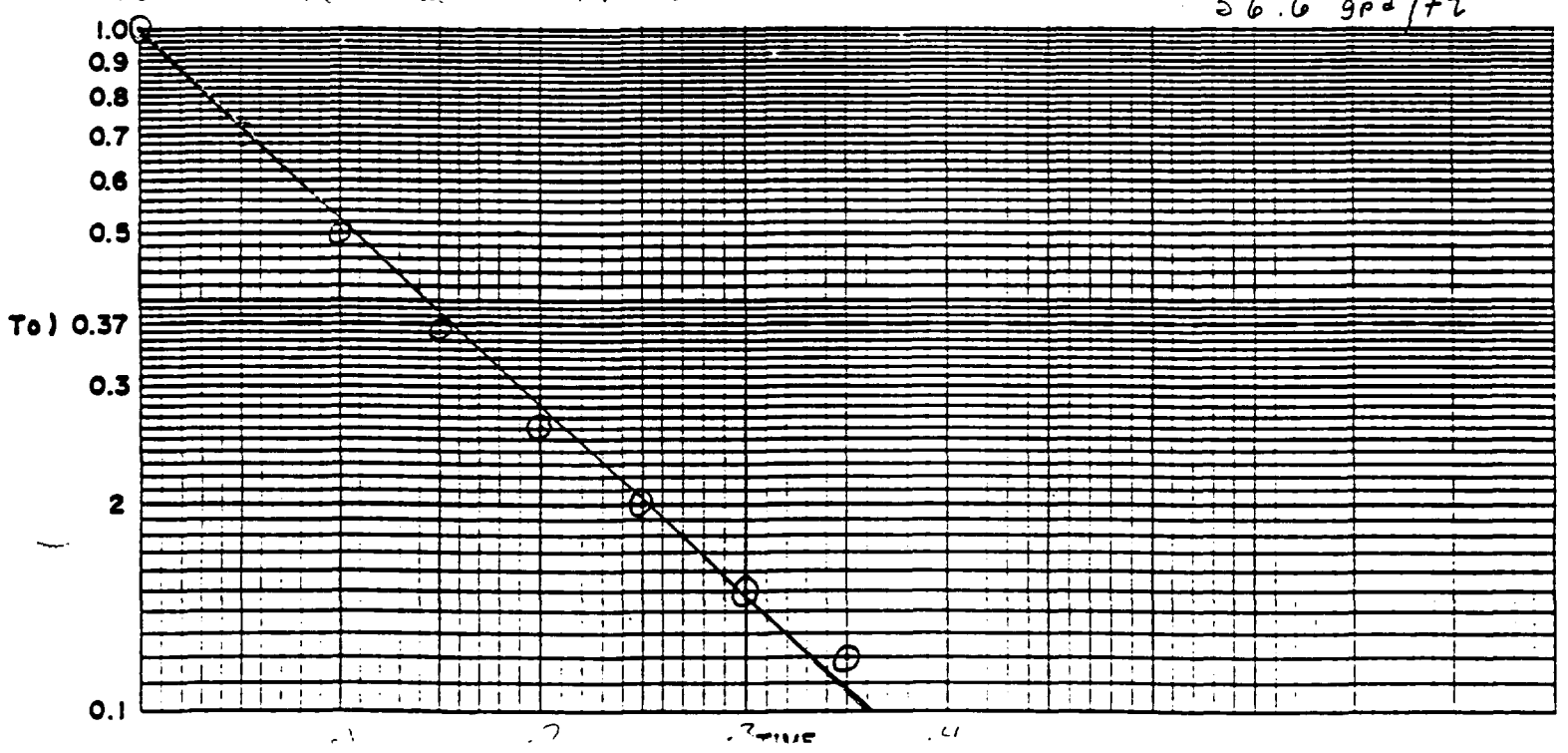
HYDRAULIC CONDUCTIVITY :

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

	RECOVERY		SLUG	
TIME min	h	$\frac{H-h}{H-H_o}$	h	$\frac{H-h}{H-H_o}$
0			17.71	1
0.05			17.17	0.70
0.1			16.81	0.50
0.15			16.56	0.36
0.2			16.38	0.26
0.25			16.27	0.20
0.3			16.19	0.15
0.35			16.14	0.12
0.4			16.07	0.08

$$K = \frac{(0.033)^2 \ln(16.3/0.33)}{2(16.3)(9.42\ \text{sec})} = 8.75 \times 10^{-5}\ \text{ft/sec} = 2.67 \times 10^{-3}\ \text{cm/sec} = 56.6\ \text{gpd/ft}^2$$

$T_o = 0.157\ \text{min} = 9.42\ \text{sec}$



IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT: Richardson Hill Rd.
WELL NUMBER: MW-4D
DATE: 6/2/92

EVACUATION METHOD: Bailer
PERSONNEL: Moore/Loretto
DATUM USED FOR CALCULATIONS: Top Of Stainless Steel

STATIC HEAD (H) = 6.12 ft

PIPE RADIUS (r) = 0.083 ft

SCREEN RADIUS (R) 0.5 ft

SCREEN LENGTH (L) 18.0 ft

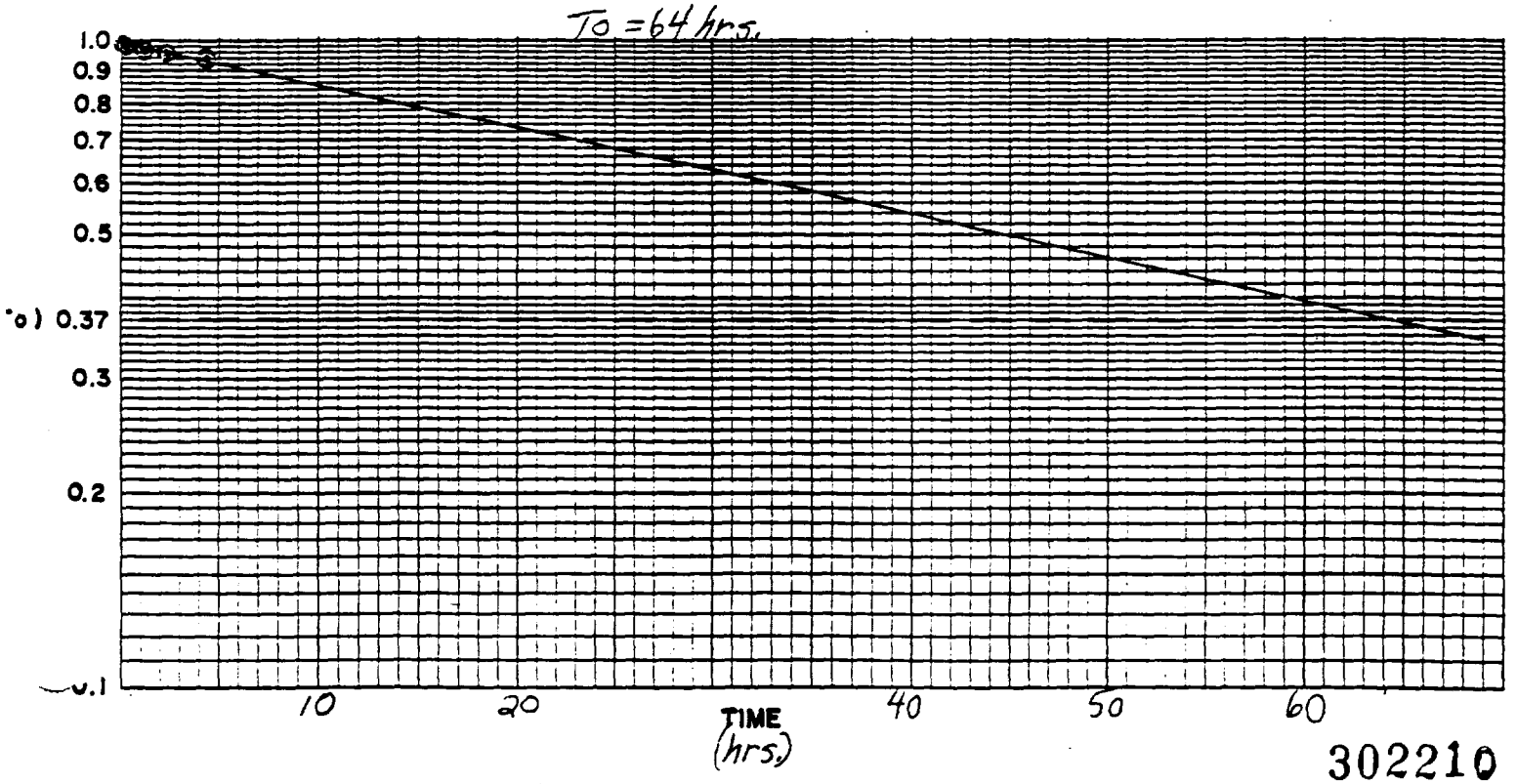
INITIAL HEAD (Ho)= 8.22 ft

To (from graph) = 3840 min
230400 sec

HYDRAULIC CONDUCTIVITY

$$K = \frac{r^2 \ln(L/R)}{2LTo} = 3.0E-09 \text{ ft/sec} = 9.1E-08 \text{ cm/sec}$$

TIME (min)	Depth to Water	h	H-h / H-Ho
1	8.19	8.19	0.99
2	8.19	8.19	0.99
3	8.18	8.18	0.98
5	8.18	8.18	0.98
10	8.18	8.18	0.98
72	8.16	8.16	0.97
134	8.13	8.13	0.96
274	8.09	8.09	0.94



302210

BOUWER & RICE METHOD
RHRLS, MW-5S

Yo = initial drawdown (from field data plot) = 0.255 feet
t = time (from field data plot) = 8.0 min = 480 sec
Yt = drawdown (from field data plot) = 0.22 feet
rc = casing radius = 0.083 feet
L = length of intake = 13.3 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 13.3 feet
D = saturated thickness = 26.8 feet
L/rw = 40.3
A = coefficient from Bouwer & Rice curve = 2.8
B = coeeficient from Bouwer & Rice curve = 0.45

<u>Determination of ln Re/rw</u>

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{(A + B \ln ((D-H)/rw)}{L/rw}^{-1}$$

$$\ln Re/rw = \frac{(1.1)}{\ln (13.3/0.33)} + \frac{(2.8 + 0.45 \ln ((26.8-13.3)/0.33)}{40.3}^{-1}$$

$$\ln Re/rw = (0.30 + 0.11)^{-1}$$

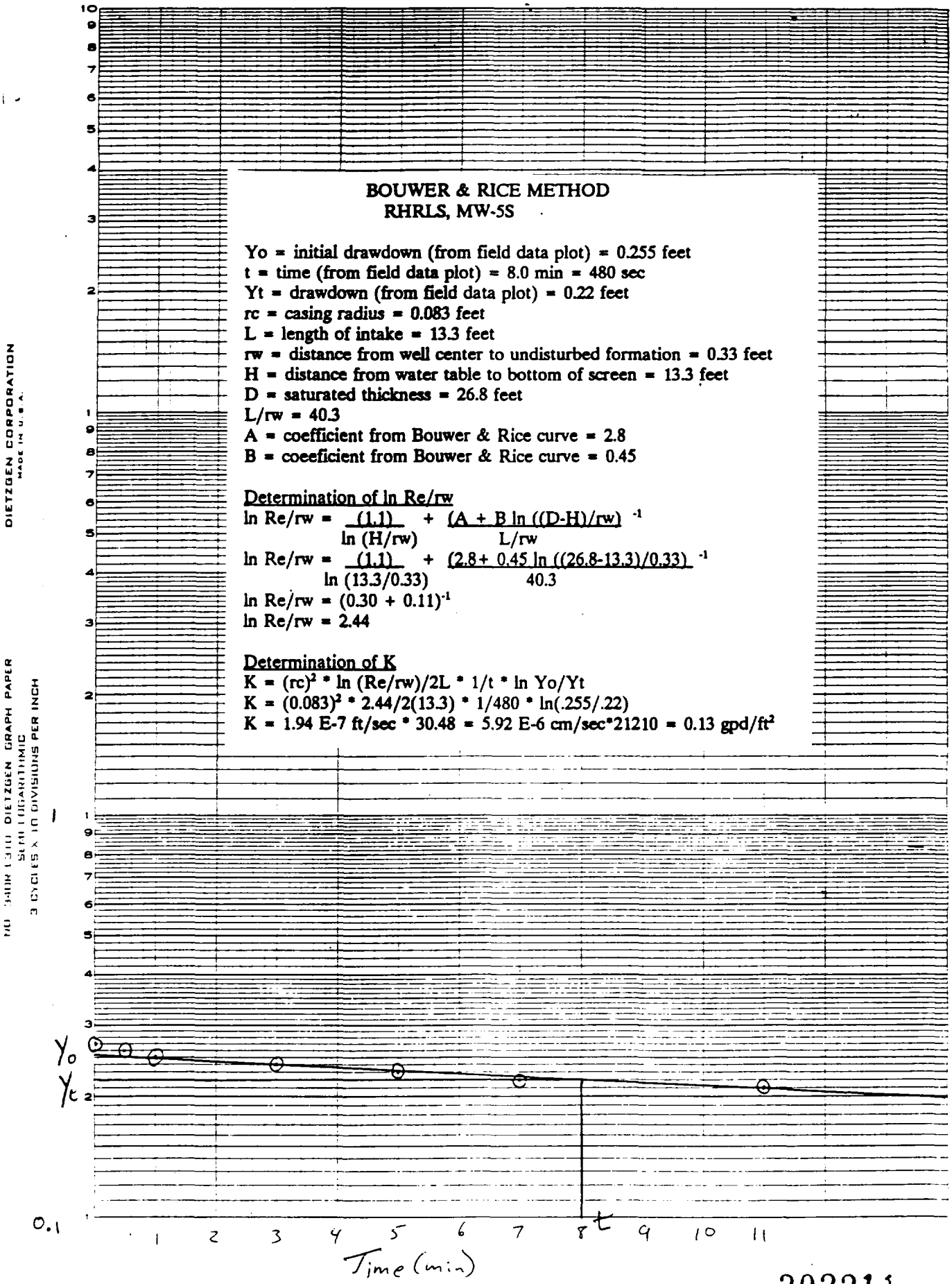
$$\ln Re/rw = 2.44$$

<u>Determination of K</u>

$$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln Yo/Yt$$

$$K = (0.083)^2 * 2.44/2(13.3) * 1/480 * \ln(.255/.22)$$

$$K = 1.94\ E\text{-}7\ ft/sec * 30.48 = 5.92\ E\text{-}6\ cm/sec * 21210 = 0.13\ gpd/ft^2$$



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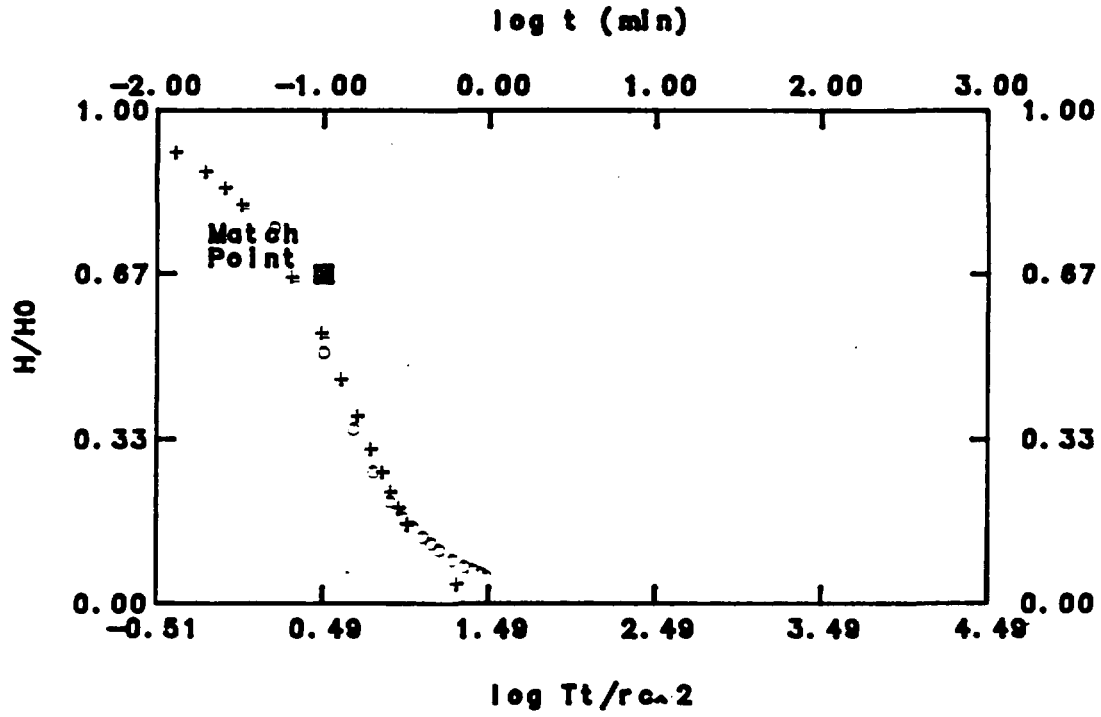
302211

MW-5D



- Data
+ - Type Curve
Slug Test: alpha = -8.0

MATCH POINT		SOLUTION	
t	= 1.000E-0001	Transmissivity	= 2.293E+0003 gpd/ft
		Hydraulic. Cond.	= 4.899E+0001 gpd/sq ft
Tt/rc^2	= 3.090E+0000	Storativity	= 6.326E-0010

WELL INFORMATION	
WELL IDENTIFICATION	: MW-5D
DATE OF AQUIFER TEST	: 12/19/90
AQUIFER THICKNESS (b)	: 4.680E+0001 ft
VOLUME OF SLUG (V)	: 6.300E-0002 cu ft
EFFECTIVE RADIUS	: 3.300E-0001 ft
WELL RADIUS AT MEASURED WATER LEVELS (rc)	: 8.300E-0002 ft

302212

BOUWER & RICE METHOD
RHRLS, MW-6

Yo = initial drawdown (from field data plot) = 1.70 feet
t = time (from field data plot) = 20 min = 1200 sec
Yt = drawdown (from field data plot) = 0.48 feet
rc = casing radius = 0.083 feet
L = length of intake = 15.25 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 15.25 feet
D = saturated thickness = 22.25 feet
L/rw = 46.2
A = coefficient from Bouwer & Rice curve = 3.00
B = coeeficient from Bouwer & Rice curve = 0.50

<u>Determination of ln Re/rw</u>

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{(A + B \ln ((D-H)/rw)}{L/rw}^{-1}$$

$$\ln Re/rw = \frac{(1.1)}{\ln (15.25/0.33)} + \frac{(3.00 + 0.50 \ln ((22.25-15.25)/0.33)}{46.2}^{-1}$$

$$\ln Re/rw = (0.29 + 0.10)^{-1}$$

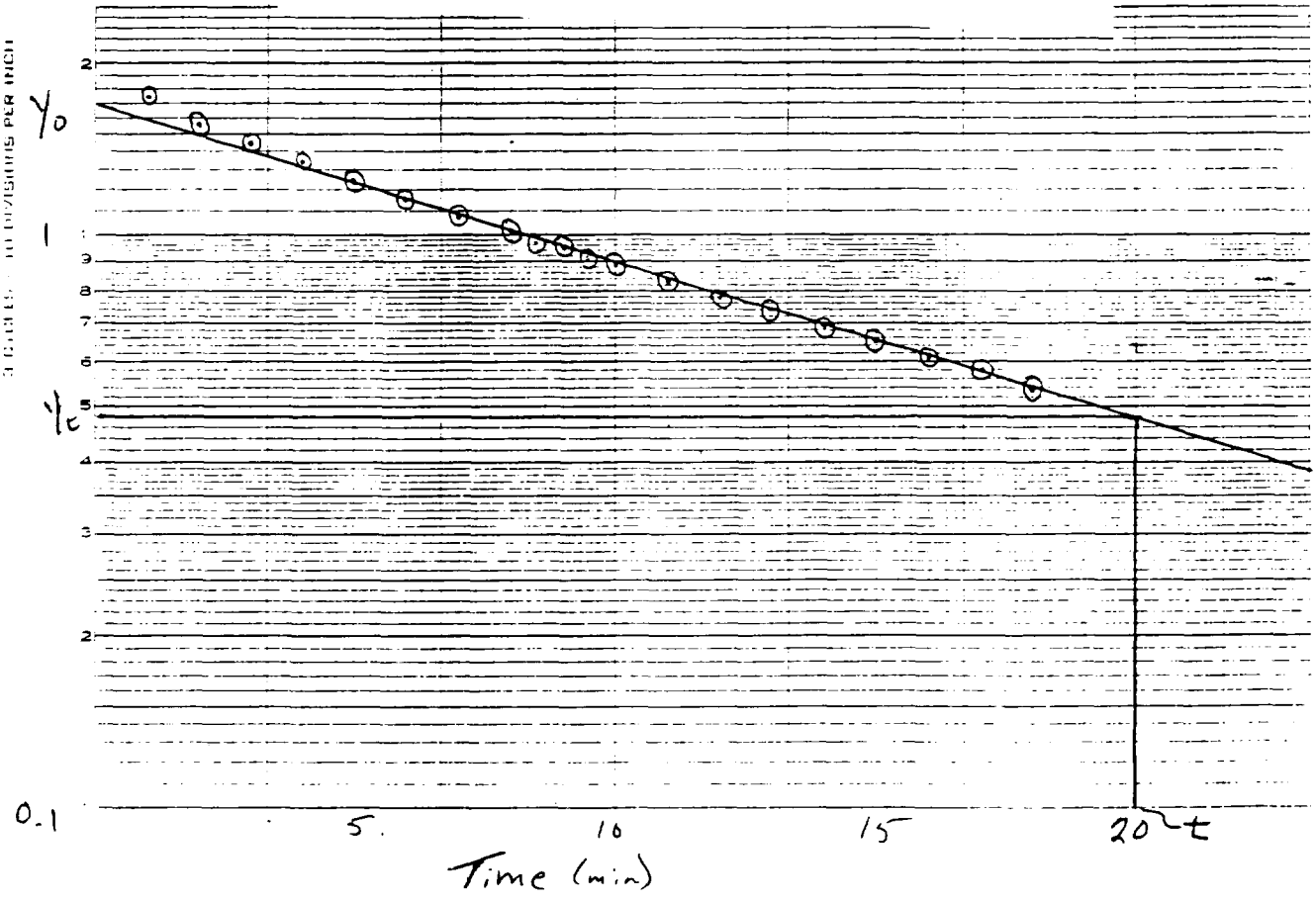
$$\ln Re/rw = 2.56$$

<u>Determination of K</u>

$$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln Yo/Yt$$

$$K = (0.083)^2 * 2.56/2(15.25) * 1/1200 * \ln(1.7/.48)$$

$$K = 6.09\ E\text{-}7\ ft/sec * 30.48 = 1.86\ E\text{-}5\ cm/sec * 21210 = 0.39\ gpd/ft^2$$



302213

BOUWER & RICE METHOD
RHRLS, MW-7S

Yo = initial drawdown (from field data plot) = 0.42 feet
t = time (from field data plot) = 4.7 min = 282 sec
Yt = drawdown (from field data plot) = 0.27 feet
rc = casing radius = 0.083 feet
L = length of intake = 13.69 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 13.69 feet
L/rw = 41.5
C = coefficient from Bouwer & Rice curve = 2.45

Determination of ln Re/rw

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{C}{L/rw}^{-1}$$

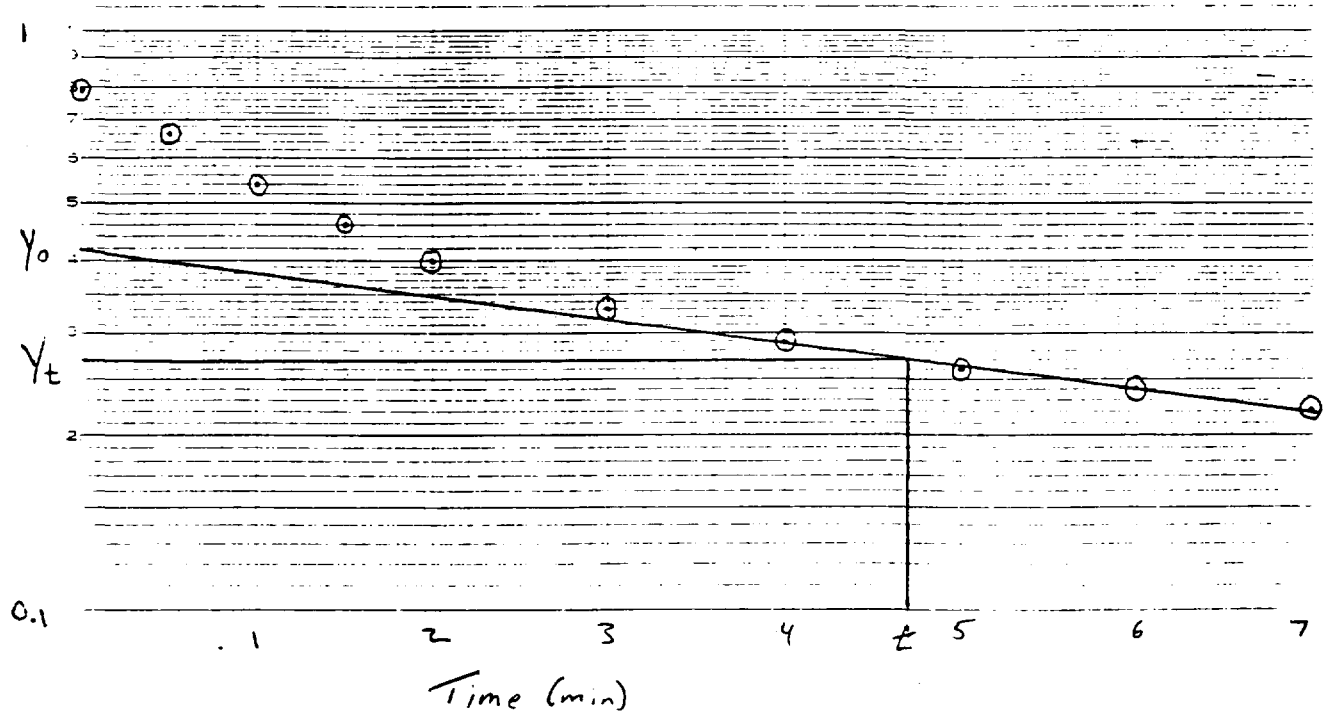
$$\ln Re/rw = \frac{(1.1)}{\ln (13.69/0.33)} + \frac{(2.45)}{41.5}^{-1}$$

$$\ln Re/rw = (0.295 + 0.059)^{-1}$$

$$\ln Re/rw = 2.82$$

Determination of K

$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln(Yo/Yt)$
$K = (0.083)^2 * 2.62/2(13.69) * 1/282 * \ln(.42/.27)$
$K = 1.03$ E-6 ft/sec * 30.48 = 3.1 E-5 cm/sec*21210 = 0.67 gpd/ft^2



302214

IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT: Richardson Hill Rd.
WELL NUMBER: MW-7D
DATE: 6/2/92

EVACUATION METHOD: Bailer
PERSONNEL: Moore/Loretto
DATUM USED FOR CALCULATIONS: Top Of Stainless Steel

STATIC HEAD (H) = 8.42 ft

PIPE RADIUS (r) = 0.083 ft

SCREEN RADIUS (R) 0.5 ft

SCREEN LENGTH (L) 17.7 ft

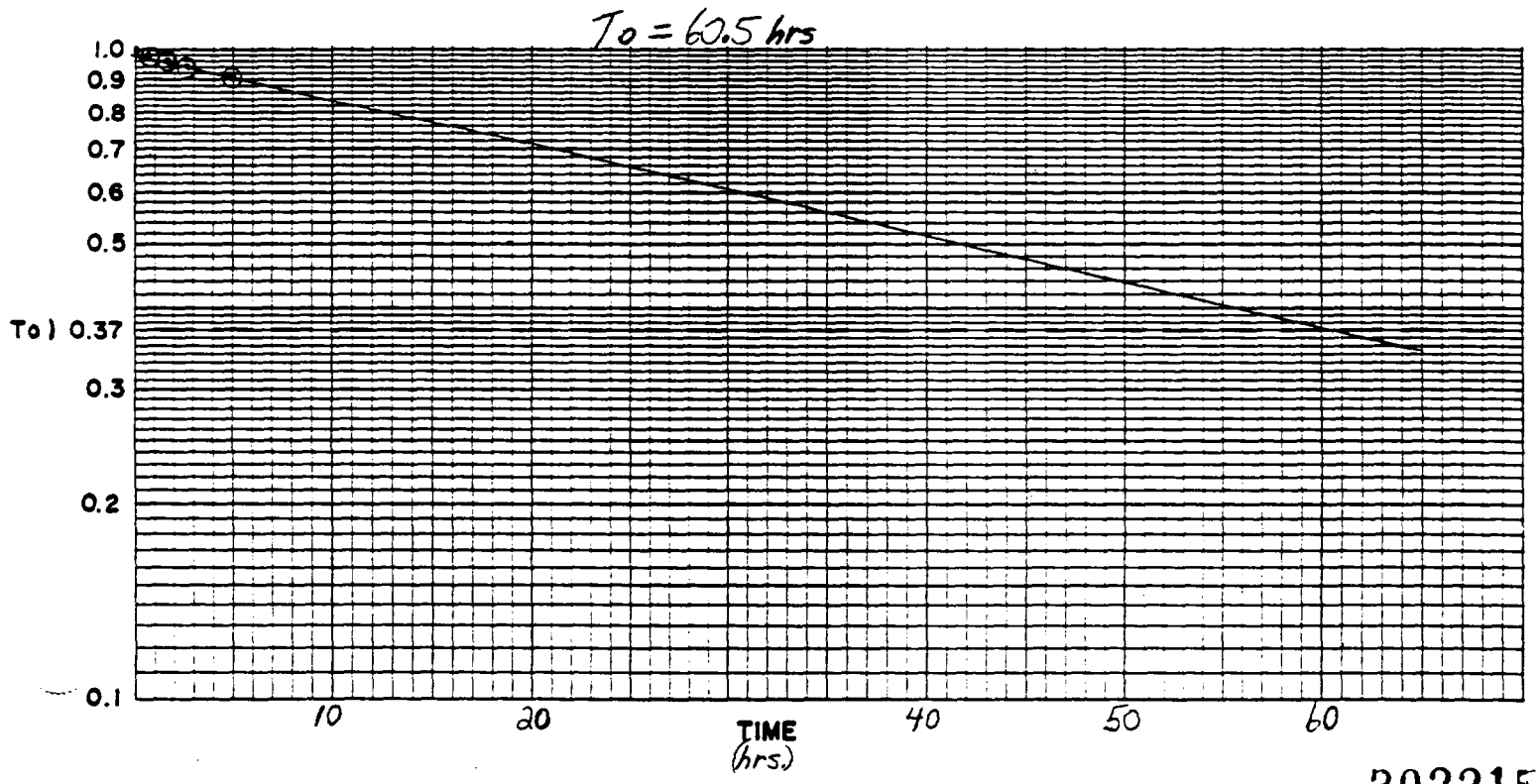
INITIAL HEAD (Ho)= 12.6 ft

To (from graph) = 3630 min
217800 sec

HYDRAULIC CONDUCTIVITY

$$K = \frac{r^2 \ln(L/R)}{2LTo} = 3.2E-09 \text{ ft/sec} = 9.7E-08 \text{ cm/sec}$$

TIME (min)	Depth to Water	h	H-h / H-Ho
1	12.57	12.57	0.99
3.25	12.55	12.55	0.99
4	12.55	12.55	0.99
5	12.55	12.55	0.99
10	12.52	12.52	0.98
96	12.42	12.42	0.96
159	12.36	12.36	0.94
301	12.24	12.24	0.91



302215

BOUWER & RICE METHOD
RHRLS, MW-8

Yo = initial drawdown (from field data plot) = 0.51 feet
t = time (from field data plot) = 3.35 min = 201 sec
Yt = drawdown (from field data plot) = 0.42 feet
rc = casing radius = 0.083 feet
L = length of intake = 15.32 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 15.32 feet
L/rw = 46.4
C = coefficient from Bouwer & Rice curve = 2.55

Determination of ln Re/rw

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{C}{L/rw}^{-1}$$

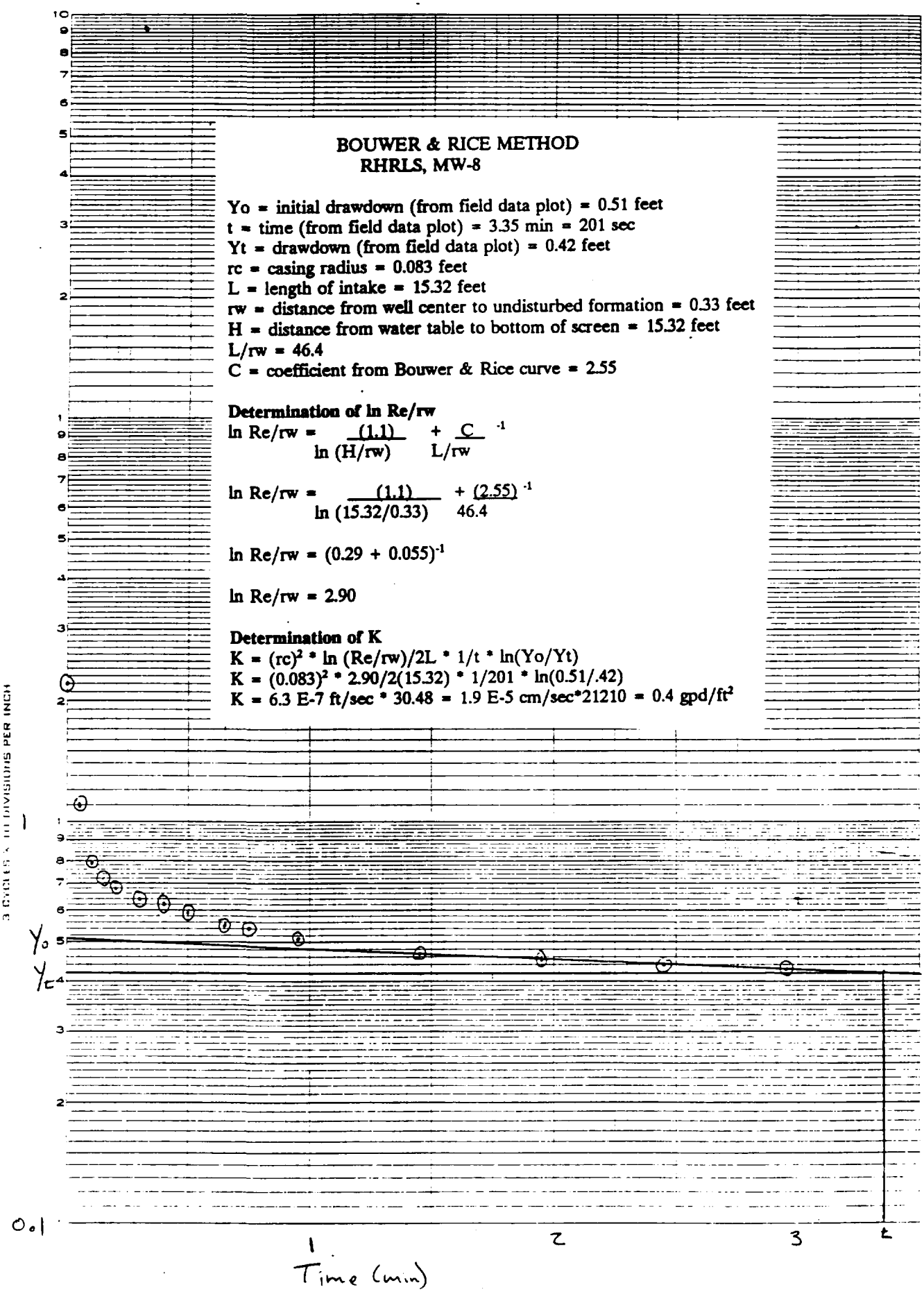
$$\ln Re/rw = \frac{(1.1)}{\ln (15.32/0.33)} + \frac{(2.55)}{46.4}^{-1}$$

$$\ln Re/rw = (0.29 + 0.055)^{-1}$$

$$\ln Re/rw = 2.90$$

Determination of K

$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln(Yo/Yt)$
$K = (0.083)^2 * 2.90/2(15.32) * 1/201 * \ln(0.51/.42)$
$K = 6.3\ E\text{-}7\ ft/sec * 30.48 = 1.9\ E\text{-}5\ cm/sec * 21210 = 0.4\ gpd/ft^2$



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MADE IN U.S.A.
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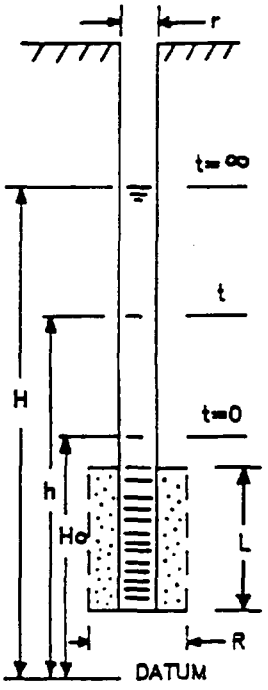
302216

O'BRIEN & GERE

IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT Richardson Hill Road Landfill
WELL NUMBER MW-9
DATE 12-12-90

LOCATION Sidney, New York
ELEVATION



well Depth - 45.88
static level - 21.51

STATIC HEAD (H) 24.37

PIPE RADIUS (r) .083

SCREEN RADIUS (R) .33

SCREEN LENGTH (L) 5.0

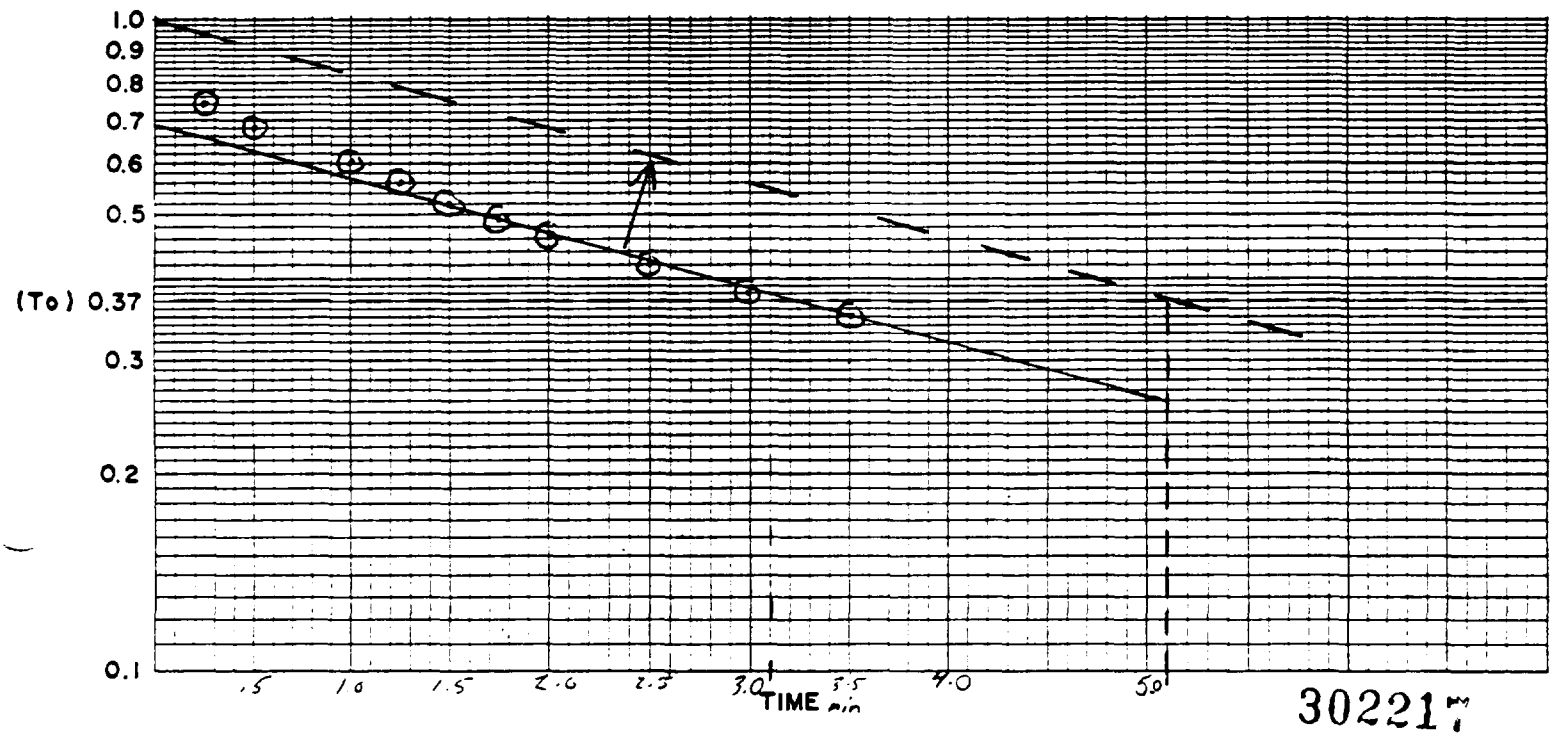
INITIAL HEAD (Ho) 18.15

HYDRAULIC CONDUCTIVITY :

$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

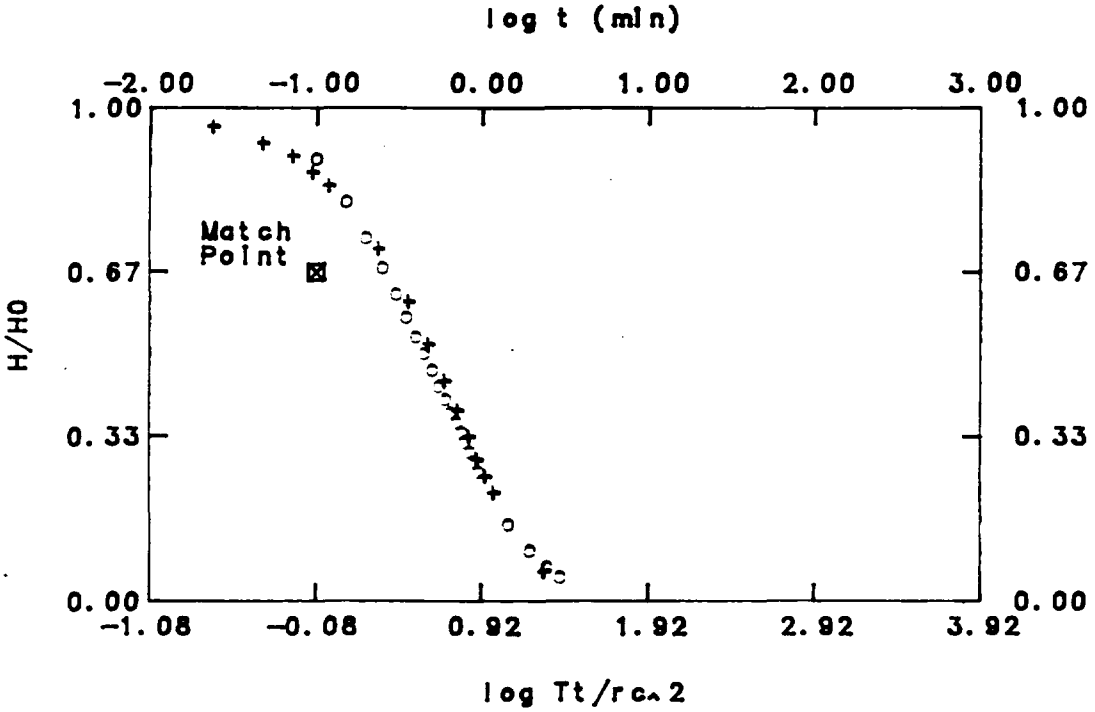
$$K = \frac{(.083)^2 \ln(5.0/.33)}{2(5.0)(306)}$$ 6.1×10^{-6} ft/sec = 4 gpd/ft²

TIME	WATER DEPTH	t_{min}	h	$\frac{H-h}{H-Ho}$
10:27	27.73	0	18.15	1.0
10:27:15	26.09	.25	19.79	.74
10:27:30	25.76	.5	20.12	.68
10:28	25.22	1.0	20.66	.60
10:28:15	24.97	1.25	20.91	.56
10:28:30	24.76	1.5	21.12	.52
10:28:45	24.58	1.75	21.30	.49
10:29	24.41	2.0	21.47	.47
10:29:30	24.11	2.5	21.77	.42
10:30	23.88	3.0	22.00	.38
10:30:30	23.66	3.5	22.22	.35
10:31	23.49	4.0	22.39	.32
10:32	23.20	5.0	22.68	.27
10:33	22.98	6.0	22.90	.24
10:34	22.79	7.0	23.09	.21



302217

MW-10

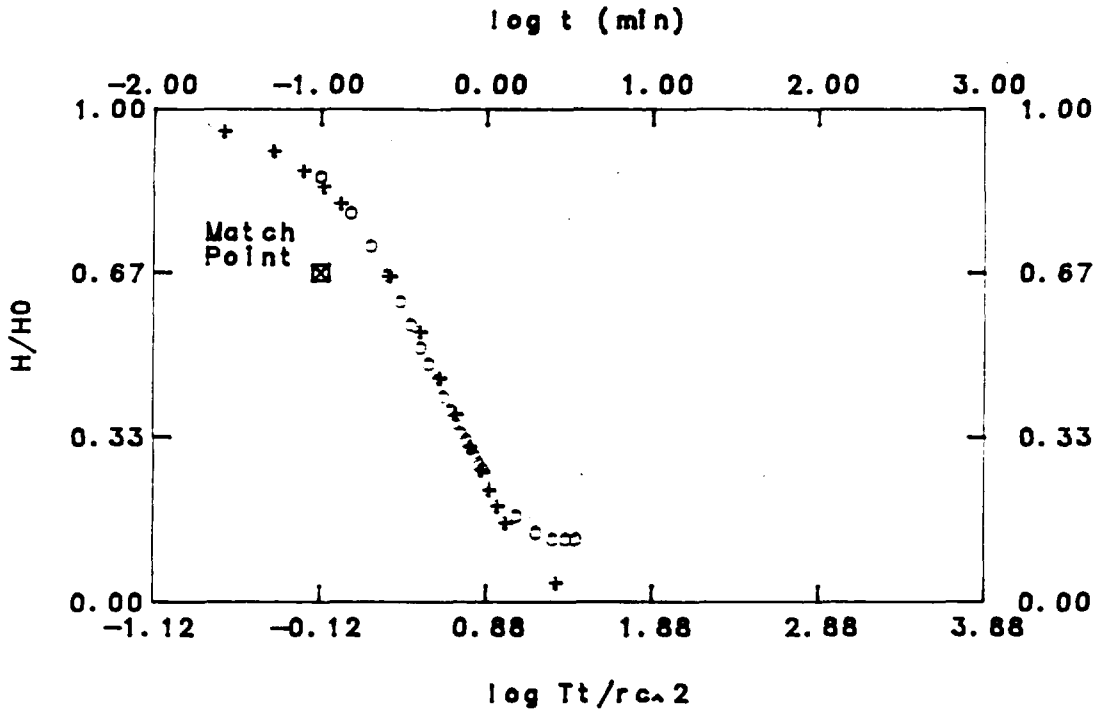


MATCH POINT		SOLUTION	
t	= 1.000E-0001	Transmissivity	= 6.171E+0002 gpd/ft
		Hydraulic. Cond.	= 4.937E+0001 gpd/sq ft
Tt/rc^2	= 8.318E-0001	Storativity	= 6.326E-0012

WELL INFORMATION	
WELL IDENTIFICATION	: MW-10
DATE OF AQUIFER TEST	: 12/19/90
AQUIFER THICKNESS (b)	: 1.250E+0001 ft
VOLUME OF SLUG (V)	: 6.700E-0002 cu ft
EFFECTIVE RADIUS	: 3.300E-0001 ft
WELL RADIUS AT MEASURED WATER LEVELS (rc)	: 8.300E-0002 ft

302218

MW-11S



· – Data
+ – Type Curve
Slug Test: alpha = -8.0

MATCH POINT		SOLUTION	
t	= 1.000E-0001	Transmissivity	= 5.628E+0002 gpd/ft
		Hydraulic. Cond.	= 2.278E+0001 gpd/sq ft
Tt/rc^2	= 7.586E-0001	Storativity	= 6.326E-0010

WELL INFORMATION	
WELL IDENTIFICATION	: MW-11S
DATE OF AQUIFER TEST	: 12/19/90
AQUIFER THICKNESS (b)	: 2.471E+0001 ft
VOLUME OF SLUG (V)	: 9.100E-0002 cu ft
EFFECTIVE RADIUS	: 3.300E-0001 ft
WELL RADIUS AT MEASURED WATER LEVELS (rc)	: 8.300E-0002 ft

302219

BOUWER & RICE METHOD
RHRHLS, MW-11D

Yo = initial drawdown (from field data plot) = 0.385 feet
t = time (from field data plot) = 2.6 min = 156 sec
Yt = drawdown (from field data plot) = 0.3 feet
rc = casing radius = 0.083 feet
L = length of intake = 5.4 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 5.4 feet
L/rw = 16.4
C = coefficient from Bouwer & Rice curve = 1.5

Determination of ln Re/rw

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{C}{L/rw}^{-1}$$

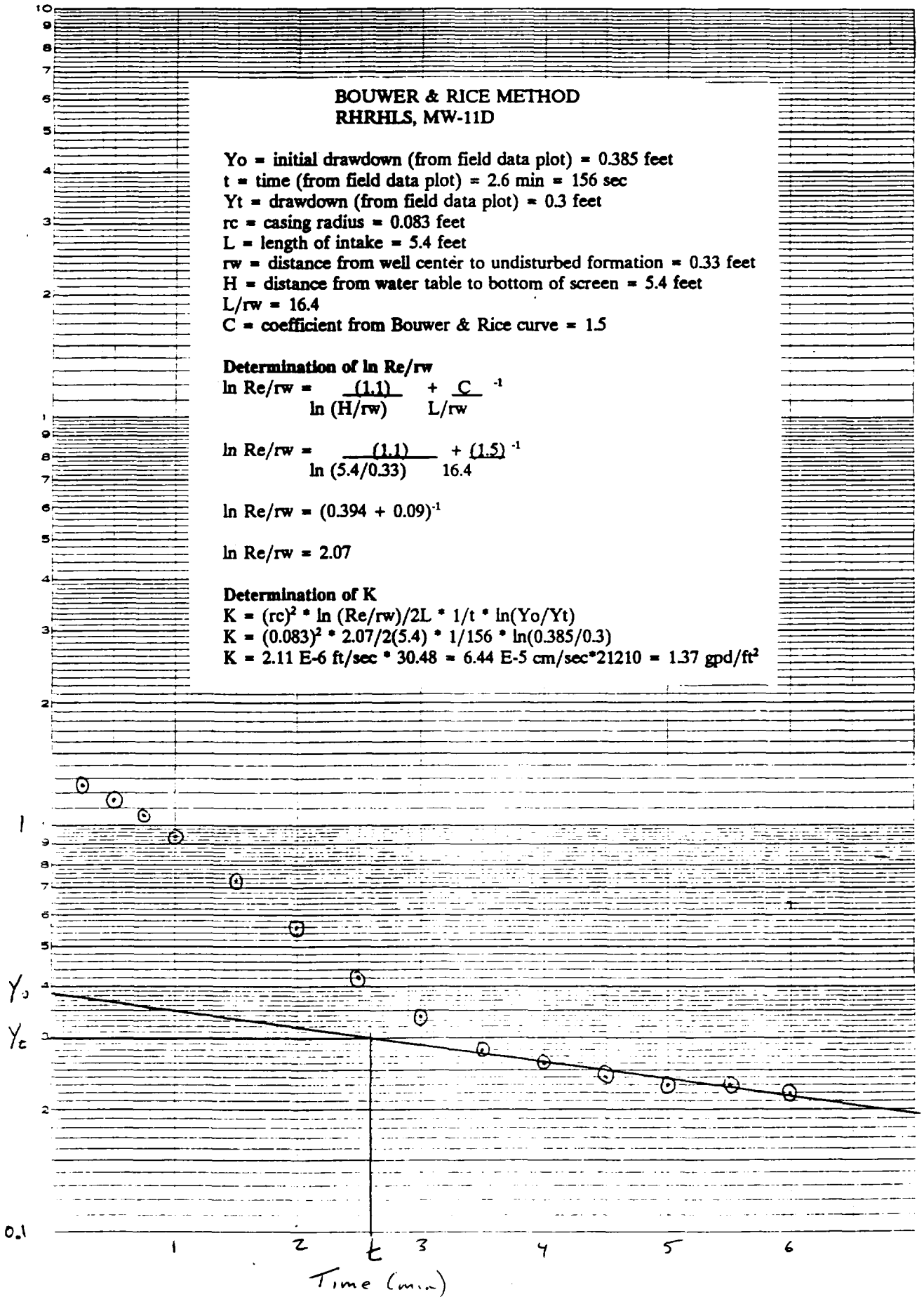
$$\ln Re/rw = \frac{(1.1)}{\ln (5.4/0.33)} + \frac{(1.5)}{16.4}^{-1}$$

$$\ln Re/rw = (0.394 + 0.09)^{-1}$$

$$\ln Re/rw = 2.07$$

Determination of K

$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln(Yo/Yt)$
$K = (0.083)^2 * 2.07/2(5.4) * 1/156 * \ln(0.385/0.3)$
$K = 2.11$ E-6 ft/sec * 30.48 = 6.44 E-5 cm/sec*21210 = 1.37 gpd/ft^2



302220

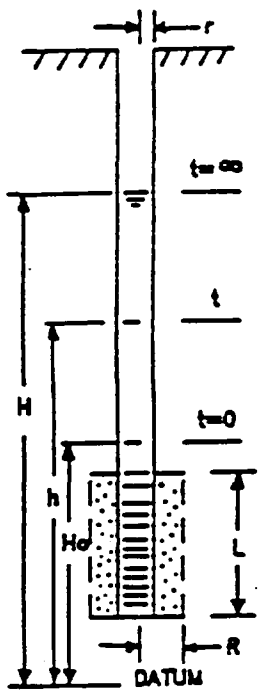
O'BRIEN & GERE

302221

IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT Richardson Hill Road Landfill
WELL NUMBER MW-12.
DATE 12/19/90

LOCATION Sidney, N.Y.
ELEVATION



STATIC HEAD (H) 5.68

PIPE RADIUS (r) 0.083

SCREEN RADIUS (R) 0.33

SCREEN LENGTH (L) 5.5

INITIAL HEAD (Ho) 9.75

HYDRAULIC CONDUCTIVITY :

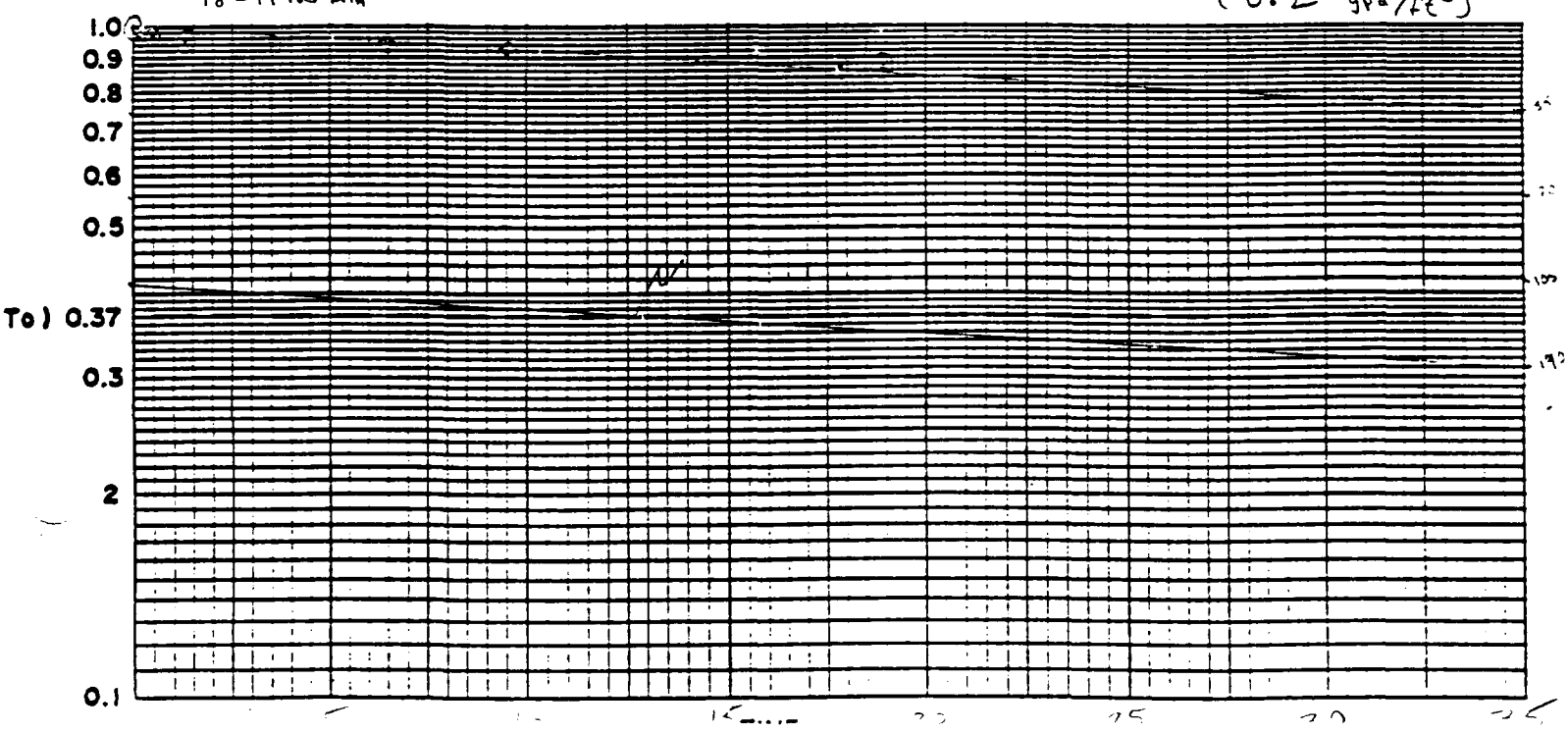
$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

$$K = \frac{(0.083)^2 \ln(5.5/0.33)}{2(5.5)(7050\ sec)} = 2.5 \times 10^{-7}\ ft/sec = 7.62 \times 10^{-5}\ cm/sec$$

(0.2 gpd/ft²)

To = 117.5 min

TIME (min)	RECOVERY h	RECOVERY (H−h)/(H−Ho)	SLUG h	SLUG (H−h)/(H−Ho)
0			9.75	1
0.05			9.73	0.99
0.2			9.70	0.99
0.4			9.65	0.98
0.55			9.64	0.97
0.7			9.63	0.97
1.4			9.57	0.96
3.4			9.49	0.94
6.4			9.43	0.92
9.4			9.39	0.91
17.9			9.34	0.87
18.9			9.33	0.87



BOUWER & RICE METHOD
RHRLS, MW-13

Yo = initial drawdown (from field data plot) = 0.48 feet
t = time (from field data plot) = 2.1 min = 126 sec
Yt = drawdown (from field data plot) = 0.28 feet
rc = casing radius = 0.083 feet
L = length of intake = 14.17 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 14.17 feet
D = saturated thickness = 16.17 feet
L/rw = 42.9
A = coefficient from Bouwer & Rice curve = 2.8
B = coeeficient from Bouwer & Rice curve = 0.45

<u>Determination of ln Re/rw</u>

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{(A + B \ln ((D-H)/rw)}{L/rw}^{-1}$$

$$\ln Re/rw = \frac{(1.1)}{\ln (14.17/0.33)} + \frac{(2.8 + 0.45 \ln ((16.17-14.17)/0.33)}{42.9}^{-1}$$

$$\ln Re/rw = (0.29 + 0.08)^{-1}$$

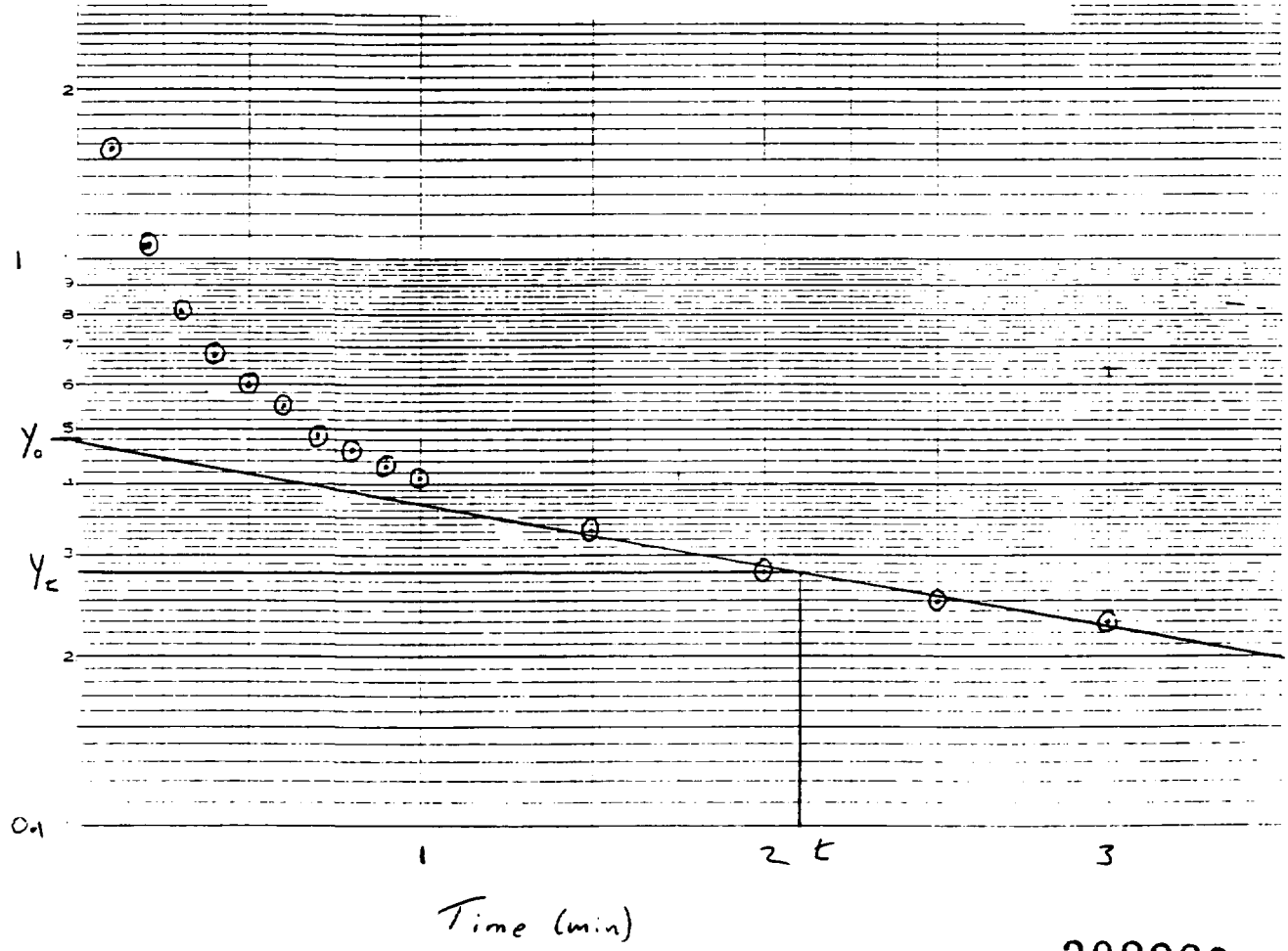
$$\ln Re/rw = 2.70$$

<u>Determination of K</u>

$$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln Yo/Yt$$

$$K = (0.083)^2 * 2.70/2(14.17) * 1/126 * \ln(.48/.28)$$

$$K = 2.81\ E\text{-}6\ ft/sec * 30.48 = 8.56\ E\text{-}5\ cm/sec * 21210 = 1.82\ gpd/ft^2$$



302222

BOUWER & RICE METHOD
RHRLS, MW-14

Yo = initial drawdown (from field data plot) = 0.34 feet
t = time (from field data plot) = 5.5 min = 330 sec
Yt = drawdown (from field data plot) = 0.14 feet
rc = casing radius = 0.083 feet
L = length of intake = 10.08 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 10.88 feet
L/rw = 30.5
C = coefficient from Bouwer & Rice curve = 2.00

Determination of ln Re/rw

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{C}{L/rw}^{-1}$$

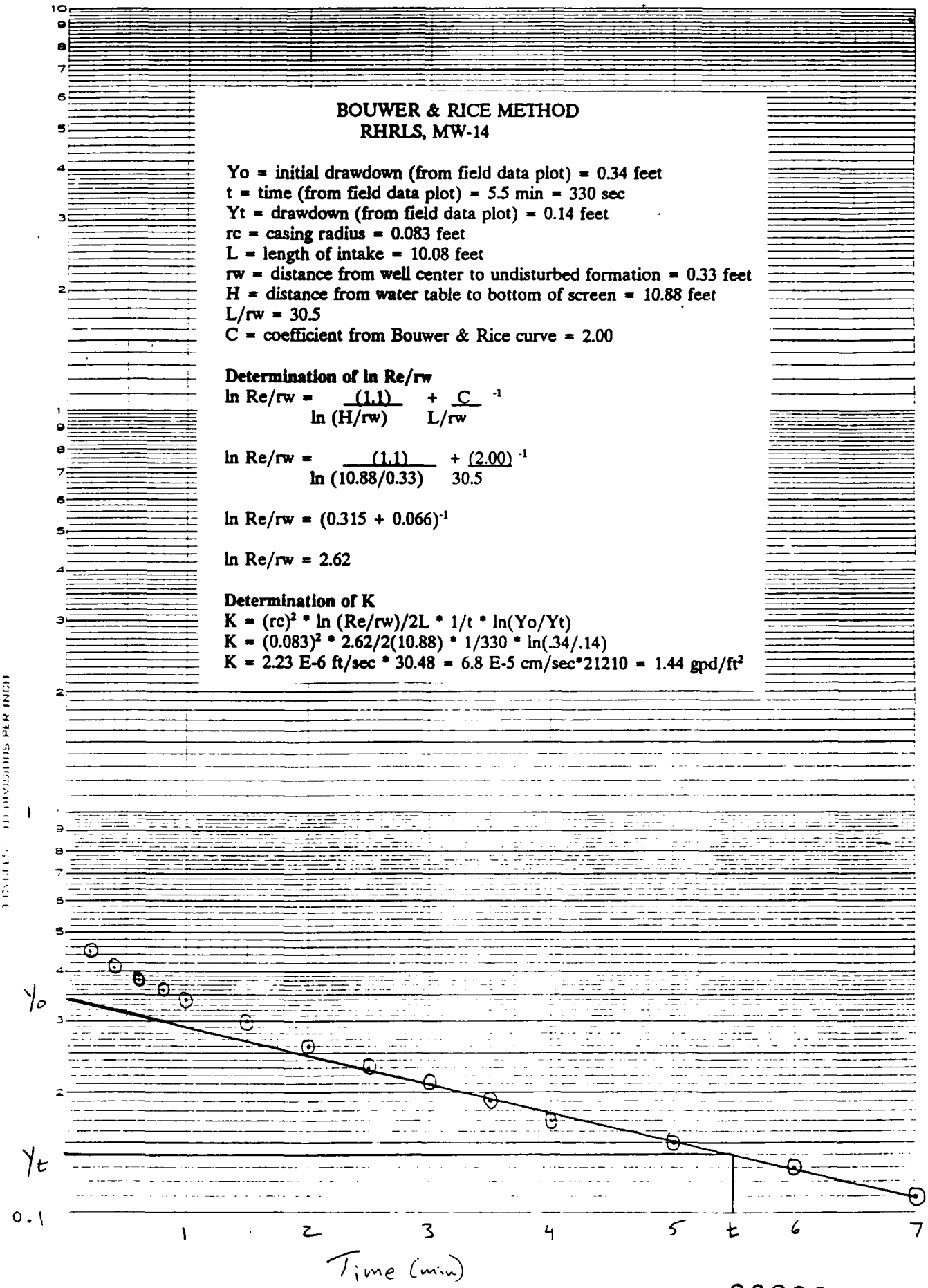
$$\ln Re/rw = \frac{(1.1)}{\ln (10.88/0.33)} + \frac{(2.00)}{30.5}^{-1}$$

$$\ln Re/rw = (0.315 + 0.066)^{-1}$$

$$\ln Re/rw = 2.62$$

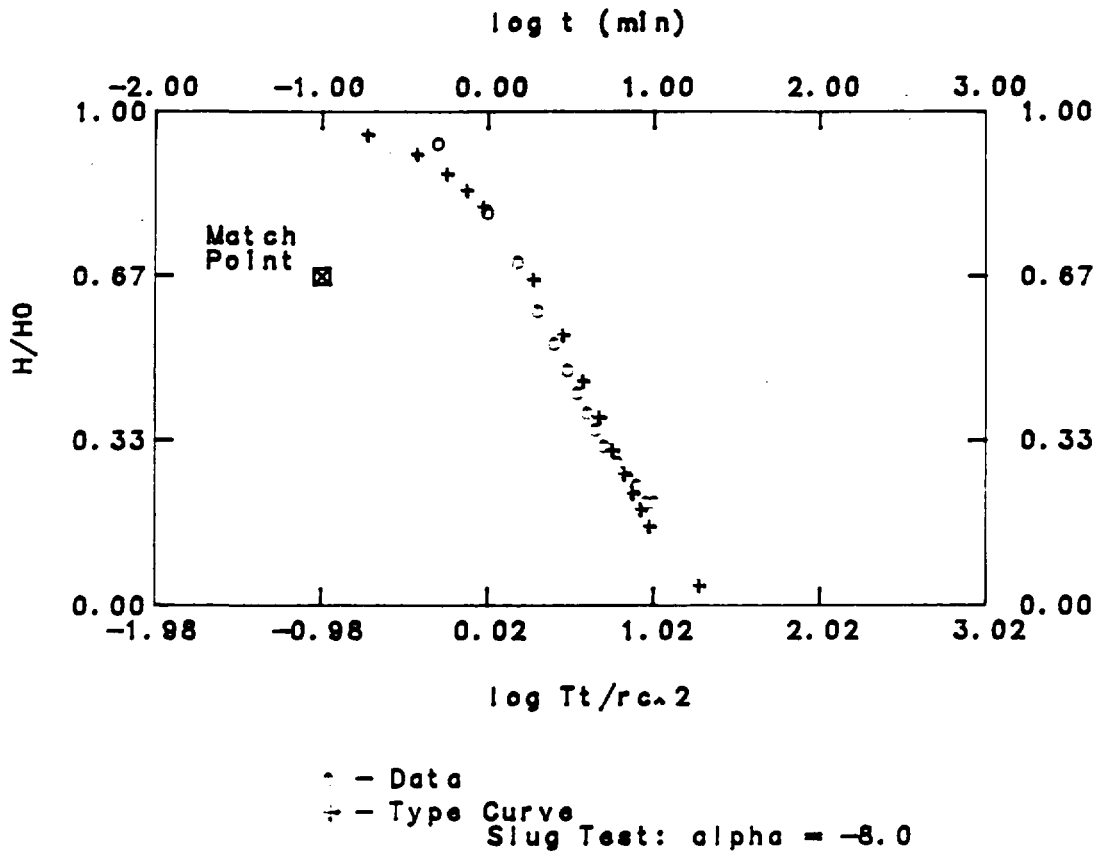
Determination of K

$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln(Yo/Yt)$
$K = (0.083)^2 * 2.62/2(10.88) * 1/330 * \ln(.34/.14)$
$K = 2.23$ E-6 ft/sec * 30.48 = 6.8 E-5 cm/sec*21210 = 1.44 gpd/ft^2



302223

MW-15



MATCH POINT		SOLUTION	
t	= 1.000E-0001	Transmissivity	= 7.769E+0001 gpd/ft
		Hydraulic. Cond.	= 5.211E+0000 gpd/sq ft
Tt/rc^2	= 1.047E-0001	Storativity	= 6.326E-0010

WELL INFORMATION	
WELL IDENTIFICATION	: MW-15
DATE OF AQUIFER TEST	: 12/19/90
AQUIFER THICKNESS (b)	: 1.491E+0001 ft
VOLUME OF SLUG (V)	: 1.500E-0002 cu ft
EFFECTIVE RADIUS	: 3.300E-0001 ft
WELL RADIUS AT MEASURED WATER LEVELS (rc)	: 8.300E-0002 ft

302224

BOUWER & RICE METHOD
RHRHLS, MW-16

Yo = initial drawdown (from field data plot) = 0.9 feet
t = time (from field data plot) = .68 min = 40.8 sec
Yt = drawdown (from field data plot) = 0.6 feet
rc = casing radius = 0.083 feet
L = length of intake = 13.72 feet
rw = distance from well center to undisturbed formation = 0.33 feet
H = distance from water table to bottom of screen = 13.72 feet
L/rw = 41.6
C = coefficient from Bouwer & Rice curve = 2.5

Determination of ln Re/rw

$$\ln Re/rw = \frac{(1.1)}{\ln (H/rw)} + \frac{C}{L/rw}^{-1}$$

$$\ln Re/rw = \frac{(1.1)}{\ln (13.72/0.33)} + \frac{(2.5)}{41.6}^{-1}$$

$$\ln Re/rw = (0.295 + 0.06)^{-1}$$

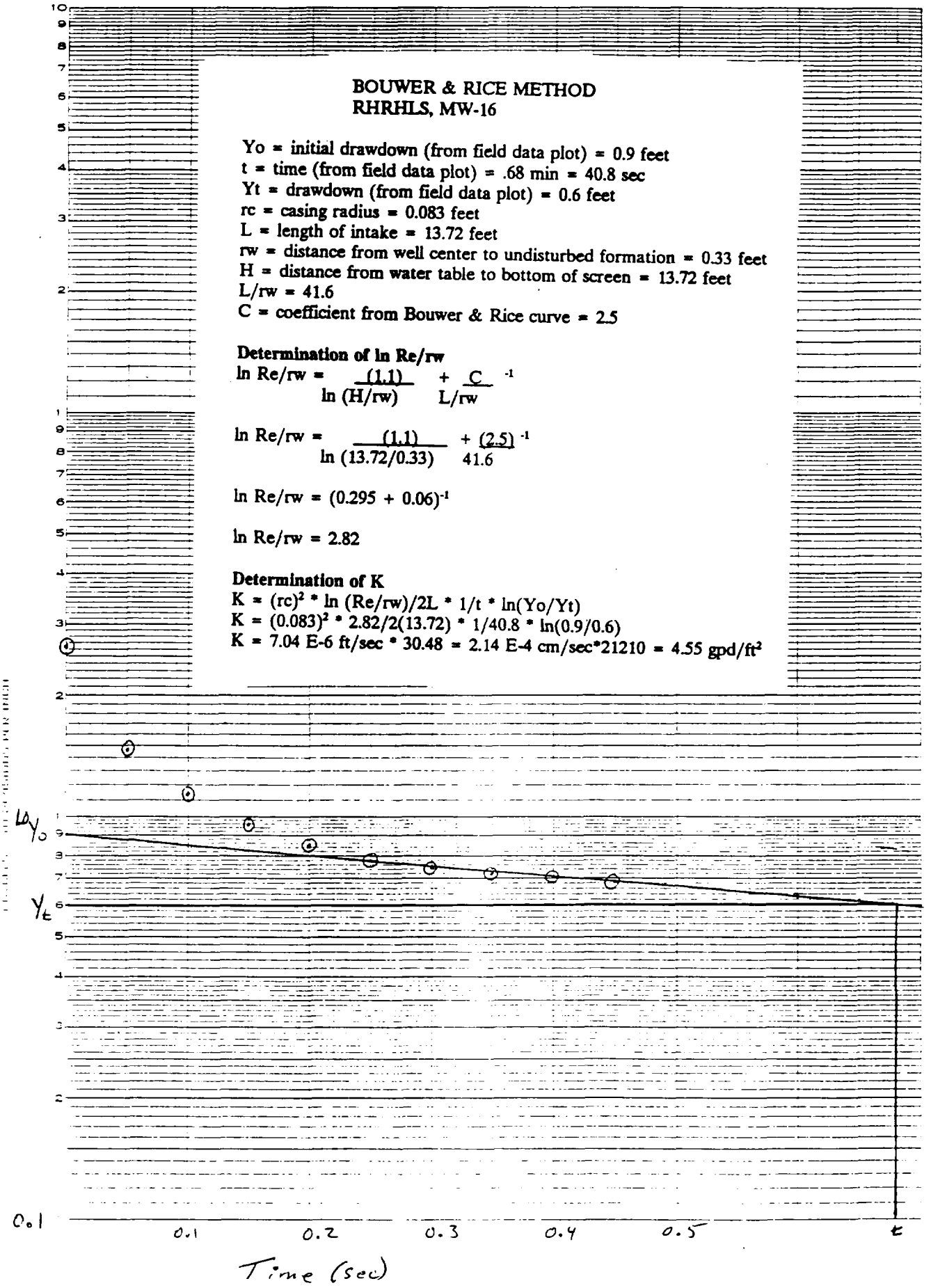
$$\ln Re/rw = 2.82$$

Determination of K

$$K = (rc)^2 * \ln (Re/rw)/2L * 1/t * \ln(Yo/Yt)$$

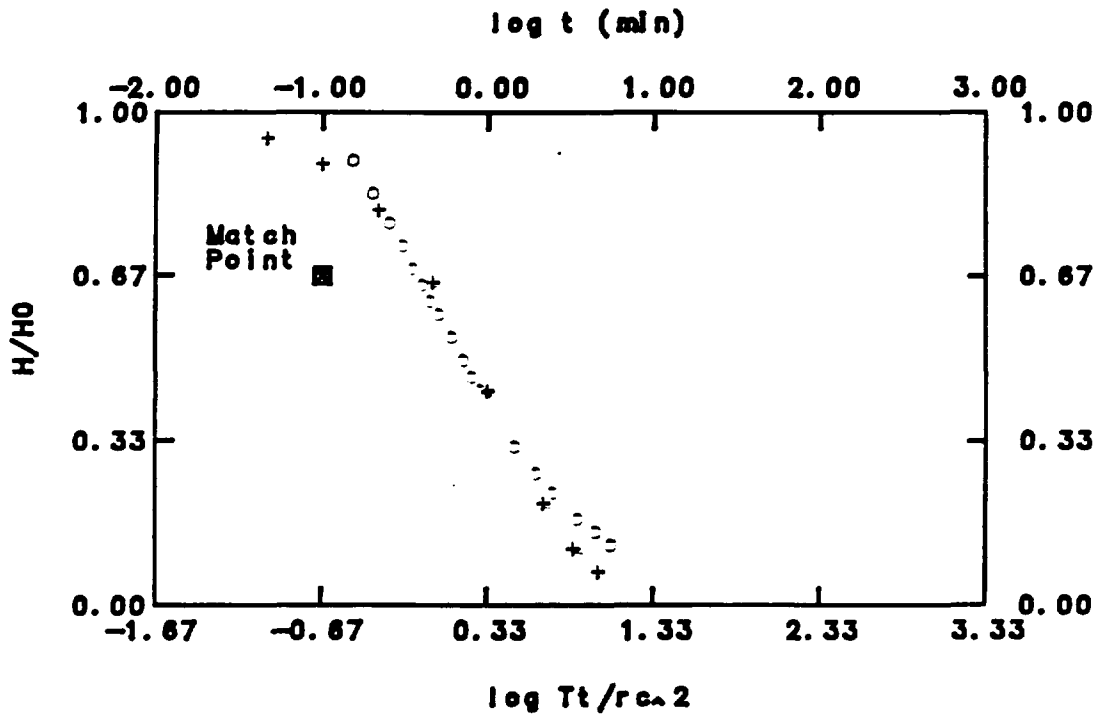
$$K = (0.083)^2 * 2.82/2(13.72) * 1/40.8 * \ln(0.9/0.6)$$

$$K = 7.04\ E\text{-}6\ ft/sec * 30.48 = 2.14\ E\text{-}4\ cm/sec * 21210 = 4.55\ gpd/ft^2$$



302225

MW-18S



MATCH POINT		SOLUTION	
t	= 1.000E-0001	Transmissivity	= 1.586E+0002 gpd/ft
		Hydraulic. Cond.	= 9.336E+0000 gpd/sq ft
Tt/rc^2	= 2.138E-0001	Storativity	= 6.326E-0006

WELL INFORMATION	
WELL IDENTIFICATION	: MW-18S
DATE OF AQUIFER TEST	: 12/19/90
AQUIFER THICKNESS (b)	: 1.699E+0001 ft
VOLUME OF SLUG (V)	: 5.600E-0002 cu ft
EFFECTIVE RADIUS	: 3.300E-0001 ft
WELL RADIUS AT MEASURED WATER LEVELS (rc)	: 8.300E-0002 ft

302226

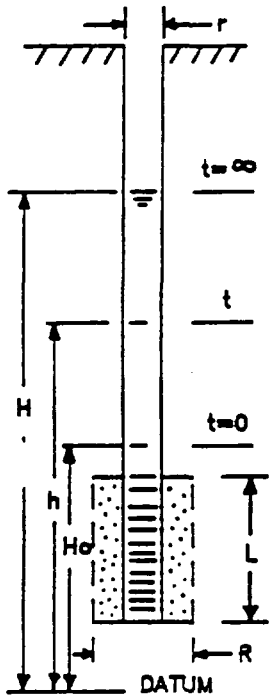
O'BRIEN & GERE

302227

IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT Richardson Hill Road Landfill
WELL NUMBER MW-18D
DATE 11-6-90

LOCATION Sidney, NY
ELEVATION



Well Depth - 51.99
static level - 17.11

STATIC HEAD (H) 34.88

PIPE RADIUS (r) .083

SCREEN RADIUS (R) .208

SCREEN LENGTH (L) 16.3

INITIAL HEAD (Ho) 14.28

HYDRAULIC CONDUCTIVITY :

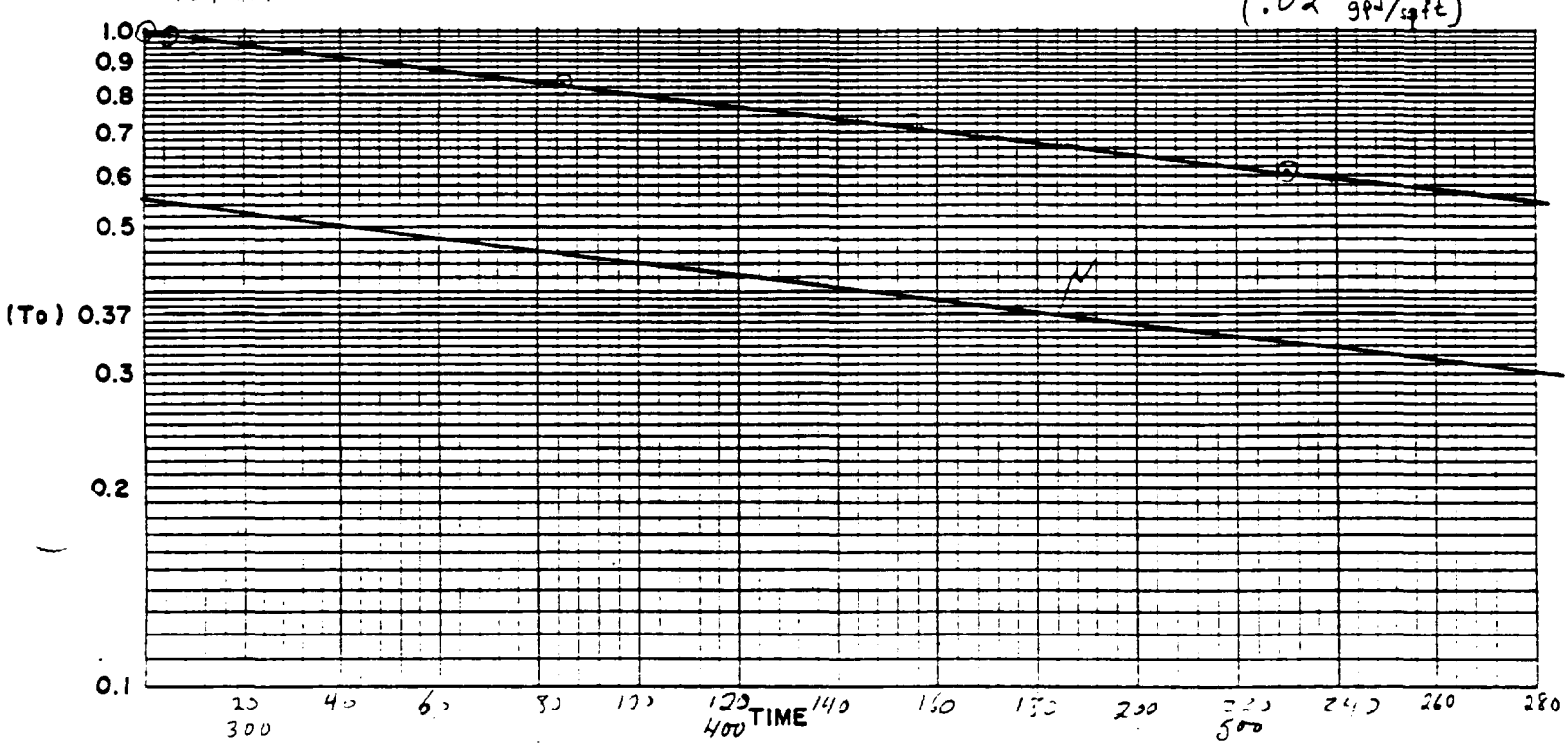
$$K = \frac{r^2 \ln(L/R)}{2LT_o}$$

$$K = \frac{(0.083)^2 \ln(16.3/0.208)}{2(16.3)(27840)} = 3.3 \times 10^{-8} \text{ ft/sec} = 1.0 \times 10^{-6} \text{ cm/sec}$$

(.02 gpd/sq ft)

T_o = 464 min.

TIME	WATER DEPTH	time	h	H-h / H-Ho
11:35	37.71	0	14.28	1
11:36	37.56	1	14.43	0.99
11:37	37.40	2	14.59	0.98
11:38	37.34	3	14.65	0.98
11:39	37.27	4	14.72	0.98
11:40	37.21	5	14.78	0.98
11:45	36.97	10	15.02	0.96
11:55	36.61	20	15.38	0.95
13:00	34.32	85	17.67	0.84
14:10	31.78	155	20.21	0.71
15:15	29.69	230	22.30	0.61



IN-SITU PERMEABILITY TEST
FIELD LOG

PROJECT: Richardson Hill Rd.
WELL NUMBER: MW-19
DATE: 6/2/92

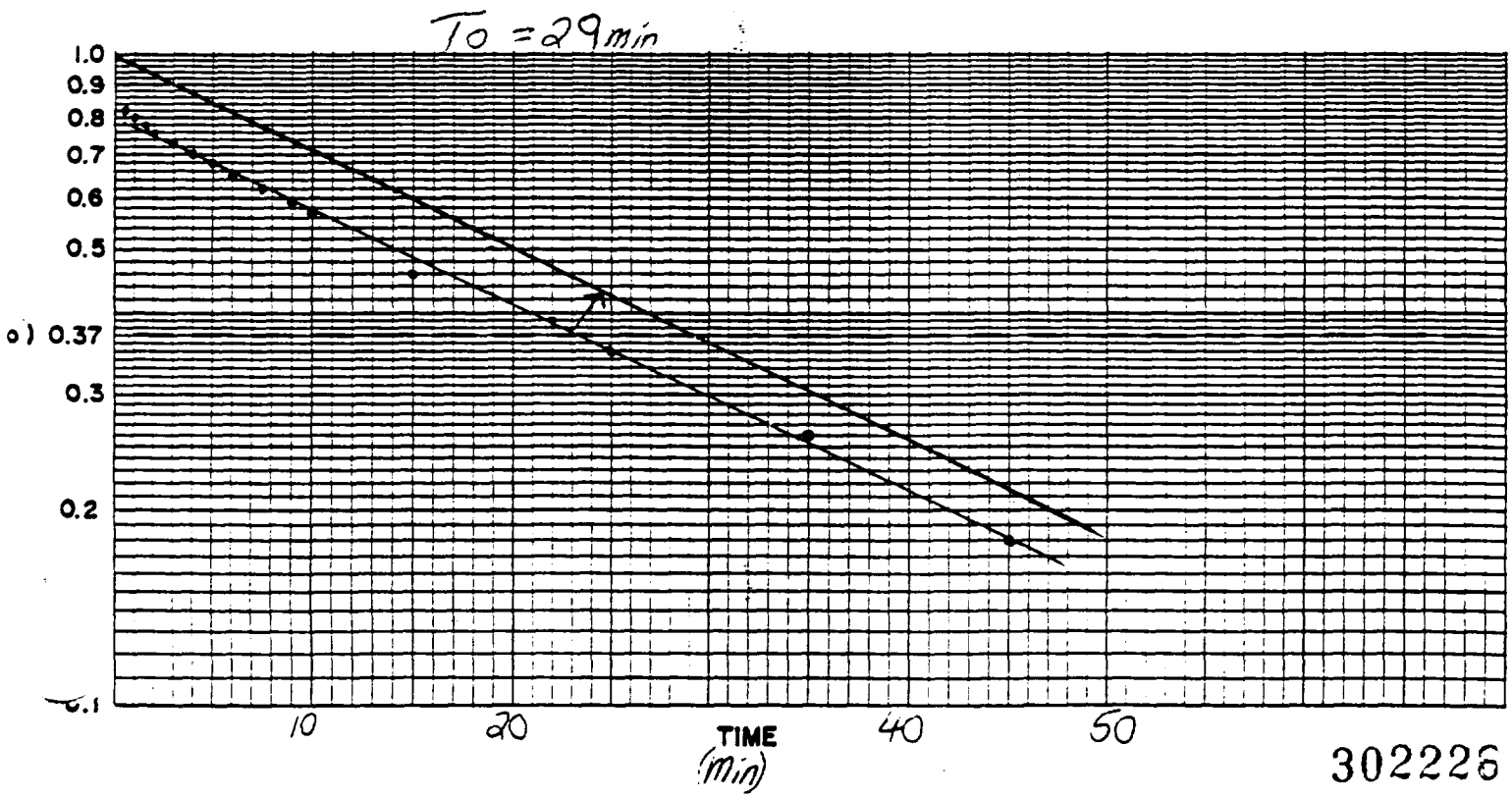
EVACUATION METHOD: Bailer
PERSONNEL: Moore/Loretto
DATUM USED FOR CALCULATIONS: Top Of Stainless Steel

STATIC HEAD (H) =	23.02	ft
PIPE RADIUS (r) =	0.083	ft
SCREEN RADIUS (R)	0.667	ft
SCREEN LENGTH (L)	17.7	ft
INITIAL HEAD (Ho)=	26.7	ft
To (from graph) =	29	min
	1740	sec

HYDRAULIC CONDUCTIVITY

$$K = \frac{r^2 \ln(L/R)}{2LTo} = 3.7E-07 \text{ ft/sec} = 1.1E-05 \text{ cm/sec}$$

TIME (min)	Depth to Water	h	H-h / H-Ho
0.5	26.04	26.04	0.82
1	25.95	25.95	0.80
1.5	25.88	25.88	0.78
2	25.82	25.82	0.76
3	25.71	25.71	0.73
4	25.61	25.61	0.70
5	25.51	25.51	0.68
6	25.43	25.43	0.65
7.5	25.31	25.31	0.62
8	25.26	25.26	0.61
9	25.19	25.19	0.59
10	25.11	25.11	0.57
15	24.73	24.73	0.46
22	24.45	24.45	0.39
25	24.31	24.31	0.35
35	23.97	23.97	0.26
45	23.69	23.69	0.18



302226

APPENDIX E

GROUND WATER SAMPLING LOGS

GROUND WATER SAMPLING FIELD LOG

302230

Sample Location Amphenol-RHRCS (South Section) Well No. MW 1
Sampled By W.J. Gabriel + J.A. Moore Date 11/18/88 Time 11:33
Weather Sunny, 40°-50° Sampled with Bailer SS Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 23.40 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 17.25 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 6.15 ft.

Volume of ~~water~~ in well:

2" diameter wells = 0.163 x (LWC) = 1.00 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Med brown Odor Strong petrol. Turbidity mod

Was an oil film or layer apparent? yes

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 6 gallons.

Did well go dry? yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Lt brown cloudy Odor strong-petro Turbidity mod

Was an oil film or layer apparent? yes

E. CONDUCTIVITY 40 μmhos

F. pH 6.8

G. TEMPERATURE 9°C

H. WELL SAMPLING NOTES:

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHELS (South Section) Well No. MW12
Sampled By J. Moore + W.J. Galnel Date 11/17/88 Time 16:15
Weather Overcast, dusk, 35-45° Sampled with Bailer SS Pump _____

A. WATER TABLE:

Well depth:
(below top of casing) 30.71 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 15.34 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 15.37 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.51 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Brown Odor Yes Turbidity Slight to Mod

Was an oil film or layer apparent? Yes

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8 gallons.

Did well go dry? Yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Cloudy Odor Strong-petrol Turbidity low

Was an oil film or layer apparent? slight to mod.

E. CONDUCTIVITY 50 μmhos

F. pH 6.9

G. TEMPERATURE 8° C

302231

H. WELL SAMPLING NOTES:

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHRLS (South Section) Well No. MW3
Sampled By W.J. Gabert + J.A Moore Date 11/16/88 Time 14:45
Weather Cloudy [illegible] 45-50°F Sampled with Bailer -- Pump [illegible]

A. WATER TABLE:

Well depth:
(below top of casing) 19.5 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 2.16 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 17.34 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.8 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Clear Odor yes Turbidity slight

Was an oil film or layer apparent? yes

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 25 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Lt brown Odor None Turbidity slight-mod.

Was an oil film or layer apparent? No

E. CONDUCTIVITY 16 μmhos

F. pH 6.8

G. TEMPERATURE 9°C

H. WELL SAMPLING NOTES:

302232

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHRCS (South Section) Well No. M[illegible]

Sampled By W. J. Gabriel Date 11/16/88 Time 14:00

Weather Overcast, cloudy 45-50°F Sampled with Bailer SS. Pump evac.

A. WATER TABLE:

Well depth: (below top of casing) 19.5 ft.

Well elevation: (top of casing) _____ ft.

Depth to water table: (below top of casing) 4.75 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 14.78 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.4 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Reddish Brown Odor No Turbidity Slight

Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 25 gallons.

Did well go dry? No.

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Lt. brown Odor None Turbidity Slight to med

Was an oil film or layer apparent? No

E. CONDUCTIVITY 3 umhos

F. pH 7.6

G. TEMPERATURE 9°C

H. WELL SAMPLING NOTES:

302233

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHRCS (South-Section) Well No. MW5S
Sampled By W.J. Hebert + J.A. Moore Date 11/16/88 Time 15:55
Weather Cloudy, windy 45-50°F Sampled with Bailer SS Pump (centr.)

A. WATER TABLE:

Well depth:
(below top of casing) 19.0 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 4.8 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 14.2 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.31 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Brown Odor No Turbidity Mod.

Was an oil film or layer apparent? Yes

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 9 gallons.

Did well go dry? yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Reddish-brown Odor moderate (petrol) Turbidity mod-high

Was an oil film or layer apparent? Slight

E. CONDUCTIVITY 34 µmhos

F. pH 6.8

G. TEMPERATURE 9°E

H. WELL SAMPLING NOTES:

302234

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHRLS (South Section) Well No. MW5d (Bedrock)
Sampled By W J Gabriel Date 11/16/88 Time 1515
Weather Cloudy, windy, 45-50°F Sampled with Bailer SS Pump Pump

A. WATER TABLE:

Well depth:
(below top of casing) 5.30 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 4.65 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 48.35 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 7.8 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Clear Odor No Turbidity No

Was an oil film or layer apparent? Yes

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 35 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Very slightly cloudy Odor None Turbidity Low-none

Was an oil film or layer apparent? No

E. CONDUCTIVITY 114 mhos

F. pH 7.1

G. TEMPERATURE 9°C

H. WELL SAMPLING NOTES:

302235

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHELS (South-Section) Well No. MW6
Sampled By W.J Gabriel + J.A. Moore Date 11/17/88 Time 14:00
Weather Partly-Cloudy - 35-45° Sampled with Bailer SS Pump evac

A. WATER TABLE:

Well depth:
(below top of casing) 20.0 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 5.94 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 14.06 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.29 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Brown Odor Yes Turbidity Slight

Was an oil film or layer apparent? Yes

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 12 gallons.

Did well go dry? Yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Reddish brown Odor Mod-petrol. Turbidity High

Was an oil film or layer apparent? Yes

E. CONDUCTIVITY 20 µs

F. pH 6.9

G. TEMPERATURE 8°C

302236

H. WELL SAMPLING NOTES:

Water very turbid (colloidal content v. high) pumped 0 - 12 gallons would not clear up.

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-Eagles Well No. MW7

Sampled By W J Gebrod Date 11/16/88 Time 16:20

Weather Cloudy, windy, 45-50° Sampled with Bailer SS. Pump (evac)

A. WATER TABLE:

Well depth: (below top of casing) 19.0 ft.

Well elevation: (top of casing) _____ ft.

Depth to water table: (below top of casing) 5.81 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 13.91 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.14 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Brown Odor No Turbidity Slight

Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 13 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Lt-med brown Odor slight Turbidity moderate

Was an oil film or layer apparent? slight

E. CONDUCTIVITY 21 µs

F. pH 7.6

G. TEMPERATURE 9°C

302237

H. WELL SAMPLING NOTES:

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol - RARCS (North Section) Well No. MW18
Sampled By W. J. Gabriel + J. Moore Date 11/18/88 Time 10:30
Weather Partly Cloudy, cool, 35-45° Sampled with Bailer SS Pump evac.

A. WATER TABLE:

Well depth: (below top of casing) 23.0 ft.

Well elevation: (top of casing) _____ ft.

Depth to water table: (below top of casing) 10.44 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 12.56 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.04 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Clear to cloudy Odor No Turbidity Slight

Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 20 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Clear to cloudy Odor None Turbidity None to slight

Was an oil film or layer apparent? No

E. CONDUCTIVITY 5 μs

F. pH 7.4

G. TEMPERATURE 9°C

H. WELL SAMPLING NOTES:

302238

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol - RHRCS (North Section) Well No. MW9
Sampled By W.J. Gilbert + J.A. Moore Date 11/16/88 Time 17:05
Weather Dark, cloudy, windy 40-45°F Sampled with Bailer SS Pump evac

A. WATER TABLE:

Well depth:
(below top of casing) 40.00 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 19.97 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 20.30 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 3.26 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color lt-med brown Odor No Turbidity slight
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 12 gallons.
Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color lt-med brown Odor none Turbidity moderate
Was an oil film or layer apparent? No

E. CONDUCTIVITY 10 μmhos

F. pH 6.8

G. TEMPERATURE 9°c

H. WELL SAMPLING NOTES:

302239

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol-RHELS (Wyatt Property) Well No. MW10
Sampled By W J Gabriel + J A Moore Date 11/16/88 Time 12:15
Weather Overcast 45-50° Sampled with Bailer SS Pump Evac

A. WATER TABLE:

Well depth:
(below top of casing) 19.0 ft.

Well elevation:
(top of casing) _____ ft.

Depth to water table:
(below top of casing) 3.35 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 15.65 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.5 gallons
4" diameter wells = 0.653 X (LWC) = _____ gallons
6" diameter wells = 1.469 X (LWC) = _____ gallons

B. PHYSICAL APPEARANCE AT START:

Color ~~lt~~ brown Odor No Turbidity Mod

Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 12 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color lt brown Odor None Turbidity Slight

Was an oil film or layer apparent? No

E. CONDUCTIVITY 700 µmhos

F. pH 7.3

G. TEMPERATURE 8°C

H. WELL SAMPLING NOTES:

302240

Evacuated w/pump (centrif)

GROUND WATER SAMPLING FIELD LOG

mple Location RHRLS - Amphenol Corp Well No. MW-1

Sampled By DRT / JAM Date 8/30/90 Time 8:45 AM

Weather Sunny, 70°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 25.16 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 21.08 ft. Water table elevation: ____ ft.

Length of water column (LWC) 4.08 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 0.67 gallons 2 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear Odor — Turbidity low

Was an oil film or layer apparent? Faint sheen

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 3 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color light brown Odor — Turbidity moderate

Was an oil film or layer apparent? Faint sheen

E. CONDUCTIVITY 280

F. pH 6.0

G. TEMPERATURE 11-12°C

H. WELL SAMPLING NOTES: 302241

Calibrated pH and S.C. meters before sampling

GROUND WATER SAMPLING FIELD LOG

mple Location RHRLS - Amphenol Corp. Well No. MW-2

sampled By DRT, CPO Date 8/30/90 Time 10:05 AM

Weather Sunny, 75°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 30.71 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 28.71 ft. Water table elevation: ____ ft.

Length of water column (LWC) 2 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 0.33 gallons 1 gal

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear Odor — Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 3 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color clear / light brown Odor — Turbidity low

Was an oil film or layer apparent? Faint sheen

E. CONDUCTIVITY 360

F. pH 6.8

G. TEMPERATURE 11°C

302242

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling. John Glover (Versar) collected splits at this well location (3 VOA's and 2 QTs.)

GROUND WATER SAMPLING FIELD LOG

mple Location RHRLS - Amphenol Corp. Well No. MW-3

sampled By DRT / CPO Date 8/30/90 Time 9 30 AM

Weather Sunny, 75°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 18.41 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 2.61 ft. Water table elevation: ____ ft.

Length of water column (LWC) 15.8 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 2.58 gallons 7.75 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear - light brown Odor slight Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor slight Turbidity moderate - high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 100

F. pH 6.1

G. TEMPERATURE 11-12°C

302243

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling. John Glover (Versar) collected splits at this well location (3 VOAs and 2 QTS).

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS - Amphenol Corp. Well No. MW-4

Sampled By DRT/CPO Date 8/29/90 Time 3:30 PM

Weather sunny, 85°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 22.53 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 6.88 ft. Water table elevation: ____ ft.

Length of water column (LWC) 15.65 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.55 gallons 7.65

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color brown Odor none Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor none Turbidity high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 20-30

F. pH 5.7

G. TEMPERATURE 13°C

302244

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling.

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS- Amphenol Corp. Well No. MW - 5s

Sampled By DRT / CPO Date 8/30/90 Time 11:20 AM

Weather Sunny, 80°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 17.96 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 5.40? ft. Water table elevation: ____ ft.

Length of water column (LWC) 12.56 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 2.05 gallons 6.15 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear / product droplets Odor — Turbidity low

Was an oil film or layer apparent? yes ≈ 1/8" - 1/4"

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 6.5 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor — Turbidity high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 180

F. pH 6.9

G. TEMPERATURE 14°C

302245

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling. John Glover (Versar) collected split at this well location (5 VOAs and 3 Qts.)

GROUND WATER SAMPLING FIELD LOG

mple Location RHRLS - Amphenol Corp. Well No. MW - 5d

Sampled By DRT / CPO Date 8/29/90 Time 5:30 PM

Weather cloudy, 75°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 51.47 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 4.53 ft. Water table elevation: ____ ft.

Length of water column (LWC) 46.94 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 7.65 gallons 22.95 gal

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color reddish brown/orange Odor none Turbidity low/clear

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 24 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color clear Odor none Turbidity very low

Was an oil film or layer apparent? no

E. CONDUCTIVITY 100

F. pH 6.5

G. TEMPERATURE 11°C

302246

H. WELL SAMPLING NOTES:

Calibrated pH and S.C meters before sampling.

GROUND WATER SAMPLING FIELD LOG

ample Location RHRLS - Amphenol Corp. Well No. MW-6

Sampled By DRT / CPO Date 8/30/90 Time 7:50 AM

Weather Sunny, 65° F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 22.32 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 7.43 ft. Water table elevation: ____ ft.

Length of water column (LWC) 14.89 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 2.43 gallons 7.28 gal.

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear / rusty colored Odor slight Turbidity low

Was an oil film or layer apparent? Sheen noted

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor slight Turbidity high

Was an oil film or layer apparent? Sheen noted

E. CONDUCTIVITY 240

F. pH 6.6

G. TEMPERATURE 14°C

302247

H. WELL SAMPLING NOTES:

Calibrated pH and S.C meters before sampling. Collected Blind Duplicate sample at this well location.

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS - Amphenol Corp. Well No. MW-7

Sampled By DRT, CPO Date 8/29/90 Time 1:30 Pm

Weather Sunny, 80°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 19.31 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 5.92 ft. Water table elevation: ____ ft.

Length of water column (LWC) 13.39 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 2.18 gallons 6.55 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear / light brown Odor none Turbidity very low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color dark brown Odor none Turbidity high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 120

F. pH 7.4

G. TEMPERATURE 12°C

H. WELL SAMPLING NOTES: 302248

Calibrated pH and S.C. meters before sampling.

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS- Amphenol Corp. Well No. MW-8

Sampled By DRT, CPO Date 8/29/90 Time 2:15 PM

Weather Sunny, 85°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 26.83 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 11.05 ft. Water table elevation: ____ ft.

Length of water column (LWC) 15.78 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 2.57 gallons 7.72 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear / light brown Odor none Turbidity very low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor none Turbidity high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 30-40

F. pH 7.2

G. TEMPERATURE 12°C

302249

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling.

GROUND WATER SAMPLING FIELD LOG

mple Location RHRLS - Amphenol Corp. Well No. MW-9

Sampled By DRT/CPD Date 8/29/90 Time 4:30 pm

Weather cloudy, 80°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) ~~29.87~~ 45.51 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 23.23 ft. Water table elevation: ____ ft.

Length of water column (LWC) 22.28 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 3.63 gallons 10.89 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear / tan Odor none Turbidity clear / very low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 12 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color dark brown Odor none Turbidity high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 60

F. pH 7.1

G. TEMPERATURE 12°C

302250

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling. Collected Matrix Spike and Matrix Spike Duplicate at this well LL Location.

GROUND WATER SAMPLING FIELD LOG

ample Location RHRLS - Amphenol Corp. Well No. MW-10

Sampled By DRT / CPO Date 8/29/90 Time 2:45 Pm

Weather Sunny, 85°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 15.87 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 3.91 ft. Water table elevation: ____ ft.

Length of water column (LWC) 11.96 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.95 gallons 5.85 gal

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear Odor none Turbidity Very low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 6 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color light brown Odor none Turbidity moderate

Was an oil film or layer apparent? no

E. CONDUCTIVITY 100

F. pH 6.6

G. TEMPERATURE 13-14°C

302251

H. WELL SAMPLING NOTES:

Calibrated pH and S.C. meters before sampling.

GROUND WATER SAMPLING FIELD LOG

Sample Location RHELS AMPHENOL Well No. MW-1

Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time 1050

Weather COOL, SUNNY, 40°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) ~~17.24~~ 22.5 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 17.24 ft. Water table elevation: ____ ft.

Length of water column (LWC) 5.26 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = .86 gallons 2.6

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons 8 BAILS

B. PHYSICAL APPEARANCE AT START:

Color CLEAR Odor ~~SLIGHT OIL SHEEN~~ YES Turbidity LOW

Was an oil film or layer apparent? ✓ NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 2.6 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color CLEAR/TAN Odor YES Turbidity LOW/MODERATE

Was an oil film or layer apparent? ~~SLIGHT~~ SHEEN

E. CONDUCTIVITY 430

F. pH 6.6

G. TEMPERATURE —

30225?

H. WELL SAMPLING NOTES:

SAMPLED AT 1100, 12-12-90, VOCS + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHKLS AMPHENOL Well No. MW-2

Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time 1120

Weather COOL SUNNY 40°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 29.5 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 28.54 ft. Water table elevation: ____ ft.

Length of water column (LWC) .96 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = .16 gallons .47

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons 1.5 BAILS

B. PHYSICAL APPEARANCE AT START:

Color CLEAR Odor YES SWEET Turbidity LOW

Was an oil film or layer apparent? YES SLIGHT SHEEN

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling .50 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color MILKY Odor YES SWEET Turbidity MODERATE

Was an oil film or layer apparent? SLIGHT SHEEN

E. CONDUCTIVITY 580

F. pH 6.6

G. TEMPERATURE —

302250

H. WELL SAMPLING NOTES:

SAMPLED AT 1125 12-12-90, VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol RHRLS Well No. MW-3

Sampled By MARK ROMA / JIM MOORE Date 12-11-90 Time 1240

Weather Cloudy Cold 20° Sampled with Bailer Y Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 18.73 ft.

Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 2.18 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 16.55 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.7 gallons 8.1

4" diameter wells = 0.653 X (LWC) = ____ gallons 25 [illegible]

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor YES SLIGHT-ODOR Turbidity MED

Was an oil film or layer apparent? ____

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8.5 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor YES MOD-ODOR Turbidity MED

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 180

F. pH 8.6

G. TEMPERATURE —

30225

H. WELL SAMPLING NOTES:

SAMPLED AT 1255 12-11-90, VOA'S + PCB'S

(BLIND DUP INCLUDED)

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol RHRLS Well No. MW-4

Sampled By MARK ROMA Jim Moore Date 12-11-90 Time 11:00

Weather Cloudy Cold 20° Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 22.82 ft.

Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 4.10 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 18.72 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 3.1 gallons 9.2

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons 29 [illegible]

B. PHYSICAL APPEARANCE AT START:

Color Brown Odor None Turbidity ~~[illegible]~~ Medium

Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 9.5 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Brown Odor None Turbidity High

Was an oil film or layer apparent? No

E. CONDUCTIVITY .040

F. pH 3.4

G. TEMPERATURE —

302255

H. WELL SAMPLING NOTES:

Sampled at 11:20 on 12-11-90 for VOA's & PCB's

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS AMPHENOL Well No. MW-55
Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time 1400
Weather COOL, SUNNY, 40°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 18.5 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 5.12 ft. Water table elevation: ____ ft.

Length of water column (LWC) 13.38 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.2 gallons 6.5
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 20 BAILS

B. PHYSICAL APPEARANCE AT START:

Color CLEAR Odor SWEET Turbidity LOW

Was an oil film or layer apparent? YES SLIGHT SHEEN

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7.0 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN Odor SWEET Turbidity MODERATE

Was an oil film or layer apparent? SLIGHT SHEEN

E. CONDUCTIVITY 500

F. pH 7.2

302250

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 1430 12-12-90, VOA'S + PLB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS AMPHENOL Well No. MW-5D
Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time 1500
Weather COOL, SUNNY, 40°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 51.5 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 4.29 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 47.21 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 7.7 gallons 23.0
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 70.0

B. PHYSICAL APPEARANCE AT START:

Color CLEAR Odor NONE Turbidity LOW

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 23.0 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN Odor NONE Turbidity MODERATE

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 130

F. pH 7.1

30225

G. TEMPERATURE ——

H. WELL SAMPLING NOTES:

SAMPLED AT 1535, 12-12-90, VOA'S, SEMI-VOLATILES
PCB'S TCL METALS (F)(U)
MS, MSD USED AT MW-5D
THIS BAILER WAS USED PRIOR FOR EQUIPMENT BLANK #3

GROUND WATER SAMPLING FIELD LOG

Sample Location [illegible] Well No. [illegible]

Sampled By [illegible] Date [illegible] Time 1015

Weather [illegible] Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 25.52 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 7.35 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 5.17 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = [illegible] gallons 7.4

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color BROWN/RUST Odor [illegible] Turbidity [illegible]

Was an oil film or layer apparent? SLIGHT SHEEN

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7.5 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color [illegible] Odor [illegible] Turbidity [illegible]

Was an oil film or layer apparent? [illegible]

E. CONDUCTIVITY [illegible]

F. pH [illegible]

302258

G. TEMPERATURE ____

H. WELL SAMPLING NOTES:

SAMPLED AT 1015 12-11-90, VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location [illegible] Well No. [illegible]-7

Sampled By [illegible] Date [illegible] Time [illegible]

Weather [illegible] Sampled with Bailer [illegible] Pump _____

A. WATER TABLE:

Well depth: (below top of casing) [illegible] ft.

Well elevation: (top of casing) _____ ft.

Depth to water table: (below top of casing) 5.91 ft.

Water table elevation: _____ ft.

Length of water column (LWC) 13.7 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = [illegible] gallons 6.7

4" diameter wells = 0.653 X (LWC) = _____ gallons

6" diameter wells = 1.469 X (LWC) = _____ gallons [illegible]

B. PHYSICAL APPEARANCE AT START:

Color [illegible] Odor [illegible] Turbidity [illegible]

Was an oil film or layer apparent? [illegible]

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling [illegible] gallons.

Did well go dry? [illegible]

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color [illegible] Odor [illegible] Turbidity [illegible]

Was an oil film or layer apparent? [illegible]

E. CONDUCTIVITY [illegible]

F. pH [illegible]

G. TEMPERATURE [illegible]

302259

H. WELL SAMPLING NOTES:

SAMPLED AT 0945 12-11-90, VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS AMPHENOL Well No. MW-8
Sampled By MARK ROMA / T. MOORE Date 12-12-90 Time 0910
Weather COOL, CLEAR, 29°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 26.81 ft.
Well elevation: (top of casing) ____ ft.
Depth to water table: (below top of casing) 10.53 ft.
Water table elevation: ____ ft.
Length of water column (LWC) 16.28 ft.
Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.7 gallons 8.0
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 24 BARS

B. PHYSICAL APPEARANCE AT START:

Color GRAY Odor NONE Turbidity HIGH
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8.5 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color GRAY Odor ~~[illegible]~~ NONE Turbidity HIGH
Was an oil film or layer apparent? NO

E. CONDUCTIVITY 060~~0~~.JM

F. pH 8.8

302260

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 0925, 12-12-90, VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHELS AMPHENOL Well No. MW-9
Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time 0930
Weather COOL, CLEAR, 35°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 45.88 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 20.84 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 25.04 ft.

Volume of water in well:

(2") diameter wells = 0.163 x (LWC) = 4.1 gallons 12.2
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

37 BAILS.

B. PHYSICAL APPEARANCE AT START:

Color CLEAR Odor NONE Turbidity LOW

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 12.5 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN Odor NONE Turbidity MED

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 090 µmhos

F. pH 8.2

302261

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 0955 12-12-90, VOAS + FLB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS Amphenol Well No. MW-10
Sampled By MARK ROMA / J. MOORE Date 12-11-90 Time 1315
Weather COOL / 35°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 16.00 ft.
Well elevation: (top of casing) ____ ft.
Depth to water table: (below top of casing) 3.47 ft.
Water table elevation: ____ ft.
Length of water column (LWC) 12.53 ft.
Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.0 gallons 6.1
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 18.5 BAILS

B. PHYSICAL APPEARANCE AT START:

Color TAN Odor NONE Turbidity LOW
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 6.5 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN/BROWN Odor NONE Turbidity MED
Was an oil film or layer apparent? NO

E. CONDUCTIVITY 120

F. pH 8.4

302262

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 1325 12-11-90, VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location CHCLS AMPHENOL Well No. MW-115
Sampled By MARK ROMA / J. MOORE Date 12-11-90 Time 1200
Weather COOL, CLOUDY, 30°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 36.69 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 11.98 ft. Water table elevation: ____ ft.

Length of water column (LWC) 24.71 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 4.0 gallons 12.0
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 36 BAILS

B. PHYSICAL APPEARANCE AT START:

Color CLEAR / TAN Odor NONE Turbidity LOW
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 12.0 gallons.
Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN Odor NONE Turbidity MED
Was an oil film or layer apparent? NO

E. CONDUCTIVITY 660

F. pH 9.3

G. TEMPERATURE —

302260

H. WELL SAMPLING NOTES:

SAMPLED AT 1217 12-11-90, VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHRLS AMPHENOL Well No. MW-11D
Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time ~~8~~ 1600
Weather COOL, 35°F / CLOUDY Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 62.10 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 56.72 ft. Water table elevation: ____ ft.

Length of water column (LWC) 5.38 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = .88 gallons 2.6
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons ~~8 BAILS~~ 2' BAILER 11 BAILS

B. PHYSICAL APPEARANCE AT START:

Color TAN Odor NONE Turbidity MODERATE

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 2.6 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN Odor NONE Turbidity MODERATE

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 240

F. pH 8.8

30226

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 1615 12-12-90 VOAS 1615, SEMI VOLATILES,
12-13-90 → 0850 PCB'S, TCL METALS,
FILTERED / UNF.

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol RHRLS Well No. MW-12

Sampled By [illegible] Date 12-11-90 Time 1140

Weather [illegible] 20° Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 45.67 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 37.58 ft. Water table elevation: ____ ft.

Length of water column (LWC) 8.09 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.3 gallons 4.0

4" diameter wells = 0.653 X (LWC) = ____ gallons 12.00

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color TAN/BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 2.5 gallons.

Did well go dry? YES

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN/BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 670

F. pH 8.7

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 1150 12-11-90, VOA'S + PCB'S

302265

GROUND WATER SAMPLING FIELD LOG

Sample Location RHELS AMPHENOL Well No. MW-13
Sampled By MARK ROMA / J. MOORE Date 12-11-90 Time 1340
Weather COOL 35°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) ~~22.07~~ 22.02 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 7.19 ft. Water table elevation: ____ ft.

Length of water column (LWC) 14.83 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.4 gallons 7.3
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 22 BAILS.

B. PHYSICAL APPEARANCE AT START:

Color TAN Odor NONE Turbidity MOD

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7.5 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 080

F. pH 8.3

302260

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 1355 12-11-90 VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location PHELS AMPHENOL Well No. MW-14
Sampled By MARK ROMA / T. MOORE Date 12-12-90 Time 1005
Weather COOL, CLEAR, 30°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) ~~[illegible]~~ 22.18 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 11.71 ft. Water table elevation: ____ ft.

Length of water column (LWC) 10.47 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 1.7 gallons 5.1
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 16 BAILS

B. PHYSICAL APPEARANCE AT START:

Color TAN Odor NONE Turbidity MODERATE

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 6.0 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 130

F. pH 7.9

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 1020, 12-12-90, VOA'S + PCB'S

30226

GROUND WATER SAMPLING FIELD LOG

Sample Location EWCLS AMPHENOL Well No. MW-15
Sampled By MARK ROMA / J. MOORE Date 12-11-90 Time 1405
Weather COOL 35°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 26.60 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 11.69 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 14.91 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.4 gallons 7.5
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 22.1 BAILS

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7.5 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 100

F. pH 8.3

G. TEMPERATURE —

302266

H. WELL SAMPLING NOTES:

SAMPLED AT 1420 12-11-90, VOAS + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location RHCLS AMPHENOL Well No. MW-16

Sampled By MARK COMA / J. MOORE Date 12-12-90 Time 08:25

Weather COLD, CLEAR, 25°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 21.15 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 6.80 ft. Water table elevation: ____ ft.

Length of water column (LWC) 14.35 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.3 gallons 7.0

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons 21 BAILS

B. PHYSICAL APPEARANCE AT START:

Color BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7.5 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color BROWN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 100

F. pH 8.0

302269

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

SAMPLED AT 0840, 12-12-90, VOA'S + RB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location Amphenol RHRLS Well No. MW-17
Sampled By MARK ROMA / JIM Moore Date 12-11-90 Time 1050
Weather cloudy cold 15° Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 35.15 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 33.49 ft. Water table elevation: ____ ft.

Length of water column (LWC) 1.66 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = .27 gallons .81
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons 3 [illegible]

B. PHYSICAL APPEARANCE AT START:

Color GREEN-TAN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 1.0 gallons.

Did well go dry? YES

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color GREEN-TAN Odor NONE Turbidity HIGH

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 640

F. pH 8.2

G. TEMPERATURE —

302270

H. WELL SAMPLING NOTES:

SAMPLED AT 1045 12-11-90 VOA'S + PCB'S

GROUND WATER SAMPLING FIELD LOG

Sample Location [illegible] Well No. [illegible]
Sampled By [illegible] Date [illegible] Time [illegible]
Weather [illegible] Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 21.4 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 4.15 ft.

Water table elevation: ____ ft.

Length of water column (LWC) [illegible] ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = [illegible] gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color ____ Odor ____ Turbidity ____

Was an oil film or layer apparent? ____

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling ____ gallons.

Did well go dry? ____

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color ____ Odor ____ Turbidity ____

Was an oil film or layer apparent? ____

E. CONDUCTIVITY ____

F. pH ____

G. TEMPERATURE ____

302271

H. WELL SAMPLING NOTES:

SAMPLED AT 1005 12-11-90 FOR VOA'S + PCB'S
THIS BAILER WAS USED PRIOR FOR EQUIPMENT BLANK #2

GROUND WATER SAMPLING FIELD LOG

Sample Location RHELS AMPHENOL Well No. MW-18D
Sampled By MARK ROMA / J. MOORE Date 12-12-90 Time 1630
Weather COOL, SUNNY, 40°F Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 51.99 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 16.67 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 35.32 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 5.8 gallons 17.3
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

5-2 BAILS

B. PHYSICAL APPEARANCE AT START:

Color TAN/BROWN Odor NONE Turbidity MODERATE
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 16.0 gallons.
Did well go dry? YES

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN/BROWN Odor NONE Turbidity MODERATE
Was an oil film or layer apparent? NO

E. CONDUCTIVITY 560

F. pH 8.2

302277

G. TEMPERATURE —

H. WELL SAMPLING NOTES:

-13-

SAMPLED AT 0900 12-12-90, VOA'S, SEMI-VOLATILES, PCBS, TCL METALS, FE-TALS & UNFILTERED

GROUND WATER SAMPLING FIELD LOG

Sample Location (RHRLS) RICHARDSON HILL ROAD LANDFILL Well No. MW-5D

Sampled By JAMES A. MOORE Date 12-5-91 Time 1230

Weather COLD Sampled with Bailer X Pump ____

4.11

A. WATER TABLE:

Well depth: (below top of casing) 57.79 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 4.07 ft. Water table elevation: ____ ft.

Length of water column (LWC) 47.72 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 7.78 gallons 23.34 gal

4" diameter wells = 0.653 X (LWC) = ____ gallons

6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color COLORLESS Odor NONE Turbidity LOW

Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 24.0 gallons.

Did well go dry? NO

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN/LIGHT BROWN Odor YES Turbidity MODERATE

Was an oil film or layer apparent? NO

E. CONDUCTIVITY 6gal 12gal 18gal 24gal 60, 100, 120, 120

F. pH 7.0, 7.0, 7.0, 7.0

G. TEMPERATURE -, -, -, -

H. WELL SAMPLING NOTES:

SAMPLED AT 1315

302273

GROUND WATER SAMPLING FIELD LOG

Sample Location (RHRLS) RICHARDSON HILL ROAD LANDFILL Well No. MW-11D
Sampled By JAMES A. MOORE Date 12-5-91 Time 1115
Weather COLD Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth:
(below top of casing) 61.68 ft.

Well elevation:
(top of casing) ____ ft.

Depth to water table:
(below top of casing) 56.67' ft.

Water table elevation: ____ ft.

Length of water column (LWC) 5.01 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = .81 gallons 2.45 gal.
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Light tan/Brown Odor none Turbidity High
Was an oil film or layer apparent? No

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 1.5 gallons.
Did well go dry? Yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color Tan Odor NONE Turbidity MODERATE
Was an oil film or layer apparent? NO

E. CONDUCTIVITY 1 gal 240 1.5 1900

F. pH 1 gal 7.0 1.5 7.0

G. TEMPERATURE — —

30227

H. WELL SAMPLING NOTES:

SAMPLED AT 1130 MW-11D & BLIND DUP

DIW
16.52

GROUND WATER SAMPLING FIELD LOG

Sample Location (RHRLS) RICHARDSON HILL ROAD LANDFILL Well No. MW-18D
Sampled By JAMES A. MOORE Date 12-5-91 Time 1355
Weather COLD Sampled with Bailer X Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 57.59 ft.
Well elevation: (top of casing) ____ ft.
Depth to water table: (below top of casing) 16.48 ft.
Water table elevation: ____ ft.
Length of water column (LWC) 35.11 ft.
Volume of water in well:
2" diameter wells = 0.163 x (LWC) = 5.7 gallons 17.19 gal
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color COLORLESS/TAN Odor NONE Turbidity Low
Was an oil film or layer apparent? NO

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7.0 gallons.
Did well go dry? YES

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color TAN Odor NONE Turbidity Low
Was an oil film or layer apparent? NO

E. CONDUCTIVITY 6 gal 12 gal, 18 gal 7 gal 340 ≠ 410

F. pH 7 PH, 7.0

G. TEMPERATURE —, —, ~~AA~~

302275

H. WELL SAMPLING NOTES:

SAMPLED AT 1535

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd. Landfill site Well No. MW-7S

Sampled By DRT, PJL Date 5/4/92 Time 3:00 pm

Weather cloudy, windy, 45°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 19.39 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 5.94 ft. Water table elevation: ____ ft.

Length of water column (LWC) 13.45 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.2 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color brown Odor none Turbidity very high

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 8 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor none Turbidity very high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 190 uS/cm, 220 uS/cm, 200 uS/cm, 200 uS/cm

F. pH 9.56, 9.20, 8.95, 9.0

G. TEMPERATURE 46°F, 44°F, 43.9°F, 43.8°F

302270

H. WELL SAMPLING NOTES:

HNU reading over well = 0.1 ppm (Background)

Collected MS and MSD at 7S

Turbidity > 100 NTUs

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill Site Well No. MW-4d

Sampled By DRT, PJL Date 5/4/92 Time 3:50 pm

Weather partly sunny, 50°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 48.65 ft.

Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 2.85 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 45.80 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 7.47 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear Odor none Turbidity very low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling ~~25~~ 16 gallons.

Did well go dry? yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color clear Odor none Turbidity very low

Was an oil film or layer apparent? no

E. CONDUCTIVITY 420uS/cm, 400uS/cm, 420uS/cm

F. pH 9.09, 9.24, 9.25

G. TEMPERATURE 52.7°F, 52.6°F, 52.7°F

302277

H. WELL SAMPLING NOTES:

HNU reading over well = 0.1 ppm (Background)

Checked Turbidity w/ HACH Turbidimeter > 100 NTU

Split Samples w/ VERSAR rep. Pete Kaminski

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd. Landfill site Well No. mw-11d

Sampled By DRT, PJL Date 5/4/92 Time 12.55 Pm

Weather cloudy, 50°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 61.98 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 56.64 ft. Water table elevation: ____ ft.

Length of water column (LWC) 5.34 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 0.87 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear Odor none Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 1.5 gallons.

Did well go dry? yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color clear Odor none Turbidity low

Was an oil film or layer apparent? no

E. CONDUCTIVITY 260 uS/cm, 240 uS/cm, 240 uS/cm

F. pH 8.0, 8.10, 7.98

G. TEMPERATURE 51.6°F, 49.2°F, 48.8°F

302278

H. WELL SAMPLING NOTES:

HNu reading over well = 0.1 ppm (Background)

Turbidity > 100 NTUs

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill site Well No. MW-11S

Sampled By DRT, PJL Date 5/4/92 Time 1:25 PM

Weather cloudy, 50°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 36.54 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 11.26 ft. Water table elevation: ____ ft.

Length of water column (LWC) 25.28 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 4.12 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color dark gray Odor none Turbidity moderate

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 13 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color gray Odor none Turbidity moderate

Was an oil film or layer apparent? no

E. CONDUCTIVITY 50uS/cm, 50uS/cm, 50uS/cm, 50uS/cm

F. pH ~~48.5°F~~ 8.62, 8.54, 8.53, 8.54

G. TEMPERATURE 48.5°F, 45.9°F, 45°F, 44.7°F

302279

H. WELL SAMPLING NOTES:

HNU reading over well = 0.1 ppm (Background)

Turbidity > 100 NTUs

Split Samples w/ Versar rep. Pete Kaminski

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill site Well No. MW-4S

Sampled By DRT, PJL Date 5/4/92 Time 12:20 pm

Weather sunny, 50°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 22.71 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 3.50 ft. Water table elevation: ____ ft.

Length of water column (LWC) 19.21 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 3.13 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color light brown/clear Odor none Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 10 gallons.

Did well go dry? No

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color light brown Odor none Turbidity low

Was an oil film or layer apparent? no

E. CONDUCTIVITY 30uS/cm, 30uS/cm, 30uS/cm

F. pH 9.06, 8.81, 8.68, 8.62

G. TEMPERATURE 54.4°F, 54.7°F, ~~53.8°F~~ 43.8°F, 45.2°F,

302280

H. WELL SAMPLING NOTES:

HNu Reading over well = 0.1 ppm (Background)

Turbidity > 100 NTU

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill Well No. MW-5d

Sampled By DRT, PJL Date 5/5/92 Time 11:00 AM

Weather Snow, 35°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 52.05 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 3.78 ft. Water table elevation: ____ ft.

Length of water column (LWC) 48.27 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 7.87 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color light gray Odor none Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 25 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color clear Odor none Turbidity low

Was an oil film or layer apparent? no

E. CONDUCTIVITY (uS/cm) 90 150 153

F. pH 11.28 11.2 10.93

G. TEMPERATURE 46.8°F 46.5°F 46.5°F

302281

H. WELL SAMPLING NOTES:

HNU reading over well = 0.1 ppm (Background)

Turbidity > 100 NTU's

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill Well No. MW-5S

Sampled By DRT, PJL Date 5/5/92 Time 11:30 Am

Weather snow, 35°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 18.50 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 5.10 ft. Water table elevation: ____ ft.

Length of water column (LWC) 13.4 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.18 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color brown Odor YES Turbidity moderate/high

Was an oil film or layer apparent? YES (0.31 ft. thick layer)

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 7 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor YES Turbidity moderate/hig

Was an oil film or layer apparent? no, slight sheen

E. CONDUCTIVITY 510 uS/cm, 500 uS/cm, 500 uS/cm

F. pH 12.2, 11.9, 12.1

G. TEMPERATURE 42.3°F 42.4°F 42.5°F

302280

H. WELL SAMPLING NOTES:

HNU reading over well = 0.1 ppm (background)

Turbidity > 100 NTUs

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill site Well No. MW-7d

Sampled By DRT / PJL Date 5/4/92 Time 2:25 pm

Weather cloudy, 50°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 37.56 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 6.78 ft. Water table elevation: ____ ft.

Length of water column (LWC) 30.78 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 5.02 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear / light gray Odor none Turbidity very low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 14 gallons.

Did well go dry? ~~no~~ Yes

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color light gray Odor none Turbidity moderate

Was an oil film or layer apparent? no

E. CONDUCTIVITY 290 uS/cm, 240 uS/cm, 370 uS/cm, 360 uS/cm

F. pH 9.37, 10.32, 9.90, 9.95

G. TEMPERATURE 50°F, 46.5°F, 45.7°F

302280

H. WELL SAMPLING NOTES:

Turbidity > 100 NTUs

HNU reading over well = 0.1 ppm (Background)

Split Sampler w/ Versar rep. Pete Kamiski;

Collected Blind Duplicate AT MW-7d

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill Site Well No. MW-18S

Sampled By DRT, PJL Date 5/5/92 Time 9:45 AM

Weather Snow 35°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 21.05 ft. Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 3.75 ft. Water table elevation: ____ ft.

Length of water column (LWC) 17.3 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 2.82 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color brown Odor no Turbidity high

Was an oil film or layer apparent? none

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 9 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color brown Odor no Turbidity high

Was an oil film or layer apparent? none

E. CONDUCTIVITY (uS cm) 350, 290, 300

F. pH 8.52, 8.25, 8.1

G. TEMPERATURE 43.5°F, 42.3°F, 41.8

30228

H. WELL SAMPLING NOTES:

HNU reading over well = 0.1 ppm (background)

Turbidity > 100 NTUs

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill Well No. mw-18d
Sampled By DRT, PJL Date 5/5/92 Time 10:05 AM
Weather snow, 35°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 51.89 ft. Well elevation: (top of casing) ____ ft.
Depth to water table: (below top of casing) 16.56 ft. Water table elevation: ____ ft.
Length of water column (LWC) 35.33 ft.
Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 5.76 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color clear Odor none Turbidity ~~very~~ low
Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 14 gallons.
Did well go dry? YES

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color clear / light gray Odor none Turbidity low
Was an oil film or layer apparent? no

E. CONDUCTIVITY 460 µS/cm, 500 µS/cm, 510 µS/cm

F. pH 8.02, 7.85, 7.85

G. TEMPERATURE 44°F, 43.8°F, 43.5°F

302285

H. WELL SAMPLING NOTES:

HNu reading over well = 0.1 ppm (Background)
Checked w/ Turbidimeter > 100 NTUs

GROUND WATER SAMPLING FIELD LOG

Sample Location Richardson Hill Rd Landfill site Well No. MW-19

Sampled By DRT, PJL Date 5/4/92 Time 11:00 AM

Weather sunny, 50°F Sampled with Bailer ✓ Pump ____

A. WATER TABLE:

Well depth: (below top of casing) 42.01 ft.

Well elevation: (top of casing) ____ ft.

Depth to water table: (below top of casing) 21.65 ft.

Water table elevation: ____ ft.

Length of water column (LWC) 20.36 ft.

Volume of water in well:

2" diameter wells = 0.163 x (LWC) = 3.32 gallons
4" diameter wells = 0.653 X (LWC) = ____ gallons
6" diameter wells = 1.469 X (LWC) = ____ gallons

B. PHYSICAL APPEARANCE AT START:

Color Light tan Odor none Turbidity low

Was an oil film or layer apparent? no

C. PREPARATION OF WELL FOR SAMPLING:

Amount of water removed before sampling 10 gallons.

Did well go dry? no

D. PHYSICAL APPEARANCE DURING SAMPLING:

Color tan Odor none Turbidity high

Was an oil film or layer apparent? no

E. CONDUCTIVITY 1000uS/cm, 570uS/cm, 110uS/cm, 173uS/cm, 101uS/cm

F. pH 8.94, 6.97, 8.22, 8.20, 8.26

G. TEMPERATURE 54.9°F, 50.2°F, 51.0°F, 49.9°F, 49.9°F

302280

H. WELL SAMPLING NOTES:

HNu reading over well = 0.1 ppm (Background)

Turbidity >> 100 NTU

Appendix E
RHRMLS Supplemental Remedial Investigation
12/94 - 3/95
Ground Water Sampling Low Flow Purge Evacuation Data
Sidney, New York

Time (Min)	Water Level (ft)	Temperature (°C)	pH(1)	pH(2)	Conductivity (µS/cm)	Oxidation Reduction Potential(mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Flow Rate Gal./Min.
MW-1									
2.8 gal	–	9.3	6.29		0.302	18	2.6	44	*
MW-2									
3	–	11.4	6.08		0.286	1	1.15	75	
6	–	11.9	6.10		0.386	-15	1.1	74	
9	–	12.3	6.13		0.355	-29	1.0	56	
12	29.28	12.5	6.13		0.416	-36	1.0	44	
15	29.19	13.1	6.15		0.421	-39	1.2	40	
18	29.05	13.3	6.15		0.421	-40	1.4	38	
21	28.91	13.2	6.16		0.42	-40	1.4	38	0.08
MW-3									
3	2.84	10.3	5.64	5.7	0.116	88	1.2	>100	
6	2.84	10.6	5.68	5.7	0.116	62	1.1	88.2	
9	2.84	10.7	5.63	5.7	0.117	74	1.1	48	
12	2.79	10.6	5.62	5.7	0.116	84	1.1	37	
15	2.79	10.6	5.63	5.7	0.116	87	1.2	39	
18	2.78	10.8	5.7	5.7	0.117	85	1.1	36	0.15
MW-3D									
0	3.86	–	–		–	–	–	–	
3	3.92	5.6	6.57		0.052	237	4.52	780	
6	3.89	5.5	6.59		0.052	220	3.82	835	
11	4.01	5.3	6.45		0.066	190	4.40	>1000	
16	3.96	6.8	6.59		0.021	148	5.37	>1000	
19	3.94	6.5	6.58		0.044	156	6.13	>1000	
25	4.00	8.0	6.58		0.075	137	7.64	>1000	
28	4.01	8.8	6.57		0.074	121	6.30	>1000	
31	4.00	8.7	6.49		0.069	130	5.80	>1000	0.06
MW-3DD									
0	38.80	–	–		–	–	–	–	
3	44.60	7.7	11.30		0.069	-56	3.46	21.0	
7	44.88	7.4	11.35		0.180	-79	2.97	18.0	
9	44.93	6.9	11.34		0.190	-85	2.82	18.0	
12	45.00	6.4	11.35		0.187	-91	2.75	26.0	
15	45.10	6.2	11.38		0.179	-97	2.55	23.0	
18	45.19	5.8	11.38		0.173	-102	2.52	28.0	
21	45.28	5.7	11.33		0.172	-110	2.39	37.8	
24	45.35	5.7	11.30		0.165	-121	2.16	84.4	
27	45.36	5.7	11.26		0.170	-136	2.19	163.0	
30	45.38	5.7	11.30		0.156	-148	1.90	375.0	
33	45.34	5.6	11.25		0.154	-153	1.85	824.0	
36	45.32	5.5	11.25		0.156	-164	1.51	>1000	0.03
MW-4S									
0	3.95	–	–		–	–	–	–	
3	4.04	8.4	8.3		0.029	2.22	11.5	69	
6	4.04	8.5	8.2		0.029	2.33	10.0	51	
9	4.04	8.5	7.5		0.028	2.42	9.6	43	
12	4.02	8.5	7.5		0.028	2.49	9.4	41	
15	4.02	8.4	7.6		0.028	2.53	9.4	38	
18	4.02	8.4	7.6		0.028	2.58	9.2	38	0.25

302287

Appendix E
RHRMLS Supplemental Remedial Investigation
12/94 - 3/95
Ground Water Sampling Low Flow Purge Evacuation Data
Sidney, New York

Time (Min)	Water Level (ft)	Temperature (°C)	pH(1)	pH(2)	Conductivity (µS/cm)	Oxidation Reduction Potential(mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Flow Rate Gal./Min.
MW-4D									
3	12.42	9.6	–		0.181	1.30	4.6	39	
6	16.34	9.7	–		0.181	1.29	4.8	35	
9	18.21	9.8	–		0.183	1.29	4.8	34	
12	19.89	9.5	–		0.180	1.36	6.4	34	
15	25.21	9.6	8.92		0.183	1.36	5.4	34	
18	26.91	9.6	8.91		0.179	1.37	4.2	33	
21	27.52	9.3	8.91		0.177	1.39	4.2	34	
24	28.56	9.6	8.90		0.186	1.33	4.4	34	0.15
MW-5D									
3	5.03	9.4	5.93	6.2	0.051	223	7.3	40	
7	5.05	9.7	5.82	6.1	0.054	210	6.8	35	
10	5.06	9.8	5.79	6.1	0.055	202	6.7	34	
13	5.06	9.9	5.84	6	0.056	186	6.6	35	
16	5.07	9.9	5.89	6	0.058	178	6.5	35	0.18
MW-6									
3	8.13	7.4	6.28	6.8	0.208	83	2.25	>100	
6	8.35	7.2	6.28	6.8	0.212	75	1.8	>100	
9	8.69	8.2	6.29	6.8	0.217	66	1.2	>100	
12	8.82	8.0	6.29	6.8	0.213	59	1.3	72	
15	8.86	7.9	6.29	6.8	0.215	55	1.45	65	
18	9.05	8.0	6.29	6.8	0.214	56	1.55	54	
22	9.26	8.0	6.28	6.8	0.223	56	1.2	49	
25	9.57	9.6	6.28	6.8	0.221	50	1	44	
27	9.68	9.3	6.28	6.8	0.218	48	0.9	40	0.13
MW-7S									
0	5.77	–	–		–	–	–	–	
3	6.18	9.0	7.9		0.113	2.03	7.0	>100	
6	6.18	10.2	8.2		0.117	2.05	5.9	>100	
9	6.23	10.7	8.0		0.119	2.07	5.7	>100	
12	6.23	10.5	7.8		0.118	2.12	5.8	>100	
15	6.32	11.2	7.7		0.120	2.13	5.5	>100	
18	6.30	11.1	7.6		0.120	2.15	5.5	>100	
21	6.31	10.9	7.6		0.120	2.19	5.6	>100	
24	6.32	11.1	7.5		0.120	2.23	5.6	>100	
27	6.36	11.2	7.5		0.120	2.24	5.3	>100	
30	6.36	11.1	7.5		0.119	2.24	5.4	>100	0.13
MW-7D									
0	6.62	–	–		–	–	–	–	
3	15.19	9.7	9.5		0.095	1.13	3.8	97	
6	17.46	10.0	9.8		0.095	1.07	3.4	60	
9	20.61	10.8	9.1		0.098	1.05	5.0	49	
12	24.78	11.0	9.3		0.098	1.05	5.6	44	
15	26.02	11.0	9.3		0.098	1.04	6.0	66	
18	27.29	11.8	9.2		0.100	0.96	5.7	95	
21	–	11.9	9.2		0.100	0.86	5.0	78	
23	–	10.8	9.2		0.097	0.81	4.9	76	0.10

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Appendix E
RHRMLS Supplemental Remedial Investigation
12/94 - 3/95
Ground Water Sampling Low Flow Purge Evacuation Data
Sidney, New York

Time (Min)	Water Level (ft)	Temperature (°C)	pH(1)	pH(2)	Conductivity (µS/cm)	Oxidation Reduction Potential(mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Flow Rate Gal./Min.
MW-8									
0	10.80	–	–		–	–	–	–	
3	10.88	9.2	7.7		0.038	1.94	12.2	92	
6	10.88	10.1	7.5		0.039	1.99	12.0	71	
9	10.89	10.7	7.4		0.039	2.05	11.6	57	
12	10.89	11.0	7.4		0.040	2.14	11.2	49	0.20
MW-9									
0	21.92	–	–	–	–	–	–	–	
3	22.98	7.3	6.11	7.4	0.004	181	12.1	>100	
6	23.12	7.6	5.92	7.3	0.037	186	11.4	>100	
9	23.15	8.3	5.92	7.3	0.037	185	11.4	85	
12	23.18	8.9	5.93	7.4	0.047	188	10.8	71	
15	23.19	9.5	5.93	7.4	0.035	193	10.4	61	
18	23.20	9.6	5.91	7.4	0.042	195	10.2	55	
22	23.23	9.7	5.88	7.4	0.042	202	10.3	52	0.07
MW-9D									
0	33.18	–	–		–	–	–	–	
3	33.93	7.8	6.51		0.061	157	5.49	67	
6	33.91	7.0	6.47		0.061	161	5.39	65	
9	33.91	6.9	6.44		0.061	164	5.41	39	
12	33.91	6.9	6.43		0.062	169	5.28	33	
15	33.91	7.3	6.47		0.062	174	5.20	27	
18	33.91	7.4	6.48		0.063	182	5.17	22	
21	33.91	7.7	6.47		0.063	186	5.16	19	
24	33.91	7.7	6.48		0.063	189	5.18	16	0.08
MW-10									
0	3.43	–	–		–	–	–	–	
3	5.07	6.7	7.4		0.063	1.64	6.2	>100	
6	5.12	7.3	7.4		0.064	1.67	6.2	>100	
9	5.37	7.6	7.5		0.064	1.92	6.2	>100	
12	5.21	7.6	7.5		0.065	2.00	6.2	>100	
15	5.02	7.7	7.5		0.066	2.07	6.2	86	
18	5.09	7.8	7.5		0.067	2.09	6.3	79	
21	5.22	7.8	7.4		0.067	2.13	6.3	71	
24	5.23	7.8	7.4		0.067	2.17	6.3	65	0.27
MW-11S									
0	12.71	–	–		–	–	–	–	
3	13.20	8.5	7.6		0.030	2.08	15.8	34	
6	13.17	8.2	7.5		0.030	2.23	12.6	31	
9	13.17	8.1	7.5		0.030	2.36	12.2	31	
12	13.17	8.1	7.5		0.030	2.47	12.0	31	
15	13.18	8.2	7.5		0.030	2.54	11.8	30	0.29
MW-11D									
1.25 gal	–	5.8	7.17		0.134	160	7.1	>100	*

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Appendix E
RHRMLS Supplemental Remedial Investigation
12/94 - 3/95
Ground Water Sampling Low Flow Purge Evacuation Data
Sidney, New York

Time (Min)	Water Level (ft)	Temperature (°C)	pH(1)	pH(2)	Conductivity (µS/cm)	Oxidation Reduction Potential(mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Flow Rate Gal./Min.
MW-12									
0	37.66	–	–		–	–	–	–	
3	41.71	8.6	8.50		0.157	-0.222	6.8	>100	
7	42.37	8.6	8.75		0.165	-0.226	6.1	>100	
10	42.57	8.6	8.87		0.170	-0.223	6.2	>100	
13	42.74	8.4	8.91		0.175	-0.223	6.0	>100	
16	42.99	8.5	8.94		0.182	-0.226	5.9	>100	0.02
MW-13									
0	6.95	–	–		–	–	–	–	
3	7.61	4.2	7.83		0.025	192	4.2	>100	
6	7.62	4.4	7.3		0.025	207	4.2	>100	
9	7.63	4.4	7.3		0.025	213	4.2	93	
12	7.64	4.6	7.42		0.025	226	4.3	57	
15	7.62	4.5	7.35		0.024	234	4.2	50.5	
18	7.63	4.5	7.3		0.025	237	4.2	45	0.35
MW-14									
1.5 gal	–	7.5	5.95		0.042	193	8.5	>100	
4.0 gal	–	7.5	5.64		0.043	230	7.4	>100	
5.1 gal	–	7.6	5.62		0.038	240	7.6	>100	*
MW-15									
3	11.31	8.8	7.7		0.026	2.67	10.2	42	
6	11.42	9.1	7.8		0.025	2.68	9.7	36	
9	11.58	9.7	7.8		0.026	2.98	9.1	35	
12	11.58	9.8	7.7		0.027	3.00	9.1	37	
15	11.58	9.7	7.7		0.026	3.02	9.1	37	0.15
MW-16									
2.25 gal	–	6.5	5.47		0.059	228	9.4	>100	
4.50 gal	–	7.0	5.47		0.059	241	9.1	>100	
6.75 gal	–	7.0	5.43		0.056	252	8.7	>100	*
MW-17									
0.25 gal	34.22	8.0	7.20		0.280	164	12.5	>100	*
MW-18S									
0	4.63	–	–	–	–	–	–	–	
7	5.42	8.2	6.13	6.9	0.225	27	4.0	>100	
12	5.51	8.3	6.14	6.9	0.213	18	2.9	>100	
16	5.55	8.5	6.20	6.9	0.209	38	1.75	>100	
21	5.56	8.7	6.24	7.0	0.213	56	1.8	>100	
23	5.38	8.4	6.23	7.1	0.040	70	2.7	>100	
31	5.36	8.4	6.22	7.1	0.041	70	2.7	>100	
35	5.55	10.2	6.20	7.1	0.202	67	2.2	>100	
39	5.61	10.0	6.20	7.1	0.202	64	2.1	>100	0.05

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Appendix E
RHRMLS Supplemental Remedial Investigation
12/94 - 3/95
Ground Water Sampling Low Flow Purge Evacuation Data
Sidney, New York

Time (Min)	Water Level (ft)	Temperature (°C)	pH(1)	pH(2)	Conductivity (µS/cm)	Oxidation Reduction Potential(mV)	Dissolved Oxygen (mg/L)	Turbidity (NTU)	Flow Rate Gal./Min.
MW-18D									
0	15.93	--	--	--	--	--	--	--	
6	19.54	7.2	6.41	7.4	0.043	126	8.2	>100	
9	19.93	7.3	6.39	7.2	0.029	119	6.4	>100	
13	20.17	7.2	6.38	6.9	0.031	113	6.2	>100	
16	20.38	6.9	6.37	6.9	0.026	111	5.8	>100	
20	20.39	6.9	6.36	6.9	0.029	110	5.9	>100	
23	20.5	6.7	6.36	6.9	0.053	110	6.1	>100	
26	20.64	6.4	6.36	6.9	0.051	111	6.0	>100	
29	21.00	5.8	6.36	6.9	0.047	110	6.5	>100	
32	21.28	6.1	6.35	6.9	0.051	107	6.0	>100	
35	21.41	6.2	6.36	6.9	0.062	101	6.0	>100	
38	21.76	6.1	6.36	6.9	0.055	98	6.1	>100	0.10
MW-18DD									
0	55.13	--	--		--	--	--	--	
3	55.17	7.4	7.81		0.145	-124	0.52	9	
6	55.18	7.8	7.67		0.145	-176	0.27	4	
9	55.17	7.9	7.63		0.144	-264	0.20	4	
12	55.18	8.1	7.64		0.143	-297	0.19	2	
15	55.18	8.2	7.63		0.144	-311	0.16	2	0.11
MW-19									
0	21.92	--	--		--	--	--	--	
2	26.13	7.3	6.69		0.030	113	9.8	>100	
6	26.68	6.6	6.53		0.030	85	9.4	>100	
9	26.70	6.2	6.39		0.029	49	9.3	>100	
12	26.75	5.7	6.29		0.029	49	9.1	>100	
15	26.85	5.9	6.23		0.031	40	8.9	>100	
18	26.95	6.5	6.19		0.031	46	8.7	>100	
21	27.02	6.9	6.19		0.031	52	8.6	>100	
25	26.99	6.7	6.13		0.029	70	8.8	>100	
28	27.18	6.5	6.11		0.008	93	9.5	>100	
31	27.29	6.9	6.11		0.007	95	9.3	>100	
34	27.43	6.8	6.12		0.008	98	9.4	>100	
37	27.52	6.7	6.11		0.007	101	9.2	>100	0.07

Notes:

(*) = Monitoring well was sampled with stainless steel bailer due to the inability to install a submersible pump or insufficient water column in well.

-- = Data was not recorded.

(1) = pH recorded with YSI 3500.

(2) = pH recorded with Corning PS15.

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