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VOLUME 3

# REMEDIAL INVESTIGATION/FEASIBILITY STUDY FOR MONTGOMERY TOWNSHIP HOUSING DEVELOPMENT/ ROCKY HILL MUNICIPAL WELLFIELD SITE

Prepared for:

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Hazardous Site Mitigation
Bureau of Site Management
Trenton, New Jersey 08625

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Submitted by:

WOODWARD-CLYDE CONSULTANTS
201 Willowbrook Boulevard
Wayne, New Jersey 07470

MGY 001 0319

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# Appendix A

MGY 001 0320

## APPENDIX A
## PREVIOUS REMEDIAL RESPONSE ACTIVITIES

The following is a listing of the response actions to the ground water pollution problem at Montgomery Township Housing Development and Rocky Hill Municipal Wellfield. The list includes physical remedial actions and sampling.

### Remedial Response Activities Within Montgomery Township Housing Development

| Date | Event |
|---|---|
| 11/19/79 | Well samples from two homesites in the development were collected by NJDEP and analyzed for volatile organics (NJDOH, 12/7/79e). |
| 12/4/79 | Well samples from 21 residents were collected and analyzed for trichloroethylene (TCE) and 1,1,1-trichloroethane by Princeton Testing Laboratory (Dennison, 12/10/79). |
| 12/19/79 | Well samples from 36 residences were collected and analyzed for TCE by Princeton Testing Laboratory (Dennison, 12/28/79). |
| 1/28/80 | Princeton Testing Laboratory reported on TCE analysis of 41 well samples from residences (Dennison, 1/28/80d). |
| 2/11/80 | NJDEP analyzed 11 private well samples for chlorinated hydrocarbons (NJDOH, 2/19/80d). |



MGY 001 0321

## Remedial Response Activities
## Within Montgomery Township Housing Development (Continued)

| Date | Event |
|---|---|
| 3/14/80 | Princeton Testing Laboratory reported on TCE content of 21 housing development well samples (Dennison, 3/18/80). |
| 5/12/80 | TCE analysis on one resident's private well was done by Princeton Testing Laboratory (Dennison, 5/12/80). |
| 11/18/80 | Princeton Testing Laboratory reported on TCE content of 26 wells (Dennison 11/18/80). |
| 1/2/81 | NJDEP septic tank samples taken from five homes (Searfoss, 7/22/83). |
| 2/10/81 | NJDEP conducted volatile organic compound (VOC) scan of six private well samples (NJDOH, 2/23/81e). |
| 3/16/81 | Installation of Elizabethtown Water Company lines (Searfoss, 7/22/83). |
| 7/14, 7/20, 8/4/81 | NJDEP conducted VOC scan of six private well samples; nutrient, total dissolved solids (TDS), chloride analysis done on one (NJDOH, 8/5/81a, 9/17/81). |
| 9/25/81 | Princeton Testing Laboratory performed TCE analysis of one private well sample (Scaaf, 9/30/81). |
| 10/15/81 | Princeton Testing Lab performed TCE analysis of 34 private well samples (Schaaf, 10/11/81). |



MGY 001 0322

## Remedial Response Activities
## Within Montgomery Township Housing Development (Continued)

| Date | Event |
|---|---|
| 3/16, 3/18, 5/25/82 | NJDEP conducted VOC scan and polychlorinated biphenyl (PCB) analysis of six potable wells in development (NJDOH, 6/16/82). |
| 6/14/82 | TCE analysis was performed on 15 private well samples; VOC analysis of 9 private well samples (Schaaf, 6/14/83). |
| 5/2/83 | Princeton Testing Lab VOC analysis of two well samples (Searfoss, 7/22/83). |
| 7/7/83 | Somerset Clinical VOC analysis of one well sample (Searfoss, 7/22/83). |
| 7/17/85 | WCC enters into contract with NJDEP to conduct remedial investigation at MTHD. |
| 11/7, 11/8, 12/3/85 | WCC conducted electrical resistivity sounding and profiling survey of MTHD. |
| 1/86 | NJDEP Division of Water Resources placed a restriction on future well drilling for water supply wells in MTHD. |
| 5/28/86-10/8/86 | WCC performed inspection of drilling, installation, and development of 26 monitoring wells. |



MGY 001 0323

## Remedial Response Activities
## Within Montgomery Township Housing Development (Continued)

| Date | Event |
|---|---|
| 6/5/86-<br>6/6/86 | Well samples from 35 residents were collected by WCC and analyzed for VOC. |
| 11/18/86-<br>12/4/86 | Well samples from 20 monitoring wells were collected by WCC and analyzed for priority pollutants plus 40. |
| 11/3, 12/1,<br>12/2/86 | WCC conducted field permeability tests on 14 monitoring wells. |
| 4/22/87 | Second round private well samples from 3 residences collected by WCC and analyzed for VOC. |
| 4/22/87 | Surface water and stream sediment from 5 locations in the vicinity were collected by WCC and analyzed for priority pollutants plus 40 and VOC, respectively. |
| 4/22, 5/27/87 | WCC conducted ambient air quality survey of MTHD site. |
| 6/1/86-<br>6/16/87 | Inspection of 3 soil borings were performed and soil samples were collected by WCC and analyzed for VOC. |



MGY 001 0324

## Remedial Response Activities
## Within Montgomery Township Housing Development (Continued)

| Date | Event |
|---|---|
| 6/23/87 | Septic tank samples from 7 industries and residences were collected by WCC and analyzed for VOC. |
| 6/23/87-8/22/87 | Second round monitoring well samples from 29 monitoring wells were collected by WCC and analyzed for VOC. |
| 7/13/87 | WCC submitted a Draft Operable Unit Remedial Investigation/Feasibility Study (DRI/FS) of the Montgomery Township Housing Development site. |
| 7/15/87 | The DRI/FS was placed in public repositories for public review and comment. |
| 7/29/87 | A public meeting was held to discuss the results of the DRI/FS. |
| 8/14/87 | Public comment period ended. |
| 9/87 | A Record of Decision (ROD) regarding private wells in MTHD was issued by NJDEP requiring that all residents be connected to the Elizabethtown Water Company System. |



MGY 001 0325

## Remedial Response Activities Within Rocky Hill Municipal Wellfield

| Date | Event |
|---|---|
| 9/78-5/79 | Rutgers University took samples of Rocky Hill Municipal well water (Rocky Hill Water Department, 1979). |
| 11/9/78 | Rocky Hill Municipal well water samples were taken by the NJDEP (NJDEP, 1980). |
| 11/5/79-11/9/79 | Potable water well samples were taken from residential and industrial wells in the Rocky Hill vicinity (Rocky Hill Water Department, 1980). |
| 11/14/79 | Rocky Hill Municipal Well Number 2 shut down (Post, 1979). |
| 12/8/79-12/18/80 | Quality Control Laboratory Division took samples of the Rocky Hill Municipal Water Supply (Quality Control Laboratory Division, 1980). |
| 1/11/80-1/20/80 | Water samples were taken from Rocky Hill Municipal Well #2 (Rocky Hill Water Department, 1980). |
| 1/14/80 | Water samples were collected along Van Horn Brook (NJDEP, 1980). |
| 1/15/80 | Water samples were taken in the Rocky Hill Borough Area (Rocky Hill Water Department, 1980). |
| 1/17/80 | A water sample was taken from the Rocky Hill Cemetery Well (NJDEP, 1980). |



MGY 001 0326

## Remedial Response Activities Within Rocky Hill Municipal Wellfield (Continued)

| Date | Event |
|---|---|
| 3/17/80-3/19/80 | Water level readings were taken at nine industrial and residential wells in the Rocky Hill Area (NJDEP, 1980). |
| 5/14/80 | Water samples were collected along Van Horn Brook (NJDEP, 1980). |
| 1/81 (Circa) | Samples were taken from Borough residential water supplies (NJDEP, 1981). |
| 2/20/81-12/11/81 | International Hydronics Corporation took samples of the Rocky Hill Municipal Well water (International Hydronics Corporation, 1981). |
| 7/5/81 | The Rocky Hill Water Department reopened Municipal Well Number 2 (The Princeton Packet, 1981). |
| 11/24/81-2/16/83 | Accutest Laboratories took water samples from the Rocky Hill well system. (Accutest Laboratories, 1983). |
| 1/25/82 | The Borough of Rocky Hill closed Well Number 2 after it switched back to the Elizabethtown Water Supply (Geoghan, 1982). |
| 2/23/82 | Well Number 2 was returned to service for residential use. |
| 3/17/82 | Rocky Hill Municipal Wellwater samples were taken by NJDEP (NJDEP, 1982). |



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## Remedial Response Activities
## Within Rocky Hill Municipal Wellfield (Continued)

| Date | Event |
|---|---|
| 1/6/83-1/1/83 | Random potable water well samples were taken in the Rocky Hill Borough Area (NJ Division of Water Resources, 1983). |
| 7/27/83 | Air-stripping pilot testing was conducted on Well Number 2 (Merk, 1983). |
| 7/17/85 | WCC enters into contract with NJDEP to conduct remedial investigation at RHMW. |
| 12/13/86 | WCC performed short duration pumping test at Rocky Hill municipal well. |
| 4/22, 5/27/87 | WCC conducted ambient air quality survey of RHMW vicinity. |
| 4/22/87 | WCC collected samples from 2 private wells to be analyzed for VOC's. |



MGY 001 0328

## Remedial Response Activities
## At Suspected Sources - Polycell Corp.

| Date | Event |
|---|---|
| 2/11/80 | NJDEP sampled Polycell septic tank; VOC scan (NJDOH, 2/21/80). |
| 2/21/80 | NJDEP sampled Polycell well; VOC scan (NJDOH, 3/18/80). |
| 2/10/81 | NJDEP sampled Polycell well; VOC scan (NJDOH, 2/23/81a). |
| 5/5/81 | NJDEP sampled three pipelines; VOC scan (NJDOH, 6/10/81). |
| 7/14/81 | NJDEP sampled Polycell well; VOC scan, TDS (NJDOH, 8/5/81b). |
| 7/14/81 | NJDEP sampled Polycell #4 tank; VOC scan (NJDOH, 8/5/81b). |
| 3/17/82 | NJDEP sampled Polycell well; VOC scan (NJDOH, 4/6/82d). |
| 4/12/82 | NJDEP took shallow well and deep well samples, performed a VOC scan, and analyzed for TDS, chloride, sulfate, specific conductance, hexavalent chromium; additional shallow well sample for heavy metal analysis (NJDOH, 6/1/82b). |
| 3/30/83 | NJDEP took a shallow well sample and performed a VOC scan; and took a deep well sample and analyzed for PCB and also conducted a VOC scan (NJDOH, 4/19/83c). |
| 5/17/83 | NJDEP sampled Polycell bedrock well; PCB analysis (NJDOH 6/3/83b). |



MGY 001 0329

## Remedial Response Activities
## At Suspected Sources - Polycell Corp. (Continued)

| Date | Event |
|---|---|
| 10/28/83 | NJDEP sampled soil to be analyzed for PCB (Cunningham, 12/23/83). |
| 5/27/87 | WCC conducted ambient air quality survey. |
| 6/8/87-<br>6/15/87 | WCC inspected 6 soil borings and collected 11 soil samples; priority pollutants plus 40 or VOC analysis. |



MGY 001 0330

## Remedial Response Activities
## At Suspected Sources - 1377 Route 206 (PCR)

| Date | Event |
|---|---|
| 2/11/80 | NJDEP sampled 1377 Route 206 (PCR) septic, VOC scan (NJDOH, 2/19/80b). |
| 2/21/80 | NJDEP sampled 1377 Route 206 (PCR) well, VOC scan (NJDOH, 3/18/80). |
| 4/17/80 | NJDEP sampled 1377 Route 206 (PCR) septic; VOC scan (NJDOH, 5/27/80). |
| 2/10/81 | NJDEP sampled 1377 Route 206 (PCR)-1 and (PCR)-2 wells; VOC scan (NJDOH, 2/23/81c). |
| 2/13/81 | NJDEP took soil sample at pipe end; VOC scan (NJDOH, 1/26/82). |
| 7/14/81 | NJDEP sampled 1377 Route 206 (PRC)-2 well; VOC scan, TDS, iron (NJDOH, 8/5/81c). |
| 3/17/82 | NJDEP sampled well water; VOC scan. Sample of black soil material; VOC scan. Sample of monitoring well near Village Shopper (NJDOH, 4/6/82, 5/5/82). |
| 3/18/82 | NJDEP sampled well water (top); PCB analysis, VOC scan (NJDOH, 5/5/82b). |
| 4/12/82 | NJDEP sampled 1377 Route 206 (PCR) well; VOC scan, TDS, chloride, sulfate, specific conductance, hexavalent chromium. Also sampled monitoring well at Village Shopper; VOC scan (NJDOH, 6/1/82a). |



MGY 001 0331

## Remedial Response Activities
## At Suspected Sources - 1377 Route 206 (PCR) (Continued)

| Date | Event |
|---|---|
| 12/6/82 | NJDEP took soil samples at holes #1, 2A, 2B, 3; VOC scan, PCB analysis (NJDOH, 1/7/83). |
| 3/30/83 | NJDEP sampled Village Shopper monitoring well; VOC scan. 1377 Route 206 (PCR) shallow well sample; PCB analysis (NJDOH, 4/19/83a). |
| 3/31/83 | NJDEP sampled 1377 Route 206 (PCR)-2 well; VOC scan (NJDOH, 4/19/83b). |
| 5/17/83 | NJDEP sampled 1377 Route 206 (PCR)-2 well; PCB analysis and Village Shopper background well; PCB analysis (NJDOH, 6/3/83c). |
| 8/29/83 | NJDEP and Princeton Testing Laboratory collected soil samples for PCB and volatile organics (see Appendix E) (NJDOH 9/30/83). |
| 10/28/83 | NJDEP collected soil samples on property immediately east of 1377 Route 206 (PCR) (Cunningham, 12/23/83). |
| 9/16/86-9/30/86 | WCC inspected drilling, installation and development of one deep and one shallow monitoring well. |
| 11/21/86 | WCC sampled monitoring wells; priority pollutants plus 40 analysis. |



MGY 001 0332

## Remedial Response Activities
## At Suspected Sources - 1377 Route 206 (PCR) (Continued)

| Date | Event |
|---|---|
| 5/27/87 | WCC conducted ambient air quality survey. |
| 6/1/87-<br>6/5/87 | WCC inspected 6 soil borings and collected 11 soil samples; priority pollutants plus 40 or VOC analysis. |
| 6/23/87 | WCC sampled septic tank; VOC analysis. |
| 7/6/87 | WCC sampled monitoring wells; VOC analysis. |
| 7/7/87 | WCC sampled production well; VOC analysis. |



MGY 001 0333

## Remedial Response Activities
## At Suspected Sources - Princeton Airport

| Date | Event |
|---|---|
| 11/19/79 | NJDEP obtained well water sample; VOC scan (NJDOH, 12/7/79a). |
| 12/17/82 | NJDEP took soil samples at 1A, 1B, 2 sites; VOC scan (NJDOH, 1/4/83). |
| 1/6/83 | NJDEP obtained well sample; VOC scan (NJDOH, 2/18/83b). |
| 1/11/83 | NJDEP obtained well sample; PCB analysis (NJDOH, 1/31/83b). |
| 1/20/83 | NJDEP took 2', 4', 5', 6' depth composite trench sediment samples; VOC scan, Trench 2, 2' + 4' samples for PCB. Groundwater analysis from trench 2 at 2', 4', 5'; VOC scan, PCB analysis (NJDOH, 2/18/83c). |
| 4/4/83 | NJDEP took stream sample adjacent to airport; VOC scan (NJDOH, 4/19/83g). |
| 5/4/83 | Airport submitted hydrogeological plan to NJDEP (Cunningham, 5/26/83). |
| 7/6/83 | NJDEP and airport collected water samples from four monitoring wells; VOC scan (NJDOH, 7/26/83). |
| 9/26/83 | NJDEP collected soil samples at a location where a fuel tank had been removed (NJDOH, 9/26/83). |

MGY 001 0334

## Remedial Response Activities
## At Suspected Sources - Princeton Airport (Continued)

| Date | Event |
|---|---|
| 10/17/83 | NJDEP and Princeton Airport collected samples from 5 additional wells (Cunningham 12/23/83). |
| 11/20, 12/4/86 | WCC sampled 3 monitoring wells; priority pollutants plus 40 analysis. |
| 4/22/87 | WCC conducted ambient air quality survey. |



MGY 001 0335

## Remedial Response Activities
## At Suspected Sources - Princeton Gamma Tech (PGT)

| Date | Event |
|---|---|
| 11/19/79 | NJDEP sampled PGT septic tank; VOC scan (NJDOH, 12/7/79f). |
| 1/17/80 | NJDEP sampled PGT septic tank; VOC scan (NJDOH, 2/26/80). |
| 1/8/80 | Princeton Testing Lab sampled PGT well water (Dennison, 1/11/80). |
| 2/11/80 | NJDEP sampled PGT well; organic scan (NJDOH, 2/19/80a). |
| 2/21/80 | NJDE sampled PGT well; VOC scan (NJDOH, 3/18/80). |
| 5/9/80 | Princeton Testing Lab sampled ground water; TCE analysis (Dennison, 5/9/80). |
| 5/16/80 | Princeton Testing Lab sampled well; VOC scan (Dennison 6/2/80). |
| 3/25/83 | NJDEP sampled Elizabethtown Water Company water and aeration tank; VOC scan (NJDOH, 4/13/83). |
| 3/25/83 | NJDEP sampled soil at 1A, 1B, 1C, 1D sites; VOC scan (NJDOH, 4/15/83). |
| 6/11/86-6/30/86 | WCC inspected drilling, installation, and development of one deep and one shallow monitoring well. |
| 11/18/86 | WCC sampled monitoring wells; priority pollutants plus 40 analysis. |

MGY 001 0336

## Remedial Response Activities
## At Suspected Sources - Princeton Gamma Tech (PGT) (Continued)

| Date | Event |
|---|---|
| 4/22/87 | WCC conducted ambient air quality survey. |
| 6/10, 6/11/87 | WCC inspected 3 soil borings and collected 6 soil samples; priority pollutant plus 40 or VOC analysis. |
| 6/23/87 | WCC sampled aeration tank; VOC analysis. |
| 7/9/87 | WCC sampled monitoring wells; VOC analysis. |



MGY 001 0337

## Remedial Response Activities
## At Suspected Sources - Compo Industries

| Date | Event |
|---|---|
| 11/5/79 | NJDEP sampled raw well water; VOC scan (NJDOH, 12/7/79c). |
| 11/14/79 | NJDEP sampled raw well water; VOC scan (NJDOH, 12/12/79). |
| 2/11/80 | NJDEP sampled Compo septic; VOC scan (NJDOH, 2/21/80). |
| 10/6/80 | Chemical analysis of 10 storage drums was performed by Stablex-Reutter Inc. (Hartman, 10/6/80). |
| 2/10/81 | NJDEP sampled Compo well water: VOC scan (NJDOH, 2/23/81b). |
| 3/26/81 | Borough of Rocky Hill sampled Compo effluent; VOC scan (Bruns, 4/6/81). |
| 4/7/81 | Borough of Rocky Hill Sampled Compo effluent; VOC scan (Bruns, 4/13/81). |
| 2/23/82 | Princeton Testing Lab analyzed Compo effluent; VOC scan (Rodoti, 3/9/82). |
| 3/30/83 | NJDEP sampled monitoring well; VOC scan (NJDOH, 4/19/83d). |
| 4/12/83 | NJDEP sampled production well; VOC scan (NJDOH, 5/10/83). |
| 5/17/83 | NJDEP sampled monitoring well; VOC scan (NJDOH, 6/3/83d). |
| 4/22/86 | WCC conducted ambient air quality survey. |

MGY 001 0338

## Remedial Response Activities
## At Suspected Sources - Compo Industries (Continued)

| Date | Event |
|---|---|
| 6/10, 6/11/87 | WCC inspected 2 soil borings and collected 4 soil samples; priority pollutant plus 40 or VOC analysis. |



MGY 001 0339

## Remedial Response Activities
## At Suspected Sources - Other Sources

| Date | Event |
|---|---|
| 11/19/79 | NJDEP sampled Ingersoll-Rand well; VOC scan (NJDOH, 12/7/79b). |
| 12/10/79 | Princeton Testing Lab sampled Ingersoll-Rand well; TCE analysis (Dennison, 12/13/79). |
| 12/19/79 | Princeton Testing Lab sampled Ingersoll-Rand well; TCE analysis (Dennison, 12/28/79). |
| 1/17/80 | NJDEP sampled Rocky Hill Cemetery well; VOC scan (NJDOH, 2/26/80). |
| 2/6/80 | Ingersoll-Rand well sample; VOC scan (Author unknown, no date, circa 1980). |
| 2/11/80 | NJDEP sampled Montgomery Shopping Center Septic #1 and Septic #2 for organic scan (NJDOH, 4/9/80). |
| 3/4/80 | Ingersoll-Rand well sample; VOC scan (Author unknown, no date circa 1980). |
| 8/27/80 | Ingersoll-Rand well sample; VOC scan (Dennison, 8/27/80). |
| 1/29/82 | Stablex & Reutter sampled Town and Country Animal Hospital potable well water for organic scans (Hartman, 1/29/82). |



MGY 001 0340

## Remedial Response Activities
## At Suspected Sources - Other Sources (Continued)

| Date | Event |
|---|---|
| 3/23/82 | Stablex & Reutter sampled Town and Country Animal Hospital potable well water for volatile petroleum hydrocarbon analysis (Hartman, 4/16/82). |
| 1/6/83 | NJDEP took well samples from Town & Country; VOC scan, Thul's Auto; VOC Wm. Penn Gas; VOC scan (NJDOH, 2/18/83a, b). |
| 1/11/83 | NJDEP took well samples from Texaco Gas; VOC scan (NJDOH, 1/31/83). |
| 4/1/83 | NJDEP took well samples from Thul's; VOC scan, Texaco; VOC scan, Wm. Penn Gas; VOC scan (NJDOH, 4/19/83f). |
| 10/28/83 | NJDEP collected sediment samples for PCB analysis from a small stream near the PCR facility (Cunningham 12/23/83). |
| 4/22, 5/27/87 | WCC conducted ambient air quality survey at Ingersoll-Rand, Thul's, Texaco, Wm. Penn Gass, Town and Country, Montgomery Shopping Center, Village Shopper, and Princeton VW. |
| 6/3/87-6/16/87 | Inspection of soil borings and collecting of soil samples by WCC at Thul's, Texaco, Wm. Penn Gas, Town and Country, Montgomery Shopping Center, Village Shopper, Princeton VW, and Tigers Tale; VOC analysis. |
| 6/13/87-6/23/87 | WCC inspected installation of 3 monitoring wells at Montgomery Shopping Center. |



MGY 001 0341

## Remedial Response Activities
## At Suspected Sources - Other Sources (Continued)

| Date | Event |
|---|---|
| 6/23/87 | WCC sampled septic tanks at Wm. Penn Gas, Montgomery Shopping Center, and Village Shopper; VOC analysis. |
| 7/8/87 | WCC sampled 3 monitoring wells at Montgomery Shopping Center; VOC analysis. |



MGY 001 0342

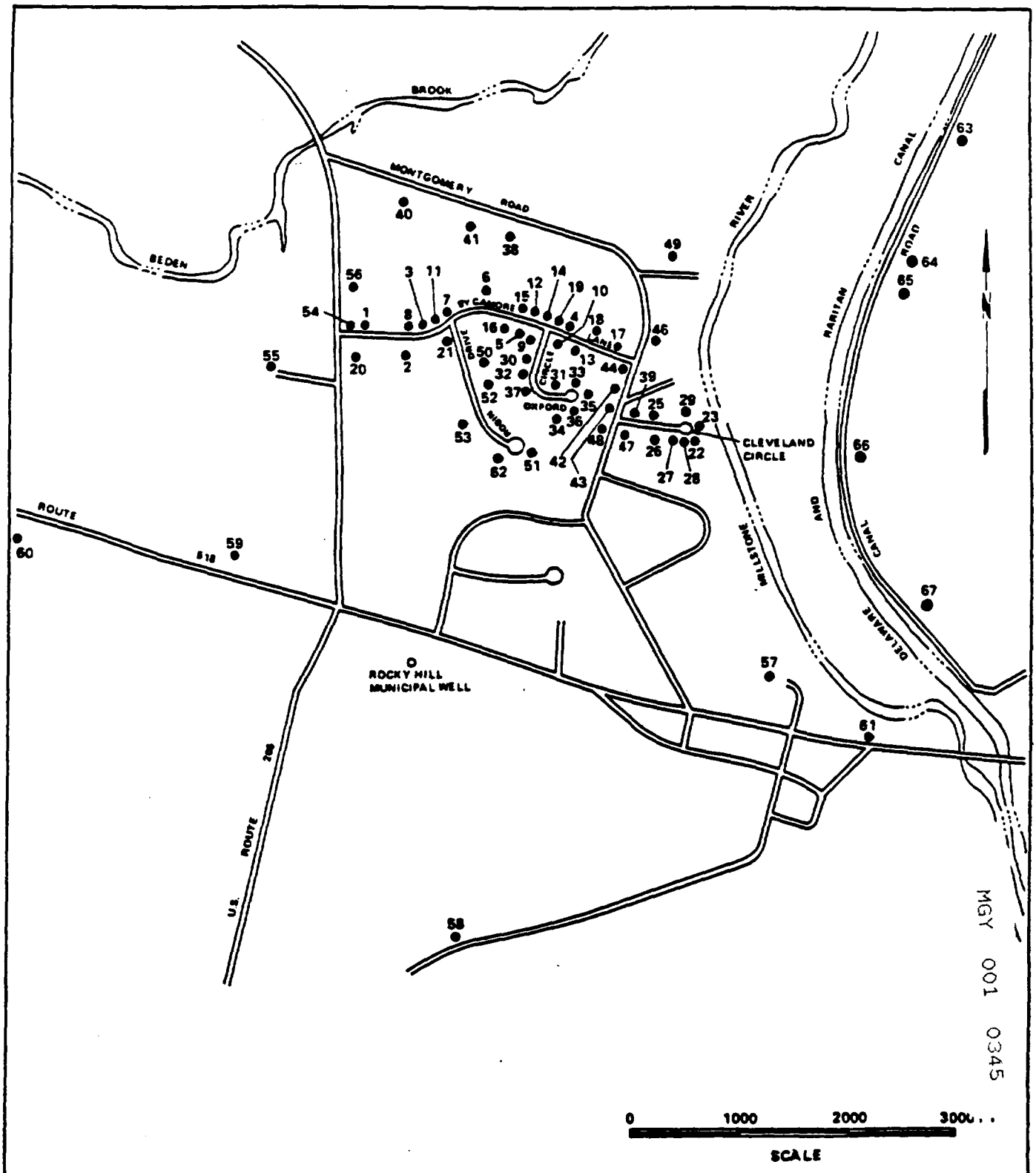
# Appendix B

MGY 001 0343

# APPENDIX B
# SUMMARY OF ANALYTICAL DATA



MGY 001 0344




LEGEND

47 ● LOCATION OF RESIDENTIAL WELL SAMPLING POINT; NUMBERS REFER TO RESIDENTIAL CHEMICAL DATA TABLES.

**RESIDENTIAL WELL SAMPLING POINTS 1979–1987**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BAS | SCALE: | AS SHOWN | PROJNO. | 84C4007-A2M |
| CK'D. BY: | MC | DATE: | 11 DEC 1987 | FIG. NO.: | B-1 |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 29003 | 29002 | 29003 | 29003 | 29002 | 29003 | 29003 | 29003 | 29002 | 29002 | 29003 | 29003 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 16 | 40 | 14 | 5 | 18 | 11 | 12 | 15 | 17 | 8 | 13 | 8 |
| | Map Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 1,1-Dichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/30/84 | - | 8.4 | - | - | - | - | - | - | - | - | - | - |
| | 6/5/86 | - | 4.5-5.6 | - | ND | - | - | 4.0 | 2.6 | ND | ND | - | ND |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | 3 | - | - | - | - | - | - |
| | 3/16-18/82 | - | 5 | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| | 10/30/84 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | 2ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 12/17/81 | | | | | | | | | | | | |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/10/79 | - | - | 2ND | - | - | - | - | 2ND | 2ND | - | 2ND | 7 |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29003 | 29002 | 29003 | 29003 | 29002 | 29003 | 29003 | 29003 | 29002 | 29002 | 29003 | 29003 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 16 | 40 | 14 | 5 | 18 | 11 | 12 | 15 | 17 | 8 | 13 | 8 |
| | Map Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Trichloroethene | 6/5/86 | - | 40-44 | - | 3.8 | - | - | 32 | 24 | 3.9 | 18 | - | ND |
| | 10/30/84 | - | 41 | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | 6 | - | - | - | - | - | - |
| | 3/16-18/82 | - | 40 | - | - | - | - | - | - | - | - | - | - |
| | 10/15/81 | ND | - | - | - | - | - | 16 | 8 | - | 6 | 5 | 16 |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/10-18/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/18/80 | 1ND | - | 13 | - | - | 4 | - | 4 | - | - | 2 | - |
| | 5/12/80 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/14/80 | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | 2.1 | - | - | - | - | - |
| | 1/28/80 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/19/79 | - | - | - | - | - | ND | 2ND | - | - | - | - | - |
| | 12/10/79 | - | - | 4 | - | - | - | - | 2 | 2ND | - | 2ND | 2ND |
| | 11/18-19/79 | 1.5 | - | - | - | - | - | - | - | - | - | - | - |
| Methylene Chloride | 6/5-6/86 | - | 2.4-1.8 | - | 7.1 | - | - | ND | 1.7 | 3.0 | ND | - | ND |
| | 10/30/84 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | 5ND | - | - | - | - | - | - |
| Acetone | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| Diethyl phthalate | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| 1,2-Dichloroethene | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29003 / 16 / 1 | 29002 / 40 / 2 | 29003 / 14 / 3 | 29003 / 5 / 4 | 29002 / 18 / 5 | 29003 / 11 / 6 | 29003 / 12 / 7 | 29003 / 15 / 8 | 29002 / 17 / 9 | 29002 / 8 / 10 | 29003 / 13 / 11 | 29003 / 8 / 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | 1 | - | - | - | - | - | - | - | - | - | - |
| | 12/17/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | - | - | - | - | ND | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |
| Tetrachloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5-6/86 | - | 1.5 | - | ND | - | - | ND | ND | ND | ND | - | ND |
| | 6/14/82 | - | - | - | - | - | 2ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | 3 | - | - | - | - | - | - | - | - | - | - |
| | 12/17/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |
| Di-n-butylphthalate | 6/6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,2,2-Tetrachloroethene | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - |
| Trans 1,2-dichloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ethylbenzene | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29003 / 16 / 1 | 29002 / 40 / 2 | 29003 / 14 / 3 | 29003 / 5 / 4 | 29002 / 18 / 5 | 29003 / 11 / 6 | 29003 / 12 / 7 | 29003 / 15 / 8 | 29002 / 17 / 9 | 29002 / 8 / 10 | 29003 / 13 / 11 | 29003 / 8 / 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |
| Chlordane | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | .76 | ND | - | ND |
| Toluene | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| | 6/14/82 | - | - | - | - | - | ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| Carbon Tetrachloride | 6/14/82 | - | - | - | - | - | 5ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | 1.1 | - | - | - | - | - |
| | 11/19/79 | ND | - | - | - | - | - | - | - | - | - | - | - |
| 1,1-Dichloroethene | 6/14/82 | - | - | - | - | - | 1ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29003 16 1 | 29002 40 2 | 29003 14 3 | 29003 5 4 | 29002 18 5 | 29003 11 6 | 29003 12 7 | 29003 15 8 | 29002 17 9 | 29002 8 10 | 29003 13 11 | 29003 8 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 11/19/79 | - | - | ND | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethane | 6/14/82 | - | - | - | - | - | 1ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | 3 | - | - | - | - | - | - | - | - | - | - |
| Trichlorofluoromethane | 8/14/81 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | ND | - | - | - | - | - |
| Bromodichloromethane | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| | 6/14/82 | - | - | - | - | - | 5ND | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| o-Dichlorobenzene | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| 1,2,4-Trichlorobenzene | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| N-Butylbenzene | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| 2,3-Benzofuran | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| Cyclopropylbenzene | 3/16-18/82 | - | ND | - | - | - | - | - | - | - | - | - | - |
| V.O. Scan | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| PCBs | 3/16-18/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - |
| Aluminum | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29003 / 16 / 1 | 29002 / 40 / 2 | 29003 / 14 / 3 | 29003 / 5 / 4 | 29002 / 18 / 5 | 29003 / 11 / 6 | 29003 / 12 / 7 | 29003 / 15 / 8 | 29002 / 17 / 9 | 29002 / 8 / 10 | 29003 / 13 / 11 | 29003 / 8 / 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6/5-6/86 | - | 18-20 | - | ND | - | - | 8.7 | 8.5 | ND | 7.2 | - | ND |
| Barium | 6/5-6/86 | - | 142-144 | - | 151 | - | - | 165 | 118 | 105 | 62 | - | 58 |
| Beryllium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Cadmium | 6/5-6/86 | - | ND | - | ND | - | - | ND | ND | ND | ND | - | ND |
| Calcium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Chromium | 6/5-6/86 | - | 10-11 | - | ND | - | - | 10 | 12 | ND | 11 | - | 8.5 |
| Cobalt | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Copper | 6/5-6/86 | - | 31 | - | 114 | - | - | 31 | 18 | 171 | 47 | - | 126 |
| Iron | 6/5-6/86 | - | 510-514 | - | 18 | - | - | 89 | 26 | 15 | 57 | - | 56 |
| Lead | 6/5-6/86 | - | 7.7 | - | 6.0 | - | - | 5 | ND | 4.7 | 91 | - | ND |
| Magnesium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Manganese | 6/5-6/86 | - | 6.2-6.1 | - | ND | - | - | 5.6 | 3.6 | ND | 44 | - | 6.2 |
| Mercury | 6/5-6/86 | - | .18-.24 | - | ND | - | - | .14 | ND | ND | .14 | - | .14 |
| Nickel | 6/5-6/86 | - | 12-14 | - | ND | - | - | ND | 14 | ND | 11 | - | 15 |
| Potasium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |

MGY 001 0351

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29003 | 29002 | 29003 | 29003 | 29002 | 29003 | 29003 | 29003 | 29002 | 29002 | 29003 | 29003 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 16 | 40 | 14 | 5 | 18 | 11 | 12 | 15 | 17 | 8 | 13 | 8 |
| | Map Location | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Silver | 6/5-6/86 | - | 10 | - | ND | - | - | ND | ND | ND | ND | - | ND |
| Sodium | 6/5-6/86 | - | 14,700-14,100 | - | 5160 | - | - | 13,900 | 9,040 | 6,440 | 10,600 | - | 13,600 |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29002 7 13 | 29003 7 14 | 29003 10 15 | 29002 19 16 | 29003 2 17 | 29003 4 18 | 29003 6 19 | 29002 43 20 | 29002 37 21 | 23001 25 22 | 23001 24 23 | 23001 21 25 | 23001 28 26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/30/84 | ND | - | - | - | - | - | - | ND | ND | - | - | - | - |
| | 6/5/86 | - | - | - | - | - | - | - | 3.8 | ND | - | - | - | 1.5 |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 1ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | 1 |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | ND | - | - |
| 1,1 Dichloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5/86 | - | - | - | - | - | - | - | ND | ND | - | - | - | ND |
| | 10/30/84 | ND | - | - | - | - | - | - | ND | ND | - | - | - | - |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 2ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | 5 |
| | 12/17/81 | | | | | | | | | | | | | |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| | 12/10/79 | - | - | - | - | - | - | - | - | - | - | - | 2ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | ND | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29002 / 7 / 13 | 29003 / 7 / 14 | 29003 / 10 / 15 | 29002 / 19 / 16 | 29003 / 2 / 17 | 29003 / 4 / 18 | 29003 / 6 / 19 | 29002 / 43 / 20 | 29002 / 37 / 21 | 23001 / 25 / 22 | 23001 / 24 / 23 | 23001 / 21 / 25 | 23001 / 28 / 26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethene | 6/5/86 | - | - | - | - | - | - | - | 35 | 2.5 | - | - | - | 140 |
| | 10/30/84 | 9.9 | - | - | - | - | - | - | 27 | 12 | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | 5 |
| | 10/15/81 | - | - | 13 | ND | - | ND | - | - | - | 120 | - | 2ND | 46 |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | - | - | - | - | - | - | - | - | - | - | - | 95 |
| | 6/14/81 | - | - | - | - | - | - | - | - | 14 | - | - | - | 58 |
| | 3/10-18/81 | - | - | - | - | - | - | - | - | - | - | - | - | 318 |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | 45 |
| | 11/18/80 | - | - | - | - | - | - | - | - | 15 | - | 84 | 1 | - |
| | 5/12/80 | - | - | - | - | 1ND | 1ND | 1ND | - | - | - | - | - | 63 |
| | 3/14/80 | - | - | - | 2ND | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | 69 | - | 2ND | - |
| | 1/28/80 | - | 3ND | - | - | - | - | 3ND | - | - | - | - | - | 63 |
| | 12/19/79 | - | - | 2ND | - | - | 2ND | - | - | - | - | - | - | 51 |
| | 12/10/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/18-19/79 | - | - | - | - | - | - | - | - | - | - | 17.2 | - | 50 |
| Methylene Chloride | 6/5-6/86 | - | - | - | - | - | - | - | ND | 16 | - | - | - | ND |
| | 10/30/84 | ND | - | - | - | - | - | - | ND | ND | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Acetone | 6/5-6/86 | - | - | - | - | - | - | - | ND | 12 | - | - | - | 3.5 |
| Diethyl phthalate | 6/5-6/86 | - | - | - | - | - | - | - | ND | 4.2 | - | - | - | ND |
| 1,2-Dichloroethene | 6/5-6/86 | - | - | | - | - | - | - | ND | ND | - | - | - | 5.6 |

MGY 001 0054

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29002 | 29003 | 29003 | 29002 | 29003 | 29003 | 29003 | 29002 | 29002 | 23001 | 23001 | 23001 | 23001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 7 | 7 | 10 | 19 | 2 | 4 | 6 | 43 | 37 | 25 | 24 | 21 | 28 |
| Map | Location | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 25 | 26 |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | ND | - | - |
| Chloroform | 6/5-6/86 | - | - | - | - | - | - | - | ND | ND | - | - | - | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 2ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | 8 |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | ND | - | - |
| Chlordane | 6/5-6/86 | - | - | - | - | - | - | - | ND | ND | - | - | - | ND |
| Toluene | 6/5-6/86 | - | - | - | - | - | - | - | ND | ND | - | - | - | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 1ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Carbon Tetrachloride | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 5ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | 3.1 | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | ND | - | - |
| 1,1-Dichloroethene | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 1ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29002 / 7 / 13 | 29003 / 7 / 14 | 29003 / 10 / 15 | 29002 / 19 / 16 | 29003 / 2 / 17 | 29003 / 4 / 18 | 29003 / 6 / 19 | 29002 / 43 / 20 | 29002 / 37 / 21 | 23001 / 25 / 22 | 23001 / 24 / 23 | 23001 / 21 / 25 | 23001 / 28 / 26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | ND | - | - | 7.8 |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethane | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 1ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Trichlorofluoromethane | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | ND | - | - | - |
| Bromodichloromethane | 6/5-6/86 | - | - | - | - | - | - | - | ND | ND | - | - | - | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | 5ND | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| o-Dichlorobenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| 1,2,4-Trichlorobenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | 42 |
| N-Butylbenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| 2,3-Benzofuran | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| Cyclopropylbenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | ND |
| V.O. Scan | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PCBs | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | 1ND |
| Aluminum | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29002 7 13 | 29003 7 14 | 29003 10 15 | 29002 19 16 | 29003 2 17 | 29003 4 18 | 29003 6 19 | 29002 43 20 | 29002 37 21 | 23001 25 22 | 23001 24 23 | 23001 21 25 | 23001 28 26 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6/5-6/86 | - | - | - | - | - | - | - | 5.1 | 4.4 | - | - | - | ND |
| Barium | 6/5-6/86 | - | - | - | - | - | - | - | 121 | 135 | - | - | - | 125 |
| Beryllium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cadmium | 6/5-6/86 | - | - | - | - | - | - | - | ND | ND | - | - | - | ND |
| Calcium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chromium | 6/5-6/86 | - | - | - | - | - | - | - | 5.0 | 9.5 | - | - | - | 6.9 |
| Cobalt | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Copper | 6/5-6/86 | - | - | - | - | - | - | - | 26 | 31 | - | - | - | 41 |
| Iron | 6/5-6/86 | - | - | - | - | - | - | - | 86 | 124 | - | - | - | 44 |
| Lead | 6/5-6/86 | - | - | - | - | - | - | - | 740 | 7.0 | - | - | - | 3.6 |
| Magnesium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Manganese | 6/5-6/86 | - | - | - | - | - | - | - | 5.9 | 6.1 | - | - | - | 4.2 |
| Mercury | 6/5-6/86 | - | - | - | - | - | - | - | .18 | .18 | - | - | - | 0.14 |
| Nickel | 6/5-6/86 | - | - | - | - | - | - | - | 12 | 16 | - | - | - | 14 |
| Potasium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29002 | 29003 | 29003 | 29002 | 29003 | 29003 | 29003 | 29002 | 29002 | 23001 | 23001 | 23001 | 23001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 7 | 7 | 10 | 19 | 2 | 4 | 6 | 43 | 37 | 25 | 24 | 21 | 28 |
| | Map Location | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 25 | 26 |
| Silver | 6/5-6/86 | - | - | - | - | - | - | - | ND | 10 | - | - | - | 10 |
| Sodium | 6/5-6/86 | - | - | - | - | - | - | - | 8,035 | 15,400 | - | - | - | 10,000 |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 23001 | 23001 | 23001 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 27 | 26 | 23 | 16 | 9 | 15 | 10 | 13 | 11 | 12 | 14 | 5A |
| | Map Location | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| 1,1-Dichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/30/84 | ND | - | - | - | - | - | - | - | - | - | 10 | - |
| | 6/5/86 | ND | - | ND | - | - | - | - | - | ND | ND | 7.1 | ND |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | 4 | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | ND | - | - | - | - | - | - | - | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1 Dichloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5/86 | ND | - | ND | - | - | - | - | - | ND | ND | 3.7 | ND |
| | 10/30/84 | ND | - | - | - | - | - | - | - | - | - | 10 | - |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 12/17/81 | | | | | | | | | | | | |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | 7.3 | - | - | - | - | - | - | - | - | - | 5 | - |
| | 12/10/79 | - | - | - | 2ND | - | - | - | 2ND | - | - | 5 | 6 |
| | 11/19/79 | - | - | - | - | - | - | ND | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 / 27 / 27 | 23001 / 26 / 28 | 23001 / 23 / 29 | 29002 / 16 / 30 | 29002 / 9 / 31 | 29002 / 15 / 32 | 29002 / 10 / 33 | 29002 / 13 / 34 | 29002 / 11 / 35 | 29002 / 12 / 36 | 29002 / 14 / 37 | 29001 / 5A / 38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethene | 6/5/86 | 60 | - | 72 | - | - | - | - | - | 220 | 64 | 72 | ND |
| | 10/30/84 | ND | - | - | - | - | - | - | - | - | - | 45 | - |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | 249 | - | - | - | - | - |
| | 10/15/81 | 55 | 94 | 140 | ND | - | 2 | - | 68 | - | 6 | 5 | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | 52 | - | - | - | - | - | - | - | - | - | - |
| | 6/14/81 | 210 | 52 | - | - | - | - | - | 54 | - | - | 14 | - |
| | 3/10-18/81 | - | 120 | - | - | - | - | 249 | 18 | - | - | - | - |
| | 2/10/81 | 45 | 59 | - | - | - | - | 28 | - | - | - | - | - |
| | 11/18/80 | - | - | 90 | - | 5 | - | - | 33 | - | - | 10 | - |
| | 5/12/80 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/14/80 | - | - | - | 2ND | - | 2ND | - | - | - | - | 11 | - |
| | 2/11/80 | 58 | - | - | - | - | - | - | - | - | - | 13 | - |
| | 1/28/80 | 79 | 130 | 78 | - | 6 | - | 58 | - | 68 | - | - | - |
| | 12/19/79 | - | 110 | 79 | - | - | - | - | - | 36 | - | - | - |
| | 12/10/79 | - | - | - | 2ND | - | - | - | 21 | - | - | 15 | 2ND |
| | 11/18-19/79 | - | - | - | ND | 5.5 | 2 | 146 | 38.8 | 108 | 35 | 22 | ND |
| Methylene Chloride | 6/5-6/86 | ND | - | 4.0 | - | - | - | - | - | ND | 1.8 | ND | ND |
| | 10/30/84 | 31 | - | - | - | - | - | - | - | - | - | ND | - |
| | 6/14/82 | - | 5ND | - | - | - | - | - | - | - | - | - | - |
| Acetone | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | ND |
| Diethyl phthalate | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | - |
| 1,2-Dichloroethene | 6/5-6/86 | 4.4 | - | 5.3 | - | - | - | - | - | 7.6 | ND | 3.4 | ND |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 23001 | 23001 | 23001 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 27 | 26 | 23 | 16 | 9 | 15 | 10 | 13 | 11 | 12 | 14 | 5A |
| | Map Location | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | 18 | - | - | - | - | 5 | - | - | - | - | - |
| | 12/17/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | 7.6 | - | - | - | - | - | - | - | - | - | 4.6 | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| Tetrachloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5-6/86 | ND | - | ND | - | - | - | - | - | 26 | ND | 1.9 | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | 5 | - | - | - | - | 5 | - | - | - | - | - |
| | 12/17/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | 12 | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | ND | ND | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | ND | - | - | - | - | - | - | - | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| Di-n-butylphthalate | 6/6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,2,2-Tetrachloroethene | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - |
| Trans 1,2-dichloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| Ethylbenzene | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 1/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |

MGY 001 0361

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 27 27 | 23001 26 28 | 23001 23 29 | 29002 16 30 | 29002 9 31 | 29002 15 32 | 29002 10 33 | 29002 13 34 | 29002 11 35 | 29002 12 36 | 29002 14 37 | 29001 5A 38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | 1 | - | - | - | - | 2 | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | ND | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| Chlordane | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | ND |
| Toluene | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| Carbon Tetrachloride | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| | 2/11/80 | 1.9 | - | - | - | - | - | - | - | - | - | 1.1 | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1-Dichloroethene | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 23001 | 23001 | 23001 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 27 | 26 | 23 | 16 | 9 | 15 | 10 | 13 | 11 | 12 | 14 | 5A |
| | Map Location | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethane | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | 8 | - | - | - | - | - |
| Trichlorofluoromethane | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | ND | - |
| Bromodichloromethane | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | ND | - | - | - | - | ND | - | - | - | - | - |
| o-Dichlorobenzene | 3/16-18/82 | - | 438 | - | - | - | - | ND | - | - | - | - | - |
| 1,2,4-Trichlorobenzene | 3/16-18/82 | - | ND | - | - | - | - | 8 | - | - | - | - | - |
| N-Butylbenzene | 3/16-18/82 | - | 691 | - | - | - | - | 12 | - | - | - | - | - |
| 2,3-Benzofuran | 3/16-18/82 | - | 148 | - | - | - | - | ND | - | - | - | - | - |
| Cyclopropylbenzene | 3/16-18/82 | - | 24 | - | - | - | - | ND | - | - | - | - | - |
| V.O. Scan | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/87 | - | - | - | - | - | - | - | - | - | - | - | - |
| PCBs | 3/16-18/82 | - | 1ND | - | - | - | - | 1ND | - | - | - | - | - |
| Aluminum | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |

MGY 001 0363

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block Lot Map Location | 23001 27 27 | 23001 26 28 | 23001 23 29 | 29002 16 30 | 29002 9 31 | 29002 15 32 | 29002 10 33 | 29002 13 34 | 29002 11 35 | 29002 12 36 | 29002 14 37 | 29001 5A 38 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6/5-6/86 | ND | - | ND | - | - | - | - | - | 4.2 | ND | ND | ND |
| Barium | 6/5-6/86 | 106 | - | 107 | - | - | - | - | - | 135 | 85 | 72 | 295/306 |
| Beryllium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Cadmium | 6/5-6/86 | ND | - | 5.7 | - | - | - | - | - | 5.3 | ND | ND | 4.1 |
| Calcium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Chromium | 6/5-6/86 | ND | - | 13 | - | - | - | - | - | 13 | 11 | 12 | 9.2-7.6 |
| Cobalt | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Copper | 6/5-6/86 | 45 | - | 31 | - | - | - | - | - | 94 | 47 | 47 | 31-30 |
| Iron | 6/5-6/86 | ND | - | 59 | - | - | - | - | - | 30 | 125 | 97 | 70/75 |
| Lead | 6/5-6/86 | 4.4 | - | ND | - | - | - | - | - | 40 | 6.1 | 3.6 | 3.2 |
| Magnesium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |
| Manganese | 6/5-6/86 | ND | - | 5.6 | - | - | - | - | - | 5.3 | 18 | 13 | 5.4-5.2 |
| Mercury | 6/5-6/86 | ND | - | ND | - | - | - | - | - | ND | 0.18 | ND | ND |
| Nickel | 6/5-6/86 | ND | - | 71 | - | - | - | - | - | 15 | 25 | 19 | 12-17 |
| Potasium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - |

MGY 001 0364
0071

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 23001 | 23001 | 23001 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29002 | 29001 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 27 | 26 | 23 | 16 | 9 | 15 | 10 | 13 | 11 | 12 | 14 | 5A |
| | Map Location | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 |
| Silver | 6/5-6/86 | ND | - | 10 | - | - | - | - | - | 10 | ND | 20 | 10 |
| Sodium | 6/5-6/86 | 5,660 | - | 14,100 | - | - | - | - | - | 15,000 | 15,800 | 12,900 | 12,000- |

MGY 001 0365

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 23001 | 29001 | 29001 | 29002 | 29002 | 29002 | 23001 | 23001 | 29002 | 23001 | 29002 | 29002 | 29002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 20 | 2 | 4 | 4 | 2 | 5 | 19 | 29 | 1 | 17 | 22 | 28 | 24 |
| | Map Location | 39 | 40 | 41 | 42 | 43 | 44 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
| 1,1-Dichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/30/84 | - | - | - | - | - | - | - | - | ND | - | 9 | - | 5.8 |
| | 6/5/86 | ND | ND | ND | ND | - | - | - | - | - | ND | 8.6 | ND | 3.5 |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | 1ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 22 | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1 Dichloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5/86 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 10/30/84 | - | - | - | - | - | - | - | - | ND | - | ND | - | ND |
| | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | - | - | - | - | 2ND | - | - | 2ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 3.2 | - |
| | 12/17/81 | | | | | | | | | | | | | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | ND | - | - | - | - |
| | 12/10/79 | - | - | 3 | - | 2ND | - | - | - | - | - | - | 2ND | 2ND |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 20 39 | 29001 2 40 | 29001 4 41 | 29002 4 42 | 29002 2 43 | 29002 5 44 | 23001 19 46 | 23001 29 47 | 29002 1 48 | 23001 17 49 | 29002 22 50 | 29002 28 51 | 29002 24 52 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethene | 6/5/86 | 1.9 | ND | ND | 58 | - | - | - | - | - | ND | 28 | ND | 46 |
| | 10/30/84 | - | - | - | - | - | - | - | - | ND | - | 20 | - | 34 |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | 1ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 950 | - |
| | 10/15/81 | - | - | - | - | - | - | 30 | - | 2ND | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | 1ND | - | - | 1ND | - | - | 322 | - |
| | 7/14-20/81 | - | - | - | - | - | - | 28 | - | - | - | - | - | - |
| | 6/14/81 | - | - | - | - | - | 1ND | 30 | - | - | - | - | - | - |
| | 3/10-18/81 | - | - | - | - | - | - | 28 | - | - | - | - | 2 | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | 430 | - |
| | 11/18/80 | - | - | - | - | - | - | 29 | 1ND | 1 | - | - | - | - |
| | 5/12/80 | - | - | - | - | - | - | - | - | - | - | - | 2ND | - |
| | 3/14/80 | - | - | - | - | 6 | - | - | - | - | - | - | 309/2 | - |
| | 2/11/80 | - | - | - | - | - | - | 20 | - | 2.2 | - | - | 111 | - |
| | 1/28/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/19/79 | - | - | - | - | - | - | - | 2ND | - | - | - | - | - |
| | 12/10/79 | - | - | 2ND | - | 6 | - | - | - | - | - | - | 2 | 6 |
| | 11/18-19/79 | 1.9 | ND | - | - | - | - | - | - | - | - | - | - | - |
| Methylene Chloride | 6/5-6/86 | ND | ND | ND | ND | - | - | - | - | - | ND | 1.1 | 5.8 | 3.2 |
| | 10/30/84 | - | - | - | - | - | 20ND | - | - | 83 | - | ND | - | ND |
| | 6/14/82 | - | - | - | - | - | 5ND | - | - | 5ND | - | - | - | - |
| Acetone | 6/5-6/86 | ND | ND | 4.6 | ND | - | - | - | - | - | ND | 5.3 | ND | 7.3 |
| Diethyl phthalate | 6/5-6/86 | - | - | - | - | - | - | - | - | - | ND | ND | ND | ND |
| 1,2-Dichloroethene | 6/5-6/86 | ND | ND | ND | 4.0 | - | - | - | - | - | ND | 4.0 | ND | 3.5 |

MGY 001 0367

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 / 20 / 39 | 29001 / 2 / 40 | 29001 / 4 / 41 | 29002 / 4 / 42 | 29002 / 2 / 43 | 29002 / 5 / 44 | 23001 / 19 / 46 | 23001 / 29 / 47 | 29002 / 1 / 48 | 23001 / 17 / 49 | 29002 / 22 / 50 | 29002 / 28 / 51 | 29002 / 24 / 52 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 32 | - |
| | 12/17/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | 17 | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Tetrachloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5-6/86 | ND | ND | ND | 1.8 | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | 2ND | - | - | 2ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 51 | - |
| | 12/17/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/14-20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | ND | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Di-n-butylphthalate | 6/6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,2,2-Tetrachloroethene | 4/1/83 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Trans 1,2-dichloroethene | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Ethylbenzene | 6/5-6/86 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | 1ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 23001 | 29001 | 29001 | 29002 | 29002 | 29002 | 23001 | 23001 | 29002 | 23001 | 29002 | 29002 | 29002 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 20 | 2 | 4 | 4 | 2 | 5 | 19 | 29 | 1 | 17 | 22 | 28 | 24 |
| | Map Location | 39 | 40 | 41 | 42 | 43 | 44 | 46 | 47 | 48 | 49 | 50 | 51 | 52 |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | ND | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | 6/5-6/86 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | 2ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 560 | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | 2.0 | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chlordane | 6/5-6/86 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND | ND |
| Toluene | 6/5-6/86 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | 1ND | - | - | 1ND | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 8 | - |
| Carbon Tetrachloride | 6/14/82 | - | - | - | - | - | ND | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | ND | - | - | 16.3 | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1-Dichloroethene | 6/14/82 | - | - | - | - | - | ND | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 20 39 | 29001 2 40 | 29001 4 41 | 29002 4 42 | 29002 2 43 | 29002 5 44 | 23001 19 46 | 23001 29 47 | 29002 1 48 | 23001 17 49 | 29002 22 50 | 29002 28 51 | 29002 24 52 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | ND | - | - | ND | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethane | 6/14/82 | - | - | - | - | - | ND | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | ND | - | - | 53 | - |
| Trichlorofluoromethane | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | ND | - | - | 23.6 | - |
| Bromodichloromethane | 6/5-6/86 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | - | - | - | - | ND | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 40 | - |
| o-Dichlorobenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 70 | - |
| 1,2,4-Trichlorobenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| N-Butylbenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| 2,3-Benzofuran | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | ND | - |
| Cyclopropylbenzene | 3/16-18/82 | - | - | - | - | - | - | - | - | - | | - | ND | - |
| V.O. Scan | 4/22/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/87 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PCBs | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | 1ND | - |
| Aluminum | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 / 20 / 39 | 29001 / 2 / 40 | 29001 / 4 / 41 | 29002 / 4 / 42 | 29002 / 2 / 43 | 29002 / 5 / 44 | 23001 / 19 / 46 | 23001 / 29 / 47 | 29002 / 1 / 48 | 23001 / 17 / 49 | 29002 / 22 / 50 | 29002 / 28 / 51 | 29002 / 24 / 52 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6/5-6/86 | 39 | 7.5 | ND | ND | - | - | - | - | - | ND | 10 | ND | 10 |
| Barium | 6/5-6/86 | 106 | 6.7 | 8.4 | 82 | - | - | - | - | - | 199 | 120 | 70 | 114 |
| Beryllium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Cadmium | 6/5-6/86 | ND | 4.8 | 4.7 | ND | - | - | - | - | - | ND | ND | ND | ND |
| Calcium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chromium | 6/5-6/86 | 11 | 8.8 | 9.3 | 8.2 | - | - | - | - | - | 7.8 | 11 | 6.4 | 13 |
| Cobalt | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Copper | 6/5-6/86 | 31 | 31 | 144 | 28 | - | - | - | - | - | 30 | 31 | 118 | 47 |
| Iron | 6/5-6/86 | 69 | 196 | 3840 | 23 | - | - | - | - | - | 25 | 116 | 30 | 163 |
| Lead | 6/5-6/86 | 3.5 | ND | ND | 28 | - | - | - | - | - | 2.8 | 4.0 | 4.0 | 143 |
| Magnesium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Manganese | 6/5-6/86 | 5.9 | 295 | 222 | ND | - | - | - | - | - | 3.7 | 94 | 4.2 | 74 |
| Mercury | 6/5-6/86 | ND | 0.18 | 0.14 | 0.14 | - | - | - | - | - | ND | 0.14 | 0.14 | 0.18 |
| Nickel | 6/5-6/86 | 24 | 28 | 37 | 20 | - | - | - | - | - | 23 | 33 | 18 | 27 |
| Potasium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MGY 001 0371

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 23001 / 20 / 39 | 29001 / 2 / 40 | 29001 / 4 / 41 | 29002 / 4 / 42 | 29002 / 2 / 43 | 29002 / 5 / 44 | 23001 / 19 / 46 | 23001 / 29 / 47 | 29002 / 1 / 48 | 23001 / 17 / 49 | 29002 / 22 / 50 | 29002 / 28 / 51 | 29002 / 24 / 52 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Silver | 6/5-6/86 | 30 | 10 | ND | ND | - | - | - | - | - | ND | 10 | 10 | ND |
| Sodium | 6/5-6/86 | 14,000 | 57,900 | 10 | 10,800 | - | - | - | - | - | 13,000 | 16,900 | 7,740 | 15,300 |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29002 / 33 / 53 | 29003 / 18 / 54 | 28001 / 37 / 55 | 29001 / 1 / 56 | ELIZABETH TOWN WATER | 4 / 28 / 57 | 14 / 3 / 58 | 59 | 60 | 61 | 9 / 8 / 63 | 9 / 2.04+2.4 / 64 | 9 / 9.1 / 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1-Dichloroethane | 4/22/87 | - | - | - | - | - | 38 | - | - | - | - | - | - | - |
| | 10/30/84 | - | - | - | - | - | - | - | - | - | - | ND | ND | ND |
| | 6/5/86 | 5.8 | ND | ND | ND | ND | - | - | - | - | - | - | - | - |
| | 4/1/83 | - | - | - | - | - | 19 | - | - | - | - | - | - | - |
| | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | - | - | - | - | 2 | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1 Dichloroethene | 4/22/87 | - | - | - | - | - | 44 | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 4/22/87 | - | - | - | - | - | 37 | - | - | - | - | - | - | - |
| | 6/5/86 | ND | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND |
| | 10/30/84 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 4/1/83 | - | - | - | - | - | 22 | - | - | - | - | - | - | - |
| | 6/14/82 | - | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 12/17/81 | | | | | | 57 | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/10/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 29002 | 29003 | 28001 | 29001 | ELIZABETH | 4 | 14 | | | | 9 | 9 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 33 | 18 | 37 | 1 | TOWN WATER | 28 | 3 | | | | 8 | 2.04+2.4 | 9.1 |
| | Map Location | 53 | 54 | 55 | 56 | | 57 | 58 | 59 | 60 | 61 | 63 | 64 | 65 |
| Trichloroethene | 6/5/86 | 340 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND |
| | 10/30/84 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | 257 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/15/81 | - | ND | - | ND | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/10-18/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | 39 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/18/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 5/12/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/14/80 | - | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/28/80 | - | - | - | 3ND | - | - | - | - | - | - | - | - | - |
| | 12/19/79 | 39 | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 12/10/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/18-19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Methylene Chloride | 6/5-6/86 | ND | 2.1 | ND | ND | 24 | - | - | - | - | - | 4.1 | ND | ND |
| | 10/30/84 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/14/82 | - | 5ND | - | - | - | - | - | - | - | - | - | - | - |
| | | | | | | | | - | - | - | - | - | - | - |
| Acetone | 6/5-6/86 | ND | ND | ND | ND | ND | - | - | - | - | - | 6.4 | ND | ND |
| Diethyl phthalate | 6/5-6/86 | ND | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND |
| 1,2-Dichloroethene | 6/5-6/86 | 17 | ND | ND | ND | ND | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29002 | 29003 | 28001 | 29001 | ELIZABETH | 4 | 14 | | | | 9 | 9 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 33 | 18 | 37 | 1 | TOWN WATER | 28 | 3 | | | | 8 | 2.04+2.4 | 9.1 |
| | Map Location | 53 | 54 | 55 | 56 | | 57 | 58 | 59 | 60 | 61 | 63 | 64 | 65 |
| | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | - | - | - | - | 5 | - | - | - | - | - | - | - |
| | 12/17/81 | - | - | - | - | - | 27 | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Tetrachloroethene | 4/22/87 | - | - | - | - | - | 15 | - | - | - | - | - | - | - |
| | 6/5-6/86 | 1.4 | ND | ND | ND | ND | - | - | - | - | ND | ND | ND | ND |
| | 6/14/82 | - | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | 24 | - | - | - | - | 6 | - | - | - | - | - | - | - |
| | 12/17/81 | - | - | - | - | - | 15 | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/14-20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | 18 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Di-n-butylphthalate | 6/6/86 | - | - | - | - | - | - | - | - | - | - | ND | ND | ND |
| 1,1,2,2-Tetrachloroethene | 4/1/83 | - | - | - | - | - | 7 | - | - | - | - | - | - | - |
| Trans 1,2-dichloroethene | 4/22/87 | - | - | - | - | - | 8.7 | - | - | - | - | ND | ND | ND |
| Ethylbenzene | 6/5-6/86 | ND | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND |
| | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29002 | 29003 | 28001 | 29001 | ELIZABETH | 4 | 14 | | | | 9 | 9 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 33 | 18 | 37 | 1 | TOWN WATER | 28 | 3 | | | | 8 | 2.04+2.4 | 9.1 |
| Map | Location | 53 | 54 | 55 | 56 | | 57 | 58 | 59 | 60 | 61 | 63 | 64 | 65 |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | 6/5-6/86 | ND | ND | ND | ND | 11 | - | - | - | - | - | ND | ND | ND |
| | 6/14/82 | - | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | 1 | - | - | - | - | 31 | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chlordane | 6/5-6/86 | ND | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND |
| Toluene | 6/5-6/86 | ND | ND | ND | ND | 4.7 | - | - | - | - | - | ND | ND | ND |
| | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Carbon Tetrachloride | 6/14/82 | - | 1ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/10/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1-Dichloroethene | 6/14/82 | - | 5ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | - | - | - | - | - | - | - | - | - | - | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 29002 | 29003 | 28001 | 29001 | ELIZABETH | 4 | 14 | | | | 9 | 9 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Lot | 33 | 18 | 37 | 1 | TOWN WATER | 28 | 3 | | | | 8 | 2.04+2.4 | 9.1 |
| Map | Location | 53 | 54 | 55 | 56 | | 57 | 58 | 59 | 60 | 61 | 63 | 64 | 65 |
| | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 7/20/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 11/19/79 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2-Dichloroethane | 6/14/82 | - | 2ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | 8 | - | - | - | - | - | - | - | - | - | - | - | - |
| Trichlorofluoromethane | 8/14/81 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Bromodichloromethane | 6/5-6/86 | ND | ND | ND | ND | 2.8 | - | - | - | - | - | ND | ND | ND |
| | 6/14/82 | - | 5ND | - | - | - | - | - | - | - | - | - | - | - |
| | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| o-Dichlorobenzene | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2,4-Trichlorobenzene | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| N-Butylbenzene | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| 2,3-Benzofuran | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Cyclopropylbenzene | 3/16-18/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| V.O. Scan | 4/22/87 | - | - | - | - | - | - | ND | - | - | - | - | - | - |
| | 11/19/87 | - | - | - | - | - | - | - | 1ND | 1ND | - | - | - | - |
| PCBs | 3/16-18/82 | 1ND | - | - | - | - | - | - | - | - | - | - | - | - |
| Aluminum | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | 102 | 146 | 147 |

MGY 001 0377

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 29002 / 33 / 53 | 29003 / 18 / 54 | 28001 / 37 / 55 | 29001 / 1 / 56 | ELIZABETH TOWN WATER | 4 / 28 / 57 | 14 / 3 / 58 | 59 | 60 | 61 | 9 / 8 / 63 | 9 / 2.04+2.4 / 64 | 9 / 9.1 / 65 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Arsenic | 6/5-6/86 | 10 | ND | ND | ND | ND | - | - | - | - | - | ND | ND | ND |
| Barium | 6/5-6/86 | 88 | 131 | 102 | 233 | 39 | - | - | - | - | - | 54 | 9.7 | 142 |
| Beryllium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | ND | ND | ND |
| Cadmium | 6/5-6/86 | ND | ND | ND | 9.8 | 4.1 | - | - | - | - | - | ND | 5.1 | ND |
| Calcium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | 34600 | 336000 | 41700 |
| Chromium | 6/5-6/86 | 12 | 117 | 15 | 14 | 7.6 | - | - | - | - | - | 4.1 | 15 | 9.7 |
| Cobalt | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | 5 | 13 | 8.3 |
| Copper | 6/5-6/86 | 23 | 31 | 46 | 31 | 76 | - | - | - | - | - | 31 | 31 | 196 |
| Iron | 6/5-6/86 | 656 | 56 | 40 | 107 | 74 | - | - | - | - | - | 62 | 60 | 46 |
| Lead | 6/5-6/86 | 19 | 20 | 7.0 | 7.0 | 18 | - | - | - | - | - | 18 | 2.1 | 4.4 |
| Magnesium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | 5340 | 8690 | 75600 |
| Manganese | 6/5-6/86 | 6.1 | 6.1 | 5.3 | 15 | 6.0 | - | - | - | - | - | 5.2 | 6.1 | 5.3 |
| Mercury | 6/5-6/86 | ND | ND | 0.18 | ND | ND | - | - | - | - | - | ND | .18 | .14 |
| Nickel | 6/5-6/86 | 21 | 14 | 10 | 19 | 16 | - | - | - | - | - | 14 | 13 | 16 |
| Potasium | 6/5-6/86 | - | - | - | - | - | - | - | - | - | - | ND | ND | 19 |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 29002 | 29003 | 28001 | 29001 | ELIZABETH | 4 | 14 | | | | 9 | 9 | 9 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PPB | Lot | 33 | 18 | 37 | 1 | TOWN WATER | 28 | 3 | | | | 8 | 2.04+2.4 | 9.1 |
| | Map Location | 53 | 54 | 55 | 56 | | 57 | 58 | 59 | 60 | 61 | 63 | 64 | 65 |
| Silver | 6/5-6/86 | 10 | 20 | 10 | 10 | 10 | - | - | - | - | - | 10 | 40 | 10 |
| Sodium | 6/5-6/86 | 2,600 | 9,270 | 12,400 | 14,600 | 11,100 | - | - | - | - | - | 13200 | 13700 | 17600 |

MGY 001 0379

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 9 | 9 | 29002 |
|---|---|---|---|---|
| | Lot | 5 | 7+7.0 | 30 |
| | Map Location | 66 | 67 | 62 |
| 1,1-Dichloroethane | 4/22/87 | - | - | - |
| | 10/30/84 | ND | ND | ND |
| | 6/5/86 | - | - | - |
| | 4/1/83 | - | - | - |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/20/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| 1,1 Dichloroethene | 4/22/87 | - | - | - |
| 1,1,1-trichloroethane | 4/22/87 | - | - | - |
| | 6/5/86 | ND | ND | ND |
| | 10/30/84 | - | - | - |
| | 4/1/83 | - | - | - |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 12/17/81* | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/20/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 12/10/79 | - | - | - |
| | 11/19/79 | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 9 | 9 | 29002 |
|---|---|---|---|---|
| PPB | Lot | 5 | 7+7.0 | 30 |
| | Map Location | 66 | 67 | 62 |
| Trichloroethene | 6/5/86 | ND | ND | 86 |
| | 10/30/84 | - | - | - |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 10/15/81 | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/14-20/81 | - | - | - |
| | 6/14/81 | - | - | - |
| | 3/10-18/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 11/18/80 | - | - | - |
| | 5/12/80 | - | - | - |
| | 3/14/80 | - | - | - |
| | 2/11/80 | - | - | - |
| | 1/28/80 | - | - | - |
| | 12/19/79 | - | - | - |
| | 12/10/79 | - | - | - |
| | 11/18-19/79 | - | - | - |
| Methylene Chloride | 6/5-6/86 | ND | 2.1 | 3.1 |
| | 10/30/84 | - | - | - |
| | 6/14/82 | - | - | - |
| | | - | - | - |
| Acetone | 6/5-6/86 | ND | ND | 5.7 |
| Diethyl phthalate | 6/5-6/86 | ND | ND | ND |
| 1,2-Dichloroethene | 6/5-6/86 | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 9 | 9 | 29002 |
|---|---|---|---|---|
| | Lot | 5 | 7+7.0 | 30 |
| | Map Location | 66 | 67 | 62 |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 12/17/81 | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/20/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| Tetrachloroethene | 4/22/87 | - | - | - |
| | 6/5-6/86 | ND | ND | ND |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 12/17/81 | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/14-20/81 | - | - | - |
| | 2/10/81 | - | - | 1.4 |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| Di-n-butylphthalate | 6/6/86 | ND | ND | ND |
| 1,1,2,2-Tetrachloroethene | 4/1/83 | - | - | - |
| Trans 1,2-dichloroethene | 4/22/87 | ND | ND | 3.7 |
| Ethylbenzene | 6/5-6/86 | ND | ND | ND |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 8/14/81 | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 9 / 5 / 66 | 9 / 7+7.0 / 67 | 29002 / 30 / 62 |
|---|---|---|---|---|
| | 7/20/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| Chloroform | 6/5-6/86 | ND | ND | ND |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/20/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| Chlordane | 6/5-6/86 | ND | ND | ND |
| Toluene | 6/5-6/86 | ND | ND | ND |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| Carbon Tetrachloride | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| | 8/14/81 | - | - | - |
| | 7/20/81 | - | - | - |
| | 2/10/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| 1,1-Dichloroethene | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block / Lot / Map Location | 9 / 5 / 66 | 9 / 7+7.0 / 67 | 29002 / 30 / 62 |
|---|---|---|---|---|
| | 8/14/81 | - | - | - |
| | 7/20/81 | - | - | - |
| | 2/11/80 | - | - | - |
| | 11/19/79 | - | - | - |
| 1,2-Dichloroethane | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| Trichlorofluoromethane | 8/14/81 | - | - | - |
| | 2/11/80 | - | - | - |
| Bromodichloromethane | 6/5-6/86 | ND | ND | ND |
| | 6/14/82 | - | - | - |
| | 3/16-18/82 | - | - | - |
| o-Dichlorobenzene | 3/16-18/82 | - | - | - |
| 1,2,4-Trichlorobenzene | 3/16-18/82 | - | - | - |
| N-Butylbenzene | 3/16-18/82 | - | - | - |
| 2,3-Benzofuran | 3/16-18/82 | - | - | - |
| Cyclopropylbenzene | 3/16-18/82 | - | - | - |
| V.O. Scan | 4/22/87 | - | - | - |
| | 11/19/87 | - | - | - |
| PCBs | 3/16-18/82 | - | - | - |
| Aluminum | 6/5-6/86 | 161 | 153 | 89 |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS PPB | Block | 9 | 9 | 29002 |
|---|---|---|---|---|
| | Lot | 5 | 7+7.0 | 30 |
| | Map Location | 66 | 67 | 62 |
| Arsenic | 6/5-6/86 | ND | ND | ND |
| Barium | 6/5-6/86 | 12 | 201 | 73 |
| Beryllium | 6/5-6/86 | ND | ND | ND |
| Cadmium | 6/5-6/86 | ND | 4.6 | ND |
| Calcium | 6/5-6/86 | 19600 | 38900 | 6250 |
| Chromium | 6/5-6/86 | 13 | 15 | 19 |
| Cobalt | 6/5-6/86 | 11 | 12 | 81 |
| Copper | 6/5-6/86 | 120 | 30 | 94 |
| Iron | 6/5-6/86 | 68 | 48 | 262 |
| Lead | 6/5-6/86 | 8.4 | 4.8 | 2170 |
| Magnesium | 6/5-6/86 | 5760 | 6880 | 5490 |
| Manganese | 6/5-6/86 | 6.1 | 6.0 | 29 |
| Mercury | 6/5-6/86 | .14 | .14 | .24 |
| Nickel | 6/5-6/86 | 16 | 19 | 25 |
| Potesium | 6/5-6/86 | ND | ND | ND |

MONTGOMERY TOWNSHIP WELLS - REVISED DECEMBER 31, 1987

| CONTAMINANTS | Block | 9 | 9 | 29002 |
|---|---|---|---|---|
| PPB | Lot | 5 | 7+7.0 | 30 |
| | Map Location | 66 | 67 | 62 |
| Silver | 6/5-6/86 | 180 | 10 | 20 |
| Sodium | 6/5-6/86 | 10100 | 19600 | 11000 |

GROUND WATER ANALYSES

| Compound | Sampling Date | Thuls Auto | Wm. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte.206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V.O. Scan | 11/5/79 | - | - | - | - | - | - | - | - | ND+ | - | - |
| | 11/14/79 | - | - | - | - | - | - | - | - | 25ND | - | - |
| | 11/29/79 | - | - | - | - | ND+ | ND+ | - | - | - | - | - |
| | 2/6/80 | - | - | - | - | ND+ | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND+ | - | ND+ | - |
| | 3/4/80 | - | - | - | - | ND+ | - | - | - | - | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | - | ND+ | - |
| | 8/27/80 | - | - | - | - | ND+ | - | - | - | - | - | - |
| | 2/10/81 | - | - | - | - | - | - | ND+ | ND | ND+ | - | - |
| | 7/14/81 | - | - | - | - | - | - | ND+ | ND | - | - | - |
| | 3/17/82 | - | - | - | - | - | - | ND+ | ND+ | - | - | - |
| | 3/18/82 | - | - | - | - | - | - | ND+ | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | ND+ | ND+ | - | - | ND+ |
| | 1/6/83 | ND+ | ND+ | - | ND | - | ND | - | - | - | - | - |
| | 1/11/83 | - | - | ND+ | - | - | 2ND | - | - | - | - | - |
| | 1/20/83 | - | - | - | - | - | 19peaks | - | - | - | - | - |
| | 3/30/83 | - | - | - | - | - | - | - | ND+ | ND | - | - |
| | 3/31/83 | - | - | - | - | - | - | - | - | - | - | - |
| | 4/1/83 | ND+ | ND+ | ND+ | - | - | - | - | - | - | - | - |
| | 5/17/83 | - | | - | - | - | - | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | 1peak | - | - | - | - | - |
| | 9/26/83 | - | - | - | - | - | ND | - | - | - | - | - |
| Trichloroethene | 11/5/79 | - | - | - | - | - | - | - | - | 37.0 | - | - |
| | 11/19/79 | - | - | - | ND | 1.7 | ND | - | - | - | - | - |
| | 12/18/79 | - | - | - | - | 14 | - | - | - | - | - | - |
| | 12/19/79 | - | - | - | - | 12 | - | - | - | - | - | - |
| | 1/6/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/6/80 | - | - | - | - | 2ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | 124.9 | 48.0 | - | 28.7 | - |
| | 3/4/80 | - | - | - | - | 74 | - | - | - | - | - | - |
| | 5/5/80 | - | - | - | - | - | - | - | - | - | 60-75 | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | - | 91 | - |
| | 2/10/81 | - | - | - | - | - | - | 67 | ND | 25 | - | - |
| | 2/10/81 | - | - | - | - | - | - | 250 | - | - | - | - |
| | 7/14/81 | - | - | - | - | - | - | 482 | ND | - | - | - |
| | 3/17/82 | - | - | - | - | - | - | 210 | 50.0 | - | - | - |
| | 3/18/82 | - | - | - | - | - | - | 360 | ND | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 180 | 6.0 | - | - | ND |
| | 1/6/83 | 120 | 7.0 | - | ND | - | ND | - | - | - | - | - |
| | 1/11/83 | - | - | 3.0 | - | - | - | - | - | - | - | - |
| | 3/30/83 | - | - | - | - | - | - | - | 6.0 | ND | - | - |
| | 3/30/83 | - | - | - | - | - | - | - | 12.0 | - | - | - |
| | 3/31/83 | - | - | - | - | - | - | 160 | - | - | - | - |
| | 4/1/83 | 24 | 9.0 | ND | - | - | - | - | - | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 46 | - | - |
| 1,1-dichloroethene | 11/5/79 | - | - | - | - | - | - | - | - | 12.2 | - | - |

MGY 001 0387

GROUND WATER ANALYSES

| Compound | Sampling Date | Tools Auto | Mr. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte. 206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/6/80 | - | - | - | - | 400 | - | - | - | - | 13.2 | - |
| | 2/21/80 | - | - | - | - | - | - | 5.5 | 7.4 | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | 200 | - |
| | 3/17/82 | - | - | - | - | - | - | ND | 5.0 | - | - | - |
| | 1/6/83 | 8.5 | ND | - | ND | - | ND | - | - | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/31/83 | - | - | - | - | - | - | ND | - | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 17 | - | - |
| 1,1,1-trichloroethane | 11/5/79 | - | - | - | - | - | - | - | - | 34.8 | - | - |
| | 11/19/79 | - | - | - | - | 3.9 | ND | - | - | - | - | - |
| | 12/18/79 | - | - | - | - | ND | - | - | - | - | - | - |
| | 12/19/79 | - | - | - | - | ND | - | - | - | - | - | - |
| | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | 18.7 | 4.2 | - | 32.6 | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 8/27/80 | - | - | - | - | ND | - | - | - | - | - | - |
| | 3/18/82 | - | - | - | - | - | - | 2 | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 1 | 2 | - | - | ND |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/31/83 | - | - | - | - | - | - | 2 | - | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 44 | - | - |
| | 5/17/83 | - | - | - | - | - | - | - | - | 3 | - | - |
| 1,1,2,2-tetrachloroethane | 1/6/83 | ND | ND | ND | - | - | ND | - | - | - | - | - |
| | 4/1/83 | ND | ND | ND | - | - | - | - | - | - | - | - |
| Benzene | 12/18/79 | - | - | - | - | ND | - | - | - | - | - | - |
| | 12/19/79 | - | - | - | - | ND | - | - | - | - | - | - |
| | 1/8/80 | - | - | - | - | - | - | - | - | - | 100 | - |
| | 2/6/80 | - | - | - | - | 50 | - | - | - | - | - | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/23/82 | - | - | - | 500 | - | - | - | - | - | - | - |
| | 1/20/83 | - | - | - | - | - | 8000 | - | - | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| Toluene | 11/5/79 | - | - | - | - | - | - | - | - | 52.4 | - | - |
| | 1/8/80 | - | - | - | - | - | - | - | - | - | 17 | - |
| | 2/21/80 | - | - | - | - | - | - | ND | 1.0 | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/17/82 | - | - | - | - | - | - | ND | ND | - | - | ND |
| | 3/23/82 | - | - | - | 500 | - | - | - | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | ND | ND | - | - | 6 |
| | 1/20/83 | - | - | - | - | - | 18000 | - | - | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/30/83 | - | - | - | - | - | - | - | ND | ND | - | ND |

GROUND WATER ANALYSES

| Compound | Sampling Date | Tools Auto | Wm. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte.206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | - | 1 | - |
| | 3/23/82 | - | - | - | 50ND | - | - | - | - | - | - | - |
| | 1/28/83 | - | - | - | - | - | 170J | - | - | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| 1,1,2,2-tetrachloroethane | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | ND | ND | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/30/83 | - | - | - | - | - | - | - | 7.0 | ND | - | - |
| | 3/30/83 | - | - | - | - | - | - | - | 9.0 | - | - | - |
| | 3/31/83 | - | - | - | - | - | - | 14 | - | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 16 | - | - |
| 1,2-dichloroethane | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | ND | ND | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/17/82 | - | - | - | - | - | - | ND | 2 | - | - | - |
| | 3/18/82 | - | - | - | - | - | - | 5 | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 5 | ND | - | - | ND |
| | 1/23/83 | - | - | - | - | - | 65 | - | - | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/30/83 | - | - | - | - | - | - | - | 2.0 | ND | - | - |
| 1,2-dichloroethene | 11/5/79 | - | - | - | - | - | - | - | - | 4.0 | - | - |
| | 2/21/80 | - | - | - | - | - | - | 16.3 | 2.4 | - | ND | - |
| | 3/31/83 | - | - | - | - | - | - | ND | - | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 6 | - | ND |
| 1,1-dichloroethane | 11/5/79 | - | - | - | - | - | - | - | - | 4 | - | - |
| | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | 50.0 | ND | - | 2.3 | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/17/82 | - | - | - | - | - | - | ND | ND | - | - | ND |
| | 3/18/82 | - | - | - | - | - | - | 17 | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 10 | 30 | - | - | ND |
| | 4/12/82 | - | - | - | - | - | - | - | 2 | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/30/83 | - | - | - | - | - | - | - | 5 | ND | - | 3 |
| | 3/30/83 | - | - | - | - | - | - | - | 6 | - | - | - |
| | 3/31/83 | - | - | - | - | - | - | 9 | - | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 4 | - | - |
| Tetrachloroethene | 11/5/79 | - | - | - | - | - | - | - | - | 6.1 | - | - |
| | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | 14.5 | 16.5 | - | 3.6 | - |

GROUND WATER ANALYSES

| Compound | Sampling Date | Tnuis Auto | Wm. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte.206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/18/81 | - | - | - | - | - | - | ND | - | - | - | - |
| | 3/17/82 | - | - | - | - | - | - | 2 | 4 | - | - | ND |
| | 3/18/82 | - | - | - | - | - | - | 5 | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | | 3 | - | - | ND |
| | 4/12/82 | - | - | - | - | - | - | 5 | 3 | - | - | 2 |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/30/83 | - | - | - | - | - | - | - | ND | ND | - | ND |
| | 4/12/83 | - | - | - | - | - | - | ND | ND | ND | - | ND |
| Carbon Tetrachloride | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | ND | 1.4 | - | ND | - |
| | 2/18/80 | - | - | - | - | - | - | ND | - | - | - | - |
| | 7/14/81 | - | - | - | - | - | - | 163 | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 150 | ND | - | - | ND |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| tetrachloroethylene | 2/21/80 | - | - | - | - | - | - | ND | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 1200 | - | - | - | ND |
| Trifluorotoluene | 2/21/80 | - | - | - | - | - | - | ND | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 611 | - | - | - | ND |
| n-pentane | 3/23/82 | - | - | - | 50ND | - | - | - | - | - | - | - |
| n-hexane | 3/23/82 | - | - | - | 50ND | - | - | - | - | - | - | - |
| n-heptane | 3/23/82 | - | - | - | 50ND | - | - | - | - | - | - | - |
| Xylenes | 3/23/82 | - | - | - | 50ND | - | - | - | - | - | - | - |
| 33 purgeable organics | 1/29/82 | - | - | - | 10ND | - | - | - | - | - | - | - |
| Chloroform | 11/5/79 | - | - | - | | - | - | - | - | 2.8 | - | - |
| | 11/19/79 | - | - | - | - | ND | 2.8 | - | - | - | - | - |
| | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | - | - | ND | 4 | - | 2 | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | - | 40 | - |
| | 3/17/82 | - | - | - | - | - | - | ND | 2 | - | - | - |
| | 3/18/82 | - | - | - | - | - | - | 1 | - | - | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | 25 | - |
| TCE | 3/18/82 | - | - | - | - | - | - | 56 | - | - | - | - |
| | 3/30/83 | - | - | - | - | - | - | 1.12 | 0.69 | - | - | - |
| | 5/17/83 | - | - | - | - | - | - | 19.8 | 0.80 | - | - | ND |
| p-xylene | 1/28/83 | - | - | - | - | - | 1200 | - | - | - | - | - |

MGY 001 0390

GROUND WATER ANALYSES

| Compound | Sampling Date | Tools Auto | Wa. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte.206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| o-xylene | 1/28/83 | - | - | - | - | - | 2400 | - | - | - | - | - |
| m-xylene | 1/28/83 | - | - | - | - | - | 3300 | - | - | - | - | - |
| Cumene | 1/28/83 | - | - | - | - | - | 18 | - | - | - | - | - |
| Styrene | 1/28/83 | - | - | - | - | - | 75 | - | - | - | - | - |
| n-propylbenzene | 1/28/83 | - | - | - | - | - | 220 | - | - | - | - | - |
| 1,3,5 trimethylbenzene | 1/28/83 | - | - | - | - | - | 520 | - | - | - | - | - |
| 1,2,4 trimethylbenzene | 1/28/83 | - | - | - | - | - | 1900 | - | - | - | - | - |
| p-dichlorobenzene | 1/28/83 | - | - | - | - | - | 2200 | - | - | - | - | - |
| o-dichlorobenzene | 1/28/83 | - | - | - | - | - | 980 | - | - | - | - | - |
| n-butylbenzene | 1/28/83 | - | - | - | - | - | 340 | - | - | - | - | - |
| Naphthalene | 3/18/82 | - | - | - | - | - | - | ND | - | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 10 | - | - | - | - |
| | 1/28/83 | - | - | - | - | - | 2200 | - | - | - | - | - |
| Petroleum hydrocarbons | 1/28/83 | - | - | - | - | - | 324 | - | - | - | - | - |
| | 1/28/83 | - | - | - | - | - | 3.7 | - | - | - | - | - |
| | 1/28/83 | - | - | - | - | - | 209 | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | ND | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | ND | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | ND | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | 17.7 | - | - | - | - | - |
| | 3/8/84 | - | - | - | - | - | 19520 | - | - | - | - | - |
| | 7/16/84 | - | - | - | - | - | 3470* | - | - | - | - | - |
| | 9/3/84 | - | - | - | - | - | 9400* | - | - | - | - | - |
| | 10/31/84 | - | - | - | - | - | 1540* | - | - | - | - | - |
| Aromatic hydrocarbon | 2/10/81 | - | - | - | - | - | - | - | ND | - | - | - |
| | 7/14/81 | - | - | - | - | - | - | - | ND | - | - | - |
| | 3/17/82 | - | - | - | - | - | - | - | - | - | - | ND |
| | 3/30/83 | - | - | - | - | - | - | - | - | ND | - | - |
| | 7/6/83 | - | - | - | - | - | ND | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | ND | - | - | - | - | - |
| | 7/16/84 | - | - | - | - | - | ND | - | - | - | - | - |
| | 10/31/84 | - | - | - | - | - | ND | - | - | - | - | - |
| Chlorinated hydrocarbon | 2/10/81 | - | - | - | - | - | - | - | 5ND | - | - | - |
| | 7/14/81 | - | - | - | - | - | - | - | 5ND | - | - | - |
| | 3/17/82 | - | - | - | - | - | - | - | - | - | - | ND |
| | 3/30/83 | - | - | - | - | - | - | - | - | ND | - | - |

GROUND WATER ANALYSES

| Compound | Sampling Date | Inuls Auto | Wm. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte.206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/6/83 | - | - | - | - | - | 1ND | - | - | - | - | - |
| | 7/6/83 | - | - | - | - | - | 1ND | - | - | - | - | - |
| Methylene Chloride | 1/8/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 2/21/80 | - | - | - | - | ND | - | ND | - | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/17/82 | - | - | - | - | - | - | 25 | - | - | - | ND |
| | 4/12/82 | - | - | - | - | - | - | 50 | - | - | - | 1 |
| | 3/25/83 | - | - | - | - | - | - | - | - | - | ND | - |
| | 3/30/83 | - | - | - | - | - | - | ND | ND | ND | - | ND |
| 1,1,2,2-trichlorotri-fluoroethane | 2/21/80 | - | - | - | - | - | - | 40 | - | - | - | - |
| Total Dissolved Solids | 7/14/81 | - | - | - | - | - | - | 220ppm | 386ppm | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | 130ppm | 346ppm | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | - | 120ppm | - | - | - |
| | 4/12/83 | - | - | - | - | - | - | - | - | 712ppm | - | - |
| Iron | 7/14/81 | - | - | - | - | - | - | 23077ppm | - | - | - | - |
| Chloride | 4/12/82 | - | - | - | - | - | - | 18ppm | 78ppm | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | - | 8ppm | - | - | - |
| Sulfate | 4/12/82 | - | - | - | - | - | - | 26ppm | 46ppm | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | - | 10ppm | - | - | - |
| Specific Conductance | 4/12/82 | - | - | - | - | - | - | 175.3 | 486.4 | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | - | 149.9 | - | - | - |
| Hexavalent Chromium | 4/12/82 | - | - | - | - | - | - | 5ND | 13 | - | - | - |
| | 4/12/82 | - | - | - | - | - | - | - | 5ND | - | - | - |
| Dibromochloromethane | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 2ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | 3.2 | ND | - | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 5ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| Trans-1,1-dichloroethane | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| 1,2-dichloropropane | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 15ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |

MGY 001 0392

GROUND WATER ANALYSES

| Compound | Sampling Date | Tauis Auto | Wm. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte. 206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| Trans-1,3-dichloropropane | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| cis-1,3-dichloropropane | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| 1,1,2-trichloroethane | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 3ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| 2-chloroethylvinyl ether | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 5ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| Bromoform | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 4ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 14 | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| Chlorobenzene | 1/8/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 1ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |
| Benzene | 1/8/80 | - | - | - | - | - | - | - | - | 3 | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | 3.6 | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | ND | - | - |

GROUND WATER ANALYSES

| Compound | Sampling Date | Thuls Auto | Wm. Penn | Texaco | Town & Country | Ingersoll Rand | Princeton Airport | 1377 Rte.206 | Polycell | Compo Industries | P.G.T. | Village Shopper |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Bromodichloromethane | 1/8/83 | - | - | - | - | - | - | - | - | ND | - | - |
| | 2/6/80 | - | - | - | - | 2ND | - | - | - | - | - | - |
| | 2/21/80 | - | - | - | - | - | - | - | ND | ND | ND | - |
| | 5/9/80 | - | - | - | - | - | - | - | - | ND | - | - |
| | 5/16/80 | - | - | - | - | - | - | - | - | 2ND | ND | - |
| | 3/25/83 | - | - | - | - | - | - | - | - | 9.5 | - | - |
| Acid Extractables | 3/8/84 | - | - | - | - | - | 5ND | - | - | - | - | - |
| | 3/14/84 | - | - | - | - | - | ND | - | - | - | - | - |
| Base Neutrals | 3/8/84 | - | - | - | - | - | 5ND | - | - | - | - | - |
| | 3/14/84 | - | - | - | - | - | ND | - | - | - | - | - |

Note:

all concentrations in ppb except where noted
ND not detected
2ND not detected at 2ppb
ND+ not detected except for compounds listed below
* represents maximum concentration of several samples

SOIL ANALYSES

| Compound | Sampling Date | 1377 Route 206 | Princeton Airport | Princeton Gamma Tech | Thule Auto | William Penn | Tigers Tale | Village Shopper | Polycell | Town & Country | Compo Industries | Princeton V.W. | Texaco | 1581 Rte. 206 | Friendly's | Print Shop |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V.O. Scan | 5/9/80 | - | - | 2x3 | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/13/81 | ND | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/17/82 | ND+ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/6/82 | ND | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/17/82 | - | 4peaks | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/17/82 | - | 4peaks | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 1peak | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/30/83 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/30/83 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/25/83 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/30/83 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 3/30/83 | - | - | ND | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/29/83 | 3peaks+ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/87 | ND+ | - | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ | ND+ |
| Tetrachloroethene | 12/6/82 | 100 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Methylene Chloride | 3/17/82 | 735 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/29/83 | 110+ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/87 | 89+ | - | 90+ | 40+ | 29+ | 37+ | - | 18+ | 13 | 25+ | 37 | 130+ | 15 | 23+ | 14 |
| 1,2,3-Trichlorobenzene | 12/6/82 | 900 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Benzene | 12/17/82 | - | 3215 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/17/82 | - | 130 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/87 | - | - | - | - | 2.4 | - | - | 2 | - | - | - | - | - | - | - |
| Toluene | 12/17/82 | - | 13200 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 12900 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/29/83 | 33+ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/87 | 180+ | | 1.6+ | - | - | - | - | - | - | 1.5 | - | - | - | - | - |
| Ethyl Benzene | 12/17/82 | - | 2330 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 4281 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| p-xylene | 12/17/82 | - | 1645 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 3533 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| o-xylene | 12/17/82 | - | 2615 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 5930 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/29/83 | 10400+ | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| m-xylene | 12/17/82 | - | 39413 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 9000 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| total xylenes | 6/87 | 250000+ug/g | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| p-bromofluorobenzene | 12/17/82 | - | 920 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 2330 | - | - | - | - | - | - | - | - | - | - | - | - | - |

SOIL ANALYSES

| Compound | Sampling Date | 1377 Route 206 | Princeton Airport | Princeton Gamma Tech | Thals Auto | William Penn | Tigers Tale | Village Shopper | Polycell | Town & Country | Compo Industries | Princeton V.W. | Texaco | 1501 Rte. 206 | Friendly's | Print Shop |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| o-chlorotoluene | 12/17/82 | - | 1270 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 3575 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,3,5-trimethylbenzene | 12/17/82 | - | 960 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 2736 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| p-cymene | 12/17/82 | - | 180 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 485 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,2,3-trimethylbenzene | 12/17/82 | - | 29756 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 8175 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| o-dichlorobenzene | 12/17/82 | - | 550 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| n-butylbenzene | 12/17/82 | - | 195 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 660 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2,3-benzofuran | 12/17/82 | - | 775 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 1040 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| hexachlorobutadiene | 12/17/82 | - | 4175 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 6030 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| naphthalene | 12/17/82 | - | 1132 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | 1220 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| cumene | 1/20/83 | - | 450 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| n-propylbenzene | 1/20/83 | - | 1576 | - | - | - | - | - | - | - | - | - | - | - | - | - |
| PCB | 12/6/82 | 23.7 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 12/6/82 | .561 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 1/20/83 | - | ND | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 8/29/83 | 16070e | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 9/29/83 | 16300e | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 10/28/83 | 2102e | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 2/28/84 | 4900000e | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/5/87 | 73000 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Chloroform | 9/29/83 | 32e | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| | 6/87 | 7.3 | - | 8.4e | 3.2 | - | - | - | - | - | - | 5.6 | - | - | - | - |
| Bromomethane | 6/87 | - | - | - | - | - | - | - | 1.3 | - | - | - | - | - | - | - |
| Acetone | 6/87 | 5000e | - | - | 41e | 100e | 130e | - | 36e | 15 | 140e | 170 | 600e | 8.8 | 74e | 31 |
| Bis (2-ethylhexyl) phthalate | 6/87 | 1400 | - | - | - | - | - | - | 120 | - | - | - | - | - | - | - |
| Di-n-butylphthalate | 6/87 | 81 | - | 53e | - | - | - | - | - | - | - | - | - | - | - | - |

MGY 001 0396

SOIL ANALYSES

| Compound | Sampling Date | 1377 Route 206 | Princeton Airport | Princeton Gamma Tech | Thule Auto | William Penn | Tigers Tale | Village Shopper | Polycell | Town & Country | Compo Industries | Princeton V.W. | Texaco | 1581 Rte. 206 | Friendly's | Print Shop |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,6-dinitro-2-methylphenol | 6/87 | 3800 | - | - | - | * - | - | - | - | - | - | - | - | - | - | - |
| Benzoic Acid | 6/87 | 860 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2,4-dinitro-phenol | 6/87 | 1200 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| Phenols | 6/87 | 2.6 | - | - | - | - | - | - | - | - | - | - | - | - | - | - |
| 2-butanone | 6/87 | - | - | 4.5* | - | - | - | - | - | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 6/87 | - | - | - | - | 1.3 | - | - | - | - | - | - | - | - | - | - |

Note:

all concentrations in ppb except where indicated otherwise

* represents maximum concentration of several samples collected on this date

- not analyzed for

ND not detected

ND+ not detected except for compounds indicated below

SEPTIC TANK ANALYSES

| Compound | Sampling Date | 1377 Route 206 | Princeton Gamma Tech | Polycell | Compo Industries | Montgomery Shop. Center | Friendlys | Print Shop | 1581 Rte. 206 | Village Shopper | William Penn |
|---|---|---|---|---|---|---|---|---|---|---|---|
| V.O. Scan | 11/19/79 | - | ND+ | - | - | - | - | - | - | - | - |
| | 1/17/80 | - | ND+ | - | - | - | - | - | - | - | - |
| | 2/11/80 | - | - | ND+ | ND+ | ND+ | - | - | - | - | - |
| | 4/17/80 | ND+ | - | - | - | - | - | - | - | - | - |
| | 3/25/83 | - | ND+ | - | - | - | - | - | - | - | - |
| | 6/23/87 | ND+ | ND+ | - | - | - | ND+ | ND+ | ND+ | ND+ | ND+ |
| Trichloroethene | 11/19/79 | - | 8900 | - | - | - | - | - | - | - | - |
| | 2/11/80 | 95 | - | 31.4 | 62 | ND | - | - | - | - | - |
| | 4/17/80 | 2500 | - | - | - | - | - | - | - | - | - |
| Chlorobenzene | 2/11/80 | ND | - | ND | ND | 162 | - | - | - | - | - |
| Trichloroethane | 2/11/80 | ND | - | ND | ND | 15000 | - | - | - | - | - |
| Methylene Chloride | 2/11/80 | ND | - | ND | ND | 12500 | - | - | - | - | - |
| | 6/23/87 | 5.4 | - | - | - | - | 6.9 | 64 | 170 | - | - |
| m,p-xylene | 2/11/80 | ND | - | ND | ND | 130 | - | - | - | - | - |
| o-xylene | 2/11/80 | ND | - | ND | ND | 220 | - | - | - | - | - |
| 1,1-dichloroethane | 2/11/80 | ND | - | 6.8 | 3.9 | 8800 | - | - | - | - | - |
| 1,1 dichloroethene | 2/11/80 | ND | - | - | 47.0 | 250 | - | - | - | - | - |
| Toluene | 11/19/79 | - | 795 | - | - | - | - | - | - | - | - |
| | 2/11/80 | ND | - | ND | ND | 185 | - | - | - | - | - |
| | 6/23/87 | 8.4 | - | - | - | - | - | 840 | 680 | 440 | 180 |
| 1,2-dichloroethene | 2/11/80 | ND | - | 3.6 | 9.5 | ND | - | - | - | - | - |
| 1,1,1-trichloroethane | 2/11/80 | ND | - | ND | 52.7 | ND | - | - | - | - | - |
| | 6/23/87 | | - | - | - | - | - | - | - | - | - |
| Tetrachloroethene | 2/11/80 | ND | - | 15.8 | 14.6 | ND | - | - | - | - | - |
| Ethyl Benzene | 2/11/80 | ND | - | 2.3 | ND | - | - | - | - | - | - |
| | 6/23/87 | | - | - | - | - | - | 8 | 32 | - | - |
| Chloroform | 11/19/79 | - | 1200 | - | - | - | - | - | - | - | - |
| | 3/25/83 | - | 5 | - | - | - | - | - | - | - | - |
| | 6/23/87 | 13 | 2 | - | - | - | 23 | 16 | - | - | - |
| Benzene | 11/19/79 | - | 1550 | - | - | - | - | - | - | - | - |
| Hexane | 11/19/79 | - | 162 | - | - | - | - | - | - | - | - |
| Octane | 11/19/79 | - | 28 | - | - | - | - | - | - | - | - |

MGY 001 0398

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,3 dichloropropane | 3/25/83 | - | 8 | - | - | - | - | - | - | - | - |
| Acetone | 6/23/87 | 23 | - | - | - | - | 92 | 260 | 97 | 4600 | - |
| Bromodichloromethane | 6/23/87 | 2 | - | - | - | - | - | - | - | - | - |
| 1,1,1-trichloroethane | 6/23/87 | - | 1.6 | - | - | - | - | - | - | - | - |
| 2-butanone | 6/23/87 | - | - | - | - | - | - | - | 500 | - | - |

Notes:
ND - not detected
ND+ - not detected except for compounds indicated below
- - not analyzed for
all concentrations in ppb

MGY 001 0399

EFFLUENT ANALYSES

| Parameter | Sampling Date | 1377 Rte. 286 Discharge to Deden Brook | Compo Indust. Discharge to Millstone R. | Compo Indust. Discharge to Catch Basin | P'ton. Airport Discharge to adjacent stream |
|---|---|---|---|---|---|
| V.O. Scan | 3/26/81 | - | ND+ | - | - |
| | 4/7/81 | - | ND+ | - | - |
| | 4/12/83 | - | ND+ | ND+ | - |
| Turbidity | 7/2/73 | 13 | - | - | - |
| | 6/19/74 | 430 | - | - | - |
| pH | 7/2/73 | 6.3 | - | - | - |
| | 6/19/74 | 6.4 | - | - | - |
| Alkalinity to pH4 | 7/2/73 | 28 | - | - | - |
| | 6/19/74 | 95 | - | - | - |
| Nitrate Nitrogen | 7/2/73 | 54 | - | - | - |
| Ammonia Nitrogen | 7/2/73 | 1 | - | - | - |
| Total Nitrogen | 7/2/73 | 1 | - | - | - |
| Chloride | 7/2/73 | 48 | - | - | - |
| | 6/19/74 | 150 | - | - | - |
| Suspended Solids | 7/2/73 | 18 | - | - | - |
| | 6/19/74 | 45 | - | - | - |
| Total Solids | 6/19/74 | 3122 | - | - | - |
| Ash | 7/2/73 | 3 | - | - | - |
| | 6/19/74 | 32 | - | - | - |
| Total Phosphate | 7/2/73 | 3 | - | - | - |
| | 6/19/74 | 5 | - | - | - |
| Detergents | 7/2/73 | 2.34 | - | - | - |
| COD | 7/2/73 | 1380 | - | - | - |
| | 6/19/74 | 483 | - | - | - |
| Ether Soluble Fraction | 7/2/73 | 72 | - | - | - |
| Initial D.O. | 7/2/73 | 2.9 | - | - | - |
| | 6/19/74 | 8 | - | - | - |
| BOD 2% | 7/2/73 | 94 | - | - | - |
| BOD 10% | 7/2/73 | 78 | - | - | - |
| | 6/19/74 | 61 | - | - | - |

MGY 001 0400

EFFLUENT ANALYSES

| Parameter | Sampling Date | 1377 Rte. 286 Discharge to Bacon Brook | Compo Indust. Discharge to Millstone R. | Compo Indust. Discharge to Catch Basin | P'ton. Airport Discharge to adjacent stream |
|---|---|---|---|---|---|
| Trichloroethane | 11/14/79 | - | ND | - | - |
| 1,1,2,2-tetrachloroethane | 11/14/79 | - | ND | - | - |
| | 4/4/83 | - | - | - | ND |
| Methyl Ethyl Ketone | 11/14/79 | - | 50,000ND | - | - |
| | 3/26/81 | - | 3987 | - | - |
| | 4/4/83 | - | - | - | 7 |
| m-xylene | 11/14/79 | - | 350 | - | - |
| | 3/26/81 | - | 626 | - | - |
| | 4/4/83 | - | - | - | ND |
| p-xylene | 11/14/79 | - | 350 | - | - |
| | 3/26/81 | - | 626 | - | - |
| | 4/4/83 | - | - | - | ND |
| o-xylene | 11/14/79 | - | 225 | - | - |
| | 3/26/81 | - | 626 | - | - |
| | 4/4/83 | - | | - | ND |
| Dimethyl Formide | 11/14/79 | - | ND | - | - |
| | 3/26/81 | - | .225 | - | - |
| | 4/7/81 | - | .487 | - | - |
| | 4/4/83 | - | - | - | ND |
| Toluene | 11/14/79 | - | ND | - | - |
| | 3/26/81 | - | 3793 | - | - |
| | 4/4/83 | - | - | - | ND |
| | 4/12/83 | - | ND | 2.0 | - |
| Benzene | 11/14/79 | - | ND | - | - |
| | 3/26/81 | - | 182 | - | - |
| | 4/4/83 | - | - | - | ND |
| Chlorinated hydrocarbons | 11/14/79 | - | ND | - | - |
| | 3/26/81 | - | 18ND | - | - |
| | 4/7/81 | - | 5ND | - | - |
| | 4/4/83 | - | - | - | ND |
| Petroleum hydrocarbons | 11/14/79 | - | ND | - | - |
| | 3/26/81 | - | 8.53 | - | - |
| | 4/4/83 | - | - | - | ND |
| TOC | 3/26/81 | - | 900 | - | - |
| | 4/7/81 | - | 55 | - | - |
| | [illegible] | | [illegible] | 21.0 | - |

MGY 001 0401

EFFLUENT ANALYSES

| Parameter | Sampling Date | 1377 Rte. 206 Discharge to Beden Brook | Compo Indust. Discharge to Millstone R. | Compo Indust. Discharge to Catch Basin | P'ton. Airport Discharge to adjacent stream |
|---|---|---|---|---|---|
| Chloroform | 4/12/83 | - | ND | 9.0 | - |
| 1,1,1 trichloroethane | 4/12/83 | - | ND | 2.0 | - |
| Bromodichloromethane | 4/12/83 | - | ND | 1.0 | - |
| TDS | 4/12/83 | - | - | 446 | - |
| Base Neutrals | 4/12/83 | - | - | 5.0 | - |
| Phenol | 4/12/83 | - | - | 8.2 | - |

Note:

all concentrations in ppb
- not analyzed
ND not detected
ND+ not detected except for compounds indicated below

ROCKY HILL MUNICIPAL WELL 02
RAW SAMPLE ANALYSES

| | Trichloroethene | Tetrachloro-ethene | 1,2-dichloro-ethene | trans-1,2-di-chloroethene | 1,1,1-tri-chloroethene | 1,1 dichloro-ethane | Chloroform | Benzene |
|---|---|---|---|---|---|---|---|---|
| 11/9/78 | 168 | | | | | | | |
| 12/26/78 | | | | | | | | 75 |
| 9/78-5/79 | 214 | | | | | | | |
| 4/78 | 38 | | | | | | | |
| 11/5/79 | 79 | 10 | 32 | | | | 3 | |
| 11/6/79 | 102 | 7 | | | | | | |
| 12/18/79 | 57 | 2 | | | | | | |
| 1/11/80 | 78 | 3 | | | | | | |
| 1/12/80 | 99 | 5 | | | | | | |
| 1/13/80 | 126 | 6 | | | | | | |
| 1/14/80 | 150 | 8 | | | | | | |
| 1/15/80 | 141 | 7 | | | | | | |
| 1/16/80 | 130 | 7 | | | | | | |
| 1/17/80 | 152 | 8 | | | | | | |
| 1/18/80 | 137 | 7 | | | | | | |
| 1/19/80 | 163 | 9 | | | | | | |
| 1/20/80 | 141 | 8 | | | | | | |
| 1/22/80 | 154 | 8 | | | | | | |
| 3/4/80 | 126 | 6 | | | | | | |
| 4/1/80 | 139 | 4 | | | | | | |
| 5/6/80 | 97 | 6 | | | | | | |
| 6/3/80 | 122 | 5 | | | | | | |
| 7/1/80 | 116 | 5 | | | | | | |
| 8/5/80 | 102 | 6 | | | | | | |
| 9/21/80 | 4 | 1 | | | 19 | | | |
| 10/21/80 | 28 | 1 | | | | | | |
| 11/22/80 | 42 | 1 | | | | | | |
| 12/18/80 | 35 | 1 | | | | | | |
| 2/20/81 | 15 | | | | | 27 | | |
| 3/9/81 | 10 | | | | | | | |
| 3/17/81 | 100 | | | | | | | |
| 3/25/81 | 49 | | | | | | | |
| 4/3/81 | 28 | | | | | | | |
| 4/16/81 | 27 | | | | | | | |
| 4/22/81 | 25 | | | | | | | |
| 5/1/81 | 25 | | | | | | | |
| 7/9/81 | 85 | 47 | | | | 25 | | |
| 8/13/81 | 132 | 34 | | | | 32 | | |
| 9/14/81 | 99 | | 14 | | | | | |
| 9/81 | 83 | | | | | | | |
| 10/12/81 | 47 | | | | | | | |
| 10/22/81 | 34 | | | | | | | |
| 10/28/81 | 28 | | | | | | | |
| 11/4/81 | 58 | | 10 | | | | | |
| 11/18/81 | 37 | | | | | | | |
| 11/24/81 | 23 | | | | | | | |
| 12/4/81 | 59 | | | | | | | |
| 12/11/81 | 23 | | | | | | | |
| 12/17/81 | 67 | | | | 5 | | | |

MGY 001 0403

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1/13/82 | 142 | | | | | | |
| 1/23/82 | 58 | | | | | | |
| 2/23/82 | 137 | 8 | 22 | | | | |
| 2/24/82 | 161 | 11 | | 35 | | | |
| 2/16/83 | 49 | | | | | | |
| 2/9/84 | 32 | | | | | | |
| 4/14/84 | 44 | | | | | | |
| 7/13/84 | 33 | | | | | | |
| 10/9/84 | 58 | | | | | | |
| 10/18/84 | 61 | 9 | 8 | | | | |
| 11/20/84 | 36 | | | | | | |

Note: All concentrations in ug/l.
Some numbers represent averages of several samples taken on one day.

Form [illegible]
1/79

[illegible] PROTECTION
[illegible]
MODEL STATE INFORMATION SYSTEM
WATER QUALITY COMPLIANCE SUBSYSTEM
CHEMICAL OR RADIOLOGICAL ANALYSIS INPUT

PUBLIC WATER SYSTEM NAME AND ADDRESS

ELIZABETHTOWN WATER COMPANY - MAIN SUPPLY
ONE ELIZABETHTOWN PLAZA
ELIZABETH, NEW JERSEY 07202

RECEIVED
APR 20 1987
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

| PWS ID | TRANSACTION CODE |
|---|---|
| 2 0 0 4 0 0 2 | 0 3 |

| 1-9 ABOVE | CONTAMINANT ID | CONTAMINANT NAME | ANALYSIS METHOD | ANALYSIS RESULTS | ANALYSIS DEGREES | ANALYSIS DATE MO DAY YR | °28-46 BELOW | SAMPLE ANALYZED BY: |
|---|---|---|---|---|---|---|---|---|
| DUP | 1 0 2 2 | Copper | 9 0 3 | < 0 0 1 0 | 2 | 0 3 1 4 8 7 | DUP | H.C. |
| DUP | 1 0 2 8 | Iron | 9 0 4 | < 0 0 1 0 | 2 | 0 3 1 2 8 7 | DUP | H.C. |
| DUP | 1 0 3 2 | Manganese | 9 2 4 | < 0 0 0 5 | 2 | 0 3 1 1 8 7 | DUP | H.C. |
| DUP | 1 0 5 2 | Sodium | 9 5 4 | 0 1 3 7 | 1 | 0 3 1 7 8 7 | DUP | H.C. |
| DUP | 1 0 9 5 | Zinc | 9 0 6 | < 0 0 1 0 | 2 | 0 3 1 7 8 7 | DUP | H.C. |
| DUP | | | | | | | DUP | |
| DUP | | | | | | | DUP | |
| DUP | | | | | | | DUP | |
| DUP | | | | | | | DUP | |
| DUP | | | | | | | DUP | |

| LOCATION CODE | LOCATION NAME | SAMPLE DATE MO DAY YR | SAMPLE TYPE | SAMPLE TIME | LAB ID | LAB NAME | SAMPLE COLLECTED BY: |
|---|---|---|---|---|---|---|---|
| | | 0 3 0 6 8 7 | D | 1 3 3 5 | 1 8 0 2 4 | E'town Water Co.Lab | N.D.B. |

PREPARED BY Glenn Johansen DATE 4/13/87

[signature]

MAY 06 1987

NO. 61

SAMPLE TYPE KEY
- C - CHECK SAMPLE
- D - REGULAR DISTRIBUTION SAMPLE
- P - PLANT TAP SAMPLE
- R - RAW WATER SAMPLE
- S - SPECIAL SAMPLE

MGY 001 0405

Form WAOC.010
1/79

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
MODEL STATE INFORMATION SYSTEM
WATER QUALITY COMPLIANCE SUBSYSTEM
CHEMICAL OR RADIOLOGICAL ANALYSIS INPUT

WAOC 010

RECEIVED
APR 20 1987
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING

PWS ID: 2ØØ4ØØ2

TRANSACTION CODE: Ø3

PUBLIC WATER SYSTEM NAME AND ADDRESS:
Elizabethtown Water Company - Main Supply
One Elizabethtown Plaza
Elizabeth, New Jersey Ø72Ø2

| CONTAMINANT ID | CONTAMINANT NAME | ANALYSIS METHOD | ANALYSIS RESULTS | SIGNIFICANCE | ANALYSIS DATE MO | DAY | YR | SAMPLE ANALYZED BY |
|---|---|---|---|---|---|---|---|---|
| 1Ø45 | Selenium | 92Ø | <ØØØ1 | 3 | Ø4 | Ø8 | 87 | G.G. |

| LOCATION CODE | LOCATION NAME | SAMPLE DATE MO | DAY | YR | SAMPLE TYPE | SAMPLE NUMBER | LAB ID | LAB NAME | SAMPLE COLLECTED BY |
|---|---|---|---|---|---|---|---|---|---|
| | | Ø3 | Ø6 | 87 | D | 1335 | 12129 | Accutest Laboratories | N.D.B |

SAMPLE TYPE KEY
C - CHECK SAMPLE
D - REGULAR DISTRIBUTION SAMPLE
F - FLANK TAP SAMPLE
R - RAW WATER SAMPLE
S - SPECIAL SAMPLE

PREPARED BY: Glenn Johansen DATE: 4/13/87

APPROVED BY: DATE: / /

MAY 06 1987

NO. 61

MGY 001 0406

JUL 8 '87 11:26 PAGE.08

87. 10/08 10:00 P07 *

N[illegible]RSEY [illegible] OF EN[illegible] PROTECTION
[illegible]ISIO[illegible] [illegible]ATE [illegible]OUR[illegible]
MODEL STATE INFORMATION SYSTEM
WATER QUALITY COMPLIANCE SUBSYSTEM
CHEMICAL OR RADIOLOGICAL ANALYSIS INPUT

PUBLIC WATER SYSTEM NAME AND ADDRESS

ELIZABETHTOWN WATER COMPANY - MAIN SUPPLY
ONE ELIZABETHTOWN PLAZA
ELIZABETH, NEW JERSEY 07202

RECEIVED
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER
[illegible] 1987

| PWS ID | TRANSACTION CODE |
|---|---|
| 0400 2 | 03 |

| CONTAMINANT ID | CONTAMINANT NAME | ANALYSIS METHOD | ANALYSIS RESULTS | ANALYSIS DECIMALS | ANALYSIS DATE MO DAY YR | 28-46 BELOW | SAMPLE ANALYZED BY: |
|---|---|---|---|---|---|---|---|
| 1005 | ARSENIC | 910 | <0005 | 3 | 03 19 87 | DUP | H.C. |
| 1010 | BARIUM | 915 | 0083 | 3 | 04 01 87 | DUP | H.C. |
| 1015 | CADMIUM | 916 | <0001 | 3 | 03 30 87 | DUP | H.C. |
| 1020 | CHROMIUM | 917 | <0010 | 3 | 03 28 87 | DUP | H.C. |
| 1025 | FLUORIDE | 935 | <0001 | 1 | 03 06 87 | DUP | R.A. |
| 1030 | LEAD | 918 | <0010 | 3 | 03 26 87 | DUP | H.C. |
| 1035 | MERCURY | 912 | <0005 | 4 | 03 13 87 | DUP | H.C. |
| 1040 | NITRATE | 931 | 0136 | 2 | 03 06 87 | DUP | R.A. |
| ~~1045~~ | ~~SELENIUM~~ | ~~911~~ | ~~<0005~~ | ~~3~~ | ~~03 18 87~~ | ~~DUP~~ | ~~H.C.~~ |
| 1050 | SILVER | 921 | <0002 | 3 | 03 25 87 | DUP | H.C. |

| LOCATION CODE | LOCATION NAME | SAMPLE DATE MO DAY YR | SAMPLE TYPE | SAMPLE TIME | LAB ID | LAB NAME | SAMPLE COLLECTED BY: |
|---|---|---|---|---|---|---|---|
| | | 03 06 87 | D | 1335 | 18024 | E'town Water Co.Lab | N.D.B. |

* not certified for Selenium analysis.
(see attached)

SAMPLE TYPE KEY
- C - CHECK SAMPLE
- D - REGULAR DISTRIBUTION SAMPLE
- P - PLANT TAP SAMPLE
- R - RAW WATER SAMPLE
- S - SPECIAL SAMPLE

PREPARED BY Glenn Johansen DATE 4/13/87

APPROVED [signature]

MAY 06 1987
NO. 61

MGY 001 0407

Form WADC.400
1/79

NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER RESOURCES
MODEL STATE INFORMATION SYSTEM
WATER QUALITY COMPLIANCE SUBSYSTEM
CHEMICAL OR RADIOLOGICAL ANALYSIS INPUT

RECEIVED
SEP 11 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION BUREAU OF SAFE DRINKING WATER

PWS ID: 2ØØ4ØØ2

TRANSACTION CODE: Ø3

PUBLIC WATER SYSTEM NAME AND ADDRESS:
Elizabethtown Water Company - Princeton Supply
One Elizabethtown Plaza
Elizabeth, New Jersey Ø72Ø2

| 1-9 ADDR | CONTAMINANT ID | CONTAMINANT NAME | ANALYSIS METHOD | ANALYSIS RESULTS | ANALYSIS REMARKS | ANALYSIS DATE MO | DAY | YR | 20-46 BELOW | SAMPLE ANALYZED BY |
|---|---|---|---|---|---|---|---|---|---|---|
| DUP | 2Ø Ø5 | ENDRIN | 9 4 1 | < Ø Ø Ø 1 | 4 | Ø 9 | Ø 5 | 8 6 | DUP | V.P. |
| DUP | 2Ø 1Ø | LINDANE | 9 4 1 | < Ø Ø Ø 1 | 4 | Ø 9 | Ø 5 | 8 6 | DUP | V.P. |
| DUP | 2Ø 15 | METHOXYCHLOR | 9 4 1 | < Ø Ø Ø 1 | 4 | Ø 9 | Ø 5 | 8 6 | DUP | V.P. |
| DUP | 2Ø 2Ø | TOXAPHENE | 9 4 1 | < Ø Ø Ø 1 | 4 | Ø 9 | Ø 5 | 8 6 | DUP | V.P. |
| DUP | 21 Ø5 | 2,4-D | 9 4 2 | < Ø Ø Ø 2 | 4 | Ø 9 | Ø 5 | 8 6 | DUP | V.P. |
| DUP | 21 1Ø | 2,4,5-TP SILVEX | 9 4 2 | < Ø Ø Ø 1 | 4 | Ø 9 | Ø 5 | 8 6 | DUP | V.P. |
| DUP | | | | | | | | | DUP | |
| DUP | | | | | | | | | DUP | |
| DUP | | | | | | | | | DUP | |
| DUP | | | | | | | | | DUP | |

| LOCATION CODE | LOCATION NAME | SAMPLE DATE MO | DAY | YR | SAMPLE TYPE | SAMPLE TIME | LAB ID | LAB NAME | SAMPLE COLLECTED BY |
|---|---|---|---|---|---|---|---|---|---|
| 1111 | Princeton | Ø8 | 18 | 86 | D | 1335 | 12129 | Accutest Laboratories | A.A. |

PREPARED BY: Glenn Johansen DATE: 9/8/86

APPROVED BY: _____ DATE: _____

MAR 0 2 1987

SAMPLE TYPE KEY
C - CHECK SAMPLE
D - REGULAR DISTRIBUTION SAMPLE
P - PLANT TAP SAMPLE
R - RAW WATER SAMPLE
S - SPECIAL SAMPLE

MGY 001 0408

87. 10/08 10:00 P05 *

WAQC 010

DIVISION OF WATER RESOURCES
MODEL STATE INFORMATION SYSTEM
WATER QUALITY COMPLIANCE SUBSYSTEM
CHEMICAL OR RADIOLOGICAL ANALYSIS INPUT

PUBLIC WATER SYSTEM NAME AND ADDRESS

Elizabethtown Water Company - Main Supply
One Elizabethtown Plaza
Elizabeth, New Jersey 07202

RECEIVED
SEP 11 1986
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

PWS ID: 2004002

TRANSACTION CODE: 03

| CONTAMINANT ID | CONTAMINANT NAME | ANALYSIS METHOD | ANALYSIS RESULTS | ANALYSIS DECIMALS | ANALYSIS DATE MO | DAY | YR | 28-46 BELOW | SAMPLE ANALYZED BY: |
|---|---|---|---|---|---|---|---|---|---|
| 2005 | ENDRIN | 941 | <0001 | 4 | 09 | 05 | 86 | DUP | V.P. |
| 2010 | LINDANE | 941 | <0001 | 4 | 09 | 05 | 86 | DUP | V.P. |
| 2015 | METHOXYCHLOR | 941 | <0001 | 4 | 09 | 05 | 86 | DUP | V.P. |
| 2020 | TOXAPHENE | 941 | <0001 | 4 | 09 | 05 | 86 | DUP | V.P. |
| 2105 | 2,4-D | 942 | <0002 | 4 | 09 | 05 | 86 | DUP | V.P. |
| 2110 | 2,4,5-TP SILVEX | 942 | <0001 | 4 | 09 | 05 | 86 | DUP | V.P. |
| | | | | | | | | DUP | |
| | | | | | | | | DUP | |
| | | | | | | | | DUP | |
| | | | | | | | | DUP | |

| LOCATION CODE | LOCATION NAME | SAMPLE DATE MO | DAY | YR | SAMPLE TYPE | SAMPLE TIME | LAB ID | LAB NAME | SAMPLE COLLECTED BY: |
|---|---|---|---|---|---|---|---|---|---|
| 0442 | Piscataway | 08 | 18 | 86 | D | 1230 | 12129 | Accutest Laboratories | A.A. |

PREPARED BY Glenn Johansen DATE 9/8/86

APPROVED BY [signature] DATE / /

MAR 02 1987

SAMPLE TYPE KEY
C - CHECK SAMPLE
D - REGULAR DISTRIBUTION SAMPLE
P - PLANT TAP SAMPLE
R - RAW WATER SAMPLE
S - SPECIAL SAMPLE

MGY 001 0409

New Jersey Department of Environmental Protection
Division of Water Resources, Bureau of Potable Water
CN-029, Trenton, N.J. 08625
Hazardous Contaminant Analysis Input

OCT 21 1986

N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION

RECEIVED
JUL 7 1986

PS186

PWS ID: 2004002

TRANSACTION CODE: 03

PUBLIC WATER SYSTEM NAME AND ADDRESS:
Elizabethtown Water Company - Princeton Supply
One Elizabethtown Plaza
Elizabeth, New Jersey 07202

Enter "<" sign if appropriate.

| Contaminant ID | Contaminant Name | Analysis Method | Analysis PPM Results | Analysis PPM Decimals | Analysis Date MO DAY YR | 20-40 Below | Sample Analyzed by |
|---|---|---|---|---|---|---|---|
| 2984 | Trichloroethylene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2987 | Tetrachloroethylene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2982 | Carbon tetrachloride | 217 | <0001 | 3 | 052686 | | H.K. |
| 2981 | 1,1,1 - Trichloroethane | 217 | <0001 | 3 | 052686 | | H.K. |
| 2980 | 1,2 - Dichloroethane | 217 | <0001 | 3 | 052686 | | H.K. |
| 2976 | Vinyl chloride | 217 | <0001 | 3 | 052686 | | H.K. |
| 2964 | Methylene chloride | 217 | <0001 | 3 | 052686 | | H.K. |
| 2990 | Benzene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2989 | Chlorobenzene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2406 | 1,2 - Dichlorobenzene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2402 | 1,3 - Dichlorobenzene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2404 | 1,4 - Dichlorobenzene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2378 | 1,2,4 - Trichlorobenzene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2977 | 1,1 - Dichloroethylene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2382 | Trans - 1,2 - Dichloroethylene | 217 | <0001 | 3 | 052686 | | H.K. |
| 2384 | O-Xylene | 217 | <0001 | 3 | 052686 | | H.K. |

| Sample Date MO DAY YR | Sample | Lab ID | Lab Name |
|---|---|---|---|
| 5 15 86 | D 0920 | 07044 | Garden State Labs. |

Sample location (Street address and municipality):
Princeton Borough Hall
Monument Drive, Princeton (9-5-86A280)

I certify that this sample was collected by personnel authorized by the Department in a manner approved by the Department from the location described above.

SAMPLE COLLECTED BY: Walter Sawyer 720902 DATE 5/15/86

MGY 001 0410

87. 10/08 10:00 P02 *

MB

# ELIZABETHTOWN WATER COMPANY

## ORGANIC ANALYSIS

RECEIVED
JUN 4 1987
N.J. STATE DEPT. OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

Date JANUARY - JUNE 1987

GENERAL SOURCE · RARITAN - MILLSTONE PLANT

Sample No. 1 Raritan-Millstone composite delivered water - 8:00 a.m., 1/14/87

Sample No. 2 Raritan-Millstone composite delivered water - 8:00 a.m., 2/13/87

Sample No. 3 Raritan-Millstone composite delivered water - 8:00 a.m., 3/20/87

Sample No. 4 Raritan-Millstone composite delivered water - 8:00 a.m., 4/22/87

Sample No. 5 Raritan-Millstone composite delivered water - 8:00 a.m., 5/22/87

Sample No. 6

| PARARMETER | M.C.L. E.P.A. / DEP. | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|
| CHLORINATED HYDROCARBONS | | | | | | | |
| Lindane | 0.004 mg/l | | | | | | |
| Endrin | 0.0002 mg/l | | | | | | |
| Methoxychlor | 0.100 mg/l | | | | | | |
| Toxaphene | 0.005 mg/l | | | | | | |
| | | | | | | | |
| | | | | | | | |
| CHLOROPHENOXYS | | | | | | | |
| 2, 4 - D | 0.100 mg/l | | | | | | |
| 2, 4, 5 - TP Silvex | 0.010 mg/l | | | | | | |
| | | | | | | | |
| | | | | | | | |
| TRIHALOMETHANES | | | | | | | |
| Chloroform | — | 0.008 | 0.005 | 0.011 | 0.018 | 0.018 | |
| Bromodichloromethane | — | 0.002 | 0.002 | 0.003 | 0.006 | 0.006 | |
| Chlorodibromomethane | — | < 0.001 | <0.001 | < 0.001 | < 0.001 | <0.001 | |
| Bromoform | — | < 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | |
| Total THM's | 0.100 mg/l | 0.010 | 0.007 | 0.014 | 0.024 | 0.024 | |
| | | | | | | | |
| 1,1,1-Trichloroethane | — | < 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | |
| Trichloroethylene | — | < 0.001 | < 0.001 | < 0.001 | < 0.001 | <0.001 | |
| Tetrachloroethylene | — | < 0.001 | <0.001 | <0.001 | < 0.001 | <0.001 | |
| | | | | | | | |
| | | | | | | | |
| | | | | | | | |
| Sample ID Number | — | OV6987 | OV 12787 | OV-27387 | OV38187 | OV49387 | |
| Chlorine Residual (mg/l) | — | <.05/0.80 | 0.05/0.75 | <0.05/0.70 | <.05/0.60 | <.05/0.75 | |
| Temperature, °F | — | 38° | 34° | 46° | 65° | 62° | |

MGY 001 0411

# Appendix C

MGY 001 0412

# APPENDIX C
# LOGS OF TEST BORINGS

MGY 001 0413

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D



| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 99.5 ft | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 10 JUNE 1986 | DATE FINISHED: 28 JUNE 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 7 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150.0 ft | DEPTH TO ROCK: 0.0 ft |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 7 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 ft. | NO. SAMPLES: DIST. 3 | UNDIST. — CORE 15 |
| CASING — | | WATER LEVEL: FIRST — | COMP. — 24 HR — |
| CASING HAMMER: WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. I.D. SPLIT SPOON | | INSPECTOR: GLENN WYGANT | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30. | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BLOWS | RECOV., % | ROCK CORE: RECOVERY/RQD (IN) | BEDDING | FRACTURE: SKETCH | COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE, deeply weathered; SM-SC-- Dark Reddish Brown (10R3/4) c-mf SAND, some (+) Clay & Silt, dry. | 1, 2 | S-1 | 4, 8, 13, 15 | 1.0/2.0 = 50 | | | | | | | |
| | 3, 4 | | | | | | | | | | |
| MUDSTONE as below, moist. | 5, 6 | S-2 | 32, 100 | 1.0/1.0 = 100 | | | | | | | |
| | 7, 8, 9 | | | | | | | | | | |
| MUDSTONE as below, moist. | 10 | S-3 | 100 | 1.5/1.5 = 100 | | | | | | | |
| MUDSTONE; friable hardness, friable to weak strength, moderately weathered, stratification indistinct, intense to moderate fracture spacing (80% of fractures have a coating of tan and dark green clay), dark reddish brown (10R3/4). | 11, 12, 13, 14, 15 | RUN 1 | | | 1.6/10.0 = 16 RQD | | | CP, CP, CG, CP, CS, CG, CP, CP, CP | CI, I, CI, M | 5.5 min./ft | Started core run at 1410 |
| MUDSTONE and GYPSUM; Gypsum contains dessication cracks which were filled in by overlying mud (now mudstone), light gray (N7). 16.5 – 17.0 | 16 | | | | | | | CP, CP, CS | CI | | Water level constant in wash tub. |
| CALCAREOUS CLAYSTONE, low hardness, weak strength, moderately weathered, occasional dessication cracks, intense fracture spacing, blackish red (5R2/2) | 17, 18, 19 | | | | 6.9/10.0 = 69% REC | | NCR | CS, CS, CS, NCR | I, NCR | 6.6 min./ft, NCR | |

MGY 001 0414

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D SHEET 2 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLW/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20.5 | | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1515 6/10/86 |
| SANDSTONE; moderate hardness, moderate strength, moderately weathered, fine grained, intense to slight fracture spacing (40% of fractures have a coating of dark green clay), many vugs (1/16" to 1/4") which are partly to completely occluded with calcite cement, dark reddish brown. | 21 | RUN 2 | | | 4.0/4.0 = 100% REC; 3.6/4.0 = 91 RQD | | | CP | H S M Cl M | 35 min/4 ft = 8.8 min/ft | Started core run at 1050 6/18/86; Water level remained constant in wash tub. |
| 25.5 | 25 | | | | | | | | | | Stopped core run at 1125 |
| MUDSTONE; friable to low hardness, friable to weak strength, moderately weathered, stratification indistinct, close to moderate fracture spacing, dark reddish brown (10R3/4). | 26 | RUN 3 | | | 3.7/10.0 = 37 RQD | | | CS | Cl M Cl | 40 min/10 ft = 4 min/ft | Started core run at 1140; Water level remained constant in wash tub. |
| 29.8 | | | | | | | | | | | |
| CALCAREOUS (MICRITIC) CLAYSTONE; friable hardness, friable strength, moderately weathered, horizontally laminated, intense to close fracture spacing, dark grey (N3). 32.3 | 30 | | | | | | | | H | | |
| SANDSTONE; moderate hardness, moderate strength, moderately weathered, fine grained, close to moderate fracture spacing (60% of fractures have a coating of dark green clay, 10% with calcite cement), dark reddish brown (10R3/4). | 32 | | | | 10.0/10.0 = 100% REC | | | | Cl M Cl | | Stopped core run at 1220 |
| | 35 | | | | | | | | | | Started core run at 1305 |
| SANDSTONE as above, except intense to slight fracture spacing and many vugs (1/16" to 1/4") which are partly to completely occluded with calcite cement. 43.0 | 36 | RUN 4 | | | 6.8/10.0 = 68 RQD | | | CS CP | Cl I | 45 min/10 ft = 4.5 min/ft | Water level remained constant in wash tub. |
| | 39 | | | | | | | CS | Cl | | |
| | 41 | | | | | | | CP | I | | |
| | 42 | | | | | | | | Cl | | |
| | 43 | | | | 10.0/10.0 = 100% REC | | | CS | S Cl | | |
| SILTSTONE, as below. | 44 | | | | | | | | S | | Stopped core run at 1350 |

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, close to slight fracture spacing (30% of fractures have a coating of dark green clay, 10% have calcite), several large solution channels (up to 1" wide) which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4). 53.5 | 46–55 | RUN 5 | | | RQD 7.5/10.0 = 75; 100% REC | | 40; 70; 15 | CS; CG; CG; CS; CG; CP; CP | CI; S; CI; M; CI | 36 min/10 ft = 3.5 min/ft | Started core run at 1400; Water level remained constant in wash tub; Stopped core run at 1435 |
| ARGILLACEOUS DOLOSTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micrite), mottled, dessication cracks, close to moderate fracture spacing, light gray (N7) to dark gray (N3). 55.7 | | | | | 10.0/10.0 | dessication cr., mottled | | | | | |
| MUDSTONE; low hardness, weak strength, slightly weathered, stratification indistinct, crushed to slight fracture spacing (60% are completely occluded with calcite cement), dark reddish brown (10R3/4). 64.3 | 55–65 | RUN 6 | | | RQD 5.7/10.0 = 57; 100% REC | | 80; 20 | CS; CP | CI; S; CI; M; CI; Cr | 40 min/10 ft = 4 min/ft | Started core run at 1445; Water level remained constant in wash tub; Stopped core run at 1525 |
| CLAYSTONE, dark reddish brown (10R3/4), interstratified with LIMESTONE (grainstone -- medium-sized sand), light gray (2.5Y7/2); moderate hardness, moderate strength, slightly weathered, ripples and horizontal laminations, close to moderate fracture spacing. 67.9 | | | | | 10.0/10.0 | | | | | | |
| CALCAREOUS MUDSTONE, as below. | 65–69 | RUN 7 | | | RQD 5.9/10.0 = 50 | horizontal lamination and ripples; dessication cr. & burrows | 15; 20 | CS; CG; CG | CI; M; S | 30 min/10 ft = 3 min/ft | Started core run at 1540; Water level remained constant in wash tub. |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALCAREOUS MUDSTONE; moderate hardness, weak strength, slightly weathered, dessication tracks and burrows, close to slight fracture spacing, dark reddish brown (10R3/4). 72.7 | 71, 72 | RUN 7 (CONTINUED) | | | 10.0/10.0 = 100% REC | dessication cr. & burrows | 10 | CG, CI | S, CI, S | | |
| ARGILLACEOUS LIMESTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), horizontally laminated, close to slight fracture spacing, stratigraphic dip is 18°, light gray (N7) to dark gray (N3). 75.9 | 73, 74, 75 | | | | | horizontal laminations | 20 | CP, CS, CS | CI, M | | Stopped core run at 1610 |
| SILTSTONE; moderate hardness, weak strength, slightly weathered, stratification indistinct, close to slight fracture spacing (20% of fracture have a coating of calcite and are completely occluded), many vugs (1/16" to 1/4") which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4). | 76, 77, 78, 79, 80, 81, 82, 83, 84, 85 | RUN 8 | | | 7.2/10.0 = 72 RQD; 9.4/10.0 = 94% REC | | 15, 15, 10, 60 | CG, CP, CG, CP, CP, CG, CG, CP, CG | CI, M, S, CI, S, CI, M, S, NCR | 35 min/10 ft = 3.5 min/ft, NCR | Started core run at 1620; Water loss (≈30 gal.) began at 77 feet; Stopped core run at 1655 |
| SILTSTONE, as above. | 85, 86, 87, 88, 89, 90, 91, 92, 93, 94 | RUN 9 | | | 7.5/10.0 = 75 RQD; 10.0/10.0 = 100% REC | | 15, 10, 10, 20 | CG, CG, CP, CG, CS, CS, CG, CG, CP, CG | M, CI, S, CI, I | 25 min/10 ft = 2.5 min/ft | Started core run at 1705; Water loss during coring (≈100 gal.); Stopped core run at 1730 |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D

SHEET 5 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE, as above. 96.5 | 96 | RUN 10 | | | 6.7/10.0 = 57 RQD | | 80, 20 | CG | Cl | | started core run at 1740 |
| MUDSTONE; low hardness, weak strength, slightly weathered, close to moderate fracture spacing (60% are completely occluded with calcite cement, some vugs (1/16" to 1/8") which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4). | 97 | | | | | | 10, 25 | | M | | |
| | 98 | | | | | | 5, 0 | | | | |
| | 99 | | | | | | 25, 5 | | Cl | 25 min/10 ft = 2.5 min/ft | water loss during coring (≈100 gal.) |
| | 100 | | | | | | 70, 5 | CS | | | |
| | 101 | | | | | | 5 | | M | | |
| | 102 | | | | | | 10, 20 | | Cl | | |
| | 103 | | | | | | | | M | | |
| | 104 | | | | 10.0/10.0 = 100% REC | | | | Cl | | Stopped core run at 1805 6/18/86 |
| 106.2 | 105 | RUN 11 | | | | | 5 | CS | Cl | | 6/19/86 Started core run at 0805 |
| CALCAREOUS, DOLOMITIC CLAYSHALE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), rippled, horizontally laminated, intense to close fracture spacing, light gray (N7) to dark gray (N3). | 106 | | | | 5.2/10.0 = 52 RQD | decr. mottl. | | | | | |
| | 107 | | | | | horiz. lamin. | | CG | I | | * brecciated at 107.8 |
| | 108 | | | | | | | | | | |
| 109.7 | 109 | | | | | | 5 | CS | Cl | | water loss during coring (≈100 gal.) |
| DOLOMITIC SANDSTONE; moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing, very dusky red (10R 2.5/2). 111.3 | 110 | | | | | ripples, horizontal laminations | 16 | | | | |
| | 111 | | | | | | | | S | | |
| DOLOMITIC CLAYSTONE; moderate hardness, moderate strength, slightly weathered, horizontally laminated, mottled, dessication cracks, intense to slight fracture spacing, stratigraphic dip is 18°, dark gray (N3). | 112 | | | | | dessication cracks, mottled | | CG | Cl | | |
| | 113 | | | | | | 10 | | M | | |
| | 114 | | | | 9.3/10.0 = 93% REC | | 10 | | Cl | 40 min/10 ft = 4 min/ft. | Stopped core run at 0845 |
| | 115 | RUN 12 | | | | | NCR | NCR | NCR | NCR | Started core run at 0900 |
| 117.4 | 116 | | | | | horiz. lamin. | | | I | | |
| SILTSTONE; low hardness, moderate strength, slightly weathered, close to moderate fracture spacing (70% are completely occluded with calcite cement), many vugs (1/16" to 1/4") which are completely occluded with calcite cement, dark reddish brown (10R3/4) | 117 | | | | | dess. cr. mottled | | | | | |
| | 118 | | | | 9.1/10.0 = 91 RQD | | 85 | CG | M | 25 min/10 ft = 2.5 min/ft | Water loss during coring (≈170 gal) |
| | 119 | | | | | | 5, 5 | | Cl | | |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D SHEET 6 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121–125 | RUN 12 (CONTINUED) | | | 10.0/10.0 = 100% REC | | | CG | Cl, M, Cl | | Stopped core run at 0925 |
| | 125–135 | RUN 13 | | | 6.3/10.0 = 63 RQD; 10.0/10.0 = 100% REC | | 10, 15, 15, 10, 10, 70, 40, 5, 5, 25, 25 | CG, CP, CG | Cl, M, Cl, M, Cl | 30 min./10 ft = 3 min/ft | Started core run at 0935; Water loss during coring (≈200 gal.); Stopped core run at 1005 |
| SILTSTONE as above, except fracture at 131.2 feet having a wide aperture created by the dissolution of calcite cement. | 135–144 | RUN 14 | | | 7.2/10.0 = 72 RQD; 10.0/10.0 = 100% REC | | 5, 20, 10, 80, 45, 5, 5, 20, 5 | CG, CS, CG | Cl, M, Cl, M, Cl | 35 min/10 ft = 3.5 min/ft | Started core run at 1020; Water loss during coring (≈120 gal.); Stopped core run at 1055 |
| SILTSTONE as above (run 12), except 80° fracture at 139.3 feet having a wide aperture created by the dissolution of calcite cement. | | | | | | | | | | | |

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# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-1D SHEET 7 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV. % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE, as above (run 12). | 146 | RUN 15 | | | 4.6/5.0 = 92 RQD; 5.0/5.0 = 100% REC | | 25, 5 | CG | CI | 20 min/5 ft = 4 min/ft | Started core run at 1110 |
| | 147 | | | | | | 25 | | M | | Water loss during coring (≈40 gal.) |
| | 148 | | | | | | 20, 20 | | CI | | |
| | 149 | | | | | | 5 | | M | | Stopped core run at 1130 |
| | 150 | | | | | | | | CI | | BOTTOM OF HOLE |
| | 151 | | | | | | | | | | NOTES: 1) HNU readings of all soil and rock samples was 0.0 |
| | 152 | | | | | | | | | | |
| | 153 | | | | | | | | | | |
| | 154 | | | | | | | | | | 2) water losses during coring began at 77 feet, and thereafter were gradual. |
| | 155 | | | | | | | | | | |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | 3) Drilling Equipment: 1500 Failing used to 21 ft, wire-line mobile used for subsequent rock coring, hole lastly drilled by Schramm Rotodrill T650. |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | 4) Failing rig used a 4 3/4 IN tricone during sampling and a 10 IN tricone for casing installation, Schramm rig used a 6 IN air hammer. |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | |
| | 165 | | | | | | | | | | |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | |
| | 168 | | | | | | | | | | |
| | 169 | | | | | | | | | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-2D

SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 61.4 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 9 Oct 1986 | DATE FINISHED: 9 Oct 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 7 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150.0 ft. | DEPTH TO ROCK: 0.0 feet |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 7 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 ft. | NO. SAMPLES: DIST 2; UNDIST —; CORE — | |
| CASING: — | | WATER LEVEL: FIRST —; COMPL —; 24 HR — | |
| CASING HAMMER: WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 in. I.D. SPLIT SPOON | | INSPECTOR: CARL VARTER[illegible] | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD. (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| (BRUNSWICK FORMATION) MUDSTONE; deeply weathered, SM-SC Dark Reddish Brown (10 R 3/4) cmf SAND, some (+) Clayey Silt, with occasional laminae of moderately weathered red brown, fine-grained SANDSTONE. | 1 | S-1 | 10 21 38 100% | 1.9/1.9 = 100% | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| MUDSTONE; deeply/moderately weathered, SM-SC Dark reddish brown (10 Y 3/4) cmf SAND, some (+) Silt+Clay, moderately fractured (fractured up to 0.2 inch thick and completely occluded by tan clay), moist. | 5 | S-2 | 80 51 100% | 1.5/1.5 = 100% | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| | 10 | | | | | | | | | | |
| | 11 | | | | | | | | | | |
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| | 14 | | | | | | | | | | |
| | 15 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0421

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-2D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | 10/9/86 |
| | 21 | | | | | | | | | | 10/10/86 Drilling started at 0920 |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| MUDSTONE; dark reddish brown (10R 3/4), fractures have coating of dark green and tan clay and calcite cement. | 25 | | | | | | | | | 5.6 min/14 feet = 4 min/ft. | Sample collected at 25 feet |
| | 26 | | | | | | | | | | |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | No water losses during drilling |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | Drilling stopped at 1016 |
| MUDSTONE; as above, except laminated | 35 | | | | | | | | | 8.5 min/15 feet = 5.6 min/ft | Drilling started at 1020 Sample collected at 35 feet |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | No water losses during drilling |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | |
| | 41 | | | | | | | | | | Contact based on color change of drilling fluid |
| 43.0 ARGILLACEOUS DOLOSTONE; very dusky red (10R 2/2), fine grained (micritic). | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | Sample collected at 43 feet |
| | 44 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-2D **SHEET** 3 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 46.0 | 46 | | | | | | | | | | Contact based on color change of drilling fluid |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | Drilling stopped at 1145 |
| MUDSTONE; dark reddish brown (10R 3/4), laminated. | 50 | | | | | | | | | 130 min/15 feet = 8.7 min/ft | Drilling started at 1150 Sample collected at 50 feet |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | No water losses during drilling |
| | 55 | | | | | | | | | | |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| MUDSTONE; as above | 60 | | | | | | | | | | Sample collected at 60 feet |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | Drilling stopped at 1400 10/10/86 |
| | 64 | | | | | | | | | | |
| MUDSTONE; as above, except calcite occurs as fracture-filling cement | 65 | | | | | | | | | | 10/13/86 Drilling started at 1035 Sample collected at 65 feet |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| 70.0 | 69 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-2D **SHEET** 4 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. & LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RQD, % | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | 7 min/ft | |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| SILTSTONE · dark reddish brown (10R 3/4), laminated, calcite occurs as fracture-filling cement. | 75 | | | | | | | | | 105 min/15 feet | Sample collected at 7- feet |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | Drilling stopped at 1225 |
| | 80 | | | | | | | | | | Drilling started at 1225 |
| | 81 | | | | | | | | | | |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | 7 min/ft | |
| SILTSTONE; as above | 85 | | | | | | | | | | Sample collected at 85 feet |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | 105 min/15 feet = | Water losses during drilling ≈ 50 gal. |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | | |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | Drilling stopped at 1410 |

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-2D **SHEET** 5 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; as above | 96 | | | | | | | | | 200 min/15 feet = 13.3 min/ft. | Drilling [illegible] at [illegible] +/- |
| | 97 | | | | | | | | | | Sample [illegible] at [illegible] feet |
| | 98 | | | | | | | | | | |
| | 99 | | | | | | | | | | |
| | 100 | | | | | | | | | | Water losses during drilling ≈ 50 gal. |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | |
| SILTSTONE; as above | 105 | | | | | | | | | | Sample collected at [illegible] |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | Drilling stopped at 1735 10/13/86 |
| | 109 | | | | | | | | | | |
| | 110 | | | | | | | | | | 10/14/86 Drilling started at 0730 |
| | 111 | | | | | | | | | 115 min/15 feet = 7.7 min/ft. | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | |
| | 114 | | | | | | | | | | Sample collected at [illegible] feet |
| SILTSTONE; as above | 115 | | | | | | | | | | |
| | 116 | | | | | | | | | | Water losses during drilling ≈ 25 gal |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |

MGY 001 0425

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-2D **SHEET** 6 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | Drilling started at 0925 |
| SILTSTONE; as above | 125 | | | | | | | | | | |
| | 126 | | | | | | | | | | Drilling started at 0930 |
| | 127 | | | | | | | | | | Sample collected at 125 feet. |
| | 128 | | | | | | | | | | |
| | 129 | | | | | | | | | | |
| | 130 | | | | | | | | | 120 min/15 feet = 8 min/ft | Water losses during drilling ≈ 25 gal. |
| | 131 | | | | | | | | | | |
| | 132 | | | | | | | | | | |
| | 133 | | | | | | | | | | |
| | 134 | | | | | | | | | | |
| SILTSTONE; as above | 135 | | | | | | | | | | Sample collected at 135 feet |
| | 136 | | | | | | | | | | |
| | 137 | | | | | | | | | | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | Drilling stopped at 1130 |
| | 140 | | | | | | | | | | Drilling started at 1135 |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | | | 60 min/10 ft = 6 min/ft | Water losses during drilling ≈ 25 gal. |
| | 144 | | | | | | | | | | |

MGY 001 0426

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-2D **SHEET** 7 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RQD, % | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP/TCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; as above | 146 | | | | | | | | | | [illegible] |
| | 147 | | | | | | | | | | |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | | | | | Drilling [illegible] at 1235 |
| | 150 | | | | | | | | | | BOTTOM OF HOLE |
| | 151 | | | | | | | | | | NOTES: |
| | 152 | | | | | | | | | | 1) HNU readings of all soil and rock samples was 0.0 ppm. |
| | 153 | | | | | | | | | | 2) Water losses during drilling were gradual |
| | 154 | | | | | | | | | | 3) Drilling Equipment: Failing 1500 used for entire hole |
| | 155 | | | | | | | | | | |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | 4) Failing rig used a 4 3/4 in tricone during soil sampling a 10 in tricone for casing installation, and a 6 in. tricone thereafter. |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | |
| | 165 | | | | | | | | | | |
| | 166 | | | | | | | | | | 5) Cuttings from mud rotary drilling were mostly fine-gravel in size |
| | 167 | | | | | | | | | | |
| | 168 | | | | | | | | | | |
| | 169 | | | | | | | | | | |

MGY 001 0427

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-3D

SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 141.8 | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 16 JUNE 1986 | DATE FINISHED: |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 7 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150 Ft. | DEPTH TO ROCK: 3.0 Ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 7 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 Ft. | NO. SAMPLES: DIST 11 | UNDIST — CORE — |
| CASING — | | WATER LEVEL: FIRST — | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT (LB) — DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN I.D. SPLIT SPOON | | INSPECTOR: GLENN WYGANT | |
| SAMPLER HAMMER | WEIGHT (LB) 140 DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/ROD. (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SP-SM -- Dark Reddish Brown (10R3/4) cmf SAND, some mf Gravel, little (+) Clayey Silt, dry. | 1 | S-1 | 6 6 10 12 | 0.9/2.0 = 45 | | | | | | | |
| (OVERBURDEN) 3.0 | 2 | | | | | | | | | | |
| (BRUNSWICK FORMATION) | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| MUDSTONE, deeply weathered; SM-SC Dark Reddish Brown (10R3/4) cmf SAND, some (+) Clay & Silt, moist. | 5 | S-2 | 4 9 10 10 | 1.1/2.0 = 55 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| SAME. | 10 | S-3 | 4 5 8 10 | 1.3/2.0 = 65 | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |
| SAME. | 15 | S-4 | 5 6 8 8 | 1.5/2.0 = 75 | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| 18.5 | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0428

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-3D SHEET 2 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES TYPE NO. LOC. | SAMPLES PENETR. RESIST. BLS/6IN. | SAMPLES RECOV., % | ROCK CORE RECOVERY/RQD (%) | ROCK CORE BEDDING | ROCK CORE FRACTURE SKETCH | ROCK CORE FRACTURE COND. | ROCK CORE FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SANDSTONE, deeply weathered; SC-SM-- Moderate Olive Brown (5Y4/4) mf SAND, some (-) Clay & Silt, moist. | 21 | S-5 | 7 11 14 15 | 1.5/2.0 = 75 | | | | | | | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| SAME. | 26 | S-6 | 7 9 13 16 | 1.5/2.0 = 75 | | | | | | | |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| SANDSTONE, deeply weathered; SM-- Moderate Yellowish Brown (10YR5/4) mf SAND, little (+) Clayey Silt, moist. | 30 | S-7 | 17 19 30 51 | 1.2/2.0 = 60 | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| SAME. | 35 | S-8 | 11 16 24 24 | 1.3/2.0 = 65 | | | | | | | |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| SAME. | 40 | S-9 | 27 57 82 85 | 1.2/2.0 = 60 | | | | | | | |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | |

MGY 001 0429

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-3D SHEET 3 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | ROCK CORE: DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SANDSTONE; deeply weathered, Pale Yellowish Orange (10YR 8/6), dry. | 45 | S-10 | 18 100/5 | 8/9 = .89 | | | | | | | |
| | 46 | | | | | | | | | | |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| SANDSTONE; deeply/moderately weathered, Dark Yellowish Brown (10YR 4/2), dry. | 50 | S-11 | 55 65 100/4 | 0.8/1.3 = .62 | | | | | | | |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| 53.5 | 53 | | | | | | | | | | |
| ANHYDRITE; friable hardness, friable strength, deeply weathered, light brown (5YR 6/4). 55.4 | 54 | | | | | | | | | | |
| MUDSTONE; friable hardness, friable strength, deeply/moderately weathered, Close fracture spacing (fractures coated with chlorite), dark reddish brown (10R 3/4). | 55 | RUN 1 | | | 0.8/10.0 = 8 RQD | | | CS | Cl | | |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| | 60 | | | | 5.0/10.0 = 50% REC | | NCR | NCR | NCR | NCR | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | |
| MUDSTONE, as above. 65.5 | 65 | RUN 2 | | | 1.0/5.0 = 20 RQD | | 25 | | Cl | 3.5/5.0 = 7 min/ft | 6/20/86 Started core run at 0805 |
| MUDSTONE as above, except moderately weathered and close to moderate fracture spacing. | 66 | | | | | | | | M | | |
| | 67 | | | | | | 25 | | Cl | | Water level remained constant in wash tub. |
| | 68 | | | | 2.6/5.0 = 52% REC | | NCR | NCR | NCR | NCR | |
| | 69 | | | | | | | | | | Stopped core run at 0840 6/20/86 |

MGY 001 0430

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-3D **SHEET** 4 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE as above, except close fracture spacing. 72.2 | 71 | | | | | | | CS | Cl | | 6/23/86 Started core run at 0840 |
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, moderate to slight fracture spacing (80% of fractures are partly occluded with calcite cement), many vugs and solution channels (1/4" to 2") which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4). | 72 | | | | | | 25 | | | | |
| | 73 | RUN 3 | | | 2.2/7.0 = 31 RQD | | | | S | 55 min/7ft = 7.9 min/ft | Water level remained constant in wash tub |
| | 74 | | | | | | 20 | CG | M | | |
| | 75 | | | | 5.0/7.0 = 71% REC | | NCR | NCR | NCR | NCR | |
| | 76 | | | | | | | | | | Stopped core run at 0935 |
| | 77 | | | | | | | | Cl | | Started core run at 0945 |
| | 78 | | | | | | 10 | | | | |
| | 79 | | | | | | 10 | | S | | |
| SILTSTONE as above, except close to slight fracture spacing. | 80 | | | | | | 35 | | | | |
| | 81 | RUN 4 | | | 6.2/8.0 = 78 RQD | | 5 | CG | | | Water level remained constant in wash tub. |
| | 82 | | | | | | 15 | | | | |
| | 83 | | | | 8.0/8.0 = 100% REC | | 40 | | M | 40 min/8ft = 5 min/ft | |
| | 84 | | | | | | 10 | | | | |
| | 85 | | | | | | | CP CP CP | | | Stopped core run at 1025 |
| | 86 | | | | | | | CS | I | | Started core run at 1030 |
| SILTSTONE as above, except intense to close fracture spacing. | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | 1.5/10.0 = 15 RQD | | 40 | CG | Cl | 36 min/10ft = 3.6 min/ft | Water level remained constant in wash tub. |
| | 90 | | | | | | 10 | | | | |
| | 91 | RUN 5 | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | NCR | NCR | NCR | NCR | |
| | 94 | | | | 6.1/10.0 = 61% REC | | | | | | Stopped core run at 1105 |

MGY 001 0431

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-3D SHEET 5 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RUN FM | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE as above, except close to moderate fracture spacing. | 96–104 | RUN 6 | | | 9.6/10.0 = 96% REC; 7.1/10.0 = 71 RQD | | | CG, CP, CG | M, CI, M | 65 min/10 ft = 6.5 min/ft | Started core run at 1205; Water level remained constant in wash tub; Stopped core run at 1310 |
| | 104–105 | | | | | | NCR | NCR | NCR | NCR | |
| SILTSTONE as above, except intense to close fracture spacing. | 105–114 | RUN 7 | | | 8.9/10.0 = 89% REC; 4.8/10.0 = 48 RQD | | | CS, CP, CG, CP | CI, M, CI, M, CI, H | 50 min/10 ft = 5 min/ft | Started core run at 1345; Water level remained constant in wash tub; Stopped core run at 1435 |
| | 114–115 | | | | | | NCR | NCR | NCR | NCR | |
| SILTSTONE as above, except close to moderate fracture spacing. | 115–119 | RUN 8 | | | 6.6/10.0 = 66 RQD | | | CG | M, CI | 35 min/10 ft = 3.5 min/ft | Started core run at 1445; Water level remained constant in wash tub. |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-3D SHEET 6 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121–125 | RUN 8 (CONTINUED) | | | 10.0/10.0 = 100% REC | | 25, 10, 10, 60, 15 | CG | Cl | | Stopped core run at 1520 |
| SILTSTONE, as above. 125.8 | 125–135 | RUN 9 | | | 6.8/10.0 = 68 RQD; 10.0/10.0 = 100% REC | | 70, 20, 60, 5, 50 | CP, CG, CP, CG | M, Cl, M, Cl | 30 min/10ft = 3.0 min/ft. | Started core run at 1535; Water level remained constant in wash tub.; Stopped core run at 1605 |
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, close to moderate fracture spacing (80% of fractures are partly to completely occluded by two generations of cement: inner (earlier) coating of chlorite, and an outer (later) layer of calcite), many vugs and solution channels (1/4" to 3") which are partly to completely occluded with calcite cement, dark reddish brown (10R 3/4). | 135–144 | RUN 10 | | | 6.3/10.0 = 63 RQD; 10.0/10.0 = 100% REC | | 70, 5, 5, 70, 20, 5, 10 | CG, CP, CG, CP, CG | Cl, M, Cl, M, Cl | 30 min/10ft. = 3.0 min/ft. | Started core run at 1615; Water level remained constant in wash tub.; Stopped core run at 1645 |
| SILTSTONE as above. | | | | | | | | | | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-3D

SHEET 7 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE as above, except close fracture spacing. | 146–149 | RUN 11 | | | 3.1/3.0 = 62 RQD; 4.0/3.0 = 80% REC | | | CG, CP, CG | CI | 20 min/5 ft = 4 min/ft | Started core run at 1655; water level remained constant in wash tub. |
| | 149–150 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1715 |
| | 150–169 | | | | | | | | | | BOTTOM OF HOLE |

NOTES:

1) HNU readings of all soil and rock samples was 0.0

2) No significant water loss occurred while coring.

3) Drilling Equipment: 1500 Failing used to 65 ft, wire-line Mobile used for subsequent rock coring, hole lastly drilled by Schramm Rotadrill T650.

4) Failing rig used a 4 3/4 IN tricone during sampling and a 10 IN tricone for casing installation Schramm rig used a 6 IN air hammer.

MGY 001 0434

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-4D

SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 122.8 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 16 Sept 1986 | DATE FINISHED: 30 Sept 1986 |
| DRILLING EQUIPMENT: See note, sheet 11 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150.0 ft. | DEPTH TO ROCK: 3.5 ft. |
| SIZE AND TYPE OF BIT: See note, sheet 11 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10' | NO. SAMPLES: DIST 3 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST — | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT (LB) — DROP (IN) — | BORING ANGLE AND DIRECTION: vertical | |
| SAMPLER: 2 in. I.D. SPLIT SPOON | | INSPECTOR: Carl Vartereslun | |
| SAMPLER HAMMER | WEIGHT (LB) 140 DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/RQD. (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SM-SC, Moderate Reddish Brown (10R4/6) cmf SAND, some (-) Clayey Silt, occasional pockets of limonite, dry. | 1 | S-1 | 7 8 12 13 | 1.7/2.0 = 79 | | | | | | | |
| | 2 | | | | | | | | | | |
| (OVERBURDEN) 3.5 | 3 | | | | | | | | | | |
| (BRUNSWICK FORMATION) | 4 | | | | | | | | | | |
| MUDSTONE; Deeply weathered; SM-SC Dark Reddish Brown (10R3/4) cmf SAND, some (+) Silt & Clay, moist | 5–7 | S-2 | 7 11 20 27 | 1.4/2.0 = 71 | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| MUDSTONE; friable hardness, friable to weak strength, deeply/moderately weathered, moderately fractured, (30% of sample have small vugs filled with light tan clay), dark reddish brown (10R3/4). | 10–12 | S-3 | 12 34 55 67 | 1.7/2.0 = 79 | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |
| | 15 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

9/16/86

MGY 001 0435

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-4D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC | SAMPLES: PENETR. RESIST. BLS/FT. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 21 | | | | | | | | | | 1505 |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | 1520 |
| MUDSTONE; dark reddish brown (10 R 3/4). | 25 | | | | | | | | | 40 min/20 feet = 2.0 min/ft. | 1525 |
| | 26 | | | | | | | | | | Sample collected at 2[illegible] feet |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | Water expelled at a rate of 10 gal/min |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| MUDSTONE; as above except calcite occurs as fracture-filling cement. | 35 | | | | | | | | | | Sample collected at 3[illegible] feet |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | Stopped drilling at 1615 |

MGY 001 0436

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-4D **SHEET** 3 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; as above | | | | | | | | | | | Started drilling at 0930 |
| | 46 | | | | | | | | | | Sample collected at 45 feet |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | Water expelled at a rate of 10 gal/min |
| | 50 | | | | | | | | | | |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | 2.5 min/ft. | |
| | 54 | | | | | | | | | | |
| MUDSTONE; as above | 55 | | | | | | | | | | Sample collected at 55 feet |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | 40 min/20 feet | |
| | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | Stopped drilling at 1710 9/29/86 |
| MUDSTONE; as above except fractures have a coating of tan and dark green clay, and calcite on top of (later than) the clay. | 65 | | | | | | | | | | 9/30/86 Started drilling at 0810 |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | Sample collected at 67 feet |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |
| 70.0 | | | | | | | | | | | |

MGY 001 0437

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-4D **SHEET** 4 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: REC'OV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: CORRD. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | 35 min/20 feet = 1.8 min/ft | Water expelled at a rate of 10 gal/min |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| SILTSTONE; dark reddish brown (10R 3/4), fractures coated with clay and calcite cement. | 75 | | | | | | | | | | Sample [illegible] |
| | 76 | | | | | | | | | | |
| 77.5 | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | |
| SANDSTONE; dark reddish brown (10R 3/4), fine grained, fractures coated with clay and calcite cement. | 80 | | | | | | | | | | Sample [illegible] |
| | 81 | | | | | | | | | | |
| 82.5 | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | Stopped drilling at [illegible] |
| SILTSTONE; dark reddish brown (10R 3/4), laminated, fractures filled with dark green and tan clay and calcite cement. | 85 | | | | | | | | | | [illegible] |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | 35 min/20 feet = 1.8 min/ft. | Water expelled at a rate of 15 gal/min |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | |

MGY 001 0438

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-4D **SHEET** 5 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD, % | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; as above | | | | | | | | | | | Sample collected at 95 feet |
| | 96 | | | | | | | | | | |
| 97.5 | 97 | | | | | | | | | | |
| | 98 | | | | | | | | | | |
| | 99 | | | | | | | | | | |
| | 100 | | | | | | | | | | |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | Stopped drilling at 0925 |
| MUDSTONE; dark reddish brown (10R 3/4), laminated, fractures coated w/ dark green and tan clay and calcite cement. | 105 | | | | | | | | | 35 min/20 feet = 1.9 min/ft | Started drilling at 0930 |
| | 106 | | | | | | | | | | Collected sample at 105 feet |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | Water expelled at a rate of 20 gal/min |
| | 110 | | | | | | | | | | |
| | 111 | | | | | | | | | | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | contact based on color change in fluid |
| 114.0 | 114 | | | | | | | | | | |
| ARGILLACEOUS DOLOSTONE; very dusky red (10R 2/2), laminated, fine grained (micritic), calcite occurs as fracture-filling cement. | 115 | | | | | | | | | | Collected sample at 115 feet |
| | 116 | | | | | | | | | | |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |

MGY 001 0439

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-4D **SHEET** 6 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | [illegible] 1005 |
| ARGILLACEOUS DOLOSTONE; as above | 125 | | | | | | | | | | Started [illegible] at 1010 |
| | 126 | | | | | | | | | | Sample [illegible] at [illegible] |
| | 127 | | | | | | | | | | |
| | 128 | | | | | | | | | | |
| | 129 | | | | | | | | | | |
| | 130 | | | | | | | | | | Water expelled at a rate of 20 gal/min |
| | 131 | | | | | | | | | | |
| | 132 | | | | | | | | | | |
| 133.0 | 133 | | | | | | | | | 55 min/20 feet = 2.7 min/ft. | contact based on color change in drilling fluid |
| | 134 | | | | | | | | | | |
| SILTSTONE; dark reddish brown (10R 3/4), laminated, calcite occurs as fracture-filling cement. | 135 | | | | | | | | | | Collected sample at 135 feet |
| | 136 | | | | | | | | | | |
| | 137 | | | | | | | | | | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | |
| | 140 | | | | | | | | | | |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | | | | |
| | 144 | | | | | | | | | | Stopped drilling at 1105 |

MGY 001 0440

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-4D

SHEET 7 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; as above | 146 | | | | | | | | | 12 min/5 ft. = 2.5 min/ft | Started drilling at 1110 |
| | 147 | | | | | | | | | | Sample collected at [illegible] |
| | 148 | | | | | | | | | | Stopped drilling at 1122 9/30/86 |
| | 149 | | | | | | | | | | |
| | 150 | | | | | | | | | | BOTTOM OF HOLE |
| | 151 | | | | | | | | | | NOTES: |
| | 152 | | | | | | | | | | 1) HNU readings of all soil and rock samples was 0.0 ppm |
| | 153 | | | | | | | | | | 2) Water discharge rates are approximate and represent average rates of water air lifted during drilling. |
| | 154 | | | | | | | | | | |
| | 155 | | | | | | | | | | |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | 3) Drilling equipment: Failing 1500 used to 20.0 feet, hole completed by Schramm Rotadrill T650. |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | 4) Failing rig used 10 in. tricone for casing installation, Schramm rig used a 6 in. air hammer |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | |
| | 165 | | | | | | | | | | |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | 5) Cuttings from air rotary drilling were mostly fine gravel in size. |
| | 168 | | | | | | | | | | |
| | 169 | | | | | | | | | | |

MGY 001 0441

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-5D

SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 141.6 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 22 Sept 1986 | DATE FINISHED: 24 Sept 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 7 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150 feet | DEPTH TO ROCK: 8.5 feet |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 7 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 Ft. | NO. SAMPLES: DIST 5; UNDIST —; CORE — | |
| CASING: — | | WATER LEVEL: FIRST —; COMPL. —; 24 HR — | |
| CASING HAMMER: WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 in. I.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30 | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/RQD (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SW-SM - Moderate Reddish Brown (10R4/6) cmf SAND, little (+) Silt, cf Gravel, dry. | 1 | S-1 | 6 12 11 15 | 1.1/2.0 = 95 | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| SM-SC - Moderate Reddish Brown (10R4/6) mf SAND, some (+) Clayey Silt, little c Sand, moist | 5 | S-2 | 17 33 36 44 | 0.8/2.0 = 40 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| (OVERBURDEN) 8.5 | 8 | | | | | | | | | | |
| (BRUNSWICK FORMATION) | 9 | | | | | | | | | | |
| MUDSTONE; friable hardness, friable strength, deeply/moderately weathered, moderately fractured (fractures up to 0.1 inch thick and completely occluded by dark green and tan clay), dark reddish brown (10R3/4). | 10 | S-3 | 18 16 23 26 | 1.1/2.0 = 53 | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |
| MUDSTONE; as above | 15 | S-4 | 8 15 22 24 | 1.2/2.0 = 60 | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0442

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-5D **SHEET** 2 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: REC'OV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE as above | 21 | S-5 | 12 28 26 40 | 1.4/2.0 = 70 | | | | | | | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| | 26 | S-6 | 30 56 100/.0 | 0/2.0 = 0 | | | | | | | No recovery |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | Cutting collected from 35 feet Stopped drilling at 1200 9/22/86 |
| MUDSTONE, dark reddish brown (10Y 3/4). | 35 | | | | | | | | | | |
| | 36 | | | | | | | | | | 9/23/86 Started drilling at 0740 |
| | 37 | | | | | | | | | 45 min/14 feet = 3.2 min/foot → | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | |
| | 41 | | | | | | | | | | Water level remained constant during drilling |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | |

MGY 001 0443

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-5D **SHEET** 3 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD, % | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | | | | | | | | | | |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | Collected sample at 49 feet Stopped drilling at 0825 |
| MUDSTONE; as above, except fracture-filling quartz cement abundant. | 50 | | | | | | | | | 60 min/15 feet = 4 min/ft. | Started drilling at 0830 |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| | 55 | | | | | | | | | | Water level remained constant during drilling |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | Collected sample at 63 feet |
| | 64 | | | | | | | | | | Stopped drilling at 0930 |
| MUDSTONE; as above | 65 | | | | | | | | | | Started drilling at 0935 |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |
| 70? | | | | | | | | | | | |

MGY 001 0444

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-5D

SHEET 4 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RND. TRI. | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | 100 min/15 feet = 6.7 min/ft | Water level remains constant during drilling |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| SILTSTONE; dark reddish brown (10R 3/4), laminated, fractures filled with dark green and [illegible] clay, little calcite present as fracture-filling cement. | 75 | | | | | | | | | | Sample taken at 75 feet |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | Drilling stopped at 1115 |
| | 80 | | | | | | | | | 90 min/15 feet = 6 min./ft. | Drilling started at 1120 |
| | 81 | | | | | | | | | | |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | Water losses during drilling ≈ 100 gal began at 80 feet |
| | 85 | | | | | | | | | | |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | |
| SILTSTONE; as above, except calcite fracture-filling cement is more abundant than clay. | 90 | | | | | | | MGY 001 0445 | | | Sample taken at 90 feet |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | Drilling stopped at 1255 |

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-5D

SHEET 5 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV. % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Started drilling at 1255 |
| | 96 | | | | | | | | | | |
| | 97 | | | | | | | | | | |
| | 98 | | | | | | | | | | |
| | 99 | | | | | | | | | | Water losses during drilling ≈ 100 gal |
| | 100 | | | | | | | | | | |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | |
| SILTSTONE; as above | 105 | | | | | | | | | 85 min/15 feet = 5.7 min/ft. | Sample collected at 105 feet |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | Drilling stopped at 1420 |
| | 110 | | | | | | | | | | Drilling started at 1425 |
| | 111 | | | | | | | | | | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | |
| | 114 | | | | | | | | | 85 min/15 feet = 5.7 min/ft. | Water losses during drilling ≈ 100 gal |
| | 115 | | | | | | | | | | |
| | 116 | | | | | | | | | | |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |

MGY 001 0446

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-5D **SHEET** 6 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: % RECOV. | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; as above, except fracture-filling cement is less abundant. | 121 | | | | | | | | | | Sample collected at 120 feet |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | Drilling stopped at 1550 |
| | 125 | | | | | | | | | 60 min/10 ft = 6 min/ft | Drilling started at 1600 |
| | 126 | | | | | | | | | | |
| | 127 | | | | | | | | | | |
| | 128 | | | | | | | | | | Water losses during drilling ≈ 50 gpm |
| | 129 | | | | | | | | | | |
| | 130 | | | | | | | | | | |
| | 131 | | | | | | | | | | |
| | 132 | | | | | | | | | | |
| | 133 | | | | | | | | | | Drilling stopped at 1730 9/23/86 |
| | 134 | | | | | | | | | | |
| SILTSTONE; as above | 135 | | | | | | | | | 40 min/5 ft = 8 min/ft | 9/24/86 Drilling started at 0830 Sample collected at 135 feet |
| | 136 | | | | | | | | | | |
| | 137 | | | | | | | | | | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | Stopped drilling 0910 |
| | 140 | | | | | | MGY | 001 | 0447 | 120 min/10 ft = 12 min/ft | Started drilling at 0915 |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | Water losses during drilling ≈ 50 gpm |
| | 143 | | | | | | | | | | |
| | 144 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-5D **SHEET** 7 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 146 | | | | | | | | | | |
| 147.0 | 147 | | | | | | | | | | |
| ARGILLACEOUS DOLOSTONE; very dusky red (10R 2/2), fine grained (micritic), calcite occurs as fracture-filling cement. | 148 | | | | | | | | | | [illegible] |
| | 149 | | | | | | | | | | Stopped [illegible] at 1115 |
| | 150 | | | | | | | | | | BOTTOM OF HOLE NOTES: 1) HNU readings of all soil and rock samples was 0.0ppm. 2) Water losses during drilling began at 30 feet and thereafter were gradual. 3) Drilling equipment: Failing 1500 was used for entire hole. 4) Failing rig used a 4¾ in. tricone during sampling and a 10 in. tricone for casing installation, and a 6 in. tricone to complete hole. 5) cuttings from mud rotary were mostly fine-gravel in size. |
| | 151 | | | | | | | | | | |
| | 152 | | | | | | | | | | |
| | 153 | | | | | | | | | | |
| | 154 | | | | | | | | | | |
| | 155 | | | | | | | | | | |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | |
| | 165 | | | | | | | | | | |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | |
| | 168 | | | | | | | | | | |
| | 169 | | | | | | | | | | |

MGY 001 0448

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-6D

SHEET 1 OF 5

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 145.9 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 9 SEPT 1986 | DATE FINISHED: 29 SEPT 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 5 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 100 ft. | DEPTH TO ROCK: 3.5 ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 5 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 FT. | NO SAMPLES: DIST 6; UNDIST —; CORE 7 | |
| CASING: — | | WATER LEVEL: FIRST —; COMPL —; 24 HR — | |
| CASING HAMMER: WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN I.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30 | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/ROD. (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SM-SC Light Brown (5YR 5/6) f SAND, some(-) Silt+Clay, dry | 1 | S-1 | 10 14 13 17 | 1.0/2.0 = 50 | | | | | | | |
| | 2 | | | | | | | | | | |
| (OVERBURDEN) 3.5 | 3 | | | | | | | | | | |
| (BRUNSWICK FORMATION) | 4 | | | | | | | | | | |
| MUDSTONE; Deeply weathered; SM-SC Moderate Brown (5YR 3/4) cmf SAND, some(+) Silt+Clay, moist. | 5 | S-2 | 31 42 33 32 | 1.2/2.0 = 58 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| MUDSTONE; Deeply weathered; SM-SC Dark Reddish Brown (10R 3/4) mf SAND, some (+) Silt+Clay, moderately fractured (fractures up to 0.1 inches thick and completely occluded by 2 generations of fracture filling clay), moist | 10 | S-3 | 8 10 15 17 | 1.6/2.0 = 79 | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |
| MUDSTONE; as above | 15 | S-4 | 6 10 11 12 | 1.8/2.0 = 88 | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0449

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-6D SHEET 2 OF 5

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; as above | 21 | S-5 | 13 25 26 27 | 1.5/2.0 = 88 | | | | | | • | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| | 25 | | | | | | | | | | 9/9/86 |
| MUDSTONE; as above | 26 | S-6 | 19 34 60 55 | 2.0/2.0 = 100 | | | | | | | 9/10/86 |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | |
| MUDSTONE; low hardness, weak strength, moderately weathered, stratification indistinct, intense to close fracture spacing (60% of fractures have partial coating of dark green and tan clay), dark reddish brown (10R 3/4). | 31 | RUN 1 | | | 1.0/10.0 = 10 RQD; 5.7/10.0 = 57% REC | | | CP | I | 60 min/10 ft = 6 min/ft | started core run at 0940 |
| | 32 | | | | | | | CG | Cl | | |
| | 33 | | | | | | | CP | | | No water loss during drilling |
| | 34 | | | | | | | | | | |
| | 35 | | | | | | | | I | | |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | NCR | NCR | NCR | NCR | |
| | 39 | | | | | | | | | | stopped core run at 1040 9/10/86 |
| | 40 | | | | | | | | | | 9/11/86 |
| MUDSTONE; as above except only 40% of fractures have partial coating of dark green and tan clay. | 41 | RUN 2 | | | 0.9/10.0 = 9 RQD | | | CP | I | 60 min/10 ft = 6 min/ft | started core run at 0900 |
| | 42 | | | | | | | | Cl | | No water loss during drilling |
| | 43 | | | | | | | | I | | |
| | 44 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-6D **SHEET** 3 **OF** 5

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CP | I | | |
| | 46 | | | | | | | | | | |
| | 47 | | | | | | | | | | |
| | 48 | RUN 2 (cont.) | | | 5.5 ft/10 ft = 55% REC | | NCR | NCR | NCR | NCR | |
| | 49 | | | | | | | | | | stopped core run at 1000 |
| | 50 | | | | | | | | | | |
| MUDSTONE; as above except first appearence of small vugs (>1") partially filled with dark green and tan clay. | 51 | | | | 1.4/10.0 = 14 RQD | | 45 / 30 | CP | Cl | 70 min/10 ft = 7 min/ft. | started core run at 1020 |
| | 52 | | | | | | | CS | I | | |
| | 53 | | | | | | 10 | | | | |
| | 54 | RUN 3 | | | | | | | Cl | | Water Loss during drilling ≈ 100 gal |
| | 55 | | | | | | | CP | | | |
| | 56 | | | | 6.6 ft/10 ft = 66% Rec | | | CS | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | NCR | NCR | NCR | NCR | |
| | 59 | | | | | | | | | | stopped core run at 1130 |
| | 60 | | | | | | | | | | |
| MUDSTONE; as above except 20% of fractures partially to completely filled with calcite cement 10% exhibit friable to low hardness, friable to low strength. | 61 | | | | 4.1/10 = 41 RQD | | 10 / 15 | | Cl | 40 min/10 ft = 4 min/ft. | started core run at 1150 |
| | 62 | | | | | | 5 | CP | I | | |
| | 63 | | | | | | 5 / 5 | | Cl / I | | Substantial Water loss during drilling ≈ 200 gal. |
| | 64 | | | | | | | CS | CR | | |
| | 65 | | | | | | | | Cl | | |
| | 66 | RUN 4 | | | 9.5 ft/10 ft = 95% Rec | | | | I | | |
| 67.0 | 67 | | | | | | | | Cl | | |
| SILTSTONE; low hardness, weak strength, slightly weathered, stratification indistinct close to moderate fracture spacing, vugs and solution channels are completely filled with calcite cement, dark reddish brown (10 R 3/4) | 68 | | | | | | 20 / 20 | CG | M | | |
| | 69 | | | | | | 20 | | | | stopped core run at 1130 |
| | | | | | | | NCR | NCR | NCR | NCR | |

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-6D **SHEET** 4 **OF** 5

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; friable to low hardness, friable to weak strength, slightly to moderately weathered, strat. indistinct, close to intense fracture spacing, dark reddish brown (10R 3/4) 71.8 | 71 | | | | | | | | | | started core run at 1250 |
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, close to moderate fracture spacing (20% of fractures have a coating of dark green and tan clay with sparry calcite on top of (later than) clay) Calcite cement has sealed some fractures dark reddish brown (10R 3/4) | 72–80 | RUN 5 | | | 6.8/10.0 = 68 RQD / 10.0/10.0 = 100% REC | | 10, 30, 30, 20, 15, 20, 40, 20, 40, 20 | CP, CG | CL, CR, CL, M, CL, M, CL, M, I | 40 min/10 ft = 4 min/ft | water loss during drilling ≈ 50 gal; stopped core run at 1330 |
| SILTSTONE; as above except 30% of fractures have thick (1/8"–1/4") veins of dark green and tan clay | 80–90 | RUN 6 | | | 1.9/10.0 = 19 RQD; 4.7/10.0 = 47% REC | | 20, 75, 80, 80, 90, NCR | CS, CP, CS, NCR | M, I, M, CL, I, NCR | 20 min/10 ft = 2 min/ft; NCR | started core run at 1350; Substaintial water loss during drilling ≈ 200 gal; stopped core run at 1410 |
| SILTSTONE; as above except 30% of fractures have calcite coating over the clay. | 90–94 | RUN 7 | | | 3.9/10.0 = 39 RQD | | 10, 20, 10 | CP, CG | CL, I, CL, M | 90 min/10 ft = 9 min/ft | started core run at 1530; -hole collasping; -substaintial loss of water during drilling ≈ 500 gal |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-6D

SHEET 5 OF 5

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD, (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 96 | RUN 7 (cont.) | | | 9.97/10.0 = 100% REC | | 20 | CS | Cl | | |
| | | | | | | | | | M | | |
| | 97 | | | | | | 20 | | CL | | |
| | | | | | | | | | I | | |
| | 98 | | | | | | 20 | CP | Cl | | |
| | | | | | | | 30 | | | | |
| | 99 | | | | | | 20 | | M | | Stopped core run at 1700 9/11/86 |
| | 100 | | | | | | | | | | BOTTOM OF HOLE |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | |
| | 105 | | | | | | | | | | |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | |
| | 110 | | | | | | | | | | |
| | 111 | | | | | | | | | | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | |
| | 114 | | | | | | | | | | |
| | 115 | | | | | | | | | | |
| | 116 | | | | | | | | | | |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |

NOTES:

1) HNU readings of all soil and rock samples was 0.0ppm.

2) water losses began at 55 ft and substantially increased at 85 ft

3) Drilling Equipment: Failing 1500 used for entire hole.

4) Failing rig used a 4 3/4 in. tricone during sampling, a 10 in. tricone for casing installation to a depth of 40 ft, and a 6 in. tricone thereafter.

5) Hole began collasping at 80 ft. and was abandoned at 100 ft.

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-7D

SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 143.8 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 11 JUNE 1986 | DATE FINISHED: 30 JUNE 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 7 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150 Ft. | DEPTH TO ROCK: 13.5 Ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 7 | SIZE AND TYPE CORE BARREL: | NO SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: | | WATER LEVEL: FIRST — | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT (LB) — DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. I.D. SPLIT SPOON | | INSPECTOR: CAROL SFORZA | |
| SAMPLER HAMMER | WEIGHT (LB) 140 DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | | | | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| GP-GC -- Moderate Brown (5YR4/4) mf GRAVEL and cmf SAND, some Silty CLAY, moist. | 5 | S-1 | 8 16 29 34 | 0.3/2.0 = 15 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| SC-SM -- Moderate Yellowish Brown (10YR5/4) mf SAND, some Clay & Silt, some (-) mf Gravel, moist. | 10 | S-2 | 21 21 18 21 | 0.5/2.0 = 25 | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| (OVERBURDEN) 13.4 | 13 | | | | | | | | | | contact based on color change in drilling fluid. |
| (BRUNSWICK FORMATION) | 14 | | | | | | | | | | |
| MUDSTONE, deeply weathered; SM-SC -- Dark Reddish Brown (10R3/4) cmf SAND, some (+) Clay & Silt, dry. | 15 | S-3 | 16 22 36 39 | 0.7/2.0 = 35 | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0454

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-7D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP ETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAME. | 21 | S-4 | 17 18 25 30 | 0.2/2.0 = 10 | | | | | | | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| SAME (inferred from cuttings). | 26 | S-5 | 20 24 27 42 | 0.0/2.0 = 0 | | | | | | | no recovery |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| SAME. | 30 | S-6 | 26 100 | 1.9/1.0 = 10 | | | | | | | |
| | 31 | | | | | | | | | 23 min/11 ft = 2.1 min/ft | Started drilling, 1520 |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| | 35 | | | | | | | | | | |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | Cuttings collected from 40 feet |
| MUDSTONE; dark reddish brown (10R3/4), calcite occurs as fracture-filling cement. | 41 | | | | | | | | | | Stopped drilling, 1543 6/11/86 |
| | 42 | | | | | | | | | | 6/30/86 |
| | 43 | | | | | | | | | | Added rod, 0827 |
| | 44 | | | | | | | | | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-7D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | | | | | | | | | | |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| MUDSTONE, as above. | 50 | | | | | | | | | 34 min./18 ft = 1.9 min/ft. | Cuttings collected from 50 feet. No water expected. |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| | 55 | | | | | | | | | | |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | Cuttings collected from 60 feet. |
| MUDSTONE, as above. | 60 | | | | | | | | | | Stopped drilling 0901 |
| | | | | | | | | | | | Added rod, 0901 |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | |
| | 65 | | | | | | | | | | |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |
| MUDSTONE, as above. | | | | | | | | | | | Cuttings collected from 70 feet |

MGY 001 0456

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-7D

SHEET 4 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD, (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | 24 min./20 ft. = 1.2 min/ft | No water expelled |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| | 75 | | | | | | | | | | |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | Cuttings collected from 80 feet. Stopped drilling, 0925 |
| MUDSTONE, as above. | 80 | | | | | | | | | | Added rod, 0925 |
| | 81 | | | | | | | | | | |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | |
| 85 | 85 | | | | | | | | | | |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | no water expelled. |
| ARGILLACEOUS LIMESTONE; dark gray (N3), fine grained (micritic), calcite occurs as fracture-filling cement. | 90 | | | | | | | | | 40 min./20 ft. = 2 min./ft. | Cuttings collected from 90 feet. |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | |
| 95 | | | | | | | | | | | |

MGY 001 0457

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-7D SHEET 5 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 96 | | | | | | | | | | |
| | 97 | | | | | | | | | | |
| | 98 | | | | | | | | | | |
| | 99 | | | | | | | | | | cuttings collected from 100 feet. Stopped drilling, 1005 |
| MUDSTONE; dark reddish brown (10R3/4), calcite occurs as fracture filling cement. | 100 | | | | | | | | | 15 min/10ft = 1.5 min/ft | Added rod, 1005 |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | Water expelled at a rate of 10 gal./min., dark reddish brown. |
| 105 | 105 | | | | | | | | | | |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | cuttings collected from 110 feet. Stopped drilling, 1020 |
| CALCAREOUS MUDSTONE; dark reddish brown (10R3/4), calcite occurs as fracture-filling cement. | 110 | | | | | | | | | 21 min/10ft = 2.1 min/ft | Added rod, 1020 |
| | 111 | | | | | | | | | | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | |
| | 114 | | | | | | | | | | Water expelled at a rate of 20 gal./min., dark reddish brown in color. |
| | 115 | | | | | | | | | | |
| | 116 | | | | | | | | | | |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | cuttings collected from 120 feet. Stopped drilling, 1041 |
| CALCAREOUS MUDSTONE, as above. | | | | | | | | | | | |

0458

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-7D **SHEET** 6 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Added rod, 1041 |
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | Water expelled at a rate of 20 gal./min., dark reddish brown in color. |
| 125 | 125 | | | | | | | | | 24 min/10 ft = 2.4 min/ft. | |
| | 126 | | | | | | | | | | |
| | 127 | | | | | | | | | | |
| | 128 | | | | | | | | | | |
| | 129 | | | | | | | | | | Cuttings collected from 130 feet. Stopped drilling 1105 |
| MUDSTONE; dark reddish brown (10R3/4), calcite and light tan Clay occurs as fracture-filling cements. | 130 | | | | | | | | | | Added rod, 1105 |
| | 131 | | | | | | | | | | |
| | 132 | | | | | | | | | | |
| | 133 | | | | | | | | | | |
| | 134 | | | | | | | | | | Water expelled at a rate of 30 gal./min., light reddish brown in color |
| | 135 | | | | | | | | | | |
| | 136 | | | | | | | | | | |
| | 137 | | | | | | | | | 22 min./10 ft. = 2.2 min/ft | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | Cuttings collected from 140 feet. Stopped drilling, 1127 |
| MUDSTONE, as above. | 140 | | | | | | | | | | Added rod, 1127 |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | | | | |
| | 144 | | | | | | | | | | |

MGY 001 0459

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-7D SHEET 7 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 146 | | | | | | | | | 10 min/10 ft = 1.0 min/ft | Water expelled at a rate of 40 gal./min, light reddish brown in color. |
| | 147 | | | | | | | | | | |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | | | | | Cuttings collected from 150 feet. Stopped drilling at 1137. |
| MUDSTONE, as above. | 150 | | | | | | | | | | |
| | 151 | | | | | | | | | | BOTTOM OF HOLE |
| | 152 | | | | | | | | | | NOTES: 1) HNU readings of all soil and rock samples was 0.0 |
| | 153 | | | | | | | | | | |
| | 154 | | | | | | | | | | 2) Water-discharge rates are approximate and represent average rates of water airlifted from the aquifer during drilling. |
| | 155 | | | | | | | | | | |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | 3) Drilling Equipment: 1500 Failing used to 42 ft., hole completed by Schramm Rota-drill-T650. |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | 4) Failing rig used a 4 3/4 IN tricone during sampling and a 10 IN tricone for casing installation, Schramm rig used a 6 IN air hammer. |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | |
| | 165 | | | | | | | | | | 5) Cuttings from air rotary drilling were mostly fine-gravel in size. |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | |
| | 168 | | | | | | | | | | |
| | 169 | | | | | | | | | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-9D

SHEET 1 OF 11

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 149.8 | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 7 JUNE 1986 | DATE FINISHED: 1 JULY 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 11 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 250 Ft | DEPTH TO ROCK: 8.5 Ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 11 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 FT. | NO. SAMPLES: DIST 8; UNDIST —; CORE 25 | |
| CASING — | | WATER LEVEL: FIRST —; COMP. —; 24 HR — | |
| CASING HAMMER | WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN I.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT (LB) 140 | DROP (IN) 30 | INSPECTOR: GLENN WYGANT |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD. (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SW-SM--Moderate Brown (5YR 4/4) mf SAND, little Silt, dry. | 1 | S-1 | 7 17 18 21 | 1.0/2.0 = 50 | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| SM-SC-- Moderate Brown (5YR 4/4) cmf SAND, some Silty Clay, moist | 5 | S-2 | 6 8 9 9 | 1.8/2.0 = 90 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| (OVERBURDEN) 8.5 | 8 | | | | | | | | | | contact based on color change in drilling fluid. |
| (BRUNSWICK FORMATION) | 9 | | | | | | | | | | |
| MUDSTONE, deeply weathered; SM-SC Dark Reddish Brown (10R 3/4) cmf SAND, some (-) Clay & Silt, moist. | 10 | S-3 | 7 11 18 16 | 1.8/2.0 = 90 | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |
| SAME. | 15 | S-4 | 15 19 24 23 | 2.0/2.0 = 100 | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0461

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-9D SHEET 2 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE AND LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAME. | 21–22 | S-5 | 4 5 8 8 | 1.3/2.0 = 60 | | | | | | | |
| | 23–24 | | | | | | | | | | |
| SAME. | 25–27 | S-6 | 6 11 15 17 | 2.0/2.0 = 100 | | | | | | | |
| | 28–29 | | | | | | | | | | |
| MUDSTONE; friable hardness, friable strength, deeply/moderately weathered, moderately fractured (fractures up to 0.3 inches thick and completely occluded by two generations of fracture-filling clay), dark reddish brown (10R 3/4). | 30–32 | S-7 | 21 30 48 80 | 1.8/2.0 = 90 | | | | | | | |
| | 33–34 | | | | | | | | | | |
| MUDSTONE, as above. | 35–37 | S-8 | 50 60 62 67 | 2.0/2.0 = 100 | | | | | | | 6/7/86 |
| MUDSTONE; friable hardness, friable to weak strength, deeply/moderately weathered, stratification indistinct, crushed to close fracture spacing (10% of fractures have a coating of tan and dark green clay), dark reddish brown (10R 3/4). | 37–44 | RUN 1 | | | 7.4/10.0 = 74% REC 1.7/10.0 = 17 RQD | | 30 5 | CS CP CS CS CP CS CS CS CS CP CD CD | Cr Cl I Cl I Cl Cr Cl Cr | 110 min/10 ft. = 11 min/ft. | 6/9/86 Started core run at 1130 Water level remained constant in wash tub. NCR |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-9D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | RUN 1 (CONT) | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1320 6/9/86 |
| MUDSTONE, as above. | 47 | RUN 2 | | | 2.2/3.0 = 73% REC; 0.0/2.0 = 0 RQD | | | CS, CS, CS, CP, CS | Cr, Cl, Cr, Cl | 40 min/3 ft = 13 min/ft | 6/12/86 Started core run at 1420 core barrel blocked up at 50 ft, had to be hammered excessively — low RQD |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | NCR | NCR | NCR | | Stopped core run at 1500 |
| MUDSTONE, as above. | 50 | RUN 3 | | | 3.0/5.0 = 60% REC; 0.4/5.0 = 8 RQD | | | CP | Cr, Cl, H | 50 min/5 ft = 5 min/ft | Started core run at 1540 Water level remained constant in wash tub. |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1630 6/12/86 |
| 55.5 | 55 | RUN 4 | | | 9.0/10.0 = 90% REC; 0.9/10.0 = 9 RQD | | | CS, CS, CS, CS, CS, CS, CP, CS, CS, CS, CS, CG, CP, CG, CP | Cl, Cr, Cl | 70 min/10 ft = 7 min/ft | 6/13/86 Started core run at 0810 Water level remained constant in wash tub. |
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, crushed to close fracture spacing (20% of fractures have a coating of tan and dark green clay), dark reddish brown (10R3/4). | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 0920 |
| SILTSTONE as above, except intense to close fracture spacing. | 65 | RUN 5 | | | 0.9/7.0 = 13 RQD | | | CP, CP, CG, CP, CP | Cl | 65 min/7 ft = 9.3 min/ft | Started core run at 0940 Water level remained constant in wash tub. |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-9D

SHEET 4 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | RUN 5 (CONT.) | | | 6.4/7.0 = 91% REC | | NCR | CP, NCR | I, NCR | NCR | Stopped core run at 1045 |
| | 72 | | | | | | | | | | Started core run at 1120 |
| SILTSTONE as above, except close fracture spacing. 74.5 | 73 | RUN 6 | | | 1.3/5.0 = 26 RQD | | 20, 20 | | | | |
| | 74 | | | | | | | CP | Cl | 45 min/5 ft = 9 min/ft. | Water level remained constant in wash tub. |
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, close to moderate fracture spacing (30% of fractures have a coating of tan and dark green clay), many vugs (1/16" to 3/4") which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4) | 75 | | | | 5.0/5.0 = 100% REC | | 35 | | | | |
| | 76 | | | | | | | | M | | Stopped core run at 1205 |
| | 77 | RUN 7 | | | 7.0/10.0 = 70 RQD | | 20 | CP, CP, CS | Cl | | Started core run at 1310 |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | |
| | 80 | | | | | | 20 | | M | | Water level remained constant in wash tub. |
| | 81 | | | | | | | | I | | |
| SILTSTONE as above, except intense to moderate fracture spacing. | 82 | | | | | | | | Cl | 80 min/10 ft = 8 min/ft. | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | |
| | 85 | | | | | | | | M | | |
| | 86 | | | | 9.7/10.0 = 97% REC | | | CP | Cl, I | | Stopped core run at 1430 6/13/86 |
| | 87 | | | | | | | | | | NCR 6/16/86 |
| | 88 | RUN 8 | | | 0.0/10.0 = 0 RQD | | | | | | Started core run at 0700 |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | | |
| NO RECOVERY 90.5 | 91 | | | | 0.0/10.0 = 0% REC | | NCR | NCR | NCR | 80 min/7 ft = 11.4 min./ft. | Water level remained constant in wash tub. |
| | 92 | | | | | | | | | | Core bit was found to be lacking diamonds at the end of run (94). |
| | 93 | | | | | | | | | | Stopped core run at 0820 |
| | 94 | | | | | | | 5 | CS | Cl | Started core run at 0850 |

MGY 001 0464

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-9D

SHEET 5 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SANDSTONE; moderate hardness, moderate strength, slightly weathered, fine grained, close to moderate fracture spacing, vugs (1/16" to 1/2") which are partly to completely occluded with calcite cement, dark reddish brown (10R 3/4). | 96–104 | RUN 9 | | | 7.6/10.0 = 76 RQD; 9.2/10.0 = 92% REC | | 20, 20, 20, 20, 20, NCR | CP, CP, CP, CG, CG, CG, CP, CG, CG, CG, CP, CS, NCR | Cl, M, Cl, M, Cl, NCR | 80 min/10 ft = 8 min/ft. | Water level remained constant in wash tub. Stopped core run at 1010 |
| SANDSTONE as above, except close to slight fracture spacing (25% partly to completely occluded with calcite cement). | 104–114 | RUN 10 | | | 6.7/10.0 = 67 RQD; 10.0/10.0 = 100% REC | | 20, 20 | CS, CS, CP, CS, CG, CG, CP, CP, CS, CS, CS, CG, CG, CG, CP | S, Cl, M, Cl, M, Cl | 85 min/10 ft = 8.5 min/ft. | Started core run at 1040. Water level remained constant in wash tub. Stopped core run at 1205 |
| SANDSTONE, as above. | 114–119 | RUN 11 | | | 9.5/10.0 = 95 RQD; 10.0/10.0 = 100% REC | | 15, 15, 15, 20 | CP, CS, CS, CS, CP, CP, CP | Cl, S, Cl, M | 80 min/10 ft = 8 min/ft | Started core run at 1220. Water level remained constant in wash tub. |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-9D SHEET 6 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121 | RUN 11 (cont.) | | | | | 80 | CG | | | |
| | 122 | | | | | | 80 | CS, CG | M | | |
| | 123 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1340 |
| SANDSTONE; moderate hardness, moderate strength, slightly weathered, fine grained, close to moderate fracture spacing (80% partly to completely occluded with calcite cement, 10% with anhydrite), few calcite-filled vugs (1/16" to 1/8"), dark reddish brown (10 R 3/4). | 124–129 | RUN 12 | | | 4.3/6.0 = 72 RQD; 5.0/6.0 = 83% REC | | | CS, CG | Cl, M, Cl, M, Cl | 70 min/6 ft = 11.7 min/ft | Started core run at 1400; Water level remained constant in wash tub |
| | 129 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1510 |
| SANDSTONE as above, except close to slight fracture spacing and calcite vein (1/4") at 138.0. | 130–138 | RUN 13 | | | 5.4/8.5 = 64 RQD; 7.7/8.5 = 91% REC | | 30, 40 | CG, CP | Cl, M, S, M, Cl | 65 min/8.5 ft = 7.6 min/ft. | Started core run at 1515; Water level remained constant in wash tub. |
| | 138 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1620 |
| SANDSTONE as above (run 13), except several calcite veins at 141.0. | 139–144 | RUN 14 | | | 7.3/8.0 = 91 RQD; 8.0/8.0 = 100% REC | | 25 | | Cl, S, Cl, S, M | 55 min/8 ft = 6.9 | Started core run at 1630; Water level remained constant in wash tub. |

# WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-9D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV. % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 146 | RUN 14 (CONT) | | | | | 20 | CG | M | | Stopped core run at 1725 |
| SANDSTONE as above (run 13), except calcite veins are at 147 and 150 feet. | 147–156 | RUN 15 | | | 9.5/9.5 = 100% REC; 8.2/9.5 = 86 RQD | | 60, 30 | CP, CS, CS, CS, CS, CS, CP, CG, CG, CG, CG, CS | S, CI, M, CI, M, CI | 65 min/9.5 ft = 6.8 min/ft | Started core run at 1730; Water level remained constant in wash tub; Stopped core run at 1835 |
| SANDSTONE as above (run 13), except no calcite veins. | 156–164 | RUN 16 | | | 8.0/8.0 = 100% REC; 6.1/8.0 = 76 RQD | | 20, 25, 20 | CP, CS, CS, CP | CI, S, CI, M, CI, M, CI | 50 min/10 ft = 5 min/ft | Started core run at 1840; Water level remained constant in wash tub; Stopped core run at 1930 |
| SANDSTONE as above (run 16). | 164–169 | RUN 17 | | | 10.0/10.0 = 100% REC; 7.7/10.0 = 77 RQD | | 20, 10, 10 | CG | CI, M, S, CI | 40 min/10 ft = 4 min/ft | Started core run at 1935; Water level remained constant in wash tub |

# WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-9D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BR DOWNS | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 171–174 | RUN 17 (cont.) | | | | | 10, 5, 10 | CG | CI, S, M, CI | | Stopped core run at 2010 6/16/86 |
| | 174–184 | RUN 18 | | | 9.5/10.0 = 95 RQD; 9.8/10.0 = 78% REC | | 15, 10, 10, 20 | CP, CG | CI, S, M, CI, S, M, CI, M | 55 min/10 ft = 5.5 min/ft | Started core run at 0655 6/17/86; Water level remained constant in wash tub.; Stopped core run at 0750 |
| SANDSTONE as above, except intense to slight fracture spacing and calcite vein at 177 feet. | 184–194 | RUN 19 | | | 8.4/10.0 = 84 RQD; 10.0/10.0 = 100% REC | | 5, 15, 15, 20 | CG | CI, S, M, S, CI, S, M | 35 min/10 ft = 3.5 min/ft | Started core run at 0755; Water level remained constant in wash tub.; Stopped core run at 0830 |
| SANDSTONE, as above 188.9 | | | | | | | | | | | |
| ARGILLACEOUS LIMESTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), rippled, horizontally laminated, mottled, dessication cracks, close to slight fracture spacing, stratigraphic dip is 9°, light gray (N7) to dark gray (N3). 191.2 | | | | | | | | | | | |
| SILTSTONE; low hardness, moderate strength, slightly weathered, moderate to slight fracture spacing (all are completely occluded with calcite cement, dark reddish brown (10R3/4). | | | | | | | | CG | M | | Started core run at 0835 |

**WOODWARD-CLYDE CONSULTANTS**

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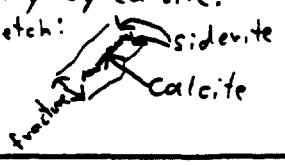
LOG OF BORING MW-9D SHEET 9 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD, IN. | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 196.5 | | | | | | | | | | | |
| ARGILLACEOUS LIMESTONE, same as in RUN 19. | 196–204 | RUN 20 | | | 9.1/10.0 = 91 RQD; 10.0/10.0 = 100% REC | | | CG; CP | M, S, M, S, Cl, S, Cl | 35 min/10 ft = 3.5 min/ft | Substantial water loss (≈ 90 gal.) began at 199 feet. Stopped core run at 0910 |
| 204.5 | | | | | | | | | | | Started core run at 0915 |
| SANDSTONE; moderate hardness, moderate strength, slightly weathered, fine grained, close to slight fracture spacing (80% partly to completely occluded with calcite cement), many calcite-filled vugs (1/16" to 3/4"), dark reddish brown (10R 3/4). | 204–214 | RUN 21 | | | 10.0/10.0 = 100 RQD; 10.0/10.0 = 100% REC | | 20; 20 | CG | S, M, S, M, S, S, Cl, M | 30 min/10 ft = 3 min/ft | Substantial water loss during coring (≈ 120 gal.) Stopped core run at 0945 |
| SANDSTONE as above, except moderate to slight fracture spacing, and large 70° fracture at 214.5 that is filled mostly by siderite (1/2") and then lastly by calcite. Fracture sketch:   | 214–219 | RUN 22 | | | 10.0/10.0 = 100 RQD; 10.0/10.0 = 100% REC | | 15; 15 | CG | S, M, S, M | 45 min/10 ft = 4.5 min/ft | Started core run at 0955. Substantial water loss during coring (≈ 180 gal.) |

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LOG OF BORING MW-9D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO LOC. | SAMPLES: PENETR. RESIST. BLS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 221–224 | RUN 22 (cont) | | | 10.0/10.0=100% REC | | | CG | M, S, M, S | | Stopped core run at 1040 |
| SANDSTONE as above, except moderate to massive fracture spacing, and siderite-calcite vein at 231 feet. | 224–233 | RUN 23 | | | 9.3/9.3=100 RQD; 9.3/9.3=100% REC | | 10, 10 | CG | M, Mv, S | 35 min/9.3 ft = 3.8 min/ft | Started core run at 1045; Substantial water loss during coring (≈140 gal.); Stopped core run at 1120 |
| SANDSTONE as above, except no siderite-calcite vein. | 233–243 | RUN 24 | | | 10.0/10.0=100 RQD; 10.0/10.0=100% REC | | 10, 10 | CG | M, Mv, S, M | 45 min/10 ft = 4.5 min/ft | Started core run at 1130; Substantial water loss during coring (≈180 gal.); Stopped core run at 1215 |
| | 243–244 | RUN 25 (CONT) | | | | | | CG | M | | Started core run at 1230 |

WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-9D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SANDSTONE as above (run 21) except close to slight fracture spacing. | 246 | RUN 25 | | | 6.7/6.7 = 100% REC | | 5 | CG | M | 30 min/6.7 ft = 4.5 min/ft | substantial water loss during coring (≈ 150 gal). |
| | 247 | | | | | | 5 | | Cl | | |
| | 248 | | | | | | 15 | | M | | |
| | 249 | | | | | | | | S | | Stopped core run at 1300 |
| | 250 | | | | | | | | | | BOTTOM OF HOLE |
| | 251 | | | | | | | | | | |
| | 252 | | | | | | | | | | |
| | 253 | | | | | | | | | | |
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| | 267 | | | | | | | | | | |
| | 268 | | | | | | | | | | |
| | 269 | | | | | | | | | | |

NOTES:

1) HNU readings of all soil and rock samples was 0.0.

2) water losses during coring began at 199 feet, and thereafter were gradual.

3) Drilling Equipment: 1500 Failing used to 47 ft, wire-line mobile used for subsequent rock coring, hole lastly drilled by Schramm Rotadrill T 650.

4) Failing rig used a 4 3/4 IN tricone during sampling and a 10 IN tricone for casing installation, Schramm rig used a 6 IN air hammer.

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-10D SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 151.7 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 29 MAY 1986 | DATE FINISHED: 24 JUNE 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 11 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 250.0 Ft | DEPTH TO ROCK: 9.5 Ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 11 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 FT. | NO. SAMPLES: DIST 20 | UNDIST —; CORE 23 |
| CASING: — | | WATER LEVEL: FINAL — | COMPL. —; DRILL — |
| CASING HAMMER: WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. I.D. SPLIT SPOON | | INSPECTOR: GLENN WYGANT | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BLS/6 IN. | RECOV., % | ROCK CORE: RECOVERY/RQD (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SM-SC -- Moderate Brown (5YR 4/4) f SAND, some (-) Silt & Clay, dry. | 1 | S-1 | 2 9 7 6 | 0.8/2.0 = 40 | | | | | | | |
| SM-SC -- Moderate Brown (5YR 4/4) cmf SAND, some Silty Clay, dry. | 2–3 | S-2 | 7 5 6 6 | 1.4/2.0 = 56 | | | | | | | |
| SAME. | 4–5 | S-3 | 6 10 10 9 | 1.1/2.0 = 55 | | | | | | | |
| SAME. | 6–7 | S-4 | 6 8 12 14 | 1.6/2.0 = 80 | | | | | | | |
| (OVERBURDEN) 9.5 | 8–9 | S-5 | 11 14 16 21 | 0.0/2.0 = 0 | | | | | | | No recovery. |
| (BRUNSWICK FORMATION) MUDSTONE, deeply weathered; SM-SC -- Dark Reddish Brown cmf SAND, some (-) Clay & Silt, moist. | 10–11 | S-6 | 18 19 10 14 | 1.3/2.0 = 65 | | | | | | | Contact based on color change in drilling fluid from brown to reddish brown, and also on the change in color of subsequent sampler. |
| SAME. | 12–13 | S-7 | 4 4 3 4 | 1.4/2.0 = 70 | | | | | | | |
| SAME. | 14–15 | S-8 | 3 3 4 8 | 0.6/2.0 = 30 | | | | | | | |
| SAME. | 16–17 | S-9 | 5 7 10 15 | 1.3/2.0 = 65 | | | | | | | |
| SAME. | 18–19 | S-10 | 10 10 14 20 | 2.0/2.0 = 100 | | | | | | | 5/29/86 |

MGY 001 0472

# WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-10D

SHEET 2 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAME. | 21 | S-11 | 7, 10, 15, 18 | 1.8/2.0 = 90 | | | | | | | 5/30/86 |
| MUDSTONE; friable hardness, friable strength, deeply/moderately weathered, moderately fractured (fractures up to 0.4 inches thick and completely occluded by two generations of fracture-filling clay) dark reddish brown (10R 3/4). | 22–24 | S-12 | 12, 15, 14, 17 | 2.0/2.0 = 100 | | | | | | | |
| MUDSTONE, as above. | 25 | S-13 | 12, 15, 16, 21 | 2.0/2.0 = 100 | | | | | | | |
| MUDSTONE, as above. | 27 | S-14 | 15, 16, 17, 21 | 2.0/2.0 = 100 | | | | | | | |
| MUDSTONE, as above. | 29 | S-15 | 17, 19, 25, 28 | 2.0/2.0 = 100 | | | | | | | |
| MUDSTONE, as above. | 31 | S-16 | 24, 28, 37, 45 | 2.0/2.0 = 100 | | | | | | | |
| MUDSTONE, as above. | 33 | S-17 | 29, 36, 48, 65 | 2.0/2.0 = 100 | | | | | | | At 34.0 ft., hardened shoe left in rock; hole redrilled 5.0 ft. to the north. |
| MUDSTONE, as above except moderately weathered, horizontal laminations. | 34 | S-18 | 36, 42 | 1.0/1.0 = 100 | | | | | | | 3 IN. I.D. spoon driven with a 300 lb hammer. |
| MUDSTONE, as above. | 35 | S-19 | 34, 39 | 1.0/1.0 = 100 | | | 70 | 70 | | | |
| MUDSTONE, as above. | 36 | S-20 | 38, 43 | 1.0/1.0 = 100 | | | 55 | 55 | | | 5/30/86 |
| MUDSTONE; friable hardness, friable to weak strength, deeply/moderately weathered, stratification indistinct, crushed to close fracture spacing (60% of fractures have a coating of tan and dark green clay, several vugs (1/8" to 1/4") which are completely occluded with calcite cement, dark reddish brown (10R3/4). | 37–43 | RUN 1 | | | 6.0/10.0 = 60% REC 1.6/10.0 = 16 RQD | | 13, 30, 20, 30, 35, 20, 20 | CS, CP, CP, CP, CP, CP, CP, CS, CP | Cl, H, Cl, Cr, H, Cl, Cr | 71 min./10 ft = 7.1 min/ft | 6/2/86 Started core run at 0934. Water level remained constant in wash tub. |
| | 44 | | | | | | NCR | NCR | NCR | NCR | |

MGY 001 0473

# WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-10D

SHEET 3 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | RUN 1 | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1045 6/2/86 |
| MUDSTONE, as above. 48.5 | 47 | | | | | | | | | | 6/3/86 Started core run at 1015 |
| MUDSTONE; friable to low hardness, friable to weak strength, moderately weathered, stratification indistinct, crushed to close fracture spacing (60% of fractures have a coating of tan and dark green clay), several vugs (1/8" to 1/4") which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4). | 48 | | | | 1.2/8.0 = 15 RQD | | 15 | CP | Cr, Cl, Cr, Cl | | |
| | 49 | | | | | | 15 | | I | | |
| | 50 | | | | | | 25 | | | | |
| | 51 | RUN 2 | | | | | 15, 80 | | Cl | 55 min/8 ft = 6.9 min/ft | Water level remained constant in wash tub. |
| | 52 | | | | 6.0/8.0 = 75% REC | | 10, 10, 30 | CS, CS, CP, CS | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1110 |
| | 55 | | | | | | | | | | Started core run at 1135 |
| MUDSTONE; low hardness, weak strength, moderately weathered, stratification indistinct, intense to close fracture spacing (70% of fractures have a coating of tan and dark green clay), several vugs (1/8" to 5/8") which are partly to completely occluded with calcite cement, dark reddish brown (10R3/4). | 56 | | | | | | 45 | CP | Cl, I, Cl, I | | |
| | 57 | | | | | | 10 | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | CS | Cl | | Water level remained constant in wash tub. |
| | 60 | | | | | | 10 | | | | |
| | 61 | RUN 3 | | | | | 10 | | | | |
| | 62 | | | | 9.8/10.0 = 98% REC | | 25 | CP, CP, CP | | | |
| | 63 | | | | | | | | I | | |
| | 64 | | | | | | 10, 10, 20 | CS, CP | Cl | 93 min/10 ft. = 9.3 min/ft. | Stopped core run at 1308 NCR |
| | 65 | | | | | | | | | | Started core run at 1346 |
| MUDSTONE as above, except close to moderate fracture spacing. | 66 | | | | 2.9/6.0 = 48 RQD | | 10 | CP, CP, CP | Cl | | |
| | 67 | | | | | | 70 | | M | | water level remained constant in wash tub. |
| | 68 | RUN 4 | | | 5.5/6.0 = 92% REC | | 30 | CG, CG | Cl | 84 min/6.0 ft. = 14 min/ft | |
| | 69 | | | | | | 70 | CG, CG | | | |

WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-10D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: WEATHERING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 70.7 | | | | | | | | | | | Stopped core run at 1510 |
| | | | | | | | | | | | NCR |
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, close to moderate fracture spacing (70% of fractures have a coating of tan and dark green clay), many vugs and solution channels (1/8" to 1/2") which are partly to completely occluded with calcite cement, dark reddish brown (10R 3/4). | 71 | RUN 5 | | | 9.3/10.0 = 93% REC 7.0/10.0 = 70 RQD | | | CS | CI | 90 min/10 ft = 9 min/ft | Started core run at 1530 |
| | 72 | | | | | | | CS | M | | |
| | 73 | | | | | | | CS | CI | | |
| | 74 | | | | | | | | | | |
| | 75 | | | | | | 40 | CS | M | | Water level remained constant in wash tub. |
| | 76 | | | | | | | CS | CI | | |
| | 77 | | | | | | | CS | | | |
| | | | | | | | | CS | | | |
| | 78 | | | | | | | CP | | | |
| | 79 | | | | | | 20 | CP | M | | |
| | | | | | | | | CG | | | |
| | 80 | | | | | | | CP | | | Stopped core run at 1700 |
| | | | | | | | NCR | NCR | NCR | NCR | 6/3/86 |
| | 81 | | | | | | | | | | 6/4/86 |
| SILTSTONE, as above. | 82 | RUN 6 | | | 9.5/10.0 = 95% REC 8.3/10.0 = 83 RQD | | 40 | CS | CI | 70 min/10 ft = 7 min/ft | Started core run at 0720 |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | CS | M | | |
| | 85 | | | | | | 30 | | | | Water level remained constant in wash tub. |
| | 86 | | | | | | 60 | CP | CI | | |
| | 87 | | | | | | | CP | | | |
| | | | | | | | | CP | | | |
| | 88 | | | | | | 80 | CS | M | | |
| | 89 | | | | | | | CS | CI | | Stopped core run at 0930 |
| | 90 | | | | | | | | M | | |
| | | | | | | | | | | | NCR |
| | 91 | | | | | | | CP | CI | | |
| SILTSTONE, as above except that fractures have a coating of calcite ontop of (later than) the clay. Calcite cement has actually sealed some of the fractures. | 92 | RUN 7 | | | 7.8/10.0 = 78 RQD | | 20 | CP | M | 100 min/10 ft = 10 ft/min | Started core run at 0855 |
| | | | | | | | | CG | CI | | |
| | 93 | | | | | | 30 | | M | | Water level remained constant in wash tub. |
| | | | | | | | | CG | CI | | |
| | 94 | | | | | | 50 | CG | M | | |

# WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-10D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: WEATHERING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 96 | RUN 7 (CONTINUED) | | | 10.0/10.0 = 100% REC | | 10 | CP | CI | | |
| | 97 | | | | | | | CG | M | | |
| | 98 | | | | | | 30 | CG | CI | | |
| | 99 | | | | | | | | M | | |
| | 100 | | | | | | | CG | CI | | Stopped core run at 1035 |
| | 101 | | | | | | | CG | CI | | Started core run at 1050 |
| | 102 | RUN 8 | | | 10.0/10.0 = 100% REC 8.3/10.0 = 83 RQD | | 10 | CS | M | | |
| | 103 | | | | | | 20 | CS | CI | | |
| SILTSTONE, as above (RUN 7). | 104 | | | | | | | CS | M | 100 min/10 ft = 10 min/ft | |
| | 105 | | | | | | 5 | CS | CI | | water level remained constant in wash tub. |
| | 106 | | | | | | | CS | | | |
| | 107 | | | | | | | CG | M | | |
| | 108 | | | | | | | CS | CI | | |
| | 109 | | | | | | 35 | CP | M | | |
| | 110 | | | | | | | CS | | | Stopped core run at 1230 |
| | 111 | | | | | | | CS | CI | | Started core run at 1240 |
| | 112 | RUN 9 | | | 10.0/10.0 = 100% REC 8.5/10.0 = 85 RQD | | | CS | CI | | |
| | 113 | | | | | | | CP | M | | |
| | 114 | | | | | | | CS | CI | | |
| | 115 | | | | | | | CP | M | | |
| SILTSTONE, as above. | 116 | | | | | | | CG | CI | 120 min/10 ft = 12 min/ft | Water level remained constant in wash tub. |
| | 117 | | | | | | | CP | M | | |
| | 118 | | | | | | | CS | CI | | |
| | 119 | | | | | | | CS | M | | |
| | | | | | | | | CS | CI | | |
| | | | | | | | | CP | CI | | |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-10D SHEET 6 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: WEATHERING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | M | | Stopped core run at 1490 |
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | Started core run at 1450 |
| SILTSTONE as above, except only close fracture spacing. | 123 | RUN 10 | | | 3.7/5.0 = 74% 2.2/5.0 = 44 | | | CS | Cl | 20 min/5 ft = 4 min/ft | Water level remained constant in wash tub. |
| | 124 | | | | | | | | | | |
| | 125 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1510 |
| | 126 | | | | | | | | | | |
| | 127 | | | | | | | CG | M | | Started core run at 1530 |
| | | | | | | | | CP | Cl | | |
| | 128 | | | | | | 60 | CS | | | |
| | 129 | | | | | | | CP | M | | |
| SILTSTONE as above, except close to slight fracture spacing. | 130 | RUN 11 | | | 9.7/10.0 = 97% REC 8.4/10.0 = 84 RQD | | | CP | | 80 min/10 ft = 8 min/ft | Water level remained constant in wash tub. |
| | | | | | | | | CP | | | |
| | 131 | | | | | | 65 | CG | Cl | | |
| | | | | | | | | CP | | | |
| | 132 | | | | | | | CP | M | | |
| | 133 | | | | | | | | S | | |
| | 134 | | | | | | | CP | | | |
| | 135 | | | | | | | | M | | Stopped core run at 1650 |
| | | | | | | | | | | | NCR |
| | 136 | | | | | | | | | | |
| 137.0 | 137 | | | | | | | CG | Cl | | Started core run at 1700 |
| | | | | | | | | | M | | |
| | 138 | | | | | | | CG | Cl | | |
| | | | | | | | | CP | | | |
| | 139 | | | | | | | | M | | |
| | | | | | | | | CG | | | |
| | 140 | | | | | | | | | | |
| MUDSTONE; low hardness, weak strength, slightly weathered, stratification indistinct, intense to moderate fracture spacing (70% are partially filled with calcite cement), dark reddish brown (10R3/4). | 141 | RUN 12 | | | 9.4/10.0 = 94% REC 8.5/10.0 = 85 RQD | | | | Cl | 130 min/10 ft = 13 min/ft | Water level remained constant in wash tub. |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | CG | I | | |
| | 144 | | | | | | | | Cl | | Stopped core run at 1910 |

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LOG OF BORING MW-10D SHEET 7 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | CG | CI | | NCR 6/4/86 |
| | 146 | | | | | | | | | | 6/5/86 |
| | 147 | RUN # 13 | | | 9.1/10.0 = 91% REC 6.6/10.0 = 66 RQD | | 15, 10 | | | | Started core run at 0835, using a new diamond bit. |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | 60 | | CI | | |
| MUDSTONE, as above. | 150 | | | | | | | CG | | 5.5 min/ft = 55 min/10 ft | Water level remained constant in wash tub. |
| | 151 | | | | | | | | | | |
| | 152 | | | | | | | | M | | |
| | 153 | | | | | | | | CI | | |
| | 154 | | | | | | | CS CG CS | H CI | | |
| | 155 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 0930 |
| | 156 | RUN 14 | | | 9.3/10.0 = 93% REC 5.7/10.0 = 57 RQD | | | | CI | | Started core run at 1030 |
| | 157 | | | | | | 10 | | M | | |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | 10 | CG | | | |
| MUDSTONE as above, except close to moderate fracture spacing. | 160 | | | | | | | | CI | 6.5 min/ft = 65 min/10 ft | Water level remained constant in wash tub. |
| | 161 | | | | | | 70 | CP CP | | | |
| | 162 | | | | | | 5 | CS | | | |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | 15 | CG | M | | |
| | 165 | | | | | | | | CI | | Stopped core run at 1135 |
| | 166 | | | | | | NCR | NCR | NCR | NCR | |
| | 167 | RUN 15 | | | 9.0/10.0 = 90 RQD | | 10 | | | | Started core run at 1200 |
| MUDSTONE as above, except close fracture spacing. 168.4 | 168 | | | | | | 60 | CG | CI | | Water loss during coring (≈200 gal.) |
| SILTSTONE, as below. | 169 | | | | | | 10 | | M | | |

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LOG OF BORING MW-10D

SHEET 8 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; low hardness, moderate strength, slightly weathered, stratification indistinct, intense to moderate fracture spacing (30% of fractures have a coating of calcite and are completely occluded), many vugs (1/8" to 1/4") which are completely occluded with calcite cement, dark reddish brown (10R3/4). | 171–176 | RUN 15 (CONTINUED) | | | 9.7/10.0 = 97% REC | | 5, 20, xxx, 20 | CG, CP, CG, CG | M, Cl, M, Cl, I, Cl | 70 min/10 ft = 7 min/ft | Stopped core run at 1310 NCR |
| SILTSTONE, as above. | 176–186 | RUN 16 | | | 7.2/10.0 = 72 RQD; 10.0/10.0 = 100% REC | | | | Cl, M, Cl, M, Cl, M, I, Cl | 70 min/10 ft = 7 min/ft | Started core run at 1335; water loss during coring; stopped core run at 1445 |
| SILTSTONE as above, except intense to slight fracture spacing. | 186–194 | RUN 17 | | | 7.5/10.0 = 75 RQD; 10.0/10.0 = 100% REC | | 50, 5, 60, 5, 5, 60 | CG, CG, CS, CG, CG | Cl, S, M, Cl, M, Cl | 75 min/10 ft = 7.5 min/ft | Started core run at 1505; water loss during coring |

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LOG OF BORING MW-10D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | RUN 17 | (cont) | | | | | CG | CI, M | | Stopped core run at 1620 |
| | 196 | | | | | | | CS, CP | CI | | Started core run at 1645 |
| | 197 | | | | | | | | S | | |
| SILTSTONE as above, except close to slight fracture spacing. | 198 | | | | | | | CG | M | | |
| | 199 | | | | | | | CG | S | | |
| | 200 | | | | | | | CG | | | Substantial water loss during coring (≈ 700 gal) |
| | 201 | RUN 18 | | | RQD 5.5/10.0 = 55 | | | CS | CI | 8.5 min/ft = 85 min/10 ft | |
| 201.4 | | | | | | | | CP | | | |
| ARGILLACEOUS LIMESTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), mottled, dessication cracks, close fracture spacing, light gray (N7) to dark gray (N3). | 202 | | | | | | | | | | |
| | 203 | | | | | | | CS | | | |
| | 204 | | | | 7.7/10.0 = 77% REC | | | | | | |
| | 205 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1810 6/5/86 |
| | 206 | | | | | | | | | | 6/6/86 |
| | 207 | | | | | | | CG | | | Started core run at 0840 |
| | 208 | | | | | | | CP | CI | | |
| MUDSTONE; low hardness, weak strength, slightly weathered, stratification indistinct, close to slight fracture spacing (20% are completely occluded with calcite cement), dark reddish brown (10R3/4). | 209 | | | | | | | | | | |
| | 210 | | | | | | | | | | Substantial water loss during coring (≈ 1000 gal) |
| | 211 | RUN 19 | | | RQD 4.1/9.0 = 46 | | | CG | S | 10 min/ft = 90 min/9 ft | |
| 213.0 | 212 | | | | | | | | CI | | |
| | | | | | | | | | M | | |
| ARGILLACEOUS, DOLOMITIC LIMESTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), rippled, horizontally laminated, mottled, dessication cracks, intense to slight fracture spacing, stratigraphic dip is 20°, light gray (N7) to dark gray (N3). | 213 | | | | 8.5/9.0 = 94% REC | | | | | | |
| | 214 | | | | | | | | CI | | Stopped core run at 1010 |
| | 215 | | | | | dessication cracks, mottled | NCR | NCR | NCR | NCR | |
| | 216 | | | | RQD | | | CG | CI, S | 9 min/ft = 90 min/10 ft | Started core run at 1050 |
| | 217 | RUN 20 | | | | ripples, horizontal laminations | | CP | CI, I | | Substantial water loss during coring (≈ 1000 gal). |
| | 218 | | | | 6.3/10.0 = 63 | | | | | | |
| | 219 | | | | | | | CG | CI | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-10D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP/ORIEN. | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 221.5 | | | | | | | | | | | |
| SANDSTONE; moderate hardness, moderate strength, slightly weathered, fine grained, close to slight facture spacing, fenestral pores and burrows filled with equant calcite spar (freshwater phreatic), some interparticle pores also filled with calcite, fractures are filled with two generations of cement: outer filling of siderite/ankerite with inner filling of equant calcite spar (freshwater phreatic), dark reddish brown (10R 3/4). 224.0 | 221 | RUN 20 (CONT.) | | | 89% REC RQD = 89% | | 45 CG; 45 CG | CP; CG; CG | I; M; Cl; S | | |
| | 222 | | | | | | | | | | |
| | 223 | | | | | | | | | | |
| | 224 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1220 |
| | 225 | | | | | | | | | | |
| SANDSTONE; moderate hardness, moderate strength, slightly weathered, fine grained, close to slight fracture spacing (all completely filled with calcite), many vugs which are partly to completely occluded with calcite cement, dark reddish brown (10R 3/4). | 226 | RUN 21 | | | 8.7/10.0 = 87 RQD | | 10 | | Cl; S | 75 min/10 ft = 7.5 min/ft | Started core run at 1335 |
| | 227 | | | | | | | | | | |
| | 228 | | | | | | | | | | |
| | 229 | | | | | | 25 | | Cl | | Substantial water loss during coring (≈ 900 gal.) |
| | 230 | | | | | | | | | | |
| | 231 | | | | 10.0/10.0 = 100% REC | | 10 | | M | | |
| | 232 | | | | | | 5 | | | | |
| | 233 | | | | | | 5 | | | | |
| | 234 | | | | | | 5 | | S | | Stopped core run at 1450 |
| | 235 | | | | | | | | Cl | | |
| SANDSTONE as above, except close to moderate fracture spacing. | 236 | RUN 22 | | | 8.8/10.0 = 88 RQD | | | CP | | | Started core run at 1820 |
| | 237 | | | | | | | | Cl | | |
| | 238 | | | | | | | | | | |
| | 239 | | | | | | | CG | | 80 min/10 ft = 8 min/ft | Substantial water loss during coring (≈ 800 gal.) |
| | 240 | | | | | | | | M | | |
| | 241 | | | | | | | | Cl | | |
| | 242 | | | | | | | | | | |
| | 243 | | | | | | | | M | | |
| | 244 | | | | 10.0/10.0 = 100% REC | | | | Cl | | Stopped core run at 1940 6/6/86 |

# WOODWARD-CLYDE CONSULTANTS

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LOG OF BORING MW-10D SHEET 11 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SANDSTONE, as above. | 246 | RUN 23 | | | 5.0/50 = 100% 4.2/3.0 = 84 | | 6 | CG | CI M CI M CI | 40 min/5 ft = 8 min/ft | Started core run at 0820 6/7/86 |
| | 247 | | | | | | 10 | | | | Substantial water loss during coring (x 500 gal.). |
| | 248 | | | | | | | | | | |
| | 249 | | | | | | 69 | | | | Stopped core run at 0900 |
| | 250 | | | | | | | | | | BOTTOM OF HOLE |
| | 251 | | | | | | | | | | NOTES: |
| | 252 | | | | | | | | | | 1) HNU readings of all soil and rock samples was 0.0. |
| | 253 | | | | | | | | | | |
| | 254 | | | | | | | | | | 2) Water losses during coring were gradual. |
| | 255 | | | | | | | | | | |
| | 256 | | | | | | | | | | 3) Drilling Equipment: 1500 Failing used to 250 ft., hole lastly drilled by Schramm Rotadrill-T650. |
| | 257 | | | | | | | | | | |
| | 258 | | | | | | | | | | |
| | 259 | | | | | | | | | | |
| | 260 | | | | | | | | | | |
| | 261 | | | | | | | | | | 4) Failing rig used a 4 3/4 IN tricone during sampling and a 10 IN tricone for casing installation, Schramm rig used a 6 IN air hammer. |
| | 262 | | | | | | | | | | |
| | 263 | | | | | | | | | | |
| | 264 | | | | | | | | | | |
| | 265 | | | | | | | | | | |
| | 266 | | | | | | | | | | |
| | 267 | | | | | | | | | | |
| | 268 | | | | | | | | | | |
| | 269 | | | | | | | | | | |

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LOG OF BORING MW-11D

SHEET 1 OF 11

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 128.0 ft | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 16 Sept 1986 | DATE FINISHED: 3 Oct, 1986 |
| DRILLING EQUIPMENT: See note, sheet 11 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 250.0 ft | DEPTH TO ROCK: 3.5 ft. |
| SIZE AND TYPE OF BIT: See note, sheet 11 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 FT. | NO. SAMPLES: DIST 4 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST — | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT (LB) — DROP (IN) — | BORING ANGLE AND DIRECTION: vertical | |
| SAMPLER: 2 in. I.D. . SPLIT SPOON | | INSPECTOR: Carl Varteresian | |
| SAMPLER HAMMER | WEIGHT (LB) 140 DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/ROD (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SM, Dark Reddish Brown (10R3/4) cmT SAND, some Silt, little f. Gravel, mottled texture, dry | 1 | S-1 | 7 8 13 14 | 25 0.5/2.0 | | | | | | | |
| (OVERBURDEN) 3.5 | 3 | | | | | | | | | | |
| (BRUNSWICK FORMATION) | 4 | | | | | | | | | | |
| MUDSTONE; deeply weathered, SM-SC Dark Reddish Brown (10 R 3/4) cmf SAND, some (+) Clayey Silt, dry. | 5–7 | S-2 | 13 13 21 27 | 71 1.4/2.0 | | | | | | | |
| MUDSTONE; deeply/moderately weathered, SM-SC Dark Reddish Brown (10R3/4) cmf SAND, some (+) Clayey Silt, moist | 10–12 | S-3 | 10 19 21 27 | 75 1.5/2.0 | | | | | | | |
| MUDSTONE; friable hardness, friable to weak strength, deeply/moderately weathered, moderately fractured, dark reddish brown (10 R 3/4). | 15–16 | S-4 | 26 60 100 | 100 1.5/1.3 | | | | | | | |

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**LOG OF BORING** MW-11D **SHEET** 2 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 21 | | | | | | | | | | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | 9/17/86 |
| MUDSTONE; dark reddish brown (10R3/4), dark green and tan clay present as fracture-filling cement. | 25 | | | | | | | | | 20 min/20 feet = 1 min/ft. | 10/2/86 Started drilling at 1120 Sample collected at 25 feet |
| | 26 | | | | | | | | | | |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| 30.0 | 30 | | | | | | | | | | Water expelled at a rate of 10 gal./min. |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| SILTSTONE; dark reddish brown (10R3/4), dark green and tan clay present as fracture-filling cement. | 35 | | | | | | | | | | Sample collected at [illegible] feet |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | Stopped drilling at 1140 |

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**LOG OF BORING** MW-11D **SHEET** 3 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE, as above | | | | | | | | | | | Started drilling at 1140 |
| | 46 | | | | | | | | | | Sample collected at [illegible] feet |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| | 50 | | | | | | | | | | Water expelled at a rate of 10 gal./min. |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| SILTSTONE; as above | 55 | | | | | | | | | | Sample collected at [illegible] feet |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | Drilling stopped at 1210 |
| SILTSTONE; as above, except calcite present as fracture filling cement. | 65 | | | | | | | | | | Drilling started at 1215 |
| | 66 | | | | | | | | | | Sample collected at [illegible] feet |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |
| 70.0 | | | | | | | | | | | |

30 min/20 feet - 1.5 min/ft.

MGY 001 0485

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-11D

SHEET 7 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALCAREOUS SILTSTONE; dark reddish brown (10 Y 3/4), calcite occurs as void-filling cement. | 71 | | | | | | | | | 30 min/20 feet = 1.5 min/ft | |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| | 75 | | | | | | | | | | Sample collected at [illegible] |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | Water expelled at a rate of 10 gal./min. |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | |
| 80.0 | 80 | | | | | | | | | | |
| | 81 | | | | | | | | | | Contacts based on color change in drilling fluid. |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | Drilling stopped at 1245. |
| ARGILLACEOUS DOLOSTONE; very dusky red (10 R 2/2) | 85 | | | | | | | | | 40 min/20 ft = 2.0 min/ft. | Drilling started at 1255 |
| | 86 | | | | | | | | | | Sample collected at 8[illegible] feet |
| | 87 | | | | | | | | | | |
| 88.0 | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | Water expelled at a rate of 10 gal./min |
| | 90 | | | | | | | | | | |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-11D **SHEET** 5 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALCAREOUS SILTSTONE · blackish red (5 R 2/2), calcite occurs as void-filling cement. | 96 | | | | | | | | | | Sample collected at 95 feet |
| | 97 | | | | | | | | | | Contacts based on color change in drilling fluid. |
| 98.0 | 98 | | | | | | | | | | |
| CALCAREOUS MUDSTONE; olive gray (5 Y 3/2) interbedded with MUDSTONE, grayish olive green (5 GY 3/2). | 99 | | | | | | | | | | Sample collected at 99 feet |
| | 100 | | | | | | | | | | |
| 101.0 | 101 | | | | | | | | | | |
| ARGILLACEOUS DOLOSTONE; grayish black (N 2), fine grained (micritic). | 102 | | | | | | | | | | Sample collected at 102 feet |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | Drilling stopped at 1335 |
| | 105 | | | | | | | | | 40 min/20 feet = 2 min/ft | Drilling started at 1340 |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | |
| 110.0 | 110 | | | | | | | | | | |
| MUDSTONE; olive gray (5 Y 3/2), calcite occurs as void-filling cement. | 111 | | | | | | | | | | Sample collected at 111 feet |
| 113.0 | 112 | | | | | | | | | | |
| CALCAREOUS SILTSTONE; blackish red (5 R 2/2) calcite occurs as void-filling cement | 113 | | | | | | | | | | Sample collected at 113 feet |
| | 114 | | | | | | | | | | |
| | 115 | | | | | | | | | | |
| | 116 | | | | | | | | | | Water expelled at a rate of 15 gal./min. |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-11D **SHEET** 6 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOW | SAMPLES: RECOV. % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP/TCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | Drilling stopped at 1420 |
| CALCAREOUS SILTSTONE; as above. | 125 | | | | | | | | | | Drilling started at 1540. Sample collected at 125 feet |
| | 126 | | | | | | | | | | |
| | 127 | | | | | | | | | | |
| | 128 | | | | | | | | | | |
| | 129 | | | | | | | | | | |
| 130.0 | 130 | | | | | | | | | 40 min/20 feet = 2.0 min/ft. | Water expelled at a rate of 15 gal./min. |
| | 131 | | | | | | | | | | |
| | 132 | | | | | | | | | | |
| | 133 | | | | | | | | | | |
| | 134 | | | | | | | | | | |
| MUDSTONE; blackish red (5R2/2) calcite occurs as void-filling cement. | 135 | | | | | | | | | | Sample collected at 135 feet |
| | 136 | | | | | | | | | | |
| | 137 | | | | | | | | | | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | |
| 140.0 | 140 | | | | | | | | | | |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | | | | |
| | 144 | | | | | | | | | | Drilling stopped at 1620 |

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**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-11D **SHEET** 7 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; dark reddish brown (10R 3/4), calcite occurs as void-filling cement. | 146 | | | | | | | | | 45 min/20 ft = 2.2 min/ft. | Drilling started at 1025 |
| | 147 | | | | | | | | | | Sample collected at 145 feet |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | | | | | Water expelled at a rate of 15 gal./min |
| | 150 | | | | | | | | | | |
| | 151 | | | | | | | | | | |
| | 152 | | | | | | | | | | |
| | 153 | | | | | | | | | | |
| | 154 | | | | | | | | | | |
| MUDSTONE; as above | 155 | | | | | | | | | | Sample collected at 155 feet |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | Drilling stopped at 1710 |
| MUDSTONE; as above. | 165 | | | | | | | | | | Drilling started at 1715 |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | Sample collected at 165 feet |
| | 168 | | | | | | | | | | |
| | 169 | | | | | | | | | | |

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**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-11D **SHEET** 7 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 171 | | | | | | | | | 50 min/20 feet = 2.5 min/ft | Water expelled at a rate of 50 gal/min |
| | 172 | | | | | | | | | | |
| | 173 | | | | | | | | | | |
| | 174 | | | | | | | | | | |
| MUDSTONE; as above. | 175 | | | | | | | | | | Sample collected at [illegible] |
| | 176 | | | | | | | | | | |
| | 177 | | | | | | | | | | |
| | 178 | | | | | | | | | | |
| | 179 | | | | | | | | | | |
| | 180 | | | | | | | | | | |
| | 181 | | | | | | | | | | |
| | 182 | | | | | | | | | | |
| | 183 | | | | | | | | | | |
| | 184 | | | | | | | | | | Drilling stopped at 1805 10/2/86 |
| MUDSTONE; as above. | 185 | | | | | | | | | 50 min/20 feet = 2.5 min/ft | 10/3/86 Drilling started at 0810 |
| | 186 | | | | | | | | | | |
| | 187 | | | | | | | | | | Sample collected at [illegible] |
| | 188 | | | | | | | | | | |
| | 189 | | | | | | | | | | |
| | 190 | | | | | | | | | | Water expelled at a rate of 50 gal/min. |
| | 191 | | | | | | | | | | |
| | 192 | | | | | | | | | | |
| | 193 | | | | | | | | | | |
| | 194 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-11D SHEET 9 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD, (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; as above | | | | | | | | | | | Sample collected at 195 feet |
| | 196 | | | | | | | | | | |
| | 197 | | | | | | | | | | Water expelled at a rate of 75 gal/min |
| | 198 | | | | | | | | | | |
| | 199 | | | | | | | | | | |
| | 200 | | | | | | | | | | |
| | 201 | | | | | | | | | | |
| | 202 | | | | | | | | | | |
| | 203 | | | | | | | | | | |
| | 204 | | | | | | | | | | Drilling stopped at 0900 |
| MUDSTONE; as above | 205 | | | | | | | | | 45 min/20 ft = 2.2 min/ft | Drilling started at 0905 |
| | 206 | | | | | | | | | | Sample collected at 205 feet |
| | 207 | | | | | | | | | | |
| | 208 | | | | | | | | | | |
| | 209 | | | | | | | | | | Water expelled at a rate of 75 gal./min. |
| | 210 | | | | | | | | | | |
| | 211 | | | | | | | | | | |
| | 212 | | | | | | | | | | |
| | 213 | | | | | | | | | | |
| | 214 | | | | | | | | | | Sample collected at 215 feet |
| MUDSTONE; as above | 215 | | | | | | | | | | |
| | 216 | | | | | | | | | | |
| | 217 | | | | | | | | | | |
| | 218 | | | | | | | | | | |
| | 219 | | | | | | | | | | |
| 220.0 | | | | | | | | | | | |

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**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-11D **SHEET** 10 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 221 | | | | | | | | | | |
| | 222 | | | | | | | | | | |
| | 223 | | | | | | | | | | |
| | 224 | | | | | | | | | | Drilling stopped at 0950 |
| SILTSTONE; dark reddish brown (10R3/4), calcite occurs as void-filling cement. | 225 | | | | | | | | | 50 min/20 ft = 2.2 min/ft. | Drilling started at [illegible] Sample collected at 225 feet |
| | 226 | | | | | | | | | | |
| | 227 | | | | | | | | | | |
| | 228 | | | | | | | | | | |
| | 229 | | | | | | | | | | |
| | 230 | | | | | | | | | | Water expelled at a rate of 100 gal/min |
| | 231 | | | | | | | | | | |
| | 232 | | | | | | | | | | |
| | 233 | | | | | | | | | | |
| | 234 | | | | | | | | | | |
| SILTSTONE; as above | 235 | | | | | | | | | | Sample collected at 235 feet |
| | 236 | | | | | | | | | | |
| | 237 | | | | | | | | | | |
| | 238 | | | | | | | | | | |
| | 239 | | | | | | | | | | |
| | 240 | | | | | | | | | | |
| | 241 | | | | | | | | | | |
| | 242 | | | | | | | | | | |
| | 243 | | | | | | | | | | |
| | 244 | | | | | | | | | | |
| 245.0 | | | | | | | | | | | Drilling stopped at 1050 |

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**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-11D **SHEET** 11 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE: dark reddish brown (10R 3/4), calcite occurs as void-filling cement. | 246 | | | | | | | | | 12 in./5 ft = 25 in./ft | Drilling [illegible] 1/05 Sample [illegible] |
| | 247 | | | | | | | | | | |
| | 248 | | | | | | | | | | |
| | 249 | | | | | | | | | | Drilling [illegible] 1/07 [illegible] |
| | 250 | | | | | | | | | | BOTTOM OF HOLE |
| | 251 | | | | | | | | | | NOTES: |
| | 252 | | | | | | | | | | 1) HNU readings of all soil and rock samples was 0.0 ppm. |
| | 253 | | | | | | | | | | 2) Water discharge rates are approximate and represent average rates of water airlifted from the aquifer during drilling |
| | 254 | | | | | | | | | | 3) Drilling Equipment: Failing 1500 used to 25 ft., hole completed by Schramm Rota-drill T 650. |
| | 255 | | | | | | | | | | 4) Failing rig used a 4 3/4 in. tricone during sampling and a 10 in. tricone for casing installation. Schramm rig used a 6 in air hammer. |
| | 256 | | | | | | | | | | 5) Cuttings from air rotary drilling were mostly fine-gravel in size. |
| | 257 | | | | | | | | | | |
| | 258 | | | | | | | | | | |
| | 259 | | | | | | | | | | |
| | 260 | | | | | | | | | | |
| | 261 | | | | | | | | | | |
| | 262 | | | | | | | | | | |
| | 263 | | | | | | | | | | |
| | 264 | | | | | | | | | | |
| | 265 | | | | | | | | | | |
| | 266 | | | | | | | | | | |
| | 267 | | | | | | | | | | |
| | 268 | | | | | | | | | | |
| | 269 | | | | | | | | | | |

MGY 001 0493

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D

SHEET 1 OF 11

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 110.6 ft | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 19 JUNE 1986 | DATE FINISHED: 2 JULY 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 11 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 250 Ft | DEPTH TO ROCK: 3.0 Ft |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 11 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10 ft. | NO. SAMPLES: BLOW 2 / WATER LEVEL: FIRST — | UNDIST — / CORE 25 / COMPL. — / DATE — |
| CASING: — | | | |
| CASING HAMMER: WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN I.D. SPLIT SPOON | | INSPECTOR: GLENN WYGANT / CARL VARTERESIAN | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BLOWS | RECOV., % | ROCK CORE: RECOVERY/RQD (%) | BIT BORING | FRACTURE: SKETCH | COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SW-SM -- Moderate Brown (5YR 4/4) f SAND, little Silt, dry. | 1 | S-1 | 6 7 16 16 | 0.7/2.0 = 35 | | | | | | | |
| (OVERBURDEN) 3.0 (BRUNSWICK FORMATION) | 2 | | | | | | | | | | |
| MUDSTONE, deeply weathered; SW-SM Dark Reddish Brown (10R3/4) f SAND, little Silt (as pockets), dry. | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| | 5 | S-2 | 45 5 10% | .7/1.4 = 50 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| MUDSTONE; friable hardness, friable strength deeply/moderately weathered, intense to close fracture spacing (30% of fractures have a coating of dark green clay), several vugs (⅛"-¼") which are partly to completely occluded with calcite cement, dark reddish brown (10R 3/4). 15.0 | 10 | RUN 1 | | | 1.8/10.0 = 18% RQD | | | CS | CI | | |
| | 11 | | | | | | | CP | I | | |
| | 12 | | | | | | | CS | CI | | |
| | 13 | | | | | | | CP | I | | |
| | 14 | | | | | | | CG | CI | | |
| CALCAREOUS MUDSTONE; moderate hardness, moderate strength, slightly weathered, close fracture spacing, fractures are completely occluded with calcite cement, dark reddish brown (10R3/4) grading into light olive gray (5Y6/1). | 15 | | | | 8.6/10.0 = 86% REC | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | NCR | NCR | NCR | NCR | |
| | 19 | | | | | | | | | | |

MGY 001 0494

6/19/86

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (IN) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE CORING | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 21 | RUN 2 | | | 3.9/5.0 = 78% RQD | | 5 | CG | C1, M | 20 min/5ft = 4 min/ft | Started core run at 1120 6/24/86 |
| | 22 | | | | | | | | | | Water level remained constant in wash tub. |
| | 23 | | | | | | 5 | CS | C1 | | |
| 24.5 | 24 | | | | 5.0/5.0 = 100% REC | | 10 | | | | |
| | 25 | | | | | | 0 | | | | Stopped core run at 1140 |
| MUDSTONE; low hardness, weak strength, moderately weathered, close to slight fracture spacing, (30 % of fractures have coating of dark green clay), abundant vugs (25-35% of core, 1/8"-1/2"), which are partly to completely occluded by calcite cement, dark reddish brown (10R 3/4). | 26 | RUN 3 | | | 7.6/10.0 = 76% RQD | | 0 | CS | C1 | 45 min/10 ft = 4.5 min/ft | Started core run at 1205 |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | CP | | | Water loss during coring (≈ 50 gal.). |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | 0 | | M | | |
| | 31 | | | | | | 10 | CG | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | 10.0/10.0 = 100% REC | | 10 | | S1 | | |
| | 34 | | | | | | 10 | | C1 | | |
| | 35 | | | | | | | | | | Stopped core run at 1250 |
| | 36 | RUN 4 | | | 7.9/10.0 = 79% RQD | | | CS | C1 | 40 min/10ft = 4 min/ft | Started core run at 1305 |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | CG | | | |
| | 39 | | | | | | | CS | | | |
| MUDSTONE, as above | 40 | | | | | | | | | | Water level remained constant in wash tub. |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | CG | | | |
| | 43 | | | | 10.0/10.0 = 100% REC | | | | | | |
| | 44 | | | | | | | | | | Stopped core run at 1345 |

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

LOG OF BORING MW-13D SHEET 3 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLWS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE, as above | 46, 47, 48, 49, 50, 51, 52, 53, 54, 55 | RUN 5 | | | 9.5/10.0 = 95% RQD; 10.0/10.0 = 100% REC | | 5, 5, 5, 5, 10, 5, 30, 5, 15 | C6, C1 | C1, M, C1, S | 2.5 min/10 ft = 2.5 min/ft | Started core run at 1355; Water level remained constant in wash tub; Stopped core run at 1420 |
| MUDSTONE, as above; MUDSTONE, as above except calcite-filled vugs occurs in less abundance (5-10% of core) | 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65 | RUN 6 | | | 7.6/10.0 = 76% RQD; 10.0/10.0 = 100% REC | | 0, 10, 10, 5, 5, 10, 10, 10, 20, 10, 0 | C5, C6, C5 | C1, M, C1, M, C1 | 4.5 min/10 ft = 4.5 min/ft | Started core run at 1425; Water level remained constant in wash tub; Stopped core run at 1510 |
| MUDSTONE, as above | 65, 66, 67, 68, 69 | RUN 7 | | | 6.3/10.0 = 63% RQD | | 10, 10, 5, 5, 10 | C6 | C1 | 7.5 min/10 ft = 7.5 min/ft | Started core run at 1520; Water level remained constant in wash tub. |

MGY 001 0496

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D SHEET 4 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE, as above, except calcite-filled vugs occur in greater abundance (25%-35% of core) | 71 | RUN 7 CONTINUED | | | 9.5/10.0 = 95% REC | | 5 | CG | CI | | |
| | 72 | | | | | | 5 | | | | |
| | 73 | | | | | | 16 | | M | | |
| | 74 | | | | | | 10 | | | | Stopped core run at 1635 |
| 74.7 | | | | | | | NCR | NCR | NCR | NCR | |
| CALCAREOUS MUDSTONE, moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing, (70% of fractures are coated with calcite cement and dark green and tan clays, medium gray (N5) to dark greenish gray (5 GY 4/1). | 75 | RUN 8 | | | 8.9/10.0 = 89% RQD | | 20 | CS | M | | Started core run at 1650 |
| | 76 | | | | | | | CG | CI | | |
| | 77 | | | | | | 0 | CG | M | | |
| | 78 | | | | | | | CG CS CD | CI | | |
| | 79 | | | | | | 10 | | S | 8.5 min/ft = 85 min/10 ft | Water level constant in wash tub. |
| | 80 | | | | | | 5 | | | | |
| | 81 | | | | 9.7/10.0 = 97% REC | | 10 | CG | M | | |
| | 82 | | | | | | 10 | | CI | | |
| | 83 | | | | | | | | S | | Stopped core run at 1815 |
| | 84 | | | | | | | | | | |
| | 85 | | | | | | | | | | NCR 6/24/86 |
| CALAREOUS MUDSTONE, as above | 86 | RUN 9 | | | 9.2/10.0 = 92% RQD | | 5 | CS | CI | | 6/25/86 Started core run at 0730 |
| | 87 | | | | | | | | | | Changed coring bit at 85 ft., now using finer-sized diamonds. |
| | 88 | | | | | | | | Ms | | |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | 5 | CS | CI | 4.0 min/ft = 40 min/10 ft | |
| | 91 | | | | | | | CG | S | | Water level constant in wash tub |
| | 92 | | | | | | | | | | |
| | 93 | | | | 10.0/10.0 = 100% REC | | 20 | CG | | | See page 11, note 5. |
| | 94 | | | | | | 20 | CS CG | M | | Stopped core run at 0810 |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D SHEET 5 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALCAREOUS MUDSTONE, as above 97.0 | 96 | | | | | | 10 | CS CG CG | Cl | | Started core run at 0820° |
| CLAYSTONE; moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing, abundant vugs (15% of core, less than 1/8" in diameter) are partially occluded with calcite cement, dark greenish gray (5GY 4/1). | 97 | | | | 9.7/10.0 = 97% | | 5 | CS | M Cl | | |
| | 98 | | | | | | | | | | |
| | 99 | | | | | | | | | | Water level remained constant in wash tub |
| | 100 | | | | | | 5 | CG | S | | |
| | 101 | RUN 10 | | | 10.0/10.0 = 100% REC | | | | | 30 min/10ft = 3 min/ft | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | See page 11, note 5. |
| | 104 | | | | | | 15 | | M | | Stopped core run at 0850 |
| | 105 | | | | | | | CS | Cl | | |
| | 106 | | | | | | | CS | Cl | | Started core run at 0905 |
| | 107 | | | | | | 5 | | | | |
| | 108 | | | | | | | | | | |
| CLAYSTONE, as above. | 109 | | | | | | | | | | |
| | 110 | | | | | | | CG | S | | Water level remained constant in wash tub. |
| | 111 | | | | | | 0 | | | | |
| | 112 | RUN 11 | | | 8.4/10.0 = 84% RQD | | | | | 2.5 min/10ft = 2.5 min/ft | |
| | 113 | | | | | | 5 | | | | See page 11, note 5. |
| | 114 | | | | | | | | M | | Stopped core run at 0930 |
| | 115 | | | | 10.0/10.0 = 100% REC | | | CS | Cl | | |
| | 116 | | | | | | 5 | CG | | | Started core run at 0940 |
| | 117 | | | | | | | | S | | |
| CLAYSTONE, as above. | 118 | RUN 12 | | | 9.6/10.0 = 96% RQD | | 5 | CG | | 6.5 min/10ft = 6.5 min/ft | Water level remained constant in wash tub. |
| | 119 | | | | | | | | | | |

LOG OF BORING MW-13D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CLAYSTONE, as above. 123.0 | 121–123 | RUN 12 CONTINUED | | | 9.6/10.0 = 96% REC | | 15, 0 | CG, CS | S, CI | | See page 11, note 5. |
| CLAYSTONE; moderate hardness, moderate strength, slightly weathered, close to moderate fracture spacing, dark greenish gray (5GY4/1) interstratified with gray sandstone having ripple laminations. 126.5 | 123–125 | | | | | | 6 | CG, CS | M, CI | | Stopped core run at 1045 |
| | 125 | | | | | | NCR | NCR | NCR | NCR | Started core run at 1055 |
| CLAYSTONE; moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing, abundant vugs (15% of core, less than ½" in diameter) are partially occluded with calcite cement, dark greenish gray (5GY 4/1). | 125–134 | RUN 13 | | | 9.1/10.0 = 91% RQD; 10.0/10.0 = 100% REC | | 15, 15, 20 | CG | S | 70 min/10 ft = 7 min/ft | See page 11, note 5. Water level constant in wash tub. Stopped core run at 1205 |
| | 135 | | | | | | | | | | Started core run at 1225 |
| CLAYSTONE, as above 138.0 | 136–137 | | | | | | 10, 5, 10 | CS | CI | | |
| CLAYSTONE; moderate hardness, moderate strength, slightly weathered, close to massive fracture space, a large 70° fracture at 139.0 is filled mostly by calcite (⅛") and then lastly by chalcopyrite, chalcopyrite also occurs as isolated tetrahedrons, greenish gray (5 GY 6/1). 143.7 | 137–143 | RUN 14 | | | 7.4/10.0 = 74% RQD; 9.1/10.0 = 91% REC | | 50 | CG, CS, CG | Ms, M, CI | 35 min/10 ft = 3.5 min/ft | Substantial water loss during coring (≈450 gal.) began at 135 feet. |
| ARGILLACEOUS LIMESTONE; (description on sheet 7) | 144 | | | | | | NCR | NCR | NCR | NCR | Stopped core run at 1300 |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D SHEET 7 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| ARGILLACEOUS LIMESTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), rippled, horizontally laminated, mottled, dessication cracks, massive fracture spacing, stratigraphic dip is 12°, greenish black (5 G 2/1). 149.2 | 146 | RUN 15 | | | 9.7/10.0 = 97% RQD | | | | | | Started core run at 1315 |
| | 147 | | | | | | | | | | |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | 25 | CG | MV | 30 min/10 ft = 3 min/ft | Substantial water loss during coring (≈ 300 gal.) |
| CALCAREOUS MUDSTONE; moderate hardness, moderate strength, slightly weathered, massive fracture spacing (all are completely occluded with calcite cement), greenish black (5 G 2/1). | 150 | | | | | | | | | | |
| | 151 | | | | 9.8/10.0 = 98% REC | | | | | | |
| | 152 | | | | | | | | | | |
| | 153 | | | | | | | | | | |
| | 154 | | | | | | | | | | Stopped core run at 1345 |
| | 155 | | | | | | | | | | NCR |
| CALCAREOUS MUDSTONE, as above except abundant dessication cracks (1/16" to 1/8") completely filled with calcite cement, dark reddish brown (10R3/4). 157.8 | 156 | RUN 16 | | | 9.0/10.0 = 90% RQD | | | | MV | | Started core run at 1355 |
| | 157 | | | | | | 5 | CS | cl | | |
| ARGILLACEOUS LIMESTONE; moderate hardness, moderate strength, slightly weathered, fine grained (micritic), rippled, horizontally laminated, mottled, dessication cracks, slight to close fracture spacing, stratigraphic dip is 12°, grayish black (N2). | 158 | | | | | | 5 | | | | |
| | 159 | | | | | | | CG CS | M | 65 min/10 ft = 6.5 min/ft | Substantial water loss during coring (≈ 300 gal). |
| | 160 | | | | | | | | | | |
| | 161 | | | | 10.0/10.0 = 100% REC | | | | | | |
| | 162 | | | | | | | CG | | | |
| | 163 | | | | | | 5 | | S | | @163, rig breaks down at 1420 (6/25/86) resumes at 0820 (6/30/86) |
| | 164 | | | | | | 15 | | M | | Stopped core run at 0900 |
| | 165 | RUN 17 | | | 10.0/10.0 = 100% RQD | | | CG | M | 50 min/10 ft = 5.0 min/ft | Started core run at 0920 |
| ARGILLACEOUS LIMESTONE, as above 167.0 | 166 | | | | | | 5 | | | | |
| CALCAREOUS SILTSTONE; moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing; a large 70° fracture at 166.5 is filled with calcite and isolated patches of pyrite, pyrite occurs as isolated euhedral cubes. | 167 | | | | | | | | S | | |
| | 168 | | | | | | 5 | | cl | | Substantial water loss during coring (≈ 200 gal) |
| | 169 | | | | | | 5 | | M | | |

**WOODWARD-CLYDE CONSULTANTS**
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LOG OF BORING MW-13D SHEET 8 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV. % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CALCAREOUS SILTSTONE as above 172.3 | 171 | RUN 17 (CONTINUED) | | | 10.0/10.0 = 100% REC | | 5 | GS | S, Cl, M | | |
| SILTSTONE; moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing, fractures are partially occluded with calcite cement and dark green clays, olive black (5Y 2/1). | 172 | | | | | | | | | | |
| | 173 | | | | | | 50 | | S | | |
| | 174 | | | | | | | | | | Stopped core run at 1010 |
| | 175 | RUN 18 | | | 9.1/10.0 = 91% RQD | | 70, 40, 70 | GS | Cl | | Started core run at 1025 |
| | 176 | | | | | | | | | | |
| | 177 | | | | | | 70 | CG | M | | |
| | 178 | | | | | | | | | | |
| 179.6 | 179 | | | | | | 70 | | | | Substantial water loss during coring (≈ 150 gal.) |
| SILTSTONE; moderate hardness, moderate strength, slightly weathered, close to slight fracture spacing, fractures completely occluded with calcite cement and dark green and tan clays, abundant vugs (1/8"-1/2") are filled with calcite cement, dark reddish brown (10 R 3/4). | 180 | | | | 10.0/10.0 = 100% REC | | 70 | | | 50 min/10 ft = 5 min/ft | |
| | 181 | | | | | | | | | | |
| | 182 | | | | | | 75 | CS | | | |
| | 183 | | | | | | | CG | S | | |
| | 184 | | | | | | 20 | | Cl | | Stopped core run at 1115 |
| | 185 | RUN 19 | | | 9.7/10.0 = 97% RQD | | 75 | CG | M | | Started core run at 1215 |
| | 186 | | | | | | | | | | |
| | 187 | | | | | | 70 | | | | |
| SILTSTONE, as above | 188 | | | | | | | | Sl | | |
| | 189 | | | | | | 15 | | Cl | | Substantial water loss during coring (≈ 200 gal.) |
| | 190 | | | | | | | | | | |
| | 191 | | | | 10.0/10.0 = 100% REC | | 70 | | Sl | 60 min/10 ft = 6 min/ft | |
| | 192 | | | | | | | | | | |
| | 193 | | | | | | | | | | |
| | 194 | | | | | | | | | | Stopped core run at 1315 |

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D SHEET 9 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE AND LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE, as above | 196–204 | RUN 20 | | | 9.4/10.0 = 94% REC; 8.3/10.0 = 83% RQD | | 10, 10, 15, 10, 5 | CS, CG, CG, CS, CG, CP | M, Cl, M, Cl | 30 min/10 ft = 3 min/ft | Started core run at 1325; Substantial water loss during coring (≈200 gal.); Stopped core run at 1355 |
| SILTSTONE, as above except vugs less abundant and of smaller size (1/16"–1/8"), fractures are partially filled with calcite | 204–215 | RUN 21 | | | 10.0/10.0 = 100% REC; 9.5/10.0 = 95% RQD | | 15, 15, 10, 10, 5 | CG, CS, CG, CS, CG, CS | Cl, M, Cl | 45 min/10 ft = 4.5 min/ft | Started core run at 1405; Substantial water loss during coring (≈150 gal.). See page 11, note 5. Stopped core run at 1450 |
| SILTSTONE, as above | 215–219 | RUN 22 | | | 9.1/10.0 = 91% RQD | | 5, 0, 5 | CG | Sl | 45 min/10 ft = 4.5 min/ft | Started core run at 1505; Substantial water loss during coring (≈150 gal.). |

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D SHEET 10 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV. % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 221 | RUN 22 (CONTINUED) | | | 10.0/10.0 = 100% REC | | 5 | CG | M | | |
| | 222 | | | | | | 5 | | CI | | See page 11, note 5. |
| | 223 | | | | | | | | | | |
| | 224 | | | | | | | | M | | Stopped core run at 1550 |
| | 225 | | | | | | X | CS | CI | | |
| | 226 | RUN 23 | | | 9.5/10.0 = 95% RQD | | 5 | CS | CI | | Started core run at 1605 |
| | 227 | | | | | | | | | | See page 11, note 5. |
| | 228 | | | | | | 10 | | M | | |
| | 229 | | | | | | 15 | CG | | | Substantial water loss during coring (≈150 gal.) |
| | 230 | | | | | | 5 | | | | |
| SILTSTONE, as above except abundant vugs (1/8"-1/4") are filled with calcite, fractures are completely occluded with calcite. | 231 | | | | 10.0/10.0 = 100% REC | | | | CI | 50 min/10 ft = 5 min/ft | |
| | 232 | | | | | | 10 | CS | | | |
| | 233 | | | | | | 15 | | M | | |
| | 234 | | | | | | | CG | | | Stopped core run at 1655 |
| | 235 | | | | | | | | CI | | |
| | 236 | RUN 24 | | | 10.0/10.0 = 100% RQD | | 5 | | M | | Started core run at 1710 |
| | 237 | | | | | | | | CI | | |
| | 238 | | | | | | | CG | M | | |
| SILTSTONE, as above | 239 | | | | 10.0/10.0 = 100% REC | | | | CI | | Substantial water loss during coring (≈180 gal). |
| | 240 | | | | | | 5 | CS | S | | |
| | 241 | | | | | | | | | | |
| | 242 | | | | | | 6 | | S | | |
| | 243 | | | | | | | | CI | 45 min/10 ft = 4.5 min/ft | |
| | 244 | | | | | | 10 | CG | M | | Stopped core run at 1755 |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-13D SHEET 11 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 246 | | | | | | | | | | Started core run at 1810 |
| | 247 | | | | | | | | S | | |
| | 248 | RUN 25 | | | 5.0/5.0 = 100% REC 4.6/5.0 = 92% RQD | | 25 | CG | | | |
| | 249 | | | | | | | | M | 25 min/5ft = 5 min/ft | Stopped core run at 1835 |
| SILTSTONE, as above | 250 | | | | | | | | | | BOTTOM OF HOLE |
| | 251 | | | | | | | | | | |
| | 252 | | | | | | | | | | |
| | 253 | | | | | | | | | | |
| | 254 | | | | | | | | | | |
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| | 268 | | | | | | | | | | |
| | 269 | | | | | | | | | | |

NOTES:
1) HNU readings of all soil and rock samples was 0.0
2) water losses during coring began at 135 feet, and thereafter were gradual.
3) Drilling Equipment: 1500 Failing used to 20 ft, wire-line Mobile used for subsequent rock coring, hole lastly drilled by Schramm Rotadrill T650.
4) Failing rig used a 4 3/4 IN tricone during sampling and a 10 IN tricone for casing installation, Schramm rig used a 6 IN air hammer.
5) Rock core from 90 to 130 feet, and from 210 to 230 feet was vandalized prior to field descriptions. The recorded data represents an attempted reconstruction.

MGY 001 0504

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-14D

SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 73.1 ft. | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 18 Sept. 1986 | DATE FINISHED: 1 Oct. 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 7 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 150.0 ft. | DEPTH TO ROCK: 1.0 ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 7 | SIZE AND TYPE CORE BARREL: NX DOUBLE-WALLED, 10ft | NO. SAMPLES: DIST. 2 | UNDIST. — CORE — |
| CASING: — | | WATER LEVEL: FINAL — | COMPL. — 24 HR. — |
| CASING HAMMER | WEIGHT (LB): — | DROP (IN): — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 in. I.D. SPLIT SPOON | | | INSPECTOR: CARL VARTERESIAN |
| SAMPLER HAMMER | WEIGHT (LB): 140 | DROP (IN): 30 | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BLOWS | RECOV., % | ROCK CORE: RECOVERY/RQD (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SM-SC - Dark Reddish Brown (10R 3/4) cm f SAND, some (+) Clayey Silt, little (OVERBURDEN) & f Gravel, dry 1.0 | | S-1 | 9 50/1 | 0.3/0.5 = 67 | | | | | | | Refusal at 7' depth probably due to quartzite cobble. |
| (BRUNSWICK FORMATION) | 1 | | | | | | | | | | |
| | 2 | | | | | | | | | | |
| | 3 | | | | | | | | | | |
| | 4 | | | | | | | | | | |
| MUDSTONE; friable hardness, friable strength, deeply / moderately weathered, moderately fractured (fractures up to 0.1 inch thick and completely occluded by dark green and tan clay) dark reddish brown (10R 3/4) | 5 | S-2 | 40 70 100/4 | 1.3/1.3 = 100 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
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| | 15 | | | | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | 9/16/86 |
| | 19 | | | | | | | | | | 10/1/86 Drilling Started at 0942 |

MGY 001 0505

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-14D **SHEET** 2 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE AND LOC. | SAMPLES: PENETR. RESIST. BLS/FT. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; dark reddish brown (10R 3/4). | 21 | | | | | | | | | 8 min/6 ft = 1.3 min/ft | Sample collected at 20 feet |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | Drilling stopped at 0950 |
| | 25 | | | | | | | | | | Drilling started at 1105 |
| | 26 | | | | | | | | | | |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | Water expelled at a rate of 10 gal/min |
| | 30 | | | | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| MUDSTONE; dark reddish brown (10 R 3/4), fractures coated with dark green and tan clay. | 35 | | | | | | | | | 30 min/20 feet = 1.5 min/ft. | Sample collected at 35 feet |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | Drilling stopped at 1125 |

MGY 001 0506

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-14D **SHEET** 3 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; as above, except calcite occures as fracture-filling cement. | 46 | | | | | | | | | | Drilling started at [illegible] Sample collected at [illegible] feet |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| 50.0 | 50 | | | | | | | | | | |
| | 51 | | | | | | | | | | Water expelled at a rate of 15 gal/min. |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| SILTSTONE; dark reddish brown (10R 3/4), fractures coated with clay and calcite cement. | 55 | | | | | | | | | [illegible] min/20 feet = 1 min/ft. | Sample collected at [illegible] feet |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | Drilling stopped at 1200 |
| SILTSTONE; as above | 65 | | | | | | | | | | Drilling started at 1205 Sample collected at 65 feet |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |

MGY 001 0507

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-14D **SHEET** 4 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | 25 min/20 feet = 1.3 min/ft | |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| SILTSTONE; as above. | 75 | | | | | | | | | | Sample collected at 75 feet |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | Water expelled at a rate of 15 gal/min |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | |
| | 80 | | | | | | | | | | |
| | 81 | | | | | | | | | | |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | Drilling stopped at 1230 |
| SILTSTONE; as above. | 85 | | | | | | | | | 30 min/20 feet = 1.5 min/ft | Drilling started at 1235 |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | Sample collected at 87 feet |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | | |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | |

MGY 001 0508

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-14D **SHEET** 5 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/FT. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE; as above | 96 | | | | | | | | | | Sample collected at 95 feet |
| | 97 | | | | | | | | | | |
| | 98 | | | | | | | | | | Water expelled at a rate of 15 gal/min |
| | 99 | | | | | | | | | | |
| | 100 | | | | | | | | | | |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | Drilling stopped at 1300 |
| SILTSTONE; as above | 105 | | | | | | | | | 35 min/20 feet = 1.8 min/ft | Drilling started at 1310 Sample collected at 105 feet |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | |
| | 110 | | | | | | | | | | |
| | 111 | | | | | | | | | | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | Water expelled at a rate of 20 gal/min |
| | 114 | | | | | | | | | | |
| SILTSTONE; as above, except fracture-filling clay and calcite are present in lower abundances. | 115 | | | | | | | | | | Sample collected at 115 feet |
| | 116 | | | | | | | | | | |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-14D

SHEET 6 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | Drilling stopped at 1345 |
| SILTSTONE; as above | 125 | | | | | | | | | | Drilling started at 1350 |
| | 126 | | | | | | | | | | |
| | 127 | | | | | | | | | | Sample [illegible] at 125 feet |
| | 128 | | | | | | | | | | |
| | 129 | | | | | | | | | | Water expelled at a rate of 50 gal/min |
| | 130 | | | | | | | | | | |
| 131.0 | 131 | | | | | | | | | 45 min/20 ft = 2.3 min/ft. | |
| | 132 | | | | | | | | | | |
| | 133 | | | | | | | | | | Contacts based on color change of drilling fluid |
| | 134 | | | | | | | | | | |
| ARGILLACEOUS DOLOSTONE; very dusky red (10 R 2/2), fine grained (micritic), calcite occurs as fracture-filling cement. 137.0 | 135 | | | | | | | | | | Sample collected at 135 feet |
| | 136 | | | | | | | | | | |
| | 137 | | | | | | | | | | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | |
| | 140 | | | | | | | | | | |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | | | | |
| | 144 | | | | | | | | | | Drilling stopped at 1435 |

MGY 001 0510

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-14D **SHEET** 7 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RQD, (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SILTSTONE, dark reddish brown (10R3/4), calcite and clay occurs as fracture-filling cement. | 146 | | | | | | | | | 10min/5ft = 2 min/ft | Drilling Started at 1440 Sample collected at [illegible] feet |
| | 147 | | | | | | | | | | |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | | | | | Drilling stopped at 1450 10/1/86 |
| | 150 | | | | | | | | | | BOTTOM OF HOLE |
| | 151 | | | | | | | | | | NOTES: 1) HNU readings of all soil and rock samples was 0.0 ppm |
| | 152 | | | | | | | | | | |
| | 153 | | | | | | | | | | |
| | 154 | | | | | | | | | | |
| | 155 | | | | | | | | | | |
| | 156 | | | | | | | | | | 2) Water discharge rates are approximate and represent average rates of water airlifted from aquifer during drilling |
| | 157 | | | | | | | | | | |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | |
| | 160 | | | | | | | | | | 3) Drilling Equipment: Failing 1500 used to 19.0 ft., hole completed by Schramm Rotadrill T650. |
| | 161 | | | | | | | | | | |
| | 162 | | | | | | | | | | |
| | 163 | | | | | | | | | | |
| | 164 | | | | | | | | | | 4) Failing rig used a 4¾ in. tricone during sampling and a 10 in tricone for casing installation. Schramm rig used a 6 in. air hammer. |
| | 165 | | | | | | | | | | |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | |
| | 168 | | | | | | | | | | 5) Cuttings from air rotary drilling were mostly fine-gravel in size. |
| | 169 | | | | | | | | | | |

MGY 001 0511

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-15D

SHEET 1 OF 11

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 123.9 | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE STARTED: 13 JUNE 1986 | DATE FINISHED: 26 JUNE 1986 |
| DRILLING EQUIPMENT: SEE NOTE, SHEET 11 | DRILLING MUD USED: BENTONITE (QUIK GEL) | COMPLETION DEPTH: 250.0 Ft. | DEPTH TO ROCK: 2.5 Ft. |
| SIZE AND TYPE OF BIT: SEE NOTE, SHEET 11 | SIZE AND TYPE CORE BARREL: | NO. SAMPLES: DIST 4 | UNDIST — CORE — |
| CASING — | | WATER LEVEL: FIRST — | COMPL — 24 HR — |
| CASING HAMMER — | WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN. I.D. SPLIT SPOON | | | INSPECTOR: J. SCARROW/C. SFORZA |
| SAMPLER HAMMER | WEIGHT (LB) 140 | DROP (IN) 30 | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/RQD (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SM-SC -- Moderate Brown (5YR4/4) mf SAND, some Silt & Clay, dry. | 1 | S-1 | 7 8 8 10 | 11.5/24 = 48 | | | | | | | |
| | 2 | | | | | | | | | | |
| (OVERBURDEN) 3.0 | 3 | | | | | | | | | | |
| (BRUNSWICK FORMATION) | 4 | | | | | | | | | | |
| MUDSTONE, deeply weathered; SM-SC-- Dark Reddish Brown cmf SAND, some clay & silt, moist. | 5 | S-2 | 12 16 26 30 | 18/24 = 75 | | | | | | | |
| | 6 | | | | | | | | | | |
| | 7 | | | | | | | | | | |
| | 8 | | | | | | | | | | |
| | 9 | | | | | | | | | | |
| SAME, but dry. | 10 | S-3 | 12 13 20 22 | 18/24 = 75 | | | | | | | |
| | 11 | | | | | | | | | | |
| | 12 | | | | | | | | | | |
| | 13 | | | | | | | | | | |
| | 14 | | | | | | | | | | |
| SAME, but dry. | 15 | S-4 | 13 19 100/4 | 8.5/16 = 53 | | | | | | | |
| | 16 | | | | | | | | | | |
| | 17 | | | | | | | | | | |
| | 18 | | | | | | | | | | |
| | 19 | | | | | | | | | | |

MGY 001 0512

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-15D **SHEET** 2 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE AND LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 21 | | | | | | | | | | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| MUDSTONE; dark reddish brown (10R3/4), calcite occurs as fracture-filling cement. | 25 | | | | | | | | | | Cuttings collected from 25 feet. Stopped drilling 6/13/86 |
| | 26 | | | | | | | | | | 6/25/86 |
| | 27 | | | | | | | | | | Started drilling |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| MUDSTONE, as above. | 35 | | | | | | | | | | Cuttings collected from 35 feet. |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | |
| MUDSTONE, as above. | | | | | | | | | | | Cuttings collected from 45 feet. |

MGY 001 0513

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-15D SHEET 3 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD, (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP/TCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | | | | | | | | | | |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| | 50 | | | | | | | | | | |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| MUDSTONE, as above. | 55 | | | | | | | | | | Cuttings collected from 55 feet. |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | |
| 60? | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| SANDSTONE; dark reddish brown (10R3/4), calcite occurs as fracture-filling cements. | 64 | | | | | | | | | | |
| | 65 | | | | | | | | | | Cuttings collected from 65 feet. |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |
| 70? | | | | | | | | | | | |

MGY 001 0514

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-15D SHEET 4 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | | |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| MUDSTONE; dark reddish brown (10R3/4), calcite occurs as fracture-filling cement. | 75 | | | | | | | | | | Cuttings collected from 75 feet. |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | |
| | 80 | | | | | | | | | | |
| | 81 | | | | | | | | | | |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | |
| MUDSTONE, as above. | 85 | | | | | | | | | | Cuttings collected from 85 feet. |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | | |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | Cuttings collected from 95 feet. |
| MUDSTONE, as above. | | | | | | | | | | | |

MGY 001 0515

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-15D SHEET 5 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 96 | | | | | | | | | | |
| | 97 | | | | | | | | | | |
| | 98 | | | | | | | | | | |
| | 99 | | | | | | | | | | |
| 100? | 100 | | | | | | | | | | |
| | 101 | | | | | | | | | | |
| | 102 | | | | | | | | | | |
| | 103 | | | | | | | | | | |
| | 104 | | | | | | | | | | |
| SILTSTONE; dark reddish brown (10R3/4), calcite occurs as fracture-filling cement. | 105 | | | | | | | | | | Cuttings collected from 105 feet. |
| | 106 | | | | | | | | | | |
| | 107 | | | | | | | | | | |
| 107.5 | | | | | | | | | | | |
| | 108 | | | | | | | | | | |
| | 109 | | | | | | | | | | |
| | 110 | | | | | | | | | | |
| | 111 | | | | | | | | | | |
| | 112 | | | | | | | | | | |
| | 113 | | | | | | | | | | |
| | 114 | | | | | | | | | | |
| DOLOMITIC LIMESTONE; brownish black (5YR2/1), fine grained (micritic). | 115 | | | | | | | | | | Cuttings collected from 115 feet |
| | 116 | | | | | | | | | | |
| | 117 | | | | | | | | | | |
| | 118 | | | | | | | | | | |
| | 119 | | | | | | | | | | |
| 120? | | | | | | | | | | | |

MGY 001 0516

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-15D **SHEET** 6 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ RQD. (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 121 | | | | | | | | | | |
| | 122 | | | | | | | | | | |
| | 123 | | | | | | | | | | |
| | 124 | | | | | | | | | | |
| ARGILLACEOUS LIMESTONE; dark gray (N3), fine grained (micritic), Calcite occurs as fracture-filling cement. | 125 | | | | | | | | | | Cuttings collected from 125 feet. |
| | 126 | | | | | | | | | | |
| | 127 | | | | | | | | | | |
| | 128 | | | | | | | | | | |
| | 129 | | | | | | | | | | |
| | 130 | | | | | | | | | | |
| | 131 | | | | | | | | | | |
| | 132 | | | | | | | | | | |
| | 133 | | | | | | | | | | |
| | 134 | | | | | | | | | | Cuttings collected from 135 feet. |
| ARGILLACEOUS LIMESTONE, as above. | 135 | | | | | | | | | | 6/13/86 |
| | 136 | | | | | | | | | | 6/26/86 Added rod, 1143 |
| | 137 | | | | | | | | | | |
| | 138 | | | | | | | | | | |
| | 139 | | | | | | | | | | |
| | 140 | | | | | | | | | | Water expelled at a rate of 50 gal./min., very dark gray in color. |
| | 141 | | | | | | | | | | |
| | 142 | | | | | | | | | | |
| | 143 | | | | | | | | | | |
| | 144 | | | | | | | | | | |
| ARGILLACEOUS LIMESTONE, as above. | | | | | | | | | | | Cuttings collected from 145 feet. |

MGY 001 0517

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-15D **SHEET** 7 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 146 | | | | | | | | | | |
| | 147 | | | | | | | | | | |
| | 148 | | | | | | | | | | |
| | 149 | | | | | | | | | | |
| 150 | 150 | | | | | | | | | 37 min./20 ft = 1.8 min./ft | Contact based on color change in drilling fluid, its now light gray in color. |
| | 151 | | | | | | | | | | |
| | 152 | | | | | | | | | | |
| | 153 | | | | | | | | | | |
| CLAYSTONE; black (N1), pyrite occurs as isolated framboids. | 154 | | | | | | | | | | Cuttings collected from 155 feet. Stopped drilling, 1220 |
| | 155 | | | | | | | | | | Added rod, 1220 |
| | 156 | | | | | | | | | | |
| | 157 | | | | | | | | | | |
| | 158 | | | | | | | | | | |
| | 159 | | | | | | | | | | Water expelled at a rate of 50 gal./min., light gray in color |
| | 160 | | | | | | | | | | |
| | 161 | | | | | | | | | 50 min./10 ft = 5.0 min./ft | |
| | 162 | | | | | | | | | | |
| | 163 | | | | | | | | | | At 164 feet, drilling fluid changed to light tan. |
| 164 | 164 | | | | | | | | | | Cuttings collected from 165 feet. Stopped drilling, 1310 |
| ARGILLACEOUS LIMESTONE; dark gray (N3), fine grained (micritic), pyrite occurs as isolated framboids. | 165 | | | | | | | | | | Added rod, 1310 |
| | 166 | | | | | | | | | | |
| | 167 | | | | | | | | | | |
| | 168 | | | | | | | | | | Water expelled at a rate of 50 gal./min., light gray in color. |
| | 169 | | | | | | | | | | |

MGY 001 0518

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-15D **SHEET** 8 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: BRECCIA | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 171 | | | | | | | | | | |
| | 172 | | | | | | | | | | |
| | 173 | | | | | | | | | | |
| | 174 | | | | | | | | | | |
| ARGILLACEOUS LIMESTONE, as above. | 175 | | | | | | | | | 57 min./10 ft. = 5.7 min/ft | Cuttings collected from 175 feet. Stopped drilling, 1407 |
| | 176 | | | | | | | | | | Added rod, 1407 |
| | 177 | | | | | | | | | | |
| | 178 | | | | | | | | | | |
| | 179 | | | | | | | | | | Water expelled at a rate of 50 gal./min., light gray in color |
| 180? | 180 | | | | | | | | | 65 min/10 ft = 6.5 min/10 ft. | |
| | 181 | | | | | | | | | | |
| | 182 | | | | | | | | | | |
| | 183 | | | | | | | | | | |
| | 184 | | | | | | | | | | Cuttings collected from 185 feet. Stopped drilling, 1512 |
| DOLOSTONE; dusky yellowish brown (10YR2/2), fine grained (micritic), pyrite occurs as isolated euhedral cubes. | 185 | | | | | | | | | | Added rod, 1512 |
| | 186 | | | | | | | | | | |
| | 187 | | | | | | | | | | |
| | 188 | | | | | | | | | | |
| | 189 | | | | | | | | | | Water expelled at a rate of 50 gal./min., medium gray in color. |
| 190? | 190 | | | | | | | | | 48 min/10 ft = 4.8 min/ft | |
| | 191 | | | | | | | | | | |
| | 192 | | | | | | | | | | |
| | 193 | | | | | | | | | | |
| ARGILLACEOUS LIMESTONE; dark gray (N3), fine grained (micritic), calcite occurs as fracture-filling cement. | 194 | | | | | | | | | | Cuttings collected from 195 feet. Stopped drilling, 1600 |

MGY 001 0519

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-15D

SHEET 9 OF 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | Added rod, 1600 |
| | 196 | | | | | | | | | | Water expelled at a rate of 50 gal./min., very dark grayish brown. |
| | 197 | | | | | | | | | | |
| | 198 | | | | | | | | | | |
| | 199 | | | | | | | | | | |
| | 200 | | | | | | | | | | |
| 201 | 201 | | | | | | | | | 67 min/10ft = 6.7 min/ft | contact based on color change in drilling fluid; its now light gray in color. |
| | 202 | | | | | | | | | | |
| | 203 | | | | | | | | | | |
| | 204 | | | | | | | | | | Cuttings collected from 205 feet. Stopped drilling, 1707 |
| CLAYSTONE; grayish black (N2), calcite occurs as fracture-filling cement, pyrite occurs as isolated framboids. | 205 | | | | | | | | | | Added rod, 1707 |
| | 206 | | | | | | | | | | |
| | 207 | | | | | | | | | | |
| | 208 | | | | | | | | | | |
| | 209 | | | | | | | | | | Water expelled at a rate of 50 gal./min., very dark gray in color. |
| | 210 | | | | | | | | | | |
| | 211 | | | | | | | | | | |
| | 212 | | | | | | | | | | |
| | 213 | | | | | | | | | 51 min/10ft = 5.1 min/ft. | |
| | 214 | | | | | | | | | | Cuttings collected from 215 feet. Stopped drilling, 1758 |
| CLAYSTONE, as above. | 215 | | | | | | | | | | Added rod, 17[illegible] |
| | 216 | | | | | | | | | | |
| | 217 | | | | | | | | | | |
| | 218 | | | | | | | | | | |
| | 219 | | | | | | | | | | |

MGY 001 0520

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-15D **SHEET** 10 **OF** 11

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD. (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 221 | 221 | | | | | | | | | 7.8 min./10 ft. = 7.2 min./ft. | Drilling fluid dark grey. Contact based on color change in fluid. |
| | 222 | | | | | | | | | | Water expelled at a rate of 50 gal./min., dark brown in color. |
| | 223 | | | | | | | | | | |
| MUDSTONE; dark reddish brown (10R 3/4), calcite occurs as fracture-filling cement | 224 | | | | | | | | | | Cuttings collected from 225 feet. Stopped drilling, 1910. |
| | 225 | | | | | | | | | 42 min./10 ft. = 4.2 min./ft. | Added rod, 1910 |
| | 226 | | | | | | | | | | |
| | 227 | | | | | | | | | | |
| | 228 | | | | | | | | | | Water expelled at a rate of 50 gal./min., reddish brown in color. |
| | 229 | | | | | | | | | | |
| | 230 | | | | | | | | | | |
| | 231 | | | | | | | | | | |
| | 232 | | | | | | | | | | |
| | 233 | | | | | | | | | | |
| | 234 | | | | | | | | | | Cuttings collected from 235 feet. Stopped drilling, 1952 |
| MUDSTONE, as above. | 235 | | | | | | | | | 48 min./10 ft. = 4.8 min./ft. | Added rod, 1952 |
| | 236 | | | | | | | | | | |
| | 237 | | | | | | | | | | |
| | 238 | | | | | | | | | | |
| | 239 | | | | | | | | | | Water expelled at a rate of 50 gal./min., reddish brown in color. |
| | 240 | | | | | | | | | | |
| | 241 | | | | | | | | | | |
| | 242 | | | | | | | | | | |
| | 243 | | | | | | | | | | |
| | 244 | | | | | | | | | | Cuttings collected from 245 feet. Stopped drilling, 2040 |
| MUDSTONE, as above. | | | | | | | | | | | |

MGY 001 0521

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-15D



| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 246 | | | | | | | | | 17 min/5ft = 3.4 min/ft | Added rod, 2040 |
| | 247 | | | | | | | | | | |
| | 248 | | | | | | | | | | Water expelled at a rate of 50 gal./min., reddish brown in color. |
| | 249 | | | | | | | | | | Cuttings collected from 250 |
| MUDSTONE, as above. | 250 | | | | | | | | | | stopped drilling, 2057 |
| | 251 | | | | | | | | | | BOTTOM OF HOLE |
| | 252 | | | | | | | | | | NOTES: |
| | 253 | | | | | | | | | | 1) HNU readings of all soil and rock samples was 0.0. |
| | 254 | | | | | | | | | | 2) water-discharge rates are approximate and represent average rates of water airlifted from the aquifer during drilling. |
| | 255 | | | | | | | | | | 3) Drilling Equipment: 1500 Failing used to 26 ft., hole completed by Schramm Rotadrill-T650. |
| | 256 | | | | | | | | | | 4) Failing rig used a 4 3/4 IN tricone for casing installation, Schramm rig used a 6 IN air hammer. |
| | 257 | | | | | | | | | | 5) Cuttings from air rotary drilling were mostly fine-gravel in size. |
| | 258 | | | | | | | | | | |
| | 259 | | | | | | | | | | |
| | 260 | | | | | | | | | | |
| | 261 | | | | | | | | | | |
| | 262 | | | | | | | | | | |
| | 263 | | | | | | | | | | |
| | 264 | | | | | | | | | | |
| | 265 | | | | | | | | | | |
| | 266 | | | | | | | | | | |
| | 267 | | | | | | | | | | |
| | 268 | | | | | | | | | | |
| | 269 | | | | | | | | | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-16 SHEET 1 OF 4

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 125.7 | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: Victor Aimar | DATE STARTED: 6/17/87 | DATE FINISHED: 6/19/87 |
| DRILLING EQUIPMENT: MAYHEW 500 | DRILLING MUD USED: N.A. | COMPLETION DEPTH: 82' | DEPTH TO ROCK: 28' |
| SIZE AND TYPE OF BIT: 4 3/4" & 7 7/8" tricone | SIZE AND TYPE CORE BARREL: NA | NO SAMPLES: DIST 7 | UNDIST — CORE — |
| CASING | | WATER LEVEL: FIRST — | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT (LB) | DROP (IN) | BORING ANGLE AND DIRECTION: Vertical |
| SAMPLER: 2" split spoon | | | INSPECTOR: Paul Kareth |
| SAMPLER HAMMER | WEIGHT (LB) 140' | DROP (IN) 30" | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/ROD, (%) | BEDDING | FRACTURE: SKETCH | COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Blacktop | | | | | | | | | | | |
| CL - Stiff reddish brown CLAY, trace gravel and Sand, plastic, moist | 1–2 | 1 | 4 6 8 9 | 1.6', 80% | | | | | | | HNU - no reading |
| CL - SAME AS ABOVE, tip had purple CLAY | 5–6 | 2 | 5 10 10 10 | 1.5', 75% | | | | | | | H-NU - no reading. |
| CL - Purple CLAY, green clay in matrix, medium hard, moist | 10–11 | 3 | 3 5 7 7 | 1.6', 80% | | | | | | | |
| CL - Reddish brown CLAY, trace sand and gravel, moist | 15–16 | 4 | 7 10 15 15 | 1.5 75% | | | | | | | |

MGY 001 0523

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-16 SHEET 2 OF 4

| DESCRIPTION | DEPTH, FT | SAMPLES TYPE NO. LOC | SAMPLES BLOWS/FT | SAMPLES POCKET PENET. BLOWS | % PENETRATION TON/FT | ROCK CORE RECOVERY % | ROCK CORE CRACK DIP | ROCK CORE CRACK DIAM | ROCK CORE PAD | ROCK CORE CORE TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CL- Reddish brown CLAY, whitish clay on fracture surfaces, medium hard to hard | 21 | 5 | 1.6 | 7 12 17 21 | | | | | | | |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| | 25 | | | | | | | | | | |
| CL- Reddish brown CLAY, white and green clay on fracture surfaces, hard | 26 | 6 | 1.4 | 15 19 30 34 | | | | | | | |
| | 27 | | | | | | | | | | |
| 28.0 | 28 | | | | | | | | | | change in rock hardness at 28' |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | refusal at 30'5" end day 6/17/87 |
| MUDSTONE - Reddish brown, hard friable | 31 | 7 | 0.2 | 100/5" | | | | | | | start 6/18/87 @ 0906 |
| | 32 | | | | | | | | | 1.8 min/ft. | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | 9 min/5ft = | |
| | 35 | | | | | | | | | | Collected cuttings at 35' |
| MUDSTONE - same as above | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | 2.4 min/ft. | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | 12 min/5ft = | |
| MUDSTONE - same as above | 40 | | | | | | | | | | Collected cuttings at 40' |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | 2.4 min/ft | Very hard rock at 42' |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | 12 min/5ft. = | |

MGY 001 0524

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-16 **SHEET** 3 **OF** 4

| DESCRIPTION | DEPTH, FT | REMARKS |
|---|---|---|
| MUDSTONE - reddish brown, calcite cement, very hard | 46, 47, 48, 49 | Collected cuttings at 45' |
| | | 2.4 min/ft ; 12 min/5ft |
| MUDSTONE - same as above | 50, 51, 52, 53, 54 | Collected cuttings at 50' |
| | | 2.4 min/ft ; 12 min/5ft |
| MUDSTONE - same as above, with calcite filled fractures | 55, 56, 57, 58, 59 | Collected cuttings at 55' |
| | | 1.6 min/ft ; 8 min/5ft |
| MUDSTONE - same as above grains of calcite and green clay - glauconite (?), calcite cement | 60, 61, 62, 63, 64 | Collected cuttings at 60' very hard at 61' |
| | | 4 min/ft ; 20 min/5ft |
| MUDSTONE - same as above grains of calcite and unknown black mineral, calcite cement | 65, 66, 67, 68, 69 | Collected cuttings at 65' |
| | | 3.6 min/ft ; 18 min/5ft |

MGY 001 0525

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-16 **SHEET** 4 **OF** 4

| DESCRIPTION | DEPTH, FT | REMARKS |
|---|---|---|
| MUDSTONE - Reddish brown, calcite cement, green and black clay on fracture surfaces, hard | 71, 72, 73, 74, 75 | Collected cuttings at 70'<br>Soft zone from 71 to 73.5'<br>11 min / 5ft = 2.2 min/ft<br>Collected cuttings at 75' |
| MUDSTONE - same as above | 76, 77, 78, 79, 80 | 15 min / 5ft = 3 min/ft<br>Collected cuttings at 80' |
| MUDSTONE - same as above | 81, 82, 83, 84 | |
| End of boring at 82' | | |

MGY 001 0526

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-17 SHEET 1 OF 4

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 139.3 | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: Victor Aimar | DATE STARTED: 15 JUNE 1987 | DATE FINISHED: 16 JUNE 1987 |
| DRILLING EQUIPMENT: Mayhew 500 | DRILLING MUD USED: — | COMPLETION DEPTH: 82' | DEPTH TO ROCK: 40' |
| SIZE AND TYPE OF BIT: 4 3/4" AND 7 7/8" tricone | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST. 8 | UNDIST. — CORE — |
| CASING: — | | WATER LEVEL: FIRST — | COMPL. — 24 HR. — |
| CASING HAMMER: WEIGHT (LB): DROP (IN): | | BORING ANGLE AND DIRECTION: Vertical | |
| SAMPLER: 2" split spoon | | INSPECTOR: CARL VARTERESIAN / Paul Kareth | |
| SAMPLER HAMMER: WEIGHT (LB): 140 | DROP (IN): 30" | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD. (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CL - stiff brown and yellow silty CLAY, trace sand and f. gravel, rootkairs, moist | 1–2 | S-1 | 4 5 4 2 | 1.0/2.0 = 50 | | | | | | | HNU: zero |
| CL - stiff reddish brown silty CLAY, trace f. sand, very moist. | 5–7 | S-2 | 9 11 13 15 | 1.0/2.0 = 50 | | | | | | | HNU: zero |
| CL - stiff brown silty CLAY, some fine sand and gravel, wet | 10–12 | S-3 | 8 8 10 10 | 0.3/2.0 = 11 | | | | | | | HNU: zero |
| CL - stiff purplish brown CLAY, trace silt, wet | 15–17 | S-4 | 6 8 9 10 | 1.6/2.0 = 80 | | | | | | | HNU: zero |

MGY 001 0527

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-17 SHEET 2 OF 4

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE SKETCH | ROCK CORE: FRACTURE COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CL - stiff dark purplish brown CLAY, wet | 21 | S-5 | 4 6 6 8 | 2.0/2.0 : 100 | | | | | | | HNU: zero |
| 23.5 | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| CL - v. stiff purplish brown CLAY, wet | 25 | S-6 | 6 11 13 15 | 2.0/2.0 : 100 | | | | | | | |
| 28.5 | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| CL - hard reddish brown CLAY, wet | 30 | S-7 | 8 14 20 26 | 1.6/2.0 : 80 | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | Drilling stopped at 35' on 6/15/87, resumed drilling on 6/16/87 |
| CL - as above | 35 | S-8 | 47 41 51 10 7/8 | | | | | | | | |
| 36.8 | 36 | | | | | | | | | | |
| Weathered bedrock | 37 | | | | | | | | | | |
| 40.0 | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | |
| MUDSTONE; low hardness reddish brown | 40 | | | | | | | | | 5'/10 min - 1½ min | Drilling started at 0932 Collected cuttings at 45' |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | |

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-17 SHEET 3 OF 4

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD, (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE, as above | 46 | | | | | | | | | | Collected cuttings at 45' |
| | 47 | | | | | | | | | | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| MUDSTONE; reddish brown, trace f. quartz gravel | 50 | | | | | | | | | | Collected cuttings at 50' |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| MUDSTONE; as above | 55 | | | | | | | | | 20'/31 min = 0.64'/min | Collected cuttings at 55' |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | Collected cuttings at 60' |
| MUDSTONE; hard, purple, calcite cement | 60 | | | | | | | | | | added 20' of rod at 1003 |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | |
| MUDSTONE; as above | 65 | | | | | | | | | | Collected cuttings at 65' |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | | |

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-17 SHEET 4 OF 4

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BL/6 IN | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE; hard, reddish brown, trace f. quartz gravel | 71 | | | | | | | | | | Collected cuttings at 70' |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | Collected cuttings at 75' |
| MUDSTONE; as above | 75 | | | | | | | | | | |
| | 76 | | | | | | | | | 20'/45 min = 0.44 ft/min | Very hard drilling from 75.5' to 78' |
| | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | | |
| MUDSTONE; as above | 80 | | | | | | | | | | Collected cuttings at 80' |
| | 81 | | | | | | | | | | |
| End of boring at 82' | 82 | | | | | | | | | | End pilot hole at 1048 with 4 3/4" tricone roller bit. Boring reamed with 7 7/8" tricone roller bit |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | |
| | 85 | | | | | | | | | | |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | | |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | |

MGY 001 0530

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-18 SHEET 1 OF 4

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 113.3 ft | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: Victor Aimar | DATE STARTED: 13 JUNE 1987 | DATE FINISHED: 13 June 1987 |
| DRILLING EQUIPMENT: Mayhew 500 | DRILLING MUD USED: QUIK-GEL BENTONITE | COMPLETION DEPTH: 80.0 FT | DEPTH TO ROCK: 12.0 FT |
| SIZE AND TYPE OF BIT: 4 3/4 AND 7 7/8 in tri-cone | SIZE AND TYPE CORE BARREL: NONE | NO. SAMPLES: DIST 4 | UNDIST — CORE — |
| CASING — | | WATER LEVEL: TIMET — | COMPL — 24 HR — |
| CASING HAMMER — WEIGHT (LB) — | DROP (IN) — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 in O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER WEIGHT (LB) 140 | DROP (IN) 30 | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BL/6 IN. | RECOV., % | ROCK CORE: RECOVERY/ROD. (%) | BEDDING | FRACTURE: SKETCH | FRACTURE: COND. | FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CL - v. stiff, reddish brown, slightly plastic silty CLAY, some c-f sand, occ. f. gravel, dry | 1, 2 | S-1 | 8, 16, 17, 15 | 0.9/2.0 = 45 | | | | | | | 6/13/87 HNU READINGS: BACKGROUND = 0.2 ppm SOIL = 0.2 ppm |
| CH - Stiff, reddish brown, plastic CLAY, tr. silts, tr. c-f sand, occ. f. gravel, moist. | 5, 6, 7 | S-2 | 4, 4, 5, 7 | 1.1/2.0 = 55 | | | | | | | HNU = 0.2 backg = 0.2 soil |
| 8.5 | 8, 9 | | | | | | | | | | |
| ML - Hard, reddish brown, non-plastic f. sandy SILT, tr. clay, tr. m. sand, dry (OVERBURDEN) | 10, 11 | S-3 | 10, 28, 50, 107 | 1.0/2.0 = 50 | | | | | | | |
| 12.0 (BRUNSWICK FORMATION) | 12, 13, 14 | | | | | | | | | | |
| | 15 | S-4 | 100/6 | 0.8/0.8 = 100 | | | | | | | |
| MUDSTONE; low hardness, weak strength, strongly weathered, some dark green and tan clay present as fracture-filling cement | 16, 17, 18, 19 | | | | | | | | | 5 min/5 ft = 1 min/ft | Drilling started at 1202 Drilling stopped at 1207 |

MGY 001 0531

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-18 **SHEET** 2 **OF** 4

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: REC'OV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP & TCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE, dark reddish brown (10R 3/4), dark green and tan clay present as fracture-filling cement | 21 | | | | | | | | | 20 min/20 ft. = 1 min/ft. | Added 20 ft. rod. Started drilling at 1300. Collected cuttings at 20 ft. |
| | 22 | | | | | | | | | | |
| | 23 | | | | | | | | | | |
| | 24 | | | | | | | | | | |
| | 25 | | | | | | | | | | Collected cuttings at 25 ft |
| MUDSTONE; as above | 26 | | | | | | | | | | |
| | 27 | | | | | | | | | | |
| | 28 | | | | | | | | | | |
| | 29 | | | | | | | | | | |
| MUDSTONE, as above | 30 | | | | | | | | | | Collected cuttings at 30 ft. |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| MUDSTONE, as above | 35 | | | | | | | | | | Collected cuttings at 35 ft |
| | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | | |
| | 38 | | | | | | | | | | |
| | 39 | | | | | | | | | | Stopped drilling at 1320. Collected cuttings at 40 ft |
| MUDSTONE; as above | 40 | | | | | | | | | | Added 20 ft rod. Started drilling at 1325 |
| | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | | Collected cuttings at 45 ft |
| MUDSTONE; as above | | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-18 SHEET 3 OF 4

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 46 | | | | | | | | | 30 min/20 ft = 1.5 min/ft | |
| | 47 | | | | | | | | | | HNU cuttings spoil pile = 5.2 = Amount Background |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| MUDSTONE, as above | 50 | | | | | | | | | | Collected cuttings at 50 ft. |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| MUDSTONE, as above | 55 | | | | | | | | | | Collected cuttings at 55 ft |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | | Stopped drilling at 1355. Collected cuttings at 60 ft |
| MUDSTONE, as above | 60 | | | | | | | | | | Added 20 ft. rod Started drilling at 1405 |
| | 61 | | | | | | | | | | |
| | 62 | | | | | | | | | | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | | |
| MUDSTONE, as above, except fracture-filling clay present in less abundance | 65 | | | | | | | | | 35 min/20 ft = 1.75 min/ft | Collected cuttings at 65 ft |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | | |
| | 68 | | | | | | | | | | |
| MUDSTONE, as above. | 69 | | | | | | | | | | Collected cuttings at 70 ft |

MGY 001 0533

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

LOG OF BORING MW-18 SHEET 4 OF 4

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/6IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 71 | | | | | | | | | | HNU reading of cuttings from pile is 0.8 ppm above background |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | |
| | 74 | | | | | | | | | | |
| MUDSTONE, as above, except calcite appears as fracture and void filling cement. | 75 | | | | | | | | | | Collected cuttings at 75 ft |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | | |
| | 78 | | | | | | | | | | Stopped drilling at 1445 |
| | 79 | | | | | | | | | | Collected cuttings at 80 ft. 6/13/87 |
| MUDSTONE, as above | 80 | | | | | | | | | | |
| Bottom of hole at 80.0 ft. | 81 | | | | | | | | | | Note: 1) HnU readings of rock samples from 70 ft were 0.8ppm above background; all others were 0.0 above background. 2) 4 3/4" tricone bit was used to drill a pilot hole. the 7 7/8" tricone bit was used to ream out the pilot hole. |
| | 82 | | | | | | | | | | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | | |
| | 85 | | | | | | | | | | |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | | |
| | 90 | | | | | | | | | | |
| | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | | |

MGY 001 0534

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-19 SHEET 1 OF 7

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET CO., NEW JERSEY | | SURFACE ELEVATION: 38.2 ft | PROJECT NO.: 84C4007 A |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: Vince Gandolfo | DATE STARTED: 8/6/87 | DATE FINISHED: 8/13/87 |
| DRILLING EQUIPMENT: CME-55 / ATV | DRILLING MUD USED: NA | COMPLETION DEPTH: 151.0' | DEPTH TO ROCK: 17.5' |
| SIZE AND TYPE OF BIT: 4 3/4 & 3 3/4 tricone | SIZE AND TYPE CORE BARREL: 2" NX core barrel | NO. SAMPLES: DIST. 4 | UNDIST. — DIST. |
| CASING: 5" steel | | WATER LEVEL: DATE | COMPL. TIME |
| CASING HAMMER: WEIGHT (LB) 300 | DROP (IN) 30 | BORING ANGLE AND DIRECTION: Vertical | |
| SAMPLER: 2" split spoon | | INSPECTOR: Paul Kareth | |
| SAMPLER HAMMER: WEIGHT (LB) 140 | DROP (IN) 30 | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | PENETR. RESIST. BLS/6IN. | RECOV., % | ROCK CORE: RECOVERY/RQD (%) | BEDDING | FRACTURE: SKETCH | COND. | FRACTURE SPACING | DRILLING RATE | REMARKS (HNU: Ambient/Sample) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CL; Brown silty CLAY, trace c-f sand, f. gravel, roothairs, wet. | 1–2 | 1 | 2 3 2 | 6", 33% | | | | | | | HNU - .2/.2 |
| 3.0 | 3–5 | | | | | | | | | | |
| SM/GM Brown silty c-f. SAND and c-f GRAVEL, some clay, angular pieces of reddish brown mudstone (Brunswick) | 6–7 | 2 | 16 32 33 41 | 15", 75% | | | | | | | HNU - .2/.2 |
| 8.0 | 8–9 | | | | | | | | | | |
| SM - Greenish Tan silty m-f. SAND, some gravel, wet | 10–12 | 3 | 12 18 32 77 | 1.0', 50% | | | | | | | HNU - .2/.2 |
| 13.0 | 13–14 | | | | | | | | | | hard drilling @ 14' |
| 15.0 | 15 | | | | | | | | | | |
| SM - Tan. silty c-f. SAND, with gravel, wet 15.5 | 15–16 | 4A | 16 86 | .3' | | | | | | | HNU - fogging |
| 16.5 Decomposed Bedrock - Dark reddish brown mudstone (Brunswick) with greenish clay in fractures | 16–17 | | 100/5 | .4' | | | | | | | drove casing to 15' and washed out |
| Competent rock @ 17.5' | 17–19 | | | | | | | | | | |

MGY 001 0535

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-19 **SHEET** 2 **OF** 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE AND LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/ ROD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: DIP/TCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MUDSTONE - Dark reddish brown fractures filled with black and white clay | 21 | | | | 2.9'/0% | | 80 | CS | | 3.3 m/ft | |
| | 22 | | | | | | 50 | CP | | 10 min/3' | |
| | 23 | | | | | | | | | | |
| MUDSTONE - Dark reddish brown, fractures filled with black and dark green clay | 24 | | | | 4.8'/40% | | 25 | CP | | | |
| | 25 | | | | | | 45 | CG | | | |
| | 26 | | | | | | 20 | CG | | 6 m/ft | |
| | 27 | | | | | | 5 | CS | | 30 min/5' | |
| | 28 | | | | | | | CG | | | drove casing to 17.5'. End of day 8/6/87. 8/7/87 - reamed hole w/4 3/4" bit to 29 ft, set and grouted casing. |
| | 29 | | | | | | | | | | |
| | 30 | | | | | | | | | | |
| | 31 | | | | | | | | | | |
| | 32 | | | | | | | | | | |
| | 33 | | | | | | | | | | |
| | 34 | | | | | | | | | | |
| | 35 | | | | | | | | | | cuttings at 35' |
| Mudstone - reddish brown, moderately hard (Brunswick Fm) | 36 | | | | | | | | | | |
| | 37 | | | | | | | | | 1.6 m/ft | |
| | 38 | | | | | | | | | 8 min/5' | |
| | 39 | | | | | | | | | | |
| | 40 | | | | | | | | | | cuttings at 40' |
| Mudstone - same as above | 41 | | | | | | | | | | |
| | 42 | | | | | | | | | 1.4 m/ft | |
| | 43 | | | | | | | | | | |
| | 44 | | | | | | | | | 7 min/5' | |

MGY 001 0536

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-19 SHEET 3 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLOWS | SAMPLES: % RECOV. | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: DESIGNING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mudstone - reddish brown, some flakes coated with black clay, calcite cement, moderately hard to hard. | 46 | | | | | | | | | | cuttings at 45' |
| | 47 | | | | | | | | | 2.4 min/ft | |
| | 48 | | | | | | | | | | |
| | 49 | | | | | | | | | | |
| Mudstone - same as above | 50 | | | | | | | | | 12 min/5ft | cuttings at 50' |
| | 51 | | | | | | | | | | |
| | 52 | | | | | | | | | 2.8 min/ft | |
| | 53 | | | | | | | | | | |
| | 54 | | | | | | | | | | |
| Mudstone - same as above | 55 | | | | | | | | | 14 min/5ft | cuttings at 55' |
| | 56 | | | | | | | | | | |
| | 57 | | | | | | | | | 2.6 min/ft | |
| | 58 | | | | | | | | | | |
| | 59 | | | | | | | | | 13 min/5ft | |
| Mudstone - same as above | 60 | | | | | | | | | | |
| | 61 | | | | | | | | | | |
| soft zone 61-63' | 62 | | | | | | | | | 2 min/ft | |
| | 63 | | | | | | | | | | |
| | 64 | | | | | | | | | 10 min/5ft | |
| Mudstone - same as above | 65 | | | | | | | | | | |
| | 66 | | | | | | | | | | |
| | 67 | | | | | | | | | 2.8 min/ft | |
| | 68 | | | | | | | | | | |
| | 69 | | | | | | | | | 14 min/5ft | |

MGY 001 0537

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-19 SHEET 4 OF 7

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE NO. LOC. | SAMPLES: PENETR. RESIST. BLS/IN. | SAMPLES: RECOV., % | ROCK CORE: RECOVERY/RQD (%) | ROCK CORE: BEDDING | ROCK CORE: FRACTURE: SKETCH | ROCK CORE: FRACTURE: COND. | ROCK CORE: FRACTURE SPACING | DRILLING RATE | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Mudstone - reddish brown, low to moderately hard, black and dark green clay coatings on some chips. | 71 | | | | | | | | | 1.6 min/ft | |
| | 72 | | | | | | | | | | |
| | 73 | | | | | | | | | | safe zone 72'-79' |
| | 74 | | | | | | | | | 3 min/5 ft | |
| Mudstone - same as above | 75 | | | | | | | | | | |
| | 76 | | | | | | | | | | |
| | 77 | | | | | | | | | 2 min/5 ft | |
| | 78 | | | | | | | | | | |
| | 79 | | | | | | | | | 10 min/5 ft = | |
| | 80 | | | | | | | | | | End of Day 8/10/87 |
| Mudstone - reddish brown, moderately hard, black and green clay coatings on some chips. calcite cement | 81 | | | | | | | | | | Resumed drilling 8/11/87 |
| | 82 | | | | | | | | | 2.4 min/ft | |
| | 83 | | | | | | | | | | |
| | 84 | | | | | | | | | 12 min/5 ft = | |
| Mudstone - same as above | 85 | | | | | | | | | | Collected cuttings at 85' |
| | 86 | | | | | | | | | | |
| | 87 | | | | | | | | | 2.8 min/ft | |
| | 88 | | | | | | | | | | |
| | 89 | | | | | | | | | 14 min/5 ft = | |
| | 90 | | | | | | | | | | collected cuttings at 90' |
| Mudstone - same as above | 91 | | | | | | | | | | |
| | 92 | | | | | | | | | 2.4 min/ft | |
| | 93 | | | | | | | | | | |
| | 94 | | | | | | | | | 12 min/5 ft = | |

MGY 001 0538

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-19 **SHEET** 5 **OF** 7

| DESCRIPTION | DEPTH, FT | REMARKS |
|---|---|---|
| Mudstone - reddish brown, moderately hard, black and dark green clay coatings on some chips, calcite cement. | 16, 97, 98, 99, 100 | cuttings at 95' |
| Mudstone - same as above | 101, 102, 103 | cuttings at 100' |
| — — — — — Soft zone — | 104, 105 | cuttings at 105' |
| Mudstone - reddish brown, low hardness, some black and dark green clay coatings | 106, 107, 108, 109, 110 | cuttings at 110' |
| Mudstone - same as above | 111, 112, 113, 114 | |
| Mudstone - same as above | 115 | |
| — — — — — End soft zone — | 116, 117, 118, 119 | |

MGY 001 0539

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING MW-19 SHEET 6 OF 7

| DESCRIPTION | DEPTH, FT | REMARKS |
|---|---|---|
| Mudstone - reddish brown, moderately hard, black and green clay coatings on some chips, calcite cement | 121, 122 | gradual water loss in mud tub ≈ 2 gal. cuttings at 120' |
| Purple Mudstone - drilling fluid turned purple. | 123, 124 | |
| Mudstone - same as above | 125, 126, 127, 128, 129 | cuttings at 125' |
| Mudstone - same as above | 130, 131 | cuttings at 130' |
| Sandstone - purple, quartz sand, low hardness, purple clay | 132, 133, 134, 135, 136, 137, 138, 139 | gradual water loss in mud tub ≈ 30 gal. cuttings at 135' |
| Sandstone - same as above | 140, 141, 142, 143, 144 | cuttings at 140' |

MGY 001 0540

**WOODWARD-CLYDE CONSULTANTS**

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** MW-19 **SHEET** 7 **OF** 7

| DESCRIPTION | DEPTH, FT | REMARKS |
|---|---|---|
| Sandstone - same as above | 146 | cuttings at 145' |
| | 147 | |
| | 148 | |
| | 149 | |
| Sandstone - same as above | 150 | cuttings at 150' |
| | 151 | |
| End of Boring at 151' | 152 | |

Notes:

1) HNU readings of all soil, rock, and drilling fluid was at background levels.

2) No "drilling muds" were added to the drilling fluid. Approved Rocky Hill potable water was used.

3) Rig used was a CME-55 ATV, with a 3 3/4" tri-cone bit; NX core barrel

MGY 001 0541

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-1 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 133.8 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 3 JUNE 1987 | DATE FINISHED: 3 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 ATV | | COMPLETION DEPTH: 20.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: 6 IN DRAG BIT | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 10 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 3 INCH O.D. SPLIT SPOON | | INSPECTOR: CARL VARTERESIAN | |
| SAMPLER HAMMER | WEIGHT SEE REMARKS DROP 30 in. | | |

| DESCRIPTION | PIEZOMETER | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| CL; hard, reddish brown silty CLAY, tr. f. sand, dry | | 1 | SS-1 | 1.5 | 8 14 16 | 1010 | NA | NA | 1011 | 140 lb. HAMMER |
| | | 2 | | | 100% | 1015 | NA | NA | | NO RECOVERY, HIT BOULDER AT 1.5 FT. |
| CL; same as above, moist | | 3 | SS-2 | 1.5 | 7 9 14 | 1053 | 2.0 | 0.2 | 1100 | AUGERED FROM 1.5 TO 2.5 FT. HNU ERRATIC |
| | | 4 | | | | | | | | |
| CL; same as above | | 5 | SS-3 | 2.0 | 2 10 14 15 | 1107 | 1.0 | 0.2 | 1115 | Same as above |
| | | 6 | | | | | | | | |
| CL; same as above | | 7 | SS-4 | 2.0 | 15 17 22 24 | 1125 | 4.0 | 0.2 | 1128 | Same as above |
| | | 8 | | | | | | | | |
| CL; same as above | | 9 | SS-5 | 1.9 | 4 6 12 14 | 1307 | NA | NA | 1310 | SWITCH TO 300 lb HAMMER AT 8 FT. HNU NOT WORKING |
| | | 10 | | | | | | | | |
| CL; same as above | | 11 | SS-6 | 2.0 | 4 8 10 11 | 1316 | NA | NA | 1319 | Same as above |
| | | 12 | | | | | | | | |
| CL; same as above, except with tan and black clay partings, moist. | | 13 | SS-7 | 1.7 | 10 17 20 24 | 1340 | NA | NA | NA | same as above |
| | | 14 | | | | | | | | |
| CL; same as above | | 15 | SS-8 | 1.8 | 4 8 10 13 | 1350 | NA | NA | NA | same as above |
| | | 16 | | | | | | | | |
| CL; same as above | | 17 | SS-9 | 1.8 | 5 9 30 33 | 1410 | NA | NA | NA | same as above |
| | | 18 | | | | | | | | |
| CL; same as above | | 19 | SS-10 | 2.0 | 14 19 20 21 | 1430 | NA | NA | NA | same as above |
| Bottom of boring at 20.0 ft. | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** SB-2 **SHEET** 1 **OF** 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 134.4 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FORMAN: GEORGE KUTSCHERE | DATE STARTED: 4 JUNE 1987 | DATE FINISHED: 4 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 ATV | | COMPLETION DEPTH: 20.0 FT. | ROCK DEPTH: N.E |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 10 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3 IN. O.D. SPLIT SPOON | | | INSPECTOR: CARL VARTERESIAN |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 IN. | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| SP; loose, light brown c-m sand, some f. sand and f. gravel, moist 0.7 FT | | | | | | | | | 140 lb. HAMMER |
| CL; v. stiff, reddish brown silty CLAY, tr. f. sand, moist 2.0 FT | 1 | SS-1 | 1.8 | 3 10 20 21 | 1015 | 0.2 | 0.2 | 1017 | |
| ML; hard, reddish brown silty clayey f. SAND, dry | 2 3 | SS-2 | 1.9 | 24 53 65 91 | 1020 | 0.2 | 0.2 | 1022 | |
| ML; same as above 5.5 FT | 4 5 | SS-3 | 2.0 | 14 28 31 37 | 1035 | 0.2 | 0.2 | 1037 | |
| CL-ML; hard, reddish brown silty CLAY, some f. sand, dry | 6 7 | SS-4 | 1.8 | 28 39 75 30 | 1050 | 0.2 | 0.2 | 1052 | |
| CL; hard, reddish brown silty CLAY, some f. gravel, dry 10.0 FT | 8 9 | SS-5 | 1.8 | 11 14 19 17 | 1055 | 2.0 | 0.2 | 1102 | SWITCH TO 300 lb HAMMER AT 7.5 FT. |
| CH-CL; hard, brownish red plastic to med. plastic silty CLAY, dry | 10 11 | SS-6 | 2.0 | 4 12 14 16 | 1130 | 0.4 | 0.2 | 1135 | |
| CH-CL; same as above, except very stiff. | 12 13 | SS-7 | 2.0 | 3 4 9 8 | 1230 | 0.4 | 0.2 | 1235 | |
| CH-CL; same as above | 14 15 | SS-8 | 1.7 | 2 2 4 8 | 1250 | 0.4 | 0.2 | 1258 | |
| CH-CL; same as above, except hard. 17.7 FT | 16 17 | SS-9 | 1.8 | 5 9 11 11 | 1310 | 0.8 | 0.2 | 1315 | |
| ML-CL; hard, reddish brown clayey f. sandy SILT, tr. m-c sand, dry. Bottom of boring at 20.0 ft | 18 19 | SS-10 | 1.9 | 3 7 10 10 | 1320 | 1.0 | 0.2 | 1335 | |

MGY 001 0543

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-3 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 123.2 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: | DATE STARTED: 5 JUNE 1987 | DATE FINISHED: 5 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 ATV | | COMPLETION DEPTH: 20.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: 6" drag bit | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: SPT 10 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3 IN. O.D. SPLIT SPOON | | | INSPECTOR: CARL VARTERESIAN |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 IN. | |

| DESCRIPTION | PENETROMETER | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| CL-ML; v.stiff, mottled brown and yellow silty f.sandy CLAY, tr. f.gravel, dry | | 1 | SS-1 | 1.8 | 5 11 11 13 | 0907 | 0.2 | 0.2 | 0915 | 140 lb. HAMMER |
| SW-SM, med dense, mottled orange, yellow and brown c-f SAND, tr. silt, saturated w/strong chem. odor. | | 3 | SS-2 | 1.8 | 8 9 17 32 | 0915 | 10.0 | 0.2 | 0925 | BORING HEADSPACE 10.0 ppm BREATHING ZONE 0.2 ppm |
| SM; very dense, brown silty f. SAND, saturated, with strong chemical odor. | | 5 | SS-3 | 1.8 | 24 85 25 27 | 0930 | 8.0 | 0.2 | 0935 | BORING H.S. 10.0 ppm BREATHING 0.2 SWITCH TO 300 lb. HAMMER AT 5 FT. |
| SM; same as above | | 7 | SS-4 | 2.0 | 20 20 17 18 | 0945 | 4.0 | 0.2 | 0955 | BORING 10.0 ppm BREATHING 0.2 |
| SM-SW - dense, mottled brown, yellow and orange silty f. SAND, tr. clay, saturated, with strong chemical odor. | | 9 | SS-5 | 2.0 | 10 13 19 18 | 1045 | 1.0 | 0.2 | 1055 | BEGAN USING AUGERS AT 8 FT. BORING 5.0 ppm BREATHING 0.2 |
| SM-SW; same as above, except tr. c-m sand, moist | | 11 | SS-6 | 1.5 | 12 20 20 19 | 1050 | 0.2 | 0.2 | 1107 | BORING 0.6 ppm BREATHING 0.2 |
| SM-SW; same as above, except dry, no chemical odor | | 13 | SS-7 | 1.5 | 9 15 15 16 | 1120 | 0.2 | 0.2 | 1130 | BORING HEADSPACE 0.2 ppm |
| SM-SW; same as above | | 15 | SS-8 | 1.6 | 5 11 22 13 | 1145 | 0.2 | 0.2 | 1150 | BORING HEADSPACE 0.2 ppm |
| SM-SW; same as above | | 17 | SS-9 | 1.5 | 14 14 23 20 | 1150 | 0.2 | 0.2 | 1155 | BORING HEADSPACE 0.2 ppm |
| SM-SW; same as above | | 19 | SS-10 | 1.0 | 8 10 18 20 | 1155 | 0.2 | 0.2 | 1205 | BORING HEADSPACE 0.2 ppm |
| Bottom of boring at 20.0 ft | | | | | | | | | | |

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-4 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 109.3 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 2 JUNE 1987 | DATE FINISHED: 2 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 ATV | | COMPLETION DEPTH: 15.8 FT. | ROCK DEPTH: 15.8 FT |
| SIZE AND TYPE OF BIT: 6 IN. DRAG BIT | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 8 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST 14 FT | COMPL — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT SEE REMARKS | DROP 30 IN | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL; hard; mottled reddish brown and orange silty CLAY, tr. c-f sand, dry | 1–2 | SS-1 | 1.5 | 4 26 24 27 | 1337 | 0.2 | 0.2 | 1340 | 140 lb. HAMMER |
| CL; same as above, except v. stiff | 3–4 | SS-2 | 1.0 | 13 14 14 13 | 1340 | 0.2 | 0.2 | 1345 | |
| CL-CH; hard, reddish brown med. plastic silty CLAY, tr. f. sand, dry | 5–6 | SS-3 | 1.0 | 23 46 26 24 | 1352 | 0.2 | 0.2 | 1355 | |
| ML-SM; hard, reddish brown, sl. plastic f. sandy SILT, some clay, dry | 7–8 | SS-4 | 2.0 | 12 16 18 15 | 1401 | 0.2 | 0.2 | 1405 | SWITCH TO 300 lb. HAMMER AT 6 FT |
| ML-SM; same as above | 9–10 | SS-5 | 1.2 | 12 18 22 46 | 1518 | 0.2 | 0.2 | 1522 | BEGAN USING HOLLOW STEM AUGERS AT 8 FT |
| ML-SM; same as above | 11–12 | SS-6 | 2.0 | 15 22 36 72 | 1533 | 0.2 | 0.2 | 1540 | |
| ML-SM; same as above | 13–14 | SS-7 | 2.0 | 37 54 42 61 | 1610 | 0.2 | 0.2 | 1616 | |
| ML-CL; hard, reddish brown med. plastic clayey silt, some f. sand, wet | 15–16 | SS-8 | 1.8 | 15 36 39 75/4 | 1640 | 0.2 | 0.2 | 1644 | FIRST OCCURRENCE OF GW AT 14 FT |
| Bottom of boring at 15.8 ft. | 16–19 | | | | | | | | |

MGY 001 0545

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-5 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 110.7 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: Earnest Thomas | DATE STARTED: 2 JUNE 1987 | DATE FINISHED: 2 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 20.0 FT | WATER DEPTH: N.E. |
| SIZE AND TYPE OF BIT: | SIZE AND TYPE CORE BARREL: | NO. SAMPLES: DIST 10 | LAYOUT: — DEAD: — |
| CASING: | — | WATER LEVEL: DIST N.E. | COMPL.: — DATE: — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 3 IN. O.D. SPLIT SPOON | | INSPECTOR: PAUL KARETH | |
| SAMPLER HAMMER: WEIGHT SEE REMARKS | DROP 30 IN. | | |

| DESCRIPTION | PENETRATION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETRA. RESIST. BL/6IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| (TOPSOIL) 1.0 FT | | 1 | SS-1 | 1.4 | 4 5 5 8 | 1220 | 0.0 | 0.0 | 1220 | 140 lb. HAMMER |
| SP; loose to med. dense yellow-brown c-f SAND, tr. gravel, moist | | 2 | | | | | | | | |
| SP; same as above, except med. dense | | 3 | SS-2 | 1.6 | 6 6 6 6 | 1235 | 0.0 | 0.0 | 1235 | |
| SP; same as above, except loose | | 4 | | | | | | | | |
| | | 5 | SS-3 | 1.7 | 6 4 3 3 | 1250 | 0.0 | 0.0 | 1250 | |
| SP; same as above, except med. dense | | 6 | | | | | | | | |
| 8.0 FT | | 7 | SS-4 | 0.8 | 4 6 12 12 | 1305 | 4.8 | 0.0 | 1305 | |
| GP; med. dense yellow-brown c-f sandy GRAVEL, moist, with slight chemical odor. | | 8 | | | | | | | | |
| | | 9 | SS-5 | 0.6 | 17 12 11 9 | 1320 | 0.8 | 0.0 | 1325 | |
| GP; same as above | | 10 | | | | | | | | |
| 12.0 FT | | 11 | SS-6 | 0.2 | 15 11 12 13 | 1400 | 0.0 | 0.0 | 1400 | |
| CL-ML; hard, mottled yellow, brown silty CLAY, tr. f. sand, tr. gravel, moist | | 12 | | | | | | | | |
| | | 13 | SS-7 | 1.8 | 18 21 23 27 | 1405 | 0.0 | 0.0 | 1410 | |
| CL-CH; hard, brown med. plastic silty CLAY, moist | | 14 | SS-8 | 0.2 | 100/6" | 1500 | 0.0 | 0.0 | 1500 | Hit refusal at 14.5 ft. Drove casing to 16 FT. |
| 16.0 FT | | 15 | | NR | NR | | NA | NA | | SWITCH TO 300 lb. HAMMER AT 16 FT. |
| SP-SM; very dense, yellow-tan m-f SAND, some silt, dry | | 16 | | | | | | | | |
| | | 17 | SS-9 | 1.3 | 21 22 24 27 | 1550 | 0.0 | 0.0 | 1555 | |
| SP-SM; same as above | | 18 | | | | | | | | |
| 19.0 FT | | 19 | SS-10 | 1.0 | 25 31 31 39 | 1600 | 0.0 | 0.0 | 1605 | |
| CL; hard, reddish brown silty CLAY, dry | | | | | | | | | | |
| Bottom of boring at 20.0 FT | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-6 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 114.4 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 8 JUNE 1987 | DATE FINISHED: 8 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 ATV | | COMPLETION DEPTH: 20.0 FT. | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 10 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST 15 FT. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3 IN. O.D. SPLIT SPOON | | | INSPECTOR: CARL VARTERESIAN |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 IN. | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL; v. stiff reddish brown silty gravelly CLAY, tr. f. sand, moist | 1 | SS-1 | 0.8 | 8 9 15 38 | 0825 | 0.2 | 0.2 | 0830 | 140 lb. HAMMER |
| CL; same as above, except hard. | 2 3 | SS-2 | 0.8 | 15 40 17 75 | 0835 | 0.2 | 0.2 | 0840 | |
| CL; same as above, except v. stiff | 4 5 | SS-3 | 1.1 | 2 4 5 5 | 1010 | 0.2 | 0.2 | 1011 | SWITCH TO 300 lb. HAMMER AT 4 FT. |
| CL; same as above, except hard. | 6 7 | SS-4 | 1.7 | 8 9 10 13 | 1020 | 0.2 | 0.2 | 1021 | |
| CL; same as above | 8 9 | SS-5 | 2.0 | 4 12 15 16 | 1038 | 0.2 | 0.2 | 1046 | |
| CL; same as above | 10 11 | SS-6 | 1.4 | 9 13 12 12 | 1050 | 0.2 | 0.2 | 1048 | |
| CL; same as above | 12 13 | SS-7 | 2.0 | 12 12 11 14 | 1125 | 0.2 | 0.2 | 1132 | |
| CL; same as above, except wet | 14 15 | SS-8 | 1.0 | 5 9 12 12 | 1130 | 0.2 | 0.2 | 1135 | FIRST OCCURRENCE OF GW AT 15 FT |
| CL; same as above | 16 17 | SS-9 | 1.9 | 8 9 12 17 | 1140 | 0.2 | 0.2 | 1142 | |
| CL; same as above. | 18 19 | SS-10 | 1.4 | 4 14 14 38 | 1150 | 0.2 | 0.2 | 1152 | |
| Bottom of boring at 20.0 ft. | | | | | | | | | |

MGY 001 0547

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-7 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 112.0 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 8 JUNE 1987 | DATE FINISHED: 8 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 ATV | | COMPLETION DEPTH: 12.0 FT. | ROCK DEPTH: 12.0 FT |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 7 | UNDIST — / CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — / 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3 IN O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 IN. | INSPECTOR: CARL VARTERESIAN |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| GP; dense, gray-green c-f sandy GRAVEL, dry (FILL) 1.2 FT | 1 | SS-1 | 1.6 | 12 32 65 43 | 1406 | 0.2 | 0.2 | 1411 | 140 lb. HAMMER |
| CL; hard, reddish brown slightly plastic silty CLAY, tr. f. sand, with tan clay partings, dry | 2–4 | SS-2 | 1.8 | 12 12 13 13 | 1416 | 0.2 | 0.2 | 1420 | SWITCH TO 300 lb. HAMMER AT 2 FT. |
| CL; same as above | 5 | SS-3 | 1.2 | 13 12 13 15 | 1420 | 0.2 | 0.2 | 1428 | |
| CL; same as above | 7 | SS-4 | 1.4 | 7 12 9 12 | 1430 | 0.2 | 0.2 | 1435 | |
| CL; same as above | 9 | SS-5 | 1.7 | 28 32 50 81 | 1445 | 0.2 | 0.2 | 1451 | |
| CL; same as above | 10 | SS-6A | 1.0 | 47 100/6 | 1500 | 0.2 | 0.2 | 1505 | HIT REFUSAL AT 11.0 FT |
| CL; same as above | 11 | SS-6B | 1.0 | 48 90 | 1550 | 0.2 | 0.2 | 1555 | AUGERED TO 11.0 FT SAMPLED 11-12 FT |
| Bottom of boring at 12.0 ft | 12 | | | | | | | | |
| | 13 | | | | | | | | |
| | 14 | | | | | | | | |
| | 15 | | | | | | | | |
| | 16 | | | | | | | | |
| | 17 | | | | | | | | |
| | 18 | | | | | | | | |
| | 19 | | | | | | | | |

MGY 001 0548

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-8 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 114.9 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 8 JUNE 1987 | DATE FINISHED: 8 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 19.9 ft. | HOLE DEPTH: 19.9 ft. |
| SIZE AND TYPE OF BIT: | SIZE AND TYPE CORE BARREL: | NO. SAMPLES: DIST 10 | UNDIST — CORE — |
| CASING: | — | WATER LEVEL: FIRST N.E. | COMPL. — 24 HR — |
| CASING HAMMER: WEIGHT 300 lb | DROP 30 IN. | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 3 IN. O.D. SPLIT SPOON | | INSPECTOR: PAUL KARETH | |
| SAMPLER HAMMER: WEIGHT 140 lb | DROP 30 in | | |

| DESCRIPTION | PENETRATION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| NO RECOVERY rock in tip | | 1 | SS-1 | 0.0 | 10 21 9 11 | 0825 | NA | NA | NA | Boring is located in a concrete shaft backfilled with crushed stone; |
| GC; loose to med. dense reddish brown clayey GRAVEL, some c-f sand, dry (FILL) | | 2 3 4 | SS-2 | 0.3 | 1 3 7 10 | 0835 | 0.2 | 0.2 | 0840 | poor recovery, gravel in tip. |
| GC; same as above 5.7 | | 5 6 | SS-3 | 0.2 | 21 7 8 10 | 0840 | 0.2 | 0.2 | 0845 | poor recovery, gravel in tip. drove casing to 6' and washed out. Hit concrete 6'-7 (solid) drilled through |
| Concrete | | 7 8 | SS-4 | 0.4 | 41 41 47 27 | 0940 | 0.2 | 0.2 | 0945 | |
| CL-CH, hard reddish brown silty CLAY, trace f. sand with some tan clay clay partings | | 9 10 | SS-5 | 0.9 | 37 39 41 47 | 0950 | 0.2 | 0.2 | 0955 | |
| CL-CH, same as above | | 11 12 | SS-6 | 1.0 | 9 37 39 48 | 1000 | 0.2 | 0.2 | 1005 | |
| CL-CH; same as above | | 13 14 | SS-7 | 1.0 | 34 34 27 28 | 1025 | 0.2 | 0.2 | 1030 | |
| CL-CH; same as above | | 15 16 | SS-8 | 1.1 | 14 21 25 27 | 1035 | 0.2 | 0.2 | 1040 | |
| CL-CH; same as above | | 17 18 | SS-9 | 1.1 | 40 54 50 62 | 1045 | 0.2 | 0.2 | 1050 | |
| CL-CH; same as above | | 19 | SS-10 | 0.9 | 14 15 19 10/5 | 1050 | 0.2 | 0.2 | 1055 | switch to 300 lb hammer at 18 ft. |
| Bottom of boring at 19.9 ft | | | | | | | | | | |

MGY 001 0549

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-9 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 114.9 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 8 JUNE 1987 | DATE FINISHED: 8 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 20.0 FT | ROCK DEPTH: |
| SIZE AND TYPE OF BIT: 3 3/4 IN TRICONE | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: SIST 10 | UNDIST — CORE — |
| CASING | | WATER LEVEL: FIRST | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT 300 lb. DROP 30 IN | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER 3 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT 140 lb DROP 30 IN | INSPECTOR: PAUL KARETH | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| No Recovery, gravel in tip | 1–2 | SS-1 | 0.0 | 1 1 1 1 | 1310 | NA | NA | | Boring is located in a concrete shaft on an old building floor, shaft is backfilled with crushed stone. |
| No Recovery, gravel in tip | 3–4 | SS-2 | 0.0 | 1 1 2 3 | 1315 | NA | NA | | |
| No Recovery, gravel in tip | 5–6 | SS-3 | 0.0 | 1 2 2 30 | 1320 | NA | NA | | drove casing to 6' and drilled out 6-8' |
| Concrete | 7 | SS-4 | | | | NA | NA | | |
| CL-CH; very stiff, reddish brown silty CLAY, tr. f.sand. | 8–9 | SS-5 | 1.1 | 8 13 13 15 | 1430 | 0.2 | 0.2 | 1435 | reddish brown clay in drill wash |
| CL-CH; same as above | 10–11 | SS-6 | 0.9 | 14 20 26 28 | 1440 | 0.2 | 0.2 | 1445 | |
| CL-CH; same as above, except with tan clay partings | 12–13 | SS-7 | 0.8 | 17 18 24 25 | 1510 | 0.2 | 0.2 | 1515 | |
| CL-CH; same as above, except clay partings not abundance | 14–15 | SS-8 | 0.6 | 21 41 41 44 | 1520 | 0.2 | 0.2 | 1525 | |
| CL-CH; same as above | 16–17 | SS-9 | 0.9 | 14 15 18 20 | 1530 | 0.2 | 0.2 | 1530 | |
| CL-CH; same as above | 18–19 | SS-10 | 1.4 | 16 47 47 64 | 1535 | 0.2 | 0.2 | 1540 | |
| Bottom of boring at 20.0 ft | | | | | | | | | |

MGY 001 0550

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** SB-10 **SHEET** 1 **OF** 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 114.9 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: Earnest Thomas | DATE STARTED: 9 JUNE 1987 | DATE FINISHED: 9 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 16.7 FT | ROCK DEPTH: 16.7 FT. |
| SIZE AND TYPE OF BIT: | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 9 | UNDIST — CORE — |
| CASING: 3 3/4 IN. O.D. STEEL | | WATER LEVEL: FIRST | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT 300 lb. | DROP 30 IN | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER | 2 IN. O.D. SPLIT SPOON | | |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 IN. | INSPECTOR: CARL VARTERESIAN |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| No Recovery gravel in tip | 1 | SS-1 | 0.0 | 1 1 1 1 | 0915 | NA | NA | | Boring is located in a concrete lined shaft on an old building floor. Shaft is backfilled with crushed stone. Drove casing to 7.5' and washed out. drilled through concrete slab at 8-9' |
| No Recovery gravel in tip | 2–3 | SS-2 | 0.0 | | | NA | NA | | |
| same as above | 4–5 | SS-3 | 0.0 | | | NA | NA | | |
| same as above | 6–7 | SS-4 | 0.0 | | 0925 | NA | NA | | |
| concrete | 8 | | | | | | | | |
| CL-CH; v. stiff, reddish brown silty CLAY, tr. f. sand. | 9–10 | SS-5 | 0.8 | 10 16 | | 0.2 | 0.2 | 1040 | drove casing to 10' |
| CL-CH; same as above | 11 | SS-6 | 1.5 | 14 18 19 21 | | 0.2 | 0.2 | 1045 | |
| CL-CH; same as above | 12–13 | SS-7 | 1.6 | 15 17 21 22 | | 0.2 | 0.2 | 1058 | |
| CL-CH; same as above, except with tan clay partings present | 14–15 | SS-8 | 1.6 | 45 66 66 100/5 | | 0.2 | 0.2 | 1102 | |
| CL-CH; same as above. | 16 | SS-9 | | 54 50/2 | | 0.2 | 0.2 | | SWITCH TO 300 lb. HAMMER AT 16 FT. |
| Bottom of boring at 16.7 ft. | 17–19 | | | | | | | | |

MGY 001 0551

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-11 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 142.10 | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 10 JUNE 1987 | DATE FINISHED: 10 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 20.0 ft | WATER DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE SEAL MATERIAL: — | NO SAMPLES: SPT 10 | VOLUME: — SEAL: — |
| CASING: — | | WATER LEVEL: FIRST N.E. | SEAL: — 24 HR: — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 3 IN. O.D. SPLIT SPOONS | | INSPECTOR: PAUL KARETH | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30 IN | | |

| DESCRIPTION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Asphalt + gravel (FILL) 1.0 FT | | | | | | | | | |
| ML-CL; stiff, reddish brown f. sandy clayey SILT, tr. f. gravel, with brick fragments. | 1 | SS-1 | 0.7 | 7 8 | 0835 | 0.2 | 0.2 | 0840 | |
| ML-CL; v. stiff, brown clayey SILT, tr. f. sand, dry | 2 3 4 | SS-2 | 1.6 | 13 12 12 13 | 0845 | 0.2 | 0.2 | 0850 | |
| ML-CL; same as above 6.0 FT | 5 | SS-3 | 1.7 | 10 11 15 17 | 0855 | 0.2 | 0.2 | 0900 | |
| CL-ML; hard, mottled brown and orange silty CLAY, tr. f. sand, dry. 8.0 FT | 6 7 8 | SS-4 | 1.9 | 11 15 18 21 | 0920 | 0.2 | 0.2 | 0925 | |
| ML-SM; very stiff, reddish brown f. sandy SILT; some clay, dry | 9 10 | SS-5 | 1.8 | 10 14 15 19 | 0930 | 0.2 | 0.2 | 0935 | |
| ML-SM, same as above | 11 12 | SS-6 | 1.9 | 7 11 14 15 | 0940 | 0.2 | 0.2 | 0945 | |
| ML-SM; same as above, except with tan clay partings present | 13 14 | SS-7 | 1.6 | 10 13 13 19 | 1030 | 0.2 | 0.2 | 1045 | |
| ML-SM; same as above | 15 16 | SS-8 | 1.8 | 11 12 15 17 | 1040 | 0.2 | 0.2 | 1050 | |
| ML-SM; same as above | 17 18 | SS-9 | 2.0 | 12 15 16 17 | 1050 | 0.2 | 0.2 | 1105 | |
| ML-SM; same as above | 19 | SS-10 | 2.0 | 18 18 19 22 | 1100 | 0.2 | 0.2 | 1105 | |
| Bottom of boring at 20.0 FT | | | | | | | | | |

MGY 001 0552

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-12 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 140.2 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 10 JUNE 1987 | DATE FINISHED: 10 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 20.0 FT. | ROCK DEPTH: NE. |
| SIZE AND TYPE OF BIT: | SIZE AND TYPE CORE BARREL: | NO SAMPLES: DIST 10 | UNDIST — CORE — |
| CASING | | WATER LEVEL: FIRST 7.0 FT | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT 300 lb. DROP 30 IN | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER 3 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT 300 lb DROP 30 IN. | INSPECTOR: PAUL KARETH | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| TOPSOIL 0.5 FT | | | | | | | | | |
| CL-ML; firm, reddish brown f. sandy silty CLAY, tr. m-c sand, tr. gravel, moist | 1 | SS-1 | 0.8 | 2 5 5 5 | 1310 | 0.2 | 0.2 | 1315 | |
| CL-ML; same as above, except brown | 2 3 | SS-2 | 1.6 | 2 3 4 6 | 1320 | 0.2 | 0.2 | 1330 | |
| CL-ML; same as above 5.5 FT | 4 5 | SS-3 | 1.2 | 8 5 7 5 | 1325 | 0.2 | 0.2 | 1335 | |
| CL-GC; soft, lt. brown sandy gravelly CLAY, some silt, with dk. green clay parting, wet | 6 7 | SS-4 | 1.1 | 3 2 1 1 | 1330 | 0.2 | 0.2 | 1340 | encountered water at 7.0 Ft. |
| CL-GC, same as above | 8 9 | SS-5 | 0.3 | 1 1 1 1 | 1335 | 0.2 | 0.2 | 1345 | |
| 10.5 FT. | 10 | NR | NR | | | | | | NO RECOVERY 10'-10.5' Casing moved 6" while flushing out. |
| CL-ML; v. stiff, reddish brown f. sandy, silty CLAY, tr. m. sand, wet | 11 | SS-6 | 1.1 | 6 8 11 | 1450 | 0.2 | 0.2 | 1445 | |
| CL-ML; same as above | 12 13 | SS-7 | 1.9 | 7 8 11 15 | 1500 | 0.2 | 0.2 | 1510 | |
| CL-ML; same as above, except tan clay partings present | 14 15 | SS-8 | 1.8 | 10 13 12 11 | 1505 | 0.2 | 0.2 | 1530 | |
| CL-ML; same as above | 16 17 | SS-9 | 2.0 | 7 8 9 12 | 1515 | 0.2 | 0.2 | 1540 | |
| CL-ML; same as above | 18 19 | SS-10 | 2.0 | 9 9 11 12 | 1530 | 0.2 | 0.2 | 1545 | |
| Bottom of boring at 20.0 ft | | | | | | | | | |

MGY 001 0553

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-13 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 142.9 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 11 JUNE 1987 | DATE FINISHED: 11 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 20.0 FT | PIEZO DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST. 10 | UNDIST. — DIST. — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL. — 24 HR. — |
| CASING HAMMER: | WEIGHT: — | DROP: — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3" O.D. SPLIT SPOON | | | INSPECTOR: PAUL KARETH |
| SAMPLER HAMMER: | WEIGHT: 300lb | DROP: 30" | |

| DESCRIPTION | PENETRATION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| (TOPSOIL) 0.4 FT | | | | | | | | | | |
| CH; stiff, brownish red, plastic CLAY, some silt, tr. f. sand, moist | | 1 | SS-1 | 1.8 | 4 6 9 11 | 0800 | 0.2 | 0.2 | 0805 | |
| CH; same as above | | 2 3 | SS-2 | 1.9 | 4 7 8 9 | 0805 | 0.2 | 0.2 | 0810 | |
| 4.0 FT | | 4 | | | | | | | | |
| CL-SC; v. stiff; mottled brown and orange silty c-f sandy CLAY, tr. gravel, moist | | 5 | SS-3 | 1.8 | 9 11 13 16 | 0810 | 0.2 | 0.2 | 0820 | |
| CL-SC; same as above | | 6 7 | SS-4 | 2.0 | 11 12 12 12 | 0820 | 0.2 | 0.2 | 0825 | |
| CL-SC; same as above | | 8 9 | SS-5 | 2.0 | 9 11 7 8 | 0825 | 0.2 | 0.2 | 0835 | |
| 9.3 FT | | | | | | | | | | |
| CL-ML; hard, reddish brown f. sandy, silty CLAY, tr. m sand, moist | | 10 11 | SS-6 | 2.0 | 5 7 10 12 | 0905 | 0.2 | 0.2 | 0910 | |
| CL-ML; same as above | | 12 13 | SS-7 | 2.0 | 6 8 11 16 | 0915 | 0.2 | 0.2 | 0920 | APPROX. 1 GAL. RHMW WATER ADDED TO BORING TO AID REMOVAL OF SPOONS |
| CL-ML; same as above | | 14 15 | SS-8 | 1.8 | 11 12 12 12 | 0920 | 0.2 | 0.2 | 0925 | |
| CL-ML; same as above | | 16 17 | SS-9 | 2.0 | 15 15 17 9 | 0925 | 0.2 | 0.2 | 0940 | |
| CL-ML; same as above | | 18 19 | SS-10 | 2.0 | 5 6 8 9 | 0930 | 0.2 | 0.2 | 0945 | |
| Bottom of boring at 20.0 ft. | | | | | | | | | | |

MGY 001 0554

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-15 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 132.9 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 16 JUNE 1987 | DATE FINISHED: 16 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 | | COMPLETION DEPTH: 15.5 ft. | PROJ. DEPTH: 15.5 ft |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: SPT 8 | UNDIST: — CORE: — |
| CASING: — | | WATER LEVEL: PART N.E. | COMPL.: — 24 HR: — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: SEE REMARKS | | INSPECTOR: CARL VARTERESIAN | |
| SAMPLER HAMMER: WEIGHT 140 lbs. | DROP 30 IN. | | |

| DESCRIPTION | PRESERVATION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| ML; hard, reddish brown fine sandy SILT, tr. clay, moist | | 1 | SS-1 | 0.7 | 44 46 17 21 | 1028 | 0.2 | 0.2 | 1030 | 3 INCH O.D. SPLIT SPOON SAMPLER USED |
| ML; same as above | | 2–3 | SS-2 | 2.0 | 25 20 27 27 | 1032 | 0.2 | 0.2 | 1035 | Same as above |
| ML; same as above, except with tan and white clay partings | | 4–5 | SS-3 | 1.0 | 7 20 27 27 | 1040 | 0.2 | 0.2 | 1045 | Same as above |
| ML; same as above | | 6–7 | SS-4 | 1.7 | 13 17 16 23 | 1048 | 0.2 | 0.2 | 1050 | 2 INCH O.D. SPLIT SPOON SAMPLER USED |
| ML; same as above | | 8–9 | SS-5 | 1.5 | 12 12 12 15 | 1105 | 0.2 | 0.2 | 1107 | Same as above |
| ML; same as above | | 10–11 | SS-6 | 2.0 | 17 20 19 16 | 1112 | 0.2 | 0.2 | 1115 | Same as above |
| ML; same as above | | 12–13 | SS-7 | 1.5 | 16 26 31 42 | 1118 | 0.2 | 0.2 | 1120 | Same as above |
| ML; same as above | | 14–15 | SS-8 | 1.5 | 56 63 18% | 1123 | 0.2 | 0.2 | 1125 | Same as above |
| Bottom of boring at 15.5 ft. | | 16 17 18 19 | | | | | | | | |

MGY 001 0555

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-16 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 121.1 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 15 JUNE 1987 | DATE FINISHED: 15 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 | | COMPLETION DEPTH: 20.0 FT | AUGER DEPTH: N.E. |
| SIZE AND TYPE OF BIT: 6 IN DRAG BIT | SIZE AND TYPE CORE BARREL: | NO. SAMPLES: SPT 10 | UNDIST: — CORE: — |
| CASING | | WATER LEVEL: FIRST 16.0 FT | COMPL: — 24 HR: — |
| CASING HAMMER | WEIGHT | DROP | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3 IN O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 IN | INSPECTOR: CARL VARTERESIAN |

| DESCRIPTION | PENETRATION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| SM- reddish brown silty fine SAND, some clay, white clay partings pockets of purple claystone, dry | | 1 | SS-1 | 1.2 | 13 23 34 61 | 0907 | 0.2 | 0.2 | | 140 lb. HAMMER |
| NO REC | | 2–3 | SS-2 | 0.0 | 15 8 5 5 | 0910 | NA | NA | | SWITCH TO 300 lb. HAMMER AT 2.0 FT NO RECOVERY gravel stuck in split spoon shoe |
| NO REC | | 4–5 | SS-3 | 0.0 | 7 7 5 5 | 0915 | NA | NA | | NO RECOVERY AUGER TO 6.0 FT |
| NO REC | | 6–7 | SS-4 | 0.0 | 6 4 4 1 | 0925 | NA | NA | | NO RECOVERY |
| NO REC | | 8–9 | SS-5 | 0.0 | 1 1 1 1 | 0935 | NA | NA | | AUGER TO 8.0 FT NO RECOVERY well headspace = 2.0 ppm |
| NO REC | | 10–11 | SS-6 | 0.0 | 1 24 | 0945 | NA | NA | | AUGER TO 10.0 FT NO RECOVERY well headspace = 0.6 ppm |
| SM; very loose, yellow brown silty f. SAND, tr. m-c sand, moist | | 12–13 | SS-7 | 0.1 | 3 1 1 1 | 0957 | NA | NA | | AUGER TO 12.0 FT POOR RECOVERY |
| NO REC | | 14–15 | SS-8 | 0.0 | 1 12 1 1 | 1010 | NA | NA | | AUGER TO 14.0 FT NO RECOVERY |
| SP-SM; loose, brown, silty f. SAND, tr. m-c sand, wet. | | 16–17 | SS-9 | 0.7 | 1 2 8 8 | 1020 | 0.2 | 0.2 | | 1st OCCURENCE OF GW AT 16 FT well headspace = 0.5 ppm |
| SP; dense, brown med. SAND, some c-f sand, tr. silt, wet | | 18–19 | SS-10 | 2.0 | 10 15 32 44 | 1045 | 0.2 | 0.2 | | |
| Bottom of boring at 20.0 FT | | | | | | | | | | |

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-17 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 115.9 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 6 JUNE 1987 | DATE FINISHED: 6 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 17.8 FT | ROCK DEPTH: 17.8 FT |
| SIZE AND TYPE OF BIT: | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST. 9 | UNDIST. — / SCALE — |
| CASING: — | | WATER LEVEL: FIRST 8.0 FT | COMPL. — / SHIP — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30" | INSPECTOR: PAUL KARETH | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| (TOPSOIL) 0.5 FT | | | | | | | | | |
| CL; stiff, brown and yellow sandy silty CLAY, tr. gravel, sand partings, dry | 1 | SS-1 | 1.0 | 2 8 5 7 | 0850 | 0.2 | 0.2 | 0855 | |
| CL; same as above | 2–3 | SS-2 | 1.3 | 10 16 17 17 | 0855 | 1.0 | 0.2 | 0900 | |
| CL; same as above | 4–5 | SS-3 | 1.7 | 16 21 19 14 | 0900 | 0.6 | 0.6 | 0910 | |
| 6.0 FT | | | | | | | | | |
| CL; stiff, reddish brown | 6–7 | SS-4 | 1.4 | 6 8 7 8 | 0905 | 0.4 | 0.4 | 0918 | |
| CL; same as above | 8–9 | SS-5 | 1.0 | 10 15 16 18 | 0915 | 0.4 | 0.4 | 0925 | encountered water at 8' |
| CL; same as above | 10–11 | SS-6 | 1.0 | 18 20 25 16 | 0920 | 0.4 | 0.4 | 0930 | |
| CL; very stiff purple-gray CLAY, moist | 12–13 | SS-7 | 1.7 | | 1030 | 0.2 | 0.2 | 1035 | |
| CL; same as above | 14–15 | SS-8 | 1.3 | 8 6 7 100/4 | 1040 | 0.2 | 0.2 | 1045 | |
| CL; same as above | 16 | | | | | | | | refusal @ 15.8', drilled to 17' |
| CL; hard reddish brown CLAY, moist, | 17 | SS-9 | 0.5 | 53 100/4 | 1115 | 0.2 | 0.2 | 1120 | |
| Bottom of boring at 17.8 ft. | 18–19 | | | | | | | | |

MGY 001 0557

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-18 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 126.7 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 11 JUNE 1987 | DATE FINISHED: 11 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 | | COMPLETION DEPTH: 20.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 10 | UNDIST: — CORE: — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL: — 24 HR: — |
| CASING HAMMER | WEIGHT — | DROP — | DRILLING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN O.D. SPLIT SPOON | | | INSPECTOR: CARL VARTERESIAN |
| SAMPLER HAMMER | WEIGHT SEE REMARKS | DROP 30 in | |

| DESCRIPTION | PENETROMETER | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| SP; loose, grayish green f-m SAND, some c. sand, tr. silt, moist | | 1 | SS-1 | 0.9 | 2 3 4 4 | 0920 | 0.4 | 0.3 | 0923 | 140 lb. HAMMER |
| SP; same as above | | 2 3 | SS-2 | 1.0 | 2 3 4 5 | 0926 | 0.5 | 0.3 | 0930 | |
| 4.5 FT | | 4 | | | | | | | | |
| CL-CH; stiff, brown silty CLAY, tr. c-f sand, moist | | 5 | SS-3 | 0.4 | 8 5 7 10 | 0930 | 0.3 | 0.3 | 0935 | |
| CL-CH; same as above, except very stiff. | | 6 7 | SS-4 | 0.2 | 8 12 16 22 | 0936 | 0.3 | 0.3 | 0940 | |
| 8.0 FT | | 8 | | | | | | | | |
| CL-ML; hard, reddish brown silty CLAY, some f. sand, moist | | 9 | SS-5 | 1.0 | 12 16 20 23 | 0945 | 0.3 | 0.3 | 0950 | |
| CL-ML; same as above | | 10 11 | SS-6 | 2.0 | 10 16 19 20 | 1005 | 1.5 | 0.3 | 1010 | |
| CL-ML; same as above | | 12 13 | SS-7 | 2.0 | 5 5 7 10 | 1015 | 0.3 | 0.3 | 1020 | SWITCH TO 340 lb. HAMMER AT 12 FT. |
| ML-SM; reddish brown silty f. SAND speckled with white clay particles moist. | | 14 15 | SS-8 | 2.0 | 8 8 18 19 | 1051 | 0.8 | 0.3 | 1055 | APPROX. 1 GAL. RAINW WATER ADDED TO BORING TO AID REMOVAL OF SPOONS |
| ML-SM; same as above with more white clay | | 16 17 | SS-9 | 1.0 | 6 7 9 10 | 1115 | 0.3 | 0.3 | 1120 | |
| ML-SM; same as above | | 18 19 | SS-10 | 1.0 | 3 6 6 7 | 1120 | 0.3 | 0.3 | 1125 | |
| Bottom of boring at 20.0 ft. | | | | | | | | | | |

MGY 001 0558

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-19 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 140.1 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 5 JUNE 1987 | DATE FINISHED: 5 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 20' | ROCK DEPTH: NA |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO SAMPLES: DIST 10 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — SHR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30 IN. | INSPECTOR: MARION CRAIG | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL & SM - intermixed tan and yellow CLAY and reddish brown silty SAND with white clay. Some pebbles | 1 | SS-1 | 1.5 | | | 0.2 | 0.2 | 1345 | |
| | 2 | | | | | | | | |
| ~~CL-SM~~ - Yellowish brown silty CLAY with v.f sand | 3 | SS-2 | 1.3 | | | 0.2 | 0.2 | 1350 | |
| | 4 | | | | | | | | |
| SM - reddish brown silty fine SAND trace of white and Black clay | 5 | SS-3 | 1.9 | | | 0.2 | 0.2 | 1357 | |
| | 6 | | | | | | | | |
| SM - same as above | 7 | SS-4 | 1.7 | | | 0.0 | 0.0 | 1410 | |
| | 8 | | | | | | | | |
| SM - same as above | 9 | SS-5 | 2.0 | | | 0.0 | 0.0 | 1425 | |
| | 10 | | | | | | | | |
| SM - same as above | 11 | SS-6 | 1.7 | | | 0.0 | 0.0 | 1435 | |
| | 12 | | | | | | | | |
| SM, same as above | 13 | SS-7 | 2.0 | | | 0.2 | 0.2 | 1510 | |
| | 14 | | | | | | | | |
| SM - same as above with more white clay | 15 | SS-8 | 1.5 | | | 0.2 | 0.2 | 1515 | |
| | 16 | | | | | | | | |
| SM - same as above | 17 | SS-9 | 1.3 | | | 0.2 | 0.2 | 1525 | |
| | 18 | | | | | | | | |
| SM - same as above | 19 | SS-10 | 1.5 | | | 0.2 | 0.2 | 1535 | |

MGY 001 0559

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-21 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 109.9 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 11 JUNE 1987 | DATE FINISHED: 11 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 7.3 FT. | ROCK DEPTH: 7.3 FT. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 4 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — SAMP — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 3 IN. O.D. SPLIT SPOON | | | INSPECTOR: PAUL KARETH |
| SAMPLER HAMMER | WEIGHT 300 lb. | DROP 30 IN. | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| ASPHALT | | | | | | | | | |
| CRUSHED STONE | 1 | | | | | | | | |
| CL; hard purple gray silty CLAY, wet. | 2 | SS-1 | 0.4 | 15 15 | 1150 | 0.4 | 0.2 | 1200 | |
| Zone of distinct colors, yellows, aquas, blues, silty CLAY | 3 | SS-2 | 1.7 | 11 17 19 23 | 1200 | 0.2 | 0.2 | 1205 | |
| CL; hard purple-gray mudstone with shale partings, wet | 4 5 | SS-3 | 1.8 | 27 29 31 37 | 1215 | 0.2 | 0.2 | 1230 | |
| CL; same as above | 6 7 | SS-4 | 1.3 | 24 31 100/3 | 1220 | 0.2 | 0.2 | 1230 | |
| Bottom of boring at 7.3 ft. | 8 9 10 11 12 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0560

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SB-22 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 105.3 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 10 JUNE 1987 | DATE FINISHED: 10 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 | | COMPLETION DEPTH: 8.0 FT | ROCK DEPTH: |
| SIZE AND TYPE OF BIT: 4 3/4 IN TRICONE | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 4 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D.. SPLIT SPOON | | INSPECTOR: CARL VARTERESIAN | |
| SAMPLER HAMMER | WEIGHT SEE REMARKS DROP 30 IN | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| ASPHALT 0.5 FT | | | | | | | | | ROLLER BIT 0-0.5 FT |
| SM- purple silty m-f SAND, yellow clay, gravel, pebbles | 1 | SS-1 | 1.0 | 12 14 15 | 1510 | 0.2 | 0.2 | 1511 | |
| SM- purple silty m-f SAND, yellow and black clay | 2 3 | SS-2 | 2.0 | 21 28 32 37 | 1511 | 0.2 | 0.2 | 1514 | |
| CL- purple silty CLAY, black clay partings, weak shale laminae | 4 5 | SS-3 | 2.0 | 48 56 67 91 | 1515 | 0.2 | 0.2 | 1520 | |
| CL- same as above | 6 7 | SS-4 | 0.9 | 29 66 85 100/3 | 1520 | 0.2 | 0.2 | 1530 | SWITCH TO 340 lb. HAMMER |
| | 8 | | 0.0 | 30/2 | | | | | |
| Bottom of boring at 8.0 FT. | 9 10 11 12 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0561

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-1 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 106.5 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 15 JUNE 1987 | DATE FINISHED: 15 JUNE 1987 |
| DRILLING EQUIPMENT: TRIPOD MOUNTED CATHEAD | | COMPLETION DEPTH: 12.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST | COMPL — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: SEE REMARKS | | | |
| SAMPLER HAMMER: WEIGHT 140 lb | DROP 30 IN. | INSPECTOR: PAUL KARETH | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| (Topsoil) 0.5 FT | | | | | | | | | |
| CL; stiff, reddish brown silty CLAY, tr. f. sand, with tan and black clay partings, moist | 1 | SS-1 | 1.8 | 4 6 9 9 | 1350 | 0.2 | 0.2 | 1355 | 3 IN. O.D. SPLIT SPOON SAMPLER USED |
| CL; same as above, | 2 3 | SS-2 | 1.6 | 7 14 23 42 | 1405 | 0.2 | 0.2 | 1410 | same |
| CL; same as above, dry | 4 5 | SS-3 | 1.7 | 35 36 40 50 | 1410 | 0.2 | 0.2 | 1415 | same |
| CL; same as above, moist | 6 7 | SS-4 | 1.5 | 15 16 12 8 | 1420 | 0.2 | 0.2 | 1425 | 2 IN. O.D. SPLIT SPOON SAMPLER USED |
| CL; same as bove, moist | 8 9 | SS-5 | 1.5 | 17 15 23 30 | 1430 | 0.2 | 0.2 | 1435 | same |
| CL; same as above | 10 11 | SS-6 | 1.8 | 17 36 30 44 | 1440 | 0.2 | 0.2 | 1445 | same |
| Bottom of boring at 12.0 FT. | 12 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0562

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-2 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 118.1 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 12 JUNE 1987 | DATE FINISHED: 12 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 | | COMPLETION DEPTH: 14.0 FT. | FIRST DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 5 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | DRILLING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: SEE REMARKS | | INSPECTOR: PAUL KARETH | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30 IN. | | |

| DESCRIPTION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| Topsoil 0.5 FT | | | | | | | | | |
| CL; very stiff, light brown silty CLAY, some c-f sand, f. gravel, moist 3.5 FT | 1 | SS-1 | 2.0 | 9 11 15 24 | 1015 | | Light rain/high humidity prevented use of HNU | | 3 IN. O.D. SPLIT SPOON SAMPLER USED |
| | 2 | | | | | | | | |
| | 3 | SS-2 | 1.1 | 24 19 47 92 | 1020 | | | | same as above |
| CL-ML; Hard, tan sandy CLAY, some f. gravel, moist | 4 | | | | | | | | |
| | 5 | SS-3 | 1.2 | 36 35 49 77 | 1025 | | | | same as above |
| CL-ML; Same as above | 6 | | | | | | | | |
| | 7 | SS-4 | 0.9 | 17 22 17 13 | 1040 | | | | 2 IN. O.D. SPLIT SPOON SAMPLER USED |
| | 8 | | | | | | | | |
| CL-ML; Same as above, grading into very stiff, tan sandy CLAY, some f. gravel | 9 | SS-5 | 1.2 | 6 11 15 15 | 1045 | | | | same as above |
| | 10 | | | | | | | | |
| | 11 | SS-6 | 0.0 | 11 12 19 17 | 1050 | | | | same as above, no. recovery |
| | 12 | | | | | | | | |
| | 13 | SS-7 | 0.0 | 15 18 20 24 | 1100 | | | | same as above, no. recovery |
| | 14 | | | | | | | | |
| Bottom of boring at 14.0 FT. | 15 | | | | | | | | |
| | 16 | | | | | | | | |
| | 17 | | | | | | | | |
| | 18 | | | | | | | | |
| | 19 | | | | | | | | |

MGY 001 0563

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** SF-3 **SHEET** 1 **OF** 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 73.1 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 11 JUNE 1987 | DATE FINISHED: 11 JUNE 1987 |
| DRILLING EQUIPMENT: TRIPOD MOUNTED CATHEAD | | COMPLETION DEPTH: 5.9 FT. | ROCK DEPTH: 5.9 FT |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 3 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: SEE REMARKS | | | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30 IN | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL; stiff, brown silty CLAY, tr. f. sand, tr. f. gravel, moist. | 1 | SS-1 | 2.0 | 4 4 7 19 | | 0.2 | 0.2 | 0945 | 3 INCH O.D. SPLIT SPOON SAMPLER USED |
| CL; hard, reddish brown CLAY, some silt, tr. f. sand, moist | 2 3 | SS-2 | 2.0 | 39 42 53 38 | | 0.2 | 0.2 | 1000 | Same as above |
| CL; same as above, except with reddish brown mudstone frags. | 4 5 | SS-3 | 1.9 | 25 55 64 100/5 | | 0.2 | 0.2 | 1015 | 2 INCH O.D. SPLIT SPOON SAMPLER USED |
| Bottom of boring at 5.9 ft. | 6 | | | | | | | | |
| | 7 | | | | | | | | |
| | 8 | | | | | | | | |
| | 9 | | | | | | | | |
| | 10 | | | | | | | | |
| | 11 | | | | | | | | |
| | 12 | | | | | | | | |
| | 13 | | | | | | | | |
| | 14 | | | | | | | | |
| | 15 | | | | | | | | |
| | 16 | | | | | | | | |
| | 17 | | | | | | | | |
| | 18 | | | | | | | | |
| | 19 | | | | | | | | |

MGY 001 0564

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-4 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 140.2 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 16 JUNE 1987 | DATE FINISHED: 16 JUNE 1987 |
| DRILLING EQUIPMENT: TRIPOD MOUNTED CATHEAD | | COMPLETION DEPTH: 12.0 FT. | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER SEE REMARKS | | INSPECTOR: CARL VARTERESIAN | |
| SAMPLER HAMMER | WEIGHT 140 lb. DROP 30 IN | | |

| DESCRIPTION | PHOTOMETER | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|
| CL-ML; firm, brown silty CLAY, some c-f. sand, trace f. gravel, moist | | 1 | SS-1 | 1.5 | 5 9 21 24 | 1455 | 0.2 | 0.2 | 1500 | 3 INCH. O.D. SPLIT SPOON SAMPLER USED |
| | | 2 | | | | | | | | |
| CL-ML; same as above | | 3 | SS-2 | 0.2 | 21 36 42 44 | 1510 | 0.2 | 0.2 | 1515 | same as above |
| 4.0 FT. | | 4 | | | | | | | | |
| CL; very stiff, reddish brown silty CLAY, tr. f. sand, moist. | | 5 | SS-3 | 1.7 | 7 14 15 17 | 1515 | 0.2 | 0.2 | 1520 | 2 INCH O.D. SPLIT SPOON SAMPLER USED |
| | | 6 | | | | | | | | |
| CL; same as above | | 7 | SS-4 | 1.0 | 4 9 12 12 | 1525 | 0.2 | 0.2 | 1530 | same as above |
| | | 8 | | | | | | | | |
| CL; very stiff, reddish brown CLAY, some silt, with tan clay partings, moist | | 9 | SS-5 | 1.8 | 11 19 17 14 | 1540 | 0.2 | 0.2 | 1545 | same as above |
| | | 10 | | | | | | | | |
| CL; same as above | | 11 | SS-6 | 1.6 | 13 20 24 18 | 1550 | 0.2 | 0.2 | 1555 | same as above |
| | | 12 | | | | | | | | |
| Bottom of boring at 12.0 ft | | 13 | | | | | | | | |
| | | 14 | | | | | | | | |
| | | 15 | | | | | | | | |
| | | 16 | | | | | | | | |
| | | 17 | | | | | | | | |
| | | 18 | | | | | | | | |
| | | 19 | | | | | | | | |

MGY 001 0565

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-6 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 104.1 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 1 JUNE 1987 | DATE FINISHED: 1 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 11.8 FT | ROCK DEPTH: 11.8 FT |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: 3" O.D. | | WATER LEVEL: FIRST 9.7 ft | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT 140 lb. | DROP 30 in. | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN. O.D. SPLIT SOON | | | |
| SAMPLER HAMMER | WEIGHT 140 lb. | DROP 30 IN. | INSPECTOR: CARL VARTERESIAN |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| (TOPSOIL) | 1 | SS-1 | 0.2 | 3 10 16 18 | 1544 | 0.0 | 0.0 | 1544 | |
| 2.0 FT CL-ML; hard reddish brown silty CLAY, some c-f. sand, tr. fine gravel, moist | 2, 3, 4 | SS-2 | 0.6 | 13 27 44 40 | 1550 | 0.2 | 0.0 | 1555 | |
| 5.0 FT CL; firm reddish brown silty CLAY, tr. f. sand, moist. | 5, 6 | SS-3 | NR | | 1603 | NA | NA | 1615 | |
| | 7 | SS-4 | 1.5 | | 1630 | 0.6 | 0.2 | 1635 | DROVE 3" CASING TO 6 FT DEPTH |
| CL; same as above, wet | 8, 9 | SS-5 | 1.0 | | 1650 | 0.2 | 0.2 | 1700 | FIRST OCCURRENCE OF GW AT 9.7 FT. |
| CL; same as above | 10, 11 | SS-6 | 1.5 | 100/3 | 1710 | 10.0 | 0.2 | 1711 | |
| Bottom of boring at 11.8 ft | 12, 13, 14, 15, 16, 17, 18, 19 | | | | | | | | |

MGY 001 0566

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**LOG OF BORING** SF-7 **SHEET** 1 **OF** 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 114.0 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 15 JUNE 1987 | DATE FINISHED: 15 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 11.9 FT | ROCK DEPTH: 11.9 FT |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST. 6 | UNDIST. — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL. — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | INSPECTOR: PAUL KARETH | |
| SAMPLER HAMMER: WEIGHT 140 lbs. | DROP 30" | | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| (TOPSOIL) 0.3 FT | | | | | | | | | |
| CL; very stiff, reddish brown silty CLAY, tr. f. sand, dry | 1 | SS-1 | 1.8 | 2 9 9 10 | 1125 | 0.2 | 0.2 | 1135 | |
| | 2 | | | | | | | | |
| | 3 | SS-2 | 1.7 | 9 9 12 13 | 1135 | 0.2 | 0.2 | 1140 | |
| CL; hard, brown CLAY, dry | 4 | | | | | | | | |
| CL; hard, reddish brown CLAY, clay partings, dry | 5 | SS-3 | 1.9 | 29 37 41 51 | 1145 | 0.2 | 0.2 | 1150 | |
| | 6 | | | | | | | | |
| | 7 | SS-4 | 2.0 | 17 31 39 47 | 1150 | 0.2 | 0.2 | 1155 | |
| CL; same as above | 8 | | | | | | | | |
| | 9 | SS-5 | 1.1 | 25 27 28 40 | 1155 | 0.2 | 0.2 | 1200 | |
| CL; same as above | 10 | | | | | | | | |
| | 11 | SS-6 | 0.9 | 49 57 62 100/5 | 1205 | 0.2 | 0.2 | 1210 | |
| Bottom of boring at 11.9 ft. | 12 | | | | | | | | |
| | 13 | | | | | | | | |
| | 14 | | | | | | | | |
| | 15 | | | | | | | | |
| | 16 | | | | | | | | |
| | 17 | | | | | | | | |
| | 18 | | | | | | | | |
| | 19 | | | | | | | | |

MGY 001 0567

**WOODWARD-CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

LOG OF BORING SF-8 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 129.1 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 10 JUNE 1987 | DATE FINISHED: 10 JUNE 1987 |
| DRILLING EQUIPMENT: TRIPOD MOUNTED CATHEAD | | COMPLETION DEPTH: 15.5 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 7 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30 in. | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL; firm, reddish brown CLAY, moist | 1 | SS-1 | 1.5 | 2 4 3 3 | 0850 | 0.2 | 0.2 | 0854 | |
| CL; same as above | 2–3 | SS-2 | 0.4 | 3 2 4 6 | 0854 | 0.2 | 0.2 | 0856 | |
| 4.0 FT | 4 | | | | | | | | |
| GW; Loose, c-f GRAVEL, wet (FILL) | 5 | SS-3 | 0.1 | 5 4 1 2 | 0856 | 2.0 | 0.2 | 0901 | penetrated leach field laterals poor recovery, gravel stuck in split spoon shoe |
| GW; v. loose, c-f GRAVEL, wet (FILL) | 6–7 | SS-4 | 0.1 | 1/12 1 1 | 0902 | 20.0 | 0.2 | 0906 | Boring Headspace = 0.4 ppm |
| GW; same as above | 8–9 | SS-5 | 0.1 | 2 2 1 1 | 0910 | 1.0 | 0.2 | 0912 | poor recovery, gravel in shoe. |
| GW; same as above | 10–11 | SS-6 | 0.1 | 1/12 1 1 | 0912 | 1.2 | 0.2 | 0915 | poor recovery, gravel in shoe |
| 12.0 FT | 12 | | | | | | | | |
| CL; soft, reddish brown silty CLAY, tr. c-f gravel, dry | 13 | SS-7 | 0.1 | 1 1 1 1 | 0916 | 1.0 | 0.2 | 0920 | |
| CL; same as above | 14–15 | SS-8 | 0.1 | 1/12 1 | 0925 | 1.0 | 0.2 | 0927 | |
| Bottom of boring at 15.5 FT. | 16–19 | | | | | | | | |

MGY 001 0568

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-8B

SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 129.1 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 10 JUNE 1987 | DATE FINISHED: 10 JUNE 1987 |
| DRILLING EQUIPMENT: TRIPOD MOUNTED CATHEAD | | COMPLETION DEPTH: 13.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2. IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT 140 lb. | DROP 30 IN. | INSPECTOR: CARL VARTERESIAN |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL; stiff, reddish brown CLAY, moist | 1 | SS-1 | 0.7 | 4 6 7 5 | 1111 | 0.4 | 0.2 | 1117 | |
| CL; same as above | 2 3 | SS-2 | 1.5 | 3 4 5 3 | 1115 | 0.4 | 0.2 | 1121 | |
| 4.0 FT | 4 | | | | | | | | |
| GW; med. dense, c-f GRAVEL, wet (FILL) | 5 | SS-3 | 0.1 | 4 5 6 6 | 1119 | 0.2 | 0.2 | 1122 | penetrated leach field laterals poor recovery, gravel stuck in split spoon shoe |
| GW; v. loose, c-f GRAVEL, wet (FILL) | 6 7 | SS-4 | 0.1 | 1 1 1 1 | 1122 | 0.2 | 0.2 | 1125 | same as above |
| GW; same as above | 8 9 10 | SS-5 | 0.1 | 1/12 1 1/12 1 | 1127 | 0.2 | 0.2 | 1130 | same as above |
| 11.0 FT | 11 | | | | | | | | |
| CL; stiff, reddish brown CLAY, wet | 12 | SS-6 | 2.0 | 9 7 10 11 | 1132 | 0.4 | 0.2 | 1135 | |
| Bottom of boring at 13.0 ft | 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0569

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-9 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 115.2 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: Earnest Thomas | DATE STARTED: 15 JUNE 1987 | DATE FINISHED: 15 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 12.0 FT | FROST DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST 4.0 FT | COMPL. — 24 HR. — |
| CASING HAMMER: WEIGHT — | DROP — | DRIVING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | INSPECTOR: PAUL KARETH | |
| SAMPLER HAMMER: WEIGHT 140 lb. | DROP 30 in. | | |

| DESCRIPTION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6IN | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| (Topsoil) 0.5 FT | | | | | | | | | |
| CL; hard, reddish brown CLAY | 1 2 | SS-1 | 1.2 | 3 12 24 20 | 0850 | 0.2 | 0.2 | 0855 | |
| CL; Same as above 3.7 FT | 3 4 | SS-2 | 0.6 | 7 9 15 8 | 0855 | 0.2 | 0.2 | 0900 | |
| GW; med. dense, c-f GRAVEL, wet (FILL) | 5 6 | SS-3 | NR | 8 7 7 6 | 0900 | NA | NA | 0905 | penetrated leach field laterals strong septic odor. NO RECOVERY |
| GW; dense, c-f GRAVEL, wet (FILL) | 7 8 | SS-4 | NR | 24 20 18 21 | 0910 | NA | NA | 0915 | NO RECOVERY, gravel stuck in split spoon shoe |
| GW; same as above 9.6 FT. | 9 10 | SS-5 | 0.2 | 17 21 21 23 | 0920 | 0.2 | 0.2 | 0935 | |
| CL; hard, reddish brown CLAY dry | 11 12 | SS-6 | 0.5 | 27 31 33 37 | 0930 | 0.2 | 0.2 | 0940 | |
| Bottom of boring at 12.0 ft. | 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0570

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-10 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 132.7 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: Earnest Thomas | DATE STARTED: 15 JUNE 1987 | DATE FINISHED: 15 JUNE 1987 |
| DRILLING EQUIPMENT: CME 55 | | COMPLETION DEPTH: 12.0 FT. | PROJ. DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST. 6 | UNDIST. — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL. — 24 HR. — |
| CASING HAMMER: | WEIGHT: — | DROP: — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | INSPECTOR: CARL VARTERESIAN |
| SAMPLER HAMMER: | WEIGHT: 140 lb. | DROP: 30 IN. | |

| DESCRIPTION | DEPTH, FT | SAMPLES TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN. | TIME | HNU READINGS (PPM) SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL-ML; v. stiff, reddish brown and brown silty CLAY, trace fine sand | 1 | SS-1 | 1.1 | 7 11 12 13 | 1402 | 0.2 | 0.2 | 1405 | |
| | 2 | | | | | | | | |
| CL-ML; Same as above | 3 | SS-2 | 1.3 | 5 8 9 11 | 1408 | 0.2 | 0.2 | 1410 | |
| 4.0 FT | 4 | | | | | | | | |
| CL; very stiff, reddish brown silty CLAY, tr. f. sand, moist. | 5 | SS-3 | 2.0 | 11 13 18 21 | 1412 | 0.2 | 0.2 | 1415 | |
| | 6 | | | | | | | | |
| CL; same as above | 7 | SS-4 | 2.0 | 8 11 15 14 | 1420 | 0.2 | 0.2 | 1422 | |
| | 8 | | | | | | | | |
| CL; same as above | 9 | SS-5 | 1.6 | 9 11 20 14 | 1424 | 0.2 | 0.2 | 1426 | |
| | 10 | | | | | | | | |
| CL- hard, reddish brown silty CLAY, tr. f. sand, with tan clay partings, moist. | 11 | SS-6 | 2.0 | 18 22 26 26 | 1430 | 0.2 | 0.2 | 1432 | |
| | 12 | | | | | | | | |
| Bottom of boring at 12.0 ft. | 13 | | | | | | | | |
| | 14 | | | | | | | | |
| | 15 | | | | | | | | |
| | 16 | | | | | | | | |
| | 17 | | | | | | | | |
| | 18 | | | | | | | | |
| | 19 | | | | | | | | |

MGY 001 0571

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-11 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 128.2 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: GEORGE KUTSCHERE | DATE STARTED: 11 JUNE 1987 | DATE FINISHED: 11 JUNE 1987 |
| DRILLING EQUIPMENT: TRIPOD MOUNTED CATHEAD | | COMPLETION DEPTH: 12.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER: WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL | |
| SAMPLER: 2 INCH O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER: WEIGHT 140 lbs. | DROP 30 in. | INSPECTOR: CARL VARTERESIAN | |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| SM; loose, greenish brown silty c-f SAND 1.0 FT | | | | | | | | | |
| CL; firm to stiff, reddish brown silty CLAY, tr. f. sand, moist. | 1 | SS-1 | 1.2 | 1 5 4 9 | 1415 | 0.3 | 0.3 | 1419 | |
| CL; stiff, reddish brown silty CLAY, tr. fine sand, with tan and black clay partings. | 2 3 4 | SS-2 | 1.5 | 5 5 10 10 | 1421 | 0.3 | 0.3 | 1425 | |
| CL; very stiff, brown CLAY, moist | 5 6 | SS-3 | 1.1 | 8 12 17 19 | 1431 | 0.5 | 0.3 | 1435 | |
| CL; hard, reddish brown silty CLAY, tr. f. sand, tr. f. gravel, moist. | 7 8 | SS-4 | 1.0 | 9 14 20 23 | 1444 | 0.2 | 0.2 | 1447 | |
| CL; same as above | 9 10 | SS-5 | 2.0 | 32 25 30 34 | 1500 | 0.3 | 0.3 | 1505 | |
| CL; same as above | 11 12 | SS-6 | 2.0 | 24 20 27 37 | 1510 | 0.3 | 0.3 | 1512 | |
| Bottom of boring at 12.0 ft | 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0572

**WOODWARD-CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-12 SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 145.7 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: Earnest Thomas | DATE STARTED: 3 JUNE 1987 | DATE FINISHED: 3 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 12.0 FT | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER | 2 IN. O.D. SPLIT SPOON | | |
| SAMPLER HAMMER | WEIGHT 140 lb. | DROP 30 in. | INSPECTOR: MARION CRAIG |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL-ML; stiff, brown silty CLAY, moist 2.0 FT | 1 | SS-1 | 1.0 | 3 6 6 6 | 1007 | 0.0 | 0.0 | 1010 | |
| CH; stiff, tan, very plastic CLAY, tr. silt, moist | 2, 3 | SS-2 | 1.2 | 2 5 6 7 | 1013 | 0.2 | 0.2 | 1015 | |
| CH; v. stiff, tan med. plastic CLAY, moist | 4, 5 | SS-3 | 1.2 | 13 13 15 20 | 1018 | 0.0 | 0.0 | 1020 | |
| CH; v. stiff, mottled brown, orange and purple, med. plastic CLAY, tr. fine sand, moist 8.0 FT | 6, 7 | SS-4 | 1.3 | 7 10 10 12 | 1022 | 0.0 | 0.0 | 1025 | |
| CH; v. stiff, purple CLAY, wet. | 8, 9 | SS-5 | 1.3 | 15 14 14 16 | 1030 | 0.0 | 0.0 | 1035 | |
| CH; same as above | 10, 11 | SS-6 | 0.6 | 17 20 20 22 | 1037 | 0.2 | 0.2 | 1040 | |
| Bottom of boring at 12.0 ft | 12, 13, 14, 15, 16, 17, 18, 19 | | | | | | | | |

MGY 001 0573

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-13

SHEET 1 OF 1

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 134.8 ft | PROJECT NO: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: Earnest Thomas | DATE STARTED: 3 JUNE 1987 | DATE FINISHED: 3 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 12.0 FT. | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT | DROP | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT: 140 lb. | DROP: 30 in | INSPECTOR: MARION CRAIG |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| CL-ML, very stiff, mottled brown and rust, silty CLAY, tr. sand, moist 2.0 FT | 1 | SS-1 | 0.7 | 10 11 11 12 | 1410 | 0.0 | 0.0 | 1412 | |
| CH; v. stiff, v. plastic brown CLAY, moist 4.0 FT | 2 3 4 | SS-2 | 1.4 | 8 10 10 12 | 1413 | 0.0 | 0.0 | 1416 | |
| CL-ML; very stiff, reddish brown silty CLAY, some f. sand, tr. f. gravel, moist. | 5 6 | SS-3 | 1.8 | 15 18 21 26 | 1417 | 0.2 | 0.0 | 1420 | |
| CL-ML; hard, reddish brown silty CLAY, tr. f. sand, moist 8.0 FT | 7 8 | SS-4 | 2.0 | 17 19 19 21 | 1425 | 0.0 | 0.0 | 1430 | |
| CL; hard, reddish brown silty CLAY, with tan clay partings, moist | 9 10 | SS-5 | 1.2 | 20 20 20 21 | 1435 | 0.0 | 0.0 | 1440 | |
| CL; same as above | 11 12 | SS-6 | 1.7 | 19 27 31 35 | 1443 | 0.0 | 0.0 | 1447 | |
| Bottom of boring at 12.0 ft | 13 14 15 16 17 18 19 | | | | | | | | |

MGY 001 0574

# WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

LOG OF BORING SF-14 SHEET 1 OF 1.

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: Montgomery Township Housing Development/ Rocky Hill Municipal Wellfield | | ELEVATION AND DATUM: 150.1 ft | PROJECT NO.: 84C4007 |
| DRILLING AGENCY: Warren George, Inc. | FOREMAN: EARNEST THOMAS | DATE STARTED: 9 JUNE 1987 | DATE FINISHED: 9 JUNE 1987 |
| DRILLING EQUIPMENT: MOBILE B-61 | | COMPLETION DEPTH: 12.0 FT. | ROCK DEPTH: N.E. |
| SIZE AND TYPE OF BIT: — | SIZE AND TYPE CORE BARREL: — | NO. SAMPLES: DIST 6 | UNDIST — CORE — |
| CASING: — | | WATER LEVEL: FIRST N.E. | COMPL — 24 HR — |
| CASING HAMMER | WEIGHT — | DROP — | BORING ANGLE AND DIRECTION: VERTICAL |
| SAMPLER: 2 IN. O.D. SPLIT SPOON | | | |
| SAMPLER HAMMER | WEIGHT 140 lb. | DROP 30 IN. | INSPECTOR: CARL VARTERESIAN |

| DESCRIPTION | DEPTH, FT | SAMPLES: TYPE & NO. | RECOV. FT. | PENETR. RESIST. BL/6 IN | TIME | HNU READINGS (PPM): SAMPLE | AMBIENT AIR | TIME | REMARKS |
|---|---|---|---|---|---|---|---|---|---|
| MH; firm, brown clayey SILT with sand, moist 2.0 FT | 1 | SS-1 | 0.8 | | | 0.3 | 0.3 | 1432 | |
| CL; firm, rusty brown CLAY with some silt, trace f. gravel, moist | 2, 3 | SS-2 | 1.2 | | | 0.3 | 0.3 | 1437 | |
| CL; same as above 6.0 FT | 4, 5 | SS-3 | 0.9 | | | 0.2 | 0.2 | 1449 | |
| GC; , tan clayey GRAVEL some f. sand, wet 8.0 FT | 6, 7 | SS-4 | 0.7 | | | 0.2 | 0.2 | 1450 | |
| S.C; , tan clayey SAND, trace f. gravel, wet 10.0 FT | 8, 9 | SS-5 | 0.4 | | | 0.3 | 0.3 | 1502 | |
| CL; reddish brown CLAY trace fine gravel and sand, wet | 10, 11 | SS-6 | 1.3 | | | 0.3 | 0.3 | 1506 | |
| Bottom of boring at 12.0 ft | 12, 13, 14, 15, 16, 17, 18, 19 | | | | | | | | |

MGY 001 0575

# Appendix D

MGY 001 0576

# APPENDIX D
# MONITORING WELL INSTALLATION REPORTS



MGY 001 0577

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-1S | O.C. 101.97 ft. I.C. 100.60 ft. | 8404007 A28 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 16 JUNE 1986 | 16 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | *SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

**BORING**

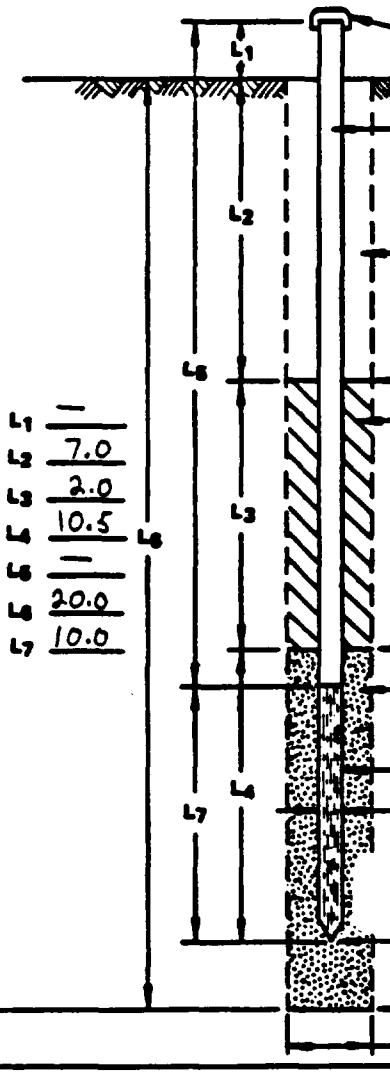
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | MUDSTONE, dark reddish brown. |
| 4 | |
| | WEATHERED BEDROCK 7.0 |
| | COMPETENT BEDROCK |
| 8 | |
| | MUDSTONE, dark reddish brown. |
| 12 | |
| 16 | 16.5 |
| | GYPSUM, light gray. 17.0 |
| | CALCAREOUS CLAYSTONE, blackish red. |
| 20 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: weathered bedrock

GROUND ELEV. 99.5 ft. TOP OF RISER ELEV. see above

| | |
|---|---|
| $L_1$ | — |
| $L_2$ | 7.0 |
| $L_3$ | 2.0 |
| $L_4$ | 10.5 |
| $L_5$ | — |
| $L_6$ | 20.0 |
| $L_7$ | 10.0 |




I.D. OF RISER PIPE: 4.0 in.
TYPE OF PIPE: Stainless steel
TYPE OF BACKFILL AROUND RISER: cement - bentonite grout
TOP OF SEAL ELEV.: 92.5 ft.
TYPE OF SEAL MATERIAL: bentonite pellets
TOP OF FILTER ELEV.: 90.5 ft.
TYPE OF FILTER MATERIAL: no. 2 morie sand
SIZE OF OPENINGS: 0.01 in.
DIAMETER OF MONITOR WELL: 4.0 in.
MGY 001 0578
BOTTOM OF MON. WELL ELEV.: 80.0 ft.
BOTTOM OF BORING ELEV.: 79.5
DIAMETER OF BORING: 8.0 in.

REMARKS: 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) developm air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lifted again for approximately 15 minutes (became dry). Water jetted along entire screen length for 25 minutes using Rocky Hill water, air lifted approx. 15 min. until dry.

INSPECTED BY: Jim Scarrow
WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-2S | O.C. 61.19 ft. I.C 61.09 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 9 Oct. 1986 | 9 Oct 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | MUDSTONE, dark reddish brown |
| 4.2 | |
| | (WEATHERED BEDROCK) 7.0 |
| | (COMPETENT BEDROCK) |
| 8.4 | |
| | MUDSTONE, dark reddish brown |
| 12.6 | |
| 16.8 | |
| 21.0 | |

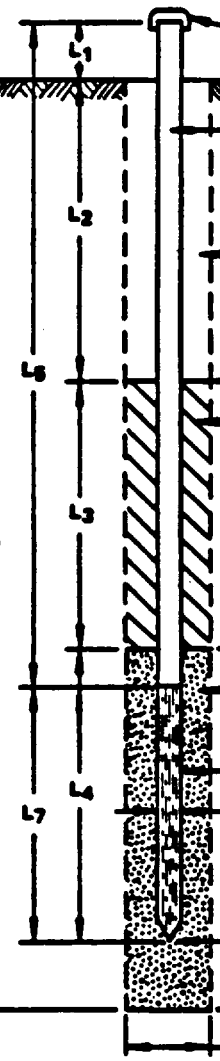
**MONITORING WELL**

TYPE OF MONITORING WELL: WEATHERED BEDROCK

GROUND ELEV. 61.4 ft.

TOP OF RISER ELEV. See above

L1 —
L2 7.0
L3 2.0
L4 12.0
L5 —
L6 21.0
L7 10.0




VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 54.4 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 52.4 ft.

TYPE OF FILTER MATERIAL no. 1 morie sand

SIZE OF OPENINGS 0.010 in.

DIAMETER OF MONITOR WELL TIP 4.0 in.

MGY 001 0579

BOTTOM OF MON. WELL ELEV. 40.4 ft.

BOTTOM OF BORING ELEV. 40.4

DIAMETER OF BORING 8.0 in

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking flush mounted protective outer cover 4) development: air lifted until dry, allowed to recover, air lifted again until dry, repeated procedure for 1 hour (water expelled from hole had slight brown color at end of development): water jetted along entire screen length for 25 min. using Rocky Hill water, air lifted until dry.

INSPECTED BY CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

MGY 001 0579

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-35 | O.C. 142.71 ft. I.C. 142.64 ft. | 8404007 A28 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 18 JUNE 1986 | 19 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

### BORING

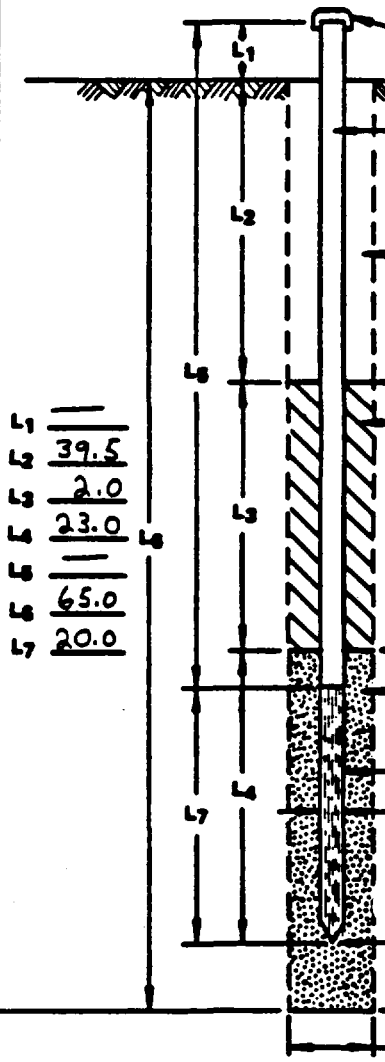
| DEPTH IN FT | DESCRIPTION | |
|---|---|---|
| 0 | OVERBURDEN | 3.0 |
| | MUDSTONE, dark reddish brown. | 18.5 |
| | SANDSTONE, yellowish brown. | |
| | WEATHERED BEDROCK | 50.0 |
| | COMPETENT BEDROCK SANDSTONE, yellowish brown. | 53.5 |
| | ANHYDRITE, light brown | 55.4 |
| | MUDSTONE, dark reddish brown. | |
| 65 | | |

### MONITORING WELL

TYPE OF MONITORING WELL: weathered bedrock

GROUND ELEV. 141.8 ft. TOP OF RISER ELEV. See above

L1 —
L2 39.5
L3 2.0
L4 23.0
L5 —
L6 65.0
L7 20.0




VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement - bentonite grout

TOP OF SEAL ELEV. 102.3 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 100.3 ft

TYPE OF FILTER MATERIAL no. 1 morie sand

SIZE OF OPENINGS 0.01 in.

DIAMETER OF MONITOR WELL 4.0 in.

MGY 001 0580

BOTTOM OF WELL ELEV. 77.3 ft

BOTTOM OF BORING ELEV. 76.8

DIAMETER OF BORING 8.0 in.

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) develop air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lifted again for approximately 15 minutes (became dry). water jetted along entire screen length for 25 minutes using Rocky Hill water, air lifted until dry.

INSPECTED BY Jim Scarrow
WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

## INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, Somerset, NJ | MW-4S | O.C. 124.24 ft. I.C. 123.43 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 16 SEPT, 1986 | 16 SEPT, 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

### LOG OF MONITORING WELL

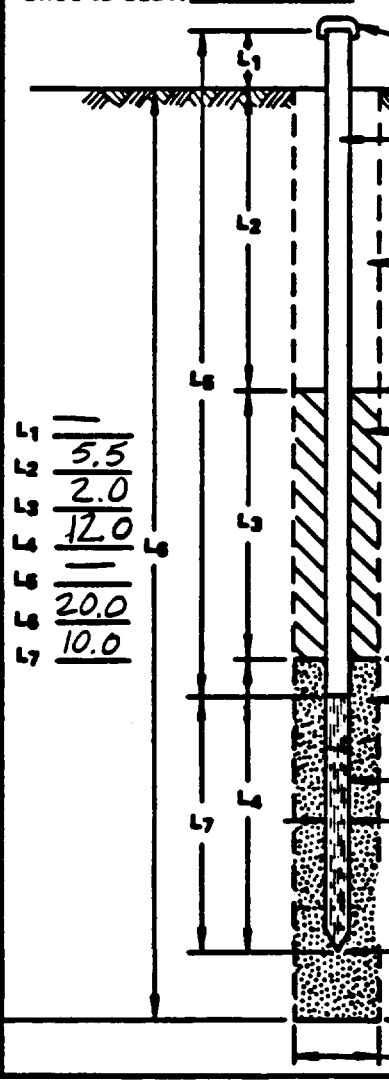
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN 3.5 |
| 4 | MUDSTONE, dark reddish brown |
| 8 | |
| | WEATHERED BEDROCK 10.0 |
| | COMPETENT BEDROCK |
| 12 | MUDSTONE, dark reddish brown |
| 16 | |
| 20 | |

**MONITORING WELL**

TYPE OF MONITORING WELL weathered bedrock

GROUND ELEV. 122.8 ft. TOP OF RISER ELEV. see above




| | |
|---|---|
| $L_1$ | — |
| $L_2$ | 5.5 |
| $L_3$ | 2.0 |
| $L_4$ | 12.0 |
| $L_5$ | — |
| $L_6$ | 20.0 |
| $L_7$ | 10.0 |

VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 117.3 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 115.3 ft

TYPE OF FILTER MATERIAL no. 1 mine sand

SIZE OF OPENINGS 0.010 in.

DIAMETER OF MONITOR WELL TIP 4.0 in.

MGY 001 0581

BOTTOM OF MON. WELL ELEV. 103.3

BOTTOM OF BORING ELEV. 102.8

DIAMETER OF BORING 8.0 in.

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) development: air lifted until dry, water jetted along entire screen length for 25 min using Rocky Hill water, air lifted until dry, allowed to recover, air lifted until dry, repeated procedure for 30 minutes.

INSPECTED BY CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-5S | O.C. 142.76 ft. I.C. 141.73 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 25 Sept 1986 | 25 Sept 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

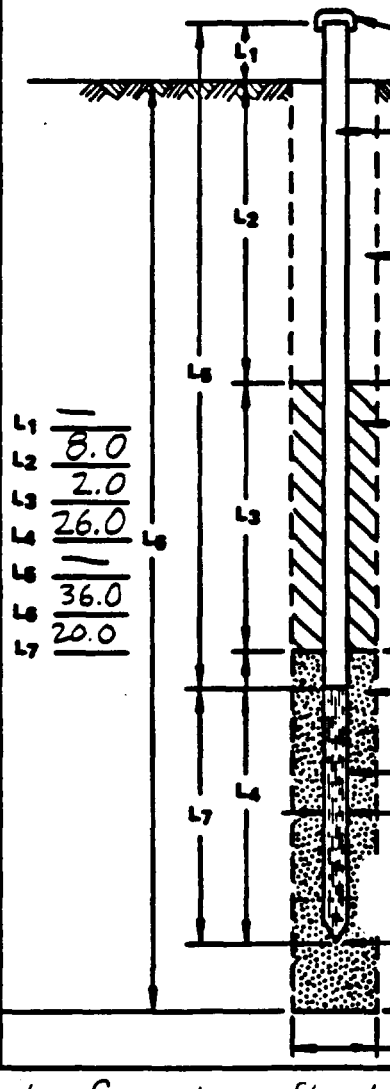
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| 7.2 | OVERBURDEN 8.5 |
| 14.4 | MUDSTONE, dark reddish brown |
| 21.6 | WEATHERED BEDROCK 26.0 |
| | COMPETENT BEDROCK |
| 28.8 | MUDSTONE, dark reddish brown |
| 36.0 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: WEATHERED BEDROCK

GROUND ELEV. 141.6 ft. TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | — |
| L2 | 8.0 |
| L3 | 2.0 |
| L4 | 26.0 |
| L5 | — |
| L6 | 36.0 |
| L7 | 20.0 |

VENTED CAP

I.D. OF RISER PIPE: 4.0 in

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement-bentonite grout

TOP OF SEAL ELEV. 133.6 ft.

TYPE OF SEAL MATERIAL: bentonite pellets

TOP OF FILTER ELEV. 131.6 ft

TYPE OF FILTER MATERIAL: no. 1 marie sand

SIZE OF OPENINGS: 0.01 in.

DIAMETER OF MONITOR WELL TIP: 4.0 in.

MGY 001 0582

BOTTOM OF MON. WELL ELEV. 105.6 ft

BOTTOM OF BORING ELEV. 105.6

DIAMETER OF BORING: 8.0 in

REMARKS: 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installing; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking 8 in. I.D. protective casing; 4) development: air lifted until dry, surged with 30 gallons of Rocky Hill water, air lifted again for approximately 15 min (until dry), repeated for 2½ hours. until evacuated water was clear, water jetted along entire screen length using Rocky Hill water, air lifted until dry.

INSPECTED BY: C. Varteresian
WOODWARD–CLYDE CONSULTANT

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO, NJ | MW-6S | O.C. 147.24 ft. I.C. 146.94 ft. | 84C4037 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 12 SEPT. 1986 | 15 Sept. 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | See Remarks |

## LOG OF MONITORING WELL

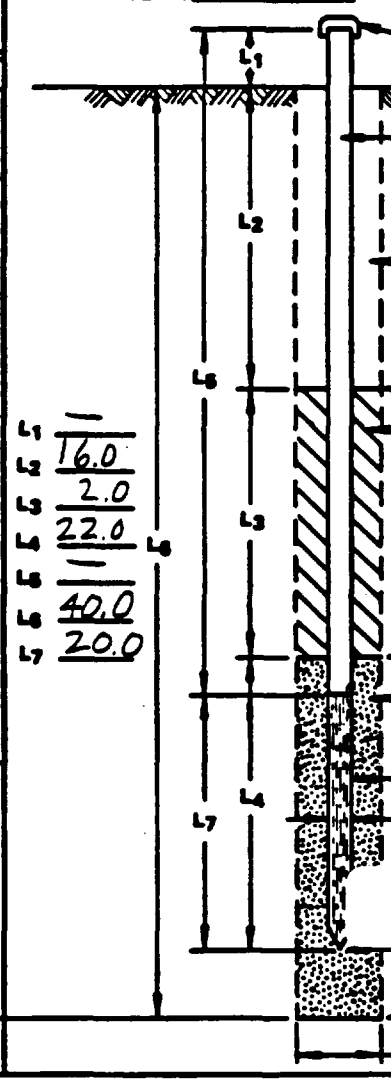
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN — 3.5 |
| 8 | |
| | MUDSTONE, dark reddish brown |
| 16 | |
| 24 | |
| | WEATHERED BEDROCK / COMPETENT BEDROCK — 29.0 |
| 32 | |
| | MUDSTONE, dark reddish brown |
| 40 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: weathered bedrock

GROUND ELEV. 145.9 — TOP OF RISER ELEV. See above




L1 —
L2 16.0
L3 2.0
L4 22.0
L5 —
L6 40.0
L7 20.0

VENTED CAP

I.D. OF RISER PIPE: 4.0 in.

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement-bentonite grout

TOP OF SEAL ELEV. 129.9 ft.

TYPE OF SEAL MATERIAL: bentonite pellets

TOP OF FILTER ELEV. 127.9 ft.

TYPE OF FILTER MATERIAL: no. 1 Morie Sand

SIZE OF OPENINGS: 0.01 in.

DIAMETER OF MONITOR WELL TIP: 4.0 in.

MGY 001 0583

BOTTOM OF MON. WELL ELEV. 105.9 ft.

BOTTOM OF BORING ELEV. 105.9

DIAMETER OF BORING: 8.0 in

REMARKS: 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking 8 in. I.D. protective outer casing; 4) development: air lifted until dry, surged with 40 gallons of Rocky Hill water, air lifted again for approximately 20 min (until dry), repeated procedure for 2½ hours until expelled water was clear, water jetted along entire screen length for 25 min using Rocky Hill water, air lifted until dry.

INSPECTED BY: Carl Varteresian
WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

## INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-75 | O.C. 146.04 ft. I.C. 145.23 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 12 JUNE 1986 | 13 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

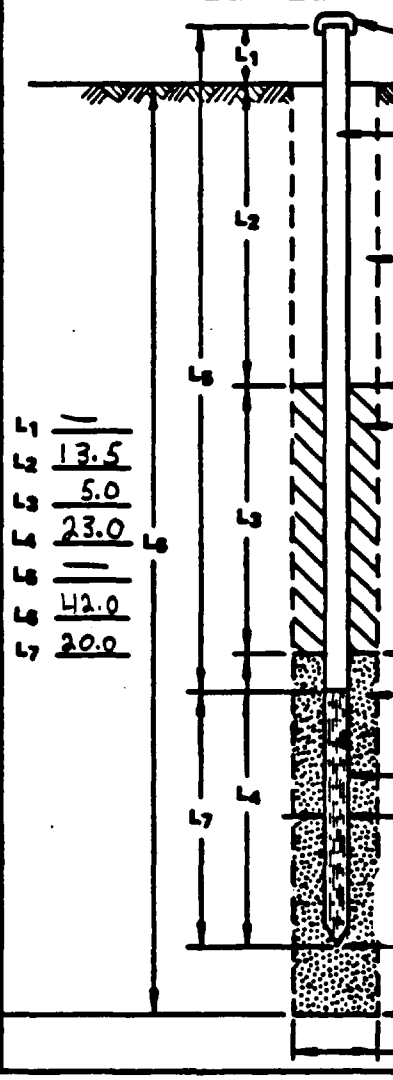
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN |
| 13.4 | |
| | MUDSTONE, dark reddish brown. |
| | WEATHERED BEDROCK |
| 31.0 | |
| | COMPETENT BEDROCK |
| | MUDSTONE, dark reddish brown. |
| 42 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: Weathered bedrock

GROUND ELEV. 143.8 ft. TOP OF RISER ELEV. See above




L1 —
L2 13.5
L3 5.0
L4 23.0
L5 —
L6 42.0
L7 20.0

VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE Stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 130.3 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 125.3 ft.

TYPE OF FILTER MATERIAL no. 2 morie sand

SIZE OF OPENINGS 0.01 in.

DIAMETER OF MONITOR WELL 4.0 in

MGY 001 0584

BOTTOM OF MONITOR WELL ELEV. 102.3 ft.

BOTTOM OF BORING ELEV. 101.8

DIAMETER OF BORING 8.0 in.

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) developme air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lifted again for approximately 15 minutes (became dry). INSPECTED BY Jim Scarrow

Water jetted along entire screen length using Rocky Hill water, air lifted until dry.

WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

## INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-95 | O.C. 151.63 ft. I.C. 150.29 ft. | 84C4007 A&B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 20 JUNE 1986 | 20 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

### LOG OF MONITORING WELL

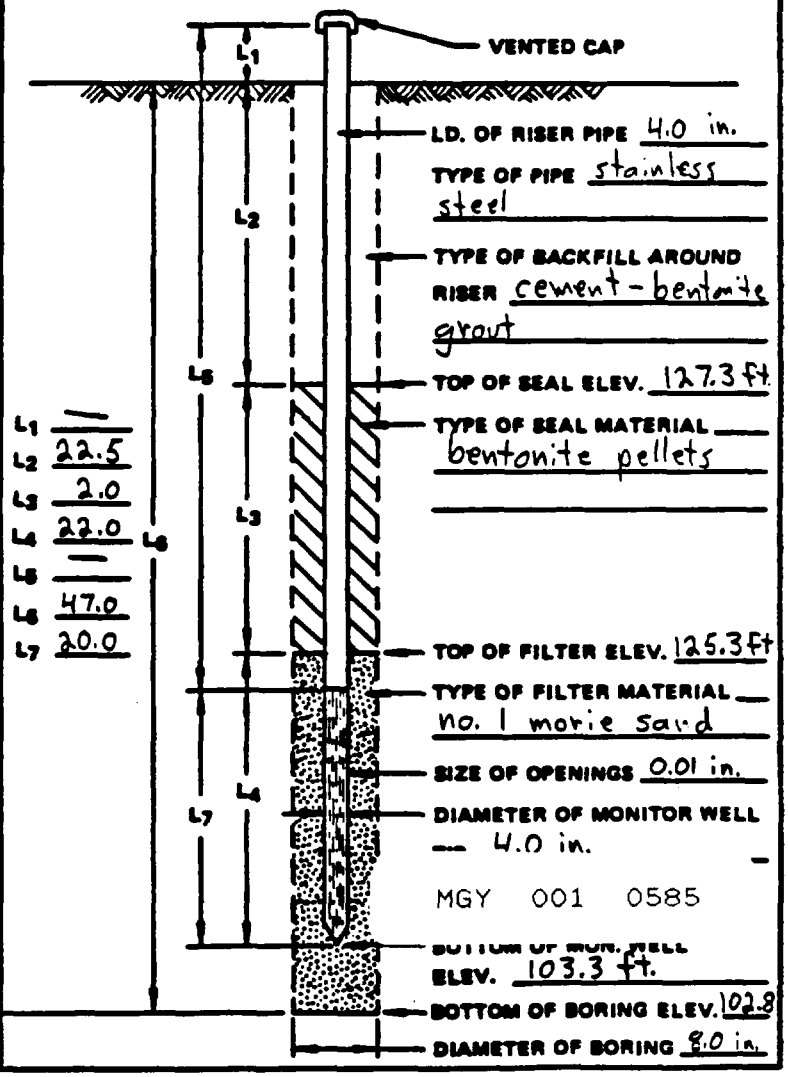
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN |
| 8.5 | |
| | MUDSTONE, dark reddish brown. |
| | WEATHERED BEDROCK |
| 35.0 | |
| | COMPETENT BEDROCK |
| | MUDSTONE, dark reddish brown. |
| 47 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: weathered bedrock

GROUND ELEV. 149.8 ft. TOP OF RISER ELEV. See above




L1 —
L2 22.5
L3 2.0
L4 22.0
L5 —
L6 47.0
L7 20.0

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) development: air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lifted again for approximately 15 minutes (became dry). Water jetted along entire screen length for 20 minutes using Rocky Hill water, air lifted until dry.

INSPECTED BY Jim Scarrow
WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-105 | O.C. 154.41 ft. I.C. 153.50 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 14 JUNE 1986 | 16 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

**BORING**

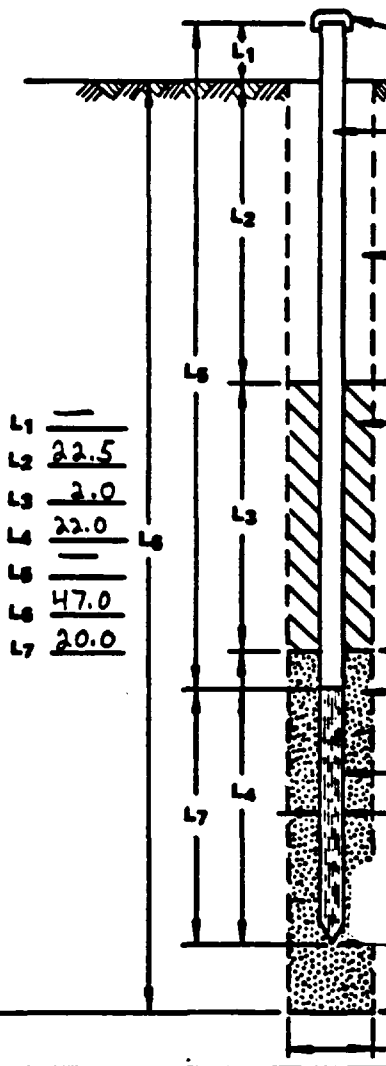
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN |
| 9.5 | MUDSTONE, dark reddish brown. |
| 34.0 | WEATHERED BEDROCK / COMPETENT BEDROCK |
| | MUDSTONE, dark reddish brown. |
| 47 | |

**MONITORING WELL**

TYPE OF MONITORING WELL weathered bedrock

GROUND ELEV. 151.7 ft

TOP OF RISER ELEV. See above




L1 —
L2 22.5
L3 2.0
L4 22.0
L5 —
L6 47.0
L7 20.0

VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 129.2 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 127.2 ft.

TYPE OF FILTER MATERIAL no. 2 morie sand

SIZE OF OPENINGS 0.01 in

DIAMETER OF MONITOR WELL TIP 4.0 in.

MGY 001 0586

BOTTOM ELEV. 105.2 ft.

BOTTOM OF BORING ELEV. 104.7

DIAMETER OF BORING 8.0 in.

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) development air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lifted again for approximately 15 minutes (became dry). Water jetted along entire screen length for 25 minutes using Rocky Hill water [illegible] lifted until dry

INSPECTED BY Jim Scarrow
WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

## INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-11S | O.C. 130.35 ft. I.C. 129.98 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 16 SEPT 1986 | 17 Sept 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

### LOG OF MONITORING WELL

**BORING**

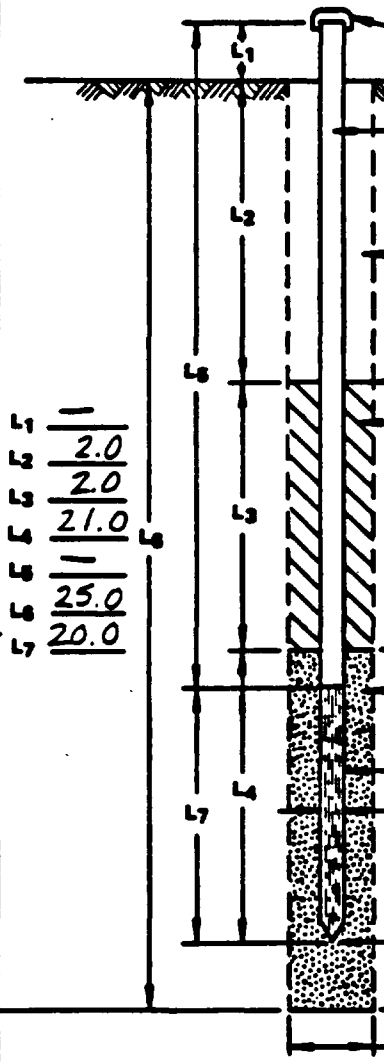
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN 3.5 |
| 5 | |
| | MUDSTONE, dark reddish brown |
| 10 | |
| 15 | WEATHERED BEDROCK 15.0 |
| | COMPETENT BEDROCK |
| 20 | MUDSTONE, dark reddish brown |
| 25 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: weathered bedrock

GROUND ELEV. 128.0 ft.

TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | — |
| L2 | 2.0 |
| L3 | 2.0 |
| L4 | 21.0 |
| L5 | — |
| L6 | 25.0 |
| L7 | 20.0 |

VENTED CAP

I.D. OF RISER PIPE: 4.0 in.

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement-bentonite grout

TOP OF SEAL ELEV. 126.0 ft

TYPE OF SEAL MATERIAL: bentonite pellets

TOP OF FILTER ELEV. 124.0 ft

TYPE OF FILTER MATERIAL: no. 1 MURIE SAND

SIZE OF OPENINGS: 0.010 in.

DIAMETER OF MONITOR WELL: 4.0 in.

MGY 001 0587

BOTTOM OF WELL ELEV. 103.0 ft.

BOTTOM OF BORING ELEV. 103.0

DIAMETER OF BORING: 8.0 in

REMARKS: 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking 8 in. I.D. protective casing; 4) development: air lifted until dry, water jetted along entire screen length for 20 min using Rocky Hill water, air lifted until dry, allowed to recover, air lifted until dry again, repeated procedure for 25 minutes.

INSPECTED BY: CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

MGY 001 0587

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**INSTALLATION REPORT**
**SHALLOW MONITORING WELL**

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-135 | O.C. 113.37 ft. I.C. 111.81 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 19 JUNE 1986 | 19 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

**BORING**

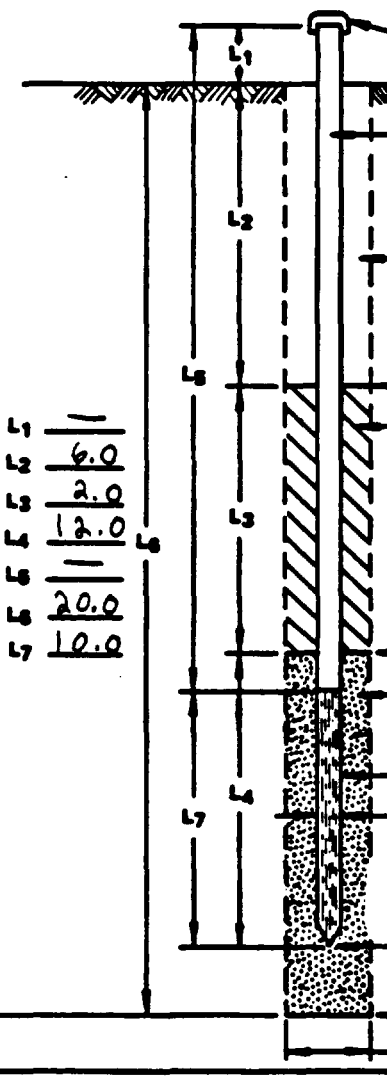
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN 3.0 |
| 4 | |
| | MUDSTONE, dark reddish brown. |
| 8 | |
| | WEATHERED BEDROCK 10.0 |
| | COMPETENT BEDROCK |
| 12 | MUDSTONE, dark reddish brown |
| | 15.0 |
| 16 | |
| | CALCAREOUS MUDSTONE, dark reddish brown |
| 20 | |

**MONITORING WELL**

TYPE OF MONITORING WELL weathered bedrock

GROUND ELEV. 110.6 ft. TOP OF RISER ELEV. see above

L1 —
L2 6.0
L3 2.0
L4 12.0
L5 —
L6 20.0
L7 10.0




VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 104.6 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 102.6 ft

TYPE OF FILTER MATERIAL No. 1 Morie Sand

SIZE OF OPENINGS 0.010 in.

DIAMETER OF MONITOR WELL 4.0 in.

MGY 001 0588

BOTTOM OF MON. ELEV. 90.6 ft.

BOTTOM OF BORING ELEV. 90.6

DIAMETER OF BORING 8.0 in

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) developmen air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lift again for approximately 15 minutes (became dry).
Water jetted along entire screen length using Rock Hill water, air lifted until dry.

INSPECTED BY Jim Scarrow
WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-14S | O.C. 75.82 ft. I.C. 74.71 ft. | 84C4007 A23 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 18 Sept 1986 | 18 Sept 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

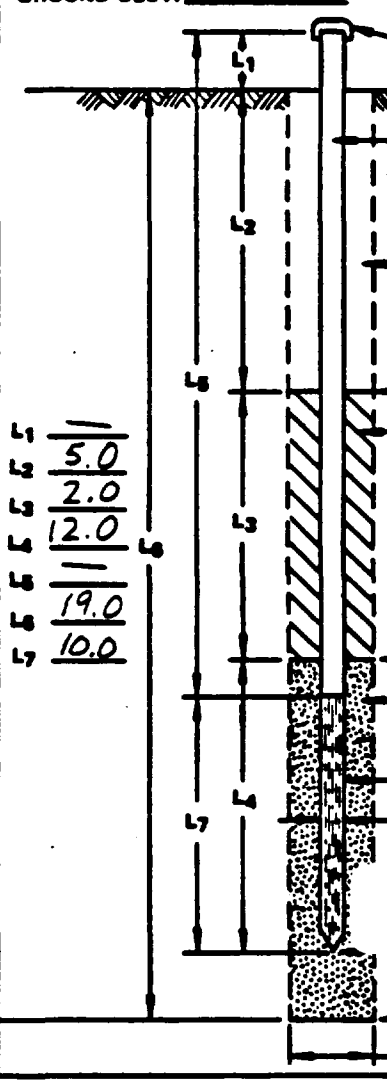
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN 1.0 |
| | MUDSTONE, dark reddish brown |
| 3.8 | |
| | WEATHERED BEDROCK 6.0 |
| | COMPETENT BEDROCK |
| 7.6 | |
| | MUDSTONE, dark reddish brown |
| 11.4 | |
| 15.2 | |
| 19.0 | |

**MONITORING WELL**

TYPE OF MONITORING WELL: WEATHERED BEDROCK

GROUND ELEV. 73.1 ft. TOP OF RISER ELEV. see above




L1 —
L2 5.0
L3 2.0
L4 12.0
L5 —
L6 19.0
L7 10.0

VENTED CAP

I.D. OF RISER PIPE 4.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 68.1 ft.

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 66.1 ft

TYPE OF FILTER MATERIAL No. 1 MORIE SAND

SIZE OF OPENINGS 0.010 in.

DIAMETER OF MONITOR WELL TIP 4.0 in.

MGY 001 0589

ELEV. 54.1 ft.

BOTTOM OF BORING ELEV. 54.1

DIAMETER OF BORING 8.0 in.

REMARKS 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) development: air lifted until dry, water jetted along entire length of screen for 30 min using Rocky Hill water, air lifted until dry, allowed to recover, air lifted again, repeated procedure for 30 min.

INSPECTED BY CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-155 | O.C. 126.25 ft<br>I.C. 125.50 ft. | 84C4007 A28 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 13 JUNE 1986 | 14 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR & WATER JET | SEE REMARKS | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

### BORING

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | |
| | OVERBURDEN 3.0 |
| | MUDSTONE, dark reddish brown. |
| | WEATHERED BEDROCK 16.0<br>COMPETENT BEDROCK |
| | MUDSTONE, dark reddish brown. |
| 26 | |

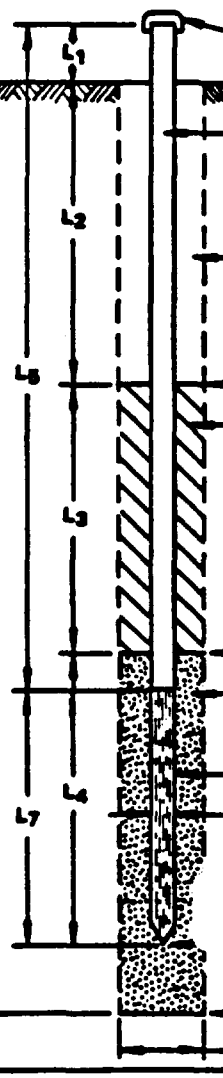
### MONITORING WELL

TYPE OF MONITORING WELL: weathered bedrock

GROUND ELEV. 123.9 ft.

TOP OF RISER ELEV. See above

| | |
|---|---|
| $L_1$ | — |
| $L_2$ | 2.5 |
| $L_3$ | 2.0 |
| $L_4$ | 21.0 |
| $L_5$ | — |
| $L_6$ | 26.0 |
| $L_7$ | 20.0 |




VENTED CAP

I.D. OF RISER PIPE: 4.0 in.

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement-bentonite grout

TOP OF SEAL ELEV. 121.4 ft.

TYPE OF SEAL MATERIAL: bentonite pellets

TOP OF FILTER ELEV. 119.4 ft

TYPE OF FILTER MATERIAL: no. 2 morie sand

SIZE OF OPENINGS: 0.010 in.

DIAMETER OF MONITOR WELL: 4.0 in.

MGY 001 0590

ELEV. 98.4 ft.

BOTTOM OF BORING ELEV.

DIAMETER OF BORING: 8.0 in

REMARKS: 1) drilling mud was flushed out with freshwater after the completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a locking, 8 in. I.D., protective casing; 4) development: air lifted until dry, surged with 30 gallons of Rocky-Hill water, immediately air lifted again for approximately 15 minutes (became dry).. Water jetted along entire screen length using Rocky Hill water, air lifted until dry.

INSPECTED BY: Jim Scarrow
WOODWARD–CLYDE CONSULTANTS

# WOODWARD–CLYDE CONSULTANTS

**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

## INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-1D | O.C. 101.93 ft. I.C. 101.45 ft. | 84C4007 A28 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 10 JUNE 1986 | 28 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 200 | 1250 | 1307 |

## LOG OF MONITORING WELL

### BORING

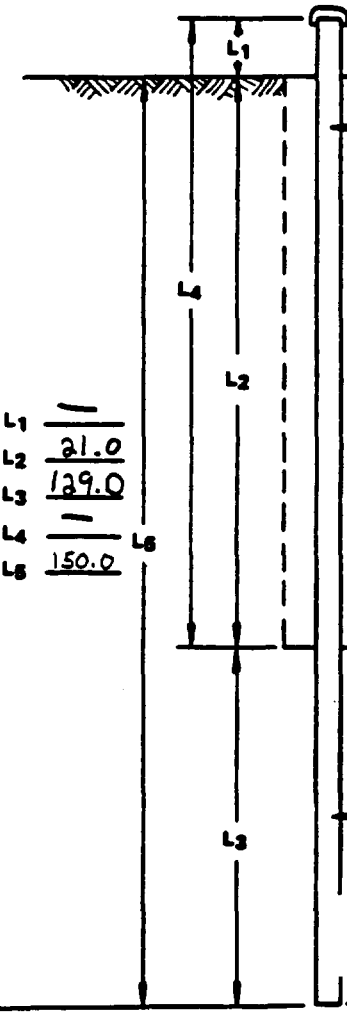
| DEPTH IN FT | DESCRIPTION | |
|---|---|---|
| 0 | MUDSTONE, dark reddish brown. | |
| | WEATHERED BEDROCK | 7.0 |
| | COMPETENT BEDROCK | |
| | MUDSTONE, dark reddish brown. | 16.5 |
| | GYPSUM, light gray. | 17.0 |
| | CALCAREOUS CLAYSTONE, blackish red. | 20.5 |
| | SANDSTONE, dark reddish brown. | 23.3 |
| 30 | MUDSTONE, dark reddish brown. | 29.8 |
| | CALCAREOUS CLAYSTONE, dark grey. | 32.3 |
| | SANDSTONE, dark reddish brown. | 43.0 |
| | SILTSTONE, dark reddish brown. | 53.5 |
| | ARGILLACEOUS DOLOSTONE, dark gray. | 55.7 |
| 60 | MUDSTONE, dark reddish brown. | 64.3 |
| | CLAYSTONE, dark reddish brown. | 67.9 |
| | CALCAREOUS MUDSTONE, dark reddish brown. | 72.7 |
| | ARGILLACEOUS LIMESTONE, dark grey. | 75.9 |
| 90 | SILTSTONE, dark reddish brown. | 96.5 |
| | MUDSTONE, dark reddish brown. | 106.2 |
| | CALCAREOUS DOLOMITIC CLAYSHALE, dark gray. | 109.7 |
| | DOLOMITIC SANDSTONE, very dusky red. | 111.3 |
| | DOLOMITIC CLAYSTONE, dark gray. | 117.4 |
| 120 | SILTSTONE, dark reddish brown. | |
| 150 | | |

### MONITORING WELL

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 99.5 ft.

TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | — |
| L2 | 21.0 |
| L3 | 129.0 |
| L4 | — |
| L5 | 150.0 |

VENTED CAP

I.D. OF RISER PIPE: 6.0 in.

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement grout

I. D. OF BORING: 10.5 in.

BOTTOM OF CASING ELEV. 78.5 ft

I.D. OF OPEN HOLE: 6.0 in.

MGY 001 0591

BOTTOM OF OPEN HOLE ELEV. -50.5 ft.

REMARKS: 1) overburden casing was emplaced into a 10.5-inch diameter, 21.0-foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for several days; 3) evacuated ground water changed, in color, from reddish brown to clear during well development; 4) installed a locking, 8 in. I.D., protective casing

INSPECTED BY: J. Scarrow / C. Sforza

WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-2D | O.C. 61.64 ft. I.C. 61.34 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 10 Oct 1986 | 14 Oct 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 200 | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

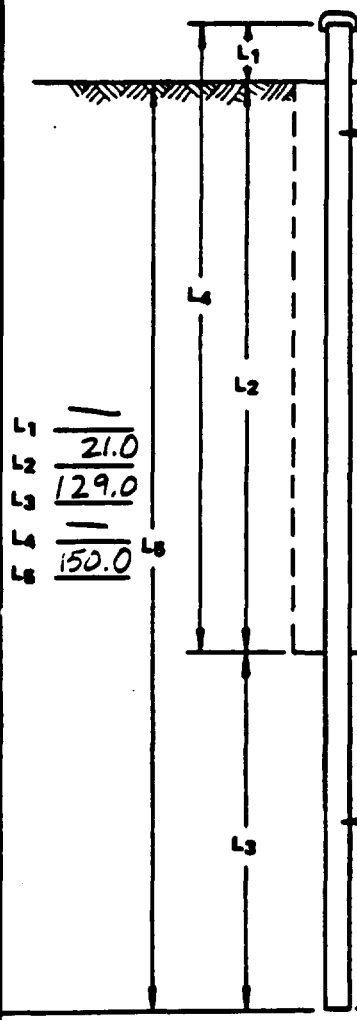
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | MUDSTONE, dark reddish brown WEATHERED BEDROCK — 7.0 |
| | COMPETENT BEDROCK |
| 30 | MUDSTONE, dark reddish brown |
| 60 | |
| | 70.0 |
| 90 | SILTSTONE, dark reddish brown |
| 120 | |
| 150 | |

**MONITORING WELL**

TYPE OF MONITOR WELL: COMPETENT BEDROCK

GROUND ELEV. 61.4 ft. TOP OF RISER ELEV. See above




L1 —
L2 21.0
L3 129.0
L4 —
L5 150.0

VENTED CAP

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE Stainless steel

TYPE OF BACKFILL AROUND RISER cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 40.4 ft.

I.D. OF OPEN HOLE 6.0 in

MGY 001 0592

BOTTOM OF OPEN HOLE ELEV. − 88.6

REMARKS 1) overburden casing emplaced into a 10.5 in. diameter, 21.0 foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set several days; 3) development: air lifted until dry, allowed to recover, air lifted again until dry, repeated procedure for 2 hours; evacuated water changed in color, from reddish brown to clear; 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY CARL VARTERESIAN

WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## DEEP MONITORING WELL

| | | | |
|---|---|---|---|
| PROJECT AND LOCATION: MTHD/RHMW SITE, SOMERSET, NJ | WELL NO.: MW-3D | ELEVATION DATUM: O.C. 143.42 ft. I.C. 143.02 ft. | PROJECT NO.: 84C4007 A2F |
| DRILLING AGENCY: WARREN GEORGE, INC. | FOREMAN: TONY TIRRO | DATE INSTALLATION STARTED: 16 JUNE 1986 | DATE INSTALLATION FINISHED: 8 Oct 1986 |
| DEVELOPMENT EQUIPMENT: AIR COMPRESSOR | GALLONS REMOVED: ≈ 375 | TIME DEVELOPMENT STARTED: See Remarks | TIME DEVELOPMENT COMPLETED: See Remarks |

## LOG OF MONITORING WELL

**BORING**

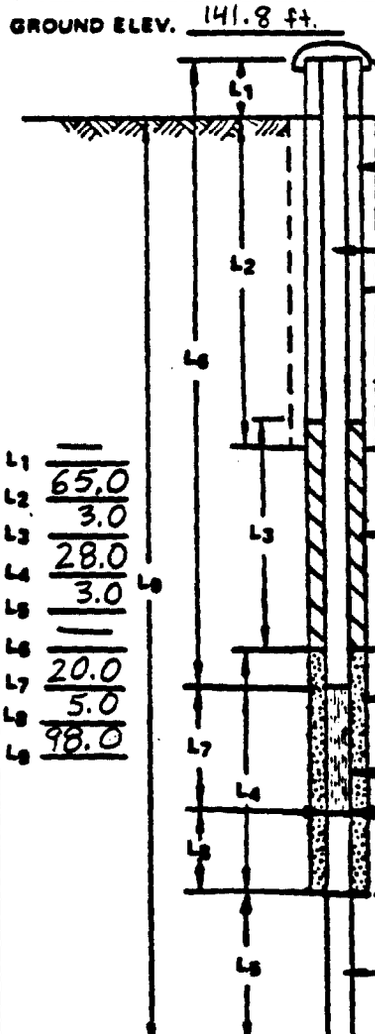
| DEPTH IN FT | DESCRIPTION |
|---|---|
| | OVERBURDEN 3.0 |
| | MUDSTONE, dark reddish brown 18.5 |
| 0 | SANDSTONE, yellowish brown |
| | WEATHERED BEDROCK |
| | SANDSTONE Yel. brn COMPETENT BEDROCK 33.5 |
| | ANHYDRITE, light brown 55.4 |
| 60 | MUDSTONE, dark reddish brown 72.2 |
| 90 | SILTSTONE, dark reddish brown |
| 120 | |
| 150 | |

**MONITORING WELL**

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 141.8 ft.

TOP OF RISER ELEV. see above




| | |
|---|---|
| L1 | — |
| L2 | 65.0 |
| L3 | 3.0 |
| L4 | 28.0 |
| L5 | 3.0 |
| L6 | — |
| L7 | 20.0 |
| L8 | 5.0 |
| L9 | 98.0 |

- VENTED CAP
- I.D. OF OUTER RISER: 6.0 in.
- TYPE OF PIPE: Stainless Steel
- I.D. OF INNER RISER: 4.0 in.
- TYPE OF BACKFILL AROUND RISER: cement grout
- I.D. OF BORING: 10.5 in.
- TOP OF SEAL ELEV.: 79.8 ft
- BOTTOM OF CASING ELEV.: 76.8 ft
- TYPE OF SEAL MATERIAL: bentonite pellets
- TOP OF FILTER ELEV.: 76.8 ft.
- TYPE OF FILTER MATERIAL: morie no. 1 sand
- SIZE OF OPENINGS: 0.01 in.
- DIAMETER OF MONITOR WELL TIP: 4.0 in.
- BOTTOM OF MON. WELL ELEV.: 48.8 ft.
- I.D. OF OPEN HOLE: 4.0 in.
- BOTTOM OF OPEN HOLE ELEV.: 43.8 ft

REMARKS: 1) overburden casing was emplaced into a 10.5 inch diameter, 65-foot deep hole, 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for several days 3) development: air lifted for 30 min; expelled water changed color, from reddish brown to clear, within 15 min. 4) installed a locking, 8 in. I.D. protective casing.

INSPECTED BY: J. Scarrow / C. Sforza / C. Vartersian

WOODWARD–CLYDE CONSULTANTS

MGT 001 0593

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

# INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMN SITE, SOMERSET, NJ | MW-4D | O.C. 123.14 ft. I.C. 122.91 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC | TONY TIRRO | 16 SEPT, 1986 | 30 SEPT, 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈300 | 1120 | 1220 |

## LOG OF MONITORING WELL

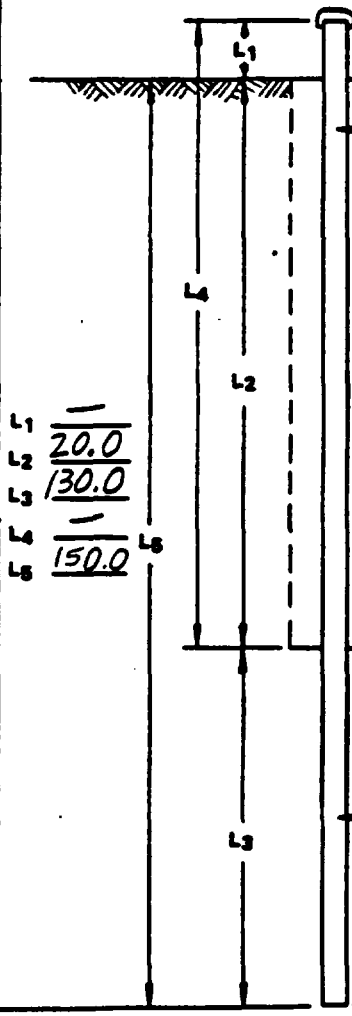
**BORING**

| DEPTH IN FT | DESCRIPTION | |
|---|---|---|
| 0 | OVERBURDEN | 3.5 |
| | MUDSTONE, dark reddish brown WEATHERED BEDROCK | 10.0 |
| | COMPETENT BEDROCK | |
| 30 | MUDSTONE, dark reddish brown | |
| 60 | | 70.0 |
| | SILTSTONE, dark reddish brown | 77.5 |
| | SANDSTONE, dark reddish brown | 82.5 |
| 90 | SILTSTONE, dark reddish brown | 97.5 |
| | MUDSTONE, dark reddish brown | 114.0 |
| 120 | ARGILLACEOUS DOLOSTONE, very dusky red | 133.0 |
| | SILTSTONE, dark reddish brown | |
| 150 | | |

**MONITORING WELL**

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 122.8 ft. TOP OF RISER ELEV. see above




L1 —
L2 20.0
L3 130.0
L4 —
L5 150.0

VENTED CAP

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER Cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 102.8 ft.

I.D. OF OPEN HOLE 6.0 in.

MGY 001 0594

BOTTOM OF OPEN HOLE ELEV. -27.2 ft.

REMARKS 1) overburden casing was emplaced into a 10.5-inch diameter, 20.0 foot hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for 2 weeks; 3) development: air lifted until dry, allowed to recover, air lifted again until dry, repeated procedure for 1 hour. Water had slight brown color at end of development; 4) installed a locking, 8 in. I.D. protective casing

INSPECTED BY CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-5D | O.C. 142.26 ft. I.C. 142.07 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 22 Sept 1986 | 24 Sept 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 350 | SEE REMARKS | SEE REMARKS |

## LOG OF MONITORING WELL

**BORING**

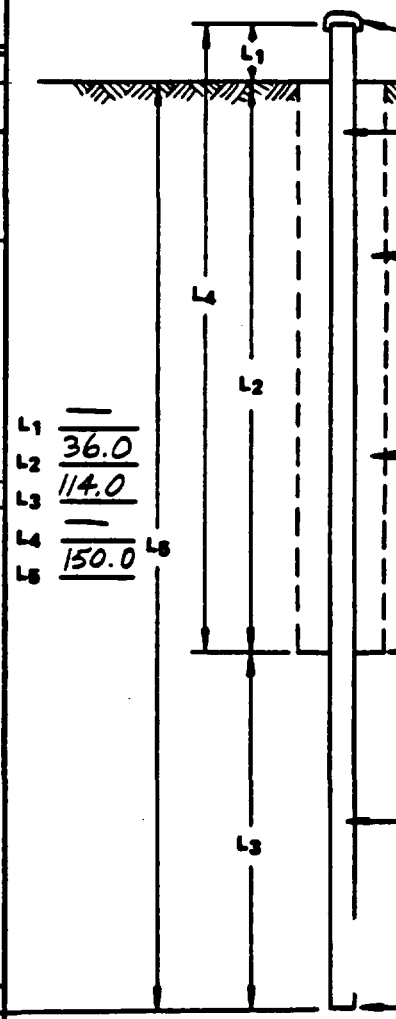
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN — 8.5 |
| | MUDSTONE, dark reddish brown |
| | WEATHERED BEDROCK — 26.0 |
| 30 | COMPETENT BEDROCK |
| | MUDSTONE, dark reddish brown |
| 60 | 70.0 |
| 90 | SILTSTONE, dark reddish brown |
| 120 | 147.0 |
| 150 | ARGILLACEOUS DOLOSTONE, very dusky red |

**MONITORING WELL**

TYPE OF MONITOR WELL: COMPETENT BEDROCK

GROUND ELEV. 141.6 ft.

TOP OF RISER ELEV. see above




L1 —
L2 36.0
L3 114.0
L4 —
L5 150.0

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE Stainless steel

TYPE OF BACKFILL AROUND RISER cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 105.6 ft.

I.D. OF OPEN HOLE 6.0 in.

MGY 001 0595

BOTTOM OF OPEN HOLE ELEV. −8.4

REMARKS 1) overburden casing was emplaced into a 10.5 in. diameter, 36.0 foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set overnight; 3) development: air lifted until dry, allowed to recover, air lifted again until dry, repeated procedure for 3 hours, evacuated ground water changed, in color, from reddish brown to clear; 4) installed a locking, 8 in. I.D., protective casing

INSPECTED BY CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

WOODWARD-CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE SOMERSET, NJ | MW-6D | O.C. 148.17 ft. I.C. 147.74 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 9 SEPT 1986 | 29 SEPT 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈600 | 0830 | 01130 |

## LOG OF MONITORING WELL

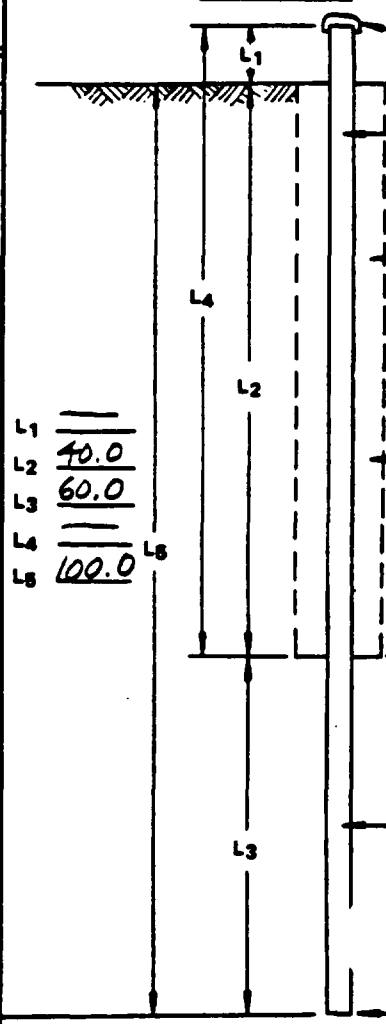
### BORING

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN 3.5 |
| | MUDSTONE, dark reddish brown |
| 20 | WEATHERED BEDROCK 29.0 |
| | COMPETENT BEDROCK |
| 40 | MUDSTONE, dark reddish brown |
| 60 | 68.0 |
| | SILTSTONE, dark reddish brown 70.0 |
| | MUDSTONE, dark reddish brown 72.0 |
| 80 | SILTSTONE, dark reddish brown |
| 100 | |

### MONITORING WELL

TYPE OF MONITOR WELL: COMPETENT BEDROCK

GROUND ELEV. 145.9 ft. TOP OF RISER ELEV. See above




L1 —
L2 40.0
L3 60.0
L4 —
L5 100.0

VENTED CAP

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 105.9 ft

I.D. OF OPEN HOLE 6.0 in.

MGY 001 0596

BOTTOM OF OPEN HOLE ELEV. 45.9 ft.

REMARKS 1) overburden casing was emplaced into a 10.5 in. diameter, 40.0 foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for 3 weeks; 3) development: air lifted until dry, allowed to recover, air lifted again until dry, repeated procedure for 3 hours, until expelled water was clear; 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY CARL VARTERESIAN

WOODWARD-CLYDE CONSULTANTS

# WOODWARD–CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

## INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-7D | O.C. 145.50 ft. I.C. 145.26 ft. | 84C4007 A28 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 11 JUNE 1986 | 30 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈400 | 1137 | 1147 |

## LOG OF MONITORING WELL

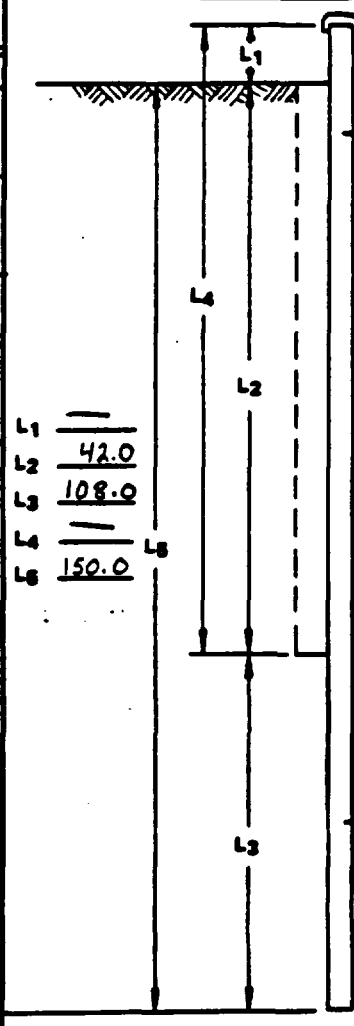
### BORING

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN |
| | 13.4 |
| | MUDSTONE, dark reddish brown. |
| 30 | WEATHERED BEDROCK 31.0 |
| | COMPETENT BEDROCK |
| 60 | MUDSTONE, dark reddish brown. |
| | 85 |
| 90 | ARGILLACEOUS LIMESTONE, dark gray. 95 |
| | MUDSTONE, dark reddish brown. |
| | 105 |
| 120 | CALCAREOUS MUDSTONE, dark reddish brown. |
| | 125 |
| | MUDSTONE, dark reddish brown. |
| 150 | |

### MONITORING WELL

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 143.8 ft. TOP OF RISER ELEV. see above




| | |
|---|---|
| L1 | — |
| L2 | 42.0 |
| L3 | 108.0 |
| L4 | — |
| L5 | 150.0 |

VENTED CAP

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE Stainless steel

TYPE OF BACKFILL AROUND RISER cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 101.8 ft.

I.D. OF OPEN HOLE 6.0 in.

BOTTOM OF OPEN HOLE ELEV. −6.2

MGY 001 0597

REMARKS 1) overburden casing was emplaced into a 10.5-inch diameter, 42-foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for several days; 3) evacuated ground water changed, in color, from reddish bro to clear during well development; 4) installed a locking

INSPECTED BY J. Scarrow / C. Sforza

WOODWARD–CLYDE CONSULTANTS

# WOODWARD–CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

## INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-9D | O.C. 151.96 ft. I.C. 151.88 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 7 JUNE 1986 | 1 JULY 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 1300 | 0959 | 1025 |

## LOG OF MONITORING WELL

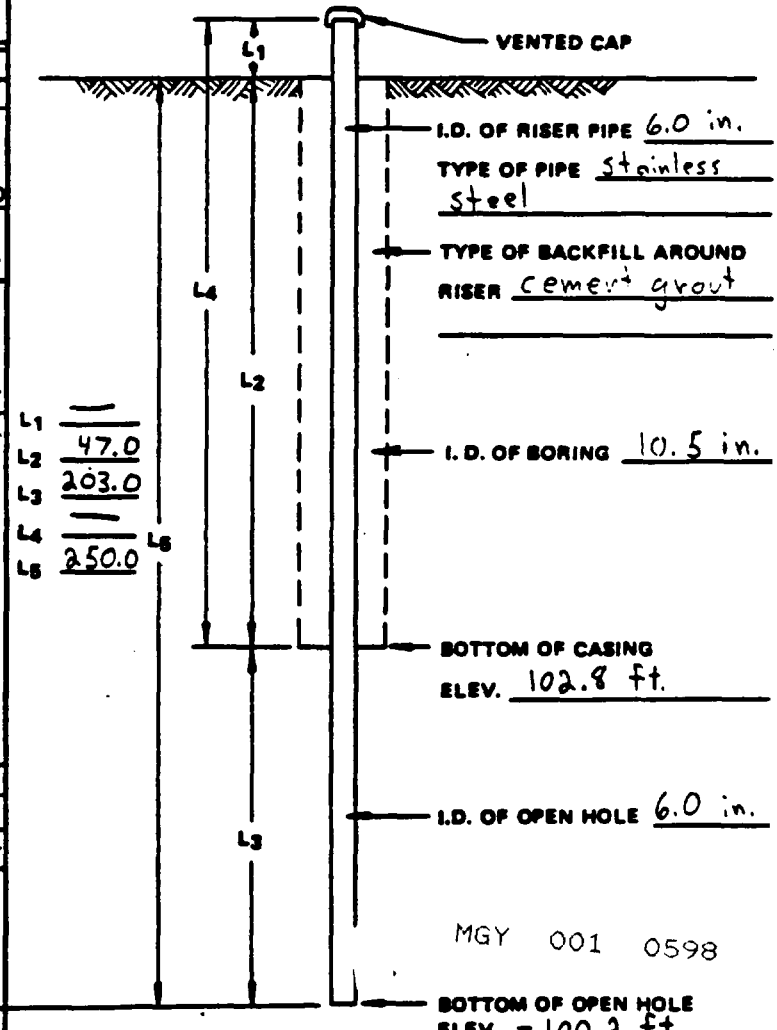
### BORING

| DEPTH IN FT | DESCRIPTION | |
|---|---|---|
| 0 | OVERBURDEN | 8.5 |
| | MUDSTONE, dark reddish brown. | |
| | WEATHERED BEDROCK / COMPETENT BEDROCK | 35.0 |
| 50 | MUDSTONE, dark reddish brown. | 55.5 |
| | SILTSTONE, dark reddish brown. | |
| | | 90.5 |
| 100 | SANDSTONE, dark reddish brown. | |
| 150 | | |
| | | 188.8 |
| | ARGILLACEOUS LIMESTONE, light gray. | 191.2 |
| 200 | SILTSTONE, dark reddish brown. | 196.5 |
| | ARGILLACEOUS LIMESTONE, light gray. | 204.5 |
| | SANDSTONE, dark reddish brown. | |
| 250 | | |

### MONITORING WELL

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 149.8 ft. TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | — |
| L2 | 47.0 |
| L3 | 203.0 |
| L4 | — |
| L5 | 250.0 |

MGY 001 0598

REMARKS 1) overburden casing was emplaced into a 10.5-inch diameter, 47.0-foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and all to set for several days; 3) evacuated ground water was clear, in color, throughout well development. 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY J. Scarrow/C. Sforza

WOODWARD–CLYDE CONSULTANT

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

## INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MT HD/RHMW SITE, SOMERSET CO., NJ | MW-10D | O.C. 153.02 ft. I.C. 152.75 ft. | 84C4007 A&B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 29 MAY 1986 | 24 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈800 | 1552 | 1605 |

### LOG OF MONITORING WELL

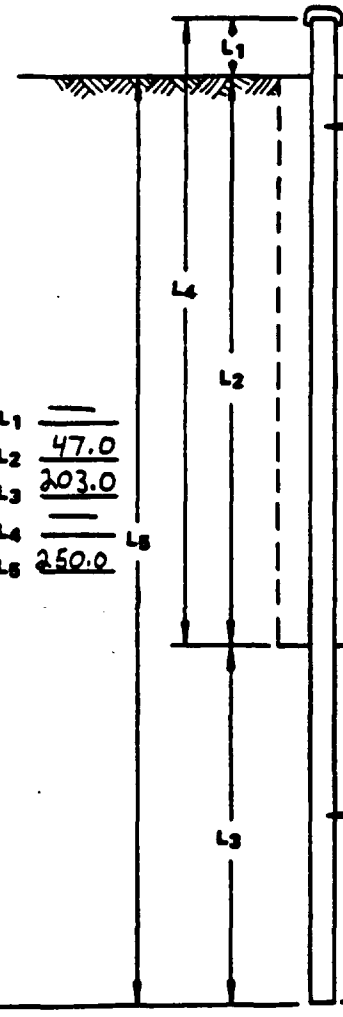
**BORING**

| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN — 9.5 |
| | MUDSTONE, dark reddish brown. |
| | WEATHERED BEDROCK / COMPETENT BEDROCK — 34.0 |
| 50 | MUDSTONE, dark reddish brown. |
| | 70.7 |
| 100 | SILTSTONE, dark reddish brown. |
| | 137.0 |
| 150 | MUDSTONE, dark reddish brown. |
| | 168.4 |
| | SILTSTONE, dark reddish brown. |
| 200 | 201.4 |
| | ARGILLACEOUS LIMESTONE, dark gray. 207.5 |
| | MUDSTONE, dark reddish brown. 213.0 |
| | ARGIL. DOLOM. LIMESTONE, dark gray. 221.5 |
| | SANDSTONE, dark reddish brown. |
| 250 | |

**MONITORING WELL**

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 151.7 ft. TOP OF RISER ELEV. see above




L1 —
L2 47.0
L3 203.0
L4 —
L5 250.0

VENTED CAP

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE Stainless steel

TYPE OF BACKFILL AROUND RISER cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 104.7 ft.

I.D. OF OPEN HOLE 6.0 in.

MGY 001 0599

BOTTOM OF OPEN HOLE ELEV. -98.3

REMARKS 1) overburden casing was emplaced into a 10.5-inch diameter, 47.0-foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for several days; 3) evacuated ground water was clear, in color, throughout we development; 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY J. Scarrow/C. Sforza
WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

# INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET, NJ | MW-11D | O.C. 129.81 ft. I.C. 128.84 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 16 SEPT, 1986 | 3 OCT, 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 400 | 1115 | 1135 |

## LOG OF MONITORING WELL

**BORING**

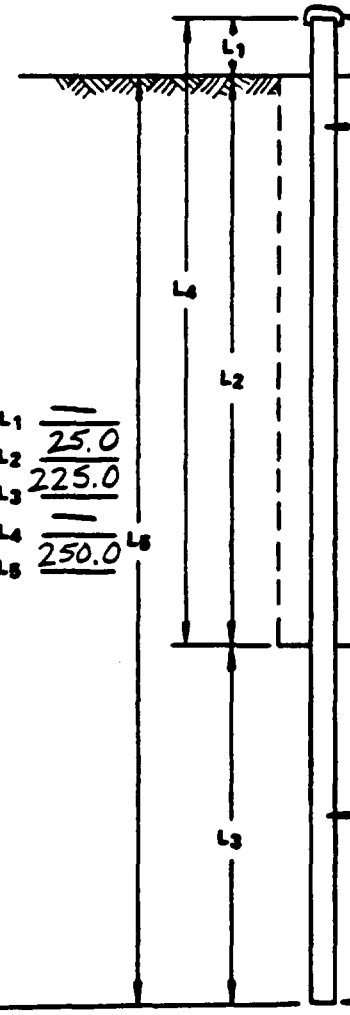
| DEPTH IN FT | DESCRIPTION | |
|---|---|---|
| 0 | OVERBURDEN | 3.5 |
| | MUDSTONE, dark reddish brown WEATHERED BEDROCK | 10.0 |
| | COMPETENT BEDROCK | |
| | MUDSTONE, dark reddish brown | 30.0 |
| 50 | SILTSTONE, dark reddish brown | 70.0 |
| | CALCAREOUS SILTSTONE, dark reddish brown | 80.0 |
| | ARGILLACEOUS DOLOSTONE, very dusky red | 88.0 |
| | CALCAREOUS SILTSTONE, blackish red | 98.0 |
| 100 | CALCAREOUS MUDSTONE, olive gray | 101.0 |
| | ARGILLACEOUS DOLOSTONE, grayish black | 110.0 |
| | MUDSTONE, olive gray | 118.0 |
| | CALCAREOUS SILTSTONE, blackish red | 130.0 |
| | MUDSTONE, blackish red | 140.0 |
| 150 | MUDSTONE, dark reddish brown | 220.0 |
| 200 | SILTSTONE, dark reddish brown | 245.0 |
| 250 | MUDSTONE, dark reddish brown | |

**MONITORING WELL**

TYPE OF MONITOR WELL: COMPETENT BEDROCK

GROUND ELEV. 128.0 ft.

TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | 25.0 |
| L2 | 225.0 |
| L3 | |
| L4 | 250.0 |
| L5 | |

VENTED CAP

I.D. OF RISER PIPE: 6.0 in.

TYPE OF PIPE: Stainless steel

TYPE OF BACKFILL AROUND RISER: cement grout

I. D. OF BORING: 10.5 in.

BOTTOM OF CASING ELEV. 103.0 ft.

I.D. OF OPEN HOLE: 6.0 in.

MGY 001 0600

BOTTOM OF OPEN HOLE ELEV. -122.0 ft.

REMARKS: 1) overburden casing was emplaced into a 10.5-inch diameter, 25.0-foot deep hole 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for two weeks; 3) development: air lifted for 20 min; expelled water changed color, from reddish brown to clear, within 10 minutes; 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY: CARL VARTERESIAN

WOODWARD–CLYDE CONSULTANTS

# WOODWARD–CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

## INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-13D | O.C. 112.42 ft. I.C. 112.13 ft. | 84C4007 A28 |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 19 JUNE 1986 | 2 JULY 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 900 | 0810 | 0937 |

## LOG OF MONITORING WELL

### BORING

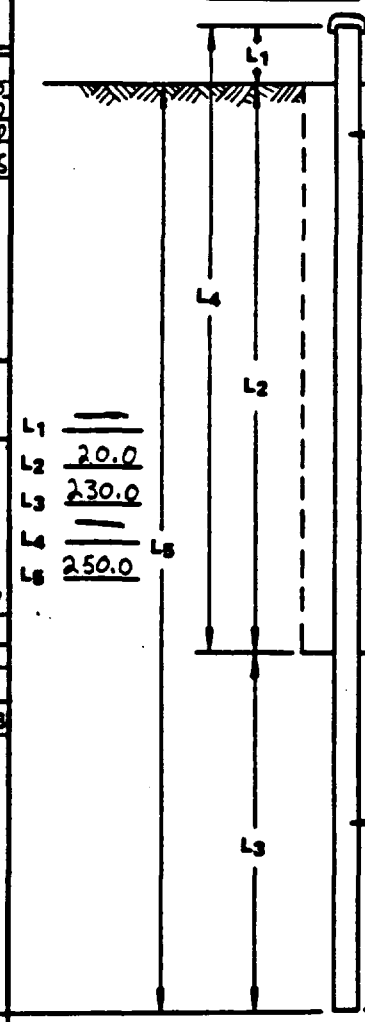
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN 2.0 |
| | MUDSTONE, dark reddish brown WEATH. B.R. 10.0 |
| | SAME. COMPETENT BEDROCK 15.0 |
| | CALCAREOUS MUDSTONE, dark reddish brown. 24.5 |
| 50 | MUDSTONE, dark reddish brown. 74.7 |
| | CALCAREOUS MUDSTONE, dark reddish brown. 97.0 |
| 100 | CLAYSTONE, gray. 143.7 |
| 150 | ARGILLACEOUS LIMESTONE, greenish black. 149.2 |
| | CALCAREOUS MUDSTONE, dark reddish brown 157.9 |
| | ARGILLACEOUS LIMESTONE, grayish black. 167.0 |
| | CALCAREOUS SILTSTONE, dark reddish brown 172.3 |
| 200 | SILTSTONE, dark reddish brown. |
| 250 | |

### MONITORING WELL

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 110.6 ft.

TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | — |
| L2 | 20.0 |
| L3 | 230.0 |
| L4 | — |
| L5 | 250.0 |

VENTED CAP

I.D. OF RISER PIPE: 6.0 in.

TYPE OF PIPE: Stainless steel

TYPE OF BACKFILL AROUND RISER: cement grout

I. D. OF BORING: 10.5 in.

BOTTOM OF CASING ELEV. 90.6 ft.

I.D. OF OPEN HOLE: 3.0 in.

MGY 001 0601

BOTTOM OF OPEN HOLE ELEV. -139.4 ft.

REMARKS: 1) overburden casing was emplaced into a 10.5-inch diameter, 20.0-foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for several days; 3) evacuated ground water was clear, in color, throughout well development; 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY: J. Scarrow/C. Sforza

WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**INSTALLATION REPORT**
**DEEP MONITORING WELL**

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE SOMERSET, NJ | MW-14D | O.C. 74.63 ft. I.C. 73.73 ft. | 84C4007A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 18 Sept 1986 | 1 Oct 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 500 | 1500 | 1700 |

## LOG OF MONITORING WELL

**BORING**

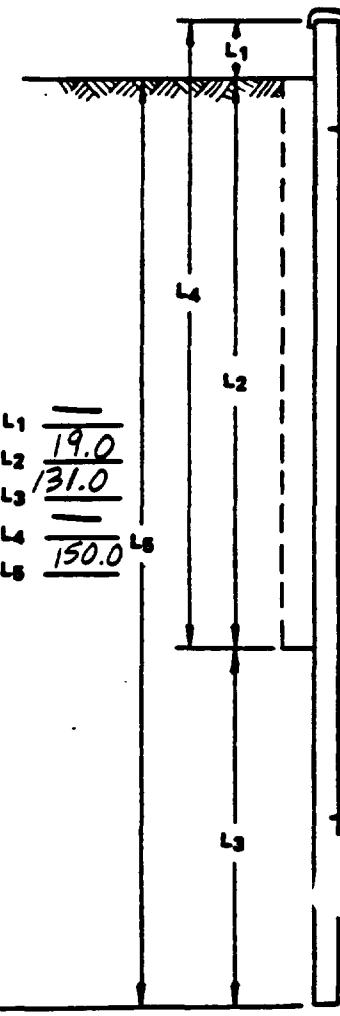
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | OVERBURDEN 1.0 |
| | MUDSTONE, dark reddish brown WEATHERED BEDROCK 6.0 |
| | COMPETENT BEDROCK |
| 30 | MUDSTONE, dark reddish brown |
| | 50.0 |
| 60 | |
| | SILTSTONE, dark reddish brown |
| 90 | |
| 120 | |
| | 131.0 |
| | ARGILLACEOUS DOLOSTONE, very dusky red 137.0 |
| | SILTSTONE, dark reddish brown |
| 150 | |

**MONITORING WELL**

TYPE OF MONITOR WELL: COMPETENT BEDROCK

GROUND ELEV. 73.1 ft.

TOP OF RISER ELEV. see above




L1 —
L2 19.0
L3 131.0
L4 —
L5 150.0

VENTED CAP

I.D. OF RISER PIPE 6.0 in.

TYPE OF PIPE stainless steel

TYPE OF BACKFILL AROUND RISER cement grout

I. D. OF BORING 10.5 in.

BOTTOM OF CASING ELEV. 54.1 ft.

I.D. OF OPEN HOLE 6.0 in.

MGY 001 0602

BOTTOM OF OPEN HOLE ELEV. ~76.9 ft.

REMARKS 1) overburden casing was emplaced into a 10.5 in. diameter, 19.0 foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for one week; 3) development: air lifted until dry, allowed to recharge, air lifted again until dry, repeated proceedure for 2 hours. Water had slight brown color at end of development; 4) installed a locking 8 in. I.D., protective casing.

INSPECTED BY CARL VARTERESIAN
WOODWARD–CLYDE CONSULTANTS

**WOODWARD–CLYDE CONSULTANTS**
**CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS**

**INSTALLATION REPORT**
**DEEP MONITORING WELL**

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW SITE, SOMERSET CO., NJ | MW-15D | O.C. 125.20 ft. I.C. 124.88 ft. | 84C4007 A2B |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | TONY TIRRO | 11 JUNE 1986 | 30 JUNE 1986 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| AIR COMPRESSOR | ≈ 200 | 2057 | 2105 |

## LOG OF MONITORING WELL

**BORING**

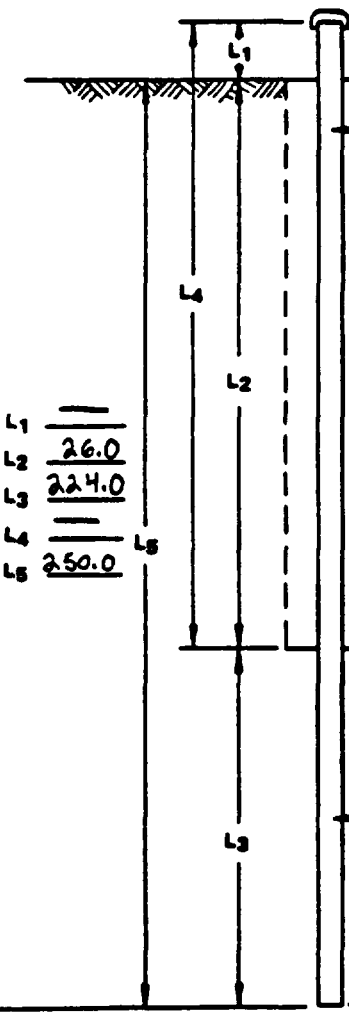
| DEPTH IN FT | DESCRIPTION | |
|---|---|---|
| 0 | OVERBURDEN | 3.0 |
| | MUDSTONE, dark reddish brown. WEATHERED BEDROCK | 26.0 |
| | COMPETENT BEDROCK | |
| 50 | MUDSTONE, dark reddish brown. | 60? |
| | SANDSTONE, dark reddish brown. | 70? |
| | MUDSTONE, dark reddish brown. | 100? |
| 100 | SILTSTONE, dark reddish brown. | 107.5 |
| | DOLOMITIC LIMESTONE, brownish black. | 120? |
| | ARGILLACEOUS LIMESTONE, dark gray. | 150 |
| 150 | CLAYSTONE, black | 164 |
| | ARGILLACEOUS LIMESTONE, dark gray. | 180? |
| | DOLOSTONE, dusky yellowish brown. | 190? |
| 200 | ARGILLACEOUS LIMESTONE, dark gray. | 221 |
| | Claystone, grayish black. | 221 |
| | MUDSTONE, dark reddish brown. | |
| 250 | | |

**MONITORING WELL**

TYPE OF MONITOR WELL: competent bedrock

GROUND ELEV. 123.9 ft.

TOP OF RISER ELEV. See above




| | |
|---|---|
| L1 | — |
| L2 | 26.0 |
| L3 | 224.0 |
| L4 | — |
| L5 | 250.0 |

VENTED CAP

I.D. OF RISER PIPE: 6.0 in.

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement grout

I. D. OF BORING: 10.5 in.

BOTTOM OF CASING ELEV. 97.9 ft.

I.D. OF OPEN HOLE: 6.0 in.

MGY 001 0603

BOTTOM OF OPEN HOLE ELEV. −126.1 ft.

REMARKS: 1) overburden casing was emplaced into a 10.5-inch diameter, 26.0-foot deep hole; 2) cement was tremie grouted into annulus around overburden casing, and allowed to set for several days; 3) evacuated ground water changed, in color, from reddish brown to clear during well development; 4) installed a locking, 8 in. I.D., protective casing.

INSPECTED BY: J. Scarrow/C. Sforza
WOODWARD–CLYDE CONSULTANTS

WOODWARD-CLYDE CONSULTANTS

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW, SOMERSET CO, NJ | MW-16 | O.C. 125.76 ft<br>I.C. 125.42 ft | 84C4007A |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | VICTOR AIMAR | 17 JUNE 1987 | 19 June 1987 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| submersible pump | 714 | 0930 | 1600 |

## LOG OF MONITORING WELL

### BORING

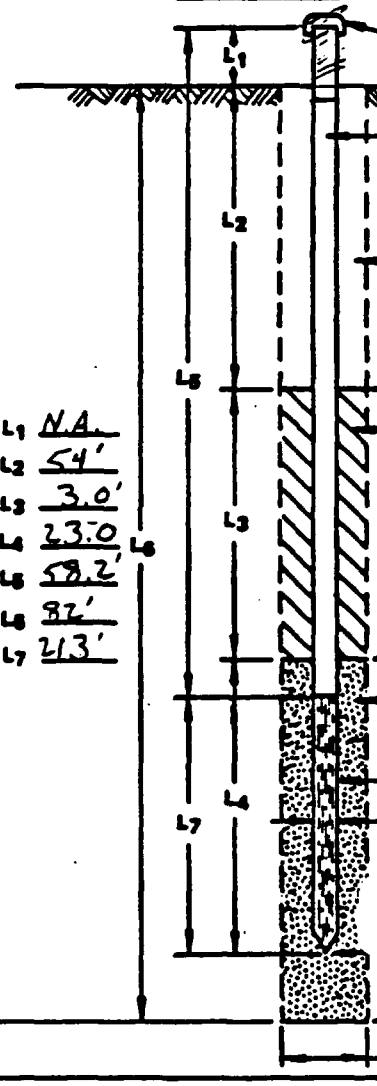
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | reddish-brown Clay + gravel and sand |
| | purplish-brown Clay |
| | reddish-brown Clay |
| 20 | white and green clay in fracture zones |
| | weathered zone 28-33' |
| | reddish brown shale |
| 40 | calcite cement |
| 60 | calcite filled fractures glauconite (?) |
| 80 | |

### MONITORING WELL

TYPE OF MONITORING WELL _____

GROUND ELEV. 125.7 ft

TOP OF RISER ELEV. 125.42 ft




L1 N.A.
L2 54'
L3 3.0'
L4 23.0
L5 58.2'
L6 82'
L7 21.3'

VENTED CAP (flush mount)

I.D. OF RISER PIPE 4"

TYPE OF PIPE Sch 40 stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 71.7 ft

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 68.7 ft

TYPE OF FILTER MATERIAL #1 Jesse Marie Sand

SIZE OF OPENINGS 0.02 in

DIAMETER OF MONITOR WELL TIP 4"

MGY 001 0604

ELEV. 45.7 ft

BOTTOM OF BORING ELEV. 43.7 ft

DIAMETER OF BORING 7 7/8"

REMARKS 1) drilling mud was flushed out with freshwater after drilling was completed; 2) cement-bentonite slurry was tremied into annulus 3) installed a flush mount cap and a sealed locking cap on the casing 4) developed with a submersible pump until silt/fines free, water was cloudy, reddish tint

INSPECTED BY Paul Kareth

WOODWARD-CLYDE CONSULTANTS

WOODWARD—CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW, SOMERSET CO., NJ | MW-17 | O.C. 141.45 ft<br>I.C. 141.20 ft | 84C4007A |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | VICTOR AIMAR | 15 JUNE 1987 | 16 JUNE 1987 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| submersible pump | 840 | 1545 | 1730 |

## LOG OF MONITORING WELL

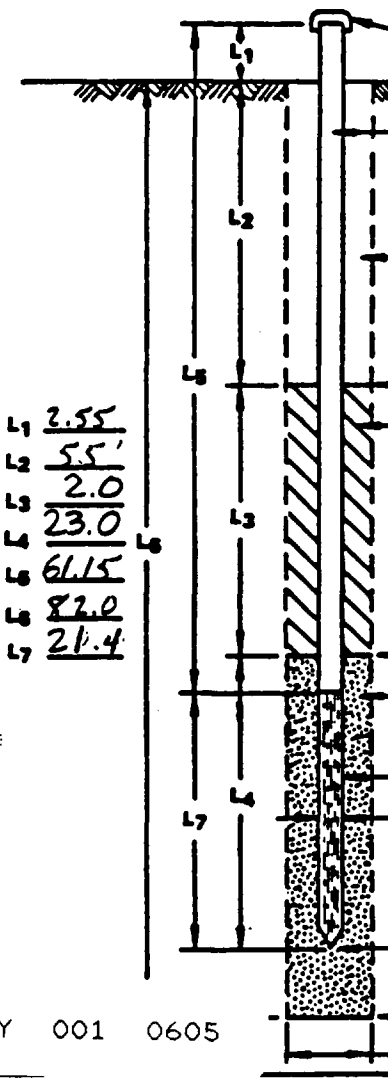
### BORING

| DEPTH IN FT | DESCRIPTION |
|---|---|
| | brown & yellow silty Clay, t. S & f. Gr. |
| | brown silty Clay |
| 20 | purple-brown Clay |
| | reddish brown Clay |
| 40 | weathered zone 34-36' reddish brown mudstone |
| 60 | purple mudstone |
| | reddish brown mudstone |
| 80 | |

### MONITORING WELL

TYPE OF MONITORING WELL: WEATHERED BEDROCK

GROUND ELEV. 139.3 ft — TOP OF RISER ELEV. 141.20 ft




L1 2.55
L2 5.5'
L3 2.0
L4 23.0
L5 61.15
L6 82.0
L7 21.4

VENTED CAP

I.D. OF RISER PIPE 4"

TYPE OF PIPE sch. 40 Stainless steel

TYPE OF BACKFILL AROUND RISER cement-bentonite grout

TOP OF SEAL ELEV. 84.3 ft

TYPE OF SEAL MATERIAL bentonite pellets

TOP OF FILTER ELEV. 82.3 ft

TYPE OF FILTER MATERIAL #1 Jesse Marie Sand

SIZE OF OPENINGS 0.02 in.

DIAMETER OF MONITOR WELL TIP 4"

BOTTOM OF MON. WELL ELEV. 59.3 ft

BOTTOM OF BORING ELEV.

DIAMETER OF BORING 7 7/8

MGY 001 0605

REMARKS 1) drilling mud was flushed out with fresh water after drilling was completed; 2) cement-bentonite slurry was tremied into annulus; 3) a six-inch locking steel protective casing is installed; 4) developed with a submersible pump until silt/fines free, water was cloudy, reddish tint

INSPECTED BY C. Vanderesian, D. Kareth
WOODWARD—CLYDE CONSULTANTS

WOODWARD—CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## SHALLOW MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW, SOMERSET CO, NJ | MW-18 | O.C. 115.97 ft<br>I.C. 115.64 ft | 84C4007A |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC. | VICTOR AIMAR | 13 JUNE 1987 | 17 JUNE 1987 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| submersible pump | 995 | 1230 | 1340 |

## LOG OF MONITORING WELL

### BORING

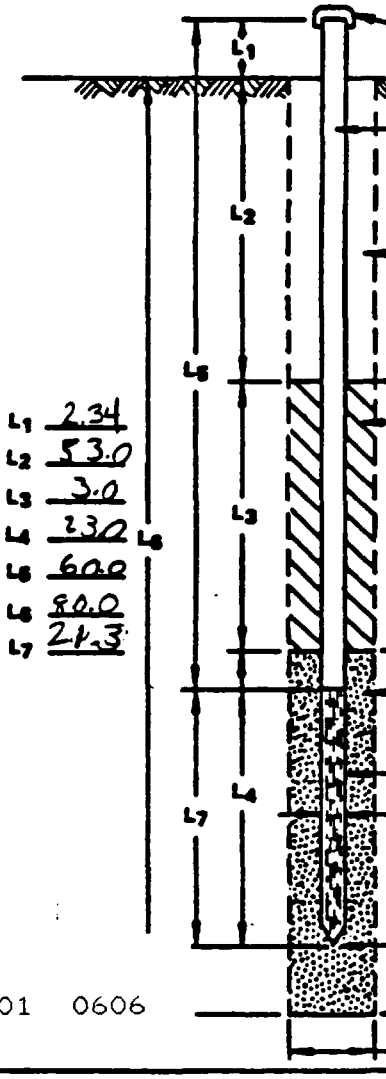
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 0 | reddish brown Clay |
| 20 | reddish brown mudstone green and tan clay in fracture fills |
| 40 | |
| 60 | calcite fillings in fractures and voids |
| 80 | |

### MONITORING WELL

TYPE OF MONITORING WELL: WEATHERED BEDROCK

GROUND ELEV. 113.3 ft

TOP OF RISER ELEV. 115.64 ft




L1 2.34
L2 53.0
L3 3.0
L4 23.0
L5 60.0
L6 80.0
L7 24.3

VENTED CAP

I.D. OF RISER PIPE: 4.0 in.

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement-bentonite grout

TOP OF SEAL ELEV.:

TYPE OF SEAL MATERIAL: bentonite pellets

TOP OF FILTER ELEV.: 57.3

TYPE OF FILTER MATERIAL: no. 1 morie sand

SIZE OF OPENINGS: 0.02 in

DIAMETER OF MONITOR WELL TIP: 4.0 in.

BOTTOM OF MON. WELL ELEV.: 34.3

BOTTOM OF BORING ELEV.:

DIAMETER OF BORING: 8.0 in

MGY 001 0606

REMARKS: 1) drilling mud was flushed out with freshwater after completion of drilling and prior to well installation; 2) cement-bentonite seal was tremie grouted into annulus; 3) installed a 6-inch steel protective casing with locking cap

INSPECTED BY: C. Vartereslan / P. Kareth
WOODWARD—CLYDE CONSULTANTS

WOODWARD–CLYDE CONSULTANTS
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS

# INSTALLATION REPORT
## DEEP MONITORING WELL

| PROJECT AND LOCATION | WELL NO. | ELEVATION DATUM | PROJECT NO. |
|---|---|---|---|
| MTHD/RHMW, Somerset Co, NJ | MW-19 | O.C. 40.61 ft<br>I.C. 39.29 ft | 84C4007A |
| **DRILLING AGENCY** | **FOREMAN** | **DATE INSTALLATION STARTED** | **DATE INSTALLATION FINISHED** |
| WARREN GEORGE, INC | V. Gandolfo | 8-6-87 | 8-13-87 |
| **DEVELOPMENT EQUIPMENT** | **GALLONS REMOVED** | **TIME DEVELOPMENT STARTED** | **TIME DEVELOPMENT COMPLETED** |
| drillstem - rig pump | 1670 gal | 1250 (8/12/87) | 1040 (8/13/87) |

## LOG OF MONITORING WELL

### BORING

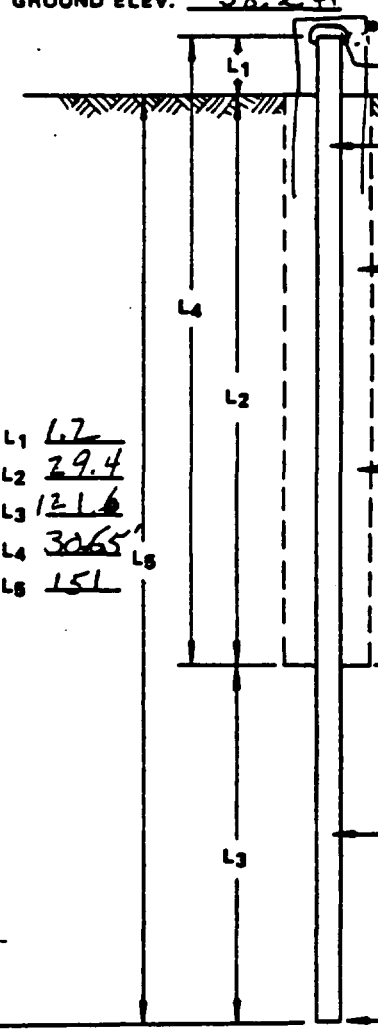
| DEPTH IN FT | DESCRIPTION |
|---|---|
| 3 | silty clays (+3') |
| | silty sands and gravel (4 5.5) |
| 15.5 | decomp bedrock (15.5-17.5') |
| | shale - Brunswick (@17.5') |
| 30 | |
| 60 | |
| 90 | |
| 120 | |
| 132 | Purple Sandstone (Brunswick) |
| 150 | |

### MONITORING WELL

TYPE OF MONITOR WELL: COMPETENT BEDROCK

GROUND ELEV. 38.2 ft

TOP OF RISER ELEV. 39.29 ft




L1 1.7
L2 29.4
L3 121.6
L4 30.65
L5 151

I.D. OF RISER PIPE 4"

TYPE OF PIPE: stainless steel

TYPE OF BACKFILL AROUND RISER: cement/bentonite grout

I.D. OF BORING 5" 4 3/4 b.t

BOTTOM OF CASING ELEV. 8.8 ft

I.D. OF OPEN HOLE 4" 3 3/4 b.t

BOTTOM OF OPEN HOLE ELEV. -112.8 ft

REMARKS: Developed over 2 days - 2 hrs Wed, 1 hr Thurs. - reverse flow through the drillstem.

INSPECTED BY: Paul Kareth
WOODWARD–CLYDE CONSULTANTS

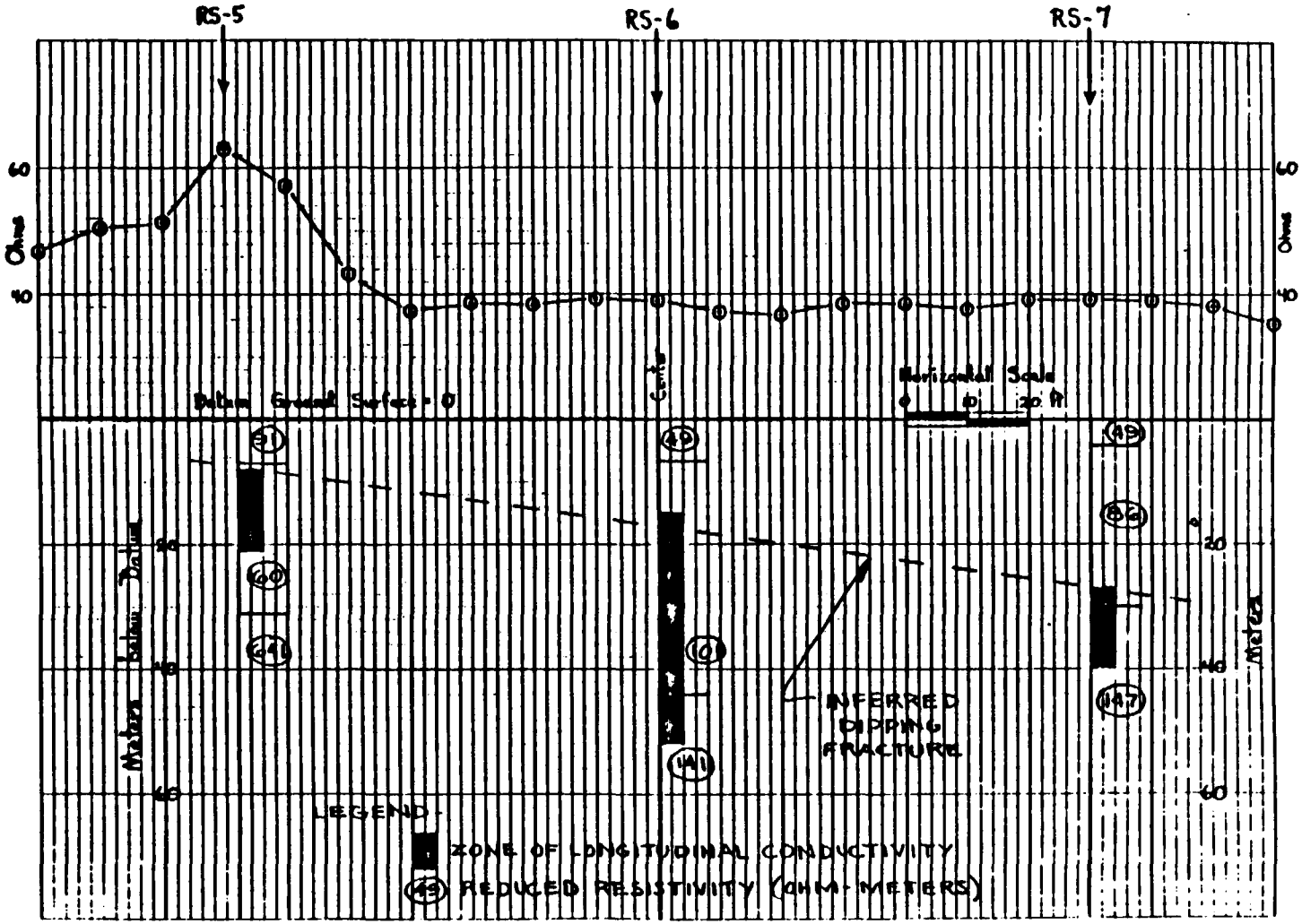
MGY 001 0607

# Appendix E

MGY 001 0608

# APPENDIX E
# RESULTS OF GEOPHYSICAL SURVEYS

MGY 001 0609

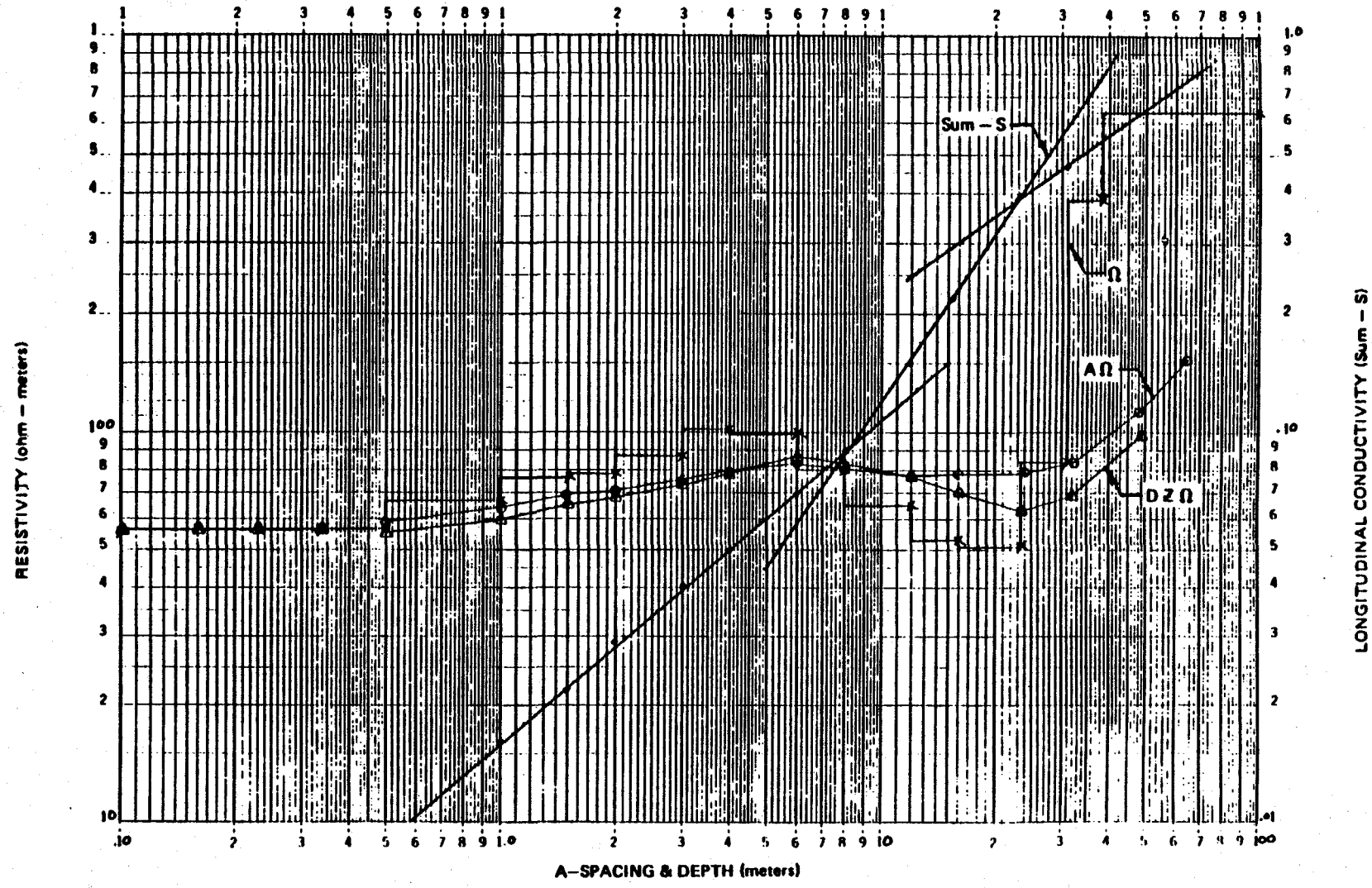



**MONTGOMERY TOWNSHIP: LINE # 1**
**SCHLUMBERGER PROFILE AND**
**WENNER SOUNDINGS**

**WOODWARD—CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E-1 |

MGY 001 0610




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**LINE # 1; STATION 0 + 70 NE, (RS-5)**

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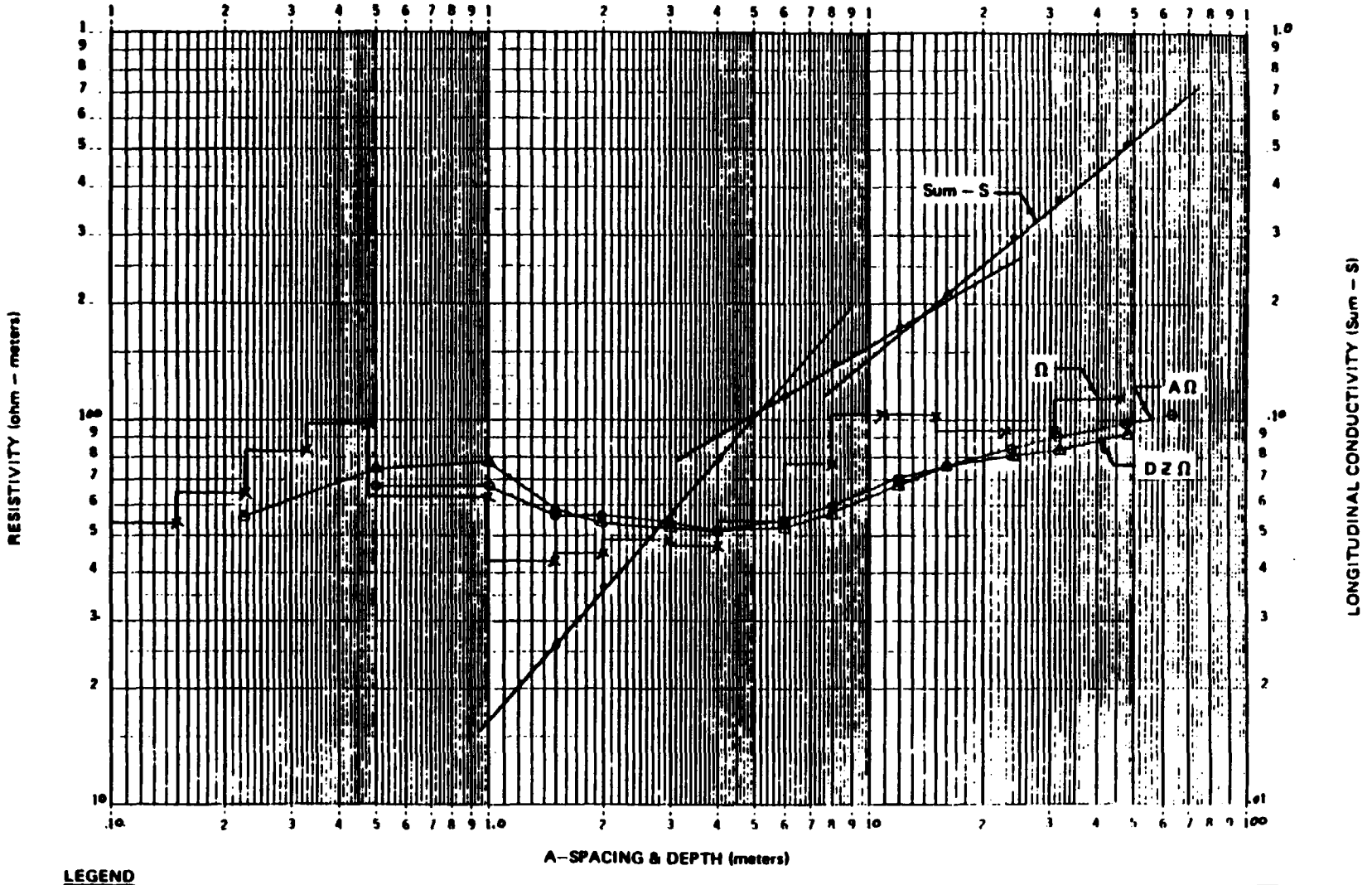
| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–2 |

MGY 001 0611




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

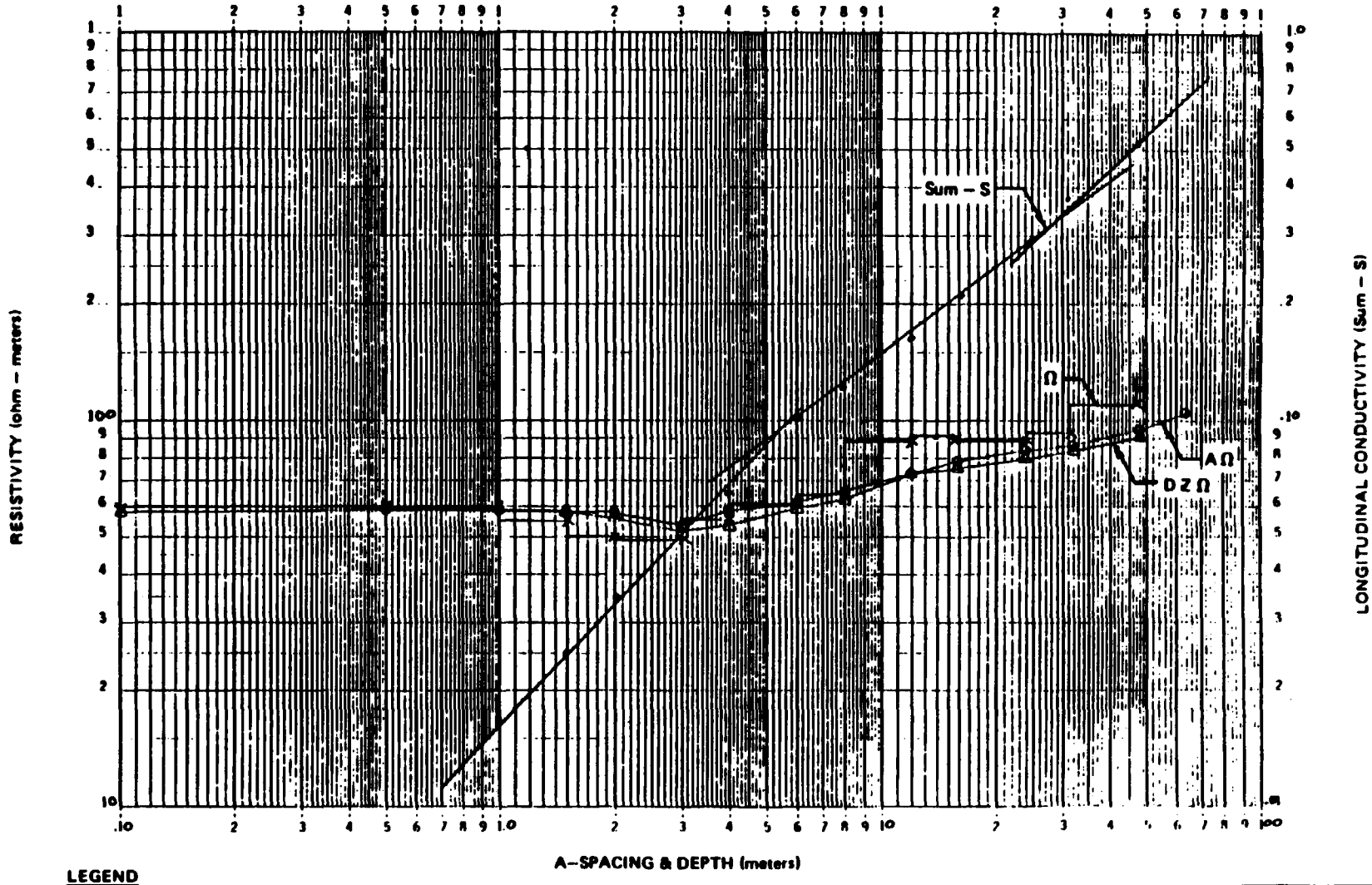
**LINE # 1; STATION 0 + 00, (RS-6)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–3 |

MGY 001 0612




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**LINE # 1; STATION 0 + 70 SW, (RS-7)**

**WOODWARD—CLYDE CONSULTANTS**

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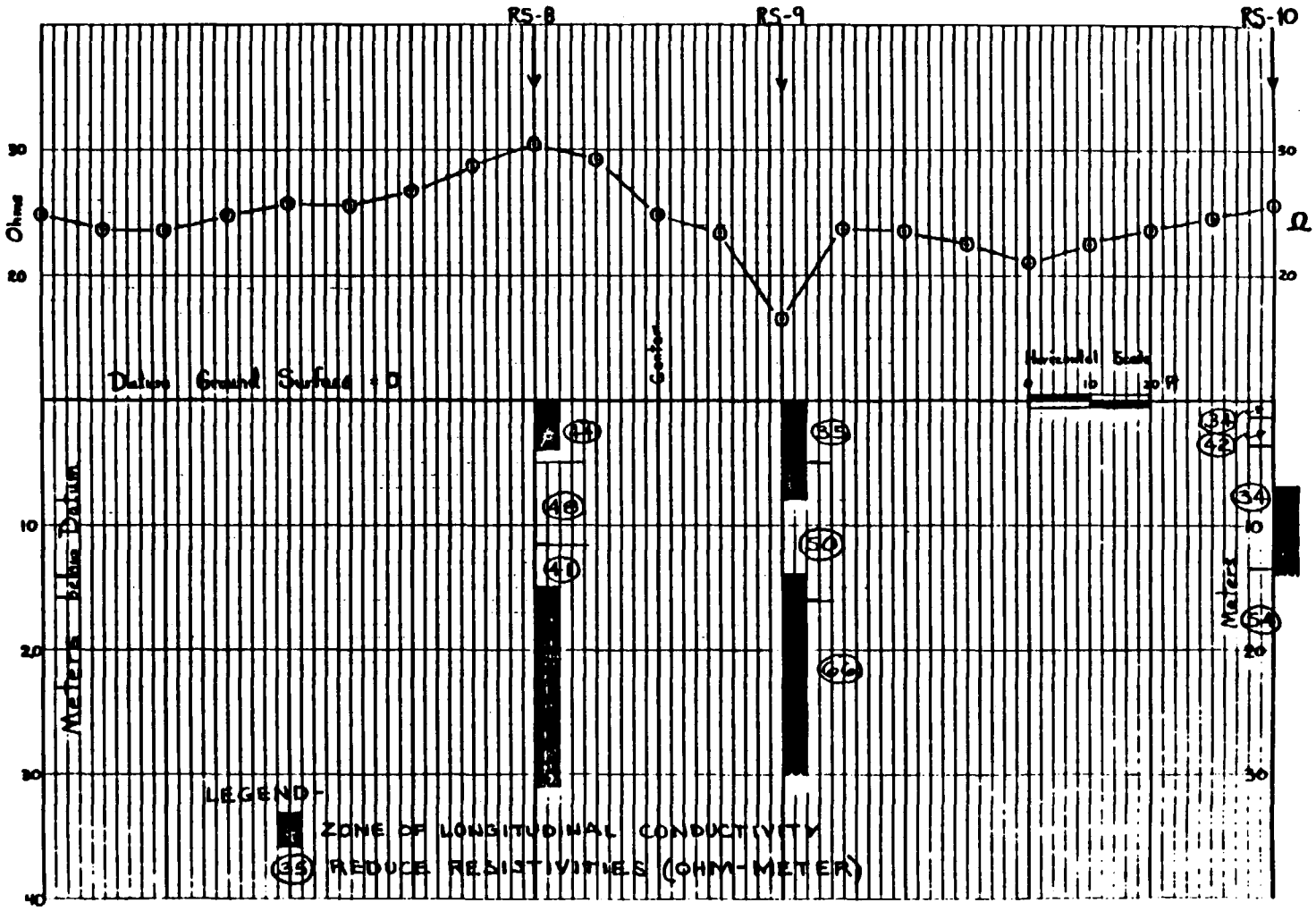
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–4 |

MGY 001 0613

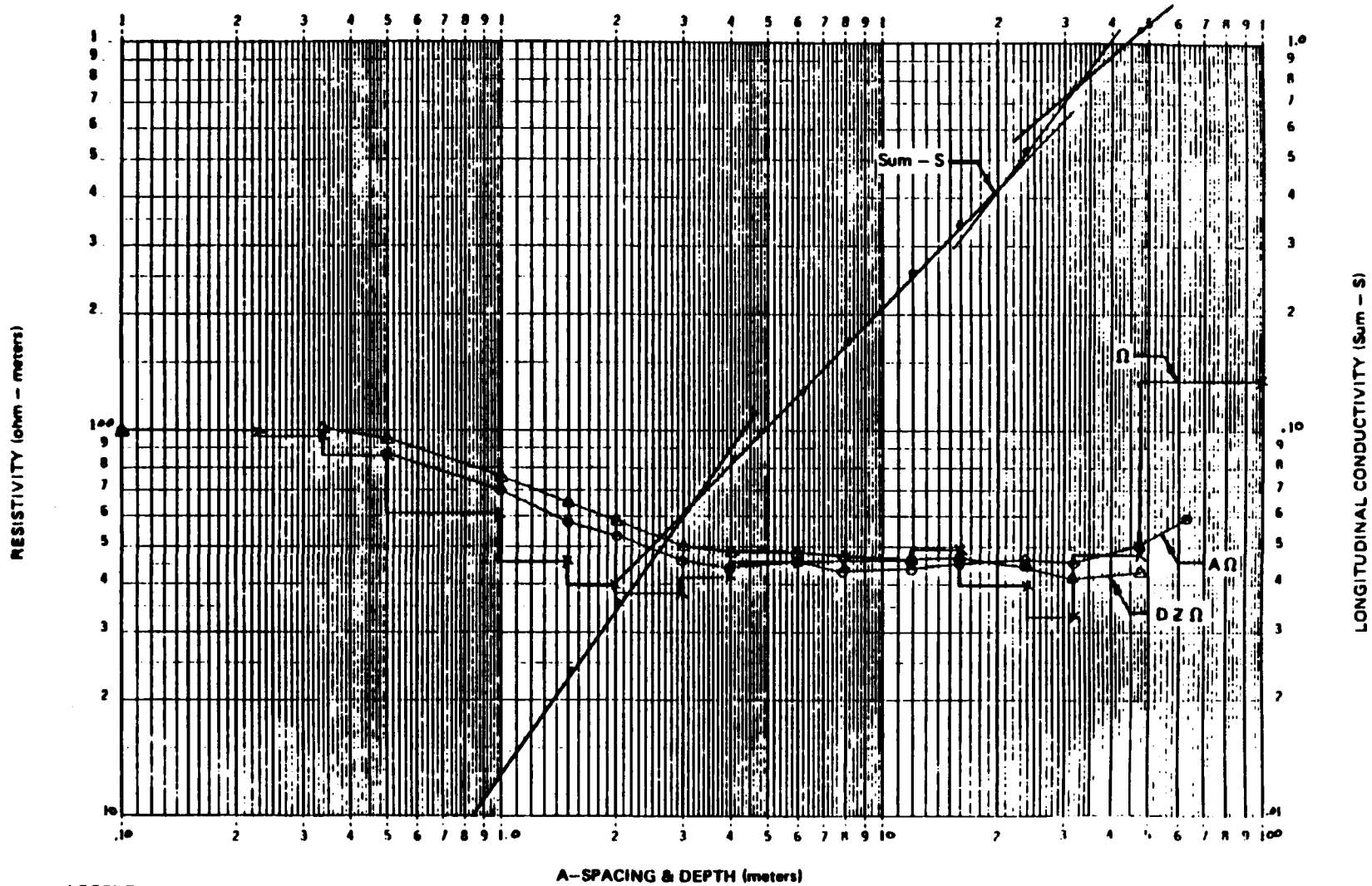



**MONTGOMERY TOWNSHIP: LINE #2**
**SCHLUMBERGER PROFILE AND**
**WENNER SOUNDINGS**

**WOODWARD—CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E-5 |

MGY 001 0614




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**LINE # 2; STATION 0 + 20 W, (RS-8)**

**WOODWARD—CLYDE CONSULTANTS**

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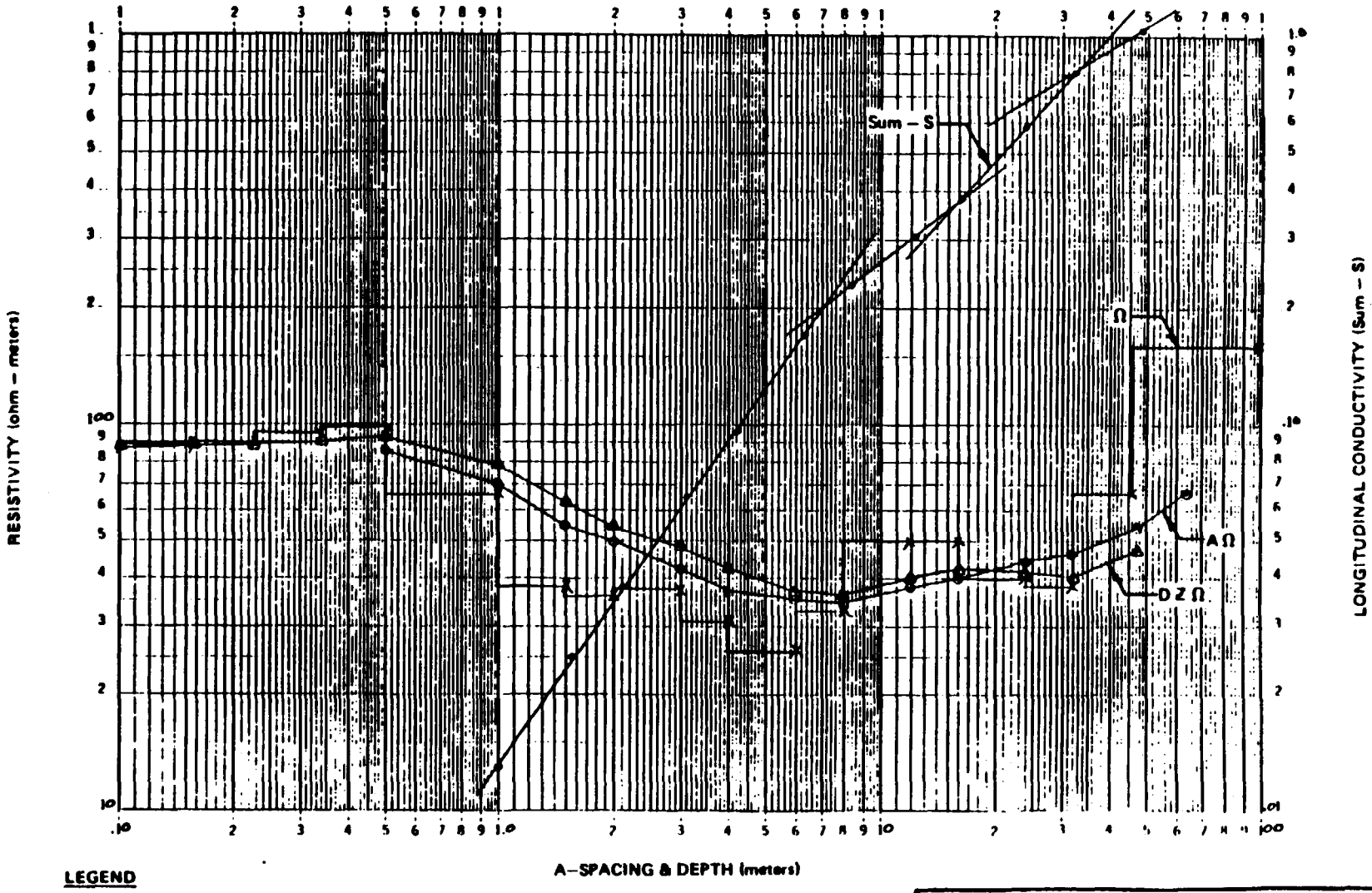
| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–6 |

MGY 001 0615




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

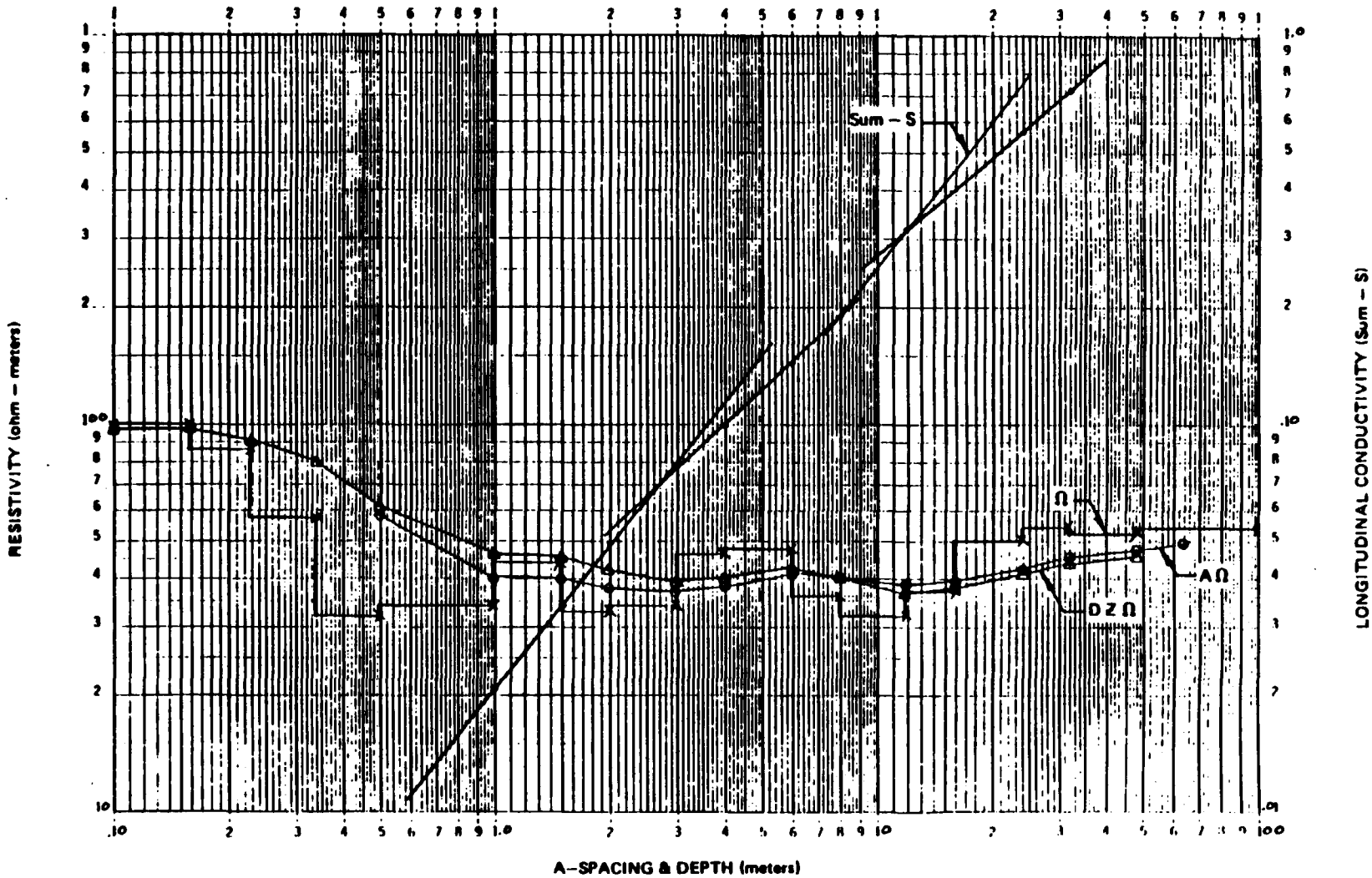
**LINE # 2; STATION 0 + 20 E, (RS-9)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–7 |

MGY 001 0616




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**LINE # 2; STATION 0 + 80 E, (RS-10)**

**WOODWARD—CLYDE CONSULTANTS**

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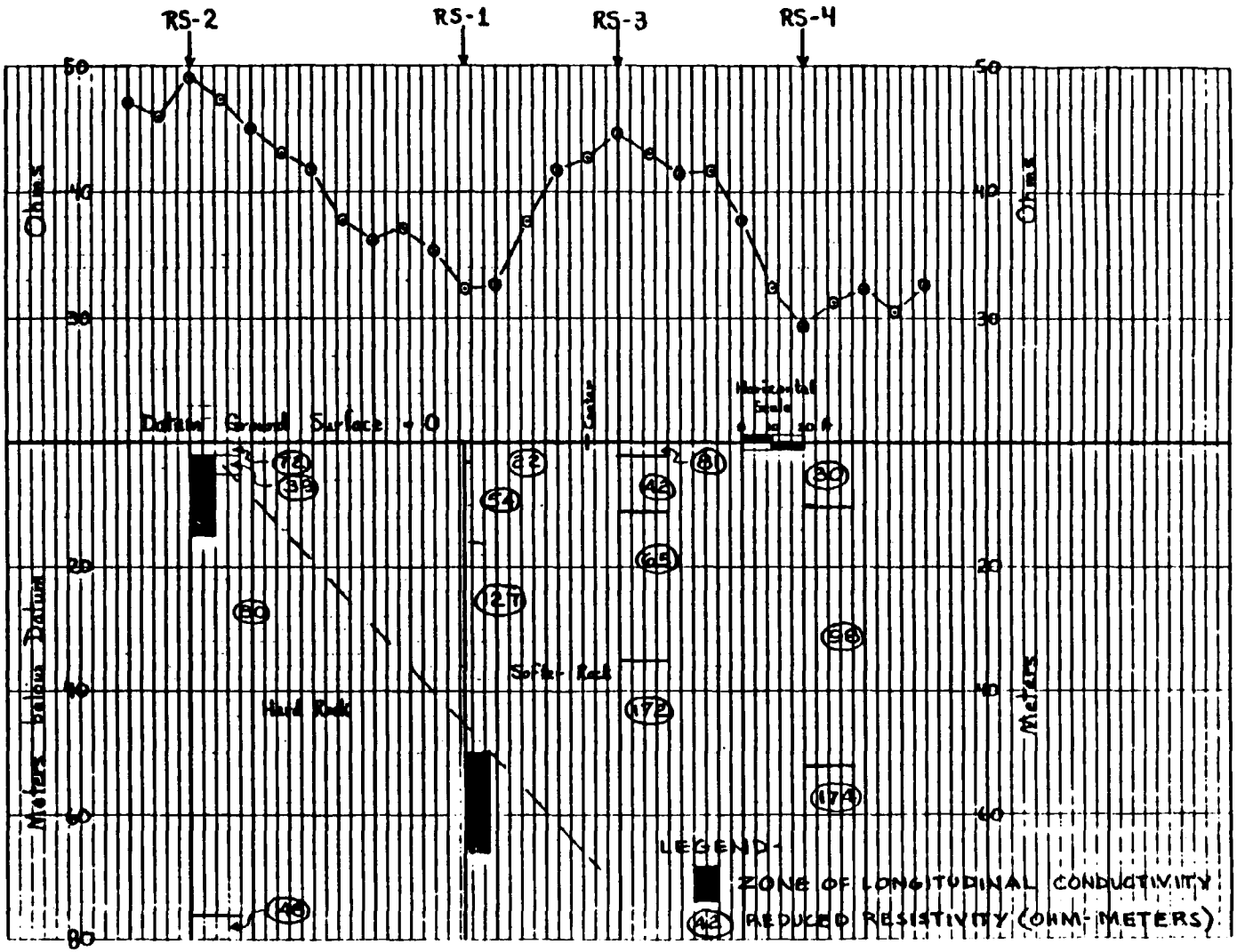
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–8 |

MGY 001 0617



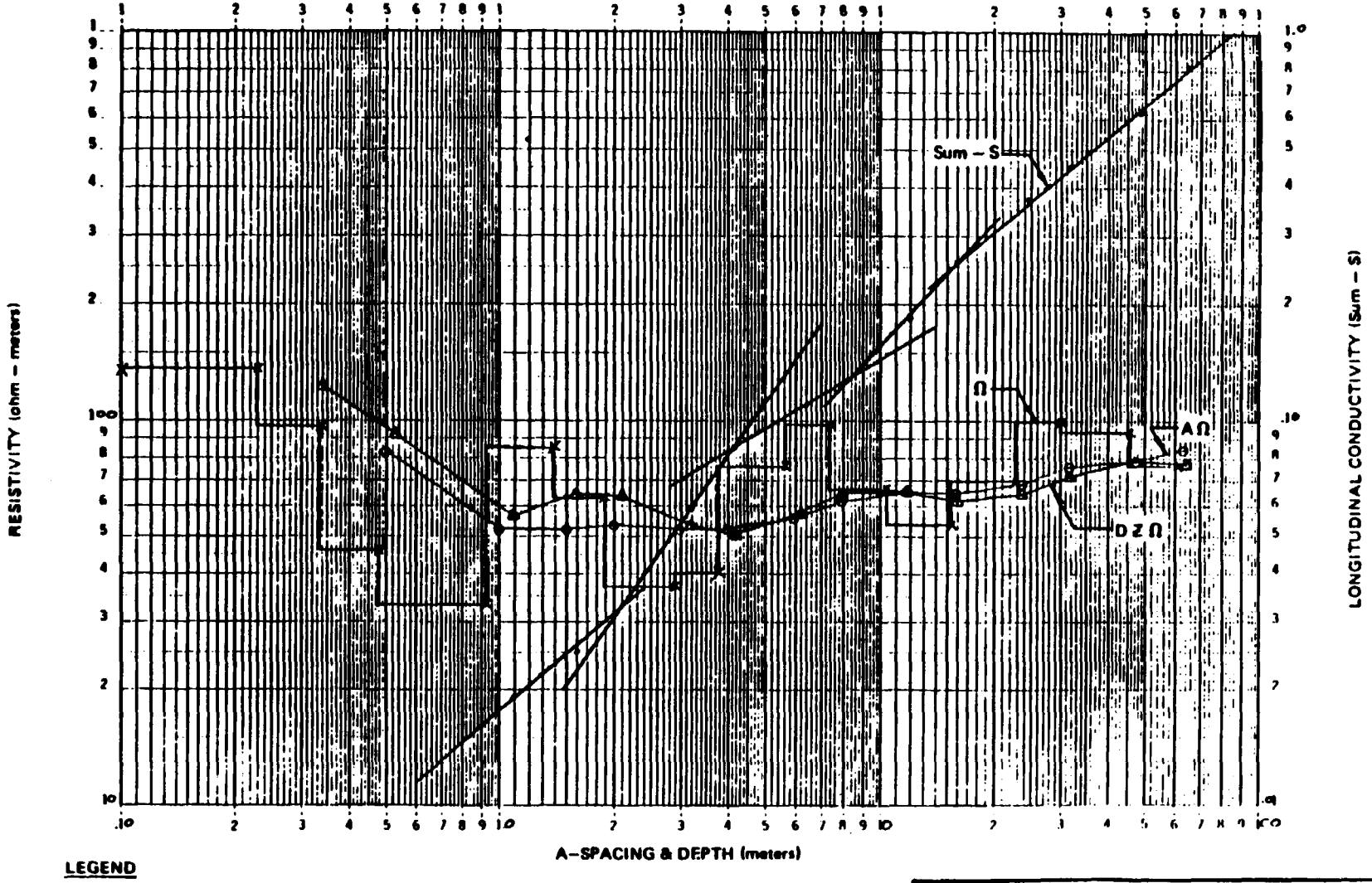

**MONTGOMERY TOWNSHIP: LINE #3**
**SCHLUMBERGER PROFILE AND**
**WENNER SOUNDINGS**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E-9 |

MGY 001 0618




**LEGEND**

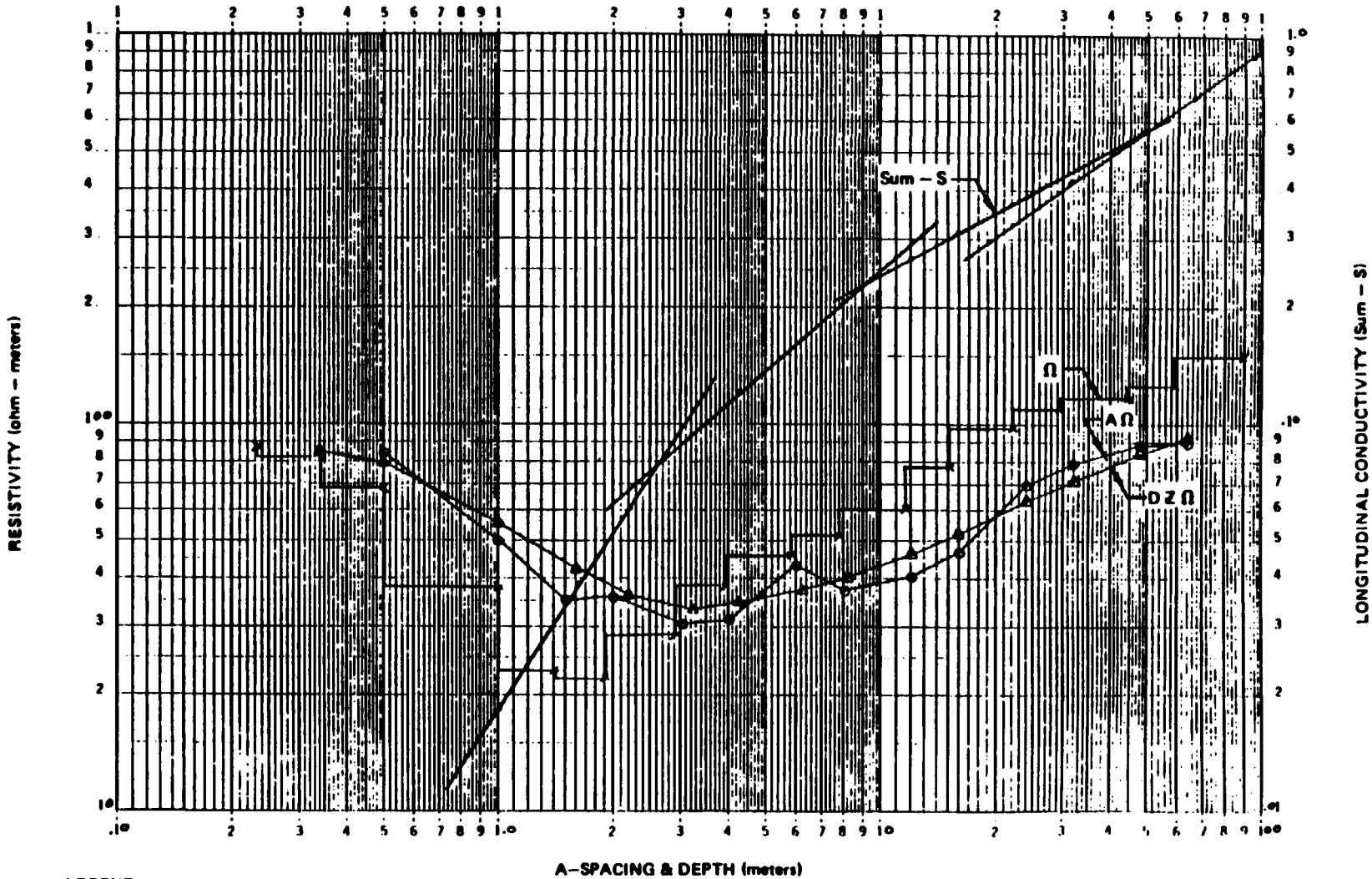
| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**
**LINE # 3; STATION 1 + 30, (RS-2)**

**WOODWARD—CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–10 |

MGY 001 0619




**LEGEND**

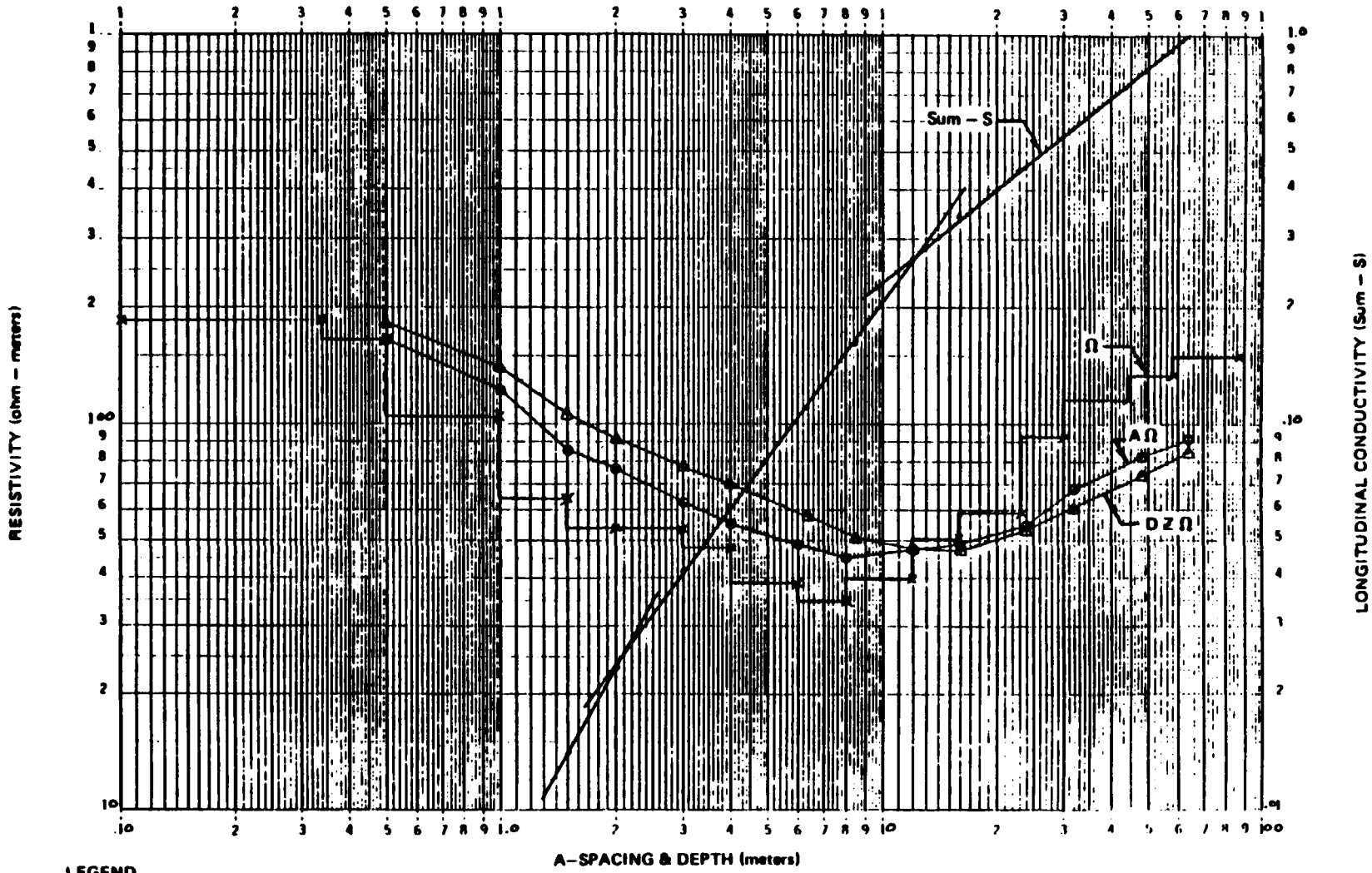
| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**
**LINE # 3; STATION 0 + 40 W, (RS-1)**

**WOODWARD—CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–11 |

MGY 001 0620




**LEGEND**

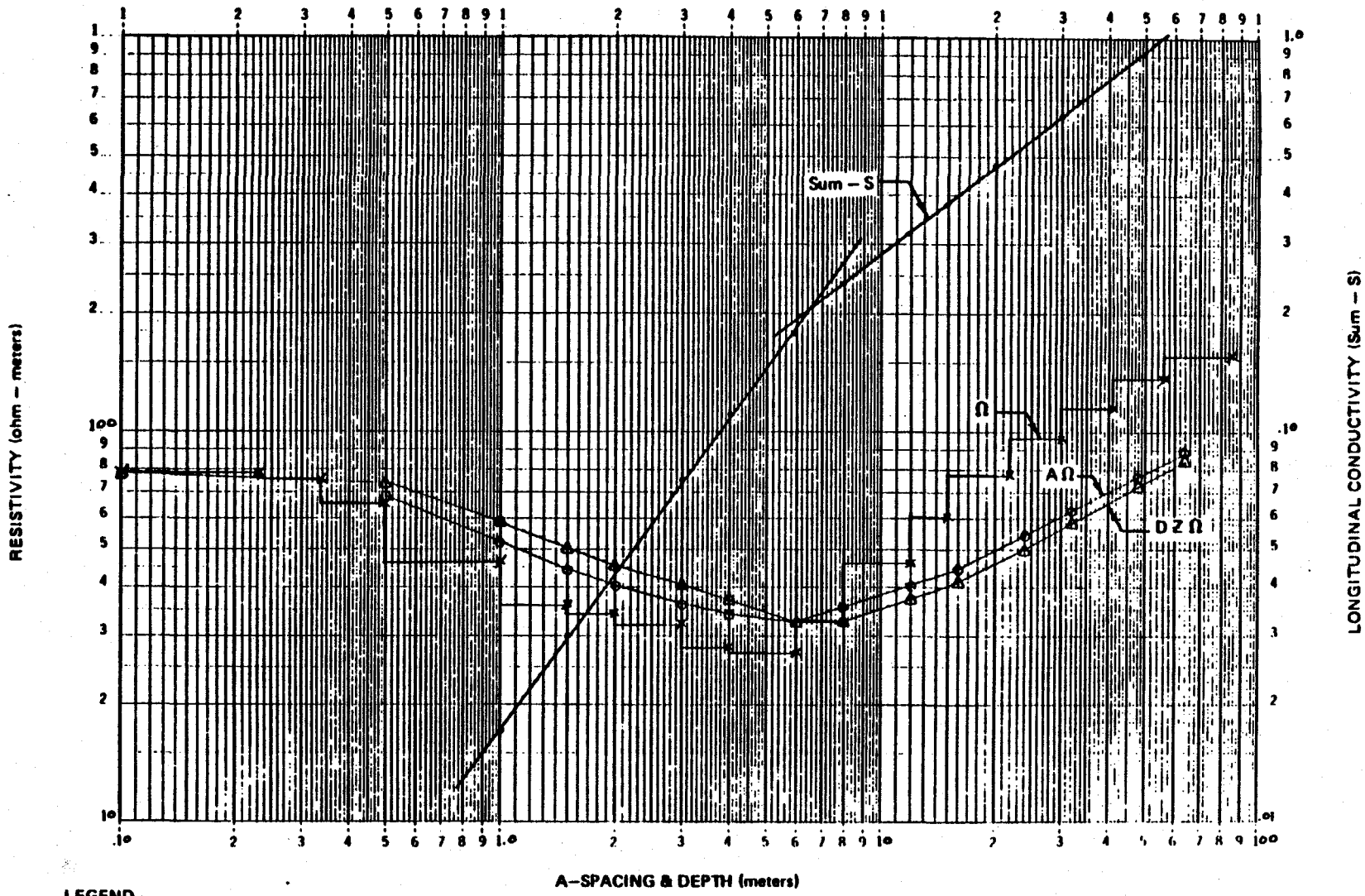
| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**
**LINE # 3; STATION 0 + 10 E, (RS-3)**

**WOODWARD—CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–12 |

MGY 001 0621




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**LINE # 3; STATION 1 + 10 E, (RS-4)**

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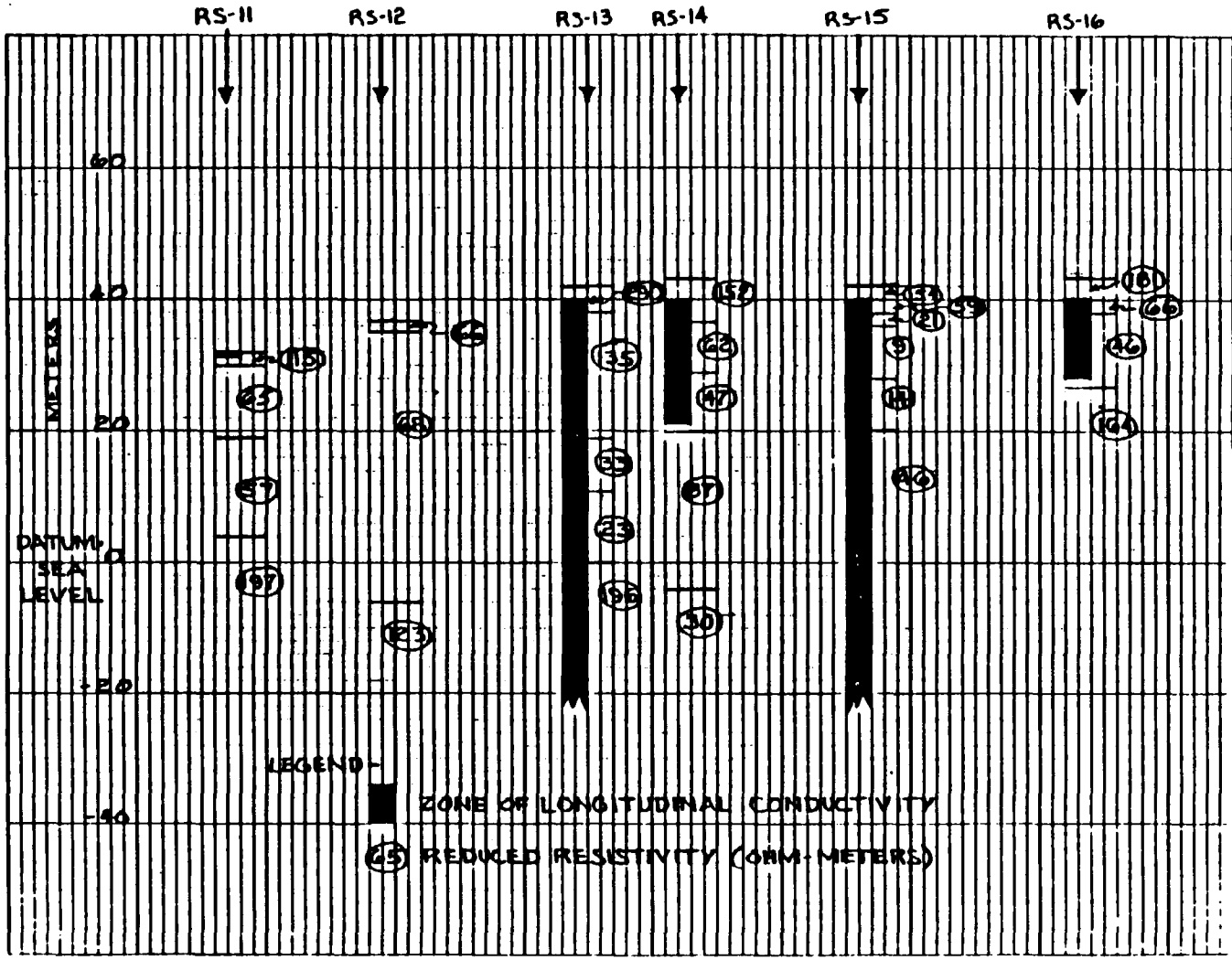
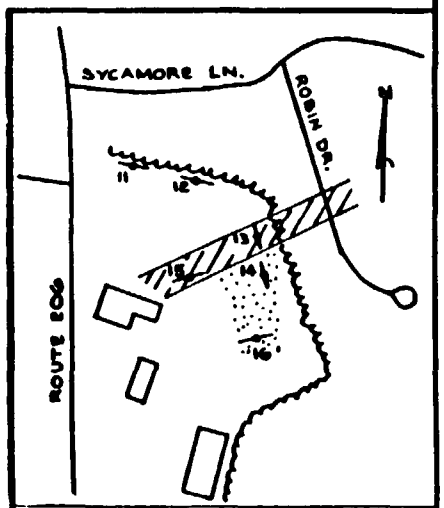
| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–13 |



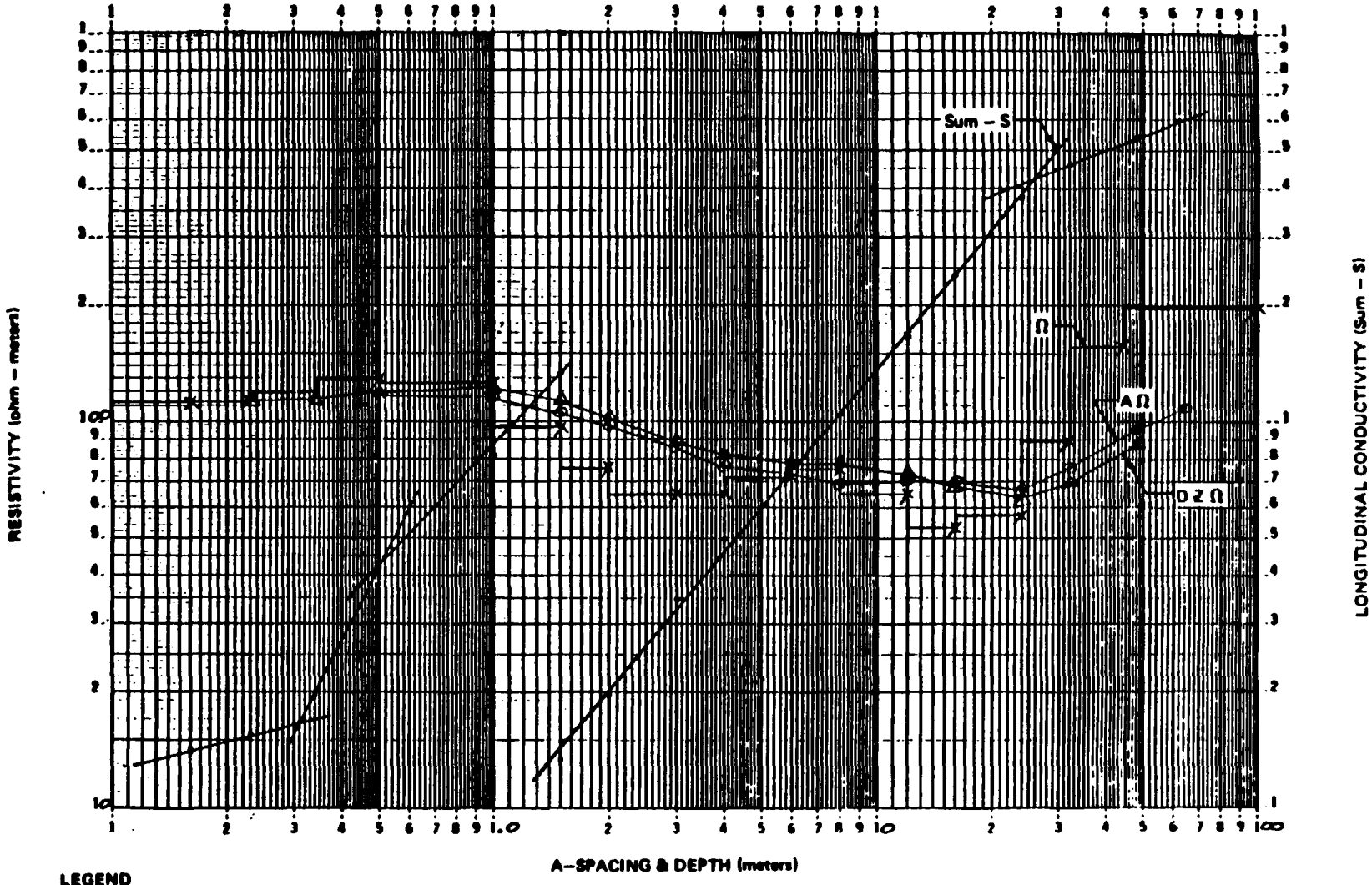




**MONTGOMERY TOWNSHIP**
**AREA NO. 4**
**WENNER SOUNDINGS**

**WOODWARD—CLYDE CONSULTANTS**
CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E-14 |

MGY 001 0623




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

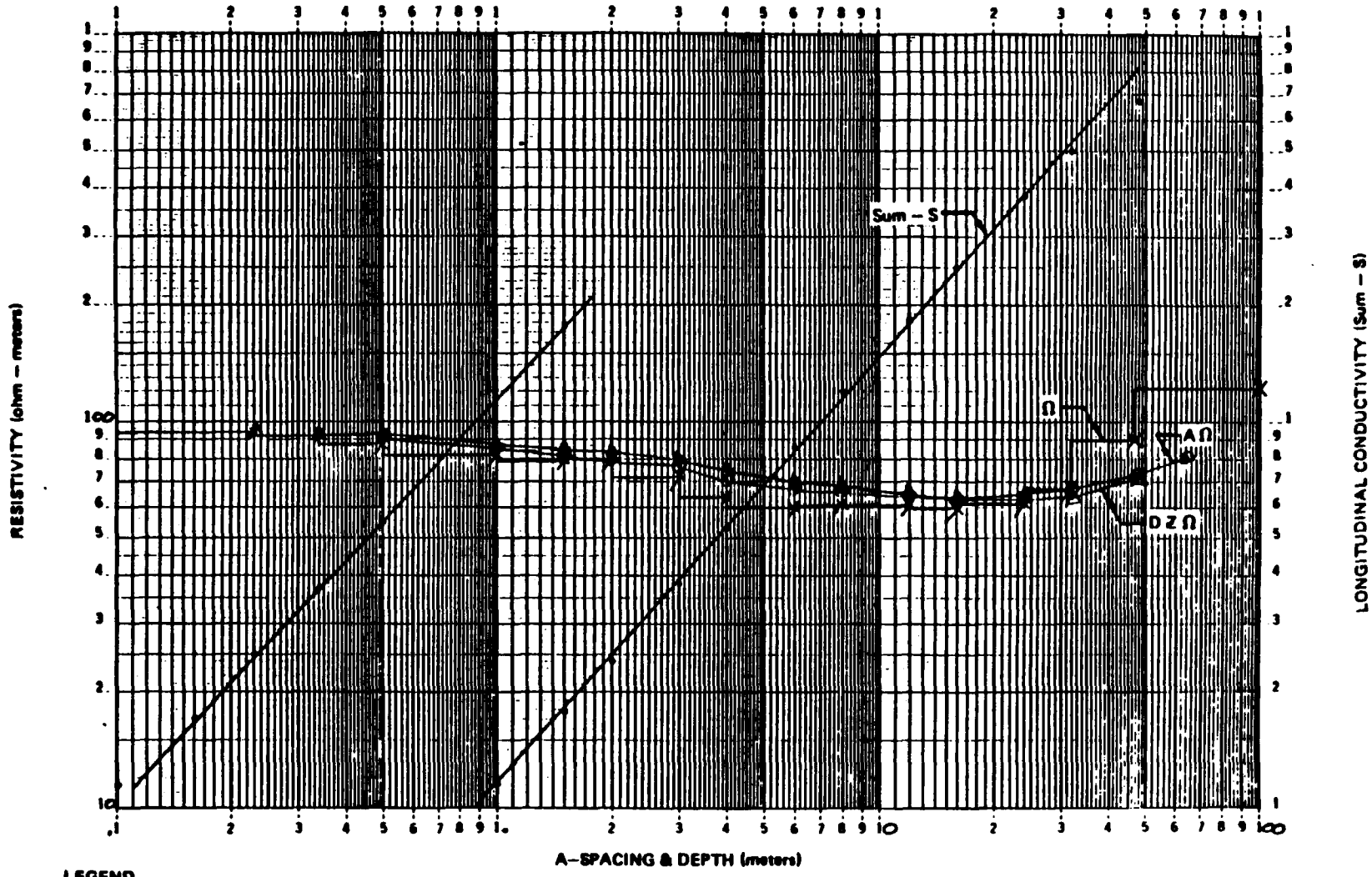
**WENNER SOUNDING (RS-11)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–15 |

MGY 001 0624




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**WENNER SOUNDING (RS-12)**

**WOODWARD—CLYDE CONSULTANTS**

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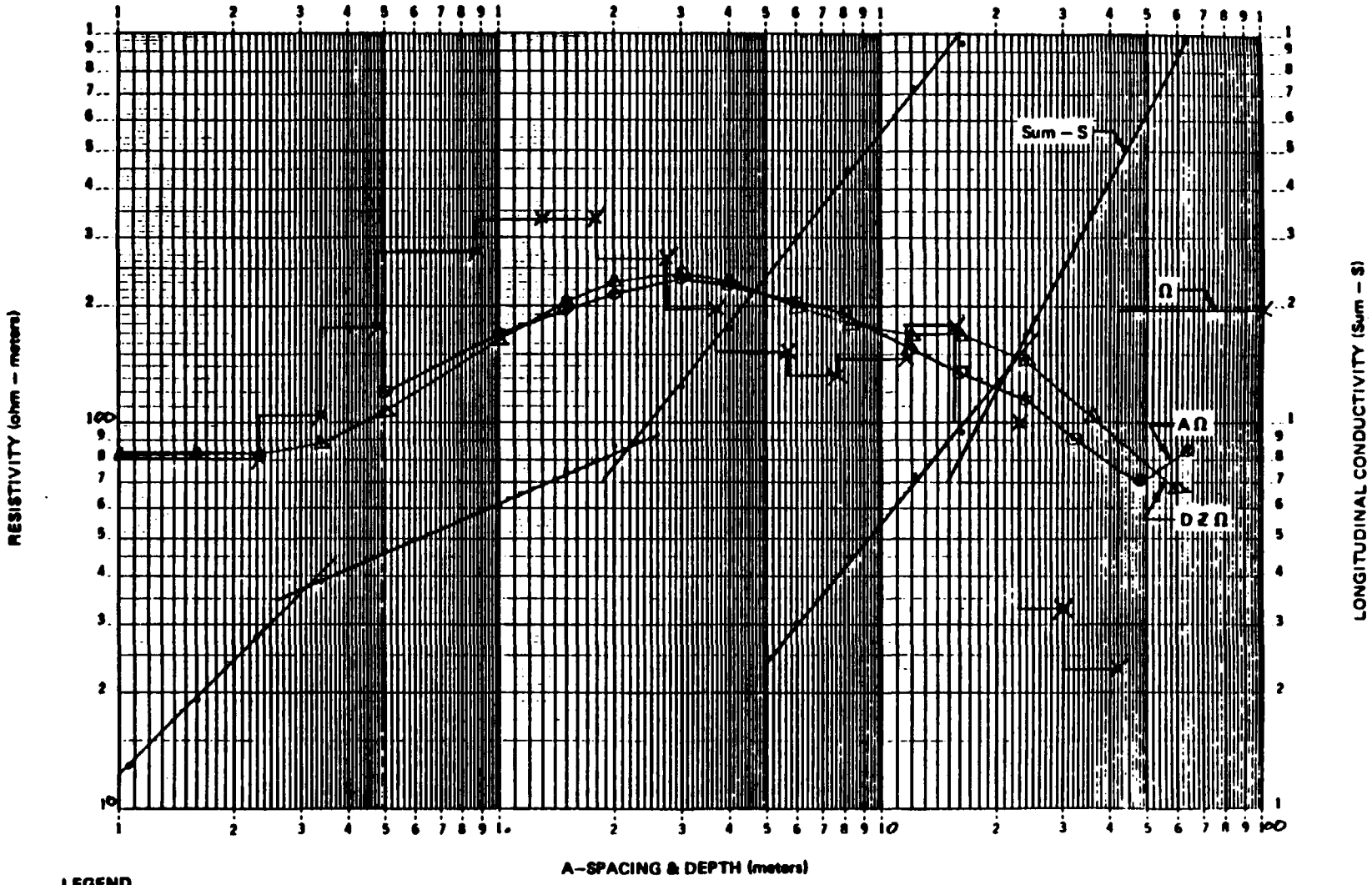
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–18 |

MGY 001 0625




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISITVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

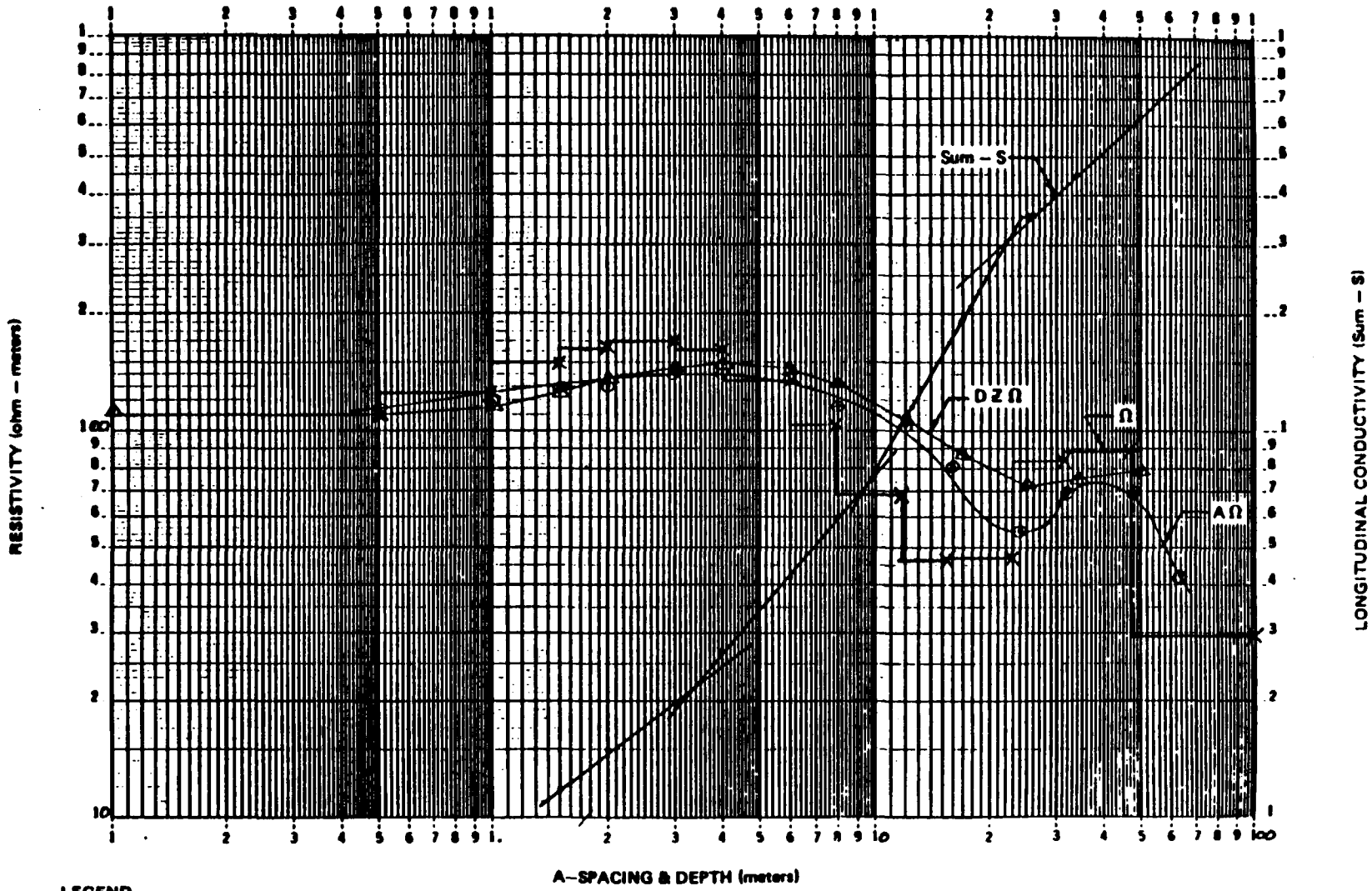
**WENNER SOUNDING (RS-13)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–17 |

MGY 001 0626




**LEGEND**

| | |
|---|---|
| A Ω | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| D Z Ω | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

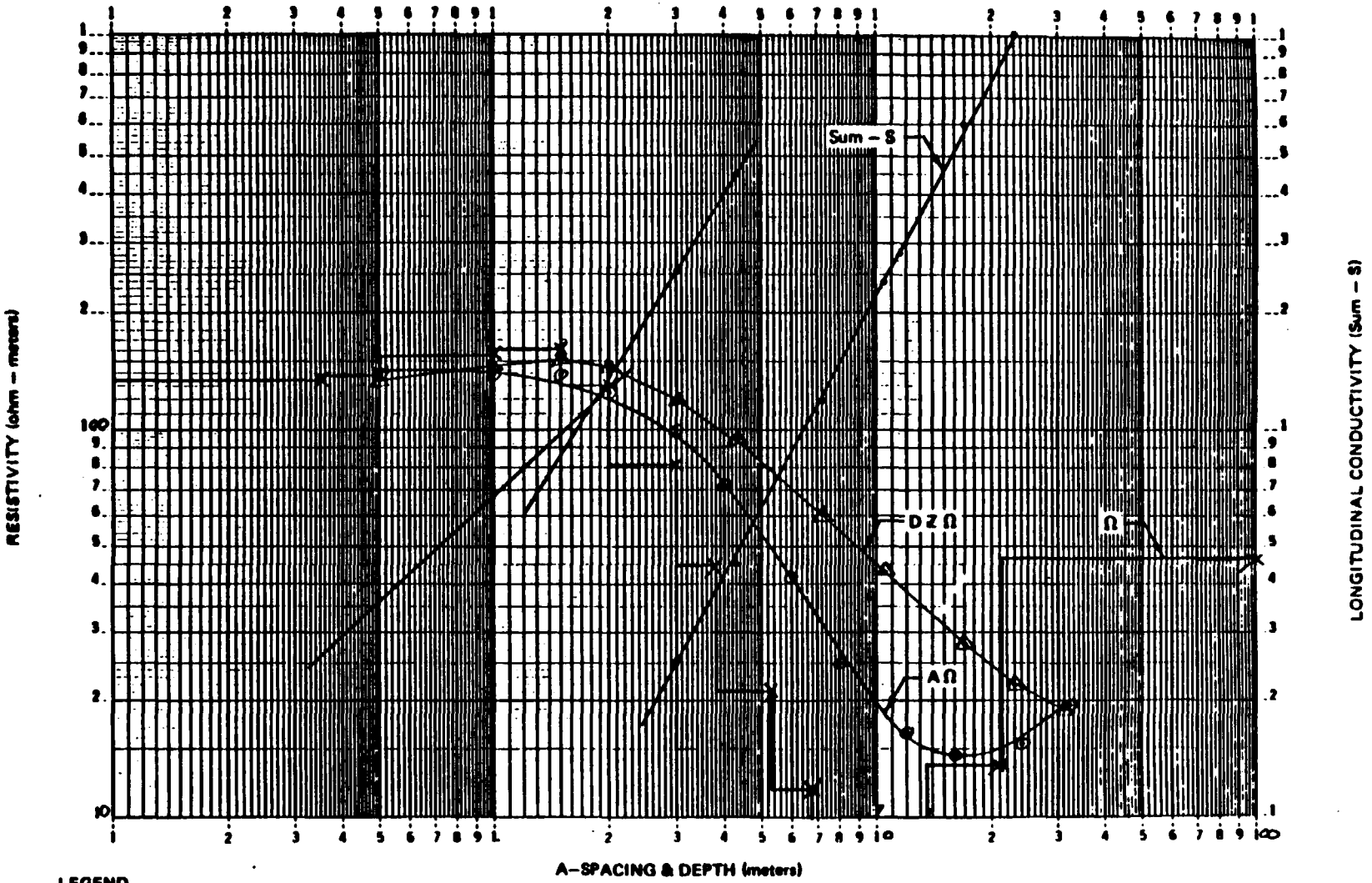
**WENNER SOUNDING (RS-14)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–18 |

MGY 001 0627




**LEGEND**

| | |
|---|---|
| AΩ | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| DZΩ | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

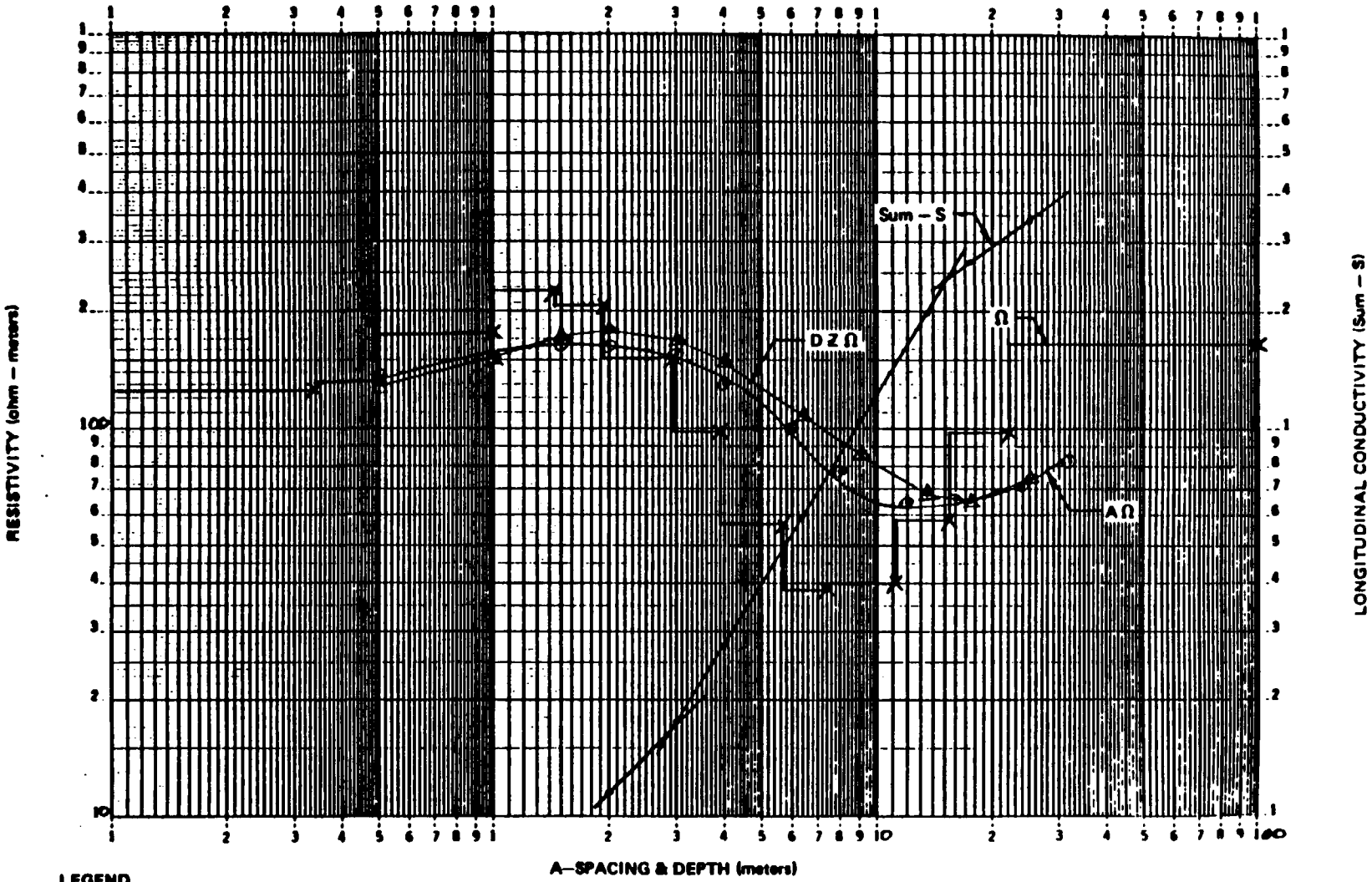
**WENNER SOUNDING (RS-15)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–19 |

MGY 001 0628




**LEGEND**

| | |
|---|---|
| A Ω | APPARENT RESISTIVITY BY A–SPACING |
| Ω | INVERSE CALCULATION OF RESISTIVITY BY DEPTH |
| D Z Ω | DAR ZARROUK ESTIMATE OF APPARENT RESISTIVITY BY DEPTH |
| Sum – S | RELATIVE CHANGE IN LONGITUDINAL CONDUCTIVITY WITH DEPTH |

**MTHD / RHMW SITE**

**WENNER SOUNDING (RS-16)**

**WOODWARD—CLYDE CONSULTANTS**

CONSULTING ENGINEERS, GEOLOGISTS AND ENVIRONMENTAL SCIENTISTS
WAYNE, NEW JERSEY

| | | | | | |
|---|---|---|---|---|---|
| DR. BY: | BTD | SCALE: | AS SHOWN | PROJ. NO.: | 84C4007A |
| CK'D. BY: | RGG | DATE: | 3 DEC 1985 | FIG. NO.: | E–20 |

MGY 001 0629

# Appendix F

MGY 001 0630

# APPENDIX F
# FIRST ROUND MONITORING AND DOMESTIC WELL CHEMICAL ANALYSES



MGY 001 0631

FIRST ROUND MONITORING WELL ANALYSES

| WELL | MW-1D | MW-1S | MW-2D | MW-2S | MW-3D | MW-3D dup | MW-3S | MW-4D | MW-4D airp |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBER | 116 | 101 | 144 | 131 | 136 | 142 | 138 | 139 | 156 |
| COMPUCHEM NUMBER | 108771 | 108765 | 111136 | 111118 | 111123 | 111131 | 109288 | 109430 | 111133 |
| DATE | 11/19/86 | 11/19/86 | 12/04/86 | 12/04/86 | 12/04/86 | 12/04/86 | 11/20/86 | 11/21/86 | 12/04/86 |
| Compound | | | | | | | | | |
| ANTIMONY | | | | | 82 | 114 | | | |
| ARSENIC | 16 | | [4.2] | [3.6] | | 186 | | | 7.9 |
| BERYLLIUM | [1.9] | [1.9] | | | 12 | 17 | 7.6 | 2.9 | |
| CADMIUM | | | | | | | | | |
| CHROMIUM | | [8.8] | 19 | 24 | 304 | 406 | 90 | 20 | 10 |
| COPPER | 29 | [6.9] | [18] | [23] | 412 | 457 | 581 | 28 | 29 |
| LEAD | | 6.7 | [3.8] | 11 | 686 | 786 | 17 | | 21 |
| MERCURY | | | | | 0.44 | | | | |
| NICKEL | | | | | 246 | 340 | 78 | | |
| SILVER | | 24 | [7.6] | | 11 | | | | 6.3 |
| ZINC | 47 | 39 | 37 | 53 | 723 | 958 | 303 | 105 | 68 |
| BARIUM | 212 | [133] | [131] | [133] | 1660 | 2300 | 513 | 102 | 409 |
| IRON | 4410 | 2810 | 1650 | 2960 | 116000 | 165000 | 68000 | 764 | 27500 |
| MANGANESE | 283 | 695 | 140 | 206 | 4870 | 6370 | 1490 | 75 | 1060 |
| VANADIUM | [9.7] | [4.3] | | [10] | 153 | 225 | 102 | | 12 |
| ALUMINUM | 3520 | 2720 | 633 | 3810 | 102000 | 140000 | 42400 | 555 | 1320 |
| COBALT | [17] | [19] | | | 72 | 98 | 44 | 7.4 | |
| MAGNESIUM | 14900 | 12000 | 10500 | 6350 | 125000 | 193000 | 25400 | 6800 | 8390 |
| CALCIUM | 38000 | 9000 | 42700 | 12500 | 1240000 | 2230000 | 17100 | 11700 | 63000 |
| SODIUM | 9160 | 10300 | 9860 | 23900 | 88400 | 82200 | 10500 | 10200 | 15000 |
| POTASSIUM | [2730] | [2970] | [2230] | 2810 | 56600 | 53200 | 6010 | 1530 | |
| CHLOROFORM | | | | | | | 17 | 17 | |
| METHYLENE CHLORIDE | 11 | | [1.7] | | | [1.9] | | | [1.5] |
| TETRACHLOROETHENE | | | | | | | [5.6] | [4] | |
| TOLUENE | | | | | [1.2] | | | | |
| TRANS-1,2-DICHLOROETHENE | | | | | | | | | |
| TRICHLOROETHENE | | | 34 | | 13 | 13 | 320 | 240 | |
| ACETONE | 24 | 22b | | | 24 | 17b | | 11b | [3.7] |
| BIS(2-ETHYLHEXYL)PHTHA | [3.8] | [2] | [9.4] | | 58 | 48 | [13] | | [7] |
| DIETHYLPHTHALATE | | | | | | | | | |
| N-NITROSODIPHENYLAMINE(1) | | | | | | | | | |
| PYRENE | | | | | [3.6] | | | | |
| PHENOL | | | | | | [19] | | | |
| CHLORDANE | | | | | | | | | |
| PCBS | | | | | 63 | 57 | | | |

Notes: all concentrations in ppb;
b - compound also appeared in laboratory blank;

MGY 001 0632

FIRST ROUND MONITORING WELL ANALYSES (cont.)

| WELL | MW-4S airp | MW-5D | MW-5D airp | MW-6D | MW-7D | MW-7S | MW-9D | MW-9D dup |
|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBER | 102 | 134 | 146 | 108 | 111 | 107 | 114 | 115 |
| COMPUCHEM NUMBER | 109287 | 109427 | 111115 | 109289 | 108759 | 108740 | 108732 | 108729 |
| DATE | 11/20/86 | 11/21/86 | 12/04/86 | 11/20/86 | 11/19/86 | 11/19/86 | 11/19/86 | 11/19/86 |
| Compound | | | | | | | | |
| ANTIMONY | | | | | | | | |
| ARSENIC | | | [8.4] | | | [3.1] | 3.6 | |
| BERYLLIUM | 4.2 | | | [3.8] | [2.8] | [3.8] | 3.8 | [3.8] |
| CADMIUM | 7 | | | | | | | |
| CHROMIUM | 44 | 60 | | 14 | | 19 | | |
| COPPER | 30 | [14] | [18] | 28 | [2.2] | 35 | 17 | 28 |
| LEAD | 26 | 20 | | 7 | | 9.7 | | |
| MERCURY | 0.2 | | | | | | | |
| NICKEL | 51 | 104 | | | | 41 | | |
| SILVER | | | 18 | | | | | |
| ZINC | 162 | 170 | 42 | 49 | 28 | 217 | 33 | 53 |
| BARIUM | 311 | 544 | [39] | [167] | [130] | 253 | 117 | [111] |
| IRON | 22200 | 17000 | 19800 | 6200 | [73] | 18500 | 381 | 318 |
| MANGANESE | 215 | 1500 | 336 | 539 | | 676 | 72 | 60 |
| VANADIUM | 44 | [30] | [6.7] | [8.6] | | [20] | | |
| ALUMINUM | 22000 | 22600 | 250 | 5000 | [42] | 12900 | 200 | 222 |
| COBALT | 24 | [29] | | [15] | [6.8] | [24] | | [6.8] |
| MAGNESIUM | 21600 | 20700 | 17600 | 8300 | 11800 | 15800 | 11800 | 11200 |
| CALCIUM | 6230 | 27300 | 32000 | 12700 | 12300 | 14100 | 23700 | 23200 |
| SODIUM | 21200 | 8660 | 16000 | 7140 | 13100 | 13600 | 13300 | 13020 |
| POTASSIUM | 3450 | 5610 | [1120] | [2800] | [2830] | [4530] | [1770] | [2020] |
| CHLOROFORM | | | | | [19] | [18] | | |
| METHYLENE CHLORIDE | | [3.9] | | [3.1] | | | | |
| TETRACHLOROETHENE | | | | | 37 | 43 | | |
| TOLUENE | | | | | | | | |
| TRANS-1,2-DICHLOROETHENE | | | | | 25 | 24 | | |
| TRICHLOROETHENE | | | | | 650 | 650 | 6.3 | 6.3 |
| ACETONE | 80 | | | | 750 | | | |
| BIS(2-ETHYLHEXYL)PHTHA | 12 | | [6.4] | | | | | |
| DIETHYLPHTHALATE | | | | | | | | |
| N-NITROSODIPHENYLAMINE(1) | | | | | | | | |
| PYRENE | | | | | | | | |
| PHENOL | | | | | | | | |
| CHLORDANE | | | | | | | | |
| PHENOLS | | | | | | | | |

Note: all concentrations in ppb

n = compound also appeared in laboratory blank

MGY 001 0633

FIRST ROUND MONITORING WELL ANALYSES (cont.)

| WELL | MW-10D | MW-11D | MW-11S | MW-13D | MW-13S | MW-14D | MW-14S | MW-15D |
|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBER | 147 | 0137 | 0157 | 143 | 109 | 0145 | 0103 | 100 |
| COMPUTER NUMBER | 109428 | 111243 | 111245 | 109284 | 108721 | 111247 | 111252 | 109426 |
| DATE | 11/21/86 | 12/03/86 | 12/03/86 | 11/20/86 | 11/19/86 | 12/03/86 | 12/03/86 | 11/21/86 |
| Compound | | | | | | | | |
| ANTIMONY | | | | | | | | |
| ARSENIC | | [4.1] | | | | [5.2] | | [3.1] |
| BERYLLIUM | [1.9] | | | [3.0] | [3.0] | | | [1.9] |
| CADMIUM | | | | | | | | |
| CHROMIUM | | 10 | 6 | [6.6] | | [8.5] | | |
| COPPER | [1.1] | [10] | 31 | | 53 | [10] | [8.1] | |
| LEAD | [4.7] | 8.1 | 39 | 13 | | 6.1 | | |
| MERCURY | | | | | | | | |
| NICKEL | | | 54 | | | | | |
| SILVER | | [5.7] | | | 36 | | | |
| ZINC | [19] | 45 | 160 | [19] | 73 | 52 | 29 | [12] |
| BARIUM | [50] | [57] | 232 | [46] | [34] | 222 | [60] | [40] |
| IRON | 477 | 839 | 18400 | 770 | 486 | 4720 | 295 | 387 |
| MANGANESE | 25 | 40 | 1150 | 116 | 22 | 427 | | 46 |
| VANADIUM | | | [33] | | | [16] | | [2] |
| ALUMINUM | 367 | 501 | 23400 | 651 | 470 | 5730 | 402 | 307 |
| COBALT | | | [23] | | [6.0] | | | |
| MAGNESIUM | 6430 | 6720 | 19100 | [4120] | [4130] | 9000 | 7200 | 8020 |
| CALCIUM | 14300 | 15300 | 9290 | 12700 | 5000 | 19000 | 8000 | 34600 |
| SODIUM | 6420 | 5470 | 7600 | 7030 | 5460 | 11700 | 17600 | 11100 |
| POTASSIUM | [1850] | [2060] | [3940] | [1850] | [1950] | [2560] | [2150] | [1790] |
| CHLOROFORM | | | | | | | | |
| METHYLENE CHLORIDE | [3.7] | | | | 2b | | [3.3] | 0.3b |
| TETRACHLOROETHENE | | | | | | | | [1.4] |
| TOLUENE | | | | | | | | |
| TRANS-1,2-DICHLOROETHENE | | | | | | | | |
| TRICHLOROETHENE | | | | | | | | |
| ACETONE | | | | 22 | 18b | | | |
| BIS(2-ETHYLHEXYL)PHTHALATE | | [17] | [5.0] | | | [0.2] | [6.6] | |
| DIETHYLPHTHALATE | | [3] | | | | | | |
| N-NITROSODIPHENYLAMINE(1) | | [2.6] | | | | | | |
| PYRENE | | | | | | | | |
| PHENOL | | | | | | | | |
| CHLORDANE | 1.3 | | | | | | | |
| PHENOLS | | | | | | | | |

Note: all concentrations in ppb;
b - compound also appeared in laboratory blank;
[ ] - concentration is below contract required detection limit.

MGY 001 0634

FIELD AND TRIP BLANKS - ROUND ONE MONITORING WELL SAMPLING

| SAMPLE DATE AND TYPE | 11/18 FB | 11/18 TB | 11/19 FB | 11/20 FB | 11/20 TB | 11/21 FB | 11/21 TB | 12/3 FB | 12/3 TB | 12/4 FB | 12/4 TB |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBER | 113 | 300 | 112 | 135 | 400 | 133 | 500 | 0145 | 0600 | 132 | 700 |
| COMPUCHEM NUMBER | 108735 | 108748 | 108768 | 109285 | 109290 | 109429 | 109436 | 111251 | 111249 | 111125 | 111129 |
| DATE | 11/19/86 | 11/19/86 | 11/19/86 | 11/20/86 | 11/20/86 | 11/21/86 | 11/21/86 | 12/03/86 | 12/03/86 | 12/04/86 | 12/04/86 |
| COMPOUND | | | | | | | | | | | |
| BERYLLIUM | [3.0] | [1.9] | [3.0] | [3.0] | [3.0] | | | | | | |
| CHROMIUM | | 15 | | | | | 12 | [9.7] | | | |
| COPPER | [8] | [1.1] | [3.4] | | | [2.2] | [8.2] | [18] | [17] | [18] | [6.1] |
| MERCURY | | | 1.4 | | | | | | | | |
| SELENIUM | | | | | | | | | | | 5.3 |
| SILVER | | | | | | | | | | 19 | 22 |
| ZINC | [13] | [11] | [17] | [19] | [3.6] | 23 | 20 | 30 | 24 | 50 | [19] |
| BARIUM | | | | [1.3] | | [2.4] | | | | | |
| IRON | [29] | [70] | [22] | [28] | [14] | [61] | [72] | [66] | [31] | [28] | [35] |
| MANGANESE | | | | | | | [2] | | | | |
| ALUMINUM | [31] | | | [25] | | [62] | | [33] | | [26] | [24] |
| COBALT | | | | | | | [7.4] | | | | |
| CALCIUM | [22] | [17] | [138] | [307] | [15] | [262] | [30] | [179] | [113] | [224] | [132] |
| SODIUM | [1960] | | | | | | | | | | |
| METHYLENE CHLORIDE | 6.7b | 5 | 17 | [4] | | [3.9]b | 8.8b | 29 | | 7 | |
| BIS(2-ETHYLHEXYL)PHTHALATE | | | | | | | | [3.2] | | [2.0] | [2.2] |

Note: all concentrations in ppb;
b - compound also appeared in lab blank;
[ ] - concentration is below contract detection limits.

## ROUND ONE
## MONITORING WELL SAMPLES
## TENTATIVELY IDENTIFIED COMPOUNDS

| Sampling Location | MW-1S | MW-2S | MW-3D* | MW-4S | MW-5D | MW-11D | MW-15D | Field Blank | Trip Blank | Field Blank | Field Blank | Field Blank |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample No. | 101 | 131 | 136 | 102 | 134 | 137 | 100 | 12/03/86 145 | 11/21/86 500 | 11/18/86 113 | 12/04/86 132 | 11/21/86 133 |
| Piperidine,1-ethyl -2-methyl- | 20 | | | | | | | | | | | |
| Pentane,2-Methoxy -2,4,4-Trimethyl | | 17 | | | | | | | | | | |
| Phenol,2-Fluoro- | | | | 42 | | | | | | | | |
| Nonanoic Acid | | | | 13 | | | | | | | | |
| Aziridine,2-Hexyl- | | | | | 14 | | | | | | | |
| Hexadecanoic Acid | | | | | | 9 | | | | | | |
| 1,2-Benzenedi- carboxylic Acid, Diheptyl ester | | | | | | 12 | | | | | | |
| Hydrobromicacid | | | | | | | 29 | | | | | |
| Ethane,1,1,2- Trichloro- 1,2,2-Trifluoro- | | | | | | | 120 | | | | | |
| Pyridine, Pentachloro- | | | | | | | | 55 | | | | |
| Benzene, 1,2-Dimethyl- | | | | | | | | | 8 | | | |
| Oxirane, (Butoxymethyl)- | | | | | | | | | | 9 | 6 | |
| Phenol,2,4,6- Tribromo- | | | | | | | | | | | 81 | |
| Naptho[2,3-B] Thiophene, 4,9-Dimethyl- | | | | | | | | | | | 140 | |
| 9-Octadecenamide, (2)- | | | | | | | | | | | | 17 |
| Tridecane,4,8- Dimethyl- | | | 10 | | | | | | | | | |
| Docosane | | | 23 | | | | | | | | | |
| Cyclohexane, 1,1'- [1,2-Bis](1,1- Dimethylethyl) -1,2-ET | | | 14 | | | | | | | | | |
| 1-Nonene,4,6,8- Trimethyl- | | | 19 | | | | | | | | | |
| Hexadecane | | | 20 | | | | | | | | | |
| 1-Octanol,2-Butyl- | | | 13 | | | | | | | | | |
| Docosane | | | 19 | | | | | | | | | |
| 9-Eicosene,(E)- | | | 8 | | | | | | | | | |
| Eicosane,10-Methyl- | | | 15 | | | | | | | | | |
| 1-Octanol,2-Butyl- | | | 29 | | | | | | | | | |
| Heptacosane | | | 15 | | | | | | | | | |
| Aziridine,1-Hexyl- | | | 13 | | | | | | | | | |

* Duplicate of this sample had no T.I.C.'s.
Note: All concentrations in ppb; all concentrations are estimated.

j87-60

MGY 001 0636

# DOMESTIC POTABLE WELL SAMPLING

MGY 001 0637

FIRST ROUND PRIVATE DOMESTIC WELL SAMPLING ANALYSES

| COMPANY | 89387 | 89376 | 89333 | 89381 | 89385 | 89386 | 89356 | 89368 | 8932: | 89338 | 89328 | 89392 | 89366 | 89334 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBERS | 89346 | 89425 | 89413 | 89348 | 89344 | 89345 | 89317 | 89331 | 89443 | 89428 | 89410 | 89353 | 89327 | 89424 |
| | 89426 | 89335 | 89370 | 89430 | 89434 | 89435 | 89399 | 89411 | 89440 | 89379 | 89367 | 89441 | 89409 | 89375 |
| WCC SAMPLE NUMBER | 017 | 030 | 020 | 034 | 035 | 023 | 022 | 032 | 018 | 015 | 025 | 029 | 027 | 024 |
| SAMPLING DATE | 6/6/86 | 6/6/86 | 6/5/86 | 6/6/86 | 6/6/86 | 6/5/86 | 6/5/86 | 6/6/86 | 6/5/86 | 6/5/86 | 6/6/86 | 6/6/86 | 6/6/86 | 6/6/86 |
| LOT/BLOCK | 9/8 | 9/2.04 +2.4 | 9/9.1 | 9/5 | 9/7 +7.0 | 28/29002 | 24/29002 | 22/29002 | 30/29002 | 33/29002 | 50/2900: | 50/2900: | 20/2300: | 2/2900: |
| Methylene Chloride | [4.1] | 0 | 0 | 0 | [2.1] | 5.8 | [3.2] | [1.1] | [3.1] | 0 | 0 | 0 | 0 | 0 |
| Acetone | [6.4] | 0 | 0 | 0 | 0 | 0 | [7.3] | [5.3] | [5.7] | 0 | 0 | 0 | 0 | 0 |
| Diethyl phthalate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1,1 Dichloroethane | 0 | 0 | 0 | 0 | 0 | 0 | [3.5] | 8.6 | 0 | [5.8] | 0 | 0 | 0 | 0 |
| 1,1,1 Trichloroethane | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Trichloroethene | 0 | 0 | 0 | 0 | 0 | 0 | 46 | 28 | 86 | 340 | 0 | 0 | [1.9] | 0 |
| Tetrachloroethene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | [1.4] | 11 | 0 | 0 | 0 | 0 |
| Di-n-butylphthalate | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Toluene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Ethyl Benzene | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| trans-1,2 - dichloroethene | 0 | 0 | 0 | 0 | 0 | 0 | [3.5] | [4.0] | [3.7] | 17 | 0 | 0 | 0 | 0 |
| Chloroform | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chloroform | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Bromodichloromethane | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aluminum | [182] | [146] | [147] | 161 | [153] | [39] | [160] | [191] | [98] | [89] | [84] | [54] | [150] | [154] |
| Arsenic | 0 | 0 | 0 | 0 | 0 | 0 | 10 | 10 | 0 | 10 | 0 | 0 | 39 | [7.5] |
| Barium | [54] | [9.7] | [142] | [12] | 201 | [78] | [114] | [120] | [73] | [88] | 295 | 306 | [106] | [6.7] |
| Beryllium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cadmium | 0 | 5.1 | 0 | 0 | 4.6 | 0 | 0 | 0 | 0 | 0 | 0 | [4.1] | 0 | [4.8] |
| Calcium | 34600 | 336000 | 41700 | 19600 | 38900 | 8800 | 46200 | 58700 | 6250 | 28600 | 25500 | 26200 | 22400 | 289000 |
| Chromium | [4.1] | 15 | [9.7] | 13 | 15 | [6.4] | 13 | 11 | 19 | [12] | [9.2] | [7.6] | 11 | [8.8] |
| Cobalt | [5.0] | 13 | [8.3] | 11 | [12] | [6.1] | [25] | [8.6] | 81 | [8.6] | [8.9] | [7.9] | [8.4] | 0 |
| Copper | 31 | 31 | 196 | 120 | 30 | 110 | 47 | 31 | 94 | [23] | 31 | 30 | 31 | 31 |
| Iron | [62] | [60] | [46] | [68] | [48] | [30] | 163 | 116 | 262 | 636 | [70] | [75] | [69] | 196 |
| Lead | 18 | [2.1] | [4.4] | 8.4 | [4.8] | [4.0] | 143 | [4.0] | 2170 | 19 | [3.2] | 0 | [3.5] | 0 |
| Magnesium | 5340 | 8690 | 75600 | 5760 | 6800 | 5720 | 19600 | 28300 | 5490 | 11000 | 6800 | 6240 | 9440 | 68000 |
| Manganese | [5.2] | [6.1] | [5.3] | [6.1] | 6.0 | [4.2] | 74 | 94 | 29 | [6.1] | [5.4] | [5.2] | [5.9] | 295 |
| Mercury | 0 | [0.18] | [0.14] | [0.14] | [0.14] | [0.14] | [0.18] | 0.14 | 0.24 | 0 | 0 | 0 | 0 | [0.18] |
| Nickel | [14] | [13] | [16] | [16] | [19] | [18] | [27] | [33] | [25] | [21] | [12] | [17] | [24] | 28 |
| Potassium | 0 | 0 | [1900] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | [1500] | [1700] |
| Silver | 10 | 40 | 10 | 100 | 10 | 10 | 0 | 10 | 20 | 10 | 10 | 0 | 30 | 10 |
| Sodium | 13200 | 13700 | 17600 | 10100 | 19600 | 7740 | 15300 | 16900 | 11000 | 2500 | 12000 | 9750 | 14000 | 57900 |
| Thallium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vanadium | 5 | [16] | [9.1] | [9.9] | [15] | [3.9] | [7.9] | 8.1 | [6.6] | 14 | [9.4] | [7.2] | [20] | [4.6] |
| Zinc | 74 | 112 | 40 | 60 | 71 | 77 | 46 | 123 | 62 | 205 | 36 | 47 | 45 | 32 |
| Cyanide | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Phenols | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 30 | 0 | 11 | 0 |

Notes: All concentrations reported in ug/l.
0 Below Method Detection Limit.
[ ] Value less than detection limit specified in lab contract.
(b) Compound also appeared in analysis of blank

MGY 001 0638

FIRST ROUND PRIVATE DOMESTIC WELL SAMPLING ANALYSES (cont.)

| CONTAINER | 89383 | 89439 | 89365 | 89332 | 89383 | 89324 | 89445 | 89354 | 89355 | 89359 | 89361 | 89364 | 89311 | 89319 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBERS | 89435 | 89349 | 89349 | 89412 | 89342 | 89486 | 89444 | 89315 | 89316 | 89320 | 89322 | 89325 | 89289 | 8948[illegible] |
| | 89362 | 89390 | 89438 | 89369 | 89432 | 89363 | 89446 | 89397 | 89398 | 89402 | 89404 | 89427 | 89383 | 89358 |
| WCC SAMPLE NUMBER | 036 | 039 | 041 | 019 | 021 | 025 | 038 | 001 | 002 | 003 | 004 | 005 | 006 | 007 |
| SAMPLING DATE | 6/6/86 | 6/6/86 | 6/6/86 | 6/5/86 | 6/5/86 | 6/6/86 | 6/6/86 | 6/5/86 | 6/5/86 | 6/5/86 | 6/5/86 | 6/5/86 | 6/5/86 | 6/5/86 |
| LOT/BLOCK | 4/29081 | 4/29082 | 17/23081 | 14/29082 | 11/29082 | 12/29082 | 66/28281 | 43/29082 | 12/29083 | 12/29083 | 37/29082 | 15/25083 | 5/29083 | 40/29082 |
| Methylene Chloride | * | * | * | * | * | [1.0] | 24 | * | * | * | 16 | [1.7] | 7.1 | [2.4] |
| Acetone | [4.6]b | * | * | [4.7]b | * | [5.9]b | * | [4.5]b | [5.7]b | * | 12 | [5.2]b | * | * |
| Diethyl phthalate | * | * | * | * | * | * | * | * | * | * | [4.2] | * | * | * |
| 1,1 Dichloroethane | * | * | * | 7.1 | * | * | * | [1.0] | * | [4.0] | * | [2.6] | * | [4.5] |
| 1,1,1 Trichloroethane | * | * | * | [3.7] | * | * | * | * | * | * | * | * | * | * |
| Trichloroethene | * | 58 | * | 72 | 220 | 64 | * | 35 | * | 32 | [2.5] | 24 | [3.8] | 48 |
| Tetrachloroethene | * | [1.0] | * | [1.9] | [26] | * | * | * | * | * | * | * | * | * |
| Di-n-butylphthalate | * | * | * | * | * | * | [1.5] | * | * | * | * | * | * | * |
| Toluene | * | * | * | * | * | * | [4.7] | * | * | * | * | * | * | * |
| Ethyl Benzene | * | * | * | * | * | * | * | * | * | * | 5.3 | * | * | * |
| trans-1,2 - dichloroethene | * | [4.0] | * | [3.4] | 7.6 | * | * | * | * | * | * | * | * | * |
| Chloroform | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Chloroform | * | * | * | * | * | * | 11 | * | * | * | * | * | * | * |
| Bromodichloroethane | * | * | * | * | * | * | [2.0] | * | * | * | * | * | * | * |
| Aluminum | [93] | [76] | [73] | [140] | [86] | [173] | [115] | [157] | [163] | [176] | [168] | [76] | * | [151] |
| Arsenic | * | * | * | * | [4.2] | * | * | [5.1] | * | [8.7] | [4.4] | [8.5] | * | 18 |
| Barium | [8.4] | [82] | [199] | [72] | [135] | [85] | [39] | [121] | [58] | [165] | [135] | [118] | [151] | [142] |
| Beryllium | * | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Cadmium | [4.7] | * | * | * | 5.3 | * | [4.1] | * | * | * | * | * | * | * |
| Calcium | 232000 | 30500 | 28300 | 32100 | 32500 | 16000 | 33600 | 21600 | 6060 | 25100 | 30200 | 21700 | 29500 | 25400 |
| Chromium | [9.3] | [8.2] | [7.0] | 12 | 13 | 11 | [7.6] | [5.0] | [8.5] | 10 | [9.5] | 12 | * | 10 |
| Cobalt | [7.0] | [7.2] | [8.0] | [3.5] | [10] | [8.0] | [7.4] | [42] | [7.0] | [8.9] | [7.2] | [9.4] | * | [8.3] |
| Copper | 144 | 28 | 30 | 47 | 94 | 47 | 76 | [26] | 186 | 31 | 31 | [18] | 114 | 31 |
| Iron | 3840 | [23] | [25] | [97] | [30] | 125 | [74] | [86] | [56] | [89] | 184 | [26] | [10] | 510 |
| Lead | * | 26 | [2.0] | [3.6] | 40 | 6.1 | 10 | 740 | * | 5.0 | 7.0 | * | 6.0 | 7.7 |
| Magnesium | 54500 | 11700 | 12400 | 17000 | 12500 | 9510 | 8120 | 8097 | [3920] | 11200 | 10500 | 8100 | 12100 | 10600 |
| Manganese | 222 | * | [3.7] | [13] | [5.3] | 10 | [6.0] | [5.9] | [6.2] | [5.6] | [6.1] | [3.6] | * | [6.2] |
| Mercury | [0.14] | [0.14] | * | * | * | [0.10] | * | [0.10] | [0.14] | [0.14] | [0.10] | * | * | [0.10] |
| Nickel | [37] | [20] | [23] | [19] | [15] | [25] | [16] | [12] | [15] | * | [16] | [14] | * | [12] |
| Potassium | * | * | * | * | * | [1600] | * | * | * | * | * | * | * | * |
| Silver | * | * | * | 20 | 10 | * | 10 | * | * | * | 10 | * | * | 10 |
| Sodium | 10 | 10000 | 13000 | 12900 | 15000 | 15000 | 11100 | 8035 | 13600 | 13900 | 15400 | 9040 | 5160 | 14700 |
| Thallium | * | * | * | * | * | * | * | * | * | * | * | * | [2.6] | * |
| Vanadium | 48500 | 6.5 | [7.6] | [8.5] | [10] | 8.0 | [4.0] | [4.5] | [4.3] | [11] | [8.2] | [9.6] | * | [13] |
| Zinc | [15] | 36 | 69 | 39 | 54 | 140 | 32 | 82 | 47 | 44 | 70 | 38 | 170 | 130 |
| Cyanide | 99 | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Phenols | 20 | * | * | * | 54 | * | * | * | * | * | * | * | * | |

Notes: All concentrations reported in ug/l.

* Below Method Detection Limit.

[ ] Value less than detection limit specified in lab contract.

(b) Compound also appeared in analysis of blank

MGY 001 0639

FIRST ROUND PRIVATE DOMESTIC WELL SAMPLING ANALYSES (cont.)

| COMPOUND | 85326 | 85312 | 85357 | 85314 | 85348 | 85362 | 85337 | 85384 | 85329 | 85455 | 85313 | 85391 | 85377 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLE NUMBERS | 85448 | 85294 | 85318 | 85382 | 85438 | 85341 | 85427 | 85343 | 85429 | | 85381 | 85358 | 85335 |
| | 85365 | 85388 | 85408 | 85314 | 85389 | 85431 | 85378 | 85433 | 85360 | | 85329 | 85440 | 85426 |
| WCC SAMPLE NUMBER | 008 | 009 | 012 | 011 | 014 | 037 | 033 | 016 | 013 | Blank | 010 | 6686 | 043 |
| SAMPLING DATE | 6/5/86 | 6/5/86 | 6/5/86 | 6/6/86 | 6/5/86 | 6/6/86 | 6/6/86 | 6/5/86 | 6/5/86 | 6/5/86 Trip Blank | 6/5/86 Field Blank | 6/6/86 Trip Blank | 6/6/86 Field Blank |
| LOT/BLOCK | 48/29002 | 17/25002 | 8/29002 | 27/23001 | 28/23001 | 23/23001 | 18/29003 | 37/28001 | 1/29001 | | | | |
| Methylene Chloride | [1.8] | [3.8] | * | * | * | [4.8] | [2.1] | * | * | * | [4.6] | 6.0 | [4.8] |
| Acetone | [4.8]b | * | * | [6.4]b | [3.5] | * | * | * | * | * | [5.9] | * | [7.4]b |
| Diethyl phthalate | * | * | * | * | * | * | * | * | * | * | * | * | * |
| 1,1 Dichloroethane | 5.6 | * | * | * | [1.5] | * | * | * | * | * | * | * | * |
| 1,1,1 Trichloroethane | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Trichloroethene | 44 | [3.9] | 18 | 68 | 140 | 72 | * | * | * | * | * | * | * |
| Tetrachloroethene | [1.5] | * | * | * | [2.1] | * | * | * | * | * | * | * | * |
| Di-n-butylphthalate | * | * | * | * | * | * | * | * | * | * | * | * | [2.8] |
| Toluene | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Ethyl Benzene | * | * | * | * | * | * | * | * | * | * | * | * | * |
| trans-1,2 - Dichloroethene | * | * | * | [4.4] | 5.6 | 5.3 | * | * | * | * | * | * | * |
| Chlorobenzene | * | 0.76 | * | * | * | * | * | * | * | * | * | * | * |
| Chloroform | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Bromodichloromethane | * | * | * | * | * | * | * | * | * | * | * | * | * |
| Aluminum | [189] | * | 144 | * | [113] | [153] | [88] | [117] | 116 | V | * | [135] | 222 |
| Arsenic | 28 | * | [7.2] | * | * | * | * | * | * | U | * | * | * |
| Barium | [144] | [185] | [62] | [186] | [125] | [187] | [131] | [182] | 233 | L | * | [3.8] | [3.8] |
| Beryllium | * | * | * | * | * | * | * | * | * | A | * | * | * |
| Cadmium | * | * | * | * | * | 5.7 | * | * | 9.8 | T | * | * | * |
| Calcium | 25000 | 14000 | 37100 | 33700 | 29600 | 32800 | 24100 | 24000 | 32400 | I | [187] | [1240] | [1320] |
| Chromium | 11 | * | 11 | * | [6.9] | 13 | 117 | 15 | 14 | L | * | [7.1] | 17 |
| Cobalt | [7.9] | * | [18] | * | [7.8] | [11] | [18] | [12] | [11] | E | * | [8.1] | [15] |
| Copper | 31 | 171 | 47 | 45 | 41 | 31 | 31 | 46 | 31 | S | 26 | 30 | 31 |
| Iron | 514 | [15] | [573] | * | 44 | [39] | [36] | [40] | 107 | | * | [86] | [50] |
| Lead | * | [4.7] | 91 | [4.4] | [3.6] | * | 20 | 7.0 | 7.0 | O | 5.3 | 10 | [2.1] |
| Magnesium | 10600 | 7220 | 17000 | 9530 | 9050 | 9440 | 7920 | 7750 | 11100 | W | * | [171] | [198] |
| Manganese | [6.1] | * | 44 | * | [4.2] | 5.6 | [6.1] | [5.3] | 15 | L | * | [5.2] | [3.5] |
| Mercury | 0.24 | * | [0.14] | * | [0.14] | * | * | [0.18] | * | Y | * | [0.18] | 0.24 |
| Nickel | [14] | * | [11] | * | [14] | 71 | [14] | [18] | [19] | | * | [23] | [20] |
| Potassium | * | * | * | * | * | * | * | * | * | | * | * | * |
| Silver | * | * | * | * | 10 | 10 | 20 | 10 | 10 | | * | 10 | 10 |
| Sodium | 14100 | 6440 | 10600 | 5660 | 10000 | 14100 | 9270 | 12400 | 14600 | | * | [2820] | 9020 |
| Thallium | * | [5.5] | * | [4.4] | * | * | * | * | * | | [2.8] | * | [11] |
| Vanadium | [13] | * | [6.8] | * | [5.7] | [18] | [11] | [13] | [13] | | * | [4.5] | 30 |
| Zinc | 148 | 26 | 43 | 31 | 73 | 29 | 95 | 42 | 48 | | 24 | 38 | * |
| Cyanide | * | * | * | * | * | * | * | * | * | | * | * | * |
| Phenols | * | * | * | * | * | * | * | * | * | | * | 54 | |

Notes: All concentrations reported in ug/L.

* Below Method Detection Limit.

[ ] Value less than detection limit specified in lab contract.

(b) Compound also appeared in analysis of blank

MGY 001 0640

ROUND ONE
POTABLE WELL SAMPLE
TENTATIVELY IDENTIFIED COMPOUNDS

| Block | 230001 | 29002 | 28001 | 29002 | 29002 | 23001 |
|---|---|---|---|---|---|---|
| Lot | 28 | 33 | 37 | 11 | 24 | 23 |
| Sample No. | 014 | 015 | 016 | 021 | 022 | 037 |
| *Ethane,1,1,2-Trichloro-1,2,2-Trifluoro | 10 | 12 | | 12 | | 4 |
| 2H-3,9A-Methano-1-Benzoxepin,Octahydro-2,2,5A,9-Tet | | | 12 | | | |
| 1,3-Cyclopentanedione, 2-Chloro- | | | | 40 | | |
| 3H-1,2-Dithiol-3-One, 4,5-Dimethyl- | | | | 22 | | |
| 1-Penten-3-One,1-(4-Chlorophenyl)- | | | | 15 | | |
| 1,3-Cyclopentanedione, 2-Chloro- | | | | 38 | | |
| 1H-Indol-4-OL,3-Methyl- | | | | 49 | | |
| 1-Penten-3-One,1-(4-Chlorophenyl)- | | | | 30 | | |
| 1,3,5,7-Cyclooctatetraene | | | | | 9 | |

* Described as possible laboratory contaminant.
Note: All concentrations in ppb; all concentrations are estimated.

j87-61

MGY 001 0641

# Appendix G

MGY 001 0642

# APPENDIX G
# SECOND ROUND ANALYSES



MGY 001 0643

MONITORING WELL ANALYSES - SECOND ROUND SAMPLING

| SAMPLING POINT | COMPUCHEM NUMBER | DATE | CHLOROFORM (ug/l) | 1,1-DICHLORO-ETHANE (ug/l) | METHYLENE CHLORIDE (ug/l) | TETRACHLORO-ETHENE (ug/l) | TRANS-1,2-DICHLORO-ETHENE (ug/l) | 1,1,1-TRI-CHLORO-ETHANE (ug/l) | TRICHLORO-ETHENE (ug/l) | ACETONE (ug/l) |
|---|---|---|---|---|---|---|---|---|---|---|
| MW-1S | 139675 | 07/01/87 | | | | | | | | |
| MW-1D | 139676 | 07/01/87 | | | | | | | | |
| MW-2S | 139759 | 07/01/87 | | | | | | | | |
| MW-2D | 139764 | 07/01/87 | | | 2.6 J | | 2.3 J | | 24 | |
| MW-3D | 140487 | 07/09/87 | | 2.6 J | 2.3 J B | 3.6 J | 8.1 | | 160 | 5.8 J |
| MW-3S | 141118 | 07/15/87 | | 2.8 J | 1 J B | 1.8 J | 3.8 J | | 85 | |
| MW-4D | 139924 | 07/06/87 | | 11 J | 15 J B | 15 J | 37 | | 590 | |
| MW-4D | 139925 | 07/06/87 | | 10 J | 12 J B | 15 J | 36 | | 630 | |
| MW-5D | 139669 | 06/30/87 | | | | | | | | |
| MW-6S | 139673 | 06/30/87 | | | | | | | | |
| MW-6D | 139672 | 06/30/87 | | | | | | | | |
| MW-7D | 140479 | 07/09/87 | 2.3 J | | 2.8 J B | 32 | 5.2 | | 180 | |
| MW-7D | 140483 | 07/09/87 | 2.2 J | | 2.2 J B | 32 | 5.3 | | 180 | |
| MW-7S | 140484 | 07/09/87 | 1.9 J | | 2.4 J B | 53 | 2.9 J | | 160 | |
| MW-9D | 139770 | 07/02/87 | | | | | | | 3.7 J | |
| MW-9S | 139769 | 07/02/87 | | | | | | | 6 | |
| MW-10S | 141117 | 07/1/87 | | | 2 J B | | | | | 6.6 J |
| MW-10D | 139674 | 07/15/87 | | | | | | | | |
| MW-11D | 140477 | 07/08/87 | | | 1.9 J B | | | | 2.7 J | |
| MW-11S | 140478 | 07/08/87 | | | 2.2 J B | | | | | |
| MW-13D | 139923 | 07/06/87 | | | 4.7 J B | | | | | 6.8 J |
| MW-13S | 140485 | 07/01/87 | | | 2.5 J B | | | | | |
| MW-14S | 139670 | 06/30/87 | | | 6.7 | | | | | |
| MW-14D | 139671 | 06/30/87 | | | | | | | | |
| MW-15D | 139928 | 07/06/87 | | | 4 J B | | | | | 6.2 J |
| MW-15S | 139927 | 07/06/87 | | | 4.3 J B | | | | | |
| MW-16 | 140473 | 07/08/87 | | | 3 J B | | | | | |
| MW-17 | 140476 | 07/08/87 | 2.5 J | | 4.3 J B | 7 J | 14 | | 300 | |
| MW-18 | 140475 | 07/08/87 | | 19 | 1.7 J B | | | 2 J | 2.3 J | |
| MW-19 | 140444 | 08/21/87 | | | 2 J B | | | | | 9.6 J |
| VILLAGE SH | 141119 | 07/15/87 | | 4.4 J | | | | | 3.1 J | 5.2 J |
| 1377-P | 140474 | 07/07/87 | | 2.2 J | 2.8 J B | 2.7 J | 19 | | 150 | |
| TRIP BLANK | 139683 | 06/29/87 | | | 5.3 | | | | | 6.9 J |
| TRIP BLANK | 139773 | 06/30/87 | | | 1.1 J | | | | | |
| TRIP BLANK | 139926 | 06/30/87 | | | 1.1 J B | | | | | |
| TRIP BLANK | 140450 | 07/07/87 | | | 3.2 J B | | | | | 4 J |
| TRIP BLANK | 141121 | 07/13/87 | | | 12 B | | | | | 8.8 J |
| TRIP BLANK | 148454 | 08/20/87 | | | 2.2 J B | | | | | |
| FIELD BLANK | 139772 | 07/02/87 | | | | | | | | |
| FIELD BLANK | 139771 | 07/01/87 | | | 1.2 J | | | | | |
| FIELD BLANK | 139667 | 07/01/87 | | | 2.4 J | | | | | |
| FIELD BLANK | 139690 | 06/30/87 | | | | | | | | |
| FIELD BLANK | 139929 | 07/06/87 | | | 3.7 J B | | | | | 4 J |
| FIELD BLANK | 140489 | 07/08/87 | | | 5 B | | | | | 5.2 J |
| FIELD BLANK | 140488 | 07/09/87 | | | 4.8 J B | | | | | 4.3 J |
| FIELD BLANK | 141120 | 07/15/87 | | | 7 B | | | | | 12 B |
| FIELD BLANK | 148446 | 08/21/87 | | | 1.5 J B | | | | | 120 B |

Note:

B analyte occurred in laboratory blank as well as sample.
J indicates an estimated value.

MGY 001 0644

Round Two
Monitoring Well Samples
Tentatively Identified Compounds

| Sampling Location | MW-3S | MW-4D | MW-4D | MW-7S | MW-7D | MW-7D | MW-15D | MW-16 | MW-17 | 1377-P |
|---|---|---|---|---|---|---|---|---|---|---|
| Sample No. | 141118 | 139924 | 139925 | 140484 | 140479 | 140483 | 139928 | 140473 | 140476 | 140474 |
| Ethane, 1,1,2-trichloro-1,2,2-trifluoro | 7 | 21 | 23 | 19 | 12 | 13 | | 130 | 17 | 4 |
| Ethane, 1,1,2-dicnloro-1,2,2-trifluoro | | | | | | | 8 | | | |
| Pentane, 2-methoxy-2,4,4-trimethyl | | | | | | | | 11 | | |

Note: All concentrations in ppb; all concentrations are estimated.

POTABLE WELL SAMPLE ANALYSES - SECOND ROUND

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| SAMPLING POINT | | 20/23001 | 28/4 | 37/29002 | 37/29002 | 5/29003 | 3/14 |
| (lot/block) | | | | | | | |
| COMPUCHEM NUMBER | | 129254 | 129256 | 129249 | 129252 | 129253 | 129255 |
| SAMPLING DATE | | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 |
| COMPOUND | MATRIX | WATER | WATER | WATER | WATER | WATER | WATER |
| 1,1-DICHLORDETHANE | ug/l | | 3.6 J | 4.7 | 4.6 | | |
| 1,1-DICHLORDETHENE | ug/l | | 44 | | | | |
| METHYLENE CHLORIDE | ug/l | 1.3 | | 2.6 | 18.1 | 1.2 | |
| TETRACHLORDETHENE | ug/l | | 15 | | | | |
| TRANS-1,2-DICHLORDETHENE | ug/l | 1.4 | 8.7 | 1 | 1 | | |
| 1,1,1-TRICHLORDETHANE | ug/l | | 37 | | | | |
| TRICHLORDETHENE | ug/l | 1.4 | 110 | 14.4 | 14.6 | 3.6 | |
| ACETONE | ug/l | | | 8 | | | |

Note:

All samples analyzed for volatile organics.

J indicates an estimated value.

Round Two
Potable Well Samples
Tentatively Identified Compounds

| Sampling Location (lot/block) | 37/29002 | 37/29002 |
|---|---|---|
| Sample No. | 129249 | 129252 |
| Ethane, 1,1,2-trichloro-1,2,2-trifluoro- | 3ppb | 3ppb |

Note: Concentrations are estimated.

VOLATILE & SEMIVOLATILE ORGANIC ANALYSES FOR SOURCE BORINGS

| SAMPLING POINT | DEPTH | COMPUCHEM NUMBER | DATE | CHLOROFORM (ug/kg) | BROMOMETHANE (ug/kg) | METHYLENE CHLORIDE (ug/kg) | TOLUENE (ug/kg) | ACETONE (ug/kg) | 2-BUTANONE (ug/kg) | XYLENES (TOTAL) (ug/g) | BIS (2-ETHYLHEXYL) PHTHALATE (ug/kg) | DI-N-BUTYL-PHTHALATE (ug/kg) | 4,6-DINITRO-2-METHYLPHENOL (ug/kg) | 2,4-DINITRO-PHENOL (ug/kg) | BENZOIC ACID (ug/kg) | PCB-1248 (ug/kg) | PHENOLS (mg/kg) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB1 | 4-6' | 136258 | 06/03/87 | | | 13 B | | 46 B | | | | | | | | | |
| SB1 | 14-16' | 136269 | 06/03/87 | | | 12 B | | 250 B | | | | 81 J | | | | | |
| SB1 | 14-16' | 136272 | 06/03/87 | 7.3 | | 32 | | 320 | | | | | | | | | |
| SB2 | 10-12' | 136563 | 06/04/87 | | | 18 B | | 43 B | | | | | | | | | |
| SB2 | 18-20' | 136584 | 06/04/87 | | | 71 B | 15 J | 2100 B | | | | | | | | | |
| SB3 | 2-4' | 136559 | 06/05/87 | | | | | | | 62000 | 1400 | | 3000 J | 1200 J | 860 J | 73000 C | 2.6 |
| SB3 | 6-8' | 136557 | 06/05/87 | | | | 180 J | | | 25000 | | | | | | | |
| SB3 | 6-8' | 136552 | 06/05/87 | | | | | | | 250000 | | | | | | | |
| SB4 | 14-16' | 136249 | 06/02/87 | 3.6 J | | 15 B | | 77 B | | | | | | | | | |
| SB4 | 4-6' | 136248 | 06/02/87 | | | 16 B | | 77 B | | | | | | | | | |
| SB5 | 16-18' | 136255 | 06/02/87 | | | 18 B | | 15 B | | | 120 J | | | | | | |
| SB5 | 8-10' | 136244 | 06/02/87 | | | 89 B | | 5000 B | | | | | | | | | |
| SB6 | 12-14' | 136858 | 06/08/87 | | | 6.1 B | | 15 B | | | | | | | | | |
| SB6 | 2-4' | 136868 | 06/08/87 | | | 7.5 B | | 12 B | | | 120 J | | | | | | |
| SB7 | 11-12' | 136855 | 06/08/87 | | | 8.2 B | | 9.4 J B | | | | | | | | | |
| SB7 | 4-6' | 136866 | 06/08/87 | | | 5.9 B | | 10 B | | | | | | | | | |
| SB8 | 2-4' | 136853 | 06/08/87 | | | 6.3 B | | 9.2 J B | | | | | | | | | |
| SB8 | 6-8' | 136854 | 06/08/87 | | | 9.1 B | | 14 B | | | | | | | | | |
| SB9 | 12-14' | 136856 | 06/08/87 | | | 6.6 B | | 27 B | | | | | | | | | |
| SB9 | 18-20' | 136857 | 06/08/87 | | | 9.4 B | | 30 B | | | | | | | | | |
| SB10 | 14-16' | 136860 | 06/09/87 | | | 11 B | | 21 B | | | | | | | | | |
| SB10 | 9-10' | 136859 | 06/09/87 | | 1.3 J | 18 B | | 36 B | | | | | | | | | |
| SB11 | 12-14' | 137301 | 06/10/87 | 4.6 J | | 90 B | 1.5 J | 84 B | | | 53 J | | | | | | |
| SB11 | 2-4' | 137292 | 06/10/87 | | | 15 B | 1.6 J | 50 B | 4.5 J | | | | | | | | |
| SB12 | 10-12' | 137304 | 06/10/87 | | | 52 B | | 95 B | 2.8 J | | 52 J | | | | | | |
| SB12 | 6-8' | 137293 | 06/10/87 | 8.4 J | | 32 B | | 130 B | | | | | | | | | |
| SB13 | 14-16' | 137283 | 06/11/87 | | | 30 B | | 79 B | | | | | | | | | |
| SB13 | 4-6' | 137276 | 06/11/87 | | | 18 B | | 43 | | | | | | | | | |
| SB13 | 4-6' | 137277 | 06/11/87 | | | 15 B | | 19 B | | | | | | | | | |
| SB15 | 10-12' | 137694 | 06/16/87 | | | 18 B | | 11 J B | | | | | | | | | |
| SB15 | 8-10' | 137696 | 06/16/87 | | | 13 B | | 23 B | | | | | | | | | |
| SB16 | 16-18' | 137702 | 06/15/87 | 1.7 J | | 23 B | | 74 B | | | | | | | | | |
| SB16 | 18-20' | 137697 | 06/15/87 | | | 16 B | | 13 B | | | | | | | | | |
| SB16 | 18-20' | 137698 | 06/15/87 | | | 19 B | | 17 B | | | | | | | | | |
| SB17 | 2-4' | 136550 | 06/05/87 | | | 8.4 B | | 130 B | | | | | | | | | |
| SB17 | 8-10' | 136545 | 06/05/87 | | | 37 B | | 42 B | | | | | | | | | |
| SB18 | 16-18' | 137280 | 06/11/87 | | | 16 B | | 26 | | | | | | | | | |
| SB18 | 6-8' | 137279 | 06/11/87 | | | 15 B | | 22 | | | | | | | | | |
| SB19 | 2-4' | 136553 | 06/05/87 | | | 12 B | | 6.8 J B | | | | | | | | | |
| SB19 | 8-10' | 136551 | 06/05/87 | | | 29 B | | 100 B | | | | | | | | | |
| SB21 | 2-4' | 137286 | 06/11/87 | | | 25 B | | 140 B | | | | | | | | | |
| SB21 | 4-6' | 137275 | 06/11/87 | | | 16 B | 1.5 J | 13 B | | | | | | | | | |
| SB22 | 2-4' | 137295 | 06/10/87 | | | 13 B | | 23 B | | | | | | | | | |
| SB22 | 4-6' | 137294 | 06/10/87 | | | 25 B | | 120 B | | | | | | | | | |

Note:

B analyte occurred in laboratory blank as well as sample.
J indicates an estimated value.
C identification confirmed by GC/MS

0648 001 MGY

NTB0006

VOLATILE & SEMIVOLATILE ORGANIC ANALYSES FOR SOURCE BORINGS (cont.)

| SAMPLING POINT | DEPTH | COMPUCHEM NUMBER | DATE | UNITS | BENZENE | CHLOROFORM | METHYLENE CHLORIDE | TOLUENE | 1,1,1-TRI-CHLOROETHANE | ACETONE |
|---|---|---|---|---|---|---|---|---|---|---|
| SF1 | 10-12' | 137699 | 06/15/87 | UG/KG | | | 13 B | | | 29 B |
| SF2 | 8-10' | 137281 | 06/12/87 | UG/KG | | | 18 B | | | 18 |
| SF3 | 4-6' | 137282 | 06/12/87 | UG/KG | | | 15 B | | | 8.8 J B |
| SF4 | 2-4' | 137695 | 06/16/87 | UG/KG | | | 15 | | | |
| SF6 | 10-12' | 136242 | 06/01/87 | UG/G | | | | | | 2400 |
| SF7 | 8-10' | 137701 | 06/15/87 | UG/KG | | | 16 B | | | 14 B |
| SF8B | 11-13' | 137291 | 06/10/87 | UG/KG | | | 14 B | | | 23 B |
| SF9 | 10-12' | 137700 | 06/15/87 | UG/KG | | | 14 B | | | 31 B |
| SF10 | 6-8' | 137693 | 06/15/87 | UG/KG | | 3.2 J | 40 B | | | 41 B |
| SF11 | 4-6' | 137278 | 06/11/87 | UG/KG | | | 130 B | | | 600 B |
| SF12 | 4-6' | 136251 | 06/03/87 | UG/KG | 2 J B | | 13 B | | | 15 B |
| SF13 | 6-8' | 136252 | 06/03/87 | UG/KG | 2.4 J B | | 18 B | | 1.3 J | 38 B |
| SF14 | 8-10' | 137300 | 06/09/87 | UG/KG | | 5.6 J | 37 B | | | 170 B |
| TRIP BLA | - | 136275 | 05/30/87 | UG/L | | | 5.6 B | | | 5.9 J |
| FIELD BL | - | 136276 | 06/01/87 | UG/L | | | 6.3 B | | | 7.4 J |
| FIELD BL | - | 136277 | 06/02/87 | UG/L | | | 8.6 J B | | | 510 |
| FIELD BL | - | 136278 | 06/03/87 | UG/L | | | | | | 14000 B |
| TRIP BLA | - | 136544 | 06/01/87 | UG/L | | | 3.1 J | | | 13 B |
| FIELD BL | - | 136539 | 06/04/87 | UG/L | | | 54 B | | | 1700 B |
| FIELD BL | - | 136540 | 06/05/87 | UG/L | | | 22 B | | | 13 B |
| TRIP BLA | - | 136850 | 06/03/87 | UG/L | | | | | | |
| FIELD BL | - | 136851 | 06/08/87 | UG/L | | 1.1 J | 32 B | 2.5 J | | 140 B |
| FIELD BL | - | 136852 | 06/09/87 | UG/L | | 1.3 J | 45 B | | | 39 B |
| TRIP BLA | - | 137289 | 06/06/87 | UG/L | | | | | | |
| FIELD BL | - | 137290 | 06/10/87 | UG/L | | | 18 B | | | 27 B |
| TRIP BLA | - | 137269 | 06/09/87 | UG/L | | | | | | 5 J B |
| FIELD BL | - | 137273 | 06/11/87 | UG/L | | 28 | 200 | | | 350 |
| FIELD BL | - | 137274 | 06/12/87 | UG/L | | | 40 B | | | 53 |
| TRIP BLA | - | 137687 | 06/12/87 | UG/L | | | | | | |
| FIELD BL | - | 137685 | 06/16/87 | UG/L | | 6.8 | 41 B | | | 29 B |
| FIELD BL | - | 137686 | 06/15/87 | UG/L | | 3.8 J | 21 B | | | 13 B |

Note:

B analyte occurred in laboratory blank as well as sample.

J indicates an estimated value.

SOURCE BORINGS - INORGANIC ANALYSES

| SAMPLING POINT | SB1 | SB1 | SB2 | SB3 | SB5 | SB6 | SB7 | SB11 | SB12 | SB13 | SB16 | SB21 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEPTH | 14-16' | 14-16' | 10-12' | 2-4' | 16-18' | 2-4' | 4-6' | 12-14' | 10-12' | 14-16' | 16-18' | 2-4' |
| COMPUCHEM NUMBER | 136270 | 136273 | 136564 | 136561 | 136255 | 136869 | 136866 | 137302 | 137305 | 137284 | 137703 | 137287 |
| SAMPLING DATE | 06/03/87 | 06/03/87 | 06/04/87 | 06/05/87 | 06/02/87 | 06/08/87 | 06/08/87 | 06/10/87 | 06/10/87 | 06/11/87 | 06/15/87 | 06/11/87 |
| MPOUND UNITS | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG | MG/KG |
| SENIC | 4.1 NF | 3.4 NF | 3 N F | 4 NF | 22 | | 4 N F | 2.8 N F | 2.9 N F | 4.8 N F | 1.4 NF | 4.2 N F |
| RYLLIUM | 0.87 E | 0.78 E | 0.47 | | 3.8 E | 0.56 | 1.4 | 0.64 | 1.1 | 0.92 | 0.25 | 2 |
| RONIUM | 5 | 7.2 | 3.8 | 22 | 56 | 9.5 | 12 | 2.9 | 3 | 3.8 | 5.3 | 31 |
| PPER | 3.9 | 4.2 | 6.4 E | 26 E | 1120 | 9.9 E | 7.5 E | 8.5 E | 9.3 E | 5.1 E | 14 E | 6.2 E |
| AD | 11 N*F | 9.1 N*F | 11 N*F | 18 N*F | 13 N*F | 13 N*F | 9.9 N*F | 8.6 N*F | 7.6 N*F | 13 N*F | 4.1 N*F | 5.7 N*F |
| RCURY | | | | | | | | | | | 3.7 CV | |
| CKEL | 10 | 11 | 17 | | 37 | 11 | 25 | | | 11 | 5.9 | 30 |
| NC | 101 | 114 | 37 E | 29 E | 312 | 40 E | 104 E | 38 E | 22 E | 40 E | 20 E | 78 E |
| RIUM | 67 | 62 | 161 | 87 | 371 | 55 | 64 | 37 | 35 | 162 | 15 | 90 |
| ON | 5250 | 7460 | 6150 | 21000 | 41400 | 9690 | 6970 | 14600 | 16800 | 7220 | 6770 | 14100 |
| NGANESE | 392 | 302 | 1860 | 70 | 1680 | 551 | 181 | 256 | 158 | 2620 | 119 | 450 |
| NADIUM | 10 E | 12 E | 10 E | 31 E | 86 E | 15 E | 11 E | 11 E | 13 E | 10 E | 11 E | 44 E |
| UMINUM | 13100 | 17100 | 9280 | 5010 | 26200 | 8320 | 9190 | 14500 | 10900 | 9590 | 2970 | 14300 |
| BALT | 21 E | 14 E | 14 E | | 16 E | 9 E | 10 E | 8.7 E | 11 E | 24 | 2.1 E | 21 E |
| GNESIUM | 2380 | 2970 | 1500 E | 383 E | 24100 | 2120 E | 5120 E | 1050 E | 532 E | 1310 E | 985 E | 16000 E |
| LCIUM | 911 | 841 | 751 | 338 | 4030 | 1100 | 1040 | 823 | 1620 | 745 | 574 | 1380 |
| DIUM | | | | | 1160 | | 520 | 582 | 601 | | 590 | 782 |
| TASSIUM | 639 | 1040 | | | 642 | | 918 | 656 | 721 | | | 4010 |
| ANIDE | | | | 3.8 | | | | | | | | |

te:

N indicates spike sample recovery is not within control limits.
F indicates analytical method used was atomic absorption furnace technique.
E diluted values not within 10% of the original value.
* indicates duplicate analysis is not within control limits.
CV indicates analytical method used was cold vapor technique.

MTRHBOR5

MGY 001 0650

Source Boring Samples
Tentatively Identified Compounds

| Sampling Location | SF14-8-10' | SB2-10-12' | SB3-2-4' | SB-15-16-18' | SB10-9-10' | SB12-10-12' | SB15-10-12' | SB19-8-10' |
|---|---|---|---|---|---|---|---|---|
| Sample No. | | | | | | | | |
| 2-Propanamine | 26 | | | | | | | |
| Benzene, 1,2-dimethyl- | | 260 | | | | | | |
| Cyclopentane, 1-ethenyl-3-methylene | | | 160000 | | | | | |
| Benzene, (1-methylethyl)- | | | 9000 | | | | | |
| Benzene, 1,2-diethyl-4,5-dimethyl- | | | 12000 | | | | | |
| Benzene, 1-methyl-2-nitro | | | 12000 | | | | | |
| 1,1'-biphenyl, 3,3,4,4'-tetramethyl- | | | 3900 | | | | | |
| Ethane, 1-(o-ethylphenyl)-1-phenyl- | | | 14000 | | | | | |
| Methanone, (dimethylphenyl)phenyl- | | | 26000 | | | | | |
| Ethane, 1-(2,3-xylylx)-1-(3,4-xylyl)- | | | 350000 | 300 | | | | |
| Benzene, 4-(2-butenyl)-1,2-dimethyl-, (E)- | | | 20000 | | | | | |
| Ethane, 1,1-bis(p-ethylphenyl)- | | | 11000 | | | | | |
| Securinan-11-one | | | 200000 | | | | | |
| Methanone, (3-methyl-3-phenyloxiranyl)phenyl-, cis- | | | 16000 | | | | | |
| Benzene, 1,1'-(1,3-butadiene-1,4-diyl)bis- | | | 170000 | | | | | |
| 1-Propanone, 2-chloro-1-(2,4-dimethylphenyl)-2-methy | | | 27000 | | | | | |
| Benzenamine, n,n'-1,2- | | | 20000 | | | | | |

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| | | | | | |
|---|---|---|---|---|---|
| 4(3H)-quinazolinone,3-(2-ethylphenyl)-2-methyl- | 13000 | | | | |
| Benzene,1,4-bis(1-(dimethylphenyl)ethyl)dimethyl- | 17000 | 180 | | | |
| 1-propanone,2-chloro-1-(2,4-dimethylphenyl)-2-methy | 13000 | | | | |
| Ethane,1,1,2-trichloro-1,2,2-trifluoro- | | 11 | | | |
| Sulfur,Mol. (S8) | | | 640 | | |
| Methyl-silane | | | | 21 | |
| Methane,trichlorofluoro- | | | | 8 | |
| Hexane | | | | | 6 |

Note: All concentrations in ppb; all concentrations are estimated.

STREAM SEDIMENT SAMPLE ANALYSES

| SAMPLING POINT | SW-1 | SW-2 | SW-3 | SW-4 | SW-5 | SW-1dup | FIELD BLANK | TRIP BLANK |
|---|---|---|---|---|---|---|---|---|
| COMPUCHEM NUMBER | 129259 | 129264 | 129265 | 129267 | 129269 | 129270 | 129257 | 129258 |
| SAMPLING DATE | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 |
| UNITS | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/kg | ug/l | ug/l |
| COMPOUND / MATRIX | SOIL | SOIL | SOIL | SOIL | SOIL | SOIL | WATER | WATER |
| METHYLENE CHLORIDE | 18 B | 15 B | 110 B | 25 B | 6.6 B | 18 B | | 2.5 JB |
| TOLUENE | | | | 2.4 J | | | | |
| TRICHLOROETHENE | | | | | | | 1 J | |
| ACETONE | 32 B | 7.4 JB | 130 B | 76 B | 14 B | 23 B | | |
| 2-BUTANONE | | | | 19 | | | | |

Note:

All samples analyzed for volatile organics.

B analyte was found in laboratory blank as well as sample.

J indicates an estimated value.

## STREAM WATER ANALYSES

| SAMPLING POINT | SW-1 | SW-1dup | SW-2 | SW-3 | SW-4 | SW-5 | Field Blank | Trip Blank |
|---|---|---|---|---|---|---|---|---|
| COMPUCHEM NUMBER | 129245 | 129248 | 129242<br>129240 | 129222<br>129210 | 129233<br>129231 | 129239<br>129237 | 129230<br>129228 | 129236 |
| SAMPLING DATE | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 | 04/22/87 |
| UNITS | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l |
| COMPOUND / MATRIX | WATER | WATER | WATER | WATER | WATER | WATER | WATER | WATER |
| ARSENIC | | 4 F | | | | | | |
| BERYLLIUM | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 1.8 |
| COPPER | 14 E | 21 E | 20 E | 30 E | 16 E | 19 E | 19 E | 5.3 E |
| NICKEL | | | | | 21 | | | |
| SELENIUM | | | | | | | 2.9 F | |
| ZINC | 26 E | 38 E | 28 E | 32 E | 27 E | 26 E | 29 E | 12 E |
| BARIUM | 15 | 33 | 15 | 40 | 42 | 43 | | |
| IRON | 484 | 905 | 657 | 660 | 762 | 733 | | 6.9 |
| MANGANESE | 56 E | 201 E | 54 E | 92 E | 90 E | 85 E | | |
| VANADIUM | 7 | 9.6 | 6.7 | 3.7 | 4.4 | 4.9 | | |
| ALUMINUM | 107 | 213 | 269 | 162 | 215 | 191 | | |
| COBALT | 12 | 15 | 12 | 8.5 | 9.6 | 11 | 8.8 | 7.8 |
| MAGNESIUM | 5700 E | 4670 E | 5150 E | 4500 E | 4600 E | 4630 E | 219 E | |
| CALCIUM | 15400 | 9260 | 13800 | 11100 | 10900 | 11000 | 67 | |
| SODIUM | 15900 | 17200 | 13900 | 16300 | 15300 | 14700 | 3510 | 2470 |
| METHYLENE CHLORIDE | | | 1.6 JB | 2 J | 2 JB | 1.9 JB | 9.4 | |
| ACETONE | | | | | | | 12 | |

Note:

All samples were analyzed for priority pollutants plus 40 additional peaks.

E diluted values not within 10% of the original value.

J indicates an estimated value.

B analyte was found in laboratory blank as well as sample.

F indicates analytical method used was atomic absorption furnace technique.

## SEPTIC TANK ANALYSES

| SAMPLING POINT | Tank 1 | Tank 2 | Tank 2 dup | Tank 3 | Tank 4 | Tank 5 | Tank 6 | Tank 7 | TRIP BLANK | FIELD BLANK |
|---|---|---|---|---|---|---|---|---|---|---|
| COMPUCHEM NUMBER | 138688 | 138689 | 138693 | 138695 | 138696 | 138697 | 138698 | 138699 | 138701 | 138700 |
| SAMPLING DATE | 06/23/87 | 06/23/87 | 06/23/87 | 06/23/87 | 06/23/87 | 06/23/87 | 06/23/87 | 06/23/87 | 06/20/87 | 06/23/87 |
| COMPOUND / UNITS | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l | ug/l |
| CHLOROFORM | 2 J | 23 | 21 | | | 16 J | 13 | | | |
| BROMODICHLOROMETHANE | | | | | | | 2 J | | | |
| ETHYLBENZENE | | | | | 32 | 8 J | | | | |
| METHYLENE CHLORIDE | | 6.9 | 6.2 | | 170 | 64 | 5.4 | | 2.7 J | |
| TOLUENE | | | | 180 | 680 | 840 | 8.4 | 440 | | |
| 1,1,1-TRICHLOROETHANE | 1.6 J | | | | | | | | | |
| ACETONE | | 86 | 92 | | 97 | 260 | 23 | 4600 | | |
| 2-BUTANONE | | | | | 600 | | | | | |

Note:

All samples analyzed for volatile organics.

J indicates an estimated value.

Septic Tank Samples-
Tentatively Identified Compounds

| Sampling Location | Tank 1 | Tank 2 | Tank 2 | Tank 3 | Tank 4 | Tank 5 | Tank 6 |
|---|---|---|---|---|---|---|---|
| Sample No. | 138688 | 138689 | 138693 | 138695 | 138696 | 138697 | 138698 |
| Methane, thiobis- | 10 | 16 | 14 | | | | |
| Methanethiol | | 36 | 32 | 120 | | 260 | 36 |
| Disulfide, dimethyl- | | | | 6 | | | |
| Silane, methyl- | | | | | 7 | | |
| 4-Carene, (1S, 3S, 6R)-(-)- | | | | | 14 | | |
| 2 Oxyabicyclo [2.2.2] Octane, 1,3,3-trimethyl- | | | | | | 58 | |

Note: All concentrations in ppb; all concentrations are estimated.

MGY 001 0656

# Appendix H

MGY 001 0657

# APPENDIX H
# AQUIFER TEST DATA



MGY 001 0658

TABLE H-1
THEIS SOLUTIONS TO PUMPING TEST DATA

| Well | Description | Log s | Log t | s (ft) | t (min) | T (gpd/ft) | r (ft) | S |
|---|---|---|---|---|---|---|---|---|
| Pumping Well | Recovery | .60 | 1.33 | 3.98 | 21.38 | 7,141 | NA | NA |
| MW-9D | Drawdown | .65 | .58 | 4.43 | 3.80 | 6,416 | 200 | .032 |
| MW-9D | Recovery | .59 | 1.63 | 3.87 | 42.66 | 7,344 | 200 | .415 |
| MW-10D | Drawdown | .58 | .88 | 3.80 | 7.59 | 7,479 | 650 | .007 |
| MW-10D | Recovery | .56 | 1.60 | 3.63 | 39.81 | 7,829 | 650 | .039 |

Notes:

1. All match points used u = .1, W(u) = 1.0

2. Drawdown data from the pumping well, and drawdown and recovery data from 7D, 11D and 15D were not analyzed because the data plots could not be matched to the Theis type curve.

IBM-133TH

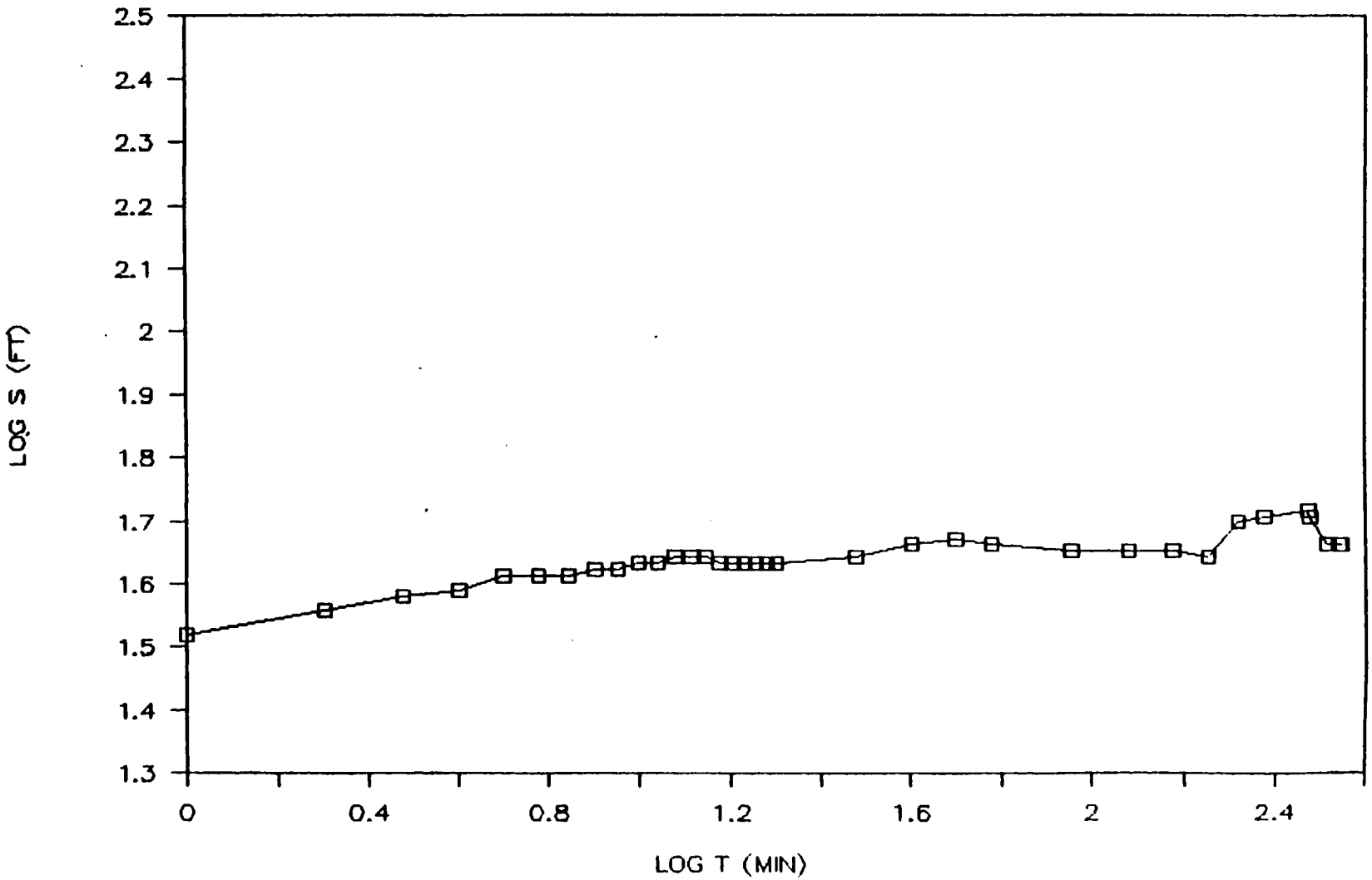
TABLE H-2
JACOB SOLUTIONS TO PUMPING TEST DATA

| Well | Description | r (ft) | t (min) | T (gpd/ft) | S |
|---|---|---|---|---|---|
| Pumping Well | Drawdown | 0 | | $8.9 \times 10^3$ | |
| Pumping Well | Recovery | 0 | | $8.1 \times 10^3$ | |
| MW-9D | Drawdown | 200 | 0.40 | $7.3 \times 10^3$ | $1.5 \times 10^{-5}$ |
| MW-9D | Recovery | 200 | | $8.1 \times 10^3$ | |
| MW-10D | Drawdown | 650 | 0.88 | $8.5 \times 10^3$ | $0.4 \times 10^{-5}$ |
| MW-10D | Recovery | 650 | | $9.4 \times 10^3$ | |

IBM-133TD

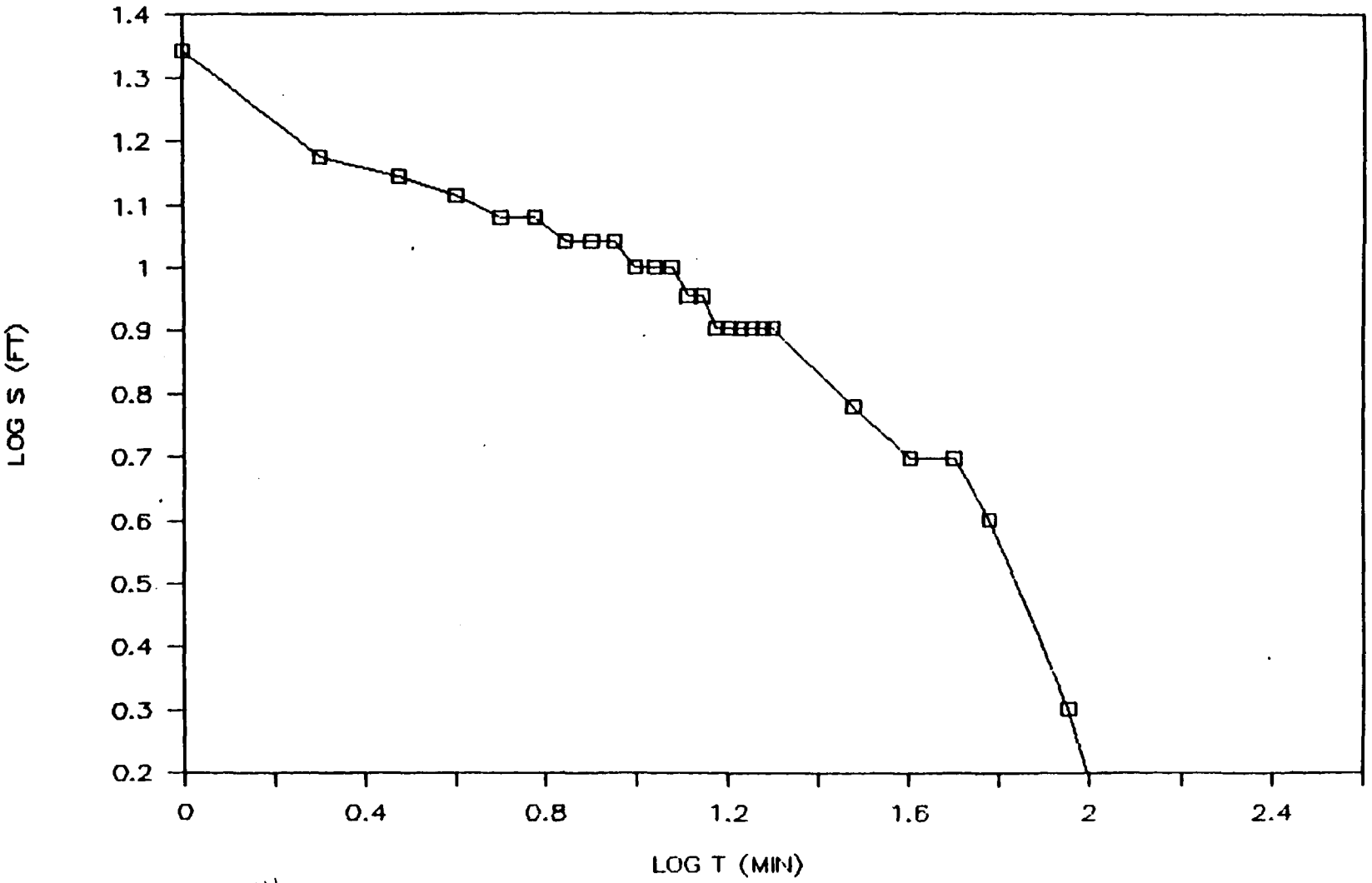
MGY 001 0660

# PUMPING WELL. DRAWDOWN



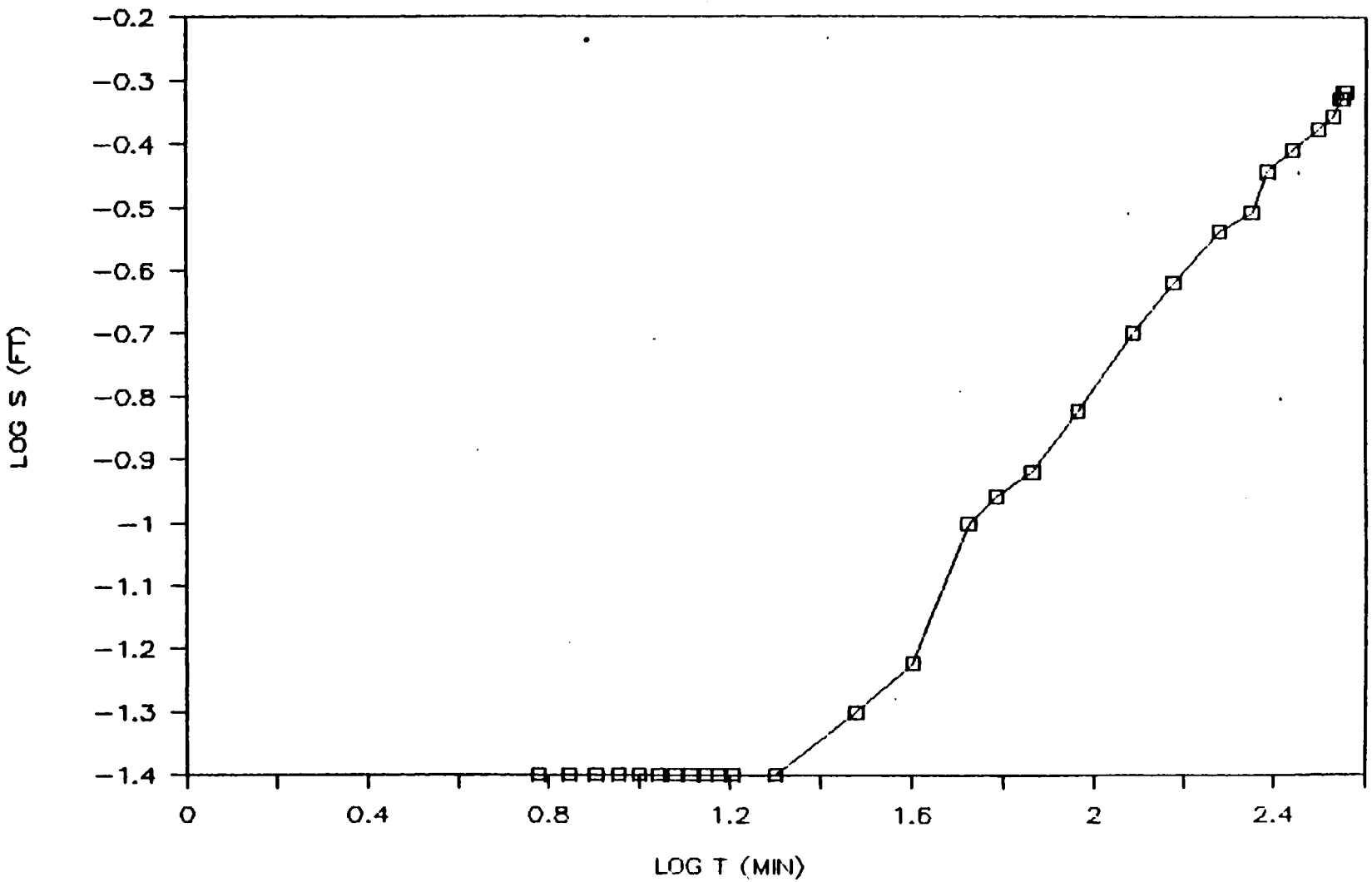

MGY 001 0661

# PUMPING WELL, RECOVERY

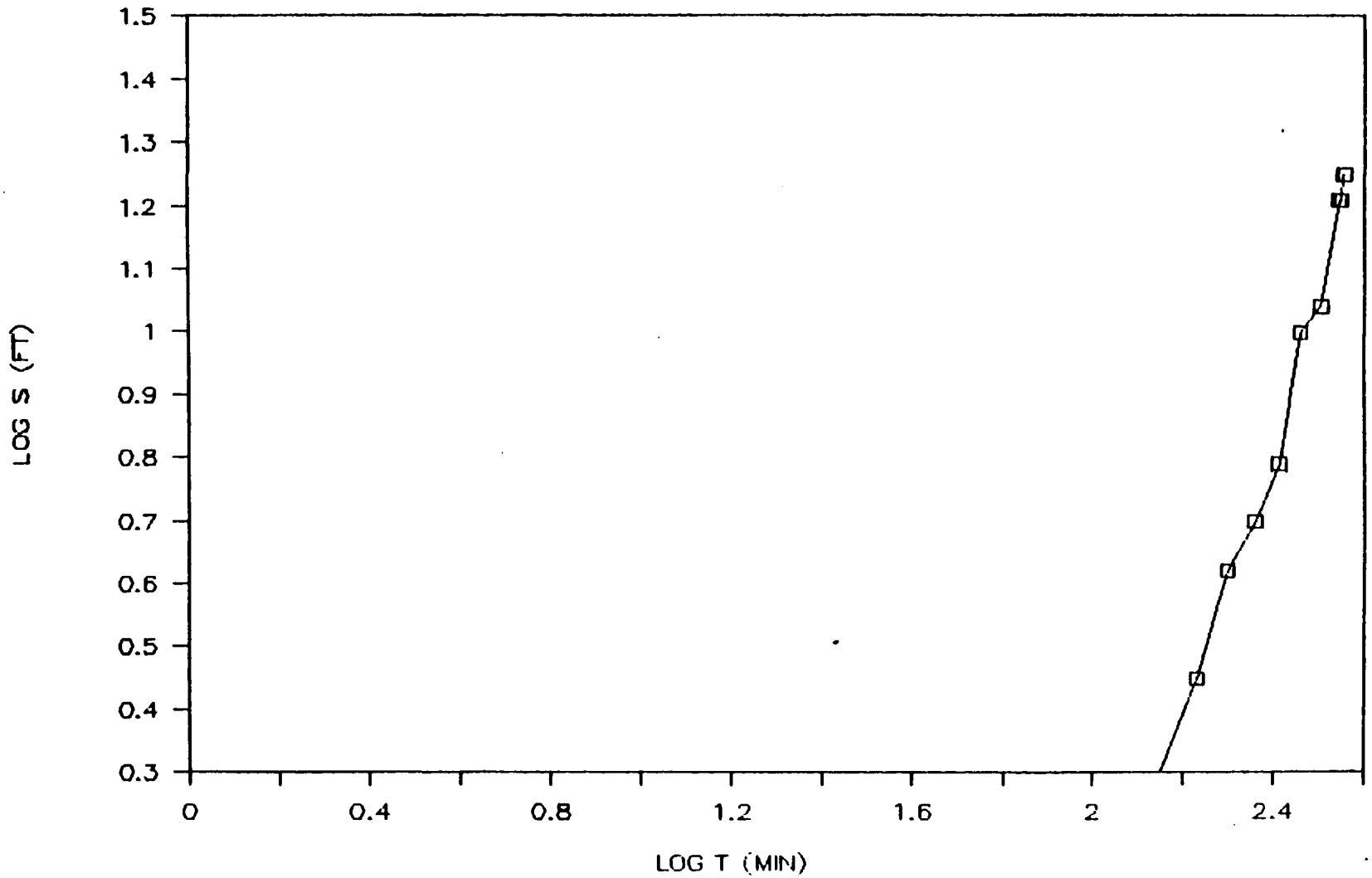



MGY 001 0662

# WELL 7D. DRAWDOWN

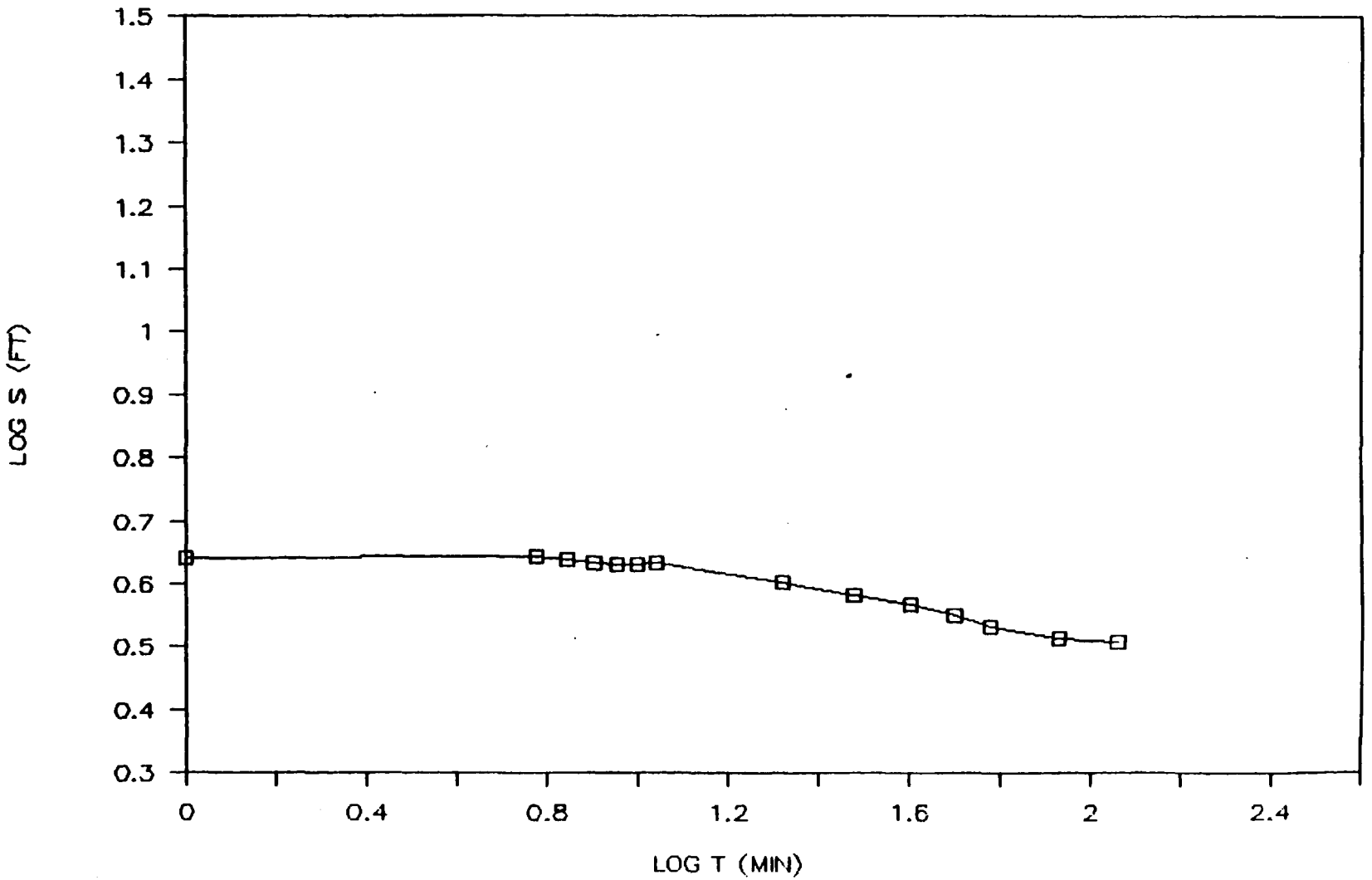


# WELL 15D. DRAWDOWN



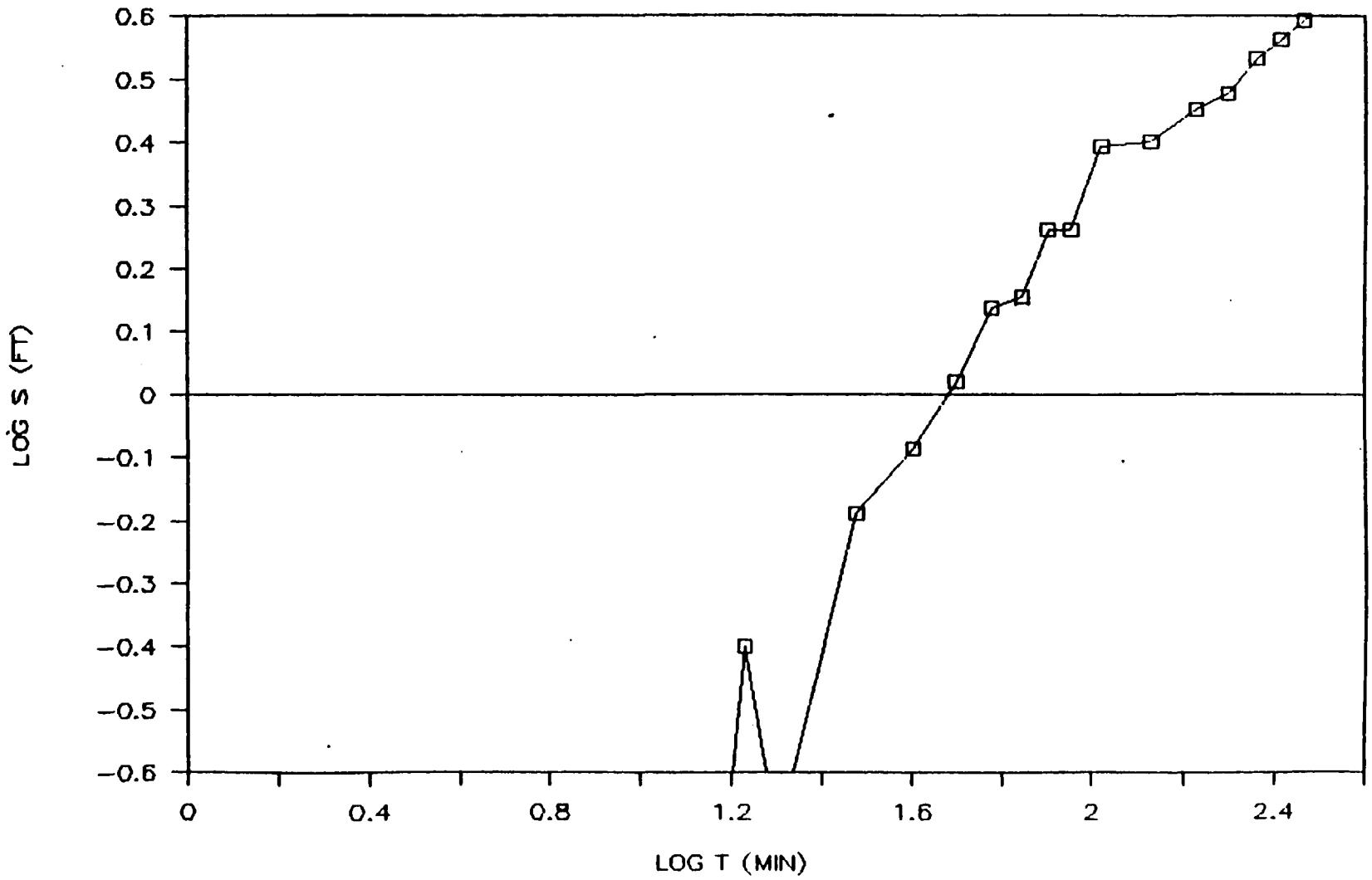

MGY 001 0664

# WELL 11D. RECOVERY

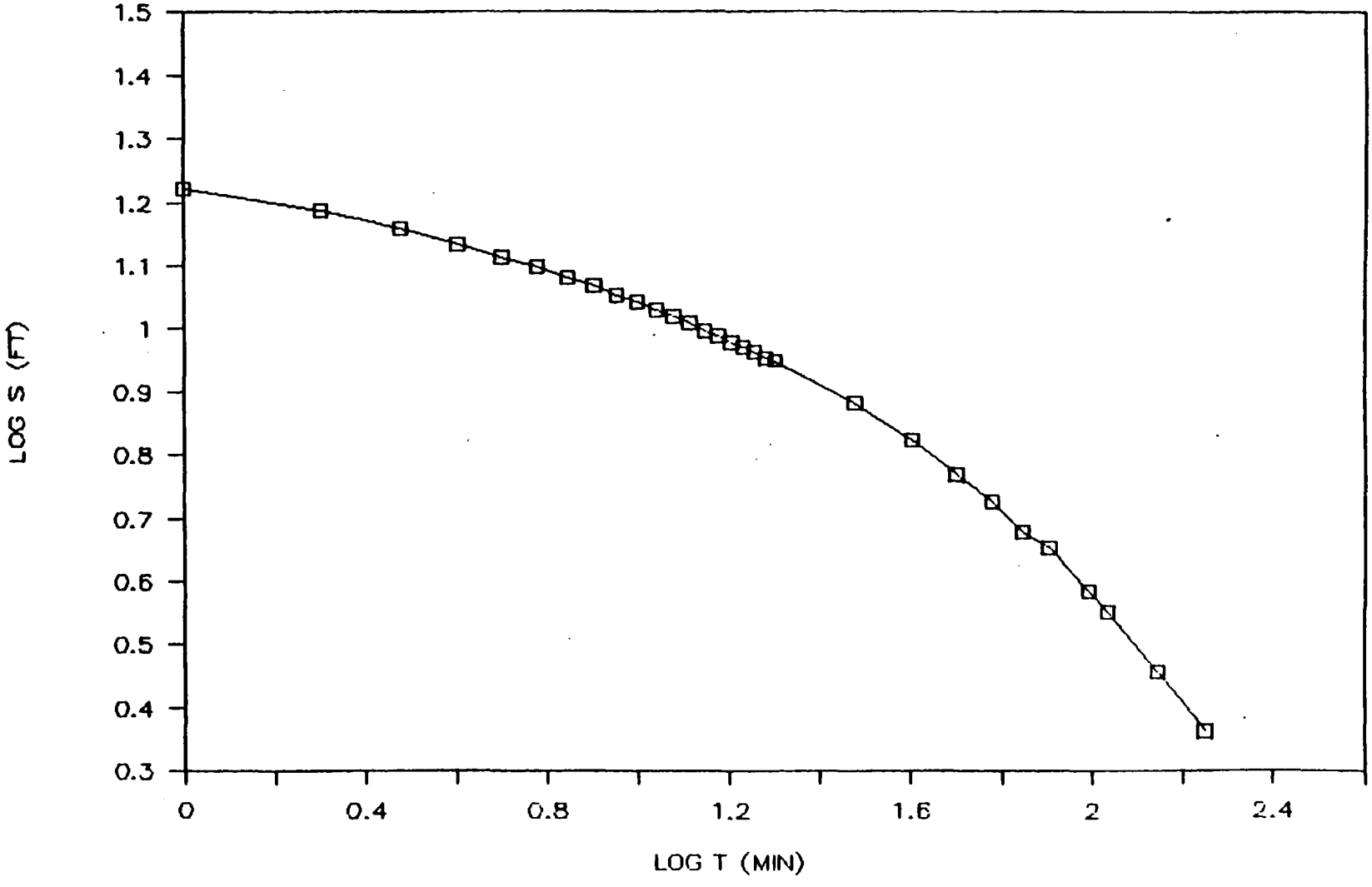



MGY 001 0665

# WELL 11D. DRAWDOWN

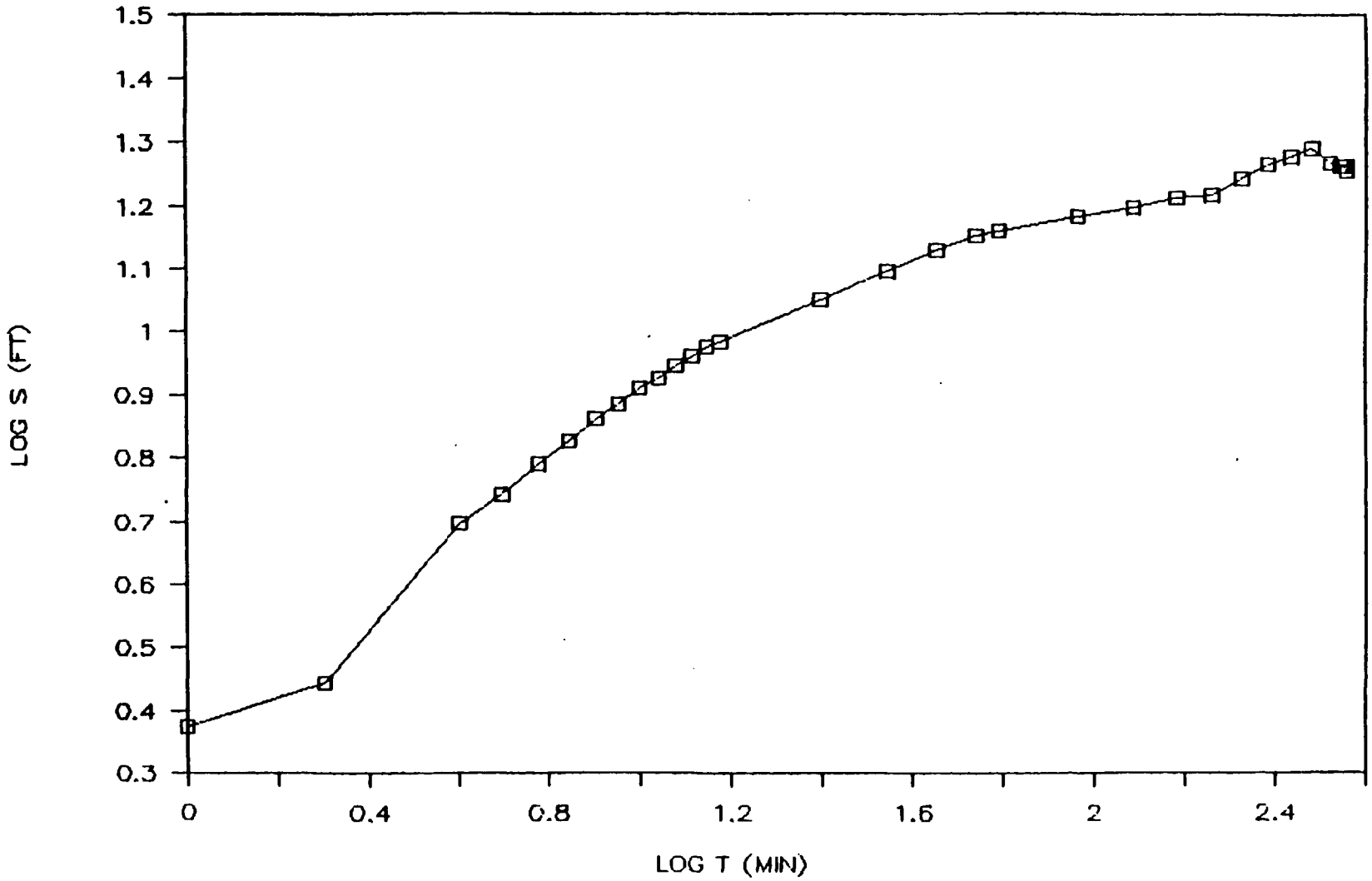


# WELL 10D, RECOVERY

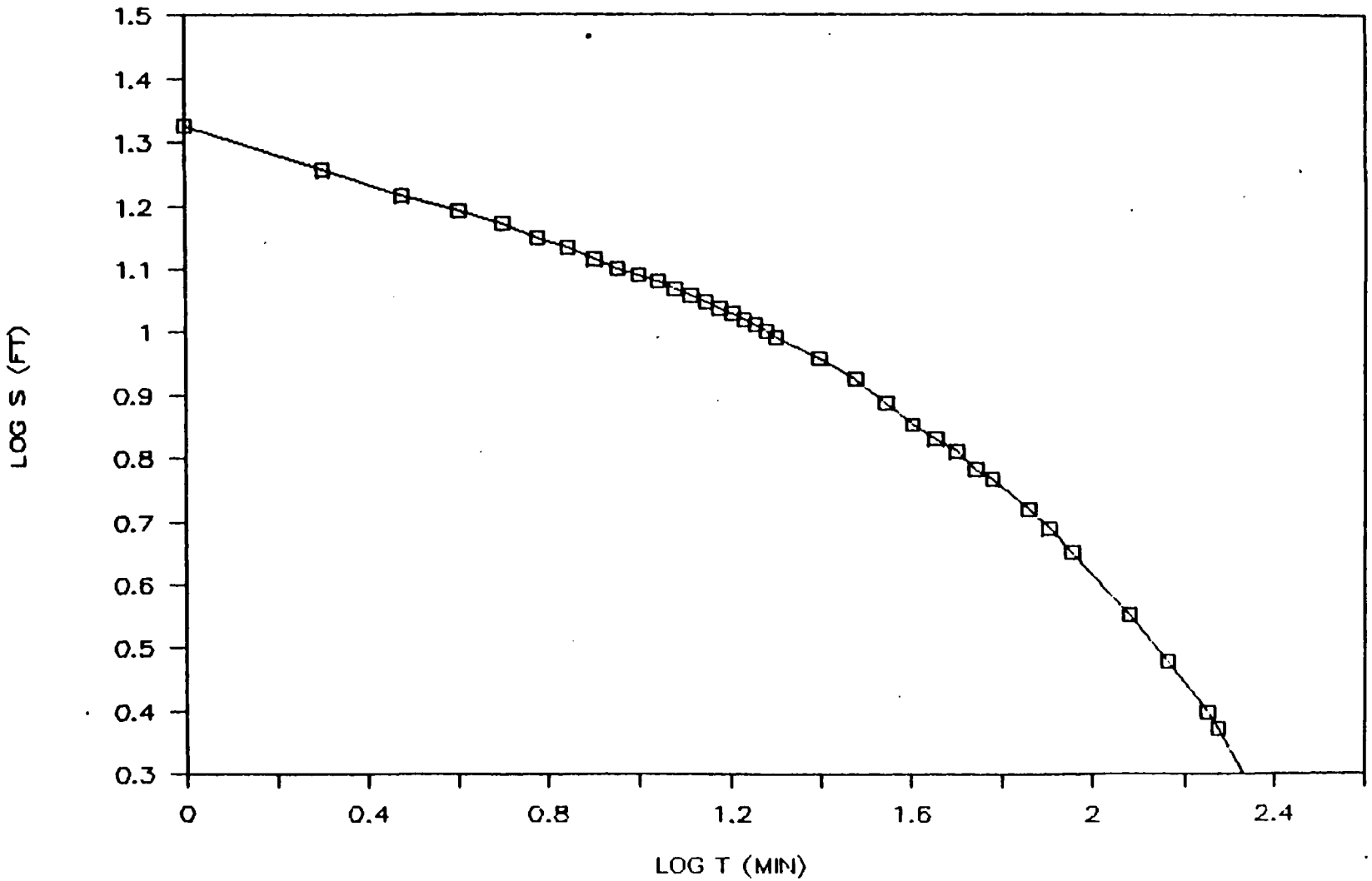



MGY 001 0667

# WELL 10D. DRAWDOWN

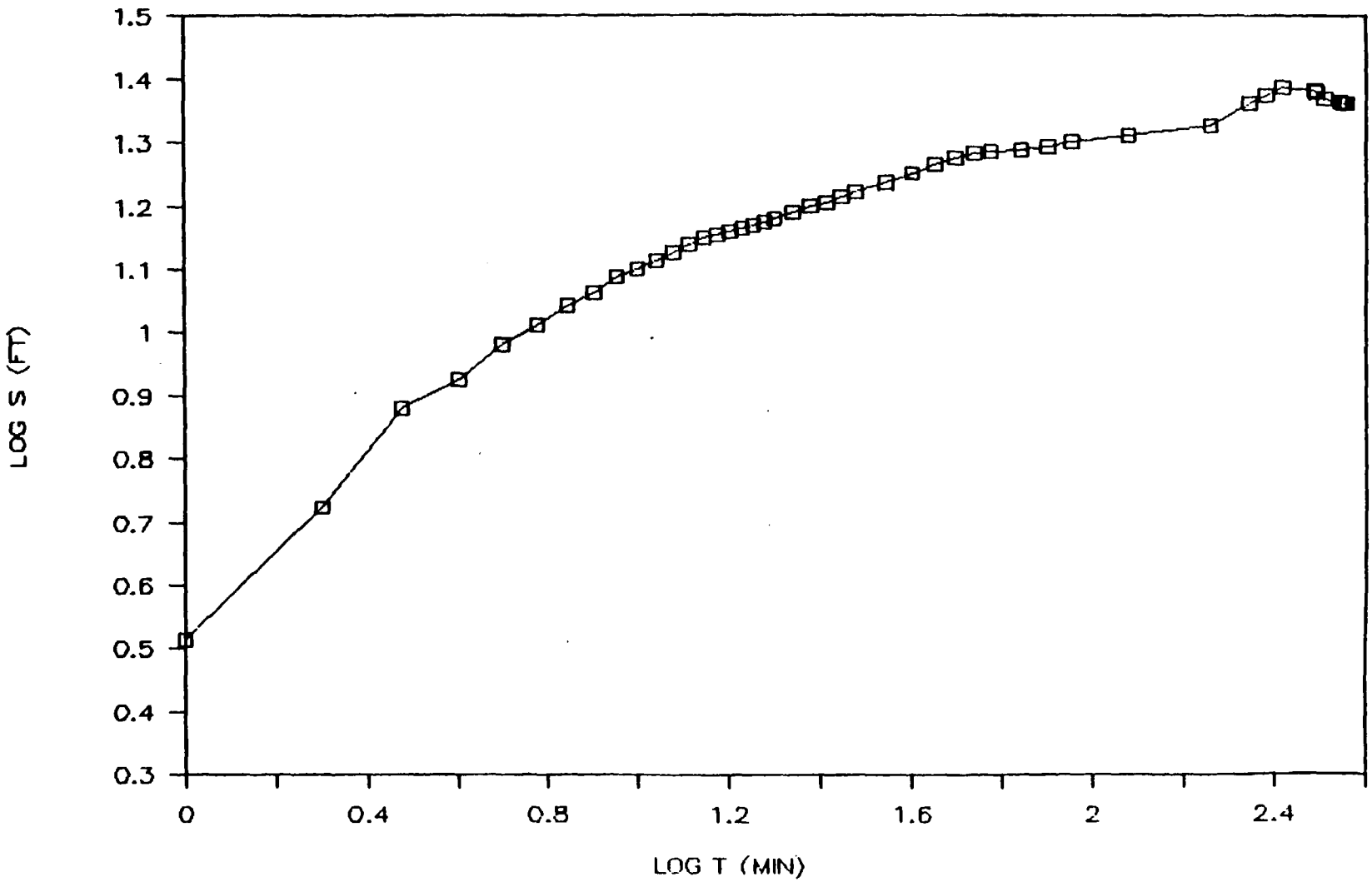


# WELL 9D, RECOVERY

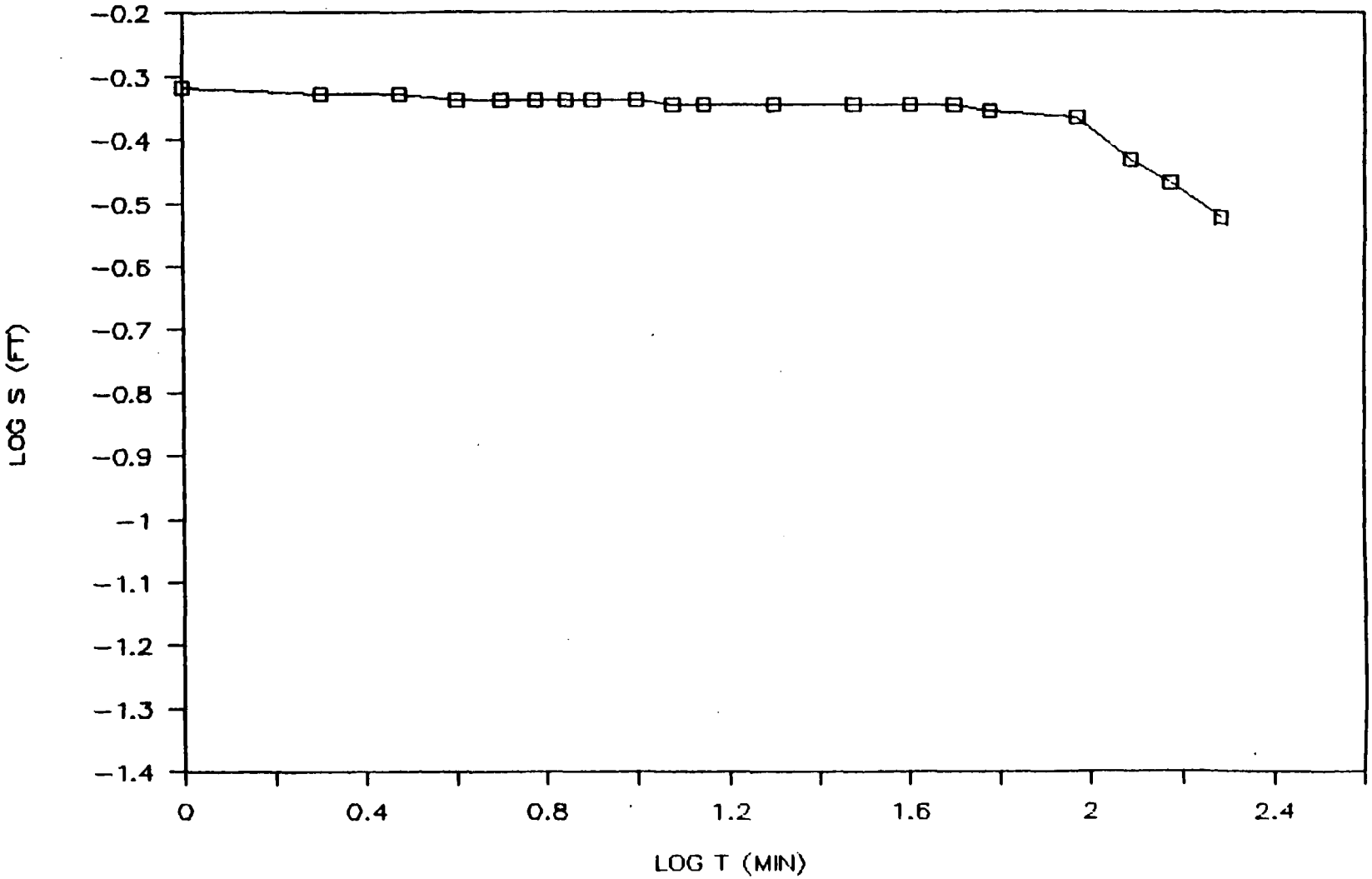



MGY 001 0669

# WELL 9D, DRAWDOWN

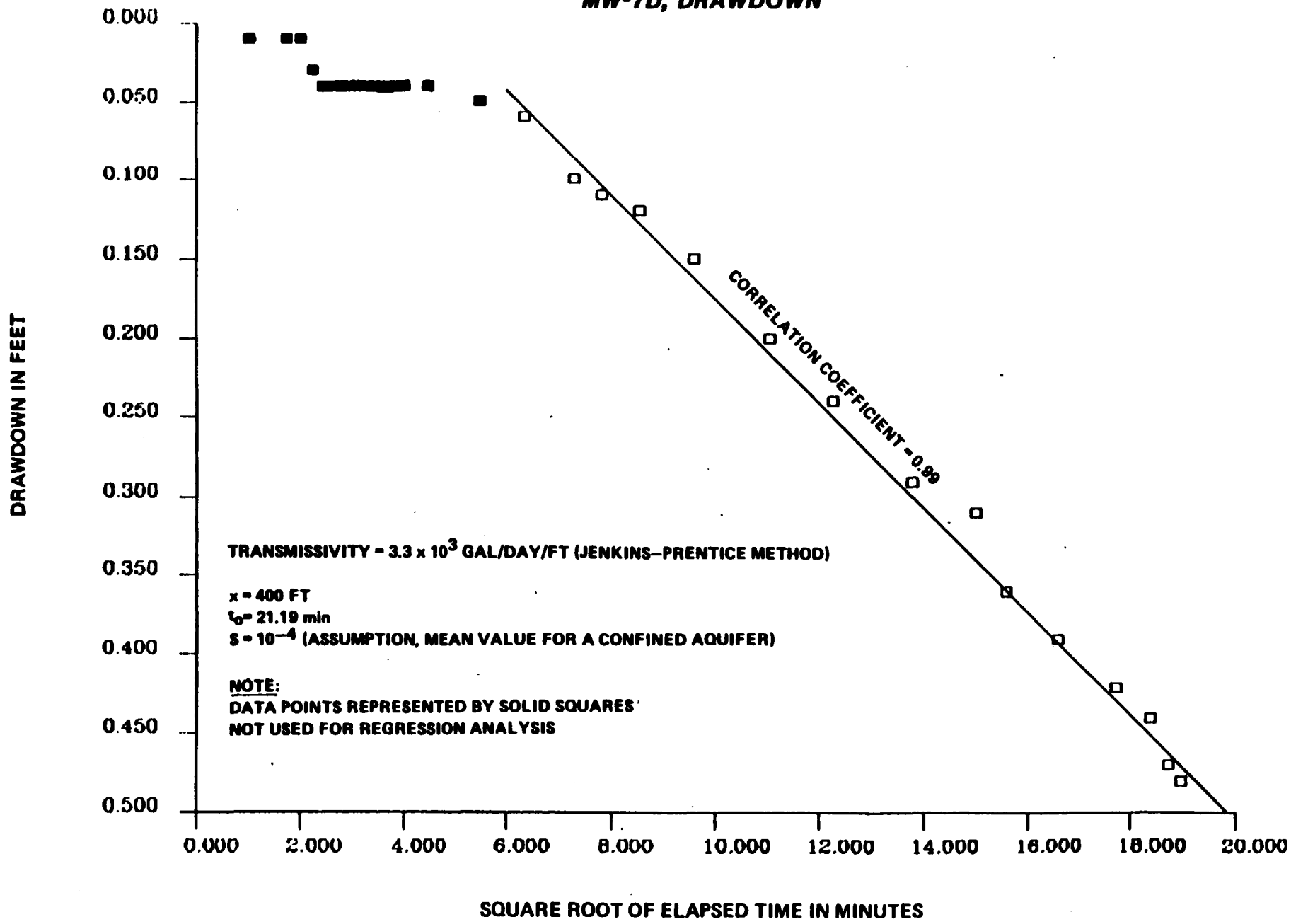


# WELL 7D. RECOVERY

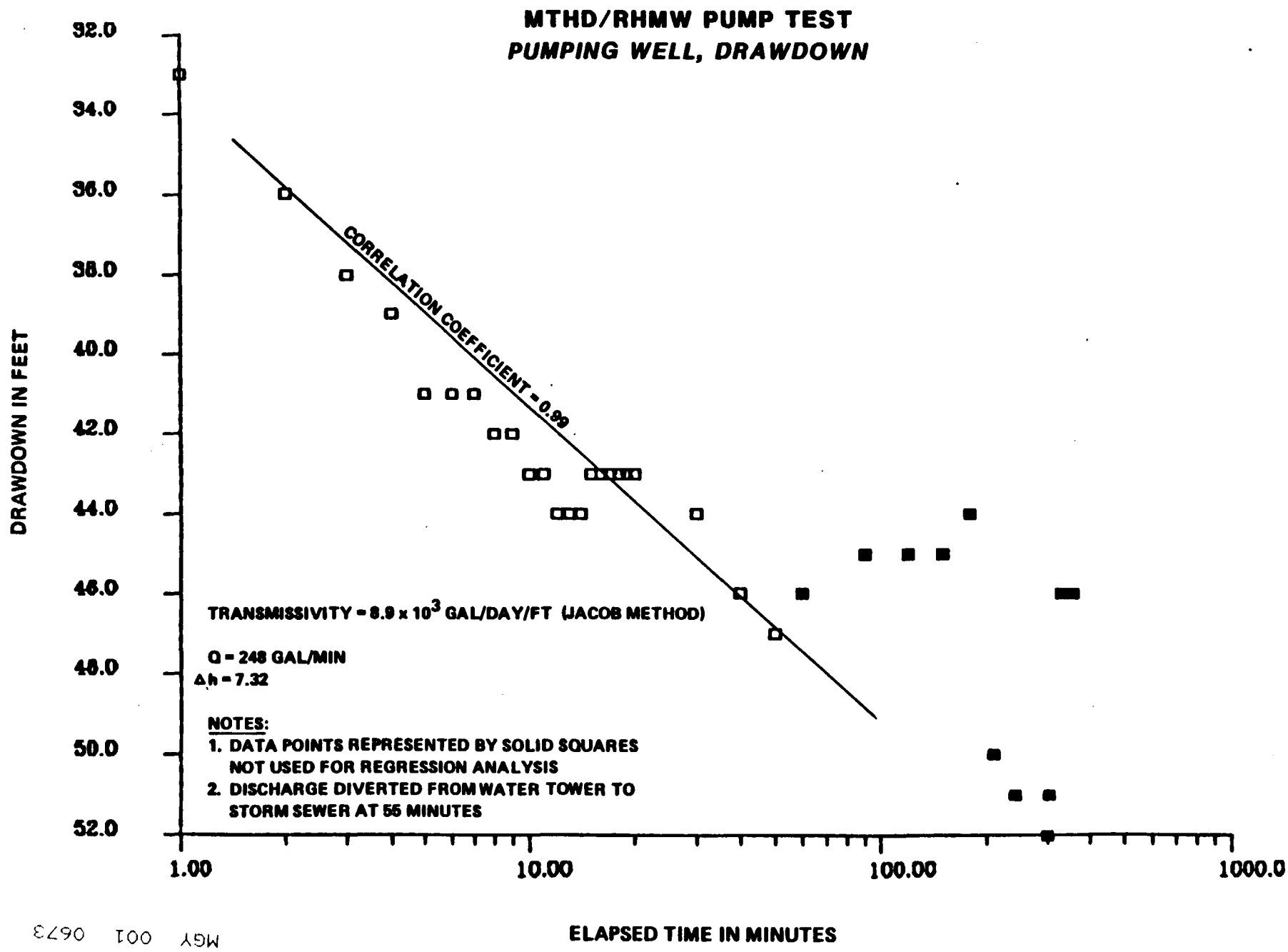



MGY 001 0671

## MTHD/RHMW PUMP TEST
### *MW-7D, DRAWDOWN*




MGY 001 0672


MTHD/RHMW PUMP TEST
PUMPING WELL, DRAWDOWN
DRAWDOWN IN FEET
32.0
34.0
36.0
38.0
40.0
42.0
44.0
46.0
48.0
50.0
52.0
CORRELATION COEFFICIENT = 0.99
TRANSMISSIVITY = 8.9 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = 248 GAL/MIN
Δh = 7.32
NOTES:
1. DATA POINTS REPRESENTED BY SOLID SQUARES NOT USED FOR REGRESSION ANALYSIS
2. DISCHARGE DIVERTED FROM WATER TOWER TO STORM SEWER AT 55 MINUTES
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES

MGY 001 0673

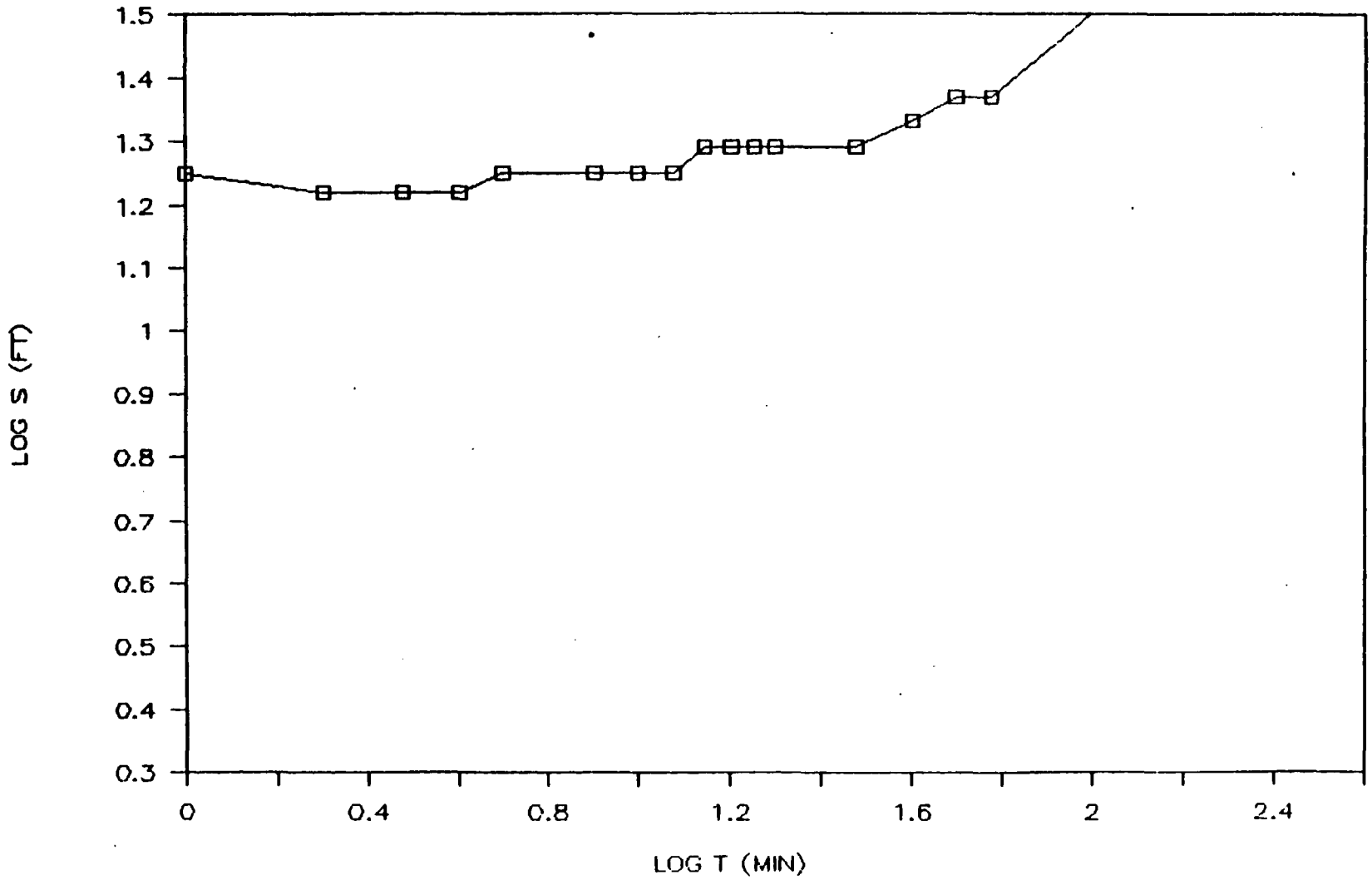
## TABLE G-2
## JACOB SOLUTIONS TO PUMPING TEST DATA

| Well | Description | r (ft) | t (min) | T (gpd/ft) | S |
|---|---|---|---|---|---|
| Pumping Well | Drawdown | 0 | | $8.9 \times 10^3$ | |
| Pumping Well | Recovery | 0 | | $8.1 \times 10^3$ | |
| MW-9D | Drawdown | 200 | 0.40 | $7.3 \times 10^3$ | $1.5 \times 10^{-5}$ |
| MW-9D | Recovery | 200 | | $8.1 \times 10^3$ | |
| MW-10D | Drawdown | 650 | 0.88 | $8.5 \times 10^3$ | $0.4 \times 10^{-5}$ |
| MW-10D | Recovery | 650 | | $9.4 \times 10^3$ | |



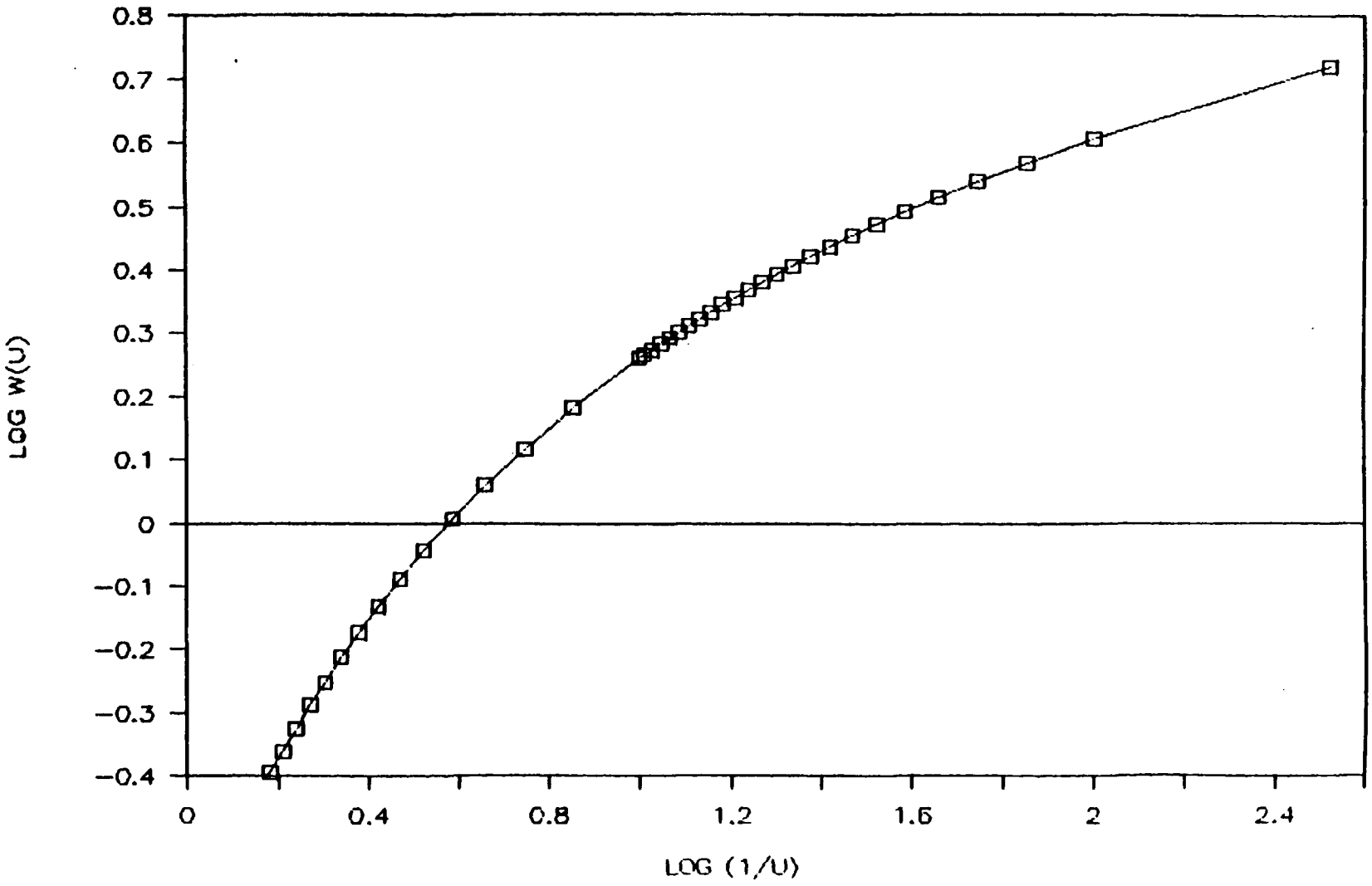
MGY 001 0674

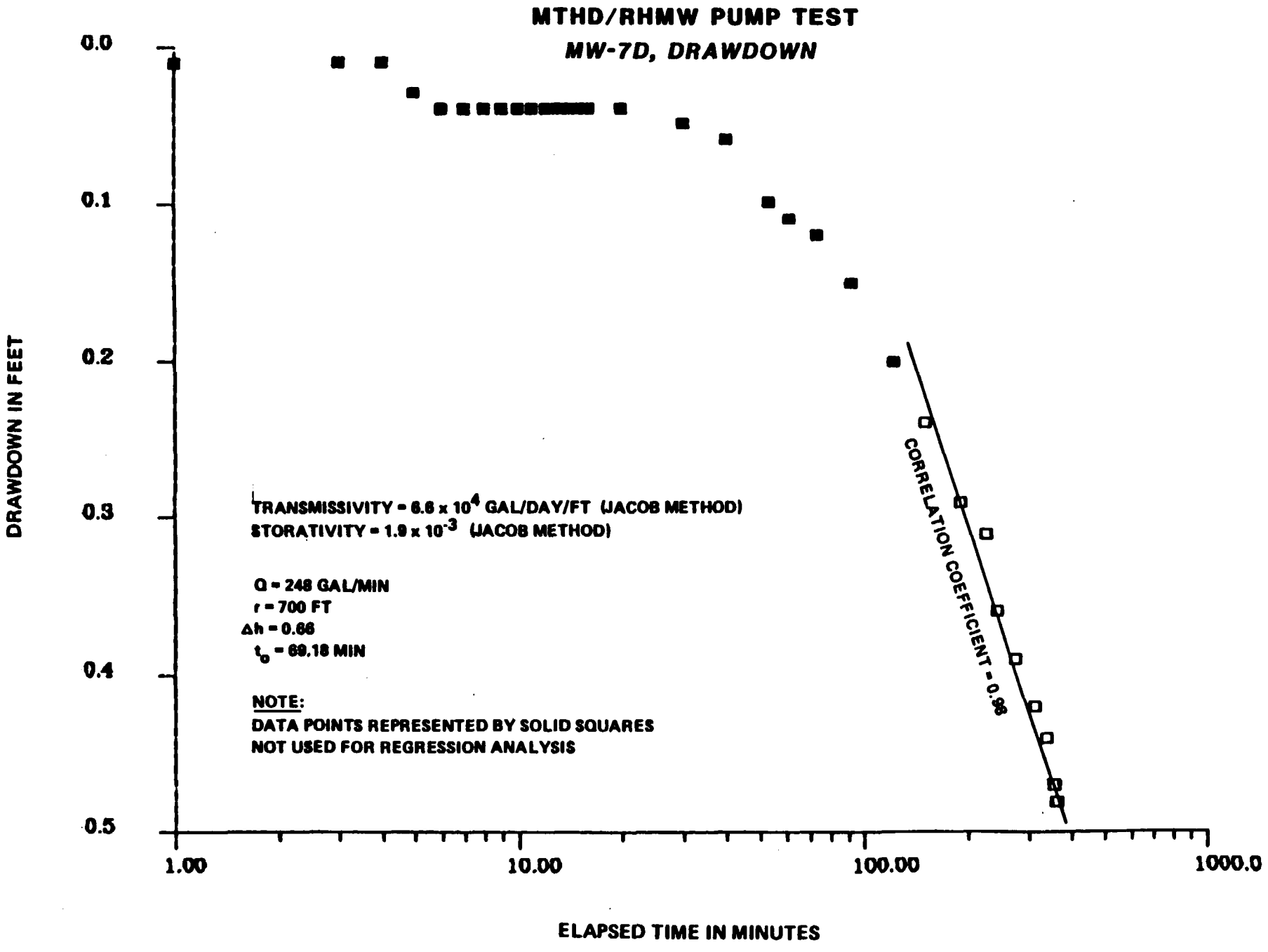
# WELL 15D. RECOVERY




MGY 001 0675

# THEIS TYPE CURVE

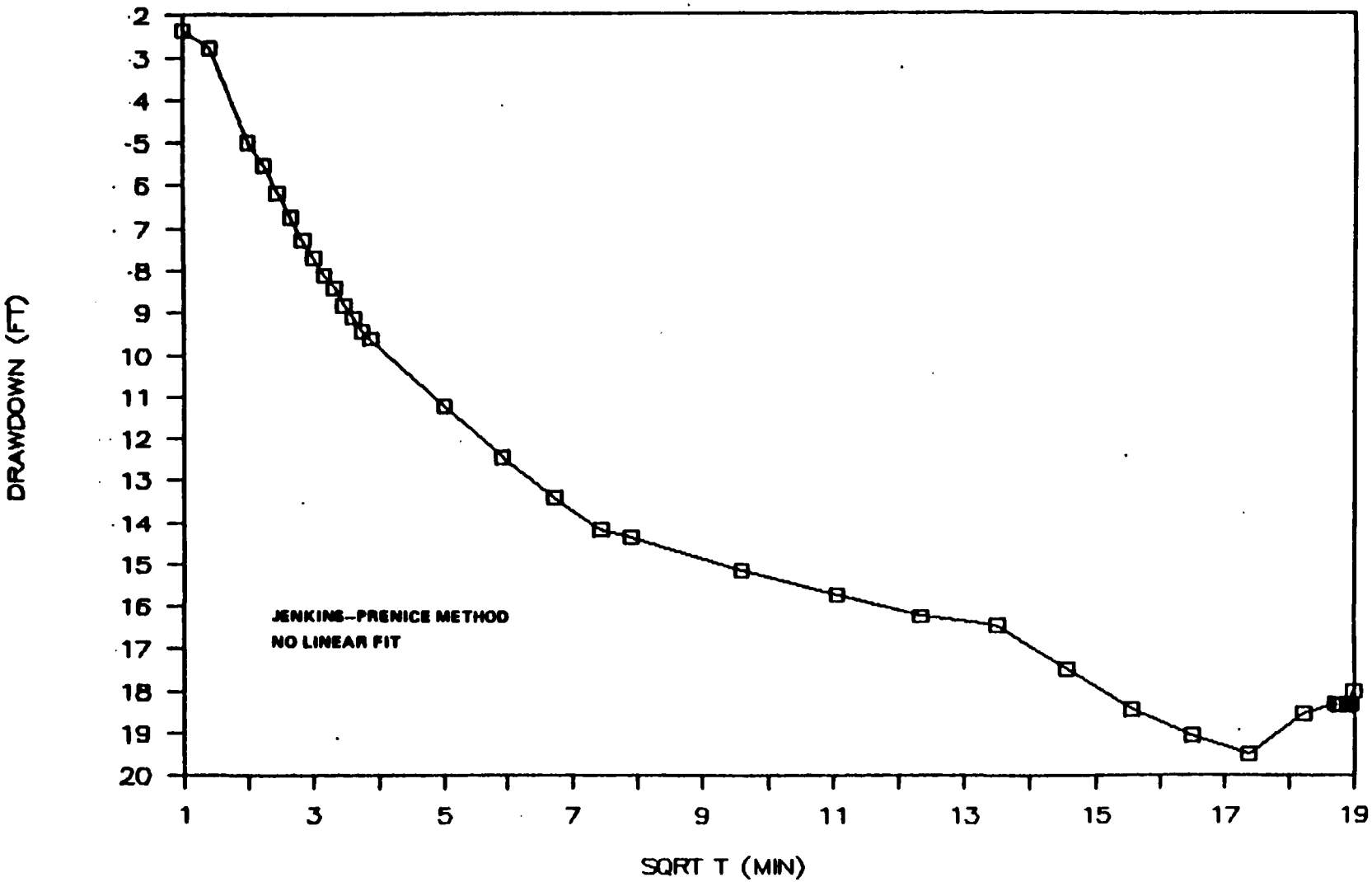



MTHD/RHMW PUMP TEST
MW-7D, DRAWDOWN
DRAWDOWN IN FEET
0.0
0.1
0.2
0.3
0.4
0.5
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES
TRANSMISSIVITY = 6.6 x 10^4 GAL/DAY/FT (JACOB METHOD)
STORATIVITY = 1.9 x 10^-3 (JACOB METHOD)
Q = 248 GAL/MIN
r = 700 FT
Δh = 0.66
t_o = 69.18 MIN
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS
CORRELATION COEFFICIENT = 0.98

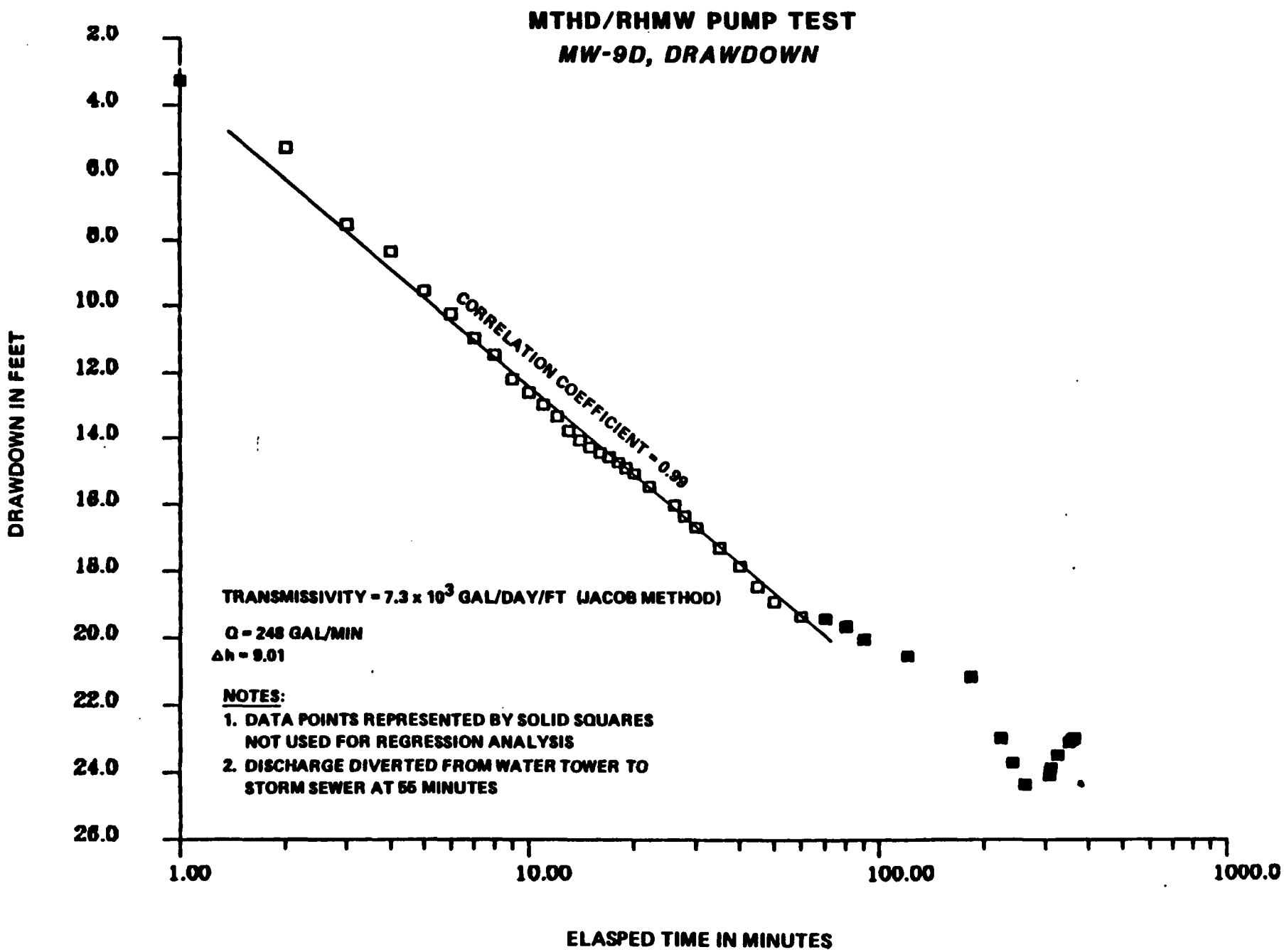
MGY 001 0677

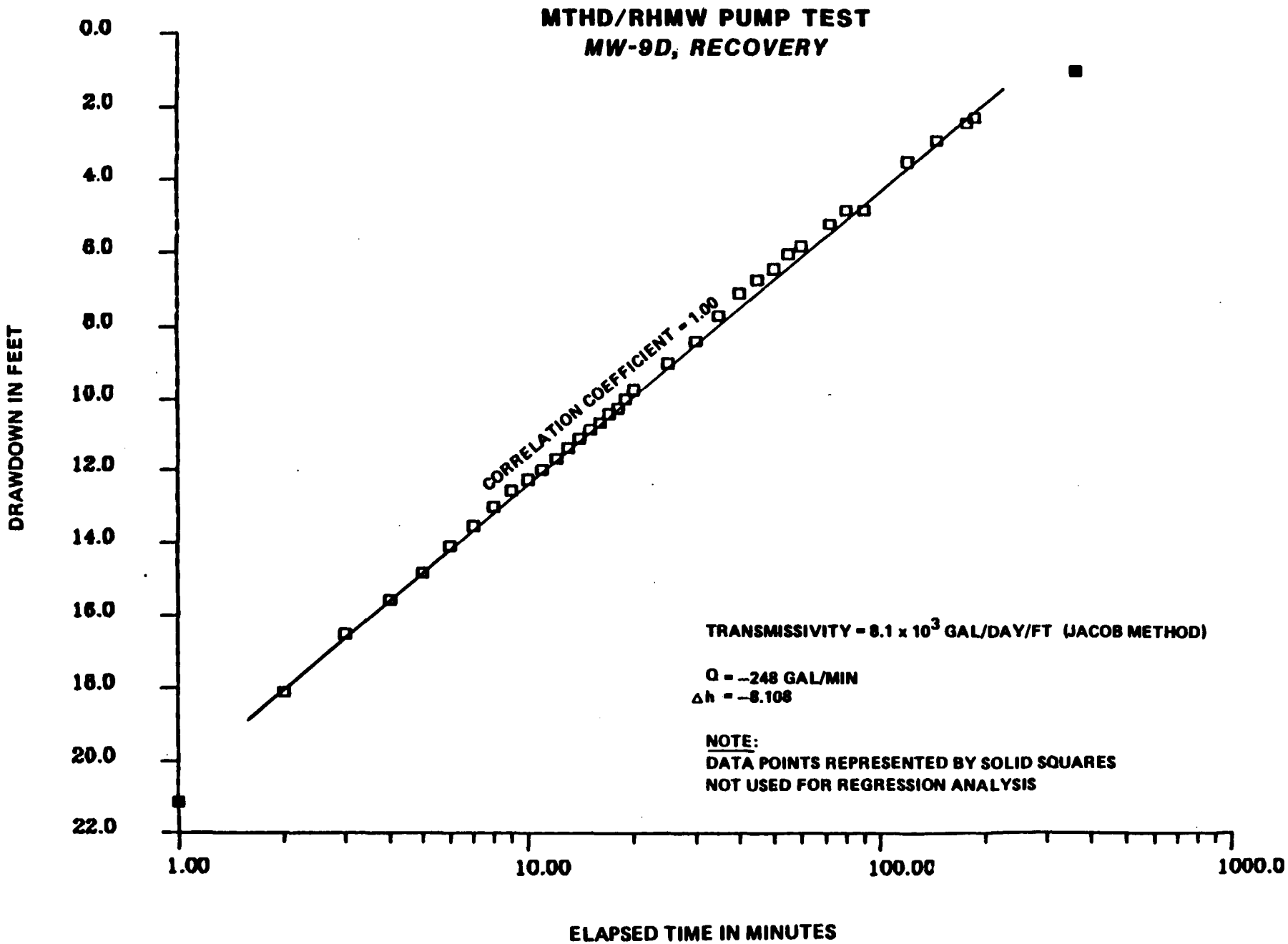
**MTHD/RHMW PUMP TEST**

***MW-10D, DRAWDOWN***

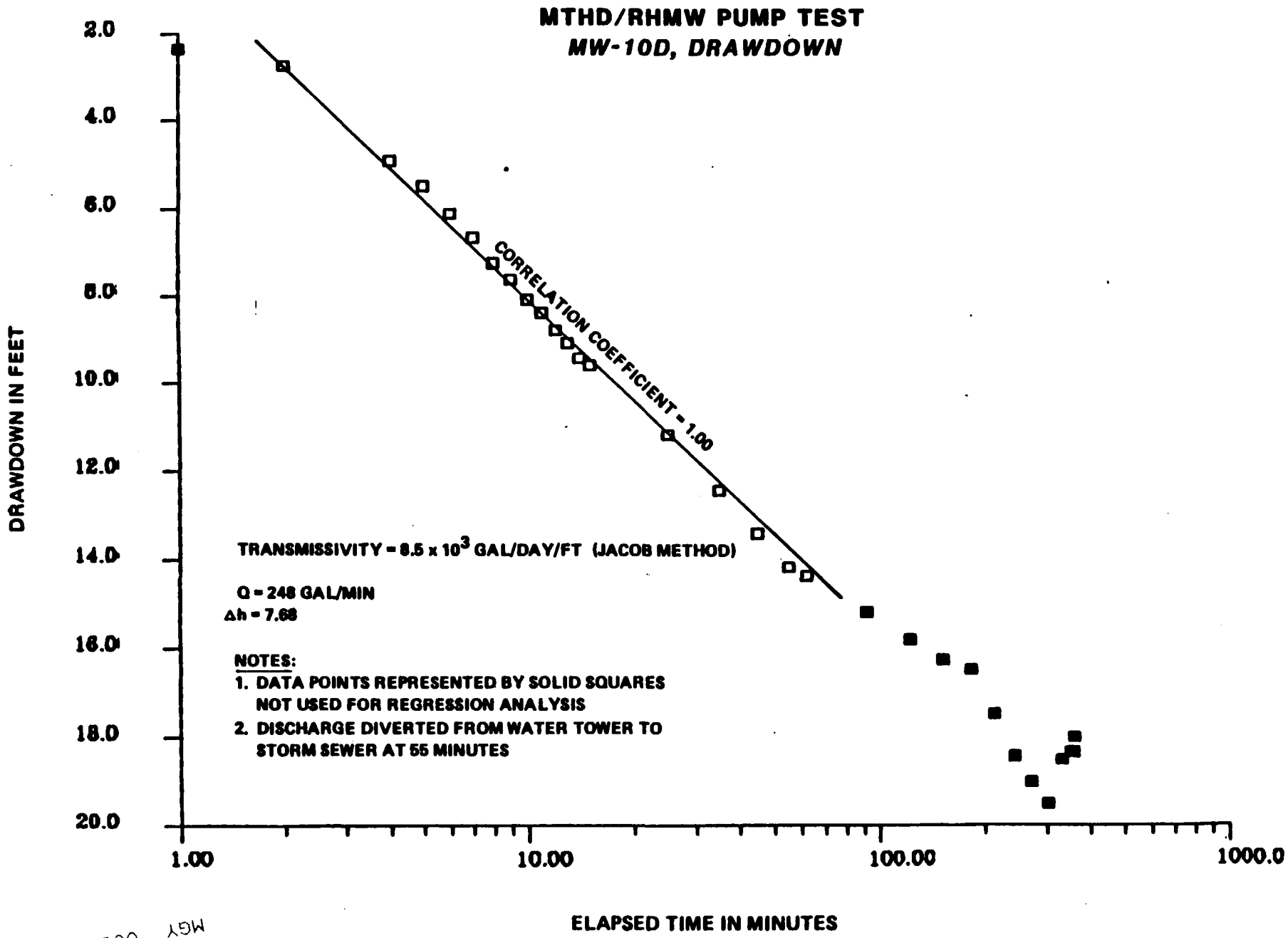



MGY 001 0678


MTHD/RHMW PUMP TEST
MW-9D, DRAWDOWN
DRAWDOWN IN FEET
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
1.00
10.00
100.00
1000.0
ELASPED TIME IN MINUTES
CORRELATION COEFFICIENT = 0.99
TRANSMISSIVITY = 7.3 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = 248 GAL/MIN
Δh = 9.01
NOTES:
1. DATA POINTS REPRESENTED BY SOLID SQUARES NOT USED FOR REGRESSION ANALYSIS
2. DISCHARGE DIVERTED FROM WATER TOWER TO STORM SEWER AT 55 MINUTES


MTHD/RHMW PUMP TEST
MW-9D, RECOVERY
DRAWDOWN IN FEET
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
CORRELATION COEFFICIENT = 1.00
TRANSMISSIVITY = 8.1 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = -248 GAL/MIN
Δh = -8.108
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES

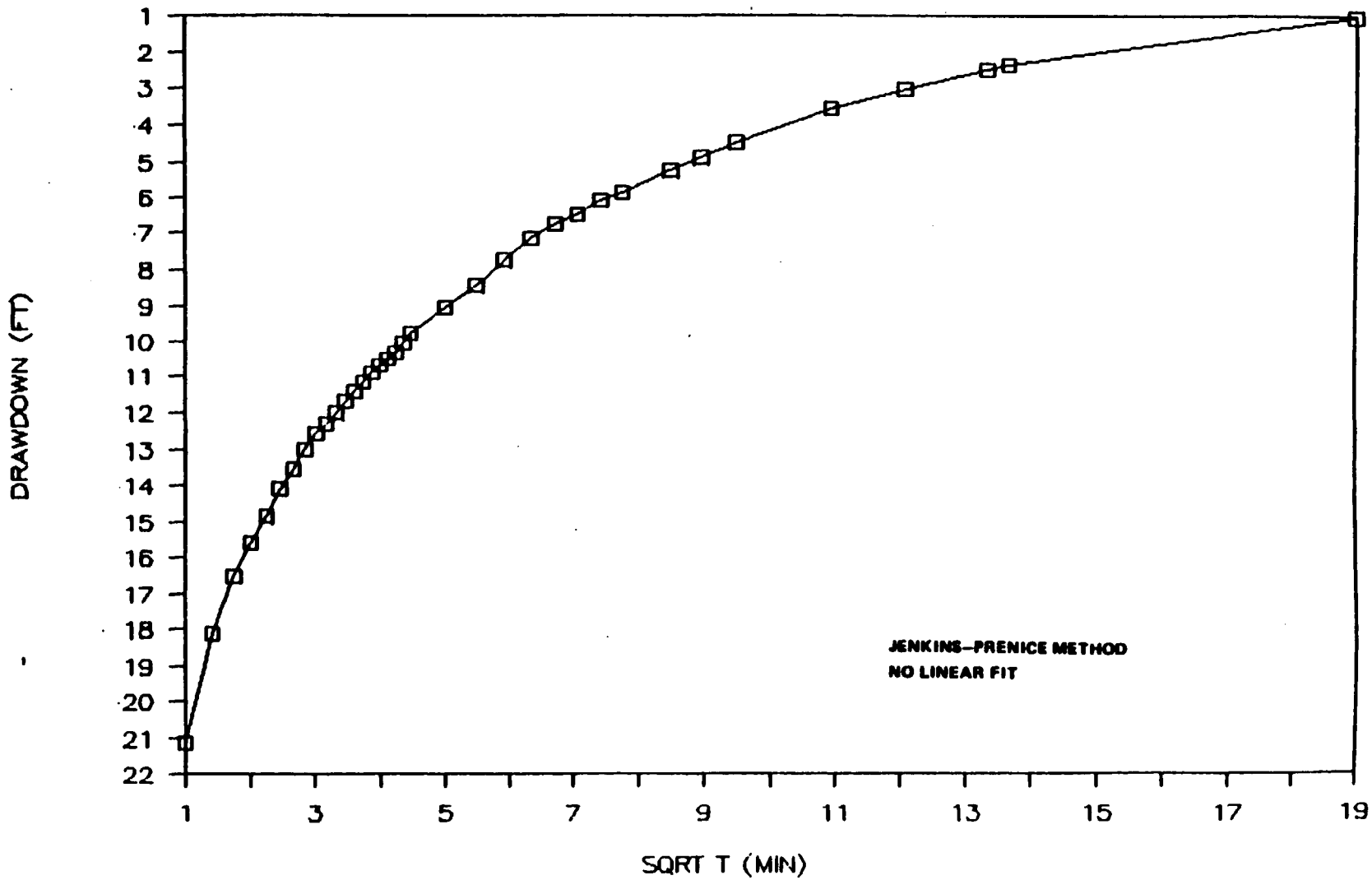
MGY 001 0690

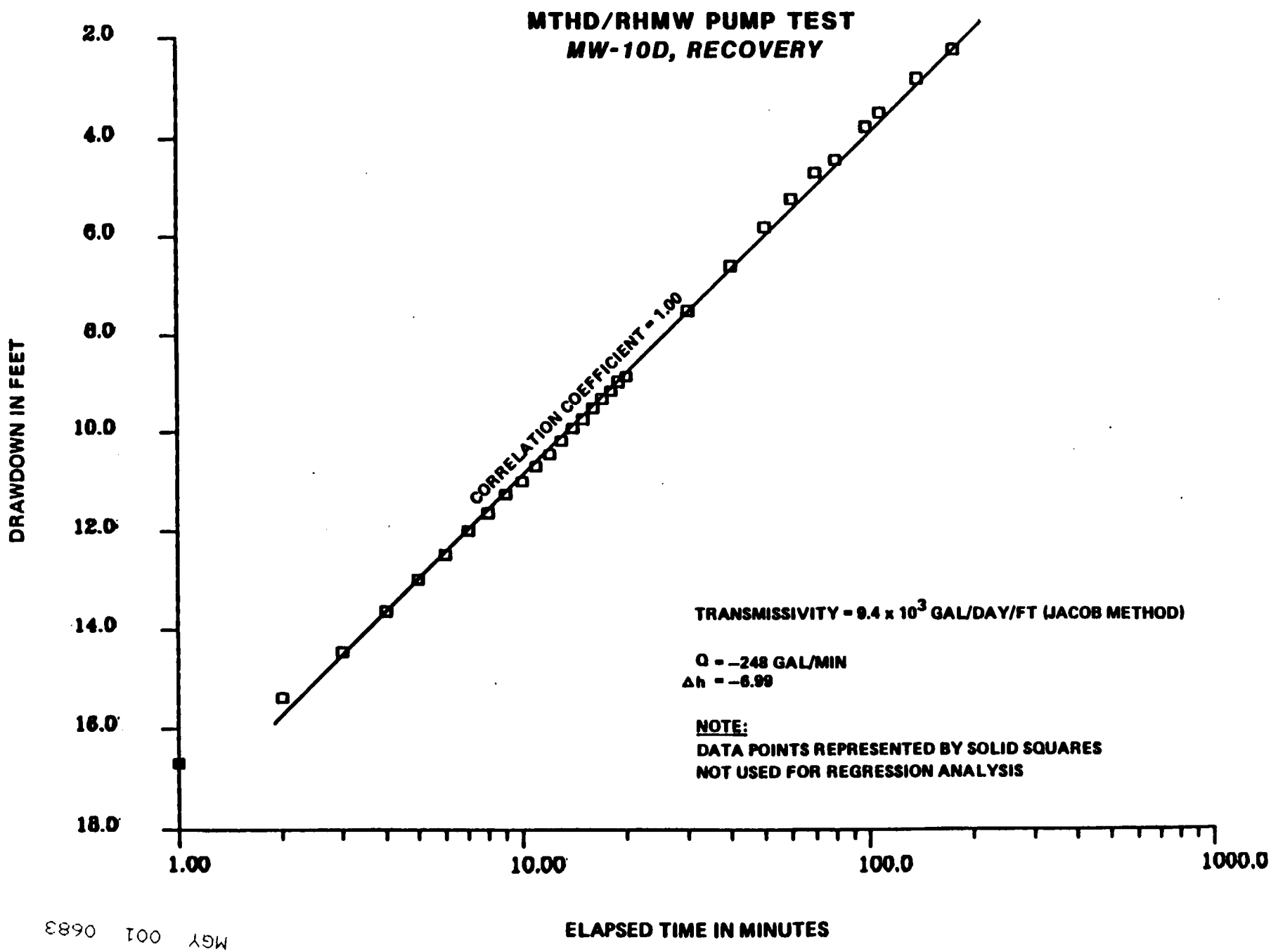

MTHD/RHMW PUMP TEST
MW-10D, DRAWDOWN
CORRELATION COEFFICIENT = 1.00
TRANSMISSIVITY = 8.5 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = 248 GAL/MIN
Δh = 7.68
NOTES:
1. DATA POINTS REPRESENTED BY SOLID SQUARES NOT USED FOR REGRESSION ANALYSIS
2. DISCHARGE DIVERTED FROM WATER TOWER TO STORM SEWER AT 55 MINUTES
DRAWDOWN IN FEET
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES

MGY 001 0681

**MTHD/RHMW PUMP TEST**

***MW-9D, RECOVERY***

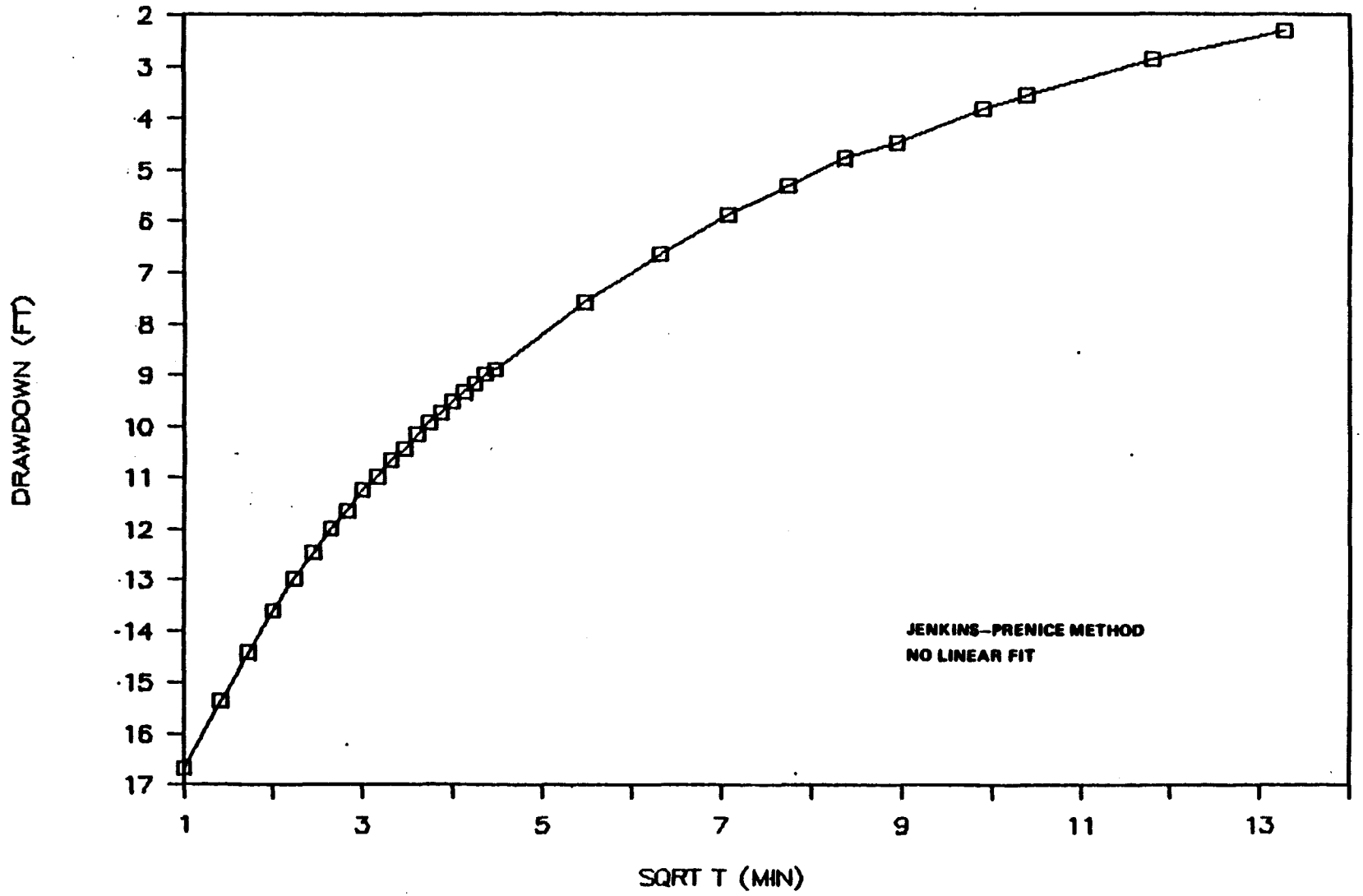



MTHD/RHMW PUMP TEST
MW-10D, RECOVERY
CORRELATION COEFFICIENT = 1.00
TRANSMISSIVITY = 9.4 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = -248 GAL/MIN
Δh = -6.99
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS
DRAWDOWN IN FEET
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
1.00
10.00
100.0
1000.0
ELAPSED TIME IN MINUTES

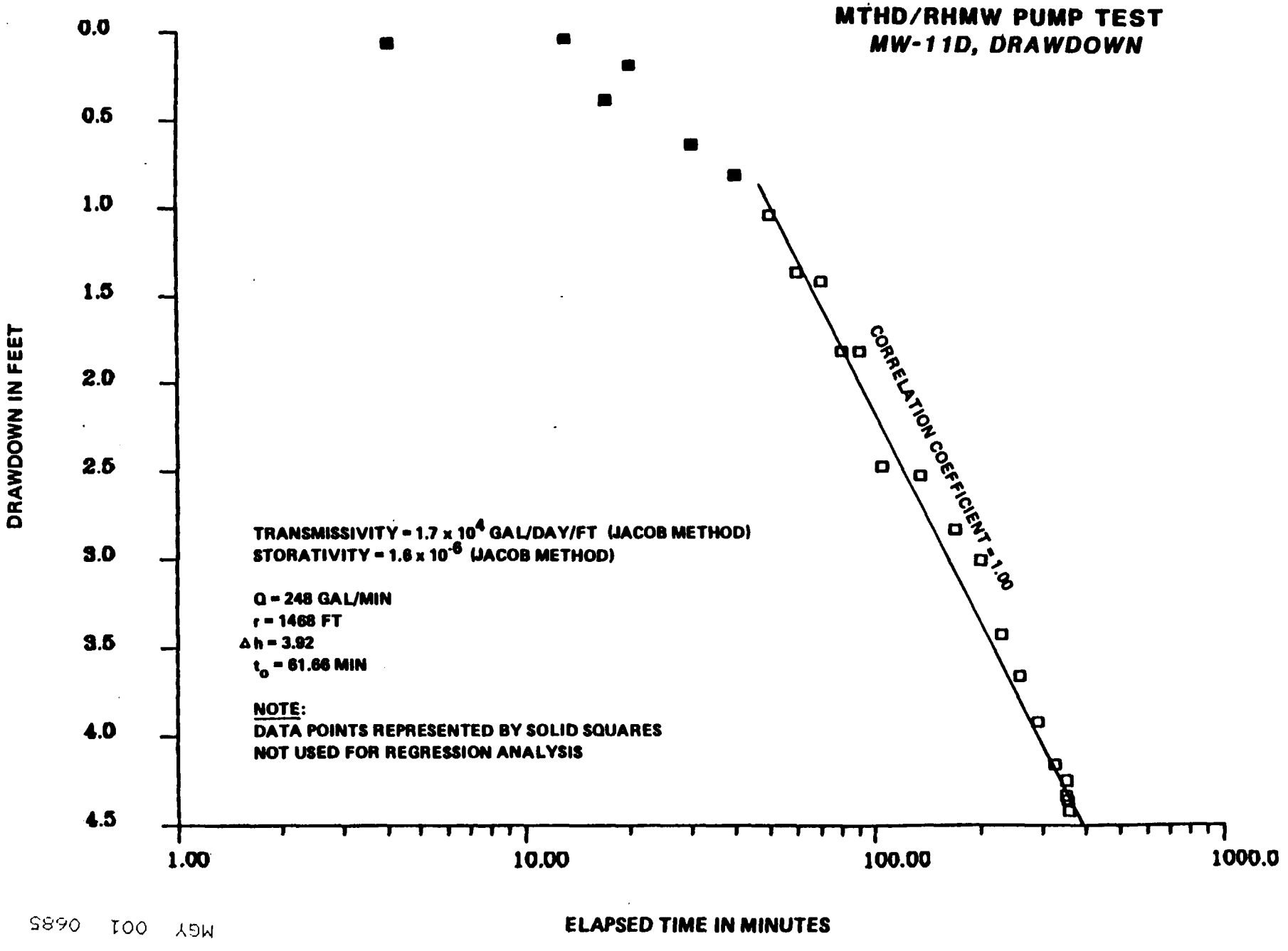
MGY 001 0683

**MTHD/RHMW PUMP TEST**

***MW-10D, RECOVERY***

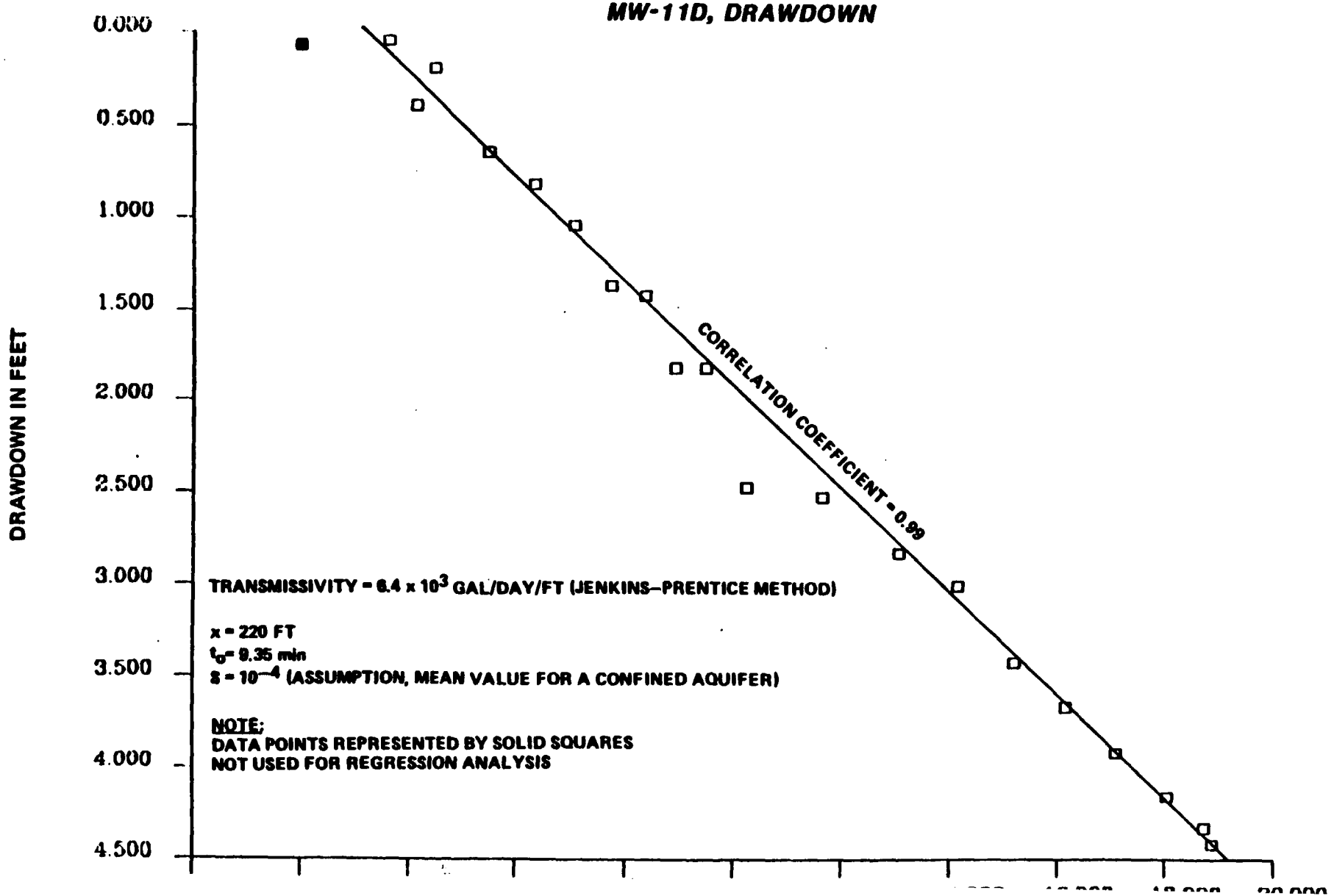



MGY 001 0684

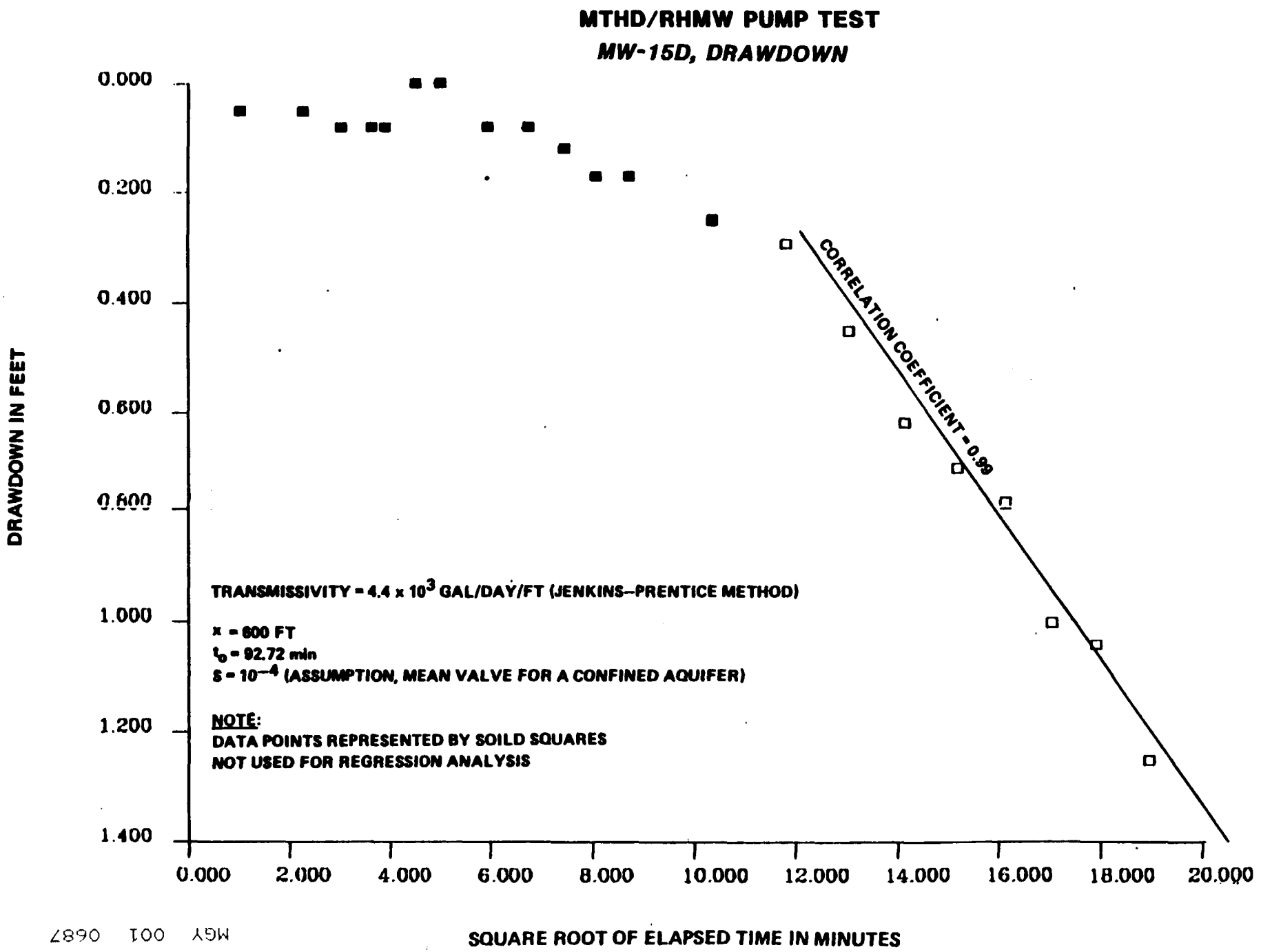

MTHD/RHMW PUMP TEST
MW-11D, DRAWDOWN
DRAWDOWN IN FEET
0.0
0.5
1.0
1.5
2.0
2.5
3.0
3.5
4.0
4.5
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES
CORRELATION COEFFICIENT = 1.00
TRANSMISSIVITY = 1.7 x 10^4 GAL/DAY/FT (JACOB METHOD)
STORATIVITY = 1.6 x 10^-6 (JACOB METHOD)
Q = 248 GAL/MIN
r = 1468 FT
Δh = 3.92
t_o = 61.66 MIN
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS

MGY 001 0685

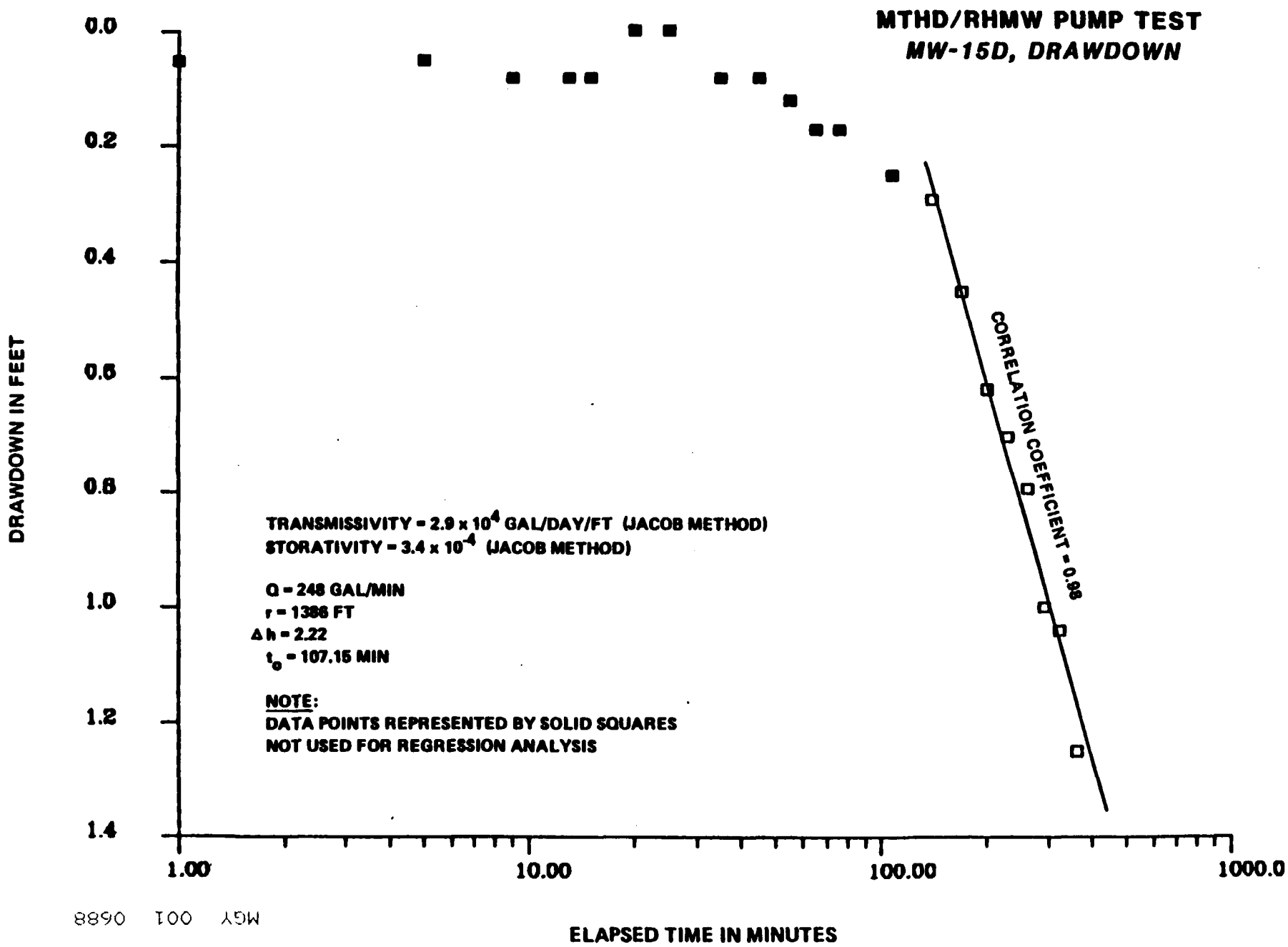
## MTHD/RHMW PUMP TEST
### *MW-11D, DRAWDOWN*




MGY 001 0686

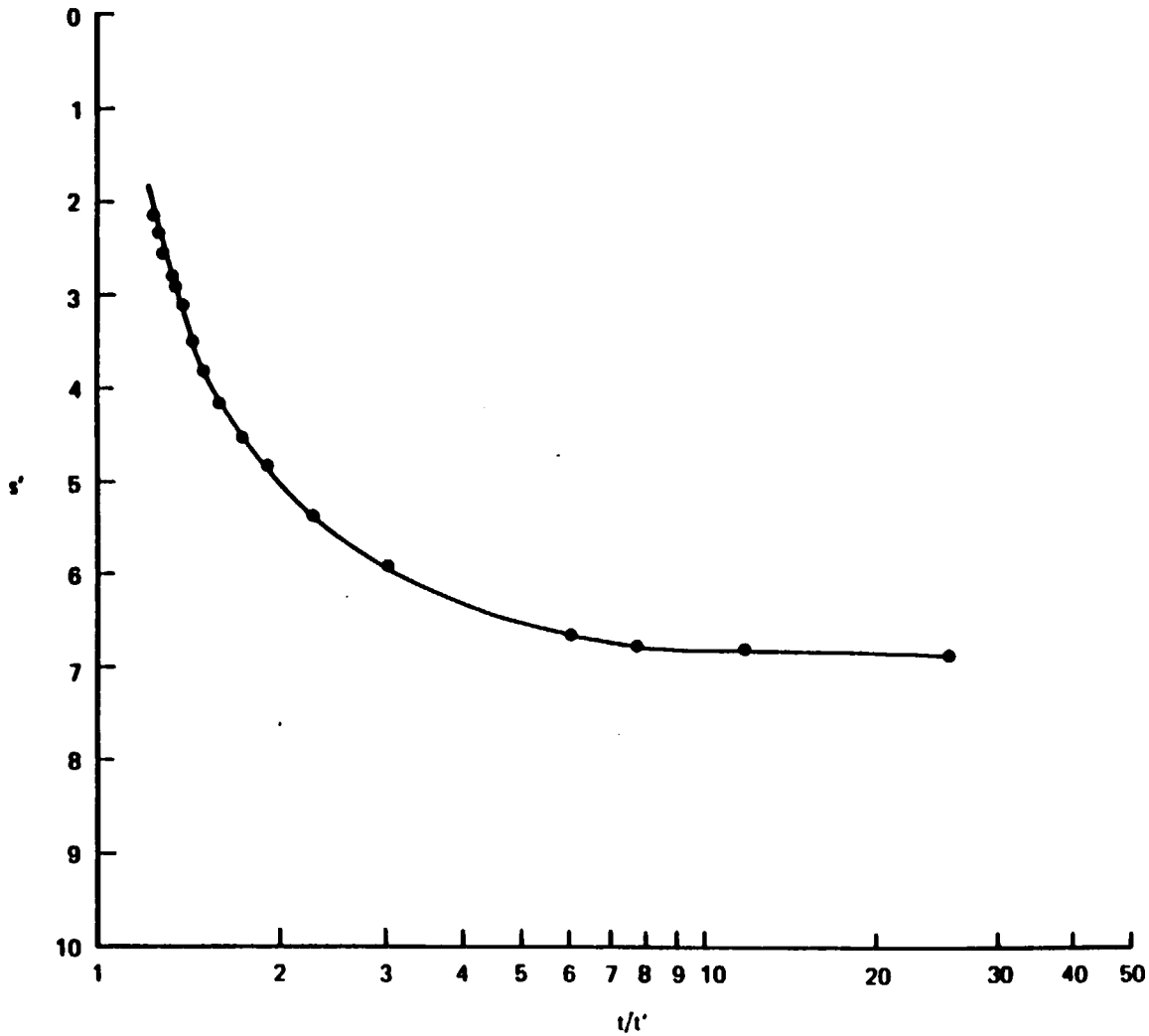

MTHD/RHMW PUMP TEST
MW-15D, DRAWDOWN
DRAWDOWN IN FEET
0.000
0.200
0.400
0.600
0.800
1.000
1.200
1.400
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
SQUARE ROOT OF ELAPSED TIME IN MINUTES
CORRELATION COEFFICIENT = 0.99
TRANSMISSIVITY = 4.4 x 10^3 GAL/DAY/FT (JENKINS–PRENTICE METHOD)
x = 800 FT
t0 = 92.72 min
S = 10^-4 (ASSUMPTION, MEAN VALVE FOR A CONFINED AQUIFER)
NOTE:
DATA POINTS REPRESENTED BY SOILD SQUARES
NOT USED FOR REGRESSION ANALYSIS

MGY 001 0687


MTHD/RHMW PUMP TEST
MW-15D, DRAWDOWN
DRAWDOWN IN FEET
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES
CORRELATION COEFFICIENT = 0.98
TRANSMISSIVITY = 2.9 x 10^4 GAL/DAY/FT (JACOB METHOD)
STORATIVITY = 3.4 x 10^-4 (JACOB METHOD)
Q = 248 GAL/MIN
r = 1386 FT
Δh = 2.22
t0 = 107.15 MIN
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS

MGY 001 0688

**MTHD SLUG TEST**
***MW–2D, RISING HEAD***




MGY 001 0689

# SLUG TEST
# DATA REDUCTION

MGY 001 0690

PROGRAM SLUGT, VERSION 3,JAN. 1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 3 Nov 1986

FIELD INVESTIGATOR: Carl Varteresian

WELL NO.: MW-2D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
LENGTH OF SCREEN OR INTAKE PORTION = 129.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 127.90 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 128.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)
NUMBER OF HEAD-TIME DATA POINTS = 8

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 15.00 | 6.750 |
| 50.00 | 5.910 |
| 110.00 | 4.820 |
| 200.00 | 3.790 |
| 290.00 | 2.890 |
| 380.00 | 2.290 |
| 440.00 | 1.960 |
| 500.00 | 1.680 |

SUCCESSIVE COMPUTED VALUES FOR H0 (FEET)

6.7739
6.8126

MGY 001 0691

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 6.81 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 1.015e-04 | 7.927e-07 | 1.655e-06 | 1.679e-04 | 1.638106 | 159.02 | .00 |
| 1.000e-02 | 1.000e-02 | 1.987e-04 | 1.553e-06 | 5.316e-06 | 2.820e-04 | 1.392267 | 105.85 | 53.17 |
| 1.000e-03 | 1.000e-03 | 3.034e-04 | 2.370e-06 | 2.144e-05 | 3.942e-04 | 1.228723 | 77.92 | 27.93 |
| 1.000e-04 | 1.000e-04 | 4.077e-04 | 3.186e-06 | 4.552e-05 | 5.036e-04 | 1.123514 | 63.41 | 14.51 |
| 1.000e-05 | 1.000e-05 | 5.105e-04 | 3.988e-06 | 7.061e-05 | 6.112e-04 | 1.059007 | 54.92 | 8.49 |
| 1.000e-06 | 1.000e-06 | 6.116e-04 | 4.779e-06 | 9.538e-05 | 7.178e-04 | 1.017667 | 49.70 | 5.22 |
| 1.000e-07 | 1.000e-07 | 7.119e-04 | 5.561e-06 | 1.195e-04 | 8.241e-04 | .989712 | 46.12 | 3.58 |
| 1.000e-08 | 1.000e-08 | 8.113e-04 | 6.339e-06 | 1.433e-04 | 9.359e-04 | .976892 | 43.51 | 2.61 |
| 1.000e-09 | 1.000e-09 | 9.103e-04 | 7.112e-06 | 1.672e-04 | 1.050e-03 | .969895 | 41.53 | 1.98 |
| 1.000e-10 | 1.000e-10 | 1.009e-03 | 7.880e-06 | 1.901e-04 | 1.168e-03 | .969965 | 40.02 | 1.51 |

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METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

PERMEABILITY = 3.83e-06 FT/seconds = 1.17e-04 CM/seconds

TRANSMISSIVITY = 4.90e-04 FT**2/seconds

MW-2D

COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 3.83e-06 FT/seconds = 1.17e-04 CM/seconds

TRANSMISSIVITY = 4.90e-04 FT**2/seconds

PROGRAM SLUGT, VERSION 3,JAN. 1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 1 Dec 1986

FIELD INVESTIGATOR: Carl Varteresian

WELL NO.: MW-4D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
NUMBER OF HEAD-TIME DATA POINTS = 8

LENGTH OF SCREEN OR INTAKE PORTION = 130.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 130.00 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 130.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 60.00 | 4.000 |
| 90.00 | 2.880 |
| 120.00 | 2.010 |
| 150.00 | 1.360 |
| 180.00 | .890 |
| 210.00 | .590 |
| 240.00 | .460 |
| 270.00 | .380 |

| SUCCESSIVE COMPUTED VALUES FOR H0 (FEET) |
|---|
| 8.0093 |
| 8.6730 |
| 9.0354 |
| 8.7497 |
| 8.3399 |

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 8.34 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 1.063e-03 | 8.175e-06 | 4.798e-04 | 1.641e-03 | 1.092866 | 74.90 | .00 |
| 1.000e-02 | 1.000e-02 | 1.518e-03 | 1.168e-05 | 9.650e-04 | 2.022e-03 | .695886 | 47.83 | 27.07 |
| 1.000e-03 | 1.000e-03 | 1.959e-03 | 1.507e-05 | 1.453e-03 | 2.393e-03 | .479555 | 31.75 | 16.08 |
| 1.000e-04 | 1.000e-04 | 2.306e-03 | 1.773e-05 | 1.946e-03 | 2.795e-03 | .368083 | 20.41 | 11.33 |
| 1.000e-05 | 1.000e-05 | 2.594e-03 | 1.995e-05 | 2.330e-03 | 3.027e-03 | .268404 | 17.78 | 2.64 |
| 1.000e-06 | 1.000e-06 | 2.987e-03 | 2.298e-05 | 2.706e-03 | 3.466e-03 | .254365 | 15.42 | 2.36 |
| 1.000e-07 | 1.000e-07 | 3.432e-03 | 2.640e-05 | 3.178e-03 | 3.696e-03 | .150763 | 9.11 | 6.31 |
| 1.000e-08 | 1.000e-08 | 3.963e-03 | 3.048e-05 | 3.511e-03 | 4.328e-03 | .206252 | 12.95 | -3.84 |
| 1.000e-09 | 1.000e-09 | 4.419e-03 | 3.399e-05 | 4.043e-03 | 4.930e-03 | .200790 | 12.62 | .33 |
| 1.000e-10 | 1.000e-10 | 4.838e-03 | 3.722e-05 | 4.471e-03 | 5.437e-03 | .199688 | 11.51 | 1.10 |

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METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

PERMEABILITY = 1.49e-05 FT/seconds = 4.54e-04 CM/seconds

MW-4D

TRANSMISSIVITY = 1.93e-03 FT**2/seconds

COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 1.49e-05 FT/seconds = 4.54e-04 CM/seconds

TRANSMISSIVITY = 1.93e-03 FT**2/seconds

MGY 001 0694

PROGRAM SLUGT, VERSION 3,JAN.' 1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 1 Dec 1986

FIELD INVESTIGATOR: Carl Vartoresian

WELL NO.: MW-6D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
LENGTH OF SCREEN OR INTAKE PORTION = 60.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 62.31 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 60.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)
NUMBER OF HEAD-TIME DATA POINTS = 8

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 5.00 | 1.560 |
| 10.00 | 1.430 |
| 40.00 | 1.040 |
| 70.00 | .720 |
| 100.00 | .550 |
| 130.00 | .420 |
| 190.00 | .370 |
| 310.00 | .330 |

| SUCCESSIVE COMPUTED VALUES FOR H0 (FEET) |
|---|
| 1.2030 |
| 1.4444 |
| 1.5909 |
| 1.6140 |

MGY 001 0695

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 1.61 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 3.656e-04 | 6.093e-06 | 2.567e-05 | 6.035e-04 | 1.580756 | 42.36 | .00 |
| 1.000e-02 | 1.000e-02 | 7.043e-04 | 1.174e-05 | 1.439e-04 | 1.027e-03 | 1.254411 | 36.83 | 5.53 |
| 1.000e-03 | 1.000e-03 | 1.079e-03 | 1.798e-05 | 3.852e-04 | 1.443e-03 | .981046 | 39.08 | -2.25 |
| 1.000e-04 | 1.000e-04 | 1.454e-03 | 2.424e-05 | 6.634e-04 | 1.862e-03 | .823906 | 41.78 | -2.70 |
| 1.000e-05 | 1.000e-05 | 1.822e-03 | 3.037e-05 | 9.392e-04 | 2.310e-03 | .751956 | 43.67 | -1.90 |
| 1.000e-06 | 1.000e-06 | 2.187e-03 | 3.645e-05 | 1.209e-03 | 2.756e-03 | .707373 | 45.06 | -1.38 |
| 1.000e-07 | 1.000e-07 | 2.547e-03 | 4.245e-05 | 1.474e-03 | 3.195e-03 | .675697 | 46.06 | -1.00 |
| 1.000e-08 | 1.000e-08 | 2.904e-03 | 4.841e-05 | 1.725e-03 | 3.632e-03 | .656544 | 46.81 | -.75 |
| 1.000e-09 | 1.000e-09 | 3.259e-03 | 5.432e-05 | 1.916e-03 | 4.066e-03 | .659546 | 47.44 | -.62 |
| 1.000e-10 | 1.000e-10 | 3.606e-03 | 6.010e-05 | 2.055e-03 | 4.498e-03 | .677530. | 49.33 | -1.89 |

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METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

MW-6D

PERMEABILITY = 2.48e-05 FT/seconds = 7.56e-04 CM/seconds

TRANSMISSIVITY = 1.49e-03 FT**2/seconds

COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 2.48e-05 FT/seconds = 7.56e-04 CM/seconds

TRANSMISSIVITY = 1.49e-03 FT**2/seconds

MGY 001 0696

PROGRAM SLUGT, VERSION 3, JAN. 1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 3 Nov 1986

FIELD INVESTIGATOR: Carl Vartoresian

WELL NO.: MW-7D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
NUMBER OF HEAD-TIME DATA POINTS = 8

LENGTH OF SCREEN OR INTAKE PORTION = 108.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 108.00 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 108.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 60.00 | 1.800 |
| 90.00 | 1.240 |
| 120.00 | .980 |
| 150.00 | .810 |
| 180.00 | .540 |
| 210.00 | .430 |
| 240.00 | .350 |
| 330.00 | .260 |

| SUCCESSIVE COMPUTED VALUES FOR H0 (FEET) |
|---|
| 2.3855 |
| 2.9597 |
| 3.0573 |
| 3.0792 |

MGY 001 0697

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 3.08 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 6.036e-04 | 5.589e-06 | 2.852e-04 | 8.176e-04 | .881931 | 53.67 | .00 |
| 1.000e-02 | 1.000e-02 | 9.618e-04 | 8.906e-06 | 6.312e-04 | 1.165e-03 | .555483 | 28.43 | 25.24 |
| 1.000e-03 | 1.000e-03 | 1.320e-03 | 1.222e-05 | 9.958e-04 | 1.507e-03 | .387000 | 18.18 | 10.25 |
| 1.000e-04 | 1.000e-04 | 1.672e-03 | 1.548e-05 | 1.350e-03 | 1.847e-03 | .297082 | 14.93 | 3.25 |
| 1.000e-05 | 1.000e-05 | 2.022e-03 | 1.873e-05 | 1.702e-03 | 2.205e-03 | .248702 | 14.30 | .63 |
| 1.000e-06 | 1.000e-06 | 2.316e-03 | 2.144e-05 | 1.736e-03 | 2.572e-03 | .360769 | 32.11 | -17.81 |
| 1.000e-07 | 1.000e-07 | 2.594e-03 | 2.402e-05 | 1.830e-03 | 2.936e-03 | .426684 | 36.82 | -4.71 |
| 1.000e-08 | 1.000e-08 | 2.875e-03 | 2.662e-05 | 2.173e-03 | 3.297e-03 | .390992 | 31.66 | 5.16 |
| 1.000e-09 | 1.000e-09 | 3.191e-03 | 2.954e-05 | 2.610e-03 | 3.595e-03 | .308717 | 24.11 | 7.55 |
| 1.000e-10 | 1.000e-10 | 3.536e-03 | 3.274e-05 | 3.054e-03 | 3.974e-03 | .260281 | 17.57 | 6.54 |

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METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

PERMEABILITY = 1.35e-05 FT/seconds = 4.10e-04 CM/seconds

TRANSMISSIVITY = 1.45e-03 FT**2/seconds

MW-7D

COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 1.35e-05 FT/seconds = 4.10e-04 CM/seconds

TRANSMISSIVITY = 1.45e-03 FT**2/seconds

8690 TOO MGY

PROGRAM SLUGT, VERSION 3,JAN.'1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 2 Dec 1986

FIELD INVESTIGATOR: Carl Vartoresian

WELL NO.: MW-13D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
LENGTH OF SCREEN OR INTAKE PORTION = 230.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 230.00 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 230.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)
NUMBER OF HEAD-TIME DATA POINTS = 8

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 60.00 | 2.440 |
| 90.00 | 1.940 |
| 120.00 | 1.620 |
| 150.00 | 1.460 |
| 180.00 | 1.400 |
| 240.00 | 1.180 |
| 300.00 | 1.020 |
| 360.00 | .910 |

| SUCCESSIVE COMPUTED VALUES FOR H0 (FEET) |
|---|
| 2.5170 |
| 2.6299 |
| 2.7785 |
| 3.0299 |
| 3.3408 |

6690 TOO MGY

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 3.34 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 2.032e-04 | 8.834e-07 | 1.171e-04 | 2.340e-04 | .575491 | 15.93 | .00 |
| 1.000e-02 | 1.000e-02 | 3.964e-04 | 1.723e-06 | 3.053e-04 | 4.727e-04 | .422373 | 19.61 | -3.67 |
| 1.000e-03 | 1.000e-03 | 5.958e-04 | 2.590e-06 | 4.978e-04 | 7.133e-04 | .361748 | 27.32 | -7.71 |
| 1.000e-04 | 1.000e-04 | 7.925e-04 | 3.446e-06 | 6.386e-04 | 9.560e-04 | .400567 | 31.72 | -4.40 |
| 1.000e-05 | 1.000e-05 | 9.855e-04 | 4.285e-06 | 7.780e-04 | 1.191e-03 | .418730 | 34.23 | -2.51 |
| 1.000e-06 | 1.000e-06 | 1.176e-03 | 5.114e-06 | 9.161e-04 | 1.424e-03 | .431693 | 35.93 | -1.70 |
| 1.000e-07 | 1.000e-07 | 1.365e-03 | 5.933e-06 | 1.053e-03 | 1.654e-03 | .440509 | 37.07 | -1.14 |
| 1.000e-08 | 1.000e-08 | 1.552e-03 | 6.748e-06 | 1.189e-03 | 1.883e-03 | .446806 | 37.93 | -.86 |
| 1.000e-09 | 1.000e-09 | 1.738e-03 | 7.558e-06 | 1.325e-03 | 2.110e-03 | .451877 | 38.61 | -.68 |
| 1.000e-10 | 1.000e-10 | 1.924e-03 | 8.363e-06 | 1.460e-03 | 2.336e-03 | .455584 | 39.13 | -.52 |

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METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

PERMEABILITY = 4.49e-06 FT/seconds = 1.37e-04 CM/seconds

TRANSMISSIVITY = 1.03e-03 FT**2/seconds

MW-13D

COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 4.49e-06 FT/seconds = 1.37e-04 CM/seconds

TRANSMISSIVITY = 1.03e-03 FT**2/seconds

MGY 001 0700

PROGRAM SLUGT, VERSION 3,JAN.' 1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 1 Dec 1986

FIELD INVESTIGATOR: Carl Vorteresian

WELL NO.: MW-14D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
NUMBER OF HEAD-TIME DATA POINTS = 8

LENGTH OF SCREEN OR INTAKE PORTION = 131.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 137.80 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 131.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 90.00 | 6.360 |
| 150.00 | 5.260 |
| 210.00 | 4.260 |
| 270.00 | 3.490 |
| 330.00 | 2.790 |
| 390.00 | 2.190 |
| 450.00 | 1.830 |
| 570.00 | 1.120 |

SUCCESSIVE COMPUTED VALUES FOR H0 (FEET)

9.0484
8.8659
8.8991

MGY 001 0701

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 8.90 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 1.806e-04 | 1.379e-06 | 8.731e-05 | 3.122e-04 | 1.245257 | 160.24 | .00 |
| 1.000e-02 | 1.000e-02 | 3.199e-04 | 2.442e-06 | 2.229e-04 | 4.536e-04 | .721000 | 92.78 | 67.46 |
| 1.000e-03 | 1.000e-03 | 4.621e-04 | 3.528e-06 | 3.754e-04 | 5.911e-04 | .466631 | 62.02 | 30.76 |
| 1.000e-04 | 1.000e-04 | 6.022e-04 | 4.597e-06 | 5.260e-04 | 7.285e-04 | .336384 | 46.56 | 15.46 |
| 1.000e-05 | 1.000e-05 | 7.401e-04 | 5.650e-06 | 6.651e-04 | 8.658e-04 | .271228 | 37.54 | 9.02 |
| 1.000e-06 | 1.000e-06 | 8.764e-04 | 6.690e-06 | 8.014e-04 | 1.002e-03 | .228791 | 31.59 | 5.95 |
| 1.000e-07 | 1.000e-07 | 1.005e-03 | 7.672e-06 | 9.360e-04 | 1.086e-03 | .150711 | 20.18 | 11.42 |
| 1.000e-08 | 1.000e-08 | 1.122e-03 | 8.564e-06 | 1.068e-03 | 1.193e-03 | .111682 | 14.98 | 5.20 |
| 1.000e-09 | 1.000e-09 | 1.250e-03 | 9.542e-06 | 1.172e-03 | 1.328e-03 | .124869 | 17.68 | -2.70 |
| 1.000e-10 | 1.000e-10 | 1.382e-03 | 1.055e-05 | 1.329e-03 | 1.462e-03 | .096252 | 12.14 | 5.54 |

**********

METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

PERMEABILITY = 4.34e-06 FT/seconds = 1.32e-04 CM/seconds

TRANSMISSIVITY = 5.68e-04 FT**2/seconds

MW-14D

COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 4.34e-06 FT/seconds = 1.32e-04 CM/seconds

TRANSMISSIVITY = 5.68e-04 FT**2/seconds

MGY 001 0702

PROGRAM SLUGT, VERSION 3,JAN. 1985

THIS PROGRAM CALCULATES MEAN TRANSMISSIVITIES FROM SLUG-TEST DATA BASED ON TWO ANALYTICAL APPROACHES:
(1) METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS, 1967 (ARTICLE IN VOL.3,NO.1 OF WRR ENTITLED 'RESPONSE OF A FINITE DIAMETER WELL TO AN INSTANTANEOUS CHARGE OF WATER')
(2) METHOD OF BOUWER AND RICE, 1976 (ARTICLE IN VOL. 12, NO.3 OF WRR ENTITLED 'A SLUG TEST FOR DETERMINING HYDRAULIC CONDUCTIVITY OF UNCONFINED AQUIFERS WITH COMPLETELY OR PARTIALLY PENETRATING WELLS')

PROJECT NO.: 87N0000 CLIENT: NJDEP

SITE LOCATION: MTHD/RHMW DATE OF SLUG TEST: 1 Dec 1986

FIELD INVESTIGATOR: Carl Vartoresian

WELL NO.: MW-15D

INPUT DATA ARE:

INNER CASING DIAMETER = 6.00 INCHES
INNER SCREEN OR OPEN-HOLE DIAMETER = 6.00 INCHES
DIAMETER OF DRILLED HOLE = 6.00 INCHES
ESTIMATED POROSITY OF GRAVEL PACK = .30
LENGTH OF SCREEN OR INTAKE PORTION = 224.00 FEET
DEPTH FROM STATIC LEVEL TO BOTTOM OF SCREEN = 226.60 FEET
THICKNESS OF SATURATED AQUIFER ZONE = 224.00 FEET
FALLING-HEAD INDEX = 0 ('1' IF FALLING,'0' IF RISING)
NUMBER OF HEAD-TIME DATA POINTS = 8

| TIME (seconds) | HEAD (FEET) |
|---|---|
| 30.00 | 4.480 |
| 60.00 | 3.480 |
| 180.00 | 1.780 |
| 300.00 | 1.240 |
| 420.00 | .950 |
| 540.00 | .770 |
| 660.00 | .640 |
| 780.00 | .560 |

| SUCCESSIVE COMPUTED VALUES FOR H0 (FEET) |
|---|
| 3.5623 |
| 3.8115 |
| 4.0788 |
| 4.3916 |
| 4.7529 |

MGY 001 0703

METHOD OF COOPER, BREDEHOEFT AND PAPADOPULOS

COMPUTED RESULTS:

COMPUTED VALUE OF H0 = 4.75 FEET

NOTE: TRANSMISSIVITY UNITS ARE IN FT**2/seconds AND PERMEABILITY UNITS ARE IN FT/seconds

| ALPHA | STORATIVITY | MEAN TRANSMIS-SIVITY | MEAN PERMEA-BILITY | MINIMUM TRANS. | MAXIMUM TRANS. | RATIO OF 'T' RANGE TO TBAR | ROOT MEAN SQUARE OF TIME DEVIATIONS | DIFFERENCE IN RMS |
|---|---|---|---|---|---|---|---|---|
| 1.000e-01 | 1.000e-01 | 2.071e-04 | 9.246e-07 | 1.214e-05 | 2.607e-04 | 1.200064 | 96.71 | .00 |
| 1.000e-02 | 1.000e-02 | 3.498e-04 | 1.562e-06 | 5.649e-05 | 4.730e-04 | 1.190576 | 53.00 | 43.71 |
| 1.000e-03 | 1.000e-03 | 4.988e-04 | 2.227e-06 | 1.312e-04 | 6.980e-04 | 1.136298 | 50.55 | 2.45 |
| 1.000e-04 | 1.000e-04 | 6.454e-04 | 2.881e-06 | 2.120e-04 | 9.112e-04 | 1.083172 | 57.74 | -7.19 |
| 1.000e-05 | 1.000e-05 | 7.907e-04 | 3.530e-06 | 2.912e-04 | 1.124e-03 | 1.053034 | 64.32 | -6.58 |
| 1.000e-06 | 1.000e-06 | 9.344e-04 | 4.171e-06 | 3.688e-04 | 1.334e-03 | 1.032780 | 69.39 | -5.07 |
| 1.000e-07 | 1.000e-07 | 1.067e-03 | 4.762e-06 | 4.453e-04 | 1.541e-03 | 1.027325 | 88.40 | -19.01 |
| 1.000e-08 | 1.000e-08 | 1.182e-03 | 5.277e-06 | 5.208e-04 | 1.748e-03 | 1.038051 | 111.88 | -23.48 |
| 1.000e-09 | 1.000e-09 | 1.301e-03 | 5.807e-06 | 5.957e-04 | 1.953e-03 | 1.043345 | 116.02 | -4.14 |
| 1.000e-10 | 1.000e-10 | 1.431e-03 | 6.388e-06 | 6.699e-04 | 2.157e-03 | 1.039279 | 109.40 | 6.63 |

**********

METHOD OF BOUWER AND RICE

COMPUTED RESULTS USING DIAMETER OF DRILLED HOLE:

PERMEABILITY = 3.77e-06 FT/seconds = 1.15e-04 CM/seconds

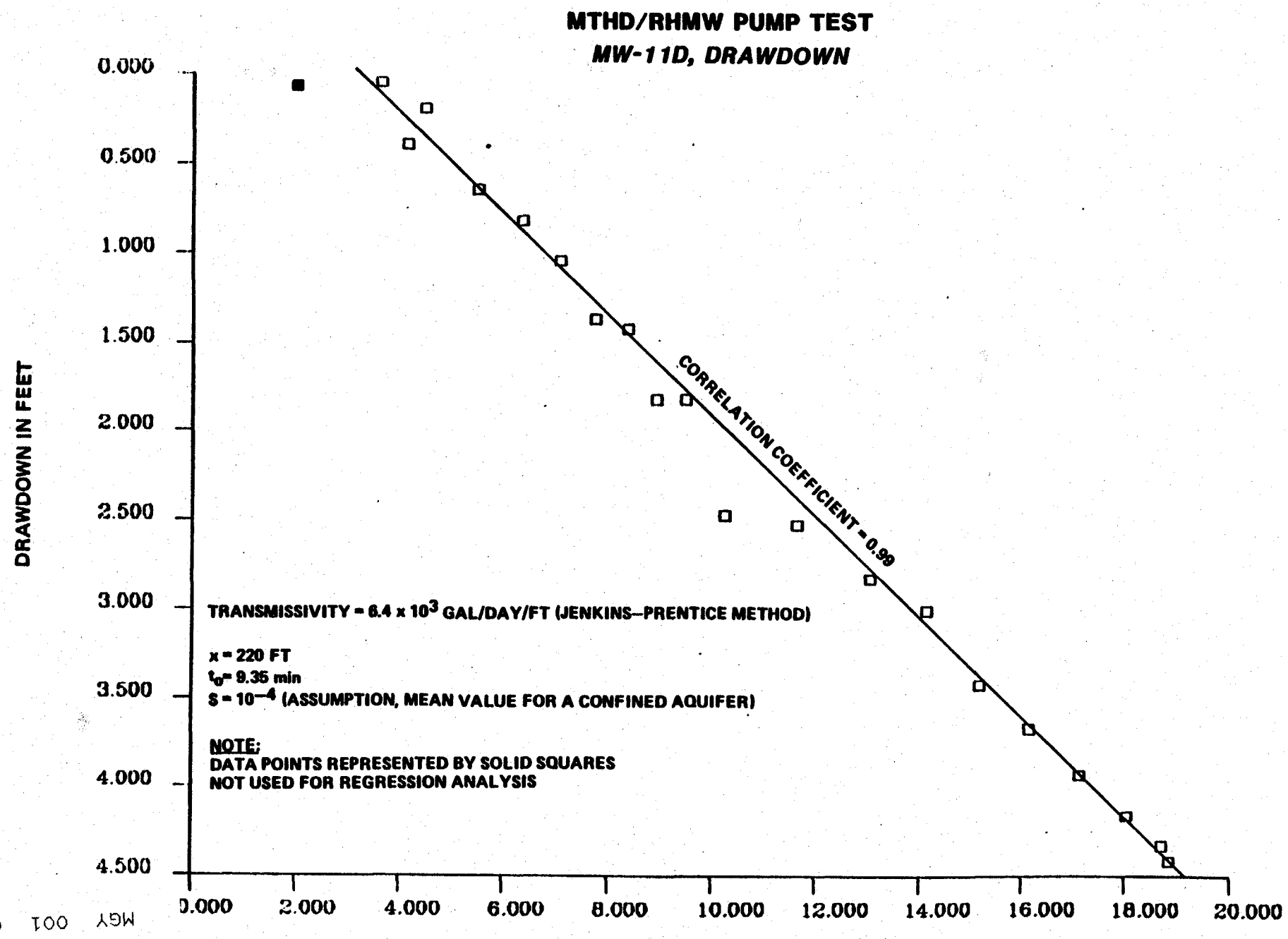
TRANSMISSIVITY = 8.45e-04 FT**2/seconds

MW-15D

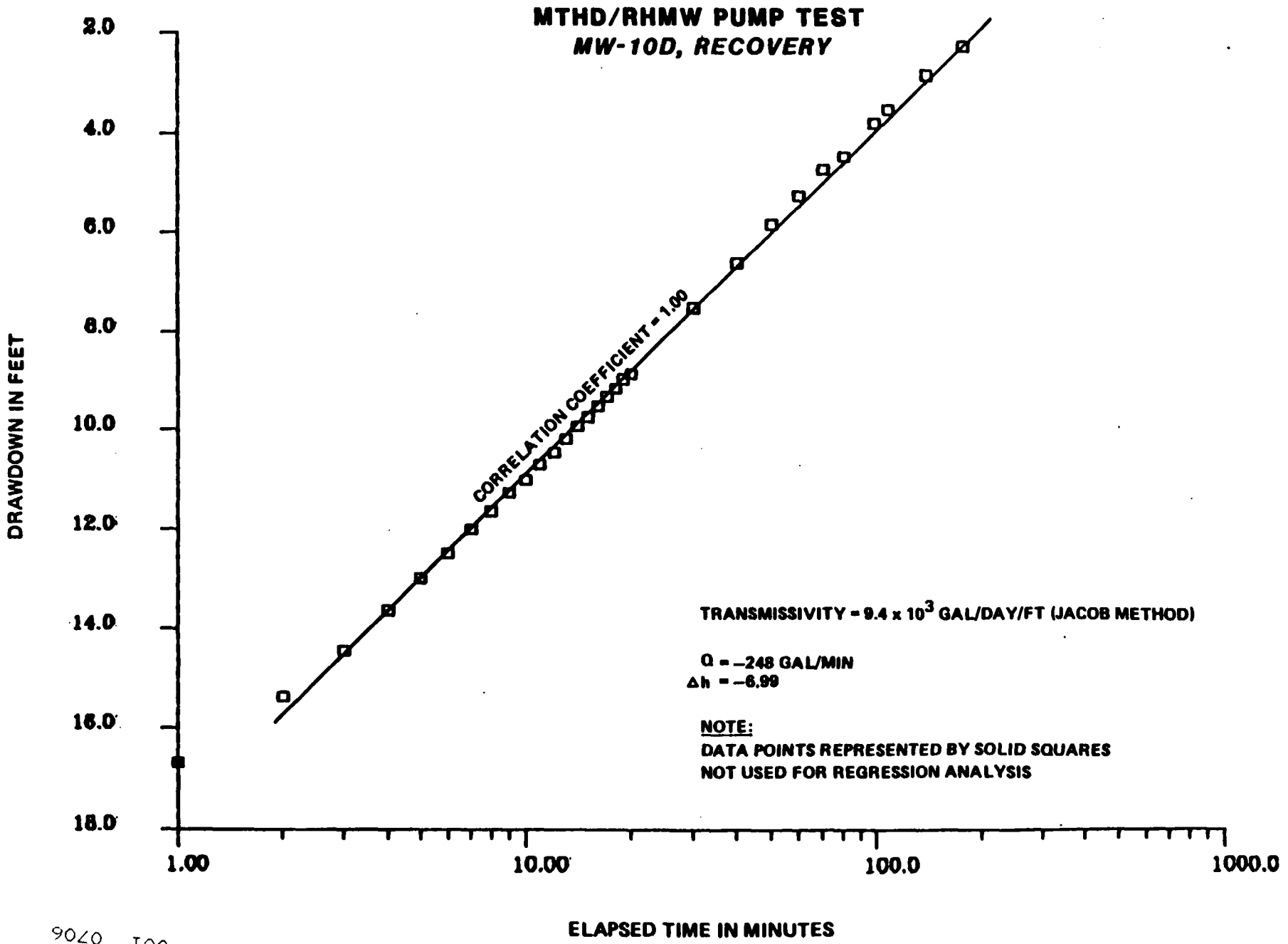
COMPUTED RESULTS USING DIAMETER OF CASING AND SCREEN:

PERMEABILITY = 3.77e-06 FT/seconds = 1.15e-04 CM/seconds

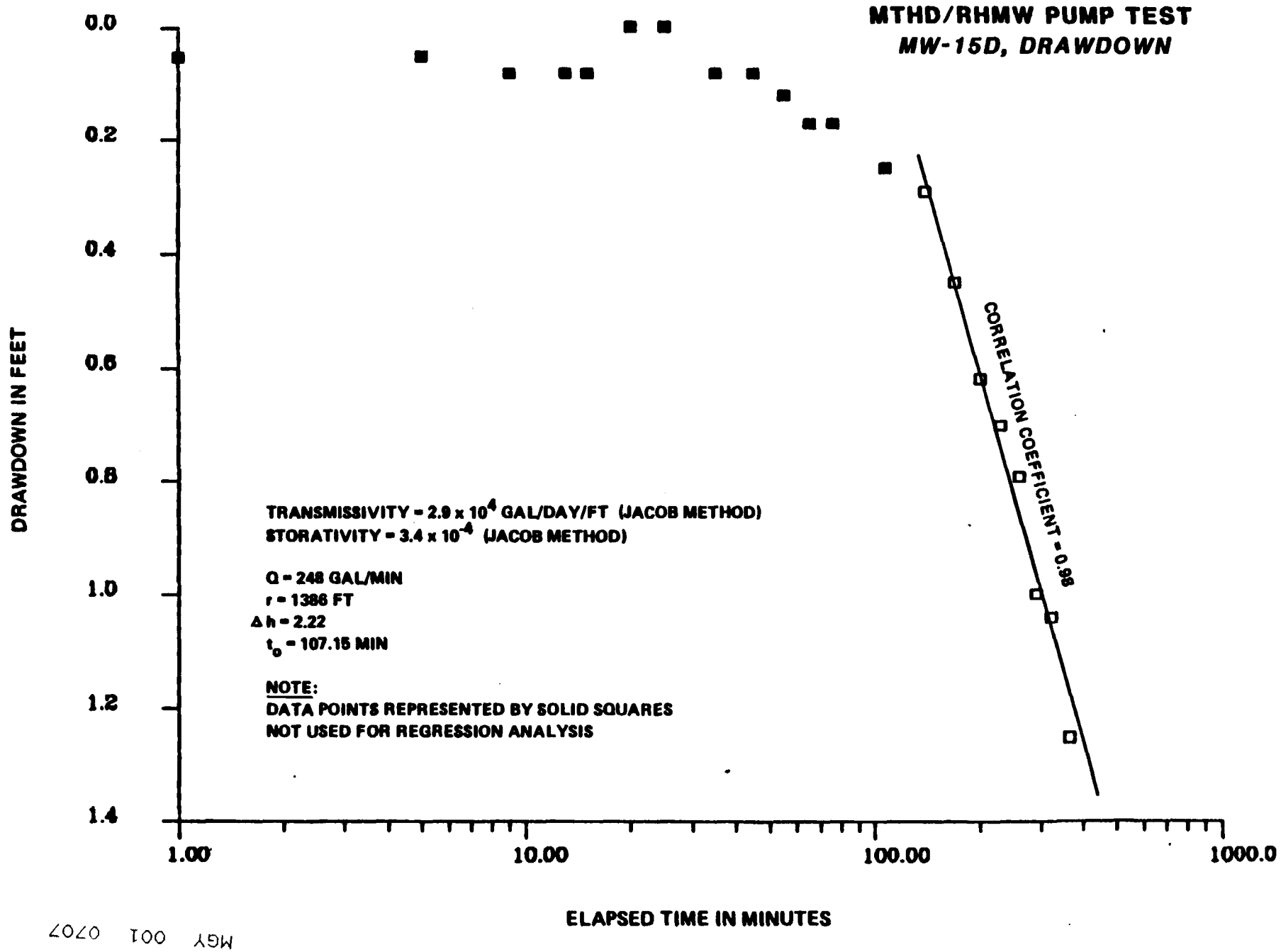
TRANSMISSIVITY = 8.45e-04 FT**2/seconds


MTHD/RHMW PUMP TEST
MW-11D, DRAWDOWN
DRAWDOWN IN FEET
0.000
0.500
1.000
1.500
2.000
2.500
3.000
3.500
4.000
4.500
0.000
2.000
4.000
6.000
8.000
10.000
12.000
14.000
16.000
18.000
20.000
CORRELATION COEFFICIENT = 0.99
TRANSMISSIVITY = 6.4 x 10^3 GAL/DAY/FT (JENKINS–PRENTICE METHOD)
x = 220 FT
t0 = 9.35 min
S = 10^-4 (ASSUMPTION, MEAN VALUE FOR A CONFINED AQUIFER)
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS

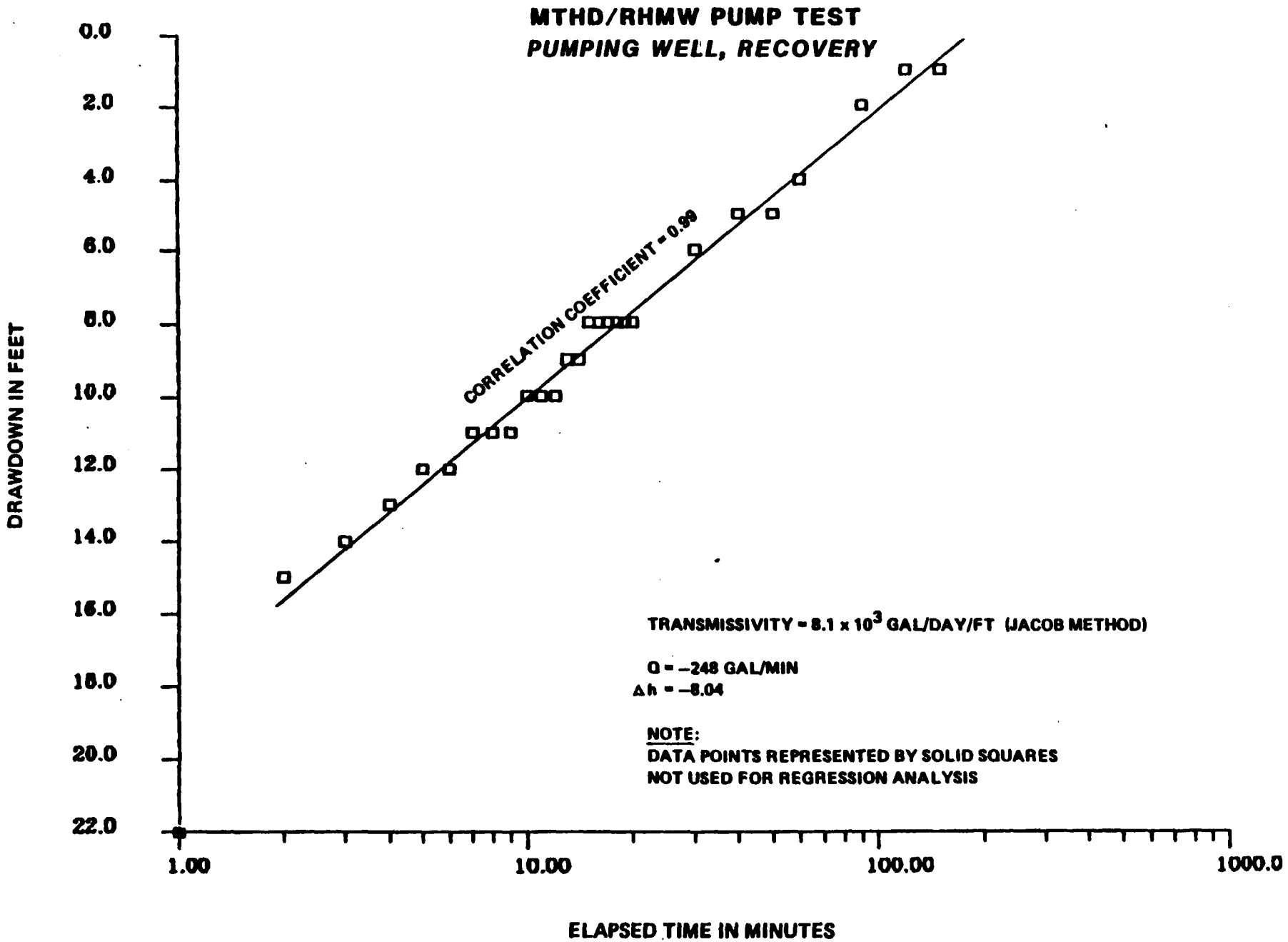
MGY 001 0705


MTHD/RHMW PUMP TEST
MW-10D, RECOVERY
CORRELATION COEFFICIENT = 1.00
TRANSMISSIVITY = 9.4 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = –248 GAL/MIN
Δh = –6.99
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS
DRAWDOWN IN FEET
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
1.00
10.00
100.0
1000.0
ELAPSED TIME IN MINUTES

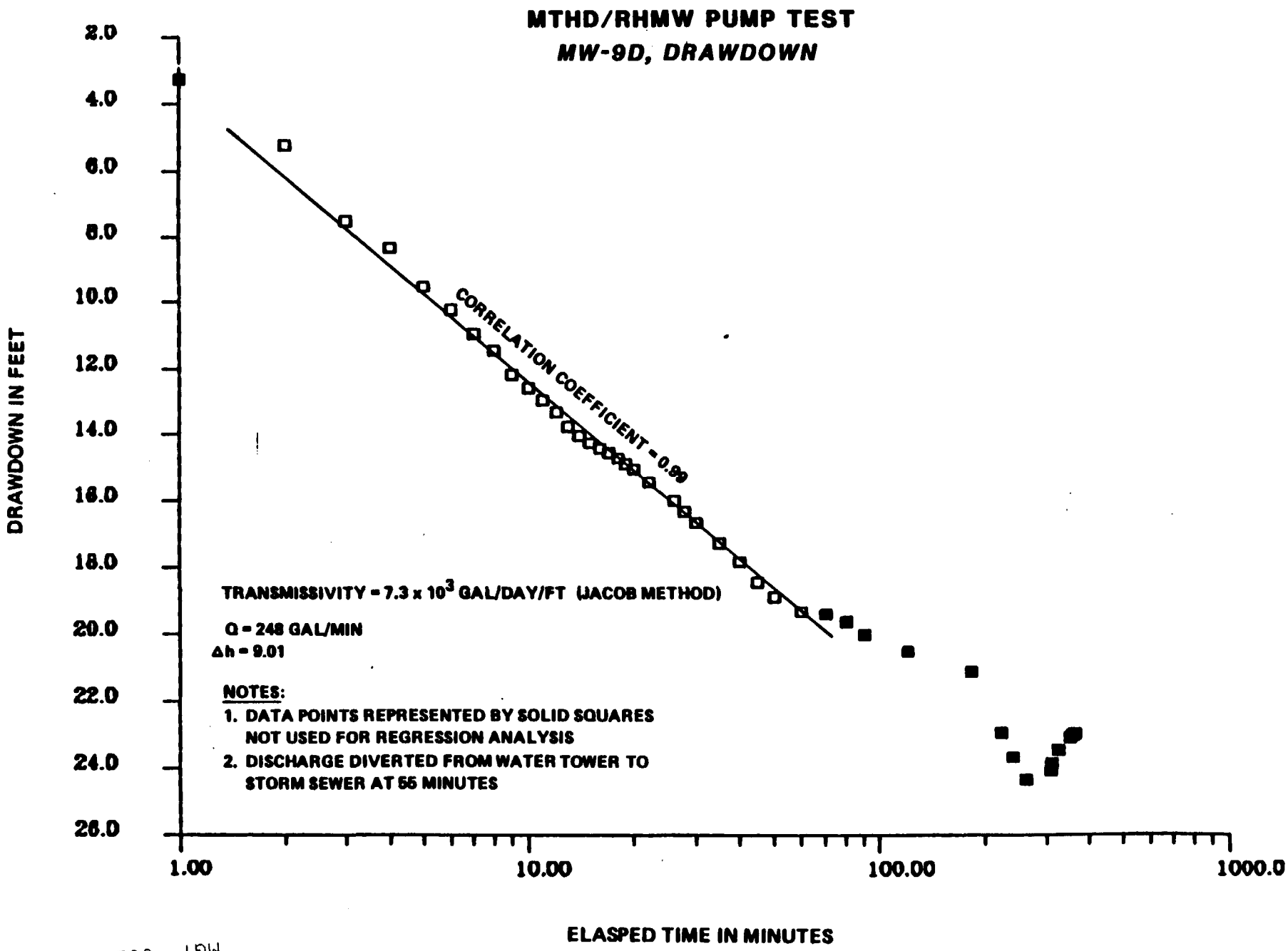
MGY 001 0706


MTHD/RHMW PUMP TEST
MW-15D, DRAWDOWN
DRAWDOWN IN FEET
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES
CORRELATION COEFFICIENT = 0.98
TRANSMISSIVITY = 2.9 x 10^4 GAL/DAY/FT (JACOB METHOD)
STORATIVITY = 3.4 x 10^-4 (JACOB METHOD)
Q = 248 GAL/MIN
r = 1386 FT
Δh = 2.22
t_o = 107.15 MIN
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS

MGY 001 0707


MTHD/RHMW PUMP TEST
PUMPING WELL, RECOVERY
CORRELATION COEFFICIENT = 0.99
TRANSMISSIVITY = 8.1 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = –248 GAL/MIN
Δh = –8.04
NOTE:
DATA POINTS REPRESENTED BY SOLID SQUARES
NOT USED FOR REGRESSION ANALYSIS
DRAWDOWN IN FEET
0.0
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
1.00
10.00
100.00
1000.0
ELAPSED TIME IN MINUTES

MGY 001 0708


MTHD/RHMW PUMP TEST
MW-9D, DRAWDOWN
DRAWDOWN IN FEET
2.0
4.0
6.0
8.0
10.0
12.0
14.0
16.0
18.0
20.0
22.0
24.0
26.0
1.00
10.00
100.00
1000.0
ELASPED TIME IN MINUTES
CORRELATION COEFFICIENT = 0.99
TRANSMISSIVITY = 7.3 x 10^3 GAL/DAY/FT (JACOB METHOD)
Q = 248 GAL/MIN
Δh = 9.01
NOTES:
1. DATA POINTS REPRESENTED BY SOLID SQUARES NOT USED FOR REGRESSION ANALYSIS
2. DISCHARGE DIVERTED FROM WATER TOWER TO STORM SEWER AT 55 MINUTES

MGY 001 0709

# Appendix I

MGY 001 0710

# APPENDIX I

# PRINCETON GAMMA TECH E.C.R.A. INVESTIGATION RESULTS

MGY 001 0711

CHEMICAL ANALYTICAL RESULTS
PRINCETON GAMMA TECH ECRA INVESTIGATION

| Volatile Organic Compounds Detected (ug/l) | Sampling Location | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 | MW - 1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sampling Date | 6/25/87 | 9/25/87 | 10/2/87 | 10/23/87 | 10/30/87 | 11/6/87 | 11/13/87 | 12/2/87 | 12/11/87 | 12/18/87 | 1/21/88 |
| Acetone | | | | | | | | | | | | |
| Methylene Chloride | | 12 | | | | 6.7 | 700 | | | | | |
| Chloroform | | | | | | | | | | | | |
| Chloromethane | | | | 650 | | | | | | | | |
| 1,1 - dichloroethene | | | | | | | | | | 45 | | |
| 1,2 - dichloroethene | | 572 | 260 | 44 | 270 | 1000 | 330 | 4700 | 360 | | | 260 |
| Trichloroethene | | 4846 | 3500 | 650 | 1600 | 4900 | 3500 | 2200 | 3200 | 750 | 3200 | 2100 |
| Tetrachloroethene | | | | | 8.5 | | | | | | | |
| Toluene | | | | | 29 | | | | | | | |
| **Tentatively Identified Volatile Organic Compounds Detected (ug/l)** | | | | | | | | | | | | |
| Ethane, 1,1,2 - trichloro - 1,2,2 - trifloro | | 45 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethene, 1,2 - dichloro- | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Urea, N,N' - dimethyl | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Major Ions Detected (mg/l)** | | | | | | | | | | | | |
| Fluoride | | 1.05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrogen, Ammonia | | 0.213 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloride | | 7.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nitrogen, Nitrate + Nitrite | | 4.35 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Sulfate | | 11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| **Molybdenum Detected (mg/l)** | | | | | | | | | | | | |
| Molybdenum, total | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

Note:

Blank spaces indicate compound not detected above detection limits.
NA - Not Analyzed

| Volatile Organic Compounds Detected (ug/l) | Sampling Location / Sampling Date | MW - 2 6/25/87 | MW - 2 12/18/87 | MW - 2 1/21/88 | MW - 3 12/2/87 | MW - 3 12/11/87 | MW - 3 12/18/87 | MW - 3 1/21/88 | MW - 4 12/2/87 | MW - 4 12/11/87 | MW - 4 12/18/87 | MW - 4 1/21/88 | MW - 7S 6/25/87 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Acetone | | | | | | | | | | | | | 20 |
| Methylene Chloride | | 1.7 | | | | 400 | | | | | | | |
| Chloroform | | | | | | | | | | | | | |
| 1,1 - dichloroethene | | | | | | 570 | | | | 130 | | | |
| 1,2 - dichloroethene | | | | | | | | | 38 | | | 14000 | |
| Trichloroethene | | 171 | 620 | 360 | 630 | 5900 | 1040 | 1400 | 320 | 1700 | 560 | 540 | 136 |
| Tetrachloroethene | | | | | | | | | | 8.2 | | | 41 |
| **Tentatively Identified Volatile Organic Compounds Detected (ug/l)** | | | | | | | | | | | | | |
| Ethane, 1,1,2 - trichloro - 1,2,2 - triflouro | | 35 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 77 |
| Ethene, 1,2 - dichloro- | | 13 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| Urea, N,N' - dimethyl | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4.0 |
| **Major Ions Detected (mg/l)** | | | | | | | | | | | | | |
| Fluoride | | 0.20 | NA | | | | | | NA | NA | NA | NA | |
| Nitrogen, Ammonia | | 0.242 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 0.168 |
| Chloride | | 52 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 12 |
| Nitrogen, Nitrate + Nitrite | | 12.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | 4.46 |
| Sulfate | | 52 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |
| **Molybdenum Detected (mg/l)** | | | | | | | | | | | | | |
| Molybdenum, total | | | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | |

Note:

Blank spaces indicate compound not detected above detection limits.

NA - Not Analyzed

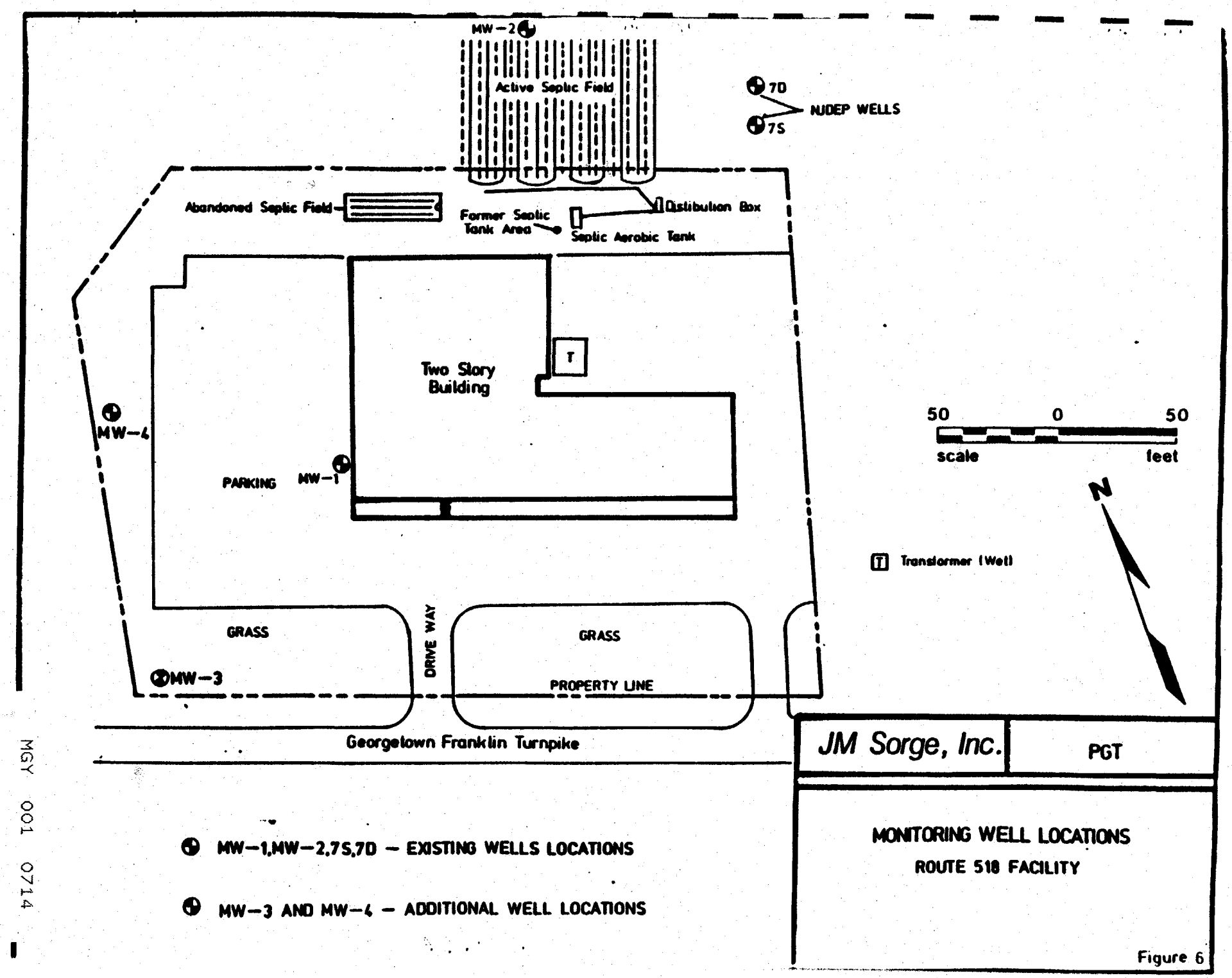

MW-2
Active Septic Field
7D
7S
NJDEP WELLS
Abandoned Septic Field
Distribution Box
Former Septic Tank Area
Septic Aerobic Tank
Two Story Building
T
MW-4
PARKING
MW-1
50
0
50
scale
feet
N
T Transformer (Well)
GRASS
DRIVE WAY
GRASS
MW-3
PROPERTY LINE
Georgetown Franklin Turnpike
JM Sorge, Inc.
PGT
MW-1,MW-2,7S,7D – EXISTING WELLS LOCATIONS
MW-3 AND MW-4 – ADDITIONAL WELL LOCATIONS
MONITORING WELL LOCATIONS
ROUTE 518 FACILITY
Figure 6

TABLE 2

PRINCETON GAMMA TECH
ECRA CASE # 85558
206 FACILITY-DRAINAGE PATH

| SAMPLE # | S-1 | S-2A | S-3A | S-3B | FB | TB |
|---|---|---|---|---|---|---|
| SAMPLING DEPTH(ft) | 1.0-1.5 | 0.0-0.5 | 0.0-0.5 | 1.0-1.5 | | |
| SAMPLING DATE | <----------5-20-87----------> | | | | | |
| ANALYTICAL PARAMETER: | | | | | | |
| PETROLEUM HYDROCARBONS(ppm) | 441 | 1330 | 64 | 35.7 | NA | NA |
| VOLATILE ORGANICS(ppb) | | NA | NA | | | |
| METHYLENE CHLORIDE | 21 B | -- | -- | 8.7 B | 7.4 B | 7.6 B |
| ACETONE | 6.5 J | -- | -- | ND | ND | ND |
| CHLOROFORM | ND | -- | -- | ND | 9.2 | ND |
| LIBRARY SEARCH(ppb)* | | | | | | |
| ETHANE,1,1,2-TRICHLORO-1,2,2-TRIFLOURO | 46 | -- | -- | 44 | 220 | 240 |

NOTES:
- J - BELOW METHOD DETECTION LIMIT
- B - ANALYTE ALSO FOUND IN METHOD BLANK
- ND - NOT DETECTED
- NA - NOT ANALYZED
- ppb - PARTS PER BILLION
- ppm - PARTS PER MILLION
- FB - FIELD BLANK
- TB - TRIP BLANK
- * - ESTIMATED CONCENTRATIONS

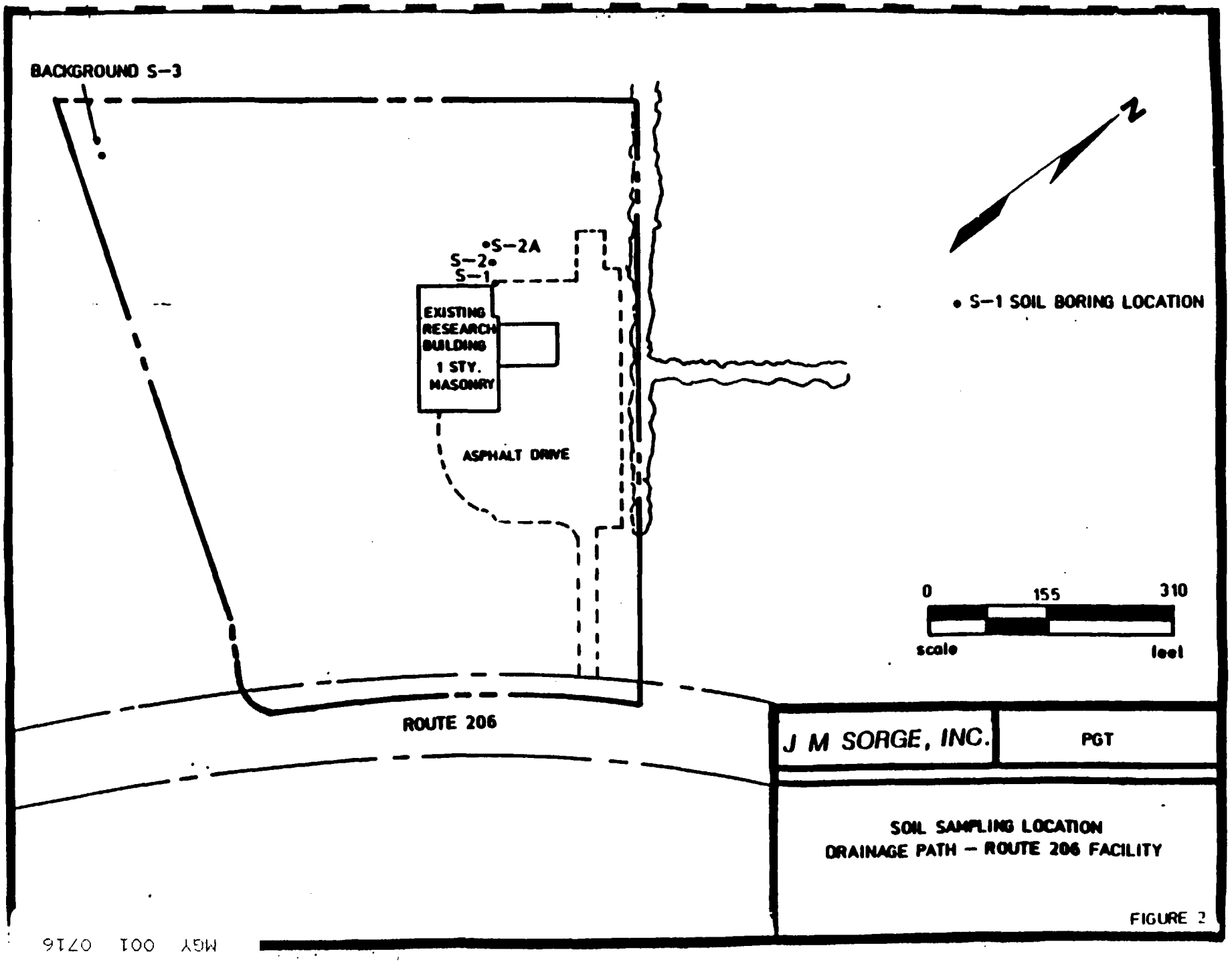

BACKGROUND S-3
•S-2A
S-2•
S-1
EXISTING RESEARCH BUILDING
1 STY. MASONRY
ASPHALT DRIVE
ROUTE 206
N
• S-1 SOIL BORING LOCATION
0
155
310
scale
feet
J M SORGE, INC.
PGT
SOIL SAMPLING LOCATION
DRAINAGE PATH – ROUTE 206 FACILITY
FIGURE 2

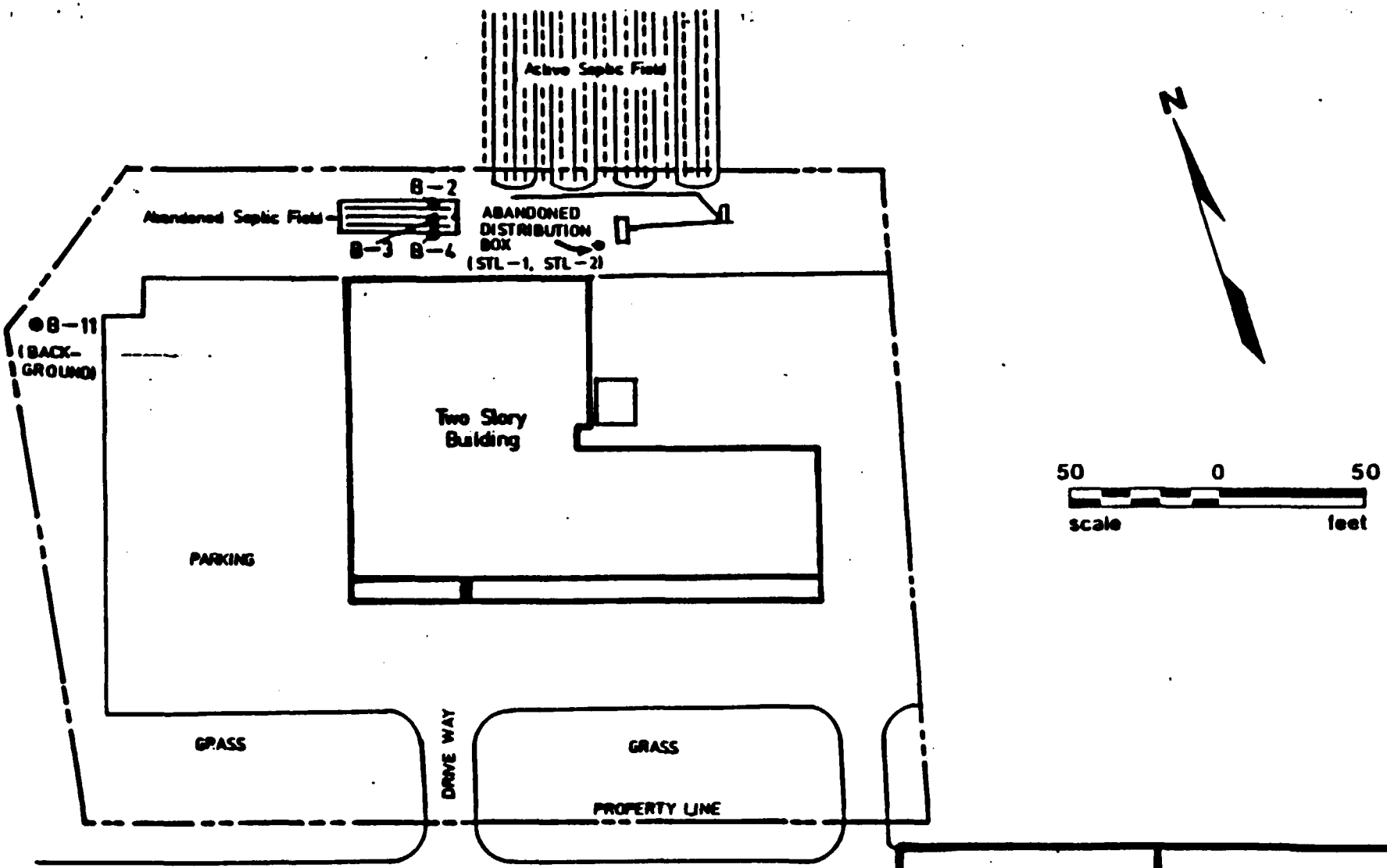
TABLE 3
PRINCETON GAMMA TECH.
ECRA CASE # 85558
FORMER SEPTIC SYSTEM-518 FACILITY

| | <----------ABANDONED SEPTIC FIELD-------> | | | | <-BACKGROUND SAMPLES-> | | <ABANDONED DIST. BOX> | |
|---|---|---|---|---|---|---|---|---|
| SAMPLE # | B-2 | B-3A | B-3 | B-4 | B-11 | B-11B | STL-1 | STS-2 |
| SAMPLING DEPTH(ft) | 12.0 | 6.0 | 12.0 | 12.0 | 6.0 | 12.0 | | |
| SAMPLING DATE | 5/19/87 | 5/26/87 | 5/26/87 | 5/26/87 | 5/26/87 | 5/26/87 | 5/20/87 | 5/20/87 |
| MATRIX: | <----------SOIL----------> | | | | | | <---LIQUID SLUDGE---> | |
| ANALYTICAL PARAMETER: | | | | | | | | |
| VOLATILE ORGANICS(ppb) | | | | | | | | |
| METHYLENE CHLORIDE | ND | 6.7 | 4.1 J | 16 | 13 | 8.6 | ND | 24 J |
| CHLOROFORM | ND | 8.9 | 15 | 14 | 4.8 J | 15 | ND | ND |
| TRICHLOROETHYLENE | ND | ND | 8 | ND | ND | ND | ND | 147 |
| ACETONE | ND | ND | ND | ND | 10 | ND | ND | 71 |
| 2-HEXANONE | ND | ND | ND | ND | ND | ND | 3 J | ND |
| 1,1,2,2-TETRACHLOROETHANE | ND | ND | ND | ND | ND | ND | 2.1 J | ND |
| TOLUENE | ND | ND | ND | ND | ND | ND | ND | 55 |
| LIBRARY SEARCH(ppb)* | | | | | | | | |
| ETHANE,1,1,2-TRICHLORO-1,2,2-TRICHLORO- | 81 | 55 | 130 | 94 | 64 | 92 | 18 | 130 |
| BENZENE,1,4-DICHLORO- | ND | ND | ND | ND | ND | ND | ND | 18 |
| UNKNOWN | -- | 6 | -- | -- | -- | -- | -- | -- |

FIELD/TRIP BLANK SUMMARY
BY DATE

| SAMPLE # | FB | TB | FB | TB | FB | TB |
|---|---|---|---|---|---|---|
| SAMPLING DATE: | 5/19/87 | | 5/20/87 | | 5/26/87 | |
| VOLATILE ORGANICS(ppb) | | | | | | |
| METHYLENE CHLORIDE | 6.3 B | 13 B | 7.6 B | 7.4 B | 14 | 7.2 |
| CHLOROFORM | 15 | 19 | 11 | 9.2 | 12 | ND |
| ACETONE | 3.7 J | 2.9 J | ND | ND | ND | ND |
| LIBRARY SEARCH(ppb)* | | | | | | |
| ETHANE,1,1,2-TRICHLORO-1,2,2-TRICHLORO- | 250 | 46 | 240 | 220 | 360 | 250 |
| UNKNOWN | -- | 4 | -- | -- | -- | -- |

NOTES:
J - BELOW METHOD DETECTION LIMIT.
B - ANALYTE ALSO FOUND IN METHOD BLANK.
ND - NOT DETECTED.
ppb - PARTS PER BILLION.
FB - FIELD BLANK.
TB - TRIP BLANK.
* - ESTIMATED CONCENTRATION.




J M SORGE, INC.

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B-1 BORING LOCATION

STL-1, STL-2 ABANDONED DISTRIBUTION BOX SAMPLES

SAMPLING LOCATIONS
FORMER SEPTIC SYSTEM
ROUTE 518 FACILITY

Figure 4

MGY 001 0718

TABLE 4
PRINCETON GAMMA TECH.
ECRA CASE # 85558
ACTIVE SEPTIC FIELD-518 FACILITY

| | <--SEPTIC/AEROBIC TANK--> | | | |
|---|---|---|---|---|
| SAMPLE # | ATL-1 | ATS-2 | FB | TB |
| MATRIX: | <LIQUID> | <SLUDGE> | | |
| SAMPLING DATE | 5/20/87 | 5/20/87 | 5/20/87 | 5/20/87 |
| ANALYTICAL PARAMETER: | | | | |
| VOLATILE ORGANICS(ppb) | | | | |
| METHYLENE CHLORIDE | ND | 420 | 7.6 B | 7.4 B |
| CHLOROFORM | 2.2 J | 3.6 J | 11 | 9.2 |
| TRICHLOROETHYLENE | 15 | ND | ND | ND |
| ACETONE | ND | 1.2 J | ND | ND |
| TOLUENE | ND | 42 | ND | ND |
| 1,1,1-TRICHLOROETHANE | 4.1 J | ND | ND | ND |
| LIBRARY SEARCH(ppb)* | | | | |
| ETHANE,1,1,2-TRICHLORO-1,2,2-TRIFLOURO | 31 | 150 | 240 | 220 |
| BENZENE,1,4-DICHLORO | ND | 31 | ND | ND |
| DISULFIDE,DIMETHYL | 10 | 640 | ND | ND |
| METHANE,THIOBIS | ND | 200 | ND | ND |

| | <----PIPE JUNCTION---> | | | |
|---|---|---|---|---|
| SAMPLE # | PL-1 | PL-2 | FB | TB |
| MATRIX: | <-------SOIL---------> | | | |
| SAMPLING DATE | 8/12/87 | 8/12/87 | 8/12/87 | 8/12/87 |
| VOLATILE ORGANICS(ppb) | | | | |
| METHYLENE CHLORIDE | 20 B | 19 B | 5.6 B | 6.2 B |
| ACETONE | 447 | ND | 1673 | ND |
| 2-HEXANONE | 20 B | 3.8 JB | ND | 4.4 JB |
| TOLUENE | 9.6 B | 11 B | 2.8 JB | 2.7 JB |
| 4-METHYL-2-PENTANONE | 26 B | 5.6 JB | ND | 5.3 JB |
| 1,1,2,2-TETRACHLOROETHANE | 6.8 J | ND | ND | ND |
| TETRACHLOROETHLENE | ND | ND | 4.6 J | 1.7 J |
| LIBRARY SEARCH(ppb)* | | | | |
| UNKNOWN | 90 | -- | 8 | -- |

NOTES:
J - BELOW METHOD DETECTION LIMIT
B - ANALYTE ALSO FOUND IN METHOD BLANK
ND - NOT DETECTED
ppb - PARTS PER BILLION
FB - FIELD BLANK
TB - TRIP BLANK
* - ESTIMATED CONCENTRATION

MGY 001 0719

TABLE 5

PRINCETON GAMMA TECH
ECRA CASE # 85558
ACTIVE DISPOSAL FIELD-518 FACILITY

SOIL SAMPLING RESULTS SUMMARY

| SAMPLE # | B-5 | B-6 | B-7 | B-8 | B-9A | B-9 | B-10 | B-11A | B-11 |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLING DEPTH(ft) | 12.0 | 12.0 | 12.0 | 12.0 | 2.0 | 12.0 | 12.0 | 2.0 | 12.0 |
| SAMPLING DATE | 5/26/87 | 5/26/87 | 5/26/87 | 5/18/87 | 5/18/87 | 5/18/87 | 5/26/87 | 5/26/87 | 5/26/87 |
| ANALYTICAL PARAMETER: | | | | | | | | | |
| VOLATILE ORGANICS(ppb) | | | | | | | | | |
| METHYLENE CHLORIDE | ND | 4 J | 4.2 J | 3.9 JB | 12 B | 7.8 B | 4 J | 25 | 8.6 B |
| CHLOROFORM | ND | 13 | 24 | ND | ND | ND | 12 | 16 | 15 |
| ACETONE | ND | ND | ND | 5.6 J | 49 | ND | ND | 2 J | ND |
| 4-METHYL-2-PENTANONE | ND | ND | ND | 2.3 J | ND | ND | ND | ND | ND |
| 2-HEXANONE | ND | ND | ND | 1.5 J | ND | ND | ND | ND | ND |
| BROMODICHLOROMETHANE | ND | ND | 5.7 | ND | ND | ND | ND | ND | ND |
| LIBRARY SEARCH(ppb)* | | | | | | | | | |
| ETHANE,1,1,2-TRICHLORO-1,2,2-TRIFLOURO | 81 | 110 | 120 | 25 | 150 | 210 | 88 | 110 | 92 |
| BENZENE,1,4-DICHLORO | ND | ND | ND | ND | ND | ND | ND | 18 | ND |

FIELD/TRIP BLANK SUMMARY

| | 5/18/87 | | 5/26/87 | |
|---|---|---|---|---|
| | FB | TB | FB | TB |
| VOLATILE ORGANICS(ppb) | | | | |
| METHYLENE CHLORIDE | 5.9 B | 5.2 B | 14 | 7.2 |
| CHLOROFORM | ND | ND | 12 | ND |
| ACETONE | 8.3 | ND | ND | ND |
| LIBRARY SEARCH(ppb)* | | | | |
| ETHANE,1,1,2-TRICHLORO-1,2,2-TRIFLOURO | 180 | 150 | 340 | 250 |

NOTES:
J - BELOW METHOD DETECTION LIMIT
B - ANALYTE ALSO FOUND IN METHOD BLANK
ND - NOT DETECTED
ppb - PARTS PER BILLION
FB - FIELD BLANK
TB - TRIP BLANK
* - ESTIMATED CONCENTRATION

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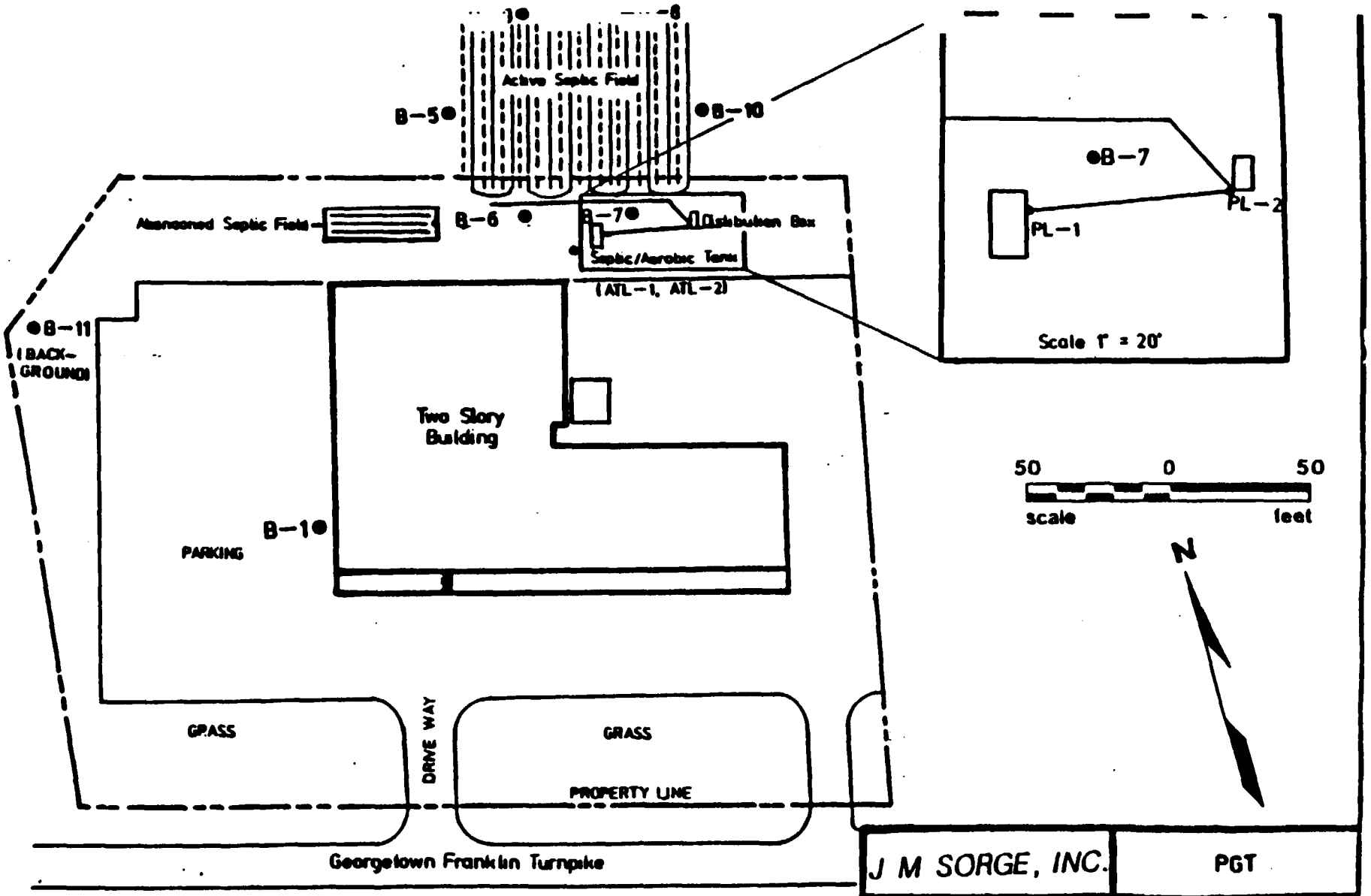


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B-1 BORING LOCATION

ATL-1, ATL-2 — TANK CONTENT SAMPLES

PL-1, PL-2 — PIPING JUNCTION SAMPLES

SAMPLING LOCATIONS
ACTIVE SEPTIC SYSTEM
ROUTE 518 FACILITY

Figure 5

MGY 001 0721

# Appendix J

MGY 001 0722

TABLE J-2. BASIC PROPERTIES OF INDICATOR CHEMICALS

| | CAS Number | Molecular Formula | Molecular Weight | Phase at 25°C | Density g/ml | Solubility in Water mg/L | Boiling Point °C | Melting Point °C | Vapor Pressure mm Hg | Color |
|---|---|---|---|---|---|---|---|---|---|---|
| Trichloroethene | 79-01-6 | $C_2HCl_3$ | 131.40 | liquid | 1.464 | $1.10 \times 10^3$ | 87 | -73 | 58 | colorless |
| Tetrachloroethene | 127-18-4 | $C_2Cl_4$ | 165.85 | liquid | 1.62 | $1.50 \times 10^2$ | 121 | -19 | 14 | colorless |
| Chlordane | 57-74-9 | $C_{10}H_6Cl_8$ | 409.80 | viscous liq. | | $5.60 \times 10^{-1}$ | decomposes | | $1 \times 10^{-5}$ | amber |
| 1,1-Dichloroethene | 75-35-4 | $C_2H_2Cl_2$ | 96.95 | liquid | 1.21 | $2.25 \times 10^3$ | 32 | -122.1 | $6 \times 10^2$ | colorless |
| Arsenic | 7440-38-2 | As | 74.92 | solid | 5.727 | insol. | 613 sublimes | 817 | 0.00 | gray, shiny |
| Barium | 7440-39-3 | Ba | 137.33 | solid | 3.6 | decomposes | 1640 | 725 | 0.00 | yellowish, white |
| Beryllium | 7440-41-7 | Be | 9.01 | solid | 1.85 | insol. | 2500 | 1287 | 0.00 | gray |
| Chromium | 7440-47-3 | Cr | 51.996 | solid | 7.20 | insol. | 2642 | 1900 | 0.00 | steel gray |
| Lead | 7439-92-1 | Pb | 207.2 | solid | 11.288 | insol. | 1740 | 327.4 | 0.00 | bluish-white, silvery gray |
| Nickel | 7440-02-0 | Ni | 58.69 | solid | 8.9 | insol. | 2837 | 1550 | 0.00 | lustrous white/silver |
| Silver | 7440-22-4 | Ag | 107.87 | solid | 10.5 | insol. | 2000 | 960.5 | 0.00 | white metallic |

Note: Standard chemical references list most metals as being insoluble in water. However, the presence of metals in the water samples collected at MTHD indicate that, in some forms, metals can be slightly soluble.

TABLE J-3. DOT HAZARD CLASS AND CHEMICAL FATE DATA FOR INDICATOR CHEMICALS

| | DOT HAZARD CLASS 49 CFR 172 | Log Kow | Koc ml/g | Henry's Law Coefficient atm/m$^3$/mol | Fish BCF (l/kg) |
|---|---|---|---|---|---|
| Trichlorethene | No DOT Hazard Class (ORM-A) Toxic by inhalation | 2.38 | 126 | $9.1 \times 10^{-3}$ | 10.6 |
| Tetrachloroethene | No DOT Hazard Class (ORM-A) Moderately toxic | 2.6 | 364 | $2.59 \times 10^{-2}$ | 31 |
| Chlordane | Flammable Liquid Toxic by ingestion, inhalation and contact | 3.32 | $1.4 \times 10^{5}$ | $9.63 \times 10^{-6}$ | $1.4 \times 10^{4}$ |
| 1,1-Dichloroethene | Flammable Liquid | 1.84 | 65 | $3.40 \times 10^{-2}$ | 5.6 |
| Arsenic | POISON B Highly toxic by inhalation and ingestion | NA | NA | NA | 44 |
| Barium | No DOT Hazard Class | NA | NA | NA | NA |
| Beryllium | POISON B Highly toxic by inhalation | NA | NA | NA | 19 |
| Chromium$^{+3}$ | No DOT Hazard Class (ORM-E) Carcinogenic | NA | NA | NA | 16 |
| Chromium$^{+6}$ | No DOT Hazard Class (ORM-E) Carcinogenic | NA | NA | NA | 16 |
| Lead | POISON B Toxic by inhalation and ingestion | NA | NA | NA | 49 |
| Nickel | POISON B Carcinogenic/Toxic | NA | NA | NA | 47 |
| Silver | Various Hazard Classes depending on compound | NA | NA | NA | $3.08 \times 10^{3}$ |

1. Koc estimated by the following equation: log Koc = (-0.55* logS) + 3.64 (Note: S in mg/l)
2. NA = information not available
3. Log of the octanol water partitioning coefficient

TABLE J-4. INDICATOR CHEMICAL SELECTION

| Substance | Priority Group[1] | Maximum Concentration (ug/l) RW | Maximum Concentration (ug/l) MW | ARAR Standard[3] (ug/l) | # Detected / # Analyzed[4] RW | # Detected / # Analyzed[4] MW | Blanks | Carcinogenic[5] Weight of Evidence Oral | Carcinogenic[5] Weight of Evidence Inhal | Other Notes | Include as Indicator Chemical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Tetrachloroethene | 1 | 26 [6] | 53 | 1 | 7/37 [7]<br>1/6 [8] | 4/25 [7]<br>9/25 [8] | OK | B2 | B2 | Detected in wells 1979 through 1987. Low levels. | Yes |
| Ethylbenzene | 3 | 5.3 | - | 680 | 1/37 | 0/25 | OK | - | - | Only detected once, low concentration | No |
| Chloroform | 1 | - | 19 [6] | 100 | 1/37 [7]<br>- [8] | 4/25 [7]<br>4/25 [8] | OK | B2 | B2 | One high reading in 1982. Detected levels range 2-11 ppb. | No |
| Chlordane | 2 | 0.76 | 1.3 | 0.5 | 1/37 | 1/25 | OK | B2 | B2 | Low level contamination one residential well, one monitoring well 1986. High KoC. | Yes |
| Toluene | 2 | - | - | 2,000 | 1/37 | 0/25 | OK | - | - | Detected only twice over time, once 1982, once in 1986. Low concentrations. | No |
| Carbon Tetrachloride | 2 | - | - | 2 | 0/37 | 0/25 | NA | B2 | B2 | Not detected in RI (1986) samples. Detected in five Montg. township residential wells in 1980 sampling round only. | No |
| 1,1-Dichloroethene | 2 | 44 | - | 2 | 0/37 [7]<br>1/6 [8] | 0/25 [7]<br>- [8] | NA | C | C | Detected in a variety of wells over time. Not detected in 1986 sampling detected in one well in 1987. | Yes |

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TABLE J-4. INDICATOR CHEMICAL SELECTION (CONTINUED)

| Substance | Priority Group[1] | Maximum Concentration (ug/l) RW | Maximum Concentration (ug/l) MW | ARAR Standard[3] (ug/l) | # Detected / # Analyzed[4] RW | # Detected / # Analyzed[4] MW | Blanks | Carcinogenic[5] Weight of Evidence Oral | Carcinogenic[5] Weight of Evidence Inhal | Other Notes | Include as Indicator Chemical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,2-Dichlorethane | 2 | - | - | 2 | 0/37 | 0/25 | NA | B2 | B2 | Detected in four Montgomery township residential wells in 1982 only. | No |
| Trichlorofluoromethane | 4 | - | - | - | 0/37 | 0/25 | NA | - | - | Detected in one Montgomery township housing development residential well in 1980. Detected in a couple of other wells which were not identified as in the development. | No |
| Bromodichloromethane | 2 | - | - | 100 | 1/37 | 0/25 | OK | - | - | Part of trihalomethanes. Detected in one sample 1982 one in 1986. | No |
| 1,1-Dichloroethane | 3 | 8.6 | 19 | - | 10/37 (7)<br>3/6 (8) | 0/25 (7)<br>7/25 (8) | OK | - | - | Low level contamination detected in 1987, 1986, and 1982. Detected in eight housing development wells 1982. | No |
| 1,1,1-Trichloroethane | 3 | 37 | 2 | 26 | 1/37 (7)<br>1/6 (8) | 0/25 (7)<br>1/25 (8) | OK | - | - | Low level contamination 1986 and 1987. Some low level contamination other years. | No |
| Trichloroethene | 1 | 340 | 650 | 1 | 21/37 (7)<br>5/6 (8) | 8/25 (7)<br>14/25 (8) | OK | B2 | B2 | Water solubility 1.1 X $10^3$ mg/l. Contaminant most frequently detected over time. Many occurrences over 100 ug/l. | Yes |

TABLE J-4. INDICATOR CHEMICAL SELECTION (CONTINUED)

| Substance | Priority Group[1] | Maximum Concentration (ug/l) RW | Maximum Concentration (ug/l) MW | ARAR Standard[3] (ug/l) | # Detected / # Analyzed[4] RW | # Detected / # Analyzed[4] MW | Blanks | Carcinogenic[5] Weight of Evidence Oral | Carcinogenic[5] Weight of Evidence Inhal | Other Notes | Include as Indicator Chemical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Methylene Chloride | 1 | 18.1 | 12 | 2 | 16/37 [7]<br>4/6 [8] | 10/25 [7]<br>15/25 [8] | CONT | B2 | B2 | Present in blanks at same levels as in samples. Present in background wells. | No |
| Acetone | NL | 12 | 80 | - | 13/37 [7]<br>1/6 [8] | 8/25 [7]<br>3/25 [8] | CONT | - | - | Low toxicity, low level of concentration with some blank contamination. | No |
| Diethyl phthalate | 4 | 4.2 [6] | 58 | - | 1/37 | 2/25 | OK | - | - | | No |
| Trans-1,2-Dichloro-ethene | 3 | 17 | 37 | 10 | 10/37 [7]<br>4/6 [8] | 3/25 [7]<br>10/25 [8] | OK<br>OK | - | - | Low level contamination | No |
| O-Dichlorobenzene | 4 | - | - | 600 | 0/37 | 0/25 | NA | - | - | Detected in two wells in 1982 only. Not detected in RI sampling. | No |
| 1,2,4-Trichlorobenzene | 4 | - | - | 8 | 0/37 | 0/25 | NA | - | - | Detected in two wells in 1982 only. Not detected in RI sampling. | No |
| N-Butyl-benzene | NL | - | - | - | - | - | NA | - | - | Detected in only two wells in 1982. Unclear whether analysis was done at other sampling dates. Not detected in RI sampling. | No |
| 2,3-Benzofuran | NL | - | - | - | - | - | NA | - | - | Detected in only two wells in 1982. Unclear whether analysis was done at other sampling dates. Not detected in RI sampling. | No |

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TABLE J-4. INDICATOR CHEMICAL SELECTION (CONTINUED)

| Substance | Priority Group[1] | Maximum Concentration (ug/l) RW | Maximum Concentration (ug/l) MW | ARAR Standard[3] (ug/l) | # Detected / # Analyzed[4] RW | # Detected / # Analyzed[4] MW | Blanks | Carcinogenic[5] Weight of Evidence Oral | Carcinogenic[5] Weight of Evidence Inhal | Other Notes | Include as Indicator Chemical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Cyclopropylbenzene | NL | - | - | - | - | - | NA | - | - | Detected in only two wells in 1982. Unclear whether analysis was done at other sampling dates. Not detected in RI sampling. | No |
| N-Nitrosodiphenylamine | 1 | - | 2.6 [6] | - | 0/37 | 1/25 | OK | - | - | Found in monitoring well. One sample only. | No |
| Bis(2-ethylhexyl)phthlate | 1 | - | 48 | 51 | 0/37 | 11/25 | CONT | B2 | B2 | Found in monitoring wells only, below level of standard. | No |
| Di-n-butylphthlate | 3 | - | - | - | 1/37 | - | CONT | - | - | Minimal contamination. | No |
| Phenols | 2-4 | 54 | 63 | - | 5/37 | 2/25 | OK | * | * | *Some phenols are B2 weighted, others are not listed. | No |
| Aluminum | NL | 191 [6] | 140,000 | 3,500 | 34/37 | 25/25 | CONT | - | - | All reported values are below detection and are estimates except for 3 samples. Trip: 135[6] Field: 222 ug/l | No |
| Arsenic | 1 | 39 | 186* | 50 | 13/27 | 11/25 | OK | A | A | * Was not detected in duplicate sample. Some other values above detection limits. | Yes |
| Barium | NL | 306 | 2,300 | 1,000 | 37/37 | 25/25 | CONT | - | - | 4 of the 37 were above level of detection. | Yes |

TABLE J-4. INDICATOR CHEMICAL SELECTION (CONTINUED)

| Substance | Priority Group(1) | Maximum Concentration (ug/l) RW | Maximum Concentration (ug/l) MW | ARAR Standard(3) (ug/l) | # Detected / # Analyzed(4) RW | # Detected / # Analyzed(4) MW | Blanks | Carcinogenic(5) Weight of Evidence Oral | Carcinogenic(5) Weight of Evidence Inhal | Other Notes | Include as Indicator Chemical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Manganese | NL | 295 | 6,370 | 50 | 33/37 | 23/25 | CONT | - | - | | No |
| Mercury | 2 | 0.24 | 0.44 | 2 | 20/36 | 2/25 | CONT | - | - | | No |
| Nickel | 1 | 71 | 340 | 350 | 32/36 | 7/25 | CONT | A | A | Carcinogen. Eight readings above detection limit, highest in MW3D, also in MW3S. Possible grout contamination in MW3D. | Yes |
| Potassium | - | 1,900 (6) | 56,600 | - | 4/36 | 24/25 | - | - | - | | No |
| Silver | 3 | 180 | 36 | 50 | 21/36 | 7/25 | CONT | - | - | Frequently detected, one reading in RW above standard, 24 readings above detection limit. | Yes |
| Sodium | - | 57,900 | 88,400 | 50,000 | 36/36 | 25/25 | CONT | - | - | American Heart Association suggests 20 mg/l. EPA does not have health based standard. | No |
| Thallium | 4 | 5.5 (6) | - | - | 3/36 | - | CONT | - | - | | No |
| Vanadium | - | 42,600 | 225 | - | 33/36 | 15/25 | CONT | - | - | | No |
| Zinc | 2 | 205 | 958 | 5,000 | 36/36 | 25/25 | CONT | - | - | | No |
| Cyanide | 1 | 99 | - | 200 | 1/36 | 0/25 | OK | - | - | | No |

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(1) Priority Group from Federal Regulations.
(2) Maximum concentration detected in any of the sampling rounds, data from Table B-1.
(3) Standard referenced in Table 2-1.
(4) Number of times the contaminant was detected/number of samples analyzed.
(5) Carcinogenic weight of evidence for oral and inhaled exposures from USEPA 1986b. Explanation of classifications:

| | | |
|---|---|---|
| A | Human Carcinogen | (Sufficient evidence from epidemiologic results to support a causal association between exposure and cancer.) |
| B1 | Probable Human Carcinogen | (Limited evidence of carcinogenicity in humans from epidemiologic studies.) |
| B2 | Probable Human Carcinogen | (Sufficient evidence of carcinogenicity in animals, inadequate evidence of carcinogenicity in humans.) |
| C | Possible Human Carcinogen | (Limited evidence of carcinogenicity in animals.) |
| D | Not Classified | (Inadequate evidence of carcinogenicity in animals.) |
| E | No Evidence of Carcinogenicity in Humans | (No evidence for carcinogenicity in at least two adequate animal tests or in both epidemiologic and animal studies.) |

(6) The concentration listed is an estimated value which is less than the specified minimum detection limit but is greater than zero.
(7) First Round of Sampling.
(8) Second Round of Sampling.

NL - Not Listed
CONT - Contamination in blanks
RW - Residential Well
MW - Monitoring Well

TABLE J - 1. SCORING FOR INDICATOR CHEMICAL SELECTION

| | C plume max. conc.(a) (ug/l) | C plume mean conc.(b) (ug/l) | NC/PC (c) | T toxicity factor(d) (oral) (water) | CT/IS (max) (e) | CT/IS (mean) (f) | Tentative rank (max) | Tentative rank (mean) |
|---|---|---|---|---|---|---|---|---|
| arsenic | 186 | 13.40 | PC | 4.07E+00 | 757.0 | 54.5 | 1 | 1 |
| 1,1-dichloroethene* | 44 | 5.45 | PC | 1.23E-01 | 5.4 | 0.7 | 2 | 2 |
| trichloroethene* | 650 | 69.77 | PC | 4.29E-03 | 2.8 | 0.3 | 3 | 3 |
| chloroform* | 19 | 5.46 | PC | 5.63E-02 | 1.1 | 0.3 | 4 | 4 |
| chlordane | 1.3 | 0.50 | PC | 4.32E-01 | 0.6 | 0.2 | 5 | 5 |
| tetrachloroethene* | 53 | 7.41 | PC | 8.86E-03 | 0.47 | 0.07 | 6 | 6 |
| bis(2-ethylhexyl)phthalate | 48 | 3.81 | PC | 5.71E-04 | 0.027 | 0.002 | 7 | 7 |
| beryllium | 17 | 5.50 | PC | NA | | | | |
| cadmium | 9.8 | 5.00 | Pc | NA | | | | |
| methylene chloride* | 24 | 4.65 | PC | NA | | | | |
| nickel | 340 | 51.80 | PC | NA | | | | |
| chromium | 406 | 22.80 | PC | NA | | | | |
| barium | 2300 | 173.65 | NC | 4.08E+00 | 9384.0 | 708.5 | 1 | 1 |
| vanadium | 42600 | 801.39 | NC | 1.43E-01 | 6091.8 | 114.6 | 2 | 6 |
| silver | 180 | 14.90 | NC | 2.00E+01 | 3600.0 | 298.0 | 3 | 2 |
| arsenic | 186 | 13.40 | NC | 1.80E+01 | 3348.0 | 241.2 | 4 | 4 |
| lead | 2170 | 90.30 | NC | 8.93E-01 | 1937.8 | 80.6 | 5 | 7 |
| nickel | 340 | 51.80 | NC | 4.26E+00 | 1448.4 | 220.7 | 6 | 5 |
| trichloroethene* | 650 | 69.77 | NC | 1.05E+00 | 682.5 | 73.3 | 7 | 8 |
| antimony | 114 | 63.04 | NC | 4.35E+00 | 495.9 | 274.2 | 8 | 3 |
| copper | 581 | 73.09 | NC | 7.14E-01 | 414.8 | 52.2 | 9 | 9 |
| zinc | 958 | 103.80 | NC | 1.07E-01 | 102.5 | 11.1 | 10 | 11 |
| cadmium | 9.8 | 5.00 | NC | 4.45E+00 | 43.610 | 22.25 | 11 | 10 |
| 1,1-dichloroethene* | 44 | 5.40 | NC | 3.71E-01 | 16.3 | 2.0 | 12 | 14 |
| mercury | 0.44 | 0.21 | NC | 1.84E+01 | 8.1 | 3.9 | 13 | 12 |
| phenol | 54 | 14.01 | NC | 1.00E-01 | 5.4 | 1.4 | 14 | 15 |
| di-n-butylphthalate | 10 | 10.00 | NC | 3.81E-01 | 3.8 | 3.8 | 15 | 13 |
| 1,2-dichloroethene* | 37 | 6.43 | NC | 5.29E-02 | 2.0 | 0.3 | 16 | 16 |
| tetrachloroethene* | 53 | 7.41 | NC | 9.62E-03 | 0.51 | 0.07 | 17 | 19 |
| 1,1-dichloroethane* | 19 | 5.15 | NC | 2.58E-02 | 0.5 | 0.1 | 18 | 17 |
| ethylbenzene | 5.3 | 5.55 | NC | 1.10E-02 | 0.1 | 0.1 | 19 | 18 |
| 1,1,1-trichloroethane* | 37 | 5.32 | NC | 7.33E-04 | 0.027 | 0.004 | 20 | 21 |
| toluene | 5 | 5.00 | NC | 5.20E-03 | 0.03 | 0.03 | 21 | 20 |
| methylene chloride* | 24 | 4.65 | NC | 9.20E-04 | 0.022 | 0.004 | 22 | 22 |
| diethylphthalate | 58 | 10.77 | NC | 2.67E-04 | 0.015 | 0.003 | 23 | 23 |
| chlordane | 1.3 | 0.50 | NC | NA | | | | |
| manganese | 6370 | 356.01 | NC | NA | | | | |
| thallium | 5.5 | 9.51 | NC | NA | | | | |
| iron | 165000 | 8756.67 | NC | NA | | | | |
| pyrene | 10 | 10.00 | NC | NA | | | | |
| cyanide | 99 | 12.47 | NC | NA | | | | |
| chloroform* | 19 | 5.46 | NC | NA | | | | |
| beryllium | 17 | 5.50 | NC | NA | | | | |
| chromium | 406 | 22.80 | NC | NA | | | | |
| n-nitrosodiphenylamine | 10 | 10.00 | | | | | | |
| aluminum | 140000 | 6676.80 | | | | | | |
| sodium | 88400 | 15244.45 | | | | | | |
| acetone* | 80 | 11.22 | | | | | | |
| potassium | 56600 | 4145.45 | | | | | | |
| bromodichloromethane | 5 | 5.00 | | | | | | |
| magnesium | 193000 | 19343.04 | | | | | | |
| cobalt | 98 | 21.16 | | | | | | |
| calcium | 2230000 | 101806.73 | | | | | | |

* indicates compounds for which the values were re-calculated based on the results of additional sampling performed in April and August, 1987.

a. plume max. concentration based on all MW and RW data with the exception of the local background wells MW6,MW11,MW13,MW15.

b. plume mean concentration based on all MW and RW data with the exception of the local background wells MW6,MW11,MW13,MW15.

c. PC indicates potential carcinogen, NC indicates non-carcinogen

d. toxicity factors from Exhibit C-3 and C-4, Superfund Public Health Manual, Oct. 1986.

e. CT and IS listed together since for this single media, single route calculation CT = IS = conc.(C) x toxicity factor (T).

TABLE J-4. INDICATOR CHEMICAL SELECTION (CONTINUED)

| Substance | Priority Group(1) | Maximum Concentration (ug/l) RW | Maximum Concentration (ug/l) MW | ARAR Standard(3) (ug/l) | # Detected / # Analyzed(4) RW | # Detected / # Analyzed(4) MW | Blanks | Carcinogenic(5) Weight of Evidence Oral | Carcinogenic(5) Weight of Evidence Inhal | Other Notes | Include as Indicator Chemical |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Beryllium | 1 | - | 17 | - | 0/37 | 16/25 | CONT | B1 | B1 | Carcinogen. Present above detection limit in MW3D & MW3S, MW3D possible grout contamination, other values below detection limit. | Yes |
| Cadmium | 1 | 9.8 | 7 | 10 | 9/37 | 1/25 | OK | NA | B1 | Carcinogen. Only 4 occurrences above detection limit, no level reported greater than twice the detection limit. | No |
| Calcium | NL | 336,000 | 2,230,000 | - | 37/37 | 25/25 | CONT | - | - | Two highest readings in MW3D, possible grout contamination. | No |
| Chromium | 1 | 117 | 406 | 50 | 3/37 | 16/37 | CONT | NA | A | Carcinogen - high conc. Two highest readings in MW3D; possible grout contamination; also in MW3S. | Yes |
| Cobalt | NL | 81 | 98 | - | 33/37 | 14/25 | CONT | - | - | | No |
| Copper | 3 | 196 | 581 | 1,000 | 37/37 | 23/25 | CONT | - | - | | No |
| Iron | NL | 3,840 | 165,000 | 300 | 36/37 | 25/25 | CONT | - | - | | No |
| Lead | 1 | 2,170 | 786 | 50 | 30/37 | 17/25 | CONT | - | - | High conc. when compared with standard. | Yes |
| Magnesium | NL | 75,600 | 193,000 | - | 37/37 | 25/25 | CONT | - | - | | No |

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