ROY F. WESTON, INC.
6501 AMERICA'S PARKWAY, N.E.
SUITE 800
ALBUQUERQUE, NEW MEXICO 87110
505-884-5050
FAX: 505-884-5388

LWM
KGK
FOR ACTION
2/25

18 February 1992

University of California
Los Alamos National Laboratory
Attention: Dr. Kenneth Rea
EES-14, ER TSO
P.O. Box 1663, MS K-485
Los Alamos, NM 87545

RE: ER Program, Mound Plant
Operable Unit 9, Site Scoping Report
Change Order Request 18-001 RFW WO# 2744-41-18

Dear Dr. Rea:

Attached is the change order request for the Operable Unit 9, Site Scoping Report. This change order is required to complete Volumes 2, 10 and 11, as discussed below.

Volume 2 - Geologic Log and Well Information Report includes a revision in response to regulatory agency comments and publication of the Final document. An addendum is also required that will include lithologic and stratigraphic data compiled from Mound Plant engineering records. The revised document is due to EPA 17 April 1992.

Volume 10 - Permits and Enforcement Actions requires revision in response to regulatory agency comments. Response to comments and the revised document are due to EPA 21 March 1992.

Volume 11 - Spills and Response Actions requires response to regulatory agency comments. The response to comments is due to EPA 17 April 1992.

One trip to Miamisburg, Ohio is included to confer with Mound personnel and complete the data-gathering efforts for these reports.

Approval pages will be included with the final copies of Volumes 2, 10 and 11 submitted to EPA on the dates cited above. Four new copies of each of these volumes will be produced with the signed approval pages and submitted to R.A. Neff, EG&G-MAT, for inclusion in the administrative record. Twenty-five copies of the approval pages and Final cover and title sheets will also be reproduced and distributed for insertion into existing documents.

Additional labor and expense charges are included in this change order request for reproduction of the large volume of reference materials used in compilation of Volume 7 - Waste Management Report. Since much of the data compiled for this report was not available through outside sources, the project managers agreed at the December FFA Meeting that one copy of the set of references for each of the agencies will be sufficient. This involves about 40 hours labor at the production technician level. Five copies of these references will be produced and distributed, two copies to EG&G-MAT and one copy each to EPA and OEPA. One copy will be retained in the WESTON project office in Cincinnati, Ohio.

29-01-01-07-02
9406140009

The change order request is in the amount of $33,295 for 417 hours. The new ceiling of this task is $88,796.

If you have any questions, please contact Bill Criswell or John Price.

Sincerely,

ROY F. WESTON, INC.

William M. Little

Michael P. Mauzy, P.E.
ER Program, TSO Subcontractor
Project Manager

CWC/shm

Attachment

pc w/o att: Dick Neff (EG&G)
pc w/att: T. Farmer (ER TSO)
ER TSO File

scopcor2.001

Document Control No. _____

Environmental Restoration Program

29-01 -01 -07 -02 -9406140009

OPERABLE UNIT 9, SITE SCOPING REPORT: VOLUME 2 - GEOLOGIC LOG AND WELL INFORMATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

May 1992

FINAL

Department of Energy
Albuquerque Field Office

Environmental Restoration Program
Technical Support Office
Los Alamos National Laboratory

REFERENCE USE ONLY

NEFF (4)

1-OU-9

ROY F. WESTON, INC.
6501 AMERICA'S PARKWAY, N.E.
SUITE 800
ALBUQUERQUE, NEW MEXICO 87110
505-884-5050
FAX: 505-884-5388

15 April 1992

University of California
Los Alamos National Laboratory
Attention: Dr. Kenneth Rea
EES-14, ER TSO
P.O. Box 1663, MS K-485
Los Alamos, NM 87545

RE: ER Program, Mound Plant
Site Scoping Report: Volume 2 - Geologic Log and Well Information RFW WO # 2744-41-18

Dear Dr. Rea:

Enclosed are copies of the Site Scoping Report: Volume 2 - Geologic Log and Well Information [Revision 1]. This report was revised in response to comments received by the regulatory agencies, and includes additional information obtained from EG&G-Mound Applied Technologies. The revisions were reviewed by D. Carfagno, EG&G-MAT, and the report is now considered to be Draft Final. It is being distributed to U.S. EPA, Ohio EPA, and other project managers pursuant to directions from A. Kleinrath. The submission of this report is in accordance with the current FFA schedule. An addendum to this report has been completed and is currently under review. The addendum will be submitted under separate cover.

If you have any questions, please contact Bill Criswell or John Price.

Sincerely,

ROY F. WESTON, INC.

for William M. Little

Michael P. Mauzy, P.E.
ER Program, TSO Subcontractor
Project Manager

CWC/shm
Enclosures

pc w/encl: A. Kleinrath (DOE-DAO)
T. Farmer (ER TSO)
D. Neff (EG&G-MAT)
K. Koehler (EG&G-MAT)
M. Williams (EG&G-MAT)
D. Mally (US EPA)
M. Hatcher (OEPA)
J. Sands (DOE-HQ)
D. Flynn (DOE AL)
B. Huntsman (Terran Corp.)
M. Walsh (SAIC)
J. Register (IT)

pc w/o encl: ER TSO File

scpltr13.415

NEFF

KGK
04-9
DGC

ROY F. WESTON, INC.
6501 AMERICA'S PARKWAY, N.E.
SUITE 800
ALBUQUERQUE, NEW MEXICO 87110
505-884-5050
FAX: 505-884-5388

DATE: April 3, 1992

University of California
Los Alamos National Laboratory
Attention: Dr. Kenneth Rea
EES-14, ERTSO
P.O. Box 1663, MS K-485
Los Alamos, NM 87545

RFW #2744-41-18-1254

DOCUMENT TRANSMITTAL

TITLE OF DOCUMENT: Site Scoping Report: Volume 2 and Addendum

REVISION NO.: 1 DATE OF DOCUMENT April 1992

Note:
Other sections to follow as available.

TYPE OF DOCUMENT:	Working Draft	Draft	Draft Final
Work Plan/FSP			
Report			
Technical Memo			X
Addendum		X	

ACTION: X Review By: X TSO __ DOE-AL __ DOE-DAO __ DOE-HQ
X EG&G-MAT __ USEPA __ OEPA
__ Transmit to Regulatory Authority

DRAFT: __ Working Draft (Preliminary)
X Draft (Program) - Addendum
X Draft Final (External) - Regulatory Approval - Vol. 2
__ Concept of Document

COMMENTS EXPECTED: COB 4/9/92
(Date)

RETURN COMMENTS TO: Bill Criswell
(Installation Manager)

Distribution: see attached

M9SSD12.DTR 04/03/92

pc: T. Farmer
R. Neff (EG&G-MAT)
W. Criswell (WESTON)

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9, SITE SCOPING REPORT: VOLUME 2 ADDENDUM - STRATIGRAPHIC AND LITHOLOGIC LOGS

MOUND PLANT
MIAMISBURG, OHIO

April 1992

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
TECHNICAL SUPPORT OFFICE
LOS ALAMOS NATIONAL LABORATORY

DRAFT
(Revision 0)

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APPENDIX G NEW PROPERTY EVALUATION
APPENDIX H SITE SURVEY PROJECT
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1. INTRODUCTION

The U.S. Department of Energy (DOE) Mound Plant, Miamisburg, Ohio, was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) on November 21, 1989 (54 FR 48184). Pursuant to its NPL status, the DOE signed a CERCLA Section 120 Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) that became effective October 11, 1990. A similar agreement is currently in negotiation between the DOE and the Ohio EPA (OEPA). The terms of the FFA require that the DOE develop and implement remedial investigations (RIs) and feasibility studies (FSs) and conduct interim remedial actions in order to ensure that environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate action is taken to protect the public health and welfare and the environment.

The Albuquerque Field Office of the DOE established the Environmental Restoration (ER) Program in 1984 to collect and assess environmental data in order to develop a conceptual site model to assess both the nature and extent of contamination and to identify potential exposure pathways and potential human and environmental receptors. These activities have been conducted under DOE policy to ensure that all facilities comply with applicable environmental regulations. In order to provide EPA with sufficient information and data gathered during these previous investigations, a multi-volume scoping report, providing background information, has been prepared. The Site Scoping Report will provide descriptions and summaries of the current conditions and characteristics of Mound Plant and will consist of at least the following volumes:

1. Groundwater Data: February 1987 - July 1990
2. Geologic Log and Well Information
3. Radiologic Site Survey
4. Engineering Map Series
5. Topographic Map Series
6. Photo History
7. Waste Management
8. Environmental Monitoring Data
9. Bibliography
10. Permits and Enforcement Actions
11. Spills and Response Actions

2. STRATIGRAPHIC AND LITHOLOGIC LOGS

This report is an addendum to the Site Scoping Report: Volume 2, Geologic Log and Well Information Report (DOE 1992) that presents well construction and borehole lithology details for monitoring and production wells located within and adjacent to Mound Plant that have been used to collect environmental samples. The current report presents stratigraphic and lithologic information for Mound Plant as a compilation of borehole logs and borehole location maps from previous investigations. Most of the work was performed during plant engineering, planning, and foundation studies and contaminant infiltration and movement studies. Borehole logs and location maps included in this report are from the following:

- Test Boring Inventory (MRC 1976),
- Site Safety Assessment (Dames and Moore 1973),
- Overflow Pond, and Retention Basin Construction (Bowser-Morner 1975; Dames and Moore 1976a)
- Potable Water Standards Project (Dames and Moore 1976b),
- Buried Valley Aquifer Evaluation (Dames and Moore 1976c),
- New Property Evaluation (Bowser-Morner 1983),
- Site Survey Project (DOE 1991), and
- Test Pit Excavation Program (Terran 1987).

A summary of each investigation is presented in section 3. Much of the borehole information collected from these investigations is included in the test boring inventory described in subsection 3.1. Borehole location maps and corresponding lithologic logs related to each investigation and the test boring inventory are presented in Appendixes A through I. (Some duplication exists where logs in the test boring inventory are incomplete.)

3. BACKGROUND OF EXPLORATORY BOREHOLE INVESTIGATIONS

3.1. TEST BORING INVENTORY

Approximately 703 onsite exploratory borings have been drilled by various subcontractors at Mound Plant since its construction in the 1940s. The borings were drilled to obtain engineering and structural information for onsite construction projects and as part of several investigations. In many cases, records that describe sample collection, groundwater level measurements, and drilling methods used are not available. Monsanto began compiling these boring logs in 1976 (MRC 1976). (Drawings of

boring logs 1 through 212 are complete; drawings of boring logs 213 through 425 are incomplete. Logs of borings 426 through 703 are recorded on drillers' log sheets.)

Appendix A includes a boring location map, Plate A1; and borehole log drawings of borings 1 through 425, Plates A2 through A10. Drillers' logs of borings 426 through 703 are presented in Appendix B. Appendix B is an incomplete listing of borings 426 through 703, since some of the logs are in engineering reports and files that are yet to be retrieved.

3.2. SITE SAFETY ASSESSMENT

As part of the site safety assessment, six widely spaced geologic borings were drilled at Mound Plant to determine lithology, structure, and physical properties of the subsurface strata at the site. The borings ranged in depth from 50 to 200 ft below the existing ground surface. Soil and rock samples were collected for laboratory tests that provided information for use in evaluating the stability of Mound Plant under static and dynamic (earthquake) loading. Potential problems that could affect site stability were identified and addressed (Dames and Moore 1973).

The borehole logs, boring location map, and additional detailed information describing the test borings and associated analyses are contained in "Description and Safety Assessment of the Mound Laboratory Site" (Dames and Moore 1973) and are included in Test Boring Inventory (log #273-278) (MRC 1976). The Test Boring Inventory logs are incomplete; therefore, the boring location map and borehole logs are also presented in Appendix C.

3.3. OVERFLOW POND AND RETENTION BASIN CONSTRUCTION

Two geotechnical investigations to determine the physical characteristics of the soil were conducted at the sites of the proposed retention basins (Bowser-Morner 1975) and overflow pond (Dames and Moore 1976a) as part of the Mound Plant's compliance with the National Pollution Discharge Elimination System.

The Bowser-Morner investigation involved drilling seven hollow-stem auger borings (B-1 through B-4 and A, B, and C) to depths ranging from 10 to 20 ft below the existing ground surface. The precise borehole locations have not been identified, but it has been confirmed that the borings were completed in the vicinity of the retention basins and overflow pond. Soil samples were collected for laboratory analysis from borings B-1 through B-4 (Bowser-Morner 1975).

The Dames and Moore investigation involved drilling three soil borings (BP-1 through BP-3) and nine auger probes (AP-1 through AP-9). Borings BP-1 and BP-2 were drilled using rotary-wash drilling equipment, and the remaining boring (BP-3) and auger probes (AP-1 through AP-9) were drilled with hollow-stem augers. Soil samples were collected for laboratory analysis from borings BP-1 through BP-3 and auger probes AP-1, AP-4, and AP-6 (Dames and Moore 1976a).

The original borehole logs, boring location map (Dames and Moore borings only), and additional information describing the borings and probes and associated laboratory results are contained in "Soil Investigation and Construction Drawings for Proposed Low Flow Retention Basin" (Bowser-Morner 1975) and the "Hydrologic and Soils/Foundation Investigations Proposed Overflow Pond Mound Laboratory for Monsanto Research Corporation" (Dames and Moore 1976a). The borehole logs from each investigation are included in the Test Borings Inventory (#284 through #302) (MRC 1976), but are incomplete. The legend and lithologic logs for borings drilled during the Bowser-Morner investigations and a location map and corresponding lithologic logs for the borings drilled during the Dames and Moore investigation are presented in Appendix D.

3.4. POTABLE WATER STANDARDS PROJECT

The objectives of the Potable Water Standards Project were to determine the extent and concentration of tritium in groundwater at and near Mound, identify source(s) and pathways of tritium contamination, evaluate current remediation efforts, identify alternative remediation options, and evaluate alternative water supply sources (Dames and Moore 1976b).

The potable water standards project included the drilling of 32 test borings. Monitoring wells 12-1, 19-4, 27-1, 27-2, 33-1, 34-1, 34-2, 35-2, 37-1, 42-1, 42-2, 43-1, 43-2, 52-1, and 55-5 were installed in 15 of the borings and were used in conjunction with existing wells to monitor groundwater levels and tritium activity at Mound Plant. Some borehole logs and well completion specifications are presented in the Site Scoping Report: Volume 2, Geologic Log and Well Information Report (DOE 1992). The remaining seventeen borings, G-1 through G-18 (G-14 was not drilled), were drilled in the historical landfill area to determine the areal extent and concentrations of tritium in the landfill. The borings ranged in depth from 15 ft in boring G-5 to 37.5 ft in boring G-18. The landfill borings did not penetrate the water table; therefore, water level data were not obtained (Dames and Moore 1976b).

The boring location map, lithology legend, and corresponding lithologic logs for test borings not included in the Geologic Log and Well Information Report (DOE 1992) are presented in Appendix E. The original borehole logs, borehole location map, and tritium concentration data can be found in "Potable Water Standards Project" (Dames and Moore 1976b).

3.5. BURIED VALLEY AQUIFER EVALUATION

The Buried Valley aquifer project (Dames and Moore 1976c) was conducted in 1976 as a follow-up study to the Potable Water Standards Project (Dames and Moore 1976b). Offsite characteristics were emphasized in the Buried Valley aquifer evaluation; whereas, the Potable Water Standards Project report emphasized onsite conditions. Objectives of the Buried Valley aquifer evaluation were to assess the feasibility of reducing tritium contamination by offsite pumping, characterize tritium distribution in soil water, characterize geologic and hydrologic properties of the aquifer, monitor changes in tritium concentration with water levels and time, and evaluate the lower zone of the aquifer as an alternative water supply for local private well owners. The program included test borings to collect soil samples and the installation of observation wells for groundwater monitoring. Ten observations wells (OW-1 through OW-8, OW-1A, and OW-6A) were constructed in the Buried Valley aquifer to obtain water level and tritium concentration data. The borehole logs and well completion specifications are presented in the Site Scoping Report: Volume 2, Geologic Log and Well Information Report (DOE 1992). Ten test borings (SB-1 through SB-10) were drilled in the Miami-Erie Canal area to evaluate the areal extent of tritium in the soil. Depths ranged from 20 ft in SB-7 to 32 ft in SB-9, with each boring penetrating the water table. One and one-half-inch slotted PVC casing was installed in SB-3, SB-6, SB-7, and SB-8. One additional boring (DD-1) was drilled to 45 ft in the center of the onsite drainage ditch to evaluate tritium concentrations in soil distillate (Dames and Moore 1976c).

The original borehole logs, borehole location maps, and tritium concentration data can be found in "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory" (Dames and Moore 1976c). The borehole location map, lithology legend, and corresponding detailed lithologic logs for each test boring are presented in Appendix F.

3.6. NEW PROPERTY EVALUATION

The new property evaluation was conducted by Bowser-Morner, Inc., in 1983, to provide Mound Plant with information for future land use planning, structure location, and landfill siting (Bowser-Morner 1983). Thirty-seven borings were drilled (No. 1 and No. 5 through No. 40) using hollow stem augers. Borings 2, 3, and 4 were canceled during the exploratory phase. The borings ranged in depth from 4 ft to 25 ft below ground surface and were made in the relative positions shown on the boring location plan (Plate G1 of Appendix G). Soil samples were collected at 5-ft intervals or at major changes in lithology, whichever occurred first. Rock cores were collected at selected borings to confirm the presence of bedrock and to determine its physical characteristics. Laboratory tests, including compressive strength, Unified Soil Classification, and natural moisture content, were performed on selected soil and rock samples (Bowser-Morner 1983).

The borehole location map and boring lithology logs are presented Appendix G. The original boring logs, boring location map, and additional detailed information describing the boring program are contained in the "Preliminary Geotechnical Study for the Mound Facility (New Property)" (Bowser-Morner 1983).

3.7. SITE SURVEY PROJECT

During the years 1982 through 1985, Mound Plant performed a systematic survey of radiologic contamination of plant soils. The purposes of the survey were to document the radionuclide levels present in the exposed land areas within the Mound Plant boundary and to characterize environmental radiological contaminants on a Site-wide basis in order to provide the DOE with the basis for estimating the cost and time required for stabilizing or removing contaminated soils. The Operable Unit 9, Site Scoping Report, Volume III - Radiological Site Survey (DOE 1991) served to summarize and analyze data obtained from the site survey project. It described and evaluated the sample collection, analysis, and reporting procedures used during the site survey project; tabulated the site survey project analytical results; identified areas of concern at the Mound Plant; and made recommendations concerning the collection of additional data and the inclusion of areas requiring further investigation.

As part of the site survey project, 97 soil borings were collected at various locations within the Mound Plant boundaries. No monitoring wells or piezometers were installed at any of the soil boring locations (DOE 1991). Core samples showing elevated gamma activity were collected at 60 locations. The drilling and sampling were performed by Bowser-Morner., Inc., in 1984, using hollow-stem augers and a 2-ft split barrel sampler. An additional 37 boreholes were drilled using solid augers and cased with 4-inch PVC pipe to facilitate *in situ* gamma ray logging of the soil profile as part of the old fill sites evaluation. Drillers' logs of the 97 borings, along with base maps of the boring locations, are presented in Appendix H.

3.8. TEST PIT EXCAVATION PROGRAM

Twelve test pits were excavated to explore the subsurface geologic conditions and define the occurrences and movement of groundwater beneath the Mound Plant (Terran 1987). Using stratigraphic data collected at the test pits, a generalized geologic cross section was developed for the site. A location map and detailed descriptive logs were recorded for the 12 test pits (Terran 1987) and are included as Appendix I.

4. REFERENCES

Bowser-Morner. 1975. "Soil Investigation and Construction Drawings for Proposed Low Flow Retention Basin." Report prepared for Monsanto Research Corporation, Cincinnati, Ohio. Laboratory Report No. 789844. August 15, 1975.

Bowser-Morner. 1983. "Preliminary Geotechnical Study for the Mound Facility (New Property) Monsanto Research Corporation, Miamisburg, Ohio." Prepared for Monsanto Research Corporation, Miamisburg, Ohio. 1983.

Dames and Moore. 1973. "Description and Safety Assessment of the Mound Laboratory Site." Prepared for the U.S. Atomic Energy Commission and Monsanto Research Corporation, Mound Laboratory. March 15, 1973.

Dames and Moore. 1976a. "Hydrologic and Soils/Foundation Investigations Proposed Overflow Pond Mound Laboratory for Monsanto Research Corporation." Prepared for Monsanto Research Corporation, Miamisburg, Ohio. March 31, 1976.

Dames and Moore. 1976b. "Potable Water Standards Project Mound Laboratory." Report prepared for Monsanto Research Corporation, Miamisburg, Ohio. August 1976.

Dames and Moore. 1976c. "Evaluation of the Buried Valley Aquifer Adjacent to Mound Laboratory." Report prepared for Monsanto Research Corporation, Miamisburg, Ohio. December 1976.

DOE 1991. "Operable Unit 9, Site Scoping Report Volume III - Radiological Site Survey (DRAFT)." U.S. Department of Energy, Albuquerque Operations Office, Albuquerque, New Mexico. April 1991.

DOE 1992. "Operable Unit 9, Site Scoping Report: Volume 2, Geologic Log and Well Information Report (DRAFT FINAL)." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. April 1992.

MRC 1976. "Site Plan--Test Borings," drawing FSE 16472, 11 sheets. Monsanto Research Corporation, Miamisburg, Ohio.

Terran 1987. "Groundwater Occurrence and Movement in the Consolidated Bedrock at the DOE Mound Laboratory, Miamisburg, Ohio." Terran Corporation, Hydrogeological Consultants, Fairborn, Ohio. March 1987.

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9,
SITE SCOPING REPORT: VOLUME 2 -
GEOLOGIC LOG AND WELL INFORMATION REPORT

MOUND PLANT

April 1992

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
TECHNICAL SUPPORT OFFICE
LOS ALAMOS NATIONAL LABORATORY

DRAFT FINAL
(REVISION 1)

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER (Program)	Environmental Restoration (Program)
FFA	Federal Facilities Agreement
FS	Feasibility Study
MCD	Miami Conservancy District
MWFPP	Miamisburg Well Field Protection Program
NPDES	National Pollutants Discharge Elimination System
NPL	National Priorities List
OEPA	Ohio Environmental Protection Agency
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
SOP	Standard Operating Procedure
TEGD	Technical Enforcement Guidance Document
USCS	Unified Soil Classification System

ACKNOWLEDGMENTS

This report was prepared by Roy F. Weston, Inc., Albuquerque, New Mexico, under subcontracts 9-XS8-0146R-1 and 9-XS1-Q7181-1 to the University of California, Los Alamos National Laboratory.

1. INTRODUCTION

The U.S. Department of Energy (DOE) Mound Plant, Miamisburg, Ohio, was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) on November 21, 1989 (54 FR 48184). Pursuant to its NPL status, the DOE signed a CERCLA Section 120 Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) that became effective October 11, 1990. A similar agreement is currently in negotiation between the DOE and the Ohio EPA (OEPA). The terms of the FFA require that the DOE develop and implement remedial investigations (RIs) and feasibility studies (FSs) and conduct interim remedial actions in order to ensure that environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate action is taken to protect the public health and welfare and the environment.

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5. Topographic Map Series
6. Photo History
7. Waste Management
8. Environmental Monitoring Data
9. Bibliography
10. Permits and Enforcement Actions
11. Spills and Response Actions

2. GEOLOGIC LOG AND WELL INFORMATION REPORT

This report presents a location map, as well as well construction and borehole lithology details, for monitoring and production wells located within and adjacent to Mound Plant that have been used to collect environmental samples. Selected residential and municipal wells, historically used for environmental monitoring, are also included. The well completion and borehole information in this report has been gathered from both historical sources and the RI field studies. The accuracy of historical information has been reviewed for completeness and consistency to the extent possible. A comprehensive location map is provided as Plate 1. The well completion logs are provided in Appendix A.

This report also contains an overview of monitoring wells installed at Mound Plant but not sampled by the ER Program. Most of these other wells have been abandoned or evaluated and not used by the ER Program. Descriptive summaries are additionally provided of test and capture pit wells installed on the Main Hill to assess tritium contamination (DOE 1989b). General construction information only is known for the capture pits and wells. Further information is provided in the Remedial Investigation Plan, Stage 3 (DOE 1989b). Not included in this report are other data pertinent to the residential and municipal wells within a two-mile radius of the plant. This data requirement is addressed in the Site-Wide RI/FS Work Plan (DOE 1992a).

Results of sampling and analyses of the environmental monitoring wells contained in this report can be found in the Remedial Investigation Plan, Stage 3 (DOE 1989b) and the Site Scoping Report: Volume 1 - Groundwater Data: February 1987 to July 1990 (DOE 1992b). Additional discussion is included in the Operable Unit 1, Area B, Technical Memorandum 3 (DOE 1991a).

3. ER PROGRAM GROUNDWATER MONITORING NETWORK

The environmental monitoring network at Mound Plant consists of municipal, domestic, plant supply, and monitoring wells installed within and adjacent to the plant. Knowledge of the construction details of municipal, domestic, and plant supply (production) wells varies considerably; there is little documentation on older wells. Monitoring wells installed within and adjacent to the plant include wells installed during the following projects:

- the 1975 Potable Water Standards Project (Dames and Moore 1976b, 1978),
- the Buried Valley Aquifer Evaluation Project (Dames and Moore 1976c),

- the 1987 DOE Headquarters Environmental Survey (DOE and Battelle 1987),
- the ER Program field investigations (DOE 1987, 1989b), and
- other undesignated projects associated with evaluations of the Mound Plant production well field.

Background information for each of these well systems and their current status in the ER Program are discussed below. The locations for all wells in the environmental monitoring network are depicted on Plate 1 of this report. A summary of the municipal and plant production wells, monitoring wells, and selected domestic supply wells is presented in Table III.1.

3.1. BACKGROUND AND CURRENT STATUS OF MUNICIPAL, DOMESTIC, AND PLANT PRODUCTION WELL SYSTEMS

3.1.1. Municipal Wells

The City of Miamisburg has several municipal supply wells on both the east and west sides of the Great Miami River. The city does not have good records of well construction dates and other data for the older wells. Some information about the municipal wells for this report was taken from historic memorandums compiled by Mound Plant personnel from interviews of city employees. Historically, the City of Miamisburg wells were all located on the east side of the Great Miami River. Many wells were located near the old Miamisburg Light Plant that was located at the present position of the Miamisburg municipal swimming pool and park area. The north and south ponds (Plate 1) were cooling ponds for the power plant. There were apparently five 50-ft deep wells located east of the north and south ponds (Plate 1) that were taken out of service in 1927-1928 (Black 1974). Wells 0912 and 0913 (originally municipal wells No. 2 and No. 3) supplied a 500,000-gallon water tank on the hillslope of the Main Hill below the OSE Building. This tank and the power plant were dismantled in 1976, and the main municipal well field was moved to the west side of the river.

Two of the original municipal wells adjacent to Mound Plant currently remain in service. Municipal well No. 2, originally known as the "Egan" well, was taken out of municipal service in 1969, but it was overhauled by Mound Plant in the middle 1970s and used for remedial pumping of the tritium-contaminated groundwater in the Buried Valley aquifer (Dames and Moore 1976c; Styron and Meyer 1981; DOE 1989b, 1991a, 1992a). Little is actually known of its construction. Its casing diameter is 26 inches, and it is about 50 ft deep. A geophysical investigation was initiated in 1987, but it was not completed. Miamisburg No. 3 (now known as well 0913 in the ER Program system) is located

Table III.1. Summary Table of Municipal, Plant Production, Monitoring, and Selected Domestic Wells On and Adjacent to Mound Plant

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0001	07/23/76	Buried Valley aquifer evaluation	OW-1	Rotary	No
0002	07/26/76	Buried Valley aquifer evaluation	OW-2	Rotary	No
0003	07/27/76	Buried Valley aquifer evaluation	OW-3	Rotary	No
0004	07/28/76	Buried Valley aquifer evaluation	OW-4	Rotary	No
0005	07/29/76	Buried Valley aquifer evaluation	OW-5	Rotary	No
0006	07/15/76	Buried Valley aquifer evaluation	OW-6	Rotary	No
0007	11/18/76	Buried Valley aquifer evaluation	OW-7	Rotary	No
0008	09/18/76	Buried Valley aquifer evaluation	OW-8	Rotary	No
0020	Ca. 1975	Buried Valley aquifer evaluation	20-1	Unknown	No
0028	Ca. 1975	Buried Valley aquifer evaluation	28-1	Unknown	No
0033	05/13/76	Portable water standards project	33-1	Auger	No
0034	05/26/76	Portable water standards project	34-1	Auger	No
0035	05/13/76	Portable water standards project	35-1	Unknown	No
0042	Ca. 1975	Portable water standards project	42-1	Unknown	No
0046	06/22/74	Other	46-1	Unknown	No
0052	05/18/76	Portable water standards project	52-1	Rotary	No
0055	Ca. 1975	Portable water standards project	55-1	Unknown	No
0063	06/18/74	Other	63-1	Unknown	No
0071	Jan. 1962	Mound Plant production well	71-1	Unknown	Yes[b]
0076	Dec. 1947	Mound Plant production well	76-1	Unknown	Yes[b]
0101	Ca. 1976	Buried Valley aquifer evaluation	OW-1A	Unknown	No
0106	Ca. 1976	Buried Valley aquifer evaluation	OW-6A	Unknown	No
0108	Ca. 1976	Buried Valley aquifer evaluation	OW-8A	Unknown	No
0111	11/17/87	ER Program remedial investigation	N/A	Cable tool	Yes
0112	11/18/87	ER Program remedial investigation	N/A	Cable tool	Yes
0113	11/16/87	ER Program remedial investigation	N/A	Air rotary	Yes
0114	11/11/87	ER Program remedial investigation	N/A	Air rotary	Yes
0115	11/10/87	ER Program remedial investigation	N/A	Cable tool	Yes
0116	11/02/87	ER Program remedial investigation	N/A	Cable tool	Yes
0117	12/02/87	ER Program remedial investigation	N/A	Air rotary	Yes

Table III.1. (page 2 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0118	10/20/87	ER Program remedial investigation	N/A	Cable tool	Yes
0119	11/13/87	ER Program remedial investigation	N/A	Cable tool	Yes
0120	12/04/87	ER Program remedial investigation	N/A	Air rotary	Yes
0121	11/12/87	ER Program remedial investigation	N/A	Cable tool	Yes
0122	11/19/87	ER Program remedial investigation	N/A	Cable tool	Yes
0123	10/07/87	ER Program remedial investigation	N/A	Cable tool	Yes
0124	10/13/87	ER Program remedial investigation	N/A	Cable tool	Yes
0125	11/10/87	ER Program remedial investigation	N/A	Cable tool	Yes
0126	10/16/87	ER Program remedial investigation	N/A	Cable tool	Yes
0127	10/02/87	ER Program remedial investigation	N/A	Cable tool	Yes
0128	09/30/87	ER Program remedial investigation	N/A	Cable tool	Yes
0129	11/05/87	ER Program remedial investigation	N/A	Cable tool	Yes
0130	11/06/87	ER Program remedial investigation	N/A	Cable tool	Yes
0137	05/24/76	Portable water standards project	37-1A	Rotary	No
0138	10/28/87	ER Program remedial investigation	N/A	Cable tool	Yes
0151	07/06/87	DOE environmental survey	N/A	Cable tool	Yes
0152	07/08/87	DOE environmental survey	N/A	Cable tool	Yes
0153	07/10/87	DOE environmental survey	N/A	Cable tool	Yes
0154	10/04/87	ER Program remedial investigation	N/A	Cable tool	Yes
0155	10/05/87	ER Program remedial investigation	N/A	Cable tool	Yes
0156	10/27/87	ER Program remedial investigation	N/A	Cable tool	Yes
0157	10/26/87	ER Program remedial investigation	N/A	Cable tool	Yes
0158	11/09/87	ER Program remedial investigation	N/A	Cable tool	Yes
0159	10/18/87	ER Program remedial investigation	N/A	Cable tool	Yes
0160	10/18/87	ER Program remedial investigation	N/A	Cable tool	Yes
0227	05/27/76	Portable water standards project	27-2	Auger	No
0236	Ca. 1975	Portable water standards project	36-2	Auger	No
0242	05/13/76	Portable water standards project	42-2	Auger	No
0271	Jan. 1948	Mound Plant production well	71-2	Unknown	Yes[b]
0276	04/04/61	Other	76-2	Percussion Jet	No

Table III.1. (page 3 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0301	08/09/89	ER Program remedial investigation	N/A	Cable tool	Yes
0302	09/15/89	ER Program remedial investigation	N/A	Cable tool	Yes
0303	09/06/89	ER Program remedial investigation	N/A	Cable tool	Yes
0304	09/20/89	ER Program remedial investigation	N/A	Cable tool	Yes
0305	08/22/89	ER Program remedial investigation	N/A	Cable tool	Yes
0306	09/02/89	ER Program remedial investigation	N/A	Cable tool	Yes
0307	09/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0308	09/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0309	08/21/89	ER Program remedial investigation	N/A	Cable tool	Yes
0310	08/16/89	ER Program remedial investigation	N/A	Cable tool	Yes
0311	08/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0312	12/13/89	ER Program remedial investigation	N/A	Cable tool	Yes
0313	09/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0314	08/03/89	ER Program remedial investigation	N/A	Cable tool	Yes
0315	08/07/89	ER Program remedial investigation	N/A	Cable tool	Yes
0316	08/05/89	ER Program remedial investigation	N/A	Cable tool	Yes
0317	08/18/89	ER Program remedial investigation	N/A	Cable tool	Yes
0318	08/09/89	ER Program remedial investigation	N/A	Cable tool	Yes
0319	08/23/89	ER Program remedial investigation	N/A	Cable tool	Yes
0320	08/19/89	ER Program remedial investigation	N/A	Cable tool	Yes
0371	04/05/61	Other	71-3	Percussion	No
0419	05/26/76	Portable water standards project	19-4	Auger	No
0471	04/05/61	Other	71-4	Percussion	No
0571	04/06/61	Other	71-5	Percussion	No
0712	Ca. 1987	Groundwater tritium assessment	PO12	Trench	No
0713	Ca. 1987	Groundwater tritium assessment	PO13	Trench	No
0714	Ca. 1987	Groundwater tritium assessment	PO14	Trench	No
0721	Ca. 1987	Groundwater tritium assessment	WO01	Pit	No
0722	Ca. 1987	Groundwater tritium assessment	WO02	Pit	No
0723	Ca. 1987	Groundwater tritium assessment	WO03	Pit	No

Table III.1. (page 4 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0724	Ca. 1987	Groundwater tritium assessment	WO04	Pit	No
0725	Ca. 1987	Groundwater tritium assessment	WO05	Pit	No
0726	Ca. 1987	Groundwater tritium assessment	WO06	Pit	No
0727	Ca. 1987	Groundwater tritium assessment	WO07	Pit	No
0812	09/23/83	New property evaluation	#12	Auger	No
0817	09/26/83	New property evaluation	#17	Auger	No
0827	09/22/83	New property evaluation	#27	Auger	No
0832	09/22/83	New property evaluation	#32	Auger	No
0901	Unknown	Offsite water supply	Bud's #1	TBD	Yes[b]
0902	Unknown	Offsite water supply	Bud's #2	TBD	Yes[b]
0903	09/03/64	Offsite water supply	Bud's #3	TBD	Yes[b]
0904	04/14/77	Offsite water supply	Jim's	TBD	Yes[b]
0905	Unknown	Offsite water supply	Jim's trailer	TBD	Yes[b]
0906	04/12/77	Offsite water supply	Bud's rental	TBD	Yes[b]
0907	04/08/77	Offsite water supply	Bud's house	TBD	Yes[b]
0908	Unknown	Offsite water supply	Drive-In	TBD	Yes[b]
0909	1986	Offsite water supply	MCD	TBD	Yes[b]
0912	1932	Miamisburg prod. well #2	MB-2	TBD	No
0913	1935	Miamisburg prod. well #3	MB-3	TBD	No
0918	1950	Miamisburg prod. well #8	MB-8	TBD	Yes[b]
0919	1950	Miamisburg prod. well #9	MB-9	TBD	Yes[b]
0920	1950	Miamisburg prod. well #10	MB-10	TBD	Yes[b]
0921	1950	Miamisburg prod. well #11	MB-11	TBD	Yes[b]
0922		Miamisburg prod. well #12	MB-12		
0923	11-29-90	MWFPP	MW-1	Cable tool	No[c]

Table III.1. (page 5 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0924	12-29-90	MWFPP	MW-2	Cable tool	No[c]
0925	11-21-90	MWFPP	MW-3	Cable tool	No[c]

[a]TEGD - Technical Enforcement Guidance Document (EPA 1986)
[b]This is a water suppoly well that can be used for characterization of potable water supplies.
[c]Well casings constructed of Schedule 40 polyvinyl chloride.
TBD - to be determined during residential well investigation
MCD - Miami Conservancy District
MWFPP - Miamisburg Well Field Protection Program
ER Program - Environment Restoration Program
DOE - U.S. Department of Energy

not completed. Miamisburg No. 3 (now known as well 0913 in the ER Program system) is located between the north and south ponds in the City of Miamisburg park (Plate 1). It was known as the "Red Eye" well. It is still in service to the municipal swimming pool.

The current municipal well field on the west side of the Great Miami River has at least four production wells. As part of a well field protection plan being developed by the city of Miamisburg, three monitoring wells were installed in 1990 in the vicinity of the Miamisburg well field (CH2M Hill 1991). The monitoring wells were used to identify potential sources of volatile organic compounds in groundwater at the city of Miamisburg municipal wells, along with identifying the extent of volatile organic compound contamination. After reaching the desired depth at each location using cable-tool drilling techniques, 4-inch diameter PVC with either 10- or 20-ft screens was lowered into the borehole. Each hole was backfilled with a sand filter pack to the top of the screen, then 1.5 to 2 ft of bentonite clay pellets were added, followed by a grout seal to the surface. Steel protective casings with locking caps were installed at all three well locations. These wells are not currently being sampled as part of the ER Program, although they continue to be sampled for the well field protection plan.

Reviewing the construction details for this report, discrepancies were noted between the text description of the screened intervals and the well logs. Whereas the text states that MW-1 and MW-2 (0923 and 0924) were completed with 20-ft screens and MW-3 has a 10-ft screen, the logs state MW-1 and MW-2 have 10-ft screens and MW-3 has a 20-ft screen.

In addition to the monitoring and production wells in the Miamisburg well field, the technical memorandum shows the location of a number of test wells. Nothing is currently known about the construction of the test wells.

Many of the Miamisburg municipal wells have been used for environmental samples for the ER Program (DOE 1989a) and the Mound Plant environmental monitoring program (DOE 1991).

3.1.2. Domestic Wells

Some information on the domestic supply wells was obtained for this report through the Ohio Division of Natural Resources, Columbus, Ohio. The state of Ohio requires that all well owners file a well log and drilling report upon completion. These reports vary in their completeness and quality depending on the drilling firm and the date of well completion; older wells typically possess less documentation. All attempts have been made to transcribe the details from the drilling reports to the schematic figures presented here, but details vary considerably from nearly complete lithologic and completion details to simply locations.

As a result of pumping Miamisburg well No. 2 in 1976, two residents who live close by the well reported that their wells were unable to produce water. Mound commissioned a study to determine the number, condition, and locations of private wells near the zone of influence of the pumping wells (Dames and Moore 1977). Three wells were replaced as a result of this evaluation. The logs of the new wells (0904, 0906, and 0907) are enclosed in Appendix A. The status of the older wells that were replaced is currently unknown. At the request of the owners of the old wells, the wells were not destroyed (Dames and Moore 1977).

All but one of the owners of the domestic supply wells elected to connect to the city of Miamisburg water supply at this writing. Well 904, also known as Jim's, is currently being used as a private source. The domestic supply wells were sampled by the ER Program during stages 1 and 2 of the remedial investigation (DOE 1989b) but are not currently used for environmental samples. The Mound Plant monthly environmental sampling program includes selected domestic wells.

In addition to domestic supply wells, the Miami Conservancy District (MCD) owns a small supply well (0909) near Mound Plant. The MCD is responsible for flood control along the Great Miami River. This well produces a potable water supply for a maintenance building adjacent to the well. The ER Program has never sampled the well. Mound Plant has included the well in their monthly environmental monitoring.

3.1.3. Mound Plant Production Wells

The plant production wells 0076 and 0271 were installed in 1947 and 1948, respectively, to supply a potable water source to the plant. The plant used water from the city of Miamisburg wells on occasions when line breaks occurred or both pumps quit. A third plant production well (0071) was installed in 1962, and a dual piping system, which eliminated the need for supplementary municipal water, was completed from the Mound Plant well field to the plant powerhouse in 1966. In 1976, the city of Miamisburg dismantled the unused pipes and old municipal pump station that had previously supplied the plant. A water chemistry investigation was performed as early as 1971 to confirm water quality and to ensure compliance with the then-promulgated Public Health Service Drinking Water Standards during the period of transition toward total reliance on plant supply (Klaer 1971). The Mound Plant production wells are part of the monthly environmental monitoring system and are sampled quarterly as part of the ER Program.

Some of the monitoring wells on the plant property were installed as part of general projects associated with evaluations of the Mound Plant production well field. Four monitoring or test wells were installed as part of the Mound Plant production well field (0276, 0371, 0471, and 0571). Little is known about

their construction. These four wells were examined by ER Program personnel in 1987 and deemed inappropriate for ER Program needs, due to small diameter, blockages, or other access or construction problems (Price 1990). These four wells have not been sampled by the ER Program and are not now part of the Mound Plant monthly environmental monitoring.

Two additional wells (0046 and 0063) were installed in June 1974. These two wells were the first true monitoring wells installed on the plant property to monitor groundwater quality. They were used by the potable water standards project and, more recently, the ER Program. Although their construction is not consistent with the Technical Enforcement Guidance Document (TEGD) (EPA 1986) and information concerning their construction details is limited, they are important because they showed some of the first results of contamination and have consistently shown higher levels than the newer wells that surround them (DOE 1989b). Results of sampling and analyses are discussed in detail in the Stage 3 Remedial Investigation Plan (DOE 1989b); and Operable Unit 1, Area B Technical Memorandum - Hydrogeology (DOE 1991a).

3.2. BACKGROUND AND CURRENT STATUS OF MONITORING WELL SYSTEMS

3.2.1. Potable Water Standards Project Monitoring Wells

The potable water standards project was conducted to characterize the tritium contamination of groundwater on Mound Plant property (Dames and Moore 1976b, 1978; Styron and Meyer 1981). Monitoring wells were installed in 1975 and 1976; the documentation is incomplete for some wells installed in 1975. The wells installed in 1976 were installed in boreholes drilled by either mud rotary or auger techniques. Wells were generally constructed with 3-inch-inside diameter (I.D.) polyvinyl chloride (PVC) casings with a 2-ft length of steel well screen at the base. The annulus pack around the screen is unknown. A 2-ft thickness of bentonite pellets was installed above the well screen. The annulus was then backfilled with earth, and a second bentonite seal was emplaced at the ground surface, with the earth then mounded around the casing to induce runoff. Protective casings were installed for some wells, but these were not locked during the initial ER Program field investigations in 1987, nor apparently were they locked during earlier periods. Well development techniques used were not discussed in the original report (Dames and Moore 1976b).

Some of the wells were destroyed and grouted to the surface during construction of the overflow pond and retention basin and other construction projects. The ER Program sampled most of the remaining wells during the reconnaissance sampling of Stage 1 of the RI and found numerous problems with well security and unacceptable construction (DOE 1989b). Other wells are not currently being sampled as

part of the ER program but have been sampled periodically during the Mound Plant environmental monitoring program.

3.2.2. Buried Valley Aquifer Evaluation Project Monitoring Wells

The Buried Valley aquifer evaluation project was conducted as a follow-up study to the potable water standards project and was intended to characterize the tritium contamination off the Mound Plant property (Dames and Moore 1976c). Ten observation wells were installed using mud rotary drilling techniques. The wells were constructed of 3-inch PVC casings with a 2-ft length of well screen on the bottom. A section of the PVC casing may also have been slotted. The boreholes were backfilled with gravel to within 3-ft of the ground surface and sealed with a bentonite pellet seal to the surface. A 6-inch locking steel casing was grouted for protection. Well development techniques were not discussed in the original report (Dames and Moore 1976c). These wells were sampled as part of the reconnaissance sampling of Stages 1 and 2 of the RI but were found to be inadequate for ER Program needs. They are not currently part of the ER Program. Some of the wells are sampled during the Mound Plant monthly environmental monitoring.

3.2.3. DOE Headquarters Environmental Survey Monitoring Wells

The DOE Headquarters environmental survey was conducted in 1987 as part of the nation-wide DOE effort to assess and prioritize environmental problems (DOE and Battelle 1987). The program was intended to complement the pursuit of environmental compliance and the ongoing efforts to characterize known problems. Three monitoring wells were installed as part of the field sampling program. The wells were installed according to protocols of the DOE Environmental Survey Manual (DOE 1986; DOE and Battelle 1987). The wells were constructed and developed in compliance with the Resource Conservation and Recovery Act (RCRA) TEGD (EPA 1986). ER Program personnel observed the installation of the DOE Headquarters wells in 1987 to ensure their construction techniques (Price 1990). These wells are currently part of the ER Program quarterly sampling project (DOE 1989b; DOE 1992a).

3.2.4. ER Program Monitoring Wells

The ER Program field investigations have been conducted as part of the RIs of historical environmental issues under CERCLA. Forty-eight monitoring wells have been installed; 28 wells in 1987 during the Stage 2 investigations, and 20 in 1989 as part of the Stage 3 investigations (DOE 1989b). These wells were located, installed, and developed according to specifications in the DOE work plans (DOE 1987, 1989b) and ER Program Standard Operating Procedures (SOPs). The SOPs are based on

regulations and guidelines established by RCRA and CERCLA (DOE 1988; EPA 1988) and the RCRA TEGD (EPA 1986). Figure 3.1 depicts a typical ER Program monitoring well installation. These wells, along with the Mound Plant production wells, provide the core of the ER Program groundwater assessment program and are currently sampled on a quarterly basis (DOE 1989b).

During compilation of this report, it was apparent that well completion records for ER Program monitoring wells 0113, 0114, 0126, and 0316 indicated that the apparent positions of the cement/bentonite grout, bentonite-pellet seal, quartz sand pack filter, and well screen were uncertain. Geophysical logging, conducted in August 1990 to corroborate the construction of these four wells, determined that each well was constructed in compliance with the proper specifications. The results are incorporated into the well completion diagrams reported here.

4. OVERVIEW OF OTHER MONITORING WELLS

In addition to the wells and projects described above, monitoring wells and cased boreholes have been installed on Mound Plant as part of the following projects:

- a site safety assessment of Mound Plant (Dames and Moore 1973),
- a geotechnical investigation of the hydrogeologic conditions in the area of the overflow pond and water retention basins (Dames and Moore 1976a),
- a new property evaluation (Bowser-Morner 1983),
- the Mound tritium groundwater assessment program (DOE 1989b), and
- an old fill sites evaluation (Bowser-Morner 1984).

4.1. SITE SAFETY ASSESSMENT

The site safety assessment of Mound Plant was completed in 1973 to comply with the Atomic Energy Commission (DOE predecessor) requirements (Dames and Moore 1973). Six boreholes were completed, and transitory groundwater levels were measured. Well completion consisted of an open hole with either a 1-1/4-inch-I.D. iron pipe and a 4-ft-long well point to bedrock, or a 4-inch-I.D. plastic casing to bedrock with the lower 20-ft of casing slotted.

No well development techniques were discussed in the original report (Dames and Moore 1973). These wells were designed for temporary use and apparently no longer exist. No record of well abandonment has been found to date.

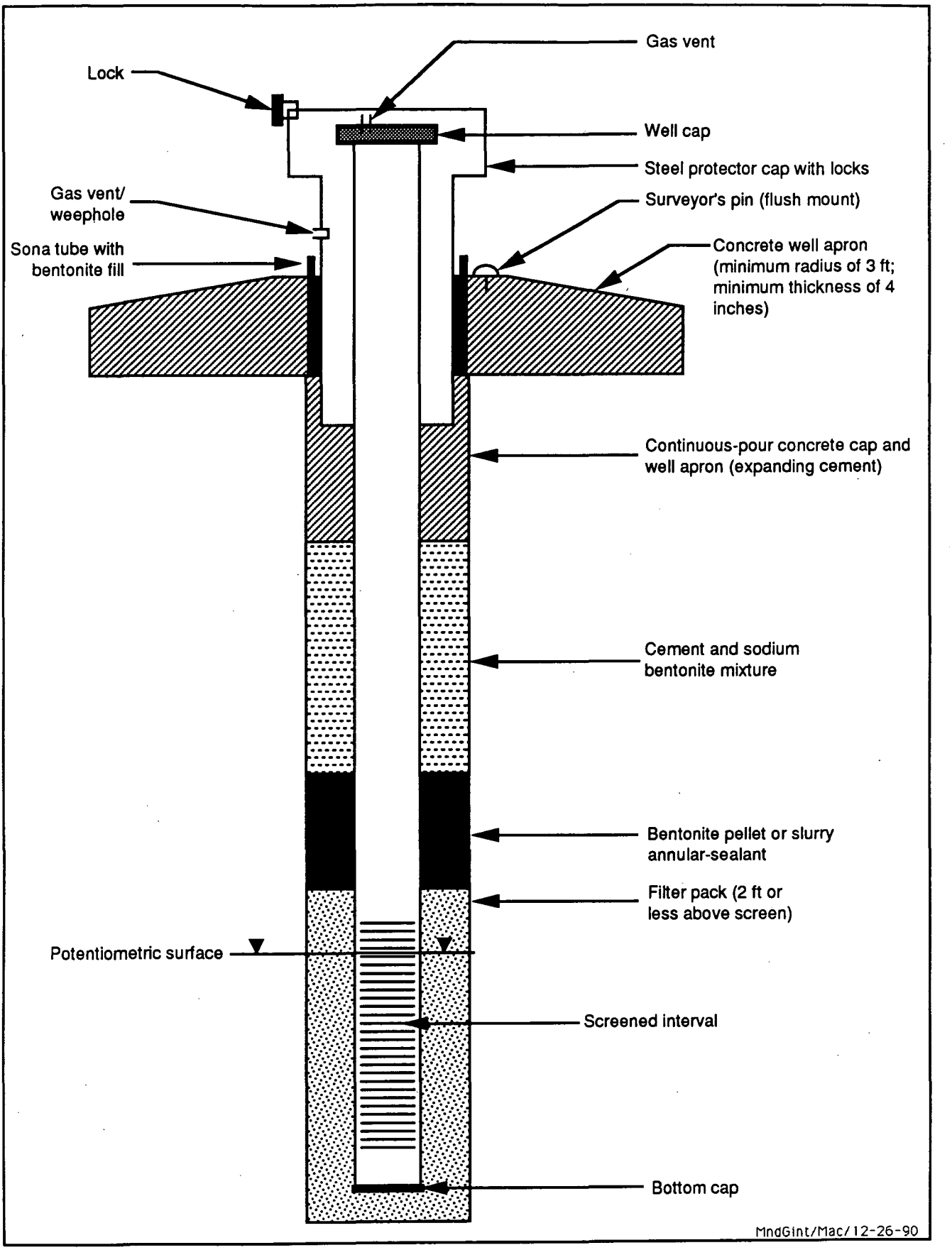


Figure 3.1. General monitoring well - cross section.

4.2. OVERFLOW POND AND RETENTION BASIN CONSTRUCTION

The geotechnical investigation at the site of the overflow pond and retention basins was conducted as part of Mound Plant's program to comply with National Pollution Discharge Elimination System (NPDES). The work partly consisted of drilling soil boreholes to depths ranging from 45 to 50 ft and drilling several auger probes to depths ranging from 13.5 to 31.5 ft. PVC casings with the bottom 5 ft slotted were installed in some of the boreholes and probe holes to monitor groundwater levels (Dames and Moore 1976a). There is no evidence that these piezometers still exist, and no record of their abandonment has been found.

4.3. NEW PROPERTY EVALUATION

The new property evaluation was conducted to assess possible land use and support new structure planning and possible landfill siting (Bowser-Morner 1983). Thirty-seven boreholes were made using a hollow-stem auger. Four of the boreholes (0812, 0817, 0827, and 0832) were completed as wells to monitor groundwater levels (Table III.1). The four piezometers were generally constructed with 1-1/4-inch-I.D. PVC casing, fitted with a 3-ft section of 0.020-inch well screen, backfilled with Ottawa sand to 4 ft below ground surface and a 2-ft bentonite seal to the surface, and emplaced without protective casing. No well development techniques were discussed, and no well security was provided (Bowser-Morner 1983). Records indicate that the piezometers have generally been dry. This was confirmed by inspection in 1987 by ER Program personnel (Price 1990). No record exists as to their current condition. The estimated locations of the four piezometers are included on Plate 1.

4.4. MOUND TRITIUM GROUNDWATER ASSESSMENT PROGRAM

The Mound tritium groundwater assessment program was conducted to help define the geological environment and stratigraphy of the Main Hill in connection with tritium-contaminated seeps (DOE 1989b). The seeps appear as small springs around the Main Hill and are thought to represent seepage of groundwater where impermeable shale layers intersect the ground surface (DOE 1989b). The locations of the known seeps are shown on Plate 1. Detailed descriptions and discussions of the seeps' conceptual model can be found in the Stage 3 Remedial Investigation Plan (DOE 1989b).

Owing to the nature of the low permeability shales and interbedded limestones, several observation test pits and trenches were installed on the Main Hill (Figure 4.1) to provide a more extensive cross section of the geology and groundwater flow than could be provided by boreholes or drilled wells. Monitoring wells were installed in test pits to provide a broad groundwater collection zone. The wells installed in test pits were originally given number designations beginning with W, but they have been

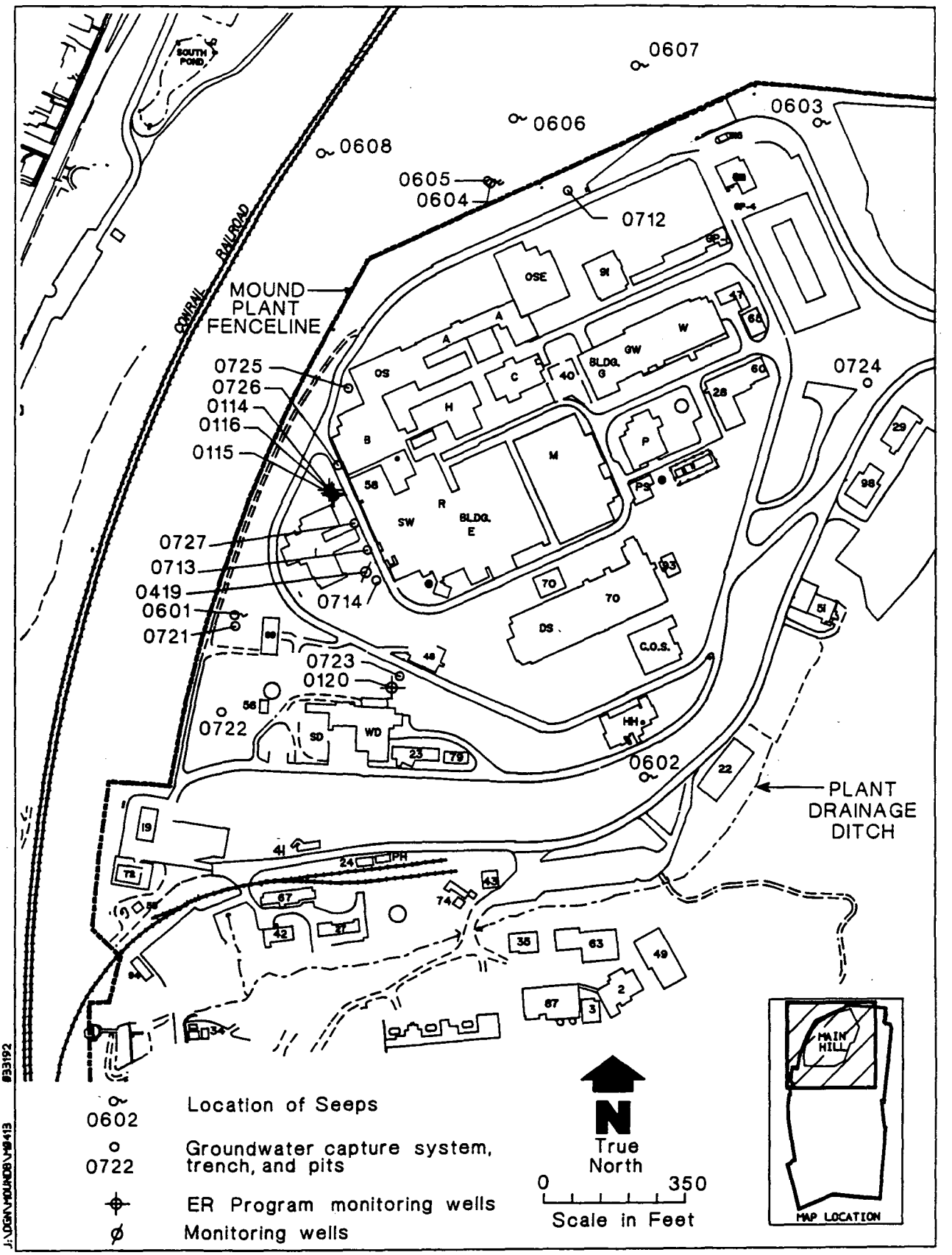
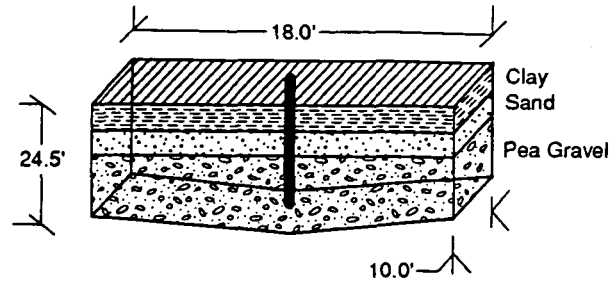


Figure 4.1. ER Program groundwater monitoring network.

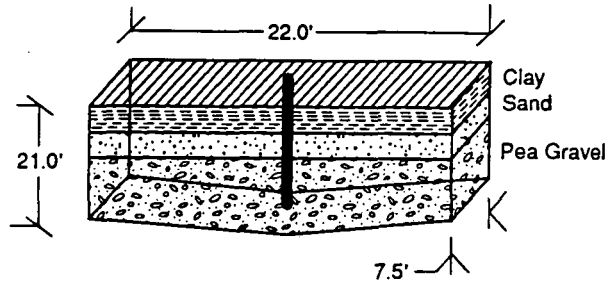
Well 0722 (F.K.A. PIT 19)

Surface Area: 1,372 ft^2
Volume: 4,410 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



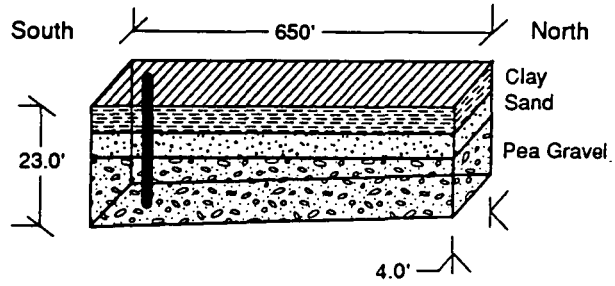
Well 0723 (F.K.A. PIT 6)
(PIT 48)

Surface Area: 1,239 ft^2
Volume: 3,465 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



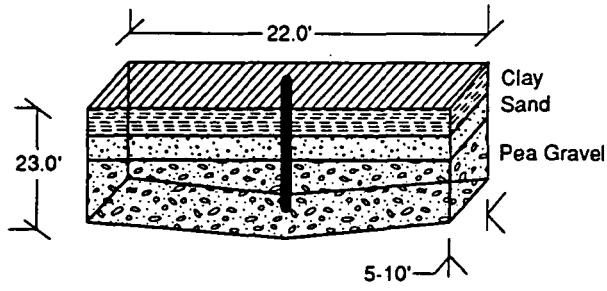
Well 0712 (F.K.A. PIT 1)
(North Trench)

Surface Area: 30,084 ft^2
Volume: 59,800 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



Well 0724 (F.K.A. PIT 7)
(PIT 45)

Surface Area: 1,242-1,472 ft^2
Volume: 2,530-5,060 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



As numbered on pit logs in the report titled "Groundwater Occurence and Movement in Consolidated Bedrock at the DOE Mound Laboratory," March 19, 1987 (Terran 1987).

F.K.A. – Formerly known as

MND-Scop-OU2-01/4-1-92

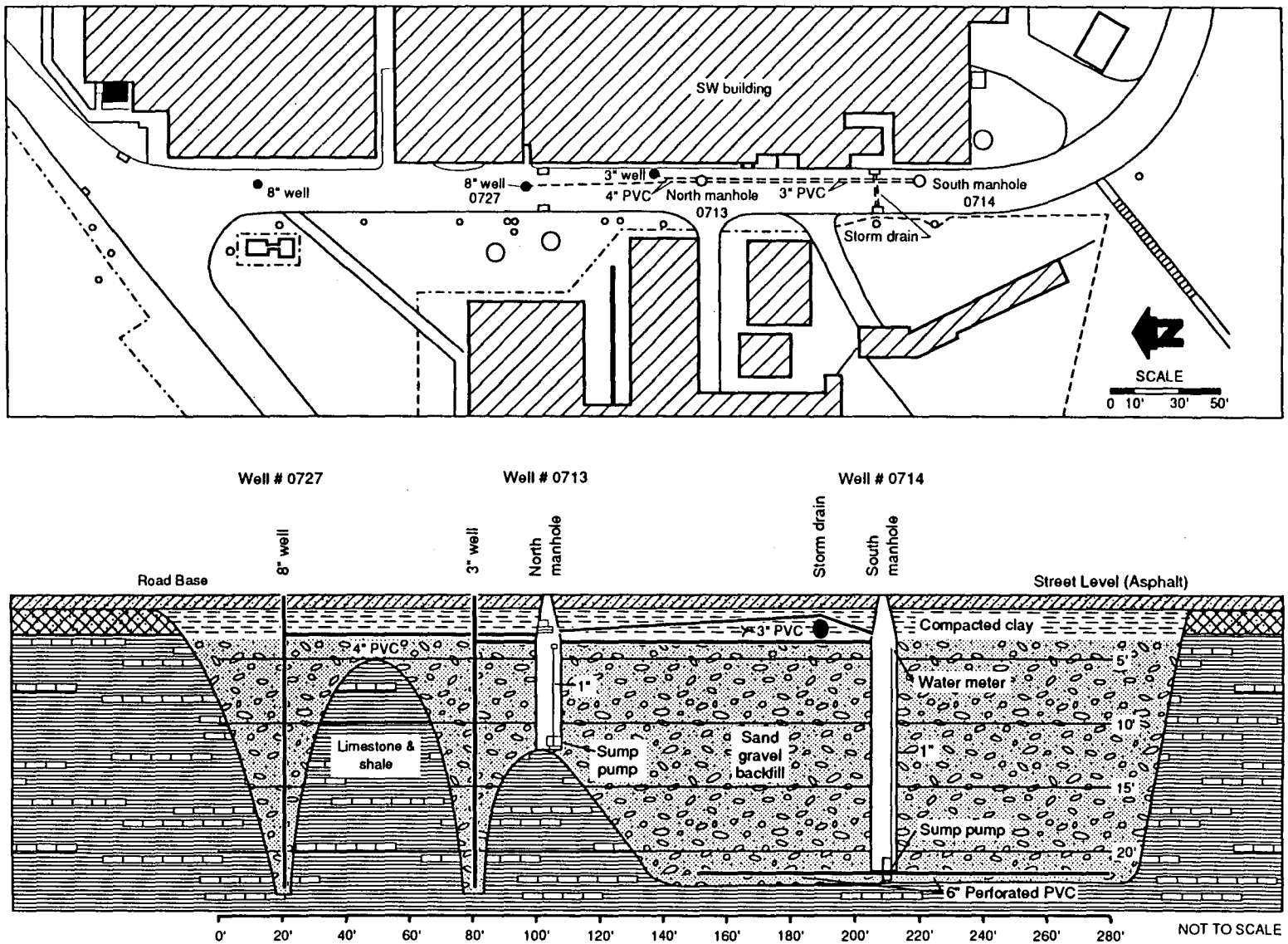
Figure 4.2. As-built diagrams of test pits on the Main Hill of Mound Plant.

renumbered to conform to the ER Program numbering system (Table III.1). The wells in test pits were constructed of 4-inch PVC casings with 3-ft slotted screens. Except for well 0712, the wells were placed at the center of the trench, and the bases of the trenches were sloped to drain to the well (Figure 4.2). The trench at well 0712 was sloped to the south end, and the well was placed near the south end. Well 0712 was part of a group. All of the trenches were backfilled with sand and gravel as shown in Figure 4.2.

On the west side of SW Building, a series of wells were completed in a long trench to form the tritium capture system. The details of the construction of the system are shown in Figure 4.3. The construction of the system centered around the deepening of two manholes and the placement of sumps to remove collected water. Perforated pipe helps to direct water to the sumps (Figure 4.3.). The wells were constructed with either 3- or 8-inch-I.D. PVC pipe. The 3-inch pipe had open-ended casings with 3-ft-long slotted screens at the bottom comprised of 0.5-inch holes drilled in the casings and then wrapped with fine wire mesh. The 8-inch wells have capped ends with 3-ft-long slotted screens. The pits were backfilled to the top of the screens with pea gravel, 2 ft of washed sand, and finally, a 2-ft compacted clay seal. The surface was covered with either dirt and topsoil or rock chips and asphalt if road repair was needed. The tritium capture system was completed in October 1987. This system forms an important part of the current tritium monitoring program on the Main Hill (DOE 1989b). The locations of wells installed as part of the tritium capture system are also shown on Plate 1. One sampling site (B001), which was included early in the project (DOE 1989b), consisted of an open construction excavation. This site is no longer part of the system and is not included on Plate 1.

4.5. OLD FILL SITES EVALUATION

The old fill sites evaluation was conducted to assist in radiological characterization of the SM/PP Hill. At least 22 cased boreholes were installed to facilitate *in situ* gamma logging of the soil profiles. These casings were not constructed to collect groundwater and are not considered part of the groundwater monitoring system. The wells were generally constructed with 4-inch PVC pipe with a glued cap at the bottom, set to the bottom of the soil boring. The boring was filled with clean sand to within 6 inches of the surface, where a bentonite seal was emplaced. A 6-inch locking steel casing was installed as a guard (Bowser-Morner 1984). Additional information regarding well utilization and borehole lithology is included in the Site Scoping Report, Volume III - Radiological Survey Report (DOE 1991b).



MND-Scop-OU2-03/4-2-92

Figure 4.3. Schematic cross section and placement of tritium capture system west of the SW building.

5. WELL DESIGNATIONS

Domestic, production, and monitoring wells that were constructed before 1986 were given location descriptor codes at the time of completion. The historical descriptor codes were converted to a format compatible with the ER Program in 1987. Table III.1 provides cross-references for the archaic and the revised ER Program well designations. The ER Program has in the past (DOE 1989b) used a prefix along with the four-digit descriptor codes. The prefixes designated the utilization of the wells and included the following:

MND01 - installation hydrogeochemical,
MND02 - installation geotechnical, and
MND03 - tritium monitoring stations.

The prefix codes are not used in this report, as the four-digit descriptor codes are unique. The well construction logs (Appendix A) are arranged numerically according to the ER Program description codes.

6. WELL LOCATIONS AND SPECIFICATIONS

Plate 1 shows the location of all wells contained in this report. Most of the well locations have been surveyed by a contractor licensed in the state of Ohio and are plotted according to the State Plane Coordinate System. The approximate locations of nonsurveyed wells are also plotted. The revised (ER Program) well designations are used to identify well locations.

The map was generated in electronic data format from data compiled by Woolpert Consultants, Inc., Dayton, Ohio, from color aerial photographs taken on December 8, 1985. The original data file used a Mound Plant coordinate system. The data were transformed to state plane coordinates using an algorithm written by Oak Ridge National Laboratory, Grand Junction Projects Office, Grand Junction, Colorado.

7. WELL TECHNICAL INFORMATION

Table VII.1 presents a summary of technical information for municipal, plant production, monitoring, and selected domestic wells within and adjacent to Mound Plant. The location ID is the ER Program designator code from Table III.1. Coordinate locations are given in the State Plane Coordinate System.

TABLE VII.1
WELL INFORMATION SUMMARY
FACILITY: MOUND PLANT

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	BOREHOLE ELEVATION (FT MSL)	BOREHOLE DEPTH (FT)	BOREHOLE DIAMETER (INCHES)	CASING ELEVATION (FT MSL)	CASING DEPTH (FT)	CASING DIAMETER (INCHES)	DEPTH TO TOP OF SCREEN	SCREENED INTERVAL (FT)
0001	597139.69	1494690.18	708.00	153.50	-	-	67.00	3.00	45.00	10.00
									65.00	2.00
0002	597343.29	1494720.33	706.00	70.00	-	-	67.	3.	47.	15.
									65.	2.
0003	597480.12	1494740.99	705.0	55.00	-	-	32.	3.	30.	2.
0004	597134.10	1494500.03	697.00	60.00	-	-	59.	3.	57.	2.
0005	597111.19	1494202.12	694.70	60.00	-	-	55.5	3.	53.5	2.
0006	597095.16	1493900.99	694.00	133.80	-	-	120.	3.	118.	2.
0007	597079.28	1493602.86	694.00	94.80	-	-	80.	2.	78.	2.
0008	597017.16	1493257.94	689.00	145.00	-	-	142.5	2.	140.5	2.
0020	598109.60	1495264.34	786.20	40.00	-	788.52	42.	2.	40.	2.
0028	597830.01	1495207.77	748.50	19.00	-	750.89	19.	2.	17.	2.
0033	597967.67	1496503.05	775.00	33.50	-	777.57	33.5	3.	31.5	2.
0034	598082.49	1496257.79	818.90	20.00	-	818.71	20.	3.	17.	3.
0035	597762.46	1495934.95	-	-	-	-	-	-	-	-
0042	597823.10	1496339.89	765.00	25.00	-	-	-	-	-	-
0046	597058.08	1494995.82	706.00	45.00	8.00	-	38.	8.	29.	3.
0052	597246.22	1496021.22	758.50	38.50	8.00	-	38.5	3.	36.5	2.
0055	596858.17	1495179.74	710.00	-	-	-	-	4.	-	-
0063	596574.31	1495055.67	704.80	45.00	8.00	707.23	37.	8.	34.	3.
0071	596424.29	1494997.59	703.00	53.50	26.00	-	53.5	26.	44.	9.5
0076	595832.03	1495095.83	703.00	64.00	-	-	64.	26.	47.	15.
0101	597131.82	1494693.42	707.90	45.00	-	708.34	45.	2.	43.	2.
0106	597097.13	1493902.18	694.00	50.00	-	-	50.	2.	48.	2.
0108	597018.81	1493256.98	687.00	22.00	-	-	22.	2.	20.	2.
0111	597971.10	1496733.11	779.	67.00	8.00	780.41	67.	4.	57.	10.
0112	597974.36	1496515.41	773.50	35.50	8.00	775.2	37.	4.	35.5	10.
0113	599083.45	1495916.48	875.40	58.00	8.00	874.62	55.7	4.	52.25	3.
0114	598615.58	1495593.02	874.20	55.00	8.00	873.51	53.	4.	49.5	3.
0115	598602.45	1495603.89	874.30	42.00	8.00	873.55	41.5	4.	30.5	9.5
0116	598607.40	1495599.74	874.10	89.00	8.00	873.05	80.5	4.	69.8	10.
0117	598073.99	1495765.12	811.90	17.50	8.00	813.5	15.5	2.	5.5	10.
0118	600022.28	1495793.93	706.80	41.50	8.00	706.35	40.63	4.	30.63	10.
0119	597543.67	1495848.78	741.60	43.00	8.00	742.84	42.68	4.	32.68	10.
0120	598125.59	1495747.12	821.50	33.00	8.00	822.36	32.2	2.	20.5	10.
0121	597999.14	1497793.04	886.90	111.50	8.00	888.65	109.	4.	95.5	10.
0122	597637.24	1495224.80	742.30	41.00	8.00	744.03	40.5	4.	31.5	10.
0123	597471.04	1494746.19	705.40	61.00	9.00	706.87	56.5	4.	50.	6.
0124	597345.59	1494711.26	705.50	55.50	8.00	706.92	55.	4.	45.	10.
0125	597320.12	1495388.29	707.30	34.00	8.00	708.85	32.78	4.	22.5	10.
0126	597159.57	1494700.46	705.90	60.50	8.00	707.43	53.83	4.	43.83	10.
0127	597116.73	1493916.16	694.20	25.70	8.00	695.85	25.	4.	15.	10.
0128	597105.64	1493917.44	693.70	55.60	8.00	695.48	55.	4.	45.	10.
0129	596836.65	1494665.72	701.90	41.50	8.00	701.31	41.	4.	31.	10.
0130	596459.64	1493663.29	695.30	35.50	8.00	694.49	34.71	4.	24.71	10.
0137	597339.95	1495065.92	723.20	75.00	-	725.25	75.	3.	73.	2.
0138	599681.10	1495320.65	700.10	41.50	4.00	699.31	41.	4.	31.	10.
0151	597275.41	1495545.64	740.52	48.80	8.00	742.83	48.8	4.	17.5	31.3
0152	596982.64	1494955.35	705.42	47.00	8.00	707.31	47.	4.	27.	20.
0153	596691.58	1494953.87	704.43	41.50	9.00	706.35	41.5	4.	21.5	20.
0154	596418.78	1494969.47	702.90	53.50	8.00	704.22	47.	4.	37.	10.
0155	596407.73	1494971.57	702.8	32.70	8.00	704.28	32.7	4.	22.7	10.
0156	596184.07	1494547.33	693.00	36.50	4.00	692.35	36.23	4.	26.23	10.
0157	596173.40	1494548.63	693.30	61.80	8.00	692.6	61.8	4.	51.8	10.
0158	594037.51	1495276.62	702.80	39.20	8.00	704.46	39.	4.	29.	10.
0159	594038.40	1494169.69	692.20	32.00	8.00	691.6	31.	4.	21.	10.
0160	594049.03	1494168.54	692.30	50.20	8.00	691.86	50.2	4.	40.2	10.
0227	597909.38	1495689.53	785.00	31.50	6.00	787.19	31.5	3.	29.3	2.

TABLE VII.1
WELL INFORMATION SUMMARY (CONT.)
FACILITY: MOUND PLANT

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	BOREHOLE ELEVATION (FT MSL)	BOREHOLE DEPTH (FT)	BOREHOLE DIAMETER (INCHES)	CASING ELEVATION (FT MSL)	CASING DEPTH (FT)	CASING DIAMETER (INCHES)	DEPTH TO TOP OF SCREEN	SCREENED INTERVAL (FT)
0236	597700.00	1495385.00	-	-	-	-	-	-	-	-
0242	597765.89	1496159.17	752.80	13.00	-	-	13.	3.	11.	2.
0271	596106.85	1495048.14	703.00	60.00	-	-	59.	26.	43.	16.
0276	596061.52	1495042.82	701.54	38.50	-	-	38.50	2.	NA	NA
0301	597872.78	1494179.84	695.10	88.00	8.00	694.44	86.2	4.	75.5	10.
0302	597080.22	1493925.90	694.00	120.60	8.00	693.22	120.	4.	109.5	10.
0303	597115.40	1494497.22	697.30	93.50	8.00	696.75	89.	4.	78.5	10.
0304	596159.94	1494549.58	693.10	103.90	8.00	692.4	102.	4.	91.	10.
0305	596493.51	1495084.47	710.00	40.50	8.00	711.76	39.2	4.	33.7	5.
0306	596672.67	1494951.74	703.90	41.00	8.00	706.07	40.	4.	34.4	5.
0307	596849.18	1495024.87	716.00	52.00	8.00	718.02	51.	4.	45.5	5.
0308	596646.45	1495223.89	750.50	68.60	8.00	752.52	67.6	4.	63.	4.
0309	596503.04	1495098.28	710.10	53.10	8.00	712.19	50.2	4.	45.7	5.
0310	596682.64	1494952.10	703.80	54.80	8.00	705.53	54.7	4.	49.2	5.
0311	597873.25	1494187.71	695.60	35.00	8.00	694.9	31.2	4.	21.2	9.3
0312	597747.88	1495032.91	731.20	33.60	8.00	733.2	32.4	4.	21.9	10.
0313	596850.50	1495022.00	716.00	41.50	8.00	718.14	40.	4.	34.5	5.
0314	597414.47	1495713.64	742.50	44.80	8.00	744.47	43.5	4.	33.	10.
0315	597341.97	1495079.79	723.80	55.60	8.00	725.88	54.	4.	43.4	10.
0316	597110.81	1495384.97	724.70	45.00	8.00	726.92	37.6	4.	22.2	10.
0317	596206.65	1495023.69	703.80	63.50	4.00	705.64	61.3	4.	50.8	10.
0318	598643.83	1497216.68	810.70	30.30	8.00	812.77	28.8	4.	18.3	10.
0319	595512.27	1495148.29	701.70	95.00	8.00	703.48	53.3	4.	42.8	10.
0320	595023.61	1495353.86	704.70	117.00	8.00	706.44	42.4	4.	31.9	10.
0371	596196.60	1495018.44	703.64	47.00	-	705.76	49.	2.0	-	-
0419	598413.05	1495683.78	873.50	19.00	-	-	19.	3.	17.	2.
0471	596265.23	1495008.91	702.84	44.50	-	704.73	-	2.0	-	-
0571	596448.77	1494972.83	702.74	44.50	-	705.26	-	2.	-	-
0712	599350.00	1496181.00	-	-	-	-	-	-	-	-
0713	598467.00	1495687.00	872.80	12.00	-	872.80	12.0	72.00	NA	NA
0714	598392.00	1495709.00	872.80	23.00	-	872.80	23.00	72.00	NA	NA
0721	598278.00	1495358.00	-	-	-	-	-	-	-	-
0722	598066.00	1495324.00	-	-	-	-	-	-	-	-
0723	598154.00	1495766.00	-	-	-	-	-	-	-	-
0724	598876.00	1496923.00	-	-	-	-	-	-	-	-
0725	598865.00	1495639.00	-	-	-	-	-	-	-	-
0726	598675.00	1495614.00	872.80	-	-	872.80	-	8.0	-	-
0727	598533.00	1495654.00	872.80	-	-	872.80	20.00	8.0	-	-
0812	596711.00	1497082.78	795.20	10.00	8.00	798.20	10.00	1.25	7.0	3.0
0817	595459.54	1496685.02	761.00	15.50	8.00	762.50	15.50	1.25	12.50	3.0
0827	595056.50	1495796.00	713.20	20.00	8.00	716.20	20.00	1.25	17.0	3.0
0832	595113.04	1495288.33	704.10	20.00	8.00	707.10	20.00	1.25	17.0	3.0
0901	596823.11	1494339.27	-	-	-	-	-	-	-	-
0902	596797.52	1493543.91	-	50.00	-	-	-	-	-	-
0903	596526.49	1493902.79	-	72.00	-	-	-	5.62	-	-
0904	596559.69	1494557.46	-	52.00	-	-	52.	-	50.	3.
0905	596442.20	1494528.36	-	-	-	-	-	-	-	-
0906	596719.01	1494545.64	-	52.00	-	-	51.	6.	48.	3.
0907	596827.04	1494529.62	-	50.00	-	-	49.	6.00	46.	3.
0908	596273.51	1494211.76	-	-	-	-	-	-	-	-
0909	597064.97	1493902.09	693.90	-	-	694.88	-	-	-	-
0912	597153.32	1494716.61	708.00	50.00	-	-	-	26.	-	-
0913	599598.99	1495364.89	-	-	-	-	-	26.	-	-
0918	601023.84	1494148.25	-	-	-	-	-	26.	-	-
0919	600438.60	1493886.48	-	-	-	-	-	26.	-	-
0920	600796.13	1494251.45	-	-	-	-	-	26.	-	-
0921	600487.30	1494369.45	-	-	-	-	-	26.	-	-
0922	600051.43	1494087.22	-	-	-	-	-	-	-	-
0923	601401.31	1494269.44	689.50	51.00	8.00	692.17	43.8	4.00	33.8	10.0
0924	600283.66	1493744.62	694.10	33.00	8.00	697.01	32.8	4.00	22.8	10.0
0925	600798.63	1493691.91	698.30	91.30	8.00	701.28	91.3	4.00	71.3	20.0

(-) No data available
(NA) Not applicable

Borehole, well casing, depth to screen, and screened interval data are given, if available. Complete well completion and construction details are given in Appendix A.

8. LOG REPORT SPECIFICATIONS

Appendix A of this report presents computerized, graphical representations of well construction detail, borehole lithology, and sampling information. Figure 8.1 provides an example of a typical geologic and well information log report. Each log presents borehole and monitoring well background information. This information is transcribed from the original field logs, then entered into a computer program that generates the information on the log report as numeric or character field outputs. The state plane coordinates, date started, and date completed are numeric fields and remain blank when the information is unknown. Total Depth is also a numeric field but requires the input of a positive numeric value. Therefore, when the total depth of the borehole is unknown, a value of 1.0 is entered. The drilling company, drilling method, drilling fluid, ground surface elevation, top of casing elevation, and logged by are character fields and can be described by "Unk" when the information is unknown. Any significant events or data pertaining to a particular borehole or well are entered into the comments field. The data transcription was reviewed and verified by a geologist.

On each log report, borehole lithology, sample depth, and well construction information are represented in graphic, symbol, and text format using the following data columns:

- **Depth**: The depth scale is represented by segmented lines within the depth column. Each segment represents a 1-ft increment.

- **Sample**: This data column presents sample information consisting of three individual columns:

  - **T column**: Sample type. A letter code illustrates the types of samplers used during drilling and at what depth they were used. The sample depth is identified by the location of the sampler letter code next to the incremented depth column. There are five sample types:

    SS - split spoon

    C - auger or rotary cuttings

    DU - Dames and Moore U-type sampler

    ST - shelby tube

    RC - rock core

  - **A column**: Sample analysis. A letter code illustrates the type of analysis performed on each sample. There are seven types of sample analyses:

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE 1 of 5

Drilling Company	Bowser Morner	Borehole/Well Id	0304
Drilling Method	Cable Tool	STATE PLANE COORDINATES	
Drilling Fluid	None	North (ft)	596159.94
Date Started	9/16/89	East (ft)	1494549.58
Date Completed	9/20/89	Ground Surface Elev. (ft)	693.10
Logged By	Jeff Manship	Top of Casing Elev. (ft)	692.40
Checked By	Tom Tharp	Total Depth (ft)	103.9
Comments:			

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							OH	Brownish black (5YR 3/2) organic clay.
				BACKFILL: Cement and bentonite grout.				
5	SS	LI	0001	CASING: Stainless steel, 4".				
	SS	LI	0002				SP	Light brown (10YR 6/3) gravelly sand, unconsolidated, medium grained, dry.
							GC-GM SP-ML	Tan (10YR 7/4) sand and gravel with silt and clay, poorly graded.
10	SS	LI	0003					
15	SS	LI	0004					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 1 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager: John B. Price	PAGE: 2 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0005					
25				BACKFILL: Cement and bentonite grout.			CL	Dark reddish brown (10YR 4/4) silty clay with fine gravel, very dense, hard.
30	SS	LI	0006	CASING: Stainless steel, 4".				
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
35	SS	LI	0007					
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
40								
45	SS	LI	0008					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 2 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager: John B. Price	PAGE: 3 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
50				BACKFILL: Cement and bentonite grout.				
55	SS	LI	0009	CASING: Stainless steel, 4".				
							SP	Sand, poorly graded, medium grained, no fines, few pebbles, wet.
60								
65	SS	LI	0010					
							GC-GM	Gray (5Y 5/1) to brown (10YR 5/6) sand and gravel with silt and clay, well graded, very dense, hard.
70	SS	LI	0011					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 3 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 4 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	SS ST ST	LI GT GT	0012 0075	BACKFILL: Cement and bentonite grout.				
							GC-GM	Gray (5Y 5/1) to brown (10YR 5/6) sand and gravel with silt and clay, well graded, very dense, hard.
80				CASING: Stainless steel, 4".				
				SEAL: Bentonite slurry.				
85	SS	LI	0013					
							CL	Sandy clay.
90	SS	LI	0014					
							GC-GM	Sand and gravel with silt and clay (< 15%), sand is coarse grained, poorly graded, wet.
				FILTER PACK: #5 quartz sand.				
95	SS	LI	0015					
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 4 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 5 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				FILTER PACK: #5 quartz sand. SCREEN: Stainless steel, 4", with .01" wire wrap slot. SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
105								Total Depth = 103.9 feet.
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 5 of 5).

LI - lithologic description

H3 - tritium

EP - EP Toxicity

AB - gross alpha and beta

PU - plutonium

VO - volatile organic compounds

GT - geotechnical testing

- ID column: Sample identification. A numerical code recorded on the original borehole log that represents the sample collected.

  Samples collected for lithologic analysis were not always designated with a sample identification number on the original borehole log. Other samples collected for lithologic analysis were assigned sample identification numbers correlating to the depth of the sample. All lithologic samples were assigned or reassigned consecutive identification numbers on the log report, beginning closest to the surface with 0001. Samples collected for analyses other than lithologic retained their original sample identification number.

- **Well Materials**: Provides pertinent well construction information in text format.

- **Well Con (Well Construction)**: A scaled illustration of the well construction using representative pattern graphics (Table VIII.1).

- **Lith (Lithology)**: A scaled illustration of lithologic types encountered during drilling using representative pattern graphics (Table VIII.2).

- **USCS or Rock Type**: A two-letter code used to classify contrasting soil types encountered during drilling using the Unified Soil Classification System (USCS) (Figure 8.2) (Waterways Equipment Station 1953).

Dual symbols are used to indicate borderline soil classifications, such as GC-GM. The USCS does not apply to bedrock lithologies or soils classified as glacial till. Therefore, letter codes were developed that classify the lithologies (rock type) not addressed by the USCS. The appropriate USCS, glacial till, or rock type classification is listed for each lithology pattern.

- **Lithologic Description**: Original lithologic descriptions are directly transcribed onto the log report and correspond with appropriate USCS/Rock Type classifications, lithology patterns, and sample depths.

  Each lithology pattern (Table VIII.2) is designed to graphically symbolize the corresponding lithologic description as closely as possible. As a result, a single USCS classification can be represented by several different lithology patterns. For example, the USCS classification "CL" can represent lithology patterns that symbolize clay, silty clay, sandy clay, or gravelly clay (Table VIII.2).

Table VIII.1. Well Construction Pattern Explanations

	Description
	Bentonite pellet backfill.
	Solid pipe surrounded by bentonite-cement grout.
	Solid pipe surrounded by bentonite pellets.
	Solid pipe surrounded by bentonite slurry.
	Backfill consisting of native sediment.
	Slotted pipe surrounded by gravel.
	Gravel backfill.
	Solid pipe surrounded by gravel backfill.
	Solid pipe surrounded by earth backfill.
	Quartz sand backfill.
	Slotted pipe surrounded by quartz sand.
	Solid pipe surrounded by quartz sand.

Table VIII.2. Borehole Lithology Pattern Explanations

USCS or Rock Type	Description
FL	Fill
SP-SW	Gravelly sand
CH	Clay with high plasticity
CL	Clay
CL	Gravelly clay
CL	Gravelly sandy clay
CL	Gravelly sandy silty clay
CL	Silty clay
CL	Silty clay with gravel
CL	Silty clay with sand and gravel
CL	Silty clay with sand
CL	Sandy clay
GC	Clayey gravel
GC-GM	Clayey silty gravel
GC	Clayey sandy gravel
GM	Silty gravel
GM	Silty sandy gravel
GP or GW	Clean gravel
GP or GW	Sandy gravel
GC-GM	Sand and gravel with silt and clay

USCS or Rock Type	Description
LS-SH	Interbedded limestone and shale
LS	Limestone
CL-ML	Silt and clay
ML	Silt
ML	Clayey silt
ML-GM	Gravelly silt
ML-GM	Sandy gravelly silt
ML	Sandy silt
ML	Sandy clayey silt
NR	No recovery
OL	Organic, silt to silty clay
OH	Organic clay
SP or SW	Sand (poorly and well graded)
SC	Clayey sand
SC-SP or SC-SW	Clayey gravelly sand
SH	Shale
SM	Silty sand
SC-SM	Silty sand to clayey sand
SM-SP or SM-SW	Silty gravelly sand
CL-SP	Interlayered clay and sand

USCS or Rock Type	Description
TI	Glacial till
TS	Topsoil

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICTY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICTY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Dual symbols are used to indicate borderline soil classifications.

MndGntSoilClass 12-26-90

Figure 8.2. Unified Soil Classification System chart (Waterways Equipment Station 1953).

The Munsell soil color chart (Munsell 1975) was used to determine the sediment or rock color when applicable. The Munsell notation for color consists of separate notations for hue, value, and chroma, traditionally are listed in that order to form the color designation.

- **Groundwater**: Provides a graphic display of groundwater levels encountered in the borehole during drilling (light indicator arrow) and in the well during well development (dark indicator arrow).

  When these data were unavailable on the original logs, the most recent groundwater level measured in the well was recorded along with the date and is displayed by the dark indicator arrow.

Appendix A contains the well log completion reports. These are arranged by ER Program ID number located in the upper right column of the report. Additional well logs may be inserted as they become available.

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ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9,
SITE SCOPING REPORT: VOLUME 2 -
GEOLOGIC LOG AND WELL INFORMATION REPORT

MOUND PLANT

May 1992

DEPARTMENT OF ENERGY
ALBUQUERQUE FIELD OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
TECHNICAL SUPPORT OFFICE
LOS ALAMOS NATIONAL LABORATORY

FINAL

Signature Page

This report is Volume 2 of a multiple-volume Site Scoping Report providing the background information pertinent to the remedial investigation/feasibility study (RI/FS) of the Mound Plant. Under the terms of the Federal Facility Agreement between DOE and US EPA, this report is submitted to US EPA for approval.

This report is approved by US EPA only for the purposes of scoping the RI/FS, and approval does not imply concurrence with the interpretations presented herein. It is recognized that additional information will be collected during the RI/FS and may supersede information contained in this report.

APPROVED: Diana Mally
Remedial Project Manager
U.S. Environmental Protection Agency
Region V

Diana Mally

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ACRONYMS

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ER (Program)	Environmental Restoration (Program)
FFA	Federal Facilities Agreement
FS	Feasibility Study
MCD	Miami Conservancy District
MWFPP	Miamisburg Well Field Protection Program
NPDES	National Pollutants Discharge Elimination System
NPL	National Priorities List
OEPA	Ohio Environmental Protection Agency
PVC	polyvinyl chloride
RCRA	Resource Conservation and Recovery Act
RI	remedial investigation
SOP	Standard Operating Procedure
TEGD	Technical Enforcement Guidance Document
USCS	Unified Soil Classification System

ACKNOWLEDGMENTS

This report was prepared by Roy F. Weston, Inc., Albuquerque, New Mexico, under subcontracts 9-XS8-0146R-1 and 9-XS1-Q7181-1 to the University of California, Los Alamos National Laboratory.

1. INTRODUCTION

The U.S. Department of Energy (DOE) Mound Plant, Miamisburg, Ohio, was placed on the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) National Priorities List (NPL) on November 21, 1989 (54 FR 48184). Pursuant to its NPL status, the DOE signed a CERCLA Section 120 Federal Facility Agreement (FFA) with the U.S. Environmental Protection Agency (EPA) that became effective October 11, 1990. A similar agreement is currently in negotiation between the DOE and the Ohio EPA (OEPA). The terms of the FFA require that the DOE develop and implement remedial investigations (RIs) and feasibility studies (FSs) and conduct interim remedial actions in order to ensure that environmental impacts associated with past and present activities at the site are thoroughly investigated and appropriate action is taken to protect the public health and welfare and the environment.

The Albuquerque Field Office of the DOE established the Environmental Restoration (ER) Program in 1984 to collect and assess environmental data in order to develop a conceptual site model to assess both the nature and extent of contamination and to identify potential exposure pathways and potential human and environmental receptors. These activities have been conducted under DOE policy to ensure that all facilities comply with applicable environmental regulations. In order to provide EPA with sufficient information and data gathered during these previous investigations, a multi-volume scoping report, providing background information, has been prepared. The Site Scoping Report will provide descriptions and summaries of the current conditions and characteristics of Mound Plant and will consist of at least the following volumes:

1. Groundwater Data: February 1987 - July 1990
2. Geologic Log and Well Information
3. Radiologic Site Survey
4. Engineering Map Series
5. Topographic Map Series
6. Photo History
7. Waste Management
8. Environmental Monitoring Data
9. Bibliography
10. Permits and Enforcement Actions
11. Spills and Response Actions

2. GEOLOGIC LOG AND WELL INFORMATION REPORT

This report presents a location map, as well as well construction and borehole lithology details, for monitoring and production wells located within and adjacent to Mound Plant that have been used to collect environmental samples. Selected residential and municipal wells, historically used for environmental monitoring, are also included. The well completion and borehole information in this report has been gathered from both historical sources and the RI field studies. The accuracy of historical information has been reviewed for completeness and consistency to the extent possible. A comprehensive location map is provided as Plate 1. The well completion logs are provided in Appendix A.

This report also contains an overview of monitoring wells installed at Mound Plant but not sampled by the ER Program. Most of these other wells have been abandoned or evaluated and not used by the ER Program. Descriptive summaries are additionally provided of test and capture pit wells installed on the Main Hill to assess tritium contamination (DOE 1989b). General construction information only is known for the capture pits and wells. Further information is provided in the Remedial Investigation Plan, Stage 3 (DOE 1989b). Not included in this report are other data pertinent to the residential and municipal wells within a two-mile radius of the plant. This data requirement is addressed in the Site-Wide RI/FS Work Plan (DOE 1992a).

Results of sampling and analyses of the environmental monitoring wells contained in this report can be found in the Remedial Investigation Plan, Stage 3 (DOE 1989b), and the Operable Unit 1, Area B, Technical Memorandum 3 (DOE 1991a). Additionally, the Site Scoping Report: Volume 1 - Groundwater Data: February 1987 to July 1990 (DOE 1992b) provides an index to wells and sample parameters over the dates indicated.

Additional geologic and lithologic information for Mound Plant can be found in the Site Scoping Report: Volume 2 Addendum - Stratigraphic and Lithologic Logs (DOE 1992c), which contains a compilation of borehole logs performed as part of plant engineering, planning, and foundation studies.

3. ER PROGRAM GROUNDWATER MONITORING NETWORK

The environmental monitoring network at Mound Plant consists of municipal, domestic, plant supply, and monitoring wells installed within and adjacent to the plant. Knowledge of the construction details of municipal, domestic, and plant supply (production) wells varies considerably; there is little documentation on older wells. Monitoring wells installed within and adjacent to the plant include wells installed during the following projects:

- the 1975 Potable Water Standards Project (Dames and Moore 1976b, 1978),
- the Buried Valley Aquifer Evaluation Project (Dames and Moore 1976c),
- the 1987 DOE Headquarters Environmental Survey (DOE and Battelle 1987),
- the ER Program field investigations (DOE 1987, 1989b), and
- other undesignated projects associated with evaluations of the Mound Plant production well field.

Background information for each of these well systems and their current status in the ER Program are discussed below. The locations for all wells in the environmental monitoring network are depicted on Plate 1 of this report. A summary of the municipal and plant production wells, monitoring wells, and selected domestic supply wells is presented in Table III.1.

3.1. BACKGROUND AND CURRENT STATUS OF MUNICIPAL, DOMESTIC, AND PLANT PRODUCTION WELL SYSTEMS

3.1.1. Municipal Wells

The City of Miamisburg has several municipal supply wells on both the east and west sides of the Great Miami River. The city does not have good records of well construction dates and other data for the older wells. Some information about the municipal wells for this report was taken from historic memorandums compiled by Mound Plant personnel from interviews of city employees. Historically, the City of Miamisburg wells were all located on the east side of the Great Miami River. Many wells were located near the old Miamisburg Light Plant that was located at the present position of the Miamisburg municipal swimming pool and park area. The north and south ponds (Plate 1) were cooling ponds for the power plant. There were apparently five 50-ft deep wells located east of the north and south ponds (Plate 1) that were taken out of service in 1927-1928 (Black 1974). Wells 0912 and 0913 (originally municipal wells No. 2 and No. 3) supplied a 500,000-gallon water tank on the north hillslope of the Main Hill below the OSE Building. This tank and the power plant were dismantled in 1976, and the main municipal well field was moved to the west side of the river.

Two of the original municipal wells adjacent to Mound Plant currently remain in service. Municipal well No. 2, originally known as the "Egan" well, was taken out of municipal service in 1969, but it was overhauled by Mound Plant in the middle 1970s and used for remedial pumping of the tritium-contaminated groundwater in the Buried Valley aquifer (Dames and Moore 1976c; Styron and Meyer 1981; DOE 1989b, 1991a, 1992a). Little is actually known of its construction. Its casing diameter is 26 inches, and it is about 50 ft deep. A geophysical investigation was initiated in 1987, but it was

Table III.1. Summary Table of Municipal, Plant Production, Monitoring, and Selected Domestic Wells On and Adjacent to Mound Plant

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0001	07/23/76	Buried Valley aquifer evaluation	OW-1	Rotary	No
0002	07/26/76	Buried Valley aquifer evaluation	OW-2	Rotary	No
0003	07/27/76	Buried Valley aquifer evaluation	OW-3	Rotary	No
0004	07/28/76	Buried Valley aquifer evaluation	OW-4	Rotary	No
0005	07/29/76	Buried Valley aquifer evaluation	OW-5	Rotary	No
0006	07/15/76	Buried Valley aquifer evaluation	OW-6	Rotary	No
0007	11/18/76	Buried Valley aquifer evaluation	OW-7	Rotary	No
0008	09/18/76	Buried Valley aquifer evaluation	OW-8	Rotary	No
0020	Ca. 1975	Buried Valley aquifer evaluation	20-1	Unknown	No
0028	Ca. 1975	Buried Valley aquifer evaluation	28-1	Unknown	No
0033	05/13/76	Portable water standards project	33-1	Auger	No
0034	05/26/76	Portable water standards project	34-1	Auger	No
0035	05/13/76	Portable water standards project	35-1	Unknown	No
0042	Ca. 1975	Portable water standards project	42-1	Unknown	No
0046	06/22/74	Other	46-1	Unknown	No
0052	05/18/76	Portable water standards project	52-1	Rotary	No
0055	Ca. 1975	Portable water standards project	55-1	Unknown	No
0063	06/18/74	Other	63-1	Unknown	No
0071	Jan. 1962	Mound Plant production well	71-1	Unknown	Yes[b]
0076	Dec. 1947	Mound Plant production well	76-1	Unknown	Yes[b]
0101	Ca. 1976	Buried Valley aquifer evaluation	OW-1A	Unknown	No
0106	Ca. 1976	Buried Valley aquifer evaluation	OW-6A	Unknown	No
0108	Ca. 1976	Buried Valley aquifer evaluation	OW-8A	Unknown	No
0111	11/17/87	ER Program remedial investigation	N/A	Cable tool	Yes
0112	11/18/87	ER Program remedial investigation	N/A	Cable tool	Yes
0113	11/16/87	ER Program remedial investigation	N/A	Air rotary	Yes
0114	11/11/87	ER Program remedial investigation	N/A	Air rotary	Yes
0115	11/10/87	ER Program remedial investigation	N/A	Cable tool	Yes
0116	11/02/87	ER Program remedial investigation	N/A	Cable tool	Yes
0117	12/02/87	ER Program remedial investigation	N/A	Air rotary	Yes

Table III.1. (page 2 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0118	10/20/87	ER Program remedial investigation	N/A	Cable tool	Yes
0119	11/13/87	ER Program remedial investigation	N/A	Cable tool	Yes
0120	12/04/87	ER Program remedial investigation	N/A	Air rotary	Yes
0121	11/12/87	ER Program remedial investigation	N/A	Cable tool	Yes
0122	11/19/87	ER Program remedial investigation	N/A	Cable tool	Yes
0123	10/07/87	ER Program remedial investigation	N/A	Cable tool	Yes
0124	10/13/87	ER Program remedial investigation	N/A	Cable tool	Yes
0125	11/10/87	ER Program remedial investigation	N/A	Cable tool	Yes
0126	10/16/87	ER Program remedial investigation	N/A	Cable tool	Yes
0127	10/02/87	ER Program remedial investigation	N/A	Cable tool	Yes
0128	09/30/87	ER Program remedial investigation	N/A	Cable tool	Yes
0129	11/05/87	ER Program remedial investigation	N/A	Cable tool	Yes
0130	11/06/87	ER Program remedial investigation	N/A	Cable tool	Yes
0137	05/24/76	Portable water standards project	37-1A	Rotary	No
0138	10/28/87	ER Program remedial investigation	N/A	Cable tool	Yes
0151	07/06/87	DOE environmental survey	N/A	Cable tool	Yes
0152	07/08/87	DOE environmental survey	N/A	Cable tool	Yes
0153	07/10/87	DOE environmental survey	N/A	Cable tool	Yes
0154	10/04/87	ER Program remedial investigation	N/A	Cable tool	Yes
0155	10/05/87	ER Program remedial investigation	N/A	Cable tool	Yes
0156	10/27/87	ER Program remedial investigation	N/A	Cable tool	Yes
0157	10/26/87	ER Program remedial investigation	N/A	Cable tool	Yes
0158	11/09/87	ER Program remedial investigation	N/A	Cable tool	Yes
0159	10/18/87	ER Program remedial investigation	N/A	Cable tool	Yes
0160	10/18/87	ER Program remedial investigation	N/A	Cable tool	Yes
0227	05/27/76	Portable water standards project	27-2	Auger	No
0236	Ca. 1975	Portable water standards project	36-2	Auger	No
0242	05/13/76	Portable water standards project	42-2	Auger	No
0271	Jan. 1948	Mound Plant production well	71-2	Unknown	Yes[b]
0276	04/04/61	Other	76-2	Percussion Jet	No

Table III.1. (page 3 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0301	08/09/89	ER Program remedial investigation	N/A	Cable tool	Yes
0302	09/15/89	ER Program remedial investigation	N/A	Cable tool	Yes
0303	09/06/89	ER Program remedial investigation	N/A	Cable tool	Yes
0304	09/20/89	ER Program remedial investigation	N/A	Cable tool	Yes
0305	08/22/89	ER Program remedial investigation	N/A	Cable tool	Yes
0306	09/02/89	ER Program remedial investigation	N/A	Cable tool	Yes
0307	09/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0308	09/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0309	08/21/89	ER Program remedial investigation	N/A	Cable tool	Yes
0310	08/16/89	ER Program remedial investigation	N/A	Cable tool	Yes
0311	08/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0312	12/13/89	ER Program remedial investigation	N/A	Cable tool	Yes
0313	09/04/89	ER Program remedial investigation	N/A	Cable tool	Yes
0314	08/03/89	ER Program remedial investigation	N/A	Cable tool	Yes
0315	08/07/89	ER Program remedial investigation	N/A	Cable tool	Yes
0316	08/05/89	ER Program remedial investigation	N/A	Cable tool	Yes
0317	08/18/89	ER Program remedial investigation	N/A	Cable tool	Yes
0318	08/09/89	ER Program remedial investigation	N/A	Cable tool	Yes
0319	08/23/89	ER Program remedial investigation	N/A	Cable tool	Yes
0320	08/19/89	ER Program remedial investigation	N/A	Cable tool	Yes
0371	04/05/61	Other	71-3	Percussion	No
0419	05/26/76	Portable water standards project	19-4	Auger	No
0471	04/05/61	Other	71-4	Percussion	No
0571	04/06/61	Other	71-5	Percussion	No
0712	Ca. 1987	Groundwater tritium assessment	PO12	Trench	No
0713	Ca. 1987	Groundwater tritium assessment	PO13	Trench	No
0714	Ca. 1987	Groundwater tritium assessment	PO14	Trench	No
0721	Ca. 1987	Groundwater tritium assessment	WO01	Pit	No
0722	Ca. 1987	Groundwater tritium assessment	WO02	Pit	No
0723	Ca. 1987	Groundwater tritium assessment	WO03	Pit	No

Table III.1. (page 4 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0724	Ca. 1987	Groundwater tritium assessment	WO04	Pit	No
0725	Ca. 1987	Groundwater tritium assessment	WO05	Pit	No
0726	Ca. 1987	Groundwater tritium assessment	WO06	Pit	No
0727	Ca. 1987	Groundwater tritium assessment	WO07	Pit	No
0812	09/23/83	New property evaluation	#12	Auger	No
0817	09/26/83	New property evaluation	#17	Auger	No
0827	09/22/83	New property evaluation	#27	Auger	No
0832	09/22/83	New property evaluation	#32	Auger	No
0901	Unknown	Offsite water supply	Bud's #1	TBD	Yes[b]
0902	Unknown	Offsite water supply	Bud's #2	TBD	Yes[b]
0903	09/03/64	Offsite water supply	Bud's #3	TBD	Yes[b]
0904	04/14/77	Offsite water supply	Jim's	TBD	Yes[b]
0905	Unknown	Offsite water supply	Jim's trailer	TBD	Yes[b]
0906	04/12/77	Offsite water supply	Bud's rental	TBD	Yes[b]
0907	04/08/77	Offsite water supply	Bud's house	TBD	Yes[b]
0908	Unknown	Offsite water supply	Drive-In	TBD	Yes[b]
0909	1986	Offsite water supply	MCD	TBD	Yes[b]
0912	1932	Miamisburg prod. well #2	MB-2	TBD	No
0913	1935	Miamisburg prod. well #3	MB-3	TBD	No
0918	1950	Miamisburg prod. well #8	MB-8	TBD	Yes[b]
0919	1950	Miamisburg prod. well #9	MB-9	TBD	Yes[b]
0920	1950	Miamisburg prod. well #10	MB-10	TBD	Yes[b]
0921	1950	Miamisburg prod. well #11	MB-11	TBD	Yes[b]
0922		Miamisburg prod. well #12	MB-12		
0923	11-29-90	MWFPP	MW-1	Cable tool	No[c]

Table III.1. (page 5 of 5)

ER Program Well I.D.	Date of Installation	Project	Former Well I.D.	Drilling Method	Consistency with TEGD[a]
0924	12-29-90	MWFPP	MW-2	Cable tool	No[c]
0925	11-21-90	MWFPP	MW-3	Cable tool	No[c]

[a]TEGD - Technical Enforcement Guidance Document (EPA 1986)
[b]This is a water suppoly well that can be used for characterization of potable water supplies.
[c]Well casings constructed of Schedule 40 polyvinyl chloride.
TBD - to be determined during residential well investigation
MCD - Miami Conservancy District
MWFPP - Miamisburg Well Field Protection Program
ER Program - Environment Restoration Program
DOE - U.S. Department of Energy

not completed. Miamisburg No. 3 (now known as well 0913 in the ER Program system) is located between the north and south ponds in the City of Miamisburg park (Plate 1). It was known as the "Red Eye" well. It is still in service to the municipal swimming pool.

The current municipal well field on the west side of the Great Miami River has at least four production wells. As part of a well field protection plan being developed by the city of Miamisburg, three monitoring wells were installed in 1990 in the vicinity of the Miamisburg well field (CH2M Hill 1991). The monitoring wells were used to identify potential sources of volatile organic compounds in groundwater at the city of Miamisburg municipal wells, along with identifying the extent of volatile organic compound contamination.

The wells were completed using cable-tool drilling techniques. After reaching the desired depth at each location, 4-inch diameter PVC casing with either 10- or 20-ft screens was lowered into the borehole. Each hole was backfilled with a sand filter pack to the top of the screen, then 1.5 to 2 ft of bentonite clay pellets were added, followed by a grout seal to the surface. Steel protective casings with locking caps were installed at all three well locations. These wells are not currently being sampled as part of the ER Program, although they continue to be sampled for the well field protection plan.

In reviewing the construction details for this report, discrepancies were noted between the text description of the screened intervals and the well logs. Whereas the text states that MW-1 and MW-2 (0923 and 0924) were completed with 20-ft screens and MW-3 has a 10-ft screen, the logs state MW-1 and MW-2 have 10-ft screens and MW-3 has a 20-ft screen (CH2M Hill 1991).

In addition to the monitoring and production wells in the Miamisburg well field, the technical memorandum shows the location of a number of test wells. Nothing is currently known about the construction of the test wells.

Many of the Miamisburg municipal wells have been used for environmental samples for the ER Program (DOE 1989a) and the Mound Plant environmental monitoring program (DOE 1991).

3.1.2. Domestic Wells

Some information on the domestic supply wells was obtained for this report through the Ohio Division of Natural Resources, Columbus, Ohio. The state of Ohio requires that all well owners file a well log and drilling report upon completion. These reports vary in their completeness and quality depending on the drilling firm and the date of well completion; older wells typically possess less documentation. All attempts have been made to transcribe the details from the drilling reports to the schematic figures

presented here, but details vary considerably from nearly complete lithologic and completion details to simply locations.

As a result of pumping Miamisburg well No. 2 in 1976, two residents who live close by the well reported that their wells were unable to produce water. Mound commissioned a study to determine the number, condition, and locations of private wells near the zone of influence of the pumping wells (Dames and Moore 1977). Three wells were replaced as a result of this evaluation. The logs of the new wells (0904, 0906, and 0907) are enclosed in Appendix A. The status of the older wells that were replaced is currently unknown. At the request of the owners of the old wells, the wells were not destroyed (Dames and Moore 1977).

By 1988, all but one of the owners of the domestic supply wells elected to connect to the city of Miamisburg water supply. Well 904, also known as Jim's, is currently being used as a private source. The domestic supply wells were sampled by the ER Program during stages 1 and 2 of the remedial investigation (DOE 1989b) but are not currently used for environmental samples. The Mound Plant monthly environmental sampling program includes selected domestic wells.

In addition to domestic supply wells, the Miami Conservancy District (MCD) owns a small supply well (0909) near Mound Plant. The MCD is responsible for flood control along the Great Miami River. This well produces a potable water supply for a maintenance building adjacent to the well. The ER Program has never sampled the well. Mound Plant has included the well in their monthly environmental monitoring for tritium.

3.1.3. Mound Plant Production Wells

The plant production wells 0076 and 0271 were installed in 1947 and 1948, respectively, to supply a potable water source to the plant. The plant used water from the city of Miamisburg wells on occasions when line breaks occurred or both pumps quit. A third plant production well (0071) was installed in 1962, and a dual piping system, which eliminated the need for supplementary municipal water, was completed from the Mound Plant well field to the plant powerhouse in 1966. In 1976, the city of Miamisburg dismantled the unused pipes and old municipal pump station that had previously supplied the plant. A water chemistry investigation was performed as early as 1971 to confirm water quality and to ensure compliance with the then-promulgated Public Health Service Drinking Water Standards during the period of transition toward total reliance on plant supply (Klaer 1971). The Mound Plant production wells are part of the monthly environmental monitoring system and are sampled quarterly as part of the ER Program.

Some of the monitoring wells on the plant property were installed as part of general projects associated with evaluations of the Mound Plant production well field. Four monitoring or test wells were installed as part of the Mound Plant production well field (0276, 0371, 0471, and 0571). Little is known about their construction. These four wells were examined by ER Program personnel in 1987 and deemed inappropriate for ER Program needs, due to small diameter, blockages, or other access or construction problems (Price 1990). These four wells have not been sampled by the ER Program and are not now part of the Mound Plant monthly environmental monitoring.

Two additional wells (0046 and 0063) were installed in June 1974. These two wells were the first true monitoring wells installed on the plant property to monitor groundwater quality. They were used by the potable water standards project and, more recently, the ER Program. Although their construction is not consistent with the Technical Enforcement Guidance Document (TEGD) (EPA 1986) and information concerning their construction details is limited, they are important because they showed some of the first results of contamination and have consistently shown higher levels than the newer wells that surround them (DOE 1989b). Results of sampling and analyses are discussed in detail in the Stage 3 Remedial Investigation Plan (DOE 1989b); and Operable Unit 1, Area B Technical Memorandum - Hydrogeology (DOE 1991a).

3.2. BACKGROUND AND CURRENT STATUS OF MONITORING WELL SYSTEMS

3.2.1. Potable Water Standards Project Monitoring Wells

The potable water standards project was conducted to characterize the tritium contamination of groundwater on Mound Plant property (Dames and Moore 1976b, 1978; Styron and Meyer 1981). Monitoring wells were installed in 1975 and 1976; the documentation is incomplete for some wells installed in 1975. The wells installed in 1976 were installed in boreholes drilled by either mud rotary or auger techniques. Wells were generally constructed with 3-inch-inside diameter (I.D.) polyvinyl chloride (PVC) casings with a 2-ft length of steel well screen at the base. The annulus pack around the screen is unknown. A 2-ft thickness of bentonite pellets was installed above the well screen. The annulus was then backfilled with earth, and a second bentonite seal was emplaced at the ground surface, with the earth then mounded around the casing to induce runoff. Protective casings were installed for some wells, but these were not locked during the initial ER Program field investigations in 1987, nor apparently were they locked during earlier periods. Well development techniques used were not discussed in the original report (Dames and Moore 1976b).

Some of the wells were destroyed and grouted to the surface during construction of the overflow pond and retention basin and other construction projects. The ER Program sampled most of the remaining

wells during the reconnaissance sampling of Stage 1 of the RI and found numerous problems with well security and unacceptable construction (DOE 1989b). Other wells are not currently being sampled as part of the ER program but have been sampled periodically during the Mound Plant environmental monitoring program.

3.2.2. Buried Valley Aquifer Evaluation Project Monitoring Wells

The Buried Valley aquifer evaluation project was conducted as a follow-up study to the potable water standards project and was intended to characterize the tritium contamination off the Mound Plant property (Dames and Moore 1976c). Ten observation wells were installed using mud rotary drilling techniques. The wells were constructed of 3-inch PVC casings with a 2-ft length of well screen on the bottom. A section of the PVC casing may also have been slotted. The boreholes were backfilled with gravel to within 3-ft of the ground surface and sealed with a bentonite pellet seal to the surface. A 6-inch locking steel casing was grouted for protection. Well development techniques were not discussed in the original report (Dames and Moore 1976c). These wells were sampled as part of the reconnaissance sampling of Stages 1 and 2 of the RI but were found to be inadequate for ER Program needs. They are not currently part of the ER Program. Some of the wells are sampled during the Mound Plant monthly environmental monitoring.

3.2.3. DOE Headquarters Environmental Survey Monitoring Wells

The DOE Headquarters environmental survey was conducted in 1987 as part of the nation-wide DOE effort to assess and prioritize environmental problems (DOE and Battelle 1987). The program was intended to complement the pursuit of environmental compliance and the ongoing efforts to characterize known problems. Three monitoring wells were installed as part of the field sampling program. The wells were installed according to protocols of the DOE Environmental Survey Manual (DOE 1986; DOE and Battelle 1987). The wells were constructed and developed in compliance with the Resource Conservation and Recovery Act (RCRA) TEGD (EPA 1986). ER Program personnel observed the installation of the DOE Headquarters wells in 1987 to ensure their construction techniques (Price 1990). These wells are currently part of the ER Program quarterly sampling project (DOE 1989b; DOE 1992a).

3.2.4. ER Program Monitoring Wells

The ER Program field investigations have been conducted as part of the RIs of historical environmental issues under CERCLA. Forty-eight monitoring wells have been installed; 28 wells in 1987 during the Stage 2 investigations, and 20 in 1989 as part of the Stage 3 investigations (DOE 1989b). These

wells were located, installed, and developed according to specifications in the DOE work plans (DOE 1987, 1989b) and ER Program Standard Operating Procedures (SOPs). The SOPs are based on regulations and guidelines established by RCRA and CERCLA (DOE 1988; EPA 1988) and the RCRA TEGD (EPA 1986). Figure 3.1 depicts a typical ER Program monitoring well installation. These wells, along with the Mound Plant production wells, provide the core of the ER Program groundwater assessment program and are currently sampled on a quarterly basis (DOE 1989b).

During compilation of this report, it was apparent that well completion records for ER Program monitoring wells 0113, 0114, 0126, and 0316 indicated that the apparent positions of the cement/bentonite grout, bentonite-pellet seal, quartz sand pack filter, and well screen were uncertain. Geophysical logging, conducted in August 1990 to corroborate the construction of these four wells, determined that each well was constructed in compliance with the proper specifications. The results are incorporated into the well completion diagrams reported here.

4. OVERVIEW OF OTHER MONITORING WELLS

In addition to the wells and projects described above, monitoring wells and cased boreholes have been installed on Mound Plant as part of the following projects:

- a site safety assessment of Mound Plant (Dames and Moore 1973),
- a geotechnical investigation of the hydrogeologic conditions in the area of the overflow pond and water retention basins (Dames and Moore 1976a),
- a new property evaluation (Bowser-Morner 1983),
- the Mound tritium groundwater assessment program (DOE 1989b), and
- an old fill sites evaluation (Bowser-Morner 1984).

4.1. SITE SAFETY ASSESSMENT

The site safety assessment of Mound Plant was completed in 1973 to comply with the Atomic Energy Commission (DOE predecessor) requirements (Dames and Moore 1973). Six boreholes were completed, and transitory groundwater levels were measured. Well completion consisted of an open hole with either a 1-1/4-inch-I.D. iron pipe and a 4-ft-long well point to bedrock, or a 4-inch-I.D. plastic casing to bedrock with the lower 20-ft of casing slotted.

No well development techniques were discussed in the original report (Dames and Moore 1973). These wells were designed for temporary use and apparently no longer exist. No record of well abandonment has been found to date.

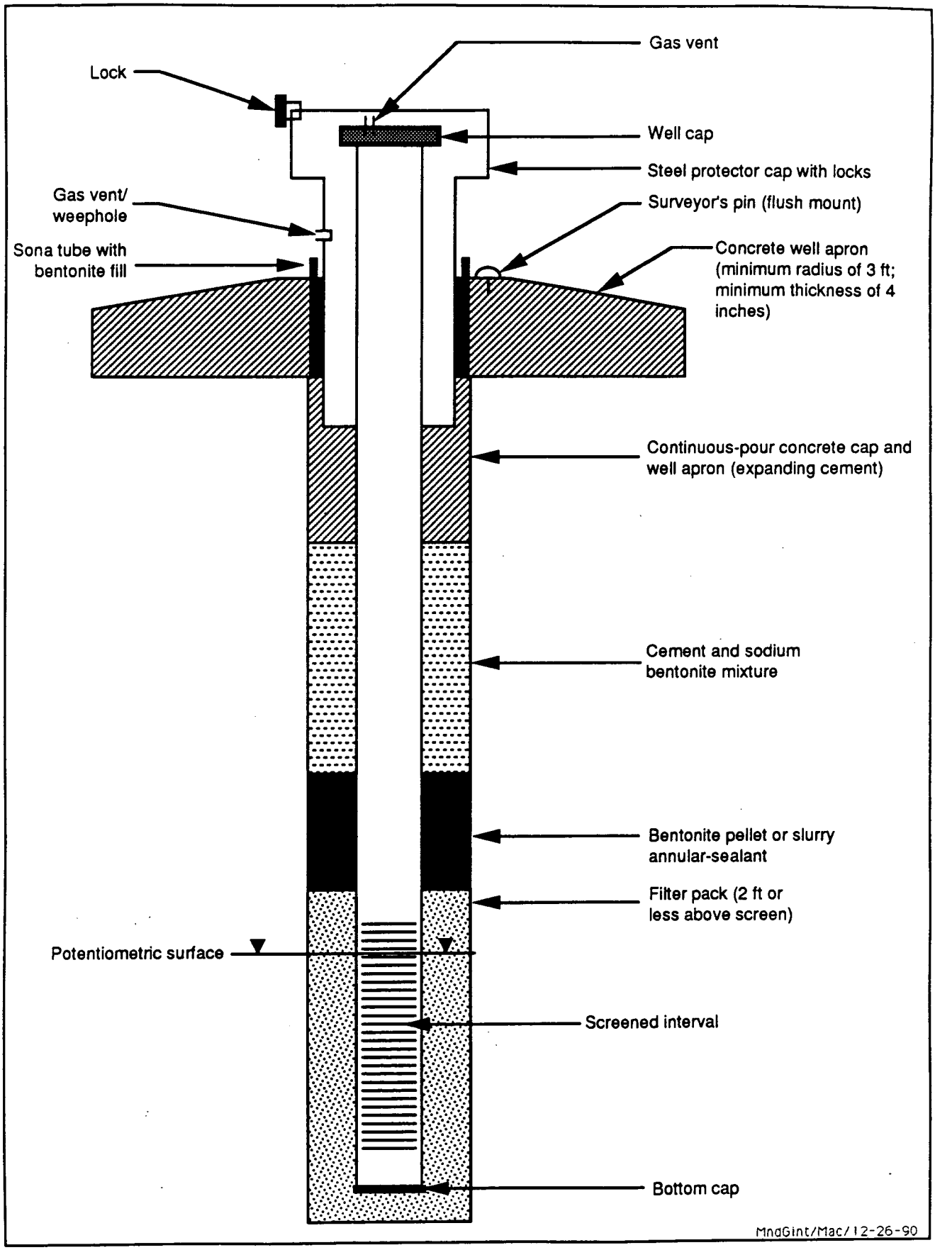


Figure 3.1. General monitoring well - cross section.

4.2. OVERFLOW POND AND RETENTION BASIN CONSTRUCTION

The geotechnical investigation at the site of the overflow pond and retention basins was conducted as part of Mound Plant's program to comply with National Pollution Discharge Elimination System (NPDES). The work partly consisted of drilling soil boreholes to depths ranging from 45 to 50 ft and drilling several auger probes to depths ranging from 13.5 to 31.5 ft. PVC casings with the bottom 5 ft slotted were installed in some of the boreholes and probe holes to monitor groundwater levels (Dames and Moore 1976a). There is no evidence that these piezometers still exist, and no record of their abandonment has been found.

4.3. NEW PROPERTY EVALUATION

The new property evaluation was conducted to assess possible land use and support new structure planning and possible landfill siting (Bowser-Morner 1983). Thirty-seven boreholes were made using a hollow-stem auger. Four of the boreholes (0812, 0817, 0827, and 0832) were completed as wells to monitor groundwater levels (Table III.1). The four piezometers were generally constructed with 1-1/4-inch-I.D. PVC casing, fitted with a 3-ft section of 0.020-inch well screen, backfilled with Ottawa sand to 4 ft below ground surface and a 2-ft bentonite seal to the surface, and emplaced without protective casing. No well development techniques were discussed, and no well security was provided (Bowser-Morner 1983). Records indicate that the piezometers have generally been dry. This was confirmed by inspection in 1987 by ER Program personnel (Price 1990). No record exists as to their current condition. The estimated locations of the four piezometers are included on Plate 1.

4.4. MOUND TRITIUM GROUNDWATER ASSESSMENT PROGRAM

The Mound tritium groundwater assessment program was conducted to help define the geological environment and stratigraphy of the Main Hill in connection with tritium-contaminated seeps (DOE 1989b). The seeps appear as small springs around the Main Hill and are thought to represent seepage of groundwater where impermeable shale layers intersect the ground surface (DOE 1989b). The locations of the known seeps are shown on Plate 1. Detailed descriptions and discussions of the seeps' conceptual model can be found in the Stage 3 Remedial Investigation Plan (DOE 1989b).

Owing to the nature of the low permeability shales and interbedded limestones, several observation test pits and trenches were installed on the Main Hill (Figure 4.1) to provide a more extensive cross section of the geology and groundwater flow than could be provided by boreholes or drilled wells. Monitoring wells were installed in test pits to provide a broad groundwater collection zone. The wells installed in test pits were originally given number designations beginning with W, but they have been

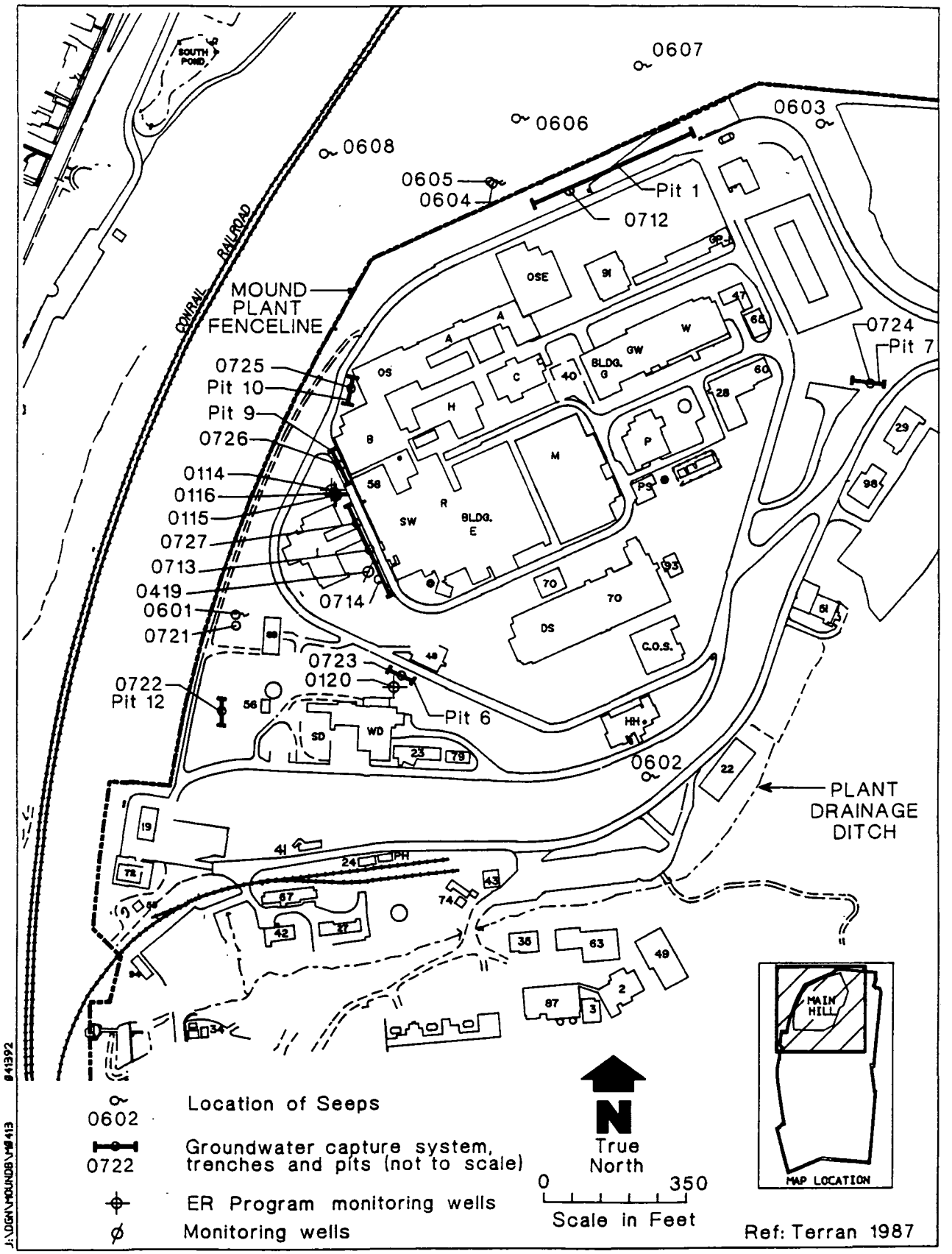


Figure 4.1. Locations of wells completed in test pits.

renumbered to conform to the ER Program numbering system (Table III.1). The wells in test pits were constructed of 4-inch PVC casings with 3-ft slotted screens. Except for well 0712, the wells were placed at the center of the trench, and the bases of the trenches were sloped to drain to the well (Figure 4.2). The trench at well 0712 was sloped to the south end, and the well was placed near the south end. Well 0712 was part of a group. All of the trenches were backfilled with sand and gravel as shown in Figure 4.2. Additional lithologic logs of the test pits are included in the addendum to this report (DOE 1992c).

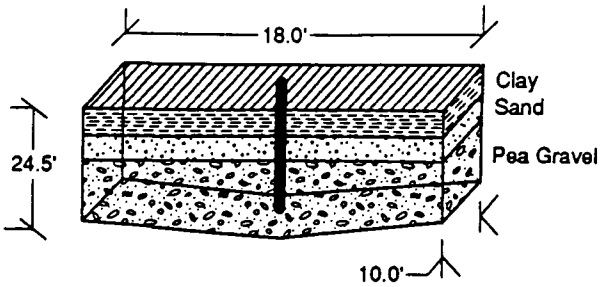
On the west side of SW Building, a series of wells were completed in a long trench to form the tritium capture system. The details of the construction of the system are shown in Figure 4.3. The construction of the system centered around the deepening of two manholes and the placement of sumps to remove collected water. Perforated pipe helps to direct water to the sumps (Figure 4.3.). The wells were constructed with either 3- or 8-inch-I.D. PVC pipe. The 3-inch pipe had open-ended casings with 3-ft-long slotted screens at the bottom comprised of 0.5-inch holes drilled in the casings and then wrapped with fine wire mesh. The 8-inch wells have capped ends with 3-ft-long slotted screens. The pits were backfilled to the top of the screens with pea gravel, 2 ft of washed sand, and finally, a 2-ft compacted clay seal. The surface was covered with either dirt and topsoil or rock chips and asphalt if road repair was needed. The tritium capture system was completed in October 1987. This system forms an important part of the current tritium monitoring program on the Main Hill (DOE 1989b). The locations of wells installed as part of the tritium capture system are also shown on Plate 1. One sampling site (B001), which was included early in the project (DOE 1989b), consisted of an open construction excavation. This site is no longer part of the system and is not included on Plate 1.

4.5. OLD FILL SITES EVALUATION

The old fill sites evaluation was conducted to assist in radiological characterization of the SM/PP Hill. At least 22 cased boreholes were installed to facilitate *in situ* gamma logging of the soil profiles. These casings were not constructed to collect groundwater and are not considered part of the groundwater monitoring system. The wells were generally constructed with 4-inch PVC pipe with a glued cap at the bottom, set to the bottom of the soil boring. The boring was filled with clean sand to within 6 inches of the surface, where a bentonite seal was emplaced. A 6-inch locking steel casing was installed as a guard (Bowser-Morner 1984). Additional information regarding well utilization and borehole lithology is included in the Site Scoping Report, Volume III - Radiological Survey Report (DOE 1991b).

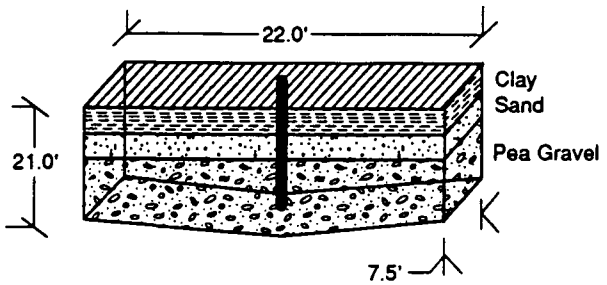
Well 0722 (F.K.A. PIT 12)

Surface Area: 1,372 ft^2
Volume: 4,410 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



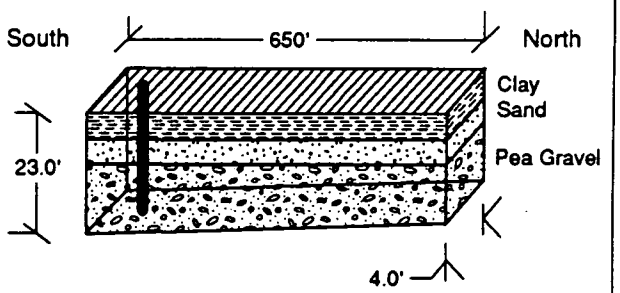
Well 0723 (F.K.A. PIT 6)
(PIT 48)

Surface Area: 1,239 ft^2
Volume: 3,465 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



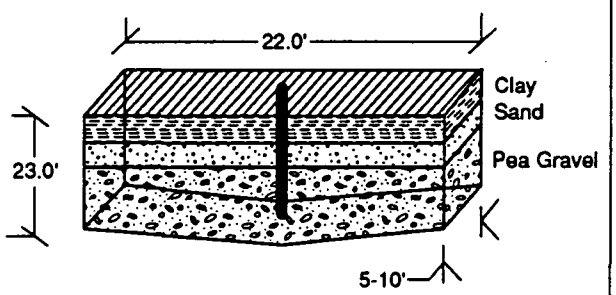
Well 0712 (F.K.A. PIT 1)
(North Trench)

Surface Area: 30,084 ft^2
Volume: 59,800 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel



Well 0724 (F.K.A. PIT 7)
(PIT 45)

Surface Area: 1,242-1,472 ft^2
Volume: 2,530-5,060 ft^3
Well Diameter: 4 inches
Screen Slot Size: 0.01
Back Fill Material: Pea Gravel

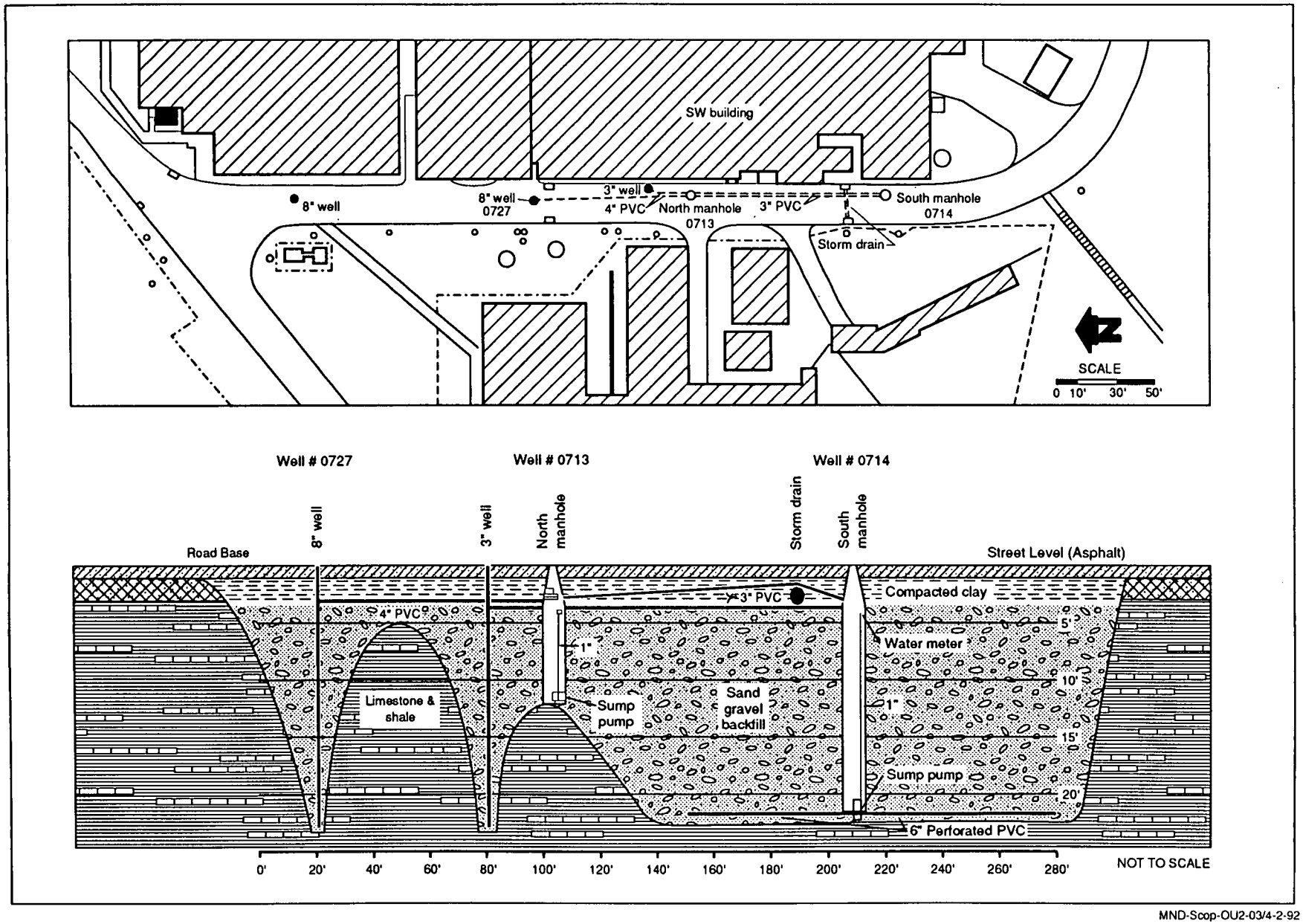


As numbered on pit logs in the report titled "Groundwater Occurence and Movement in Consolidated Bedrock at the DOE Mound Laboratory," March 19, 1987 (Terran 1987).

F.K.A. – Formerly known as

MND-Scop-OU2-01/4-14-92

Figure 4.2. As-built diagrams of test pits with monitoring wells on the Main Hill.



MND-Scop-OU2-03/4-2-92

Figure 4.3. Schematic cross section and placement of tritium capture system west of the SW building.

5. WELL DESIGNATIONS

Domestic, production, and monitoring wells that were constructed before 1986 were given location descriptor codes at the time of completion. The historical descriptor codes were converted to a format compatible with the ER Program in 1987. Table III.1 provides cross-references for the archaic and the revised ER Program well designations. The ER Program has in the past (DOE 1989b) used a prefix along with the four-digit descriptor codes. The prefixes designated the utilization of the wells and included the following:

MND01 - installation hydrogeochemical,
MND02 - installation geotechnical, and
MND03 - tritium monitoring stations.

The prefix codes are not used in this report, as the four-digit descriptor codes are unique. The well construction logs (Appendix A) are arranged numerically according to the ER Program description codes.

6. WELL LOCATIONS AND SPECIFICATIONS

Plate 1 shows the location of all wells contained in this report. Most of the well locations have been surveyed by a contractor licensed in the state of Ohio and are plotted according to the State Plane Coordinate System. The approximate locations of nonsurveyed wells are also plotted. The revised (ER Program) well designations are used to identify well locations.

The map was generated in electronic data format from data compiled by Woolpert Consultants, Inc., Dayton, Ohio, from color aerial photographs taken on December 8, 1985. The original data file used a Mound Plant coordinate system. The data were transformed to state plane coordinates using an algorithm written by Oak Ridge National Laboratory, Grand Junction Projects Office, Grand Junction, Colorado.

7. WELL TECHNICAL INFORMATION

Table VII.1 presents a summary of technical information for municipal, plant production, monitoring, and selected domestic wells within and adjacent to Mound Plant. The location ID is the ER Program designator code from Table III.1. Coordinate locations are given in the State Plane Coordinate System. Borehole, well casing, depth to screen, and screened interval data are given, if available. Complete well completion and construction details are given in Appendix A.

TABLE VII.1
WELL INFORMATION SUMMARY
FACILITY: MOUND PLANT

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	BOREHOLE ELEVATION (FT MSL)	BOREHOLE DEPTH (FT)	BOREHOLE DIAMETER (INCHES)	CASING ELEVATION (FT MSL)	CASING DEPTH (FT)	CASING DIAMETER (INCHES)	DEPTH TO TOP OF SCREEN	SCREENED INTERVAL (FT)
0001	597139.69	1494690.18	708.00	153.50	-	-	67.00	3.00	45.00	10.00
									65.00	2.00
0002	597343.29	1494720.33	706.00	70.00	-	-	67.	3.	47.	15.
									65.	2.
0003	597480.12	1494740.99	705.0	55.00	-	-	32.	3.	30.	2.
0004	597134.10	1494500.03	697.00	60.00	-	-	59.	3.	57.	2.
0005	597111.19	1494202.12	694.70	60.00	-	-	55.5	3.	53.5	2.
0006	597095.16	1493900.99	694.00	133.80	-	-	120.	3.	118.	2.
0007	597079.28	1493602.86	694.00	94.80	-	-	80.	2.	78.	2.
0008	597017.16	1493257.94	689.00	145.00	-	-	142.5	2.	140.5	2.
0020	598109.60	1495264.34	786.20	40.00	-	788.52	42.	2.	40.	2.
0028	597830.01	1495207.77	748.50	19.00	-	750.89	19.	2.	17.	2.
0033	597967.67	1496503.05	775.00	33.50	-	777.57	33.5	3.	31.5	2.
0034	598082.49	1496257.79	818.90	20.00	-	818.71	20.	3.	17.	3.
0035	597762.46	1495934.95	-	-	-	-	-	-	-	-
0042	597823.10	1496339.89	765.00	25.00	-	-	-	-	-	-
0046	597058.08	1494995.82	706.00	45.00	8.00	-	38.	8.	29.	3.
0052	597246.22	1496021.22	758.50	38.50	8.00	-	38.5	3.	36.5	2.
0055	596858.17	1495179.74	710.00	-	-	-	-	4.	-	-
0063	596574.31	1495055.67	704.80	45.00	8.00	707.23	37.	8.	34.	3.
0071	596424.29	1494997.59	703.00	53.50	26.00	-	53.5	26.	44.	9.5
0076	595832.03	1495095.83	703.00	64.00	-	-	64.	26.	47.	15.
0101	597131.82	1494693.42	707.90	45.00	-	708.34	45.	2.	43.	2.
0106	597097.13	1493902.18	694.00	50.00	-	-	50.	2.	48.	2.
0108	597018.81	1493256.98	687.00	22.00	-	-	22.	2.	20.	2.
0111	597971.10	1496733.11	779.	67.00	8.00	780.41	67.	4.	57.	10.
0112	597974.36	1496515.41	773.50	35.50	8.00	775.2	37.	4.	35.5	10.
0113	599083.45	1495916.48	875.40	58.00	8.00	874.62	55.7	4.	52.25	3.
0114	598615.58	1495593.02	874.20	55.00	8.00	873.51	53.	4.	49.5	3.
0115	598602.45	1495603.89	874.30	42.00	8.00	873.55	41.5	4.	30.5	9.5
0116	598607.40	1495599.74	874.10	89.00	8.00	873.05	80.5	4.	69.8	10.
0117	598073.99	1495765.12	811.90	17.50	8.00	813.5	15.5	2.	5.5	10.
0118	600022.28	1495793.93	706.80	41.50	8.00	706.35	40.63	4.	30.63	10.
0119	597543.67	1495848.78	741.60	43.00	8.00	742.84	42.68	4.	32.68	10.
0120	598125.59	1495747.12	821.50	33.00	8.00	822.36	32.2	2.	20.5	10.
0121	597999.14	1497793.04	886.90	111.50	8.00	888.65	109.	4.	95.5	10.
0122	597637.24	1495224.80	742.30	41.00	8.00	744.03	40.5	4.	31.5	10.
0123	597471.04	1494746.19	705.40	61.00	9.00	706.87	56.5	4.	50.	6.
0124	597345.59	1494711.26	705.50	55.50	8.00	706.92	55.	4.	45.	10.
0125	597320.12	1495388.29	707.30	34.00	8.00	708.85	32.78	4.	22.5	10.
0126	597159.57	1494700.46	705.90	60.50	8.00	707.43	53.83	4.	43.83	10.
0127	597116.73	1493916.16	694.20	25.70	8.00	695.85	25.	4.	15.	10.
0128	597105.64	1493917.44	693.70	55.60	8.00	695.48	55.	4.	45.	10.
0129	596836.65	1494665.72	701.90	41.50	8.00	701.31	41.	4.	31.	10.
0130	596459.64	1493663.29	695.30	35.50	8.00	694.49	34.71	4.	24.71	10.
0137	597339.95	1495065.92	723.20	75.00	-	725.25	75.	3.	73.	2.
0138	599681.10	1495320.65	700.10	41.50	4.00	699.31	41.	4.	31.	10.
0151	597275.41	1495545.64	740.52	48.80	8.00	742.83	48.8	4.	17.5	31.3
0152	596982.64	1494955.35	705.42	47.00	8.00	707.31	47.	4.	27.	20.
0153	596691.58	1494953.87	704.43	41.50	9.00	706.35	41.5	4.	21.5	20.
0154	596418.78	1494969.47	702.90	53.50	8.00	704.22	47.	4.	37.	10.
0155	596407.73	1494971.57	702.8	32.70	8.00	704.28	32.7	4.	22.7	10.
0156	596184.07	1494547.33	693.00	36.50	4.00	692.35	36.23	4.	26.23	10.
0157	596173.40	1494548.63	693.30	61.80	8.00	692.6	61.8	4.	51.8	10.
0158	594037.51	1495276.62	702.80	39.20	8.00	704.46	39.	4.	29.	10.
0159	594038.40	1494169.69	692.20	32.00	8.00	691.6	31.	4.	21.	10.
0160	594049.03	1494168.54	692.30	50.20	8.00	691.86	50.2	4.	40.2	10.
0227	597909.38	1495689.53	785.00	31.50	6.00	787.19	31.5	3.	29.3	2.

TABLE VII.1
WELL INFORMATION SUMMARY (CONT.)
FACILITY: MOUND PLANT

LOCATION ID	NORTH COORDINATE (FT)	EAST COORDINATE (FT)	BOREHOLE ELEVATION (FT MSL)	BOREHOLE DEPTH (FT)	BOREHOLE DIAMETER (INCHES)	CASING ELEVATION (FT MSL)	CASING DEPTH (FT)	CASING DIAMETER (INCHES)	DEPTH TO TOP OF SCREEN	SCREENED INTERVAL (FT)
0236	597700.00	1495385.00	-	-	-	-	-	-	-	-
0242	597765.89	1496159.17	752.80	13.00	-	-	13.	3.	11.	2.
0271	596106.85	1495048.14	703.00	60.00	-	-	59.	26.	43.	16.
0276	596061.52	1495042.82	701.54	38.50	-	-	38.50	2.	NA	NA
0301	597872.78	1494179.84	695.10	88.00	8.00	694.44	86.2	4.	75.5	10.
0302	597080.22	1493925.90	694.00	120.60	8.00	693.22	120.	4.	109.5	10.
0303	597115.40	1494497.22	697.30	93.50	8.00	696.75	89.	4.	78.5	10.
0304	596159.94	1494549.58	693.10	103.90	8.00	692.4	102.	4.	91.	10.
0305	596493.51	1495084.47	710.00	40.50	8.00	711.76	39.2	4.	33.7	5.
0306	596672.67	1494951.74	703.90	41.00	8.00	706.07	40.	4.	34.4	5.
0307	596849.18	1495024.87	716.00	52.00	8.00	718.02	51.	4.	45.5	5.
0308	596646.45	1495223.89	750.50	68.60	8.00	752.52	67.6	4.	63.	4.
0309	596503.04	1495098.28	710.10	53.10	8.00	712.19	50.2	4.	45.7	5.
0310	596682.64	1494952.10	703.80	54.80	8.00	705.53	54.7	4.	49.2	5.
0311	597873.25	1494187.71	695.60	35.00	8.00	694.9	31.2	4.	21.2	9.3
0312	597747.88	1495032.91	731.20	33.60	8.00	733.2	32.4	4.	21.9	10.
0313	596850.50	1495022.00	716.00	41.50	8.00	718.14	40.	4.	34.5	5.
0314	597414.47	1495713.64	742.50	44.80	8.00	744.47	43.5	4.	33.	10.
0315	597341.97	1495079.79	723.80	55.60	8.00	725.88	54.	4.	43.4	10.
0316	597110.81	1495384.97	724.70	45.00	8.00	726.92	37.6	4.	22.2	10.
0317	596206.65	1495023.69	703.80	63.50	4.00	705.64	61.3	4.	50.8	10.
0318	598643.83	1497216.68	810.70	30.30	8.00	812.77	28.8	4.	18.3	10.
0319	595512.27	1495148.29	701.70	95.00	8.00	703.48	53.3	4.	42.8	10.
0320	595023.61	1495353.86	704.70	117.00	8.00	706.44	42.4	4.	31.9	10.
0371	596196.60	1495018.44	703.64	47.00	-	705.76	49.	2.0	-	-
0419	598413.05	1495683.78	873.50	19.00	-	-	19.	3.	17.	2.
0471	596265.23	1495008.91	702.84	44.50	-	704.73	-	2.0	-	-
0571	596448.77	1494972.83	702.74	44.50	-	705.26	-	2.	-	-
0712	599350.00	1496181.00	-	-	-	-	-	-	-	-
0713	598467.00	1495687.00	872.80	12.00	-	872.80	12.0	72.00	NA	NA
0714	598392.00	1495709.00	872.80	23.00	-	872.80	23.00	72.00	NA	NA
0721	598278.00	1495358.00	-	-	-	-	-	-	-	-
0722	598066.00	1495324.00	-	-	-	-	-	-	-	-
0723	598154.00	1495766.00	-	-	-	-	-	-	-	-
0724	598876.00	1496923.00	-	-	-	-	-	-	-	-
0725	598865.00	1495639.00	-	-	-	-	-	-	-	-
0726	598675.00	1495614.00	872.80	-	-	872.80	-	8.0	-	-
0727	598533.00	1495654.00	872.80	-	-	872.80	20.00	8.0	-	-
0812	596711.00	1497082.78	795.20	10.00	8.00	798.20	10.00	1.25	7.0	3.0
0817	595459.54	1496685.02	761.00	15.50	8.00	762.50	15.50	1.25	12.50	3.0
0827	595056.50	1495796.00	713.20	20.00	8.00	716.20	20.00	1.25	17.0	3.0
0832	595113.04	1495288.33	704.10	20.00	8.00	707.10	20.00	1.25	17.0	3.0
0901	596823.11	1494339.27	-	-	-	-	-	-	-	-
0902	596797.52	1493543.91	-	50.00	-	-	-	-	-	-
0903	596526.49	1493902.79	-	72.00	-	-	-	5.62	-	-
0904	596559.69	1494557.46	-	52.00	-	-	52.	-	50.	3.
0905	596442.20	1494528.36	-	-	-	-	-	-	-	-
0906	596719.01	1494545.64	-	52.00	-	-	51.	6.	48.	3.
0907	596827.04	1494529.62	-	50.00	-	-	49.	6.00	46.	3.
0908	596273.51	1494211.76	-	-	-	-	-	-	-	-
0909	597064.97	1493902.09	693.90	-	-	694.88	-	-	-	-
0912	597153.32	1494716.61	708.00	50.00	-	-	-	26.	-	-
0913	599598.99	1495364.89	-	-	-	-	-	26.	-	-
0918	601023.84	1494148.25	-	-	-	-	-	26.	-	-
0919	600438.60	1493886.48	-	-	-	-	-	26.	-	-
0920	600796.13	1494251.45	-	-	-	-	-	26.	-	-
0921	600487.30	1494369.45	-	-	-	-	-	26.	-	-
0922	600051.43	1494269.44	-	-	-	-	-	-	-	-
0923	600283.66	1493744.62	689.50	51.00	8.00	692.17	43.8	4.00	33.8	10.0
0924	600283.66	1493744.62	694.10	33.00	8.00	697.01	32.8	4.00	22.8	10.0
0925	600798.62	1493691.91	698.30	91.00	8.00	701.28	91.0	4.00	71.0	20.0

(-) No data available
(NA) Not applicable

8. LOG REPORT SPECIFICATIONS

Appendix A of this report presents computerized, graphical representations of well construction detail, borehole lithology, and sampling information. Figure 8.1 provides an example of a typical geologic and well information log report. Each log presents borehole and monitoring well background information. This information is transcribed from the original field logs, then entered into a computer program that generates the information on the log report as numeric or character field outputs. The state plane coordinates, date started, and date completed are numeric fields and remain blank when the information is unknown. Total Depth is also a numeric field but requires the input of a positive numeric value. Therefore, when the total depth of the borehole is unknown, a value of 1.0 is entered. The drilling company, drilling method, drilling fluid, ground surface elevation, top of casing elevation, and logged by are character fields and can be described by "Unk" when the information is unknown. Any significant events or data pertaining to a particular borehole or well are entered into the comments field. The data transcription was reviewed and verified by a geologist.

On each log report, borehole lithology, sample depth, and well construction information are represented in graphic, symbol, and text format using the following data columns:

- **Depth**: The depth scale is represented by segmented lines within the depth column. Each segment represents a 1-ft increment.
- **Sample**: This data column presents sample information consisting of three individual columns:
  - **T column**: Sample type. A letter code illustrates the types of samplers used during drilling and at what depth they were used. The sample depth is identified by the location of the sampler letter code next to the incremented depth column. There are five sample types:

    SS - split spoon
    C - auger or rotary cuttings
    DU - Dames and Moore U-type sampler
    ST - shelby tube
    RC - rock core

  - **A column**: Sample analysis. A letter code illustrates the type of analysis performed on each sample. There are seven types of sample analyses:

    LI - lithologic description
    H3 - tritium
    EP - EP Toxicity
    AB - gross alpha and beta
    PU - plutonium
    VO - volatile organic compounds
    GT - geotechnical testing

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 5

Drilling Company	Bowser Morner	Borehole/Well Id	0304
Drilling Method	Cable Tool	STATE PLANE COORDINATES	
Drilling Fluid	None	North (ft)	596159.94
Date Started	9/16/89	East (ft)	1494549.58
Date Completed	9/20/89	Ground Surface Elev. (ft)	693.10
Logged By	Jeff Manship	Top of Casing Elev. (ft)	692.40
Checked By	Tom Tharp	Total Depth (ft)	103.9

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							OH	Brownish black (5YR 3/2) organic clay.
				BACKFILL: Cement and bentonite grout.				
5	SS	LI	0001	CASING: Stainless steel, 4".				
	SS	LI	0002				SP	Light brown (10YR 6/3) gravelly sand, unconsolidated, medium grained, dry.
							GC-GM SP-ML	Tan (10YR 7/4) sand and gravel with silt and clay, poorly graded,
10	SS	LI	0003					
15	SS	LI	0004					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 1 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0005					
25				BACKFILL: Cement and bentonite grout.			CL	Dark reddish brown (10YR 4/4) silty clay with fine gravel, very dense, hard.
30	SS	LI	0006	CASING: Stainless steel, 4".				
35	SS	LI	0007				SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
40							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
45	SS	LI	0008					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 2 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
50				BACKFILL: Cement and bentonite grout.				
55	SS	LI	0009	CASING: Stainless steel, 4".				
							SP	Sand, poorly graded, medium grained, no fines, few pebbles, wet.
60								
65	SS	LI	0010					
							GC-GM	Gray (5Y 5/1) to brown (10YR 5/6) sand and gravel with silt and clay, well graded, very dense, hard.
70	SS	LI	0011					

GROUNDWATER

	DEPTH	HOUR	DATE
∇	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 3 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 4 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	SS ST ST	LI GT GT	0012 0075	BACKFILL: Cement and bentonite grout.				
80				CASING: Stainless steel, 4".			GC-GM	Gray (5Y 5/1) to brown (10YR 5/6) sand and gravel with silt and clay, well graded, very dense, hard.
				SEAL: Bentonite slurry.				
85	SS	LI	0013					
90	SS	LI	0014				CL	Sandy clay.
95	SS	LI	0015	FILTER PACK: #5 quartz sand.			GC-GM	Sand and gravel with silt and clay (< 15%), sand is coarse grained, poorly graded, wet.
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 4 of 5).

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 5 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				FILTER PACK: #5 quartz sand. SCREEN: Stainless steel, 4", with .01" wire wrap slot. SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
105								Total Depth = 103.9 feet.
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

Figure 8.1. Typical geologic and well information log report (page 5 of 5).

- ID column: Sample identification. A numerical code recorded on the original borehole log that represents the sample collected.

  Samples collected for lithologic analysis were not always designated with a sample identification number on the original borehole log. Other samples collected for lithologic analysis were assigned sample identification numbers correlating to the depth of the sample. All lithologic samples were assigned or reassigned consecutive identification numbers on the log report, beginning closest to the surface with 0001. Samples collected for analyses other than lithologic retained their original sample identification number.

- **Well Materials:** Provides pertinent well construction information in text format.

- **Well Con (Well Construction):** A scaled illustration of the well construction using representative pattern graphics (Table VIII.1).

- **Lith (Lithology):** A scaled illustration of lithologic types encountered during drilling using representative pattern graphics (Table VIII.2).

- **USCS or Rock Type:** A two-letter code used to classify contrasting soil types encountered during drilling using the Unified Soil Classification System (USCS) (Figure 8.2) (Waterways Equipment Station 1953).

Dual symbols are used to indicate borderline soil classifications, such as GC-GM. The USCS does not apply to bedrock lithologies or soils classified as glacial till. Therefore, letter codes were developed that classify the lithologies (rock type) not addressed by the USCS. The appropriate USCS, glacial till, or rock type classification is listed for each lithology pattern.

- **Lithologic Description:** *Original lithologic descriptions are directly transcribed onto the log* report and correspond with appropriate USCS/Rock Type classifications, lithology patterns, and sample depths.

  Each lithology pattern (Table VIII.2) is designed to graphically symbolize the corresponding lithologic description as closely as possible. As a result, a single USCS classification can be represented by several different lithology patterns. For example, the USCS classification "CL" can represent lithology patterns that symbolize clay, silty clay, sandy clay, or gravelly clay (Table VIII.2).

  The Munsell soil color chart (Munsell 1975) was used to determine the sediment or rock color when applicable. The Munsell notation for color consists of separate notations for hue, value, and chroma, traditionally are listed in that order to form the color designation.

- **Groundwater:** Provides a graphic display of groundwater levels encountered in the borehole during drilling (light indicator arrow) and in the well during well development (dark indicator arrow).
  When these data were unavailable on the original logs, the most recent groundwater level measured in the well was recorded along with the date and is displayed by the dark indicator arrow.

Table VIII.1. Well Construction Pattern Explanations

	Description
	Bentonite pellet backfill.
	Solid pipe surrounded by bentonite-cement grout.
	Solid pipe surrounded by bentonite pellets.
	Solid pipe surrounded by bentonite slurry.
	Backfill consisting of native sediment.
	Slotted pipe surrounded by gravel.
	Gravel backfill.
	Solid pipe surrounded by gravel backfill.
	Solid pipe surrounded by earth backfill.
	Quartz sand backfill.
	Slotted pipe surrounded by quartz sand.
	Solid pipe surrounded by quartz sand.

Table VIII.2. Borehole Lithology Pattern Explanations

USCS or Rock Type	Description
FL	Fill
SP-SW	Gravelly sand
CH	Clay with high plasticity
CL	Clay
CL	Gravelly clay
CL	Gravelly sandy clay
CL	Gravelly sandy silty clay
CL	Silty clay
CL	Silty clay with gravel
CL	Silty clay with sand and gravel
CL	Silty clay with sand
CL	Sandy clay
GC	Clayey gravel
GC-GM	Clayey silty gravel
GC	Clayey sandy gravel
GM	Silty gravel
GM	Silty sandy gravel
GP or GW	Clean gravel
GP or GW	Sandy gravel
GC-GM	Sand and gravel with silt and clay

USCS or Rock Type	Description
LS-SH	Interbedded limestone and shale
LS	Limestone
CL-ML	Silt and clay
ML	Silt
ML	Clayey silt
ML-GM	Gravelly silt
ML-GM	Sandy gravelly silt
ML	Sandy silt
ML	Sandy clayey silt
NR	No recovery
OL	Organic, silt to silty clay
OH	Organic clay
SP or SW	Sand (poorly and well graded)
SC	Clayey sand
SC-SP or SC-SW	Clayey gravelly sand
SH	Shale
SM	Silty sand
SC-SM	Silty sand to clayey sand
SM-SP or SM-SW	Silty gravelly sand
CL-SP	Interlayered clay and sand

USCS or Rock Type	Description
TI	Glacial till
TS	Topsoil

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)	GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
			GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)	GM	SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES
			GC	CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES
MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	SAND AND SANDY SOILS	CLEAN SAND (LITTLE OR NO FINES)	SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
			SP	POORLY-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
	MORE THAN 50% OF COARSE FRACTION PASSING NO. 4 SIEVE	SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)	SM	SILTY SANDS, SAND-SILT MIXTURES
			SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50	ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
			CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
			OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICTY
MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50	MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
			CH	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS
			OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICTY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: Dual symbols are used to indicate borderline soil classifications.

MndGntSoilClass 12-26-90

Figure 8.2. Unified Soil Classification System chart (Waterways Equipment Station 1953).

Appendix A contains the well log completion reports. These are arranged by ER Program ID number located in the upper right column of the report. Additional well logs may be inserted as they become available.

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ER PROGRAM

MOUND PLANT

Miamisburg, Ohio

PLATE 1
Existing Groundwater Monitoring Network

Prepared for

Site Scoping Report: Volume 2, Geologic Log and Well Information Report

1981 magnetic north declination at center of plant. Magnetic north is 3 degrees west of true north. Declination between state plane (grid) north is 1.13 degrees west of true north.

Grid system is based on the Ohio State Plane Coordinate System

Legend

- Structures
- Paved Roadway
- Unpaved Roadway
- Railroad
- Water
- Fences
- Retaining Wall
- Mound Plant Boundary
- ER Program monitoring wells
- Other monitoring wells and piezometers
- Municipal and Plant production wells
- Domestic and other supply wells
- Groundwater Seep
- Tritium groundwater assessment monitoring station

NOTES:

1. The electronic base map data file was obtained by WESTON from Woolpert Consultants, Inc., Dayton, Ohio. The data was photogrammetrically compiled from aerial photography dated 12/08/85.

2. WESTON converted MOUND plant coordinates to Ohio State Plane Coordinates using an algorithm provided by Oak Ridge National Laboratory, Grand Junction Project Office.

3. Area west of Dayton-Cincinnati Pike was digitized from a hand drafted map. Dated 3/12/86 from Monstanto Research Corp.

Contour Interval 10 ft.

0 100 200 400 600 800 1000

Scale In Feet

WESTON
MANAGERS DESIGNERS/CONSULTANTS
5301 CENTRAL AVENUE N.E.
SUITE 1000
ALBUQUERQUE, NM 87108
PHONE: (505) 255-1445

C:\DGN\MOUNDB\SR2.1

Cardinal®

APPENDIX A

GEOLOGIC LOGS

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 7

Drilling Company	Raymond Int.	**Borehole/Well Id**	0001
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597139.69
Date Started	7/19/76	**East (ft)**	1494690.18
Date Completed	7/23/76	**Ground Surface Elev. (ft)**	708.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	153.5
Comments:	Dames and Moore Well # OW-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			CL-ML	Clay and silt.
	DU	LI H3	0001					
5	DU	LI H3	0002					
	DU	LI H3	0003					
10				CASING: PVC, 3".				
	DU	LI H3	0004					
15	DU	LI H3	0005					
				BACKFILL: Gravel.			GW	Sand and gravel.
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 7

Borehole/Well Id 0001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			GW	Sand and gravel.
	DU	LI H3	0007					
25				BACKFILL: Gravel.				
	DU	LI H3	0008					
30								
	DU	LI H3	0009					
35								
	DU	LI H3	0010					
40								
	DU	LI H3	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

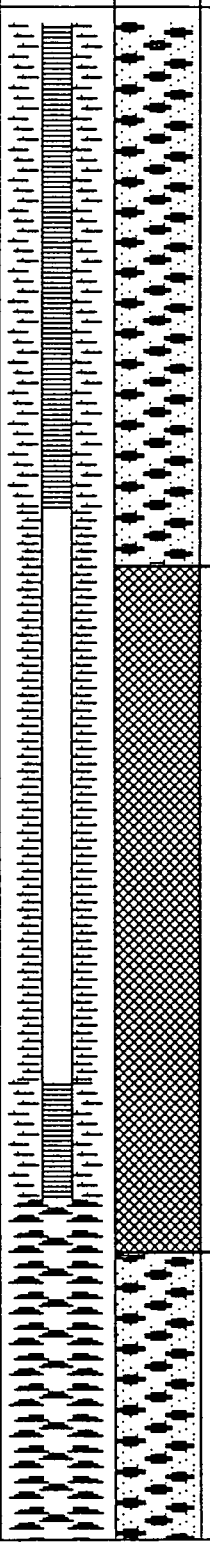
GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id: 0001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0012	SCREEN: Slotted PVC, 3". FILTER PACK: Gravel.			GW	Sand and Gravel.
50								
	DU	LI H3	0013					
55								
	DU	LI H3	0014	CASING: PVC, 3".			TI	Gray till.
60								
	DU	LI H3	0015	BACKFILL: Gravel.				
65				SCREEN: #12 slot steel, 3". FILTER PACK: Gravel.				
	DU	LI H3	0016				GW	Sand and gravel.
70				BACKFILL: Gravel.				



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 4 of 7

Borehole/Well Id 0001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0017					
75				BACKFILL: Gravel.			GW	Sand and gravel.
	DU	LI H3	0018					
80								
	DU	LI H3	0019					
85								
	DU	LI H3	0020					
90								
	DU	LI H3	0021					
95							TI	Gray till.
	DU	LI H3	0022					

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 5 of 7

Borehole/Well Id 0001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
	DU	LI H3	0023	BACKFILL: Gravel.			TI	Gray till.
105								
	DU	LI H3	0024					
110								
	DU	LI H3	0025					
115								
	DU	LI H3	0026					
120								
	DU	LI H3	0027					
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0028	BACKFILL: Gravel.			TI	Gray till.
130								
	DU	LI H3	0029					
135								
	DU	LI H3	0030					
140							GW	Sand and gravel.
	DU	LI H3	0031					
145								
	DU	LI H3	0032					
150								
							SH	Weathered shale.

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 7 of 7

Borehole/Well Id 0001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0033					
155								Total Depth = 153.5 feet.
160								
165								
170								
175								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Drilling Company	Raymond Int.	**Borehole/Well Id**	0002
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597343.29
Date Started	7/26/76	**East (ft)**	1494720.33
Date Completed	7/26/76	**Ground Surface Elev. (ft)**	706.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	70.0
Comments:	Dames and Moore Well # OW-2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			CL-ML	Clay and silt.
	DU	LI H3	0001					
5	DU	LI H3	0002					
							GW	Sand and gravel.
	DU	LI H3	0003				CL-ML	Clay and silt.
10				CASING: PVC, 3".				
	DU	LI H3	0004					
							GW	Sand and gravel.
15	DU	LI H3	0005	BACKFILL: Gravel.				
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	27.01	10:07	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0002

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GW	Sand and gravel.
	DU	LI H3	0007					
25								
	DU	LI H3	0008					
30				CASING: PVC, 3".				
	DU	LI H3	0009					
35				BACKFILL: Gravel.				
	DU	LI H3	0010					
40								
	DU	LI H3	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	27.01	10:07	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 3 of 3

Borehole/Well Id 0002

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0012				GW	Sand and gravel.
50								
	DU	LI H3	0013	SCREEN: Slotted PVC, 3".				
55				FILTER PACK: Gravel.				
	DU	LI H3	0014					
60								
	DU	LI H3	0015	BACKFILL: Gravel.			TI	Gray till.
65				SCREEN: #12 slot steel, 2". FILTER PACK: Gravel.			GW	Sand and gravel.
	DU	LI H3	0016	BACKFILL: Gravel.				
70								Total Depth = 70.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	27.01	10:07	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 3

Drilling Company	Raymond Int.	**Borehole/Well Id**	0003
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597480.12
Date Started	7/27/76	**East (ft)**	1494740.99
Date Completed	7/27/76	**Ground Surface Elev. (ft)**	705.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	55.0
Comments:	Dames and Moore Well # OW-3.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			CL-ML	Clay and silt.
	DU	LI H3	0001					
5								
	DU	LI H3	0002					
							GW	Sand and gravel.
	DU	LI H3	0003					
10				CASING: PVC, 3".				
	DU	LI H3	0004					
15	DU	LI H3	0005	BACKFILL: Gravel.				
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	26.97	10:03	09/20/90

WESTON

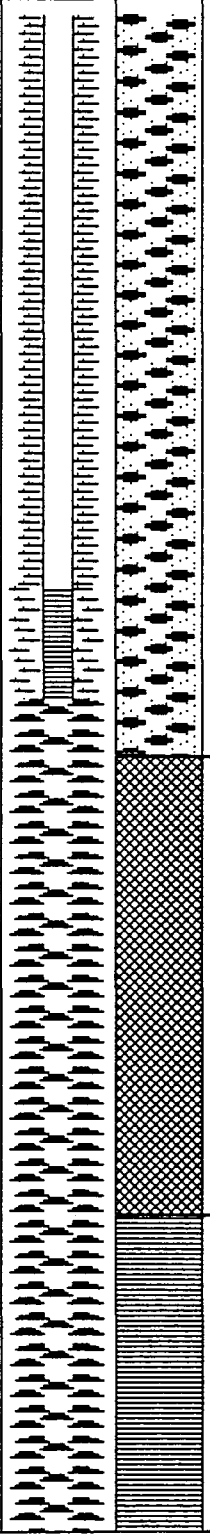
GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0003

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			GW	Sand and gravel.
	DU	LI H3	0007					
25				BACKFILL: Gravel.				
	DU	LI H3	0008					
30				SCREEN: #12 slot steel, 2". SCREEN: #12 slot steel, 2". FILTER PACK: Gravel. FILTER PACK: Gravel.				
	DU	LI H3	0009				TI	Gray till.
35				BACKFILL: Gravel.				
	DU	LI H3	0010					
40							SH	Weathered shale.
	DU	LI H3	0011					
45								



GROUNDWATER

DEPTH	HOUR	DATE
26.97	10:03	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 3 of 3

Borehole/Well Id 0003

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SH	Weathered shale.
	DU	LI H3	0012				SH	Unweathered shale.
50				BACKFILL: Gravel.				
	DU	LI H3	0013					
55								Total Depth = 55.0 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	26.97	10:03	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Drilling Company	Raymond Int.	Borehole/Well Id	0004
Drilling Method	Rotary	STATE PLANE COORDINATES	
Drilling Fluid	Unk	North (ft)	597134.10
Date Started	7/28/76	East (ft)	1494500.03
Date Completed	7/28/76	Ground Surface Elev. (ft)	697.00 (est.)
Logged By	Dames and Moore	Top of Casing Elev. (ft)	------
Checked By	Tom Tharp	Total Depth (ft)	60.0
Comments:	Dames and Moore Well # OW-4.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL-ML	Clay and silt.
				SEAL: Bentonite.			GW	Sand and gravel.
	DU	LI H3	0001					
5								
	DU	LI H3	0002				CL-ML	Clay and silt.
	DU	LI H3	0003					
10							GW	Sand and gravel.
				CASING: PVC, 3".				
	DU	LI H3	0004					
15	DU	LI H3	0005	BACKFILL: Gravel.				
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	19.10	09:43	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 3

Borehole/Well Id 0004

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			GW	Sand and gravel.
	DU	LI H3	0007					
25				BACKFILL: Gravel.				
	DU	LI H3	0008					
30								
	DU	LI H3	0009					
35								
	DU	LI H3	0010					
40								
	DU	LI H3	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	19.10	09:43	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0004

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0012	BACKFILL: Gravel.			TI	Gray till.
50				CASING: PVC, 3".				
	DU	LI H3	0013					
55							GW	Sand and gravel.
	DU	LI H3	0014	FILTER PACK: Gravel. SCREEN: #12 slot steel, 2". BACKFILL: Gravel.				
60								Total Depth = 60.0 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	19.10	09:43	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 3

Drilling Company	Raymond Int.	**Borehole/Well Id**	0005
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597111.19
Date Started	7/28/76	**East (ft)**	1494202.12
Date Completed	7/29/76	**Ground Surface Elev. (ft)**	694.70 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	----
Checked By	Tom Tharp	**Total Depth (ft)**	60.0
Comments:	Dames and Moore Well # OW-5.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
	DU	LI H3	0001					
5								
	DU	LI H3	0002					
	DU	LI H3	0003					
10				CASING: PVC, 3".				
	DU	LI H3	0004					
▼							GW	Sand and gravel.
15	DU	LI H3	0005	BACKFILL: Gravel.				
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.00	09:39	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0005

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			GW	Sand and gravel.
	DU	LI H3	0007					
25				BACKFILL: Gravel.				
	DU	LI H3	0008					
30								
	DU	LI H3	0009					
35								
	DU	LI H3	0010					
40								
	DU	LI H3	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.00	09:39	09/20/90

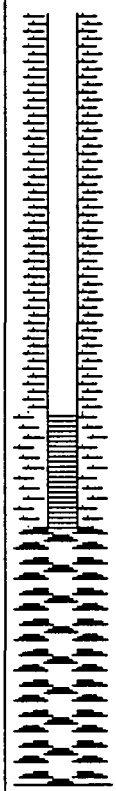
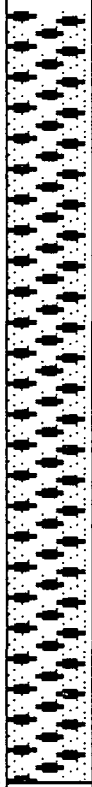
WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0005

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0012	CASING: PVC, 3".			GW	Sand and gravel.
50				BACKFILL: Gravel.				
	DU	LI H3	0013	FILTER PACK: Gravel. SCREEN: #12 slot steel, 2". SCREEN: #12 slot steel, 2". FILTER PACK: Gravel. BACKFILL: Gravel.				
55								
	DU	LI H3	0014					
60								Total Depth = 60.0 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.00	09:39	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 6

Drilling Company	Raymond Int.	**Borehole/Well Id**	0006
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597095.16
Date Started	7/13/76	**East (ft)**	1493900.99
Date Completed	7/15/76	**Ground Surface Elev. (ft)**	694.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	133.8
Comments:	Dames and Moore Well # OW-6.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			CL-ML	Clay and silt.
	DU	LI H3	0001					
5								
	DU	LI H3	0002	CASING: PVC, 3".				
	DU	LI H3	0003					
10				BACKFILL: Gravel.			GW	Sand and gravel.
	DU	LI H3	0004					
15	DU	LI H3	0005					
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	15.76	09:36	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 6

Borehole/Well Id 0006

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			GW	Sand and gravel.
	DU	LI H3	0007					
25				BACKFILL: Gravel.				
	DU	LI H3	0008					
30								
	DU	LI H3	0009					
35								
	DU	LI H3	0010					
40								
	DU	LI H3	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	15.76	09:36	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 3 of 6

Borehole/Well Id 0006

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0012	CASING: PVC, 3".			GW	Sand and gravel.
50				BACKFILL: Gravel.				
	DU	LI H3	0013					
55								
	DU	LI H3	0014					
60								
	DU	LI H3	0015					
65								
	DU	LI H3	0016					
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	15.76	09:36	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0006

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0017				GW	Sand and gravel.
75				CASING: PVC, 3".				
	DU	LI H3	0018					
80				BACKFILL: Gravel.				
							TI	Gray till.
	DU	LI H3	0019					
85								
	DU	LI H3	0020					
90								
	DU	LI H3	0021					
							GW	Sand and gravel.
95								
	DU	LI H3	0022					

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	15.76	09:36	09/20/90

WESTON

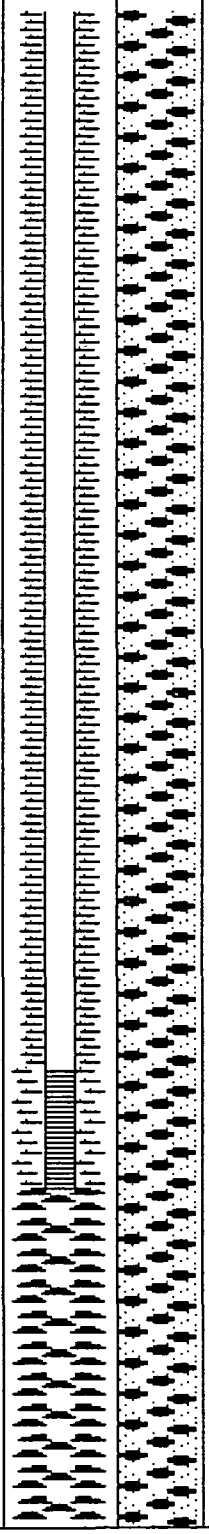
GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0006

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100							GW	Sand and gravel.
	DU	LI H3	0023	CASING: PVC, 3".				
105				BACKFILL: Gravel.				
	DU	LI H3	0024					
110								
	DU	LI H3	0025					
115								
	DU	LI H3	0026	SCREEN: #12 slot steel, 2". FILTER PACK: Gravel. BACKFILL: Gravel.				
120								
	DU	LI H3	0027					
125								



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	15.76	09:36	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 6 of 6

Borehole/Well Id 0006

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0028	BACKFILL: Gravel.			GW	Sand and gravel.
130	DU	LI H3	0029				SH	Weathered shale.
135								Total Depth = 133.8 feet.
140								
145								
150								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	15.76	09:36	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 4

Drilling Company	Raymond Int.	**Borehole/Well Id**	0007
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597079.28
Date Started	10/15/76	**East (ft)**	1493602.86
Date Completed	11/18/76	**Ground Surface Elev. (ft)**	694.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	94.8
Comments:	Dames and Moore Well # OW-7.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
	DU	LI	0001				GW	Sand and gravel.
5	DU	LI	0002	CASING: PVC, 2".				
	DU	LI	0003					
10				BACKFILL: Gravel.				
	DU	LI	0004					
15	DU	LI	0005					
	DU	LI	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0007

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 2".			GW	Sand and gravel.
	DU	LI	0007					
25				BACKFILL: Gravel.				
	DU	LI	0008					
30								
	DU	LI	0009					
35								
	DU	LI	0010					
40								
	DU	LI	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0007

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI	0012	CASING: PVC, 2".			GW	Sand and gravel.
50				BACKFILL: Gravel.				
	DU	LI	0013					
55								
	DU	LI	0014					
60								
	DU	LI	0015					
65								
	DU	LI	0016					
70								

GROUNDWATER

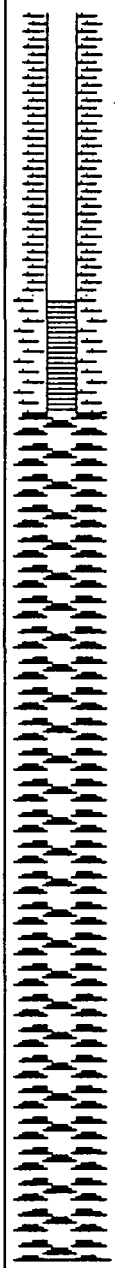
	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 4 of 4

Borehole/Well Id 0007

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI	0017	CASING: PVC, 2".			GW	Sand and gravel.
75				BACKFILL: Gravel.				
	DU	LI	0018	SCREEN: #12 slot steel, 2". FILTER PACK: Gravel.				
80								
	DU	LI	0019	BACKFILL: Gravel.				
85								
	DU	LI	0020					
90								
	DU	LI	0021				TI	Gray till.
95								Total Depth = 94.8 feet.



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 6

Drilling Company	Raymond Int.	**Borehole/Well Id**	0008
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597017.16
Date Started	9/14/76	**East (ft)**	1493257.94
Date Completed	9/18/76	**Ground Surface Elev. (ft)**	689.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	145.0
Comments:	Dames and Moore Well # OW-8.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
	DU	LI H3	0001				GW	Sand and gravel.
5	DU	LI H3	0002	CASING: PVC, 2".				
	DU	LI H3	0003					
10				BACKFILL: Gravel.				
	DU	LI H3	0004					
15	DU	LI H3	0005					
	DU	LI H3	0006					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 6

Borehole/Well Id 0008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 2".			GW	Sand and gravel.
	DU	LI H3	0007					
25				BACKFILL: Gravel.				
	DU	LI H3	0008					
30								
	DU	LI H3	0009					
35								
	DU	LI H3	0010					
40								
	DU	LI H3	0011					
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager
Al Gleason

Borehole/Well Id 0008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0012	CASING: PVC, 2".			GW	Sand and gravel.
50				BACKFILL: Gravel.				
	DU	LI H3	0013					
55								
	DU	LI H3	0014					
60								
	DU	LI H3	0015					
65								
	DU	LI H3	0016					
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0017				GW	Sand and gravel.
75				CASING: PVC, 2".				
	DU	LI H3	0018	BACKFILL: Gravel.				
80								
	DU	LI H3	0019					
85								
	DU	LI H3	0020					
90							TI	Gray till.
	DU	LI H3	0021					
95							GW	Sand and gravel.
	DU	LI H3	0022					

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100							GW	Sand and gravel.
	DU	LI H3	0023	CASING: PVC, 2".				
105				BACKFILL: Gravel.				
	DU	LI H3	0024					
110								
	DU	LI H3	0025					
115								
	DU	LI H3	0026					
120								
	DU	LI H3	0027					
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 6 of 6

Borehole/Well Id 0008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	DU	LI H3	0028				GW	Sand and gravel.
130				CASING: PVC, 2".				
	DU	LI H3	0029	BACKFILL: Gravel.				
135								
	DU	LI H3	0030					
140				SCREEN: #16 slot steel, 2". FILTER PACK: Gravel.			SH	Unweathered shale.
	DU	LI H3	0031	BACKFILL: Gravel.				
145								Total Depth = 145.0 feet.
150								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0020
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	598109.60
Date Started		**East (ft)**	1495264.34
Date Completed		**Ground Surface Elev. (ft)**	786.20
Logged By	Unk	**Top of Casing Elev. (ft)**	788.52
Checked By	Tom Tharp	**Total Depth (ft)**	40.0
Comments:	Originally numbered 20-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
▼								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	13.18	10:33	02/14/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0028
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597830.01
Date Started		**East (ft)**	1495207.77
Date Completed		**Ground Surface Elev. (ft)**	748.50
Logged By	Unk	**Top of Casing Elev. (ft)**	750.89
Checked By	Tom Tharp	**Total Depth (ft)**	19.0
Comments:	Originally numbered 28-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	12.35	10:30	02/14/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 2

Drilling Company	Raymond Int.	**Borehole/Well Id**	0033
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597967.67
Date Started	5/13/76	**East (ft)**	1496503.05
Date Completed	5/13/76	**Ground Surface Elev. (ft)**	775.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	777.57
Checked By	Tom Tharp	**Total Depth (ft)**	33.5
Comments:	Dames and Moore Well # 33-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
5				CASING: PVC, 3".				
10				BACKFILL: Earth.				
							TI	Gray till.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	20.78	11:46	08/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 2

Borehole/Well Id 0033

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			TI	Gray till.
							SH	Unweathered shale.
				BACKFILL: Earth.			TI	Gray till.
25								
30				SEAL: Bentonite.				
				SCREEN: Steel, 3". FILTER PACK: Gravel.				
								Total Depth = 33.5 feet.
35								
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
20.78	11:46	08/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 1

Drilling Company	Raymond Int.	**Borehole/Well Id**	0034
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	598082.49
Date Started	5/26/76	**East (ft)**	1496257.79
Date Completed	5/26/76	**Ground Surface Elev. (ft)**	818.10
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	818.71
Checked By	Tom Tharp	**Total Depth (ft)**	20.0
Comments:	Dames and Moore Well # 34-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
5								
10				CASING: PVC, 3".			TI	Gray till.
				BACKFILL: Earth.				
				SEAL: Bentonite.			SH	Weathered shale.
15								
				SCREEN: Steel, 3". FILTER PACK: Gravel.			SH	Unweathered shale. Total Depth = 20.0 feet.
20								

GROUNDWATER

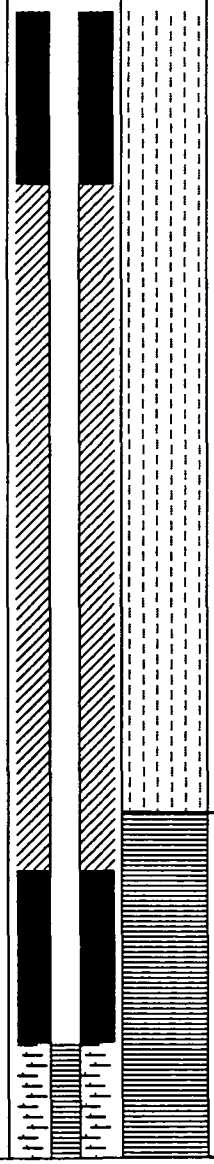
DEPTH	HOUR	DATE
16.46	14:10	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 1

Drilling Company	Raymond Int.	**Borehole/Well Id**	0035
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597762.46
Date Started	5/13/76	**East (ft)**	1495934.95
Date Completed	5/13/76	**Ground Surface Elev. (ft)**	746.10
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	Unk
Checked By	Tom Tharp	**Total Depth (ft)**	20.0
Comments:	Dames and Moore Well # 35-1		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
5								
10				CASING: PVC, 3". BACKFILL: Earth.				
15				SEAL: Bentonite.			SH	Unweathered shale.
20				SCREEN: Steel, 3". FILTER PACK: Gravel.				Total Depth = 20.0 feet.



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 4

Drilling Company	Raymond Int.	**Borehole/Well Id**	0037
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Mud	**North (ft)**	597339.96
Date Started	5/21/76	**East (ft)**	1495065.88
Date Completed	5/24/76	**Ground Surface Elev. (ft)**	723.20
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	Unk
Checked By	Tom Tharp	**Total Depth (ft)**	75.0
Comments:	Dames and Moore Well # 37-1		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
5								
10				CASING: PVC, 3".				
				BACKFILL: Earth.				
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Borehole/Well Id 0037

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			GW	Sand and gravel.
							TI	Gray till.
25				BACKFILL: Earth.				
30								
							GW	Sand and gravel.
35								
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 3 of 4

Borehole/Well Id 0037

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				CASING: PVC, 3".			GW	Sand and gravel.
50				BACKFILL: Earth.				
55								
60								
65								
70				SEAL: Bentonite.				

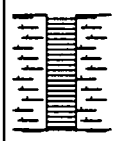
GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 4 of 4

Borehole/Well Id 0037

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SCREEN: Steel, 3". FILTER PACK: Gravel.			GW	Sand and gravel.
75								Total Depth = 75.0 feet.
80								
85								
90								
95								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 1

Drilling Company	Unk	Borehole/Well Id	0042
Drilling Method	Unk	STATE PLANE COORDINATES	
Drilling Fluid	Unk	North (ft)	597823.10
Date Started		East (ft)	1496339.89
Date Completed		Ground Surface Elev. (ft)	765.00 (est.)
Logged By	Unk	Top of Casing Elev. (ft)	----
Checked By	Tom Tharp	Total Depth (ft)	25.0
Comments:	Originally numbered 42-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	22.47	10:15	01/28/88

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 2

Drilling Company	Moody's Inc.	**Borehole/Well Id**	0046
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597058.08
Date Started	6/18/74	**East (ft)**	1494995.82
Date Completed	6/22/74	**Ground Surface Elev. (ft)**	706.00 (est.)
Logged By	John Gifford	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	45.0
Comments:	Originally numbered 46-1. Also known historically as Test Well # 6.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information incomplete.			FL	Fill.
				BACKFILL: Gravel.			GC	Yellow clay and gravel.
5				CASING: Steel, 8".				
10								
15							GC	Gravel and clay.
20								

GROUNDWATER

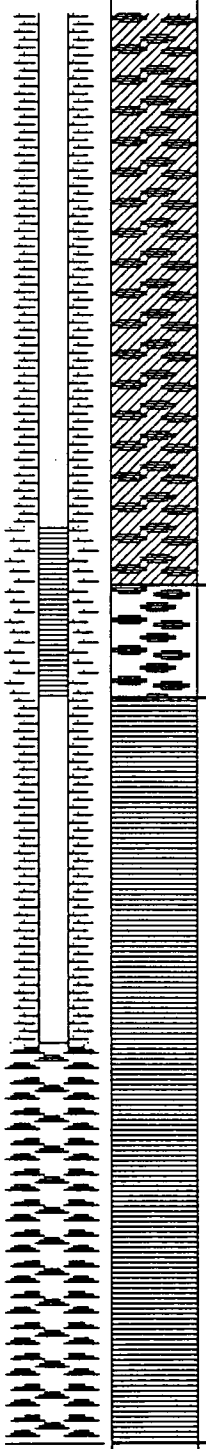
	DEPTH	HOUR	DATE
▽			
▼	28.60	12:15	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 2

Borehole/Well Id 0046

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Gravel.			GC	
25				CASING: Steel, 8".				
				FILTER PACK: Gravel. SCREEN: Red brass, 8", 40 slot.				
30							GP	Gravel.
							SH	Gray shale.
				BACKFILL: Gravel.				
35				CASING: Steel, 6".				
40				BACKFILL: Gravel.				
45								Total Depth = 45.0 feet.



GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	28.60	12:15	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 2

Drilling Company	Raymond Int.	**Borehole/Well Id**	0052
Drilling Method	Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	Mud	**North (ft)**	597246.22
Date Started	5/18/76	**East (ft)**	1496021.22
Date Completed	5/18/76	**Ground Surface Elev. (ft)**	
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	Unk
Checked By	Tom Tharp	**Total Depth (ft)**	38.5
Comments:	Dames and Moore Well # 52-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite. BACKFILL: Earth. CASING: PVC, 3".			CL-ML	Clay and silt.
5								
10								
							GW	Sand and gravel.
15							CL-ML	Clay and silt.
							TI	Gray till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 2

Borehole/Well Id 0052

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							TI	Gray till.
				BACKFILL: Earth.				
25				CASING: PVC, 3".				
30								
				SEAL: Bentonite.				
35								
				SCREEN: Steel, 3".				
				FILTER PACK: Sand.			SH	Shale, unweathered.
								Total Depth = 38.5 feet.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0055
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596858.17
Date Started		**East (ft)**	1495179.74
Date Completed		**Ground Surface Elev. (ft)**	710.00 (est.)
Logged By	Unk	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	33.2
Comments:	Originally numbered 55-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	33.20	09:39	12/21/88

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 2

Drilling Company	Moody's Inc.	**Borehole/Well Id**	0063
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596574.31
Date Started	6/13/74	**East (ft)**	1495055.67
Date Completed	6/18/74	**Ground Surface Elev. (ft)**	704.80
Logged By	John Gifford	**Top of Casing Elev. (ft)**	707.23
Checked By	Tom Tharp	**Total Depth (ft)**	45.0
Comments:	Originally numbered 63-1. Also known historically as Test Well # 5.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information incomplete.			FL	Fill.
							GC	Yellow clay and gravel.
				BACKFILL: Gravel.				
5								
				CASING: Steel, 8".				
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.47	11:58	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 2

Borehole/Well Id 0063

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Gravel.			GC	Yellow clay and gravel.
25				CASING: Steel, 8".				
30								
				FILTER PACK: Gravel. SCREEN: Red brass, 3", 40 slot.				
35							GP	Gravel.
							SH	Gray shale.
				BACKFILL: Gravel.				
40								
45								Total Depth = 45.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.47	11:58	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 3

Drilling Company	Dunbar Drilling Co.	**Borehole/Well Id**	0071
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596424.29
Date Started		**East (ft)**	1494997.59
Date Completed		**Ground Surface Elev. (ft)**	703.00 (est.)
Logged By	Unk	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	53.5
Comments:	Originally numbered 71-1. Production well # 1. Date completed late 1961 to early 1962.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Completion information is incomplete. SEAL: Bentonite.			GP	Sand and gravel.
5				BACKFILL: Quartz gravel.				
10							GC	Sand and gravel with clay.
15				CASING: Steel, 26".				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 3

Borehole/Well Id 0071

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Quartz gravel.			GC	Sand and gravel with clay.
25				CASING: Steel, 26".			GW	Sand and gravel.
30							GC	Sand and gravel with clay.
35							GW	Sand and gravel.
40							GC	Sand and gravel with clay.
45				SCREEN: Steel, 26", louvered, 1/4" slots. FILTER PACK: Quartz gravel.			GW	Sand and gravel.

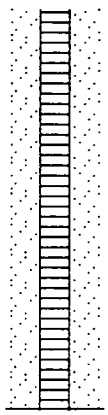
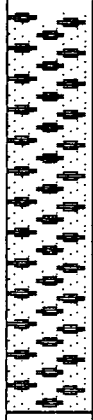
GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 3 of 3

Borehole/Well Id 0071

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50				SCREEN: Steel, 26", louvered, 1/4" slots. FILTER PACK: Quartz gravel.			GW	Sand and gravel.
55								Total Depth = 53.5 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 3

Drilling Company	Layne Ohio Co.	**Borehole/Well Id**	0076
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	595832.03
Date Started	11/5/47	**East (ft)**	1495095.83
Date Completed	12/10/47	**Ground Surface Elev. (ft)**	703.00 (est.)
Logged By	Unk	**Top of Casing Elev. (ft)**	704(est)
Checked By	Tom Tharp	**Total Depth (ft)**	64.0
Comments:	Originally numbered 76-1. Production well # 3.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			TS	Topsoil.
							GP	Coarse gravel.
5				BACKFILL: Quartz gravel.			GP	Medium gravel.
10				CASING: Steel, 26".				
							GM	Medium gravel and silt.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 3

Borehole/Well Id 0076

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Quartz gravel.				
25				CASING: Steel, 26".			CL	Clay.
30								
35							GW	Sand and gravel.
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 3 of 3

Borehole/Well Id 0076

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							GW	Sand and gravel.
							SP	Fine sand.
50							GW	Sand and gravel.
55				FILTER PACK: Quartz gravel.				
				SCREEN: Bronze, 26", slotted 3/16" X 1 1/2".				
60				CONE: Steel, with concrete fill.				
65								Total Depth = 64.0 feet.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Raymond Int	**Borehole/Well Id**	0101
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597131.82
Date Started		**East (ft)**	1494693.42
Date Completed		**Ground Surface Elev. (ft)**	707.90
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	708.34
Checked By	Tom Tharp	**Total Depth (ft)**	45.0
Comments:	Dames and Moore Well # OW-1A.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			CL-ML	Clay and silt.
5				CASING: PVC, 2".				
10				BACKFILL: Gravel.				
15								
							GW	Sand and gravel.
20								

GROUNDWATER

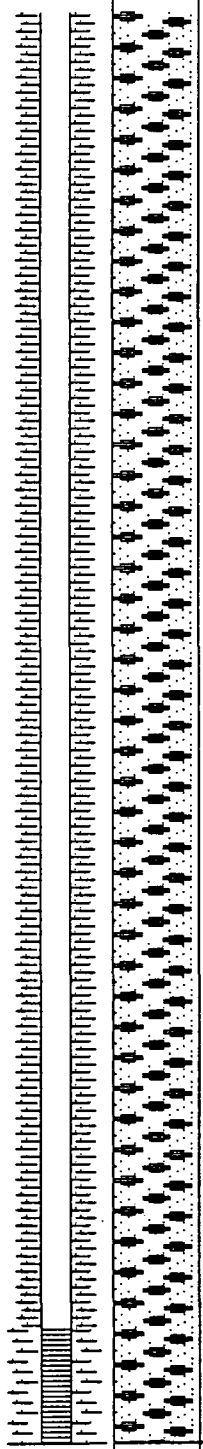
	DEPTH	HOUR	DATE
▽			
▼	34.21	10:14	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0101

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 2".			GW	Sand and gravel.
25				BACKFILL: Gravel.				
30								
35								
40				SCREEN: Steel, 2".				
				FILTER PACK: Gravel.				
45								Total Depth = 45.0 feet.



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	34.21	10:14	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Raymond Int.	**Borehole/Well Id**	0106
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597097.13
Date Started		**East (ft)**	1493902.18
Date Completed		**Ground Surface Elev. (ft)**	694.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	50.0
Comments:	Dames and Moore Well # OW-6A.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			ML	Clay and silt.
5				CASING: PVC, 2".				
10				BACKFILL: Gravel.			GW	Sand and gravel.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.73	09:35	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 3

Borehole/Well Id 0106

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GW	Sand and gravel.
				CASING: PVC, 2".				
25				BACKFILL: Gravel.				
30								
35								
40								
45								

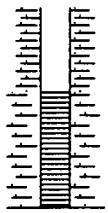
GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.73	09:35	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0106

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SCREEN: Steel, 2". FILTER PACK: Gravel.			GW	Sand and gravel.
50								Total Depth = 50.0 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.73	09:35	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Raymond Int.	**Borehole/Well Id**	0108
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597018.81
Date Started		**East (ft)**	1493256.98
Date Completed		**Ground Surface Elev. (ft)**	687.00 (est.)
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	22.0
Comments:	Dames and Moore Well # OW-8A. Note: transcribed lithologic log OW-8 due to proximity of borehole.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
5				BACKFILL: Gravel.			GW	Sand and gravel.
10								
15								
20								

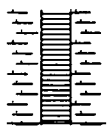
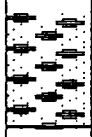
GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	10.83	11:25	12/21/88

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0108

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				SCREEN: Slotted steel, 2". FILTER PACK: Gravel.			GW	Sand and Gravel.
								Total depth = 22.0 feet.
25								
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	10.83	11:25	12/21/88

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0111
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597971.10
Date Started	11/16/87	**East (ft)**	1496733.11
Date Completed	11/17/87	**Ground Surface Elev. (ft)**	779.00
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	780.41
Checked By	Tom Tharp	**Total Depth (ft)**	67.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			FL	Fill - brown to gray gravelly clay, moist, stiff, homogeneous, low plasticity, 10% gravel up to 1/2 inches in diameter, angular, HNU=0.
5	SS	LI	0001				FL	Fill - brown to gray gravelly clay, moist, hard, homogeneous, low plasticity, 20 % gravel up to 1 1/2 inches in diameter, HNU=0.
10	SS	LI	0002				FL	Fill - dark gray gravelly clay, high plasticity, homogeneous, soft, moist, approximately 20 % gravel up to 1 1/2 inches in diameter, angular, HNU=0.
15	SS	LI	0003				ML-GM	Gray to light brown sandy, gravelly silt, poorly graded, wet, nonstratified, approximately 20 % gravel up to 1 1/2 inches in diameter, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	53.40	07:29	11/14/87
▼	56.03	09:00	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0111

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Cement and bentonite grout.				
	SS	LI	0004				SW	Light brown sand, medium grained, well graded, subangular, wet, nonstratified, HNU = 0.
25				CASING: Stainless steel, 4".				
	SS	LI	0005				NR	No recovery.
30							ML-GM	Brown to reddish brown gravelly silt, moist, stiff, homogeneous, approximately 10 % gravel up to 1/2 inch in diameter, subrounded, HNU = 0.
	SS	LI	0006				SP	Light brown to brown gravelly sand, moist, poorly graded, nonstratified, approximately 25 % gravel up to 1/2 inch in diameter, HNU = 0.
35								
	SS	LI	0007				SP	Light brown to brown gravelly sand, coarse grained, moist, poorly graded, nonstratified, approximately 20 % gravel up to 1 inch in diameter, subrounded, HNU = 0.
40								
	SS	LI	0008				SP	Light reddish brown to reddish brown gravelly sand, coarse grained, moist to wet, poorly graded, nonstratified, approximately 30 % gravel up to 1 1/2 inches in diameter, subangular, HNU = 0.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	53.40	07:29	11/14/87
▼	56.03	09:00	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id: 0111

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0009				SP	Light brown to brown gravelly sand, coarse grained, wet, poorly graded, nonstratified, approximately 20 % gravel up to 1 inch in diameter, subrounded, HNU = 0.
50								
	SS	LI	0010	SEAL: Bentonite pellets.			SM-SP	Light brown silty, gravelly sand, coarse grained, moist, poorly graded, nonstratified, approximately 30 % gravel up to 1 1/2 inches in diameter, subrounded, HNU = 0.
55								
	SS	LI	0011				SM-SP	Light brown to gray silty, gravelly sand, coarse grained, moist, poorly graded, nonstratified, wet, approximately 30 % gravel up to 1 inch in diameter, subrounded, HNU = 0.
60				FILTER PACK: #4 quartz sand.				
	SS	LI	0012				SW	Sand, coarse grained, well graded, subangular, nonstratified, saturated, HNU = 0.
65				SCREEN: Stainless steel, 4".				
	SS	LI	0013					
								Total Depth = 67.0 feet.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	53.40	07:29	11/14/87
▼	56.03	09:00	12/11/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0112
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597974.36
Date Started	11/18/87	**East (ft)**	1496515.41
Date Completed	11/18/87	**Ground Surface Elev. (ft)**	773.50
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	775.20
Checked By	Tom Tharp	**Total Depth (ft)**	35.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			OL	Dark brown to black organic silt, moist, stiff, blocky, HNU=0.
5								
	SS	LI	0001				ML-GM	Sandy, gravelly silt, moist, stiff, homogeneous, poorly graded, approximately 20 % gravel up to 1/4 inch in diameter, subrounded, HNU=0.
10								
	SS	LI	0002				ML-GM	Light brown gravelly silt, stiff, homogeneous, moist, approximately 30 % gravel up to 1 inch in diameter, angular, HNU=0.
15								
	SS	LI	0003	SEAL: Bentonite pellets.			ML-GM	Brown gravelly silt, stiff, moist, homogeneous, approximately 20 % gravel up to 1 inch in diameter, subrounded, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.57	07:33	11/19/87
▼	28.86	11:00	12/13/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0112

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0004				LS-SH	Bedrock - lithology uncertain, assume interbedded limestone and shale.
25				FILTER PACK: #4 quartz sand.				
30				SCREEN: Stainless steel, 4".				
35								Total Depth = 35.5 feet.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.57	07:33	11/19/87
▼	28.86	11:00	12/13/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0113
Drilling Method	Air Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	NA	**North (ft)**	599083.45
Date Started	11/14/87	**East (ft)**	1495916.48
Date Completed	11/16/87	**Ground Surface Elev. (ft)**	875.40
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	874.62
Checked By	Tom Tharp	**Total Depth (ft)**	58.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4".			LS-SH	Gray fossiliferous limestone with interbedded shale.
5	RC	LI	0001				LS-SH	Gray fossiliferous limestone with interbedded shale.
	RC	LI	0002	BACKFILL: Cement and bentonite grout.			LS-SH	Gray fossiliferous limestone with interbedded shale, dry.
10	RC	LI	0003				LS-SH	Gray fossiliferous limestone with interbedded shale, dry.
	RC	LI H3	0004				LS-SH	Gray fossiliferous limestone, medium bedded, with thinly layered interbedded shale, dry.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.20	08:30	11/16/87
▼	54.21	14:28	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0113

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".		
	RC	LI	0005		LS	Gray fossiliferous limestone, trace of limey shale.
25				BACKFILL: Cement and bentonite grout.		
30						
	RC	LI H3	0006	SEAL: Bentonite pellets.	LS-SH	Gray fossiliferous limestone with interbedded weathered shale, shale beds up to .25 feet thick.
35					SH	Gray weathered shale with minor limestone interbeds up to 0.3 feet thick.
				SCREEN: Stainless steel, 4".		
40				FILTER PACK: Quartz sand.	LS	Gray limestone with minor shale interbeds.
				SEAL: Bentonite pellets.		
	RC	LI H3	0007		LS-SH	Gray-blue weathered shale with interbedded limestone.
45						

GROUNDWATER

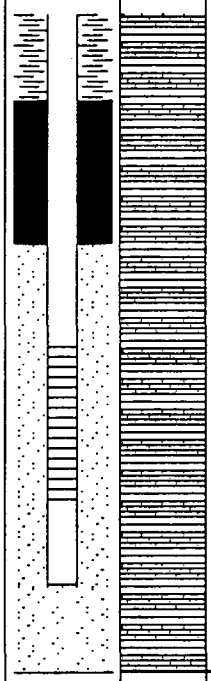
	DEPTH	HOUR	DATE
▽	55.20	08:30	11/16/87
▼	54.21	14:28	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0113

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				BACKFILL: Cement and bentonite grout.				
				SEAL: Bentonite pellets.				
50								
				SCREEN: Stainless steel, 4".				
				FILTER PACK: Quartz sand.				
55								
				BACKFILL: Quartz sand.				
								Total Depth = 58.0 feet.
60								
65								
70								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.20	08:30	11/16/87
▼	54.21	14:28	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0114
Drilling Method	Air Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	NA	**North (ft)**	598615.58
Date Started	11/3/87	**East (ft)**	1495593.02
Date Completed	11/11/87	**Ground Surface Elev. (ft)**	874.20
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	873.51
Checked By	Tom Tharp	**Total Depth (ft)**	55.0
Comments:	Transcribed geologic log from well # 0116 - no samples collected.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4".			GC	Gray to brown clayey gravel, poorly graded, nonstratified, no cement, dry, 65% gravel, subangular.
5				BACKFILL: Cement and bentonite grout.			CL	Brown gravelly clay, poorly graded, nonstratified, noncemented, 40% gravel up to 2 inches in diameter, subangular to subrounded, saturated.
10							CL	Gray gravelly clay, soft, noncemented, saturated.
							LS-SH	Gray medium bedded limestone and shale, medium graded, fossiliferous, layered, strongly cemented, homogeneous, lean.
15							SH	Gray shale, thinly bedded, moist, firm.
							LS-SH	Gray fossiliferous limestone with interbedded brown to gray organic stained shale, layered to .25 feet thick.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	50.08	14:25	05/24/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0114

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
				CASING: Stainless steel, 4".			NR	No recovery.
25				BACKFILL: Cement and bentonite grout.			LS-SH	Gray fossiliferous shale with interbedded limestone, iron staining along shale bedding and rough 90 to 70 degree fractures.
30				SEAL: Bentonite pellets.			LS-SH	Gray fossiliferous limestone interbedded with thinly layered shale, fractures are rough, subvertical and iron stained up to 6 inches long in limestone unit. Some iron staining along bedding planes of shale.
35				SCREEN: Stainless steel, 4". FILTER PACK: Quartz sand.				
40				SEAL: Bentonite pellets. BACKFILL: Cement and bentonite grout.			LS-SH	Gray fossiliferous limestone with thin interlayers of gray shale.
45								

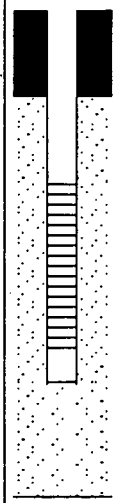
GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	50.08	14:25	05/24/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0114

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SEAL: Bentonite pellets.				
50				SCREEN: Stainless steel, 4". FILTER PACK: Quartz sand. BACKFILL: Quartz sand.			LS-SH	Gray to black fossiliferous limestone interbedded with thinly layered, gray shale.
55								Total Depth = 55.0 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	50.08	14:25	05/24/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0115
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	598602.45
Date Started	11/10/87	**East (ft)**	1495603.89
Date Completed	11/10/87	**Ground Surface Elev. (ft)**	874.30
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	873.55
Checked By	Tom Tharp	**Total Depth (ft)**	42.0
Comments:	Transcribed geologic log from well # 0116 - no samples collected.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			GC	Gray to brown clayey gravel, poorly graded, nonstratified, no cement, dry, 65% gravel, subangular.
5								
10							CL	Brown gravelly clay, poorly graded, nonstratified, noncemented, 40% gravel up to 2 inches in diameter, subangular to subrounded, saturated.
							CL	Gray gravelly clay, soft, noncemented, saturated.
							LS-SH	Gray medium bedded limestone and shale, medium graded, fossiliferous, layered, strongly cemented, homogeneous, lean.
15							SH	Gray shale, thinly bedded, moist, firm.
							LS-SH	Gray fossiliferous limestone with interbedded brown to gray organic stained shale, layered to .25 feet thick.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	39.20	13:58	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0115

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							NR	No recovery.
25				SEAL: Bentonite pellets.			LS-SH	Gray fossiliferous shale with interbedded limestone, iron staining along shale bedding and rough 90 to 70 degree fractures.
30				FILTER PACK: #4 quartz sand.			LS-SH	Gray fossiliferous limestone interbedded with thinly layered shale, fractures are rough, subvertical and iron stained up to 6 inches long in limestone unit. Some iron staining along bedding planes of shale.
35				SCREEN: Stainless steel, 4".				
40							LS-SH	Gray fossiliferous limestone with thin interlayers of gray shale.
								Total Depth = 42.0 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	39.20	13:58	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0116
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	598607.40
Date Started	10/27/87	**East (ft)**	1495599.74
Date Completed	11/2/87	**Ground Surface Elev. (ft)**	874.10
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	873.05
Checked By	Tom Tharp	**Total Depth (ft)**	89.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			GC	Gray to brown clayey gravel, poorly graded, nonstratified, no cement, dry, 65% gravel, subangular.
5								
	TS	LI	0001				CL	Brown gravelly clay, poorly graded, nonstratified, noncemented, 40% gravel up to 2 inches in diameter, subangular to subrounded, saturated.
10	SS	H3	0010					
	SS	LI	0002				CL	Gray gravelly clay, soft, noncemented, saturated.
	RC	LI H3	0003 0013				LS-SH	Gray medium bedded limestone and shale, medium graded, fossiliferous, layered, strongly cemented, homogeneous, lean.
15							SH	Gray shale, thinly bedded, moist, firm.
	RC	LI	0004				LS-SH	Gray fossiliferous limestone with interbedded brown to gray organic stained shale, layered to .25 feet thick.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.25	08:00	10/31/87
▼	64.36	14:35	05/24/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0116

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
				BACKFILL: Cement and bentonite grout.			NR	No recovery.
	RC	LI	0005				LS-SH	Gray fossiliferous shale with interbedded limestone, iron staining along shale bedding and rough 90 to 70 degree fractures.
25				CASING: Stainless steel, 4".				
	RC	LI	0006				LS-SH	Gray fossiliferous limestone interbedded with thinly layered shale, fractures are rough, subvertical and iron stained up to 6 inches long in limestone unit. Some iron staining along bedding planes of shale.
30								
35								
	RC	LI	0007				LS-SH	Gray fossiliferous limestone with thin interlayers of gray shale.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.25	08:00	10/31/87
▼	64.36	14:35	05/24/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0116

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
	RC	LI	0008		LS-SH	Gray to black fossiliferous limestone interbedded with thinly layered, gray shale.
50				BACKFILL: Cement and bentonite grout.		
55				CASING: Stainless steel, 4".		
60					LS-SH	Blue to gray shale, thinly layered, few dark gray limestone interbeds 1 to 6 inches thick.
	RC	H3	116-4			
65				SEAL: Bentonite.		
	RC	LI	0009		LS-SH	Blue to gray shale, thinly layered, few dark gray limestone interbeds to 3 inches thick, 1 foot thick limestone bed at 74.3 feet.
70				FILTER PACK: #4 quartz sand.		
				SCREEN: Stainless steel, 4".		

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.25	08:00	10/31/87
▼	64.36	14:35	05/24/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 4 of 4

Borehole/Well Id 0116

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75				FILTER PACK: #4 quartz sand.				
	RC	LI	0010	SCREEN: Stainless steel, 4".			LS-SH	Blue to gray shale, thinly layered, saturated, fresh; thin limestone interbeds up to 2 inches thick.
80	RC	H3	116-5					
85				BACKFILL: Native sediment.				
	RC	LI	0011					
90								Total Depth = 89.0 feet.
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.25	08:00	10/31/87
▼	64.36	14:35	05/24/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0117
Drilling Method	Air Rotary	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	598073.99
Date Started	12/1/87	**East (ft)**	1495765.12
Date Completed	12/2/87	**Ground Surface Elev. (ft)**	811.90
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	813.50
Checked By	Tom Tharp	**Total Depth (ft)**	17.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	C	LI H3 PU	117-1				AF	Fill (clay, gravel and sand).
				CASING: Stainless steel, 4".			LS-SH	Limestone and shale.
				BACKFILL: Cement and bentonite grout.			LS	Gray limestone (80%), fractured, fossiliferous, some clay and gravel.
5	C	LI H3 PU	117-2	SEAL: Bentonite.				
	C	LI PU	117-3				LS-SH	7.5 to 8.0 feet, limestone with minor gray brown shale, some clay. 8.0 to 8.6 feet, gray shale, weathered, saturated. 8.6 to 9.1 feet, limestone. 9.1 to 10.5 feet, gray shale, weathered.
10	C	LI PU	117-4	FILTER PACK: #4 quartz sand.				10.5 to 10.7 feet, limestone, vertically fractured with iron staining. 10.7 to 10.8 feet, gray shale, weathered. 10.8 to 12.5 feet, no recovery.
	C		117-5	SCREEN: Stainless steel, 2".			LS-SH	12.5 to 13.0 feet, gray fossiliferous limestone with minor (.5 inch) gray shale interbeds. 13.0 to 13.7 feet, gray shale, weathered, saturated, minor limestone layers (.5 to 1 inch). 13.7 to 14.1 feet, limestone with fractures. 14.1 to 15.8 feet, gray shale, weathered, saturated.
	C		117-6					
	C		117-7					
15								
	C	LI EP	117-8					
	C	LI EP	117-9					
								Total Depth = 17.5 feet.
20								

GROUNDWATER

DEPTH	HOUR	DATE
9.56	14:09	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0118
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	600022.28
Date Started	10/19/87	**East (ft)**	1495793.93
Date Completed	10/20/87	**Ground Surface Elev. (ft)**	706.80
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	706.35
Checked By	Tom Tharp	**Total Depth (ft)**	41.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			SP	Light brown to gray gravelly sand, coarse grained, poorly graded, dry, nonstratified, weak cementation, approximately 20% gravel up to 3/4 inch in diameter, subrounded, HNU=0.
5	SS	LI	0001				SP	Light brown to gray gravelly sand, coarse grained, poorly graded, nonstratified, weak cementation, approximately 20% gravel up to 1/2 inch in diameter, subrounded, HNU=0.
10	SS	LI	0002				SP	Light brown to gray gravelly sand, poorly graded, weak cementation, nonstratified, approximately 20% gravel up to 1 inch in diameter, subrounded, HNU=0.
15	SS	LI	0003				SP	Light brown to gray gravelly sand, coarse grained, moist, weak cementation, nonstratified, approximately 30% gravel up to 1 inch in diameter, subrounded, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	26.84	07:14	11/19/87
▼	26.62	11:15	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0118

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".				
	SS	LI	0004	BACKFILL: Cement and bentonite grout.			SP	Brown to light brown gravelly sand, coarse grained, moist, weak cementation, nonstratified, approximately 30% gravel up to 1 1/2 inch in diameter, subrounded, HNU = 0.
25				SEAL: Bentonite pellets.				
	SS	LI	0005				SM-SP	Silty, gravelly sand, coarse grained, poorly graded, wet, medium cementation, nonstratified, 10% silt, approximately 30% gravel up to 1 1/2 inch in diameter, subrounded, HNU = 0.
30								
	SS	LI	0006				SM-SP	Silty, gravelly sand, coarse grained, wet, medium cementation, nonstratified, 20% silt, approximately 30% gravel up to 1 1/2 inch in diameter, subrounded, HNU = 0.
35				FILTER PACK: #4 quartz sand.				
	SS	LI	0007	SCREEN: Stainless steel, 4".			SM-SP	Silty, gravelly sand, coarse grained, poorly graded, wet, weak cementation, nonstratified, 10% silt, approximately 30% gravel up to 1 inch in diameter, subrounded, HNU = 0.
40								
	SS	LI	0008					Total Depth = 41.5 feet.
45								

GROUNDWATER

DEPTH	HOUR	DATE
26.84	07:14	11/19/87
26.62	11:15	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0119
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597543.67
Date Started	11/13/87	**East (ft)**	1495848.78
Date Completed	11/13/87	**Ground Surface Elev. (ft)**	741.60
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	742.84
Checked By	Tom Tharp	**Total Depth (ft)**	43.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			CH	Gray clay, moist, stiff, blocky, high plasticity, approximately 10% gravel up to 1/2 inch in diameter, angular, HNU = 0.
5	SS	LI	0001				CH	Gray to reddish brown clay, moist, stiff, blocky, high plasticity, approximately 10% gravel up to 1/2 inch in diameter, angular, HNU = 0.
10	SS	LI	0002				ML	Dark brown clayey silt, moist, stiff, blocky, moderate plasticity, approximately 5% gravel up to 1/2 inch in diameter HNU = 0.
15	SS	LI	0003				ML-GM	Brown to reddish brown gravelly silt, dry, very stiff, homogeneous, approximately 10% gravel up to 1/2 inch in diameter, subrounded to subangular HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.71	07:48	11/19/87
▼	20.54	11:30	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0119

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".				
	SS	LI	0004	BACKFILL: Cement and bentonite grout.			ML-GM	Gravelly silt, poorly graded, moist, very stiff, homogeneous, approximately 20% gravel up to 1/2 inch in diameter, subrounded, HNU=0.
25								
	SS	LI	0005	SEAL: Bentonite pellets.			ML-GM	Dark brown sandy, gravelly silt, moist, very stiff, homogeneous, approximately 10% fine sand, 20% gravel up to 1/2 inch in diameter, subrounded, HNU=0.
30								
	SS	LI	0006				ML-GM	Dark gray sandy, gravelly silt, moist, very stiff, homogeneous, approximately 10% fine sand, 20% gravel up to 1/2 inch in diameter, subrounded, HNU=0.
35								
	SS	LI	0007	FILTER PACK: #4 quartz sand.			SP	Gravelly sand, coarse grained, poorly graded, nonstratified, no cement, approximately 40% gravel up to 1 1/2 inch in diameter, subrounded, HNU=0.
40				SCREEN: Stainless steel, 4".				
	SS	LI	0008					
								Total Depth = 43.0 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.71	07:48	11/19/87
▼	20.54	11:30	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0120
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	598125.59
Date Started	12/2/87	**East (ft)**	1495747.12
Date Completed	12/4/87	**Ground Surface Elev. (ft)**	821.50
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	822.36
Checked By	Tom Tharp	**Total Depth (ft)**	33.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							FL	Fill (gravel and clay).
				CASING: Stainless steel, 2".				
5				BACKFILL: Cement and bentonite grout.			LS-SH	Limestone, fossiliferous, minor shale interlayered, gray to brown saturated silt from 3.8 to 4.0 feet.
	C	LI	120-01				LS	Limestone.
10				SEAL: Bentonite pellets.				
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	24.00	14:05	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0120

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							LS	Limestone.
▼	C	LI	120-02	FILTER PACK: #4 quartz sand.			LS-SH	Gray shale, partially weathered, saturated, limestone interbeds.
25	C	EP	120-05					
	C	LI	120-03	SCREEN: Stainless Steel, 2".				
	C	LI	120-04					
	C	EP	120-06					
30								
								Total depth = 33.0 feet.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	24.00	14:05	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 5

Drilling Company	Bowser Morner	**Borehole/Well Id**	0121
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597999.14
Date Started	11/11/87	**East (ft)**	1497793.04
Date Completed	11/12/87	**Ground Surface Elev. (ft)**	886.90
Logged By	John Montgomery	**Top of Casing Elev. (ft)**	888.65
Checked By	Tom Tharp	**Total Depth (ft)**	111.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			LS-SH	Dominantly limestone with interbedded shale.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	98.85	08:30	13/12/87
▼	103.82	11:06	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0121

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".			SH	Dominantly shale with minor thin limestone layers.
25				BACKFILL: Cement and bentonite grout.				
							LS-SH	Limestone with thin shale layers.
30								
							LS-SH	Interbedded shale and limestone; slightly dominated by shale (approximately 65%).
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	98.85	08:30	13/12/87
▼	103.82	11:06	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 5

Borehole/Well Id 0121

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				CASING: Stainless steel, 4".				
50								
							SH	Dominantly shale with very minor limestone.
				BACKFILL: Cement and bentonite grout.				
55								
60								
							LS-SH	Limestone with interbedded shale.
65								
							LS-SH	Shale with interbedded thin limestone.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	98.85	08:30	13/12/87
▼	103.82	11:06	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 4 of 5

Borehole/Well Id 0121

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							LS-SH	Shale with interbedded thin limestone.
75				CASING: Stainless steel, 4".				
80				BACKFILL: Cement and bentonite grout.				
85								
90				SEAL: Bentonite pellets.				
							LS-SH	Limestone with thinly interbedded shale.
95				SCREEN: Stainless steel, 4".				
▽				FILTER PACK: #4 quartz sand.				

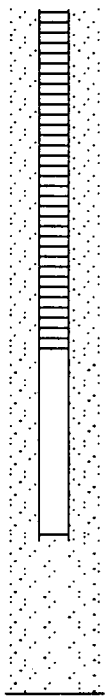
GROUNDWATER

	DEPTH	HOUR	DATE
▽	98.85	08:30	13/12/87
▼	103.82	11:06	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 5 of 5

Borehole/Well Id 0121

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				FILTER PACK: #4 quartz sand.			LS-SH	Shale with interbedded limestone.
105				SCREEN: Stainless steel, 4".				
110								
								Total Depth = 111.5 feet.
115								
120								
125								

GROUNDWATER

DEPTH	HOUR	DATE
98.85	08:30	13/12/87
103.82	11:06	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0122
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597637.24
Date Started	11/18/87	**East (ft)**	1495224.80
Date Completed	11/19/87	**Ground Surface Elev. (ft)**	742.30
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	744.03
Checked By	Tom Tharp	**Total Depth (ft)**	41.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			ML-GM	Light brown sandy, gravelly silt, moist, approximately 15% gravel up to 1/2 inch diameter, subrounded, HNU=0.
5								
	SS	LI	0001				ML-GM	Light brown sandy, gravelly silt, moist, stiff, approximately 15% gravel up to 1/2 inch diameter, subangular, HNU=0.
10								
	SS	LI	0002				ML-GM	Dark gray sandy, gravelly silt, moist, homogeneous, approximately 10% gravel up to 1/2 inch in diameter, subangular to subrounded, HNU=0.
15								
	SS	LI	0003				ML-GM	Dark gray sandy, gravelly silt, wet, homogeneous, approximately 15% gravel up to 3/4 inch in diameter, subangular to subrounded, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	35.59	16:08	11/19/87
▼	24.87	09:00	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0122

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0004				ML-GM	Dark gray sandy, gravelly silt, wet, homogeneous, approximately 15% gravel up to 1 inch in diameter, subangular to subrounded, HNU=0.
				SEAL: Bentonite.				
25								
	SS	LI	0005				ML-GM	Dark gray sandy, gravelly silt, wet, homogeneous, approximately 15% gravel up to 1 inch in diameter, subangular to subrounded, HNU=0.
30				FILTER PACK: #4 quartz sand.				
35				SCREEN: Stainless steel, 4".				
	SS	LI	0006					
40							LS-SH	Bedrock, lithology uncertain, assume interbedded limestone and shale.
								Total Depth = 41.0 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	35.59	16:08	11/19/87
▼	24.87	09:00	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0123
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597471.04
Date Started	10/6/87	**East (ft)**	1494746.19
Date Completed	10/7/87	**Ground Surface Elev. (ft)**	705.40
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	706.87
Checked By	Tom Tharp	**Total Depth (ft)**	61.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			ML	Reddish brown sandy silt, moist, firm, homogeneous, approximately 5% gravel.
5								
	SS	LI	0001				SP	Light brown to gray gravelly sand, poorly graded, nonstratified, dry, weak cementation, approximately 30% gravel, subrounded, HNU = 0.
10								
	SS	LI	0002				GC-GM	Light brown clayey, silty, sandy gravel, well graded, moist, weak cementation, high plasticity, stiff, moist, nonstratified, approximately 60% gravel, subrounded, HNU = 0.
15								
	SS	LI	0003				SP	Light brown gravelly sand, moist, nonstratified, weak cementation, approximately 40% gravel, subangular, HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.51	08:55	10/07/87
▼	29.54	15:30	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0123

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".				
	SS	LI	0004				GP	Light brown to gray sandy gravel, moist, nonstratified, weak cementation, poorly graded, limestone fragments, 5% pink granite gravel, approximately 60% gravel, subrounded, HNU = 0.
25				BACKFILL: Cement and bentonite grout.				
	SS	LI	0005				SM-SP	Light brown silty, gravelly sand, poorly graded, wet, stratified, weak cementation, approximately 30% gravel, subrounded, HNU = 0.
30								
	SS	LI	0006				CL	Dark gray silty, gravelly clay, moist, very stiff, homogeneous, medium plasticity, approximately 30% gravel, HNU = 0.
35								
	SS	LI	0007				SM	Gray, orange, light brown silty sand, banded, moist, very stiff, nonstratified, blocky, approximately 5% gravel, HNU = 0.
40								
	SS	LI	0008				SM	Brown, gray, orange brown silty sand, banded, moist, stiff, blocky, approximately 5% gravel.
45				SEAL: Bentonite pellets.				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.51	08:55	10/07/87
▼	29.54	15:30	12/09/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0123

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0009				SM	
50							GW	Sand and gravel, dense, some rock fragments.
				SCREEN: Stainless steel, 4".				
55				FILTER PACK: #4 quartz sand.				
60								
								Total Depth = 61.0 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.51	08:55	10/07/87
▼	29.54	15:30	12/09/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0124
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597345.59
Date Started	10/12/87	**East (ft)**	1494711.26
Date Completed	10/13/87	**Ground Surface Elev. (ft)**	705.50
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	706.92
Checked By	Tom Tharp	**Total Depth (ft)**	55.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			CL	Light brown to reddish brown silty, gravelly clay, moist, stiff, homogeneous, approximately 20% gravel up to 1/2 inch in diameter, HNU=0.
5								
	SS	LI	0001				SP	Brown to gray gravelly sand, poorly graded, nonstratified, dry, approximately 40% gravel up to 1 1/4 inches in diameter, subrounded, HNU=0.
10								
	SS	LI	0002				SP	Light brown gravelly sand, coarse grained, poorly graded, moist, nonstratified, approximately 30% gravel up to 1 inch in diameter, subrounded, HNU=0.
15								
	SS	LI	0003				SM-SP	Light brown to brown silty, gravelly sand, poorly graded, wet, nonstratified, approximately 30% gravel up to 1 inch in diameter, subangular, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	29.51	07:55	10/14/87
▼	29.63	10:00	12/10/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0124

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Cement and bentonite grout.				
	SS	LI	0004				CL	Light brown to brown silty, sandy clay, moist, stiff, homogeneous, stratified, moist, approximately 10% gravel up to 1/2 inch in diameter, subrounded, HNU=0.
25				CASING: Stainless steel, 4".				
	SS	LI	0005				SM-SP	Brown silty, gravelly sand, wet, nonstratified, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
30								
	SS	LI	0006				SM-SP	Light brown silty, gravelly sand, moist, poorly graded, stratified, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
35								
	SS	LI	0007	SEAL: Bentonite pellets.			SM-SP	Silty, gravelly sand, poorly graded, wet, nonstratified, approximately 40% gravel up to 1 1/4 inch in diameter, subrounded, HNU=0.
40								
	SS	LI	0008				SM-SP	Brown to light brown silty, gravelly sand, some dry pockets otherwise sample is moist, poorly graded, nonstratified, approximately 30% gravel up to 1 1/4 inch in diameter, subrounded, HNU=0.
45								

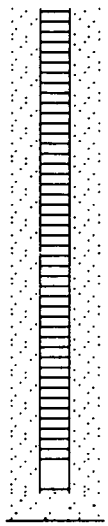
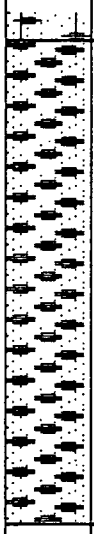
GROUNDWATER

	DEPTH	HOUR	DATE
▽	29.51	07:55	10/14/87
▼	29.63	10:00	12/10/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0124

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0009	FILTER PACK: #4 quartz sand. SCREEN: Stainless steel, 4".			GP	Light brown sandy gravel, poorly graded, saturated, weak cementation, approximately 60% gravel up to 1 inch in diameter, subrounded, HNU=0.
50								
	SS	LI	0010					
55								Total Depth = 55.5 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	29.51	07:55	10/14/87
▼	29.63	10:00	12/10/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0125
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597320.12
Date Started	11/10/87	**East (ft)**	1495388.29
Date Completed	11/10/87	**Ground Surface Elev. (ft)**	707.30
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	708.85
Checked By	Tom Tharp	**Total Depth (ft)**	34.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			ML-GM	Gray and reddish brown sandy, gravelly silt, 30% sand, 20% gravel, 50% silt, moist, slight stratification, poor grading, gravel up to 1 inch in diameter, subrounded, HNU=0.
5	SS	LI	0001				ML-GM	Dark brown to reddish brown sandy, gravelly silt, 20% sand, 20% gravel, 60% silt, stiff, poorly graded, nonstratified, sand is medium grained, gravel up to 1 inch in diameter, subrounded to subangular, HNU=0.
10	SS	LI	0002				ML-GM	Dark brown gravelly silt, stiff, homogeneous, moist, approximately 25% gravel up to 1 inch in diameter, subrounded to angular, HNU=0.
15	SS	LI	0003	SEAL: Bentonite pellets.			ML-GM	Dark brown gravelly silt, moist, homogeneous, approximately 20% gravel up to 1/2 inch in diameter, angular to subangular, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	31.99	07:53	11/19/87
▼	28.84	14:15	12/13/87

WESTON

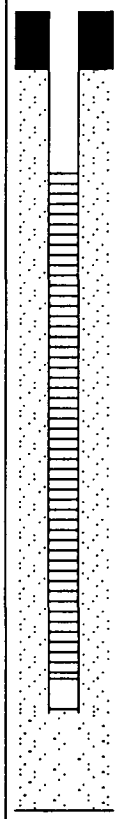
GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0125

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0004				ML-GM	Dark brown gravelly silt, stiff, homogeneous, moist, approximately 20% gravel up to 1/2 inch in diameter, angular to subangular, HNU=0.
25								
	SS	LI	0005	FILTER PACK: #4 quartz sand.			ML-GM	Dark brown gravelly silt, stiff, homogeneous, moist, approximately 20% gravel up to 1/2 inch in diameter, angular to subangular, HNU=0.
30				SCREEN: Stainless steel, 4".				
	SS	LI	0006					
35								Total Depth = 34.0 feet.
40								
45								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	31.99	07:53	11/19/87
▼	28.84	14:15	12/13/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0126
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597159.57
Date Started	10/15/87	**East (ft)**	1494700.46
Date Completed	10/16/87	**Ground Surface Elev. (ft)**	705.90
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	707.43
Checked By	Tom Tharp	**Total Depth (ft)**	60.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Silty clay, stiff, homogeneous, high plasticity, moist, 10% gravel up to 1/4 inch in diameter.
5	SS	LI	0001	CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			SP	Gravelly sand, poorly graded, nonstratified, strongly cemented, sand is medium grained, 40% gravel, subrounded.
10	SS	LI	0002				SP	Light brown to gray gravelly sand, poorly graded, nonstratified, weakly cemented, sand is coarse grained, 40% gravel up to 1 1/4 inch in diameter, subrounded.
15	SS	LI	0003				SP	Light brown to gray gravelly sand, poorly graded, nonstratified, weakly cemented, sand is coarse grained, 40% gravel up to 1 1/4 inch in diameter, subrounded.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	30.10	07:54	10/19/87
▼	30.21	10:55	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0126

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	.0004				SP	Light brown to gray gravelly sand, poorly graded, nonstratified, weakly cemented, sand is coarse grained, 40% gravel up to 1 1/4 inch in diameter, subrounded.
25	SS	LI	0005	CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			SP	Gravelly sand, poorly graded, nonstratified, weakly cemented, moist, 40% gravel containing limestone fragments up to 2 inches in length, subrounded.
30	SS	LI	0006				GP	Light brown to gray sand and gravel, poorly graded, nonstratified, moderately cemented, wet, 50% gravel up to 1 1/2 inch in diameter, subrounded.
35	SS	LI	0007	SEAL: Bentonite pellets.			SW	Light brown to brown gravelly sand, well graded, nonstratified, weakly cemented, saturated, sand is coarse grained, 30% gravel up to 1 inch in diameter.
40	SS	LI	0008	SCREEN: Stainless steel, 4". FILTER PACK: #4 quartz sand.			SM-SP	Brown to orange silty, gravelly sand, very stiff, strongly cemented, moist, 30% gravel, subrounded.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	30.10	07:54	10/19/87
▼	30.21	10:55	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0126

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0009	SCREEN: Stainless steel, 4".			GM	Brown to gray silty, sandy gravel, very stiff, homogeneous, strongly cemented, moist, 50% gravel up to 1 1/2 inch in diameter, subrounded.
50				FILTER PACK: #4 quartz sand.				
55								
	SS	LI	0010	BACKFILL: #4 quartz sand.			ML-GM	Dark gray to gray gravelly, sandy silt, stiff, homogeneous, moist, 30% fine grained sand, 20% gravel up to 1/2 inch in diameter, subrounded.
60								
								Total Depth = 60.5 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	30.10	07:54	10/19/87
▼	30.21	10:55	12/09/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0127
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597116.73
Date Started	10/2/87	**East (ft)**	1493916.16
Date Completed	10/2/87	**Ground Surface Elev. (ft)**	694.20
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	695.85
Checked By	Tom Tharp	**Total Depth (ft)**	25.7
Comments:	Transcribed geologic log from well # 0128 - no samples collected.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Dark gray silty clay, wet, stiff, HNU = 0.
				BACKFILL: Cement and bentonite grout.				
5				CASING: Stainless steel, 4".				
							CL	Black silty clay, dry.
10				SEAL: Bentonite pellets.				
							SP	Light brown sand, fine grained, dry, HNU = 0.
							SP	Light brown gravelly sand, fine grained, poorly graded, dry, approximately 40% gravel to 1 inch in diameter, HNU = 0.
15				FILTER PACK: #4 quartz sand.				
				SCREEN: Stainless steel, 4".			GP	Light brown sand and gravel, subrounded, wet, nonstratified, sand is medium grained, HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.16	15:03	10/13/87
▼	18.33	11:08	12/10/87

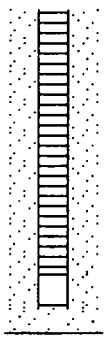
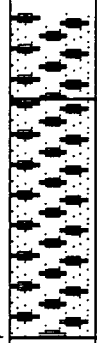
WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0127

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				SCREEN: Stainless steel, 4". FILTER PACK: #4 quartz sand.				
							GP	Light brown sand and gravel, poorly graded, wet, subrounded, sand is medium grained, HNU=0.
25								Total depth = 25.7 feet.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.16	15:03	10/13/87
▼	18.33	11:08	12/10/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0128
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597105.64
Date Started	9/28/87	**East (ft)**	1493917.44
Date Completed	9/30/87	**Ground Surface Elev. (ft)**	693.70
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	695.48
Checked By	Tom Tharp	**Total Depth (ft)**	55.6

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			CL	Dark gray silty clay, wet, stiff, HNU = 0.
5	SS	LI	0001				CL	Black silty clay, dry.
10							SP	Light brown sand, fine grained, dry, HNU = 0.
	SS	LI	0002				SP	Light brown gravelly sand, fine grained, poorly graded, dry, approximately 40% gravel to 1 inch in diameter, HNU = 0.
15	SS	LI	0003				GP	Light brown sand and gravel, subrounded, wet, nonstratified, sand is medium grained, HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.73	14:56	10/13/87
▼	17.98	09:00	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0128

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0004	CASING: Stainless steel, 4".			GP	Light brown sand and gravel, poorly graded, wet, subrounded, sand is medium grained, HNU=0.
25				BACKFILL: Cement and bentonite grout.			SW	White and dark gray sand, medium grained, banded, well graded, wet, HNU=0.
	SS	LI	0005				GP	Light brown sand and gravel, subrounded, poorly graded, saturated, nonstratified, sand is medium grained, HNU=0.
30								
	SS	LI	0006				GP	Light brown sandy gravel, saturated, nonstratified, sand is medium grained, approximately 60% gravel 1/8 inch to 1 inch in diameter, subrounded, HNU=0.
35								
	SS	LI	0007	SEAL: Bentonite.			SW	Brown to light brown gravelly sand, medium grained, well graded, nonstratified, saturated, approximately 20% gravel, HNU=0.
40								
	SS	LI	0008				SP	Brown gravelly sand, medium grained, poorly graded, subrounded, saturated, nonstratified, approximately 20% gravel, HNU=0.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.73	14:56	10/13/87
▼	17.98	09:00	12/11/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0128

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50				SCREEN: Stainless steel, 4".			GP	Light brown sandy gravel, poorly graded, saturated, nonstratified, sand is medium grained, approximately 60% gravel, subrounded, HNU=0.
55				FILTER PACK: #4 quartz sand.				
								Total Depth = 55.6 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.73	14:56	10/13/87
▼	17.98	09:00	12/11/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0129
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596836.65
Date Started	11/4/87	**East (ft)**	1494665.72
Date Completed	11/5/87	**Ground Surface Elev. (ft)**	701.90
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	701.31
Checked By	Tom Tharp	**Total Depth (ft)**	41.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4".			OL	Dark brown organic silty clay, occasional red streaks, dry, firm, homogeneous, moderate plasticity, approximately 5% sand, HNU = 0.
5				BACKFILL: Cement and bentonite grout.				
	SS	LI	0001				OL	Brown organic silty clay, occasional red streaks and gray patches, moist, high plasticity, very stiff, homogeneous, approximately 5% medium grained sand, HNU = 0.
10								
	SS	LI	0002				ML-GM	Brown to light brown gravelly silt, moist, medium plasticity, homogeneous, stiff, approximately 20% gravel up to 1/2 inch in diameter, subrounded, HNU = 0.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.57	06:57	11/19/87
▼	24.58	14:13	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0129

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".				
	SS	LI	0003				SM-SP	Gray to light gray silty, gravelly sand, coarse grained, poorly graded, moist, nonstratified, gravel up to 1 1/2 inch in diameter, subrounded, HNU=0.
25				BACKFILL: Cement and bentonite grout.				
	SS	LI	0004	SEAL: Bentonite pellets.			SM-SP	Light gray to gray silty, gravelly sand, coarse grained, poorly graded, moist, nonstratified, gravel up to 1 1/2 inch in diameter.
30								
	SS	LI	0005				NR	No recovery.
35				SCREEN: Stainless steel, 4".				
				FILTER PACK: #4 quartz sand.				
40								
								Total Depth = 41.5 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.57	06:57	11/19/87
▼	24.58	14:13	12/09/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0130
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596459.64
Date Started	11/6/87	**East (ft)**	1493663.29
Date Completed	11/6/87	**Ground Surface Elev. (ft)**	695.30
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	694.49
Checked By	Tom Tharp	**Total Depth (ft)**	35.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			SM-SW	Light brown to brown silty, gravelly sand, medium to coarse grained, well graded, moist, weakly cemented, nonstratified, approximately 10% gravel up to 1/4 inch in diameter, subangular, HNU=0.
5	SS	LI	0001				SW	Light brown sand, medium to coarse grained, well graded, subangular, moist, nonstratified, no cement, HNU=0.
10	SS	LI	0002				SP	Light brown to gray gravelly sand, coarse grained, poorly graded, nonstratified, dry, approximately 30% gravel up to 1 1/2 inches in diameter, subangular, HNU=0.
15	SS	LI	0003				SP	Gray to light brown gravelly sand, coarse grained, poorly graded, moist, nonstratified, approximately 30% gravel up to 1 inch in diameter, subrounded, HNU=0.
20								

GROUNDWATER

DEPTH	HOUR	DATE
16.70	07:01	11/19/87
16.96	09:14	12/10/87

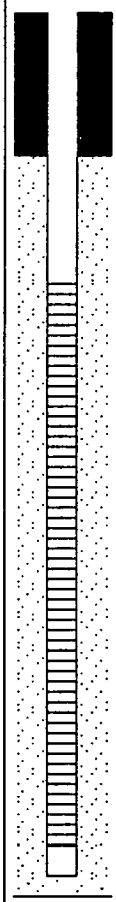
WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0130

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				SEAL: Bentonite pellets.				
	SS	LI	0004				SP	Light brown to gray gravelly sand, weakly cemented, poorly graded, wet, nonstratified, approximately 40% gravel up to 1 1/2 inches in diameter, subrounded, HNU=0.
25								
	SS	LI	0005				SP	Light brown to gray gravelly sand, weakly cemented, saturated, poorly graded, wet, nonstratified, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
30				FILTER PACK: #4 quartz sand.				
	SS	LI	0006	SCREEN: Stainless steel, 4".				
35								
								Total Depth = 35.5 feet.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.70	07:01	11/19/87
▼	16.96	09:14	12/10/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 4

Drilling Company	Unk	**Borehole/Well Id**	0137
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597339.95
Date Started		**East (ft)**	1495065.92
Date Completed		**Ground Surface Elev. (ft)**	723.20
Logged By	Unk	**Top of Casing Elev. (ft)**	725.25
Checked By	Tom Tharp	**Total Depth (ft)**	75.0
Comments:	Originally numbered 37-1A.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
5				CASING: PVC, 3".				
10				BACKFILL: Earth.				
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	43.30	13:25	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 4

Borehole/Well Id 0137

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							SW	Sand and gravel.
				CASING: PVC, 3".			TI	Gray till.
25				BACKFILL: Earth.				
30								
							GW	Sand and gravel.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	43.30	13:25	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 4

Borehole/Well Id 0137

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				CASING: PVC, 3". BACKFILL: Earth. SEAL: Bentonite. SCREEN: Steel, 3". FILTER PACK: Gravel. BACKFILL: Gravel.			GW	Sand and gravel.
50								
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	43.30	13:25	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0137

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				BACKFILL: Gravel.			GW	Sand and gravel.
75								Total Depth = 75.0 feet.
80								
85								
90								
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	43.30	13:25	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0138
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	599681.10
Date Started	10/27/87	**East (ft)**	1495320.65
Date Completed	10/28/87	**Ground Surface Elev. (ft)**	700.10
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	699.31
Checked By	Tom Tharp	**Total Depth (ft)**	41.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			SM-SP	Dark brown silty, gravelly sand, coarse grained, moist, weakly cemented, nonstratified, poorly graded, approximately 10% gravel up to 1/2 inch in diameter, subangular, HNU = 0.
5								
	SS	LI	0001				SP	Light brown to brown gravelly sand, moist, nonstratified, no cement, poorly graded, slight diesel fuel odor, approximately 30% gravel up to 1 inch in diameter, subrounded to subangular, HNU = 0.
10								
	SS	LI	0002				SP	Gravelly sand, moist, nonstratified, weak cement, poorly graded, approximately 30% gravel up to 1 1/2 inches in diameter, subrounded to subangular, HNU = 0.
15								
	SS	LI	0003				SP	Light brown to gray gravelly sand, wet to moist, nonstratified, no cement, poorly graded, approximately 40% gravel up to 1 1/2 inches in diameter, subrounded, HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.98	07:08	11/19/87
▼	19.58	09:50	12/09/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0138

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Cement and bentonite grout.				
	SS	LI	0004	CASING: Stainless steel, 4".			SP	Light brown to brown gravelly sand, coarse grained, nonstratified, poorly graded, wet, approximately 30% gravel up to 1 1/2 inch in diameter, subrounded, 5% silt, HNU = 0.
25				SEAL: Bentonite pellets.				
	SS	LI	0005				SP	Gravelly sand, coarse grained, wet, poorly graded, no cement, approximately 30% gravel up to 1 inch in diameter, subrounded to subangular, trace silt, HNU = 0.
30								
	SS	LI	0006				SP	Light brown to brown gravelly sand, coarse grained, poorly graded, no cement, saturated, nonstratified, approximately 40% gravel up to 1 1/2 inches in diameter, trace silt, HNU = 0.
35				FILTER PACK: #4 quartz sand.				
	SS	LI	0007				SP	Light brown to brown gravelly sand, coarse grained, saturated, nonstratified, poorly graded, no cement, approximately 40% gravel up to 1 inch in diameter, trace silt, HNU = 0.
40				SCREEN: Stainless steel, 4".				
	SS	LI	0008					Total Depth = 41.5 feet.
45								

GROUNDWATER

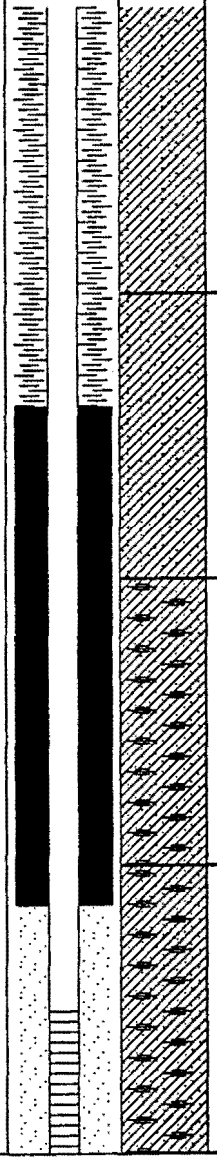
	DEPTH	HOUR	DATE
▽	19.98	07:08	11/19/87
▼	19.58	09:50	12/09/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0151
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	Water	**North (ft)**	597275.41
Date Started	7/6/87	**East (ft)**	1495545.64
Date Completed	7/6/87	**Ground Surface Elev. (ft)**	740.83
Logged By	Mark Hampton	**Top of Casing Elev. (ft)**	742.83
Checked By	Tom Tharp	**Total Depth (ft)**	48.8
Comments:	Originally numbered 44-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: stainless steel, 4". BACKFILL: Cement and bentonite grout.			SC	Brown clayey sand, trace gravel.
5	SS	LI	0001				SC	Brown clayey sand, trace gravel.
10	SS	LI	0002	SEAL: Bentonite pellets.			SC-SP	Gray clayey, gravelly sand.
15	SS	LI	0003				SC-SP	Gray clayey, gravelly sand.
20								



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	44.30	12:32	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0151

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004	FILTER PACK: #4 quartz sand.			CL	Dark gray sandy, gravelly clay.
25	SS	LI	0005	SCREEN: 3/16" stainless steel, 4".			CL	Dark gray sandy, gravelly clay.
30	SS	LI	0006				CL	Dark gray sandy, gravelly clay.
35	SS	LI	0007				CL	Dark gray sandy, gravelly clay.
40	SS	LI	0008				CL	Dark gray sandy, gravelly clay.
45	SS	LI	0009				CL	Dark gray sandy, gravelly clay, dense.

GROUNDWATER

DEPTH	HOUR	DATE
44.30	12:32	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0151

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								Total Depth = 48.8 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	44.30	12:32	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0152
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596982.64
Date Started	7/7/87	**East (ft)**	1494955.35
Date Completed	7/8/87	**Ground Surface Elev. (ft)**	705.81
Logged By	Mark Hampton	**Top of Casing Elev. (ft)**	707.81
Checked By	Tom Tharp	**Total Depth (ft)**	47.0
Comments:	Originally numbered 46-2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4".			CL	Dark gray to brown clay, soft, trace sand.
				BACKFILL: Cement and bentonite grout.				
5	SS	LI	0001				CL	Sandy, gravelly clay.
10	SS	LI	0002				SP	Gravelly sand.
15	SS	LI	0003				SP	Gravelly sand, some gravel consists of limestone fragments.
				SEAL: Bentonite pellets.				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.19	12:13	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0152

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004	FILTER PACK: #4 quartz sand.			SP	Gravelly sand, some gravel consists of limestone fragments.
25	SS	LI	0005	SCREEN: Stainless steel, 4".			CL	Dark gray clay, dense, dry, some limestone fragments.
30	SS	LI	0006				GP	Sand and gravel, wet, some limestone fragments, trace small clay lenses.
35	SS	LI	0007				GC	Clayey sand and gravel.
40	SS	LI	0008				SH	Dark gray shale, weathered, soft, dry.
	SS	LI	0009				SH	Dark gray shale, weathered, soft, dry.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.19	12:13	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0152

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								Total depth = 47.0 feet.
50								
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.19	12:13	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0153
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596691.58
Date Started	7/9/87	**East (ft)**	1494953.87
Date Completed	7/10/87	**Ground Surface Elev. (ft)**	704.43
Logged By	Mark Hampton	**Top of Casing Elev. (ft)**	706.35
Checked By	Tom Tharp	**Total Depth (ft)**	41.5
Comments:	Originally numbered 55-2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4".			SW	Brown gravelly sand, fine to coarse grained, dry, trace silt and clay, gravel up to 2 inches in diameter.
5	SS	LI	0001	BACKFILL: Cement and bentonite grout.			SW	Brown gravelly sand, fine to coarse grained, dry, trace silt and clay, gravel up to 2 inches in diameter.
	SS	LI	0002				SW	Brown gravelly sand, fine to coarse grained, dry, trace silt and clay, gravel up to 2 inches in diameter.
10	SS	LI	0003				CL	Yellowish brown to grayish brown silty clay, moist, medium plasticity, trace of gravel.
15	SS	LI	0004	SEAL: Bentonite pellets.			CL	Yellowish brown to grayish brown silty clay, moist, medium plasticity, trace of gravel.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	07:40	07/10/87
▼	24.15	12:11	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0153

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0005				CL	Yellowish brown to grayish brown silty clay, moist, medium plasticity, trace of gravel.
25	SS	LI	0006	FILTER PACK: #4 quartz sand.			SC-SW	Grayish brown clayey gravelly sand, medium to coarse grained, wet, gravel up to 1 inch in diameter.
				SCREEN: Stainless steel, 4".				
30	SS	LI	0007				GC	Grayish brown clayey sand and gravel, moist, sand is medium to coarse grained, clay is of low plasticity, gravel up to 2 inches in diameter.
35	SS	LI	0008				GW	Sand and gravel, moist, gravel composed of angular limestone fragments.
40	SS	LI	0009				SH	Grayish blue shale, hard.
45								Total Depth = 41.5 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	07:40	07/10/87
▼	24.15	12:11	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0154
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596418.78
Date Started	10/3/87	**East (ft)**	1494969.47
Date Completed	10/4/87	**Ground Surface Elev. (ft)**	702.90
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	704.22
Checked By	Tom Tharp	**Total Depth (ft)**	53.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			SP	Light brown gravelly sand, medium grained, poorly graded, subrounded, dry, weakly cemented, approximately 30% gravel, HNU=0
5	SS	LI	0001				CL	Brown to red gravelly, silty clay, moist, stiff, homogeneous, high plasticity, approximately 25% gravel, HNU=0
10	SS	LI	0002				CL	Dark brown gravelly, silty clay, moist, stiff, homogeneous, approximately 25% gravel, HNU=0.
15	SS	LI	0003				SP	Light brown to brown gravelly sand, coarse grained, weakly cemented, wet, nonstratified, approximately 40% gravel, HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	27.88	16:35	10/13/87
▼	28.66	16:30	12/10/87

WESTON

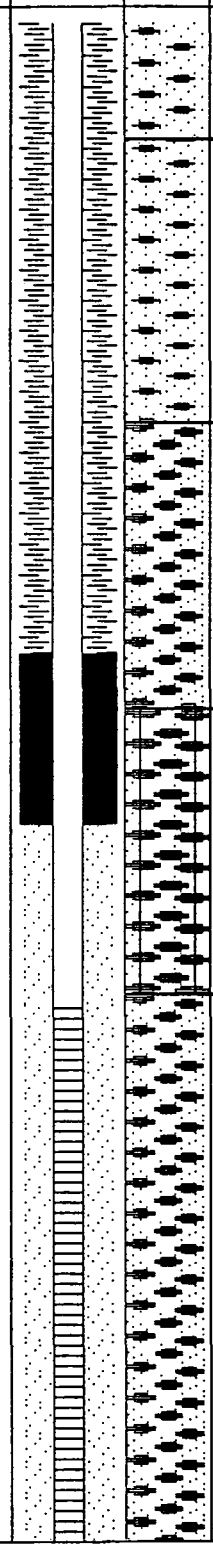
GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0154

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20				BACKFILL: Cement and bentonite grout.		
	SS	LI	0004		SP	Light brown gravelly sand, coarse grained, wet, poorly graded, medium cementation, approximately 30% gravel, subrounded, HNU=0.
25				CASING: Stainless steel, 4".		
	SS	LI	0005		GP	Light brown sandy gravel, coarse grained, moist, weak cementation, approximately 60% gray limestone and light gray shale fragments, subangular, HNU=0.
30						
	SS	LI	0006	SEAL: Bentonite pellets.	GM	Light brown silty, sandy gravel, moist, weak cementation, approximately 60% gray to brown gravel, HNU=0.
35						
	SS	LI	0007		GP	Dark brown sandy gravel, medium grained, poorly graded, nonstratified, wet, approximately 60% gravel, subrounded, HNU=0.
40						
				FILTER PACK: #4 quartz sand.		
45				SCREEN: Stainless steel, 4".		



GROUNDWATER

	DEPTH	HOUR	DATE
▽	27.88	16:35	10/13/87
▼	28.66	16:30	12/10/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0154

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0008				CL	Dark gray silty, gravelly clay, moist, very stiff, homogeneous, approximately 20% gravel, HNU = 0.
50								
	SS	LI	0009				LS	Limestone.
								Total Depth = 53.5 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	27.88	16:35	10/13/87
▼	28.66	16:30	12/10/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0155
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596407.73
Date Started	10/5/87	**East (ft)**	1494971.57
Date Completed	10/5/87	**Ground Surface Elev. (ft)**	702.80
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	704.28
Checked By	Tom Tharp	**Total Depth (ft)**	32.7

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout.			SP	Gray to brown gravelly sand, coarse grained, poorly graded, dry, unconsolidated, approximately 30% gravel up to 1 inch in diameter, subrounded, HNU = 0.
5				CASING: Stainless steel, 4".				
	SS	LI	0001				GP	Light brown to gray sandy gravel, coarse grained, poorly graded, moist, nonstratified, firm, medium plasticity, approximately 60% gravel up to 1 1/2 inches in diameter, subrounded, HNU = 0.
10								
	SS	LI	0002				GM	Gray to light brown silty, sandy gravel, coarse grained, poorly graded, moist, nonstratified, noncemented, approximately 60% gravel, subrounded, HNU = 0.
15				SEAL: Bentonite pellets.				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.07	16:32	10/13/87
▼	28.92	14:18	12/10/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0155

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0003				SP	Light brown sand, medium grained, homogeneous, moist to wet, firm, nonstratified.
25				SCREEN: Stainless steel, 4".				
	SS	LI	0004				SW	Light brown gravelly sand, coarse grained, wet, nonstratified, well graded, firm, approximately 30% gravel, subrounded, HNU = 0.
30				FILTER PACK: #4 quartz sand.				
	SS	LI	0005					
								Total Depth = 32.7 feet.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.07	16:32	10/13/87
▼	28.92	14:18	12/10/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0156
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596184.07
Date Started	10/26/87	**East (ft)**	1494547.33
Date Completed	10/27/87	**Ground Surface Elev. (ft)**	693.00
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	692.35
Checked By	Tom Tharp	**Total Depth (ft)**	36.5
Comments:	Transcribed geologic log from well # 0157 - no samples collected.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			SP	Brown gravelly sand, coarse grained, poorly graded, dry, nonstratified, weakly cemented, approximately 10% gravel up to 3/4 inch in diameter, subrounded, HNU=0
5							SM-SP	Light brown to gray silty, gravelly sand, poorly graded, moist, nonstratified, medium cementation, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
10							SM-SP	Light brown to brown silty, gravelly sand, poorly graded, nonstratified, medium cementation, homogeneous, stiff, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
15							SP	Light brown to gray gravelly sand, medium grained, poorly graded, weak cementation, nonstratified, dry, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
20								

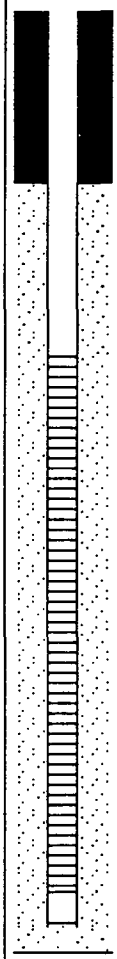
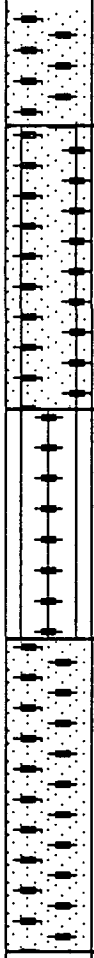
GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.29	06:48	11/19/87
▼	15.30	16:20	12/08/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0156

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				SEAL: Bentonite pellets.				
25							SM-SP	Silty, gravelly sand, medium grained, poorly graded, medium cementation, wet, nonstratified, 30% gravel up to 1 inch in diameter, subrounded, HNU=0.
30							ML-GM	Dark gray gravelly silt, moist, stiff, homogeneous, approximately 25% gravel up to 1/2 inch in diameter, subangular, HNU=0.
35				SCREEN: Stainless steel, 4". FILTER PACK: #4 quartz sand.			SP	Light brown to brown gravelly sand, coarse grained, saturated, nonstratified, cement absent, approximately 30% gravel up to 1 1/4 inches in diameter, rounded, HNU=0.
40								Total Depth = 36.5 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.29	06:48	11/19/87
▼	15.30	16:20	12/08/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0157
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596173.40
Date Started	10/20/87	**East (ft)**	1494548.63
Date Completed	10/26/87	**Ground Surface Elev. (ft)**	693.30
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	692.60
Checked By	Tom Tharp	**Total Depth (ft)**	61.8

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			SP	Brown gravelly sand, coarse grained, poorly graded, dry, nonstratified, weakly cemented, approximately 10% gravel up to 3/4 inch in diameter, subrounded, HNU=0
5								
	SS	LI	0001				SM-SP	Light brown to gray silty, gravelly sand, poorly graded, moist, nonstratified, medium cementation, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
10								
	SS	LI	0002				SM-SP	Light brown to brown silty, gravelly sand, poorly graded, nonstratified, medium cementation, stiff, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
15								
	SS	LI	0003				SP	Light brown to gray gravelly sand, medium grained, poorly graded, weakly cemented, nonstratified, dry, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.58	06:52	11/19/87
▼	15.55	14:45	12/08/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0157

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".				
	SS	LI	0004				SM-SP	Silty, gravelly sand, medium grained, poorly graded, medium cementation, wet, nonstratified, 30% gravel up to 1 inch in diameter, subrounded, HNU=0.
25				BACKFILL: Cement and bentonite grout.				
	SS	LI	0005				ML-GM	Dark gray gravelly silt, moist, stiff, homogeneous, approximately 25% gravel up to 1/2 inch in diameter, subangular, HNU=0.
30								
	SS	LI	0006				SP	Light brown to brown gravelly sand, coarse grained, saturated, nonstratified, cement absent, approximately 30% gravel up to 1 1/4 inch in diameter, HNU=0.
35								
	SS	LI	0007				SP	Light brown gravelly sand, saturated, nonstratified, no cement, approximately 30% gravel up to 1 inch in diameter, subrounded to subangular, HNU=0.
40								
	SS	LI	0008				GP	Sand and gravel, sand is coarse grained, gravel up to 3 inches in diameter; sample collected from bailer.
45				SEAL: Bentonite pellets.				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.58	06:52	11/19/87
▼	15.55	14:45	12/08/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0157

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50				FILTER PACK: #4 quartz sand.				
55				SCREEN: Stainless steel, 4".			SP	Light brown to dark gray gravelly sand, coarse grained, saturated, nonstratified, no cement, approximately 25% gravel up to 1 inch in diameter, subrounded.
	SS	LI	0009				GP	Sand and gravel, sand is coarse grained, gravel up to 3 inches in diameter; sample collected from bailer.
60								
								Total depth = 61.8 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.58	06:52	11/19/87
▼	15.55	14:45	12/08/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0158
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	594037.51
Date Started	11/9/87	**East (ft)**	1495276.62
Date Completed	11/9/87	**Ground Surface Elev. (ft)**	702.80
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	704.46
Checked By	Tom Tharp	**Total Depth (ft)**	39.2

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			SP	Brown to light brown gravelly sand, coarse grained, dry, nonstratified, no cement, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU = 0
5	SS	LI	0001				CL	Brown silty, sandy clay, dark brown mottling, firm, high plasticity, homogeneous, moist, no cement, nonstratified, approximately 5% gravel up to 1/4 inch in diameter, HNU = 0.
10	SS	LI	0002				SM-SP	Light brown to brown silty, gravelly sand, nonstratified, no cement, moist, poorly graded, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU = 0.
15	SS	LI	0003				SP	Light brown to gray gravelly sand, coarse grained, poorly graded, weakly cemented, wet, approximately 30% gravel up to 1/2 inch in diameter, subangular, HNU = 0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	27.78	07:20	11/19/87
▼	27.83	10:30	12/11/87

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0158

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0004				SP	Light brown silty, gravelly sand, coarse grained, poorly graded, weakly cemented, wet, nonstratified, 40% gravel up to 1 inch in diameter, subrounded, HNU = 0.
25				SEAL: Bentonite pellets.				
	SS	LI	0005				SP	Light brown to gray gravelly sand, coarse grained, poorly graded, saturated, nonstratified, no cement, approximately 40% gravel up to 1 inch in diameter, subrounded, HNU = 0.
30								
	SS	LI	0006	FILTER PACK: #4 quartz sand.			SM-SP	Light brown silty, gravelly sand, coarse grained, poorly graded, saturated, nonstratified, weakly cemented, approximately 30% gravel up to 1 inch in diameter, subrounded, HNU = 0.
35								
	SS	LI	0007	SCREEN: Stainless steel, 4".				
40								Total Depth = 39.2 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	27.78	07:20	11/19/87
▼	27.83	10:30	12/11/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0159
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	594038.40
Date Started	10/18/87	**East (ft)**	1494169.69
Date Completed	10/18/87	**Ground Surface Elev. (ft)**	692.20
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	691.60
Checked By	Tom Tharp	**Total Depth (ft)**	32.0
Comments:	Transcribed geologic log from well # 0160 - no samples collected.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			ML	Brown to light brown sandy silt, moist, firm, homogeneous, weak cementation, approximately 40% fine sand, HNU=0.
5								
10							SP	Light brown to gray gravelly sand, coarse grained, poorly graded, dry, nonstratified, medium cementation, approximately 30% gravel up to 1 1/2 inch in diameter, subrounded, HNU=0.
15				SEAL: Bentonite pellets.			SP	Light brown to brown gravelly sand, medium to coarse grained, poorly graded, moist, nonstratified, approximately 20% gravel up to 1 inch in diameter, subrounded, HNU=0.
20							SP	Light brown to gray gravelly sand, coarse grained, poorly graded, saturated, nonstratified, weakly cemented, approximately 40% gravel up to 1 1/4 inch in diameter, HNU=0.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	14.26	09:56	10/21/87
▼	14.39	17:30	12/07/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0159

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							SP	Brown gravelly sand, coarse grained, poorly graded, saturated, nonstratified, weak cementation, approximately 20% gravel up to 1 inch in diameter, subrounded, HNU = 0.
25								
				FILTER PACK: #4 quartz sand. SCREEN: Stainless steel, 4".			GP	Sand and gravel, sand is coarse grained, gravel up to 3 inches in diameter, rounded to subrounded; sample collected from bailer.
30								
								Total Depth = 32.0 feet.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	14.26	09:56	10/21/87
▼	14.39	17:30	12/07/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0160
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	594049.03
Date Started	10/17/87	**East (ft)**	1494168.54
Date Completed	10/18/87	**Ground Surface Elev. (ft)**	692.30
Logged By	Lyn Lawlor	**Top of Casing Elev. (ft)**	691.86
Checked By	Tom Tharp	**Total Depth (ft)**	50.2

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4". BACKFILL: Cement and bentonite grout.			ML	Brown to light brown sandy silt, moist, firm, homogeneous, weak cementation, approximately 40% fine sand, HNU=0.
5	SS	LI	0001				SP	Light brown to gray gravelly sand, coarse grained, poorly graded, dry, nonstratified, medium cementation, approximately 30% gravel up to 1 1/2 inch in diameter, subrounded, HNU=0.
10	SS	LI	0002				SP	Light brown to brown gravelly sand, medium to coarse grained, poorly graded, moist, nonstratified, approximately 20% gravel up to 1 inch in diameter, subrounded, HNU=0.
15	SS	LI	0003				SP	Light brown to gray gravelly sand, coarse grained, poorly graded, saturated, nonstratified, weakly cemented, approximately 40% gravel up to 1 1/4 inch in diameter, HNU=0.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	14.48	10:02	10/21/87
▼	14.78	10:50	12/08/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 3

Borehole/Well Id 0160

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0004	CASING: Stainless steel, 4".			SP	Brown gravelly sand, coarse grained, poorly graded, saturated, nonstratified, weak cementation, approximately 20% gravel up to 1 inch in diameter, subrounded, HNU=0.
25				BACKFILL: Cement and bentonite grout.				
	SS	LI	0005				GP	Sand and gravel, sand is coarse grained, gravel up to 4 inches in diameter, rounded to subrounded; sample collected from bailer.
30								
35				SEAL: Bentonite pellets.				
40								
				FILTER PACK: #4 quartz sand.				
45				SCREEN: Stainless steel, 4".				

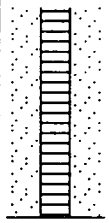
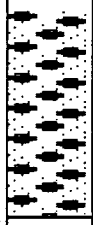
GROUNDWATER

	DEPTH	HOUR	DATE
▽	14.48	10:02	10/21/87
▼	14.78	10:50	12/08/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0160

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								
50								Total Depth = 50.2 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	14.48	10:02	10/21/87
▼	14.78	10:50	12/08/87

WESTON

ŒOLOGIC LOG — MOUND PLANT

Project Manager: Al Gleason

ling Company	Raymond Int.	Borehole/Well Id	0227
lling Method	Auger	STATE PLANE COORDINATES	
lling Fluid	Unk	North (ft)	597909.38
te Started	5/27/76	East (ft)	1495689.53
te Completed	5/27/76	Ground Surface Elev. (ft)	783.40
gged By	Dames and Moore	Top of Casing Elev. (ft)	787.19
ecked By	Tom Tharp	Total Depth (ft)	31.5
omments:	Dames and Moore well # 27-2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
				CASING: PVC, 3".			GP GP	Sand and gravel.
10				BACKFILL: Earth.			CL-ML	Clay and silt.
							GP	Sand and gravel.
15							CL-ML	Clay and silt.
20								

GROUNDWATER

DEPTH	HOUR	DATE
16.95	14:16	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 2 of 2

Borehole/Well Id 0227

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: PVC, 3".			CL-ML	Clay and silt.
25				BACKFILL: Earth.				
							SH	Unweathered shale.
30				SCREEN: Steel, 3". FILTER PACK: Gravel.				
								Total Depth = 31.5 feet.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	16.95	14:16	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager Al Gleason	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0236
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597700.00
Date Started		**East (ft)**	1495385.00
Date Completed		**Ground Surface Elev. (ft)**	Unk
Logged By	Unk	**Top of Casing Elev. (ft)**	Unk
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally numbered 36-2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Al Gleason

Drilling Company	Raymond Int.	Borehole/Well Id	0242
Drilling Method	Auger	STATE PLANE COORDINATES	
Drilling Fluid	Unk	North (ft)	597765.89
Date Started	5/13/76	East (ft)	1496159.17
Date Completed	5/13/76	Ground Surface Elev. (ft)	752.20
Logged By	Dames and Moore	Top of Casing Elev. (ft)	754.56
Checked By	Tom Tharp	Total Depth (ft)	13.0
Comments:	Dames and Moore well #42-2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
							LS	Limestone.
							SH	Unweathered shale.
				CASING: PVC, 3".			LS	Limestone.
				BACKFILL: Earth.			SH	Weathered shale.
5								
				SEAL: Bentonite.				
10				SCREEN: Steel, 3". FILTER PACK: Gravel.			LS	Limestone.
							SH	Weathered shale.
								Total Depth = 13.0 feet.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	12.96	12:57	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 3

Drilling Company	Layne Ohio Co.	**Borehole/Well Id**	0271
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596106.85
Date Started	12/17/47	**East (ft)**	1495048.14
Date Completed	1/14/48	**Ground Surface Elev. (ft)**	703.00 (est.)
Logged By	Unk	**Top of Casing Elev. (ft)**	704(est)
Checked By	Tom Tharp	**Total Depth (ft)**	60.0
Comments:	Originally numbered 71-2. Production well #2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			TS	Topsoil.
5				CASING: Steel, 26".			GP	Sand and gravel.
10				BACKFILL: Quartz gravel.			GC	Sand and gravel with clay.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 3

Borehole/Well Id 0271

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				CASING: Steel, 26".			GC	Sand and gravel with clay.
25				BACKFILL: Quartz gravel.			GW	Gravel.
30							GC	Sand and gravel with clay.
35							GW	Gravel.
40								
45								

GROUNDWATER

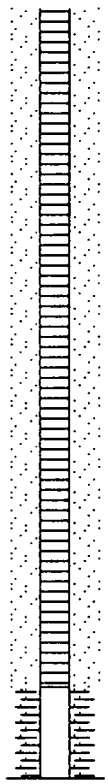
	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 3 of 3

Borehole/Well Id 0271

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				FILTER PACK:			GC	Sand and gravel with clay.
50				SCREEN: Bronze, 26", slotted 3/16" X 1 1/2" 30% opening.			GP	Sand and gravel.
55							GW	Gravel.
				CONE: Steel, 2' with concrete plug.				
60								Total Depth = 60.0 feet.
65								
70								



GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 2

Drilling Company	Earth Sci. Lab. Inc.	**Borehole/Well Id**	0276
Drilling Method	Jet Percussion	**STATE PLANE COORDINATES**	
Drilling Fluid	Water	**North (ft)**	596061.52
Date Started		**East (ft)**	1495042.82
Date Completed	4/4/61	**Ground Surface Elev. (ft)**	703.00 (est.)
Logged By	Unk	**Top of Casing Elev. (ft)**	-----
Checked By	Tom Tharp	**Total Depth (ft)**	37.5
Comments:	Originally numbered 76-2. Also known as Test Well # 4.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is incomplete.			TS	Topsoil.
							SM	Silty sand.
5							GW	Sandy gravel.
10							GW	Coarse gravel.
15				CASING: 2", iron pipe 38.5 length. NO SCREEN.				
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 2

Borehole/Well Id 0276

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25							GW	Clean gravel.
30								
35								No sample.
								Total Depth = 37.5 feet.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0301
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597872.78
Date Started	8/5/89	**East (ft)**	1494179.84
Date Completed	8/9/89	**Ground Surface Elev. (ft)**	695.10
Logged By	Cate Grube	**Top of Casing Elev. (ft)**	694.44
Checked By	Tom Tharp	**Total Depth (ft)**	88.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							SW	Brown (10YR 4/3) to yellowish brown (10YR 6/4) fine to medium gravelly sand, well graded, moderately dense, moist.
5	SS	LI	0001	CASING: Stainless steel, 4". BACKFILL: Portland type 1 cement with 50% bentonite quick gel.			SW	Brown (10YR 4/3) to yellowish brown (10YR 6/4) fine to medium gravelly sand, well graded, moderately dense, moist.
10	SS	LI	0002				SW	Brown (10YR 4/3) to yellowish brown (10YR 6/4) fine to medium gravelly sand, well graded, moderately dense, moist.
15	SS	LI	0003				SW	Brown (10YR 5/1) fine to coarse gravelly sand, well graded very dense.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.60	15:18	08/08/89
▼	13.66	09:50	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id: 0301

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004				GC	Brown (10YR 5/3) clayey, sandy gravel, well graded, dense.
25	SS	LI	0005	CASING: Stainless steel, 4". BACKFILL: Portland type 1 cement with 50% bentonite quick gel.			GC	Brown (10YR 5/3) to yellow brown (10YR 5/6) clayey, sandy gravel, moist, very dense.
30	SS	LI	0006				GC	Brown (10YR 5/4) clayey, sandy gravel, well graded, very dense, moist.
35	SS	LI	0007				SW	Olive brown (2.5Y 4/4) sand, trace of fine to coarse gravel, wet, very dense.
40	SS	LI	0008				SW-SC	Olive to grayish brown (2.5Y 4/4 to 5/2) gravelly, clayey sand, interlayered, medium to coarse grained, well graded, wet, very dense.
45	SS	LI	0009				SC	Olive gray (5Y 4/2) clayey sand, trace fine to coarse gravel, well graded, wet, dense.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.60	15:18	08/08/89
▼	13.66	09:50	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0301

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	SS	LI	0010	CASING: Stainless steel, 4". BACKFILL: Portland type 1 cement with 50% bentonite quick gel.			SC	Grayish brown (2.5Y 5/2) clayey sand, well graded, trace fine to medium gravel, very dense, wet.
55	SS	LI	0011				CL	Dark gray (5Y 4/1) silty clay, very stiff, trace sand and fine to medium gravel, low plasticity, moist.
60	SS	LI	0012				CL	Dark gray (5Y 4/1) gravelly, sandy, silty clay, very stiff to hard, low plasticity, moist.
	SS	LI	0013	SEAL: Bentonite pellets.			CL	Dark gray to greenish gray (5Y 4/1) gravelly, sandy clay, hard, low plasticity, very moist to moist.
65								
70	SS	LI	0014				CL	Grayish brown to white (10YR 5/2 to 8/1) sandy, silty clay, very stiff, low plasticity, very moist, trace medium to coarse gravel.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.60	15:18	08/08/89
▼	13.66	09:50	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0301

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	SS	LI	0015	SCREEN: Stainless steel, 4", with .01" wire wrap slot.			CL	Very pale brown to yellowish brown (10YR 7/3 to 5/4) silty clay, stiff, low plasticity, very moist, trace sand and fine to medium gravel.
80	SS	LI	0016	FILTER PACK: #5 torpedo quartz sand.			CL	Brown to yellowish brown (10YR 5/3 to 5/4) gravelly, sandy, silty clay, very stiff, low plasticity, very moist.
85	SS	LI	0017				CL	Yellowish brown (10YR 5/4) to dark gray (5Y 4/4) sandy, silty clay, hard, low plasticity, moist, trace fine to medium gravel.
	SS	LI	0018				LS	Very dark gray limestone, fossiliferous, crystalline.
90								Total Depth = 88.0 feet.
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.60	15:18	08/08/89
▼	13.66	09:50	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 5

Drilling Company	Bowser Morner	**Borehole/Well Id**	0302
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597080.22
Date Started	9/5/89	**East (ft)**	1493925.90
Date Completed	9/15/89	**Ground Surface Elev. (ft)**	694.00
Logged By	Jeff Manship	**Top of Casing Elev. (ft)**	693.22
Checked By	Tom Tharp	**Total Depth (ft)**	120.6

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout.			CL	Dark gray (2.5Y 3/0) clay, some silt (< 10%).
5	SS	LI	0001	CASING: Stainless steel, 4".			CL	Dark gray (2.5Y 3/0) clay, some silt (< 10%).
10	SS	LI	0002				GM	Silty, sandy gravel, trace clay, some pebbles.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.50	16:20	09/05/89
▼	13.62	10:15	09/17/89

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0302

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0003	BACKFILL: Cement and bentonite grout.			GM	Silty, sandy gravel, some pebbles, 5% clay.
25	SS	LI	0004	CASING: Stainless steel, 4".			GM	Sand, silt, and pebbles in equal proportions.
30	SS	LI	0005				GM	Sand, silt, and pebbles, in equal proportions.
35	SS	LI	0006				GM	Sand, silt, and pebbles, in equal proportions.
40	SS	LI	0007				GM	Sand, silt, and pebbles, in equal proportions.
45	SS	LI	0008				GM	Sand, silt, and pebbles, in equal proportions.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.50	16:20	09/05/89
▼	13.62	10:15	09/17/89

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0302

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	SS	LI	0009	BACKFILL: Cement and bentonite grout.			GC-GM	Sand, silt, and pebbles, in equal proportions, 10% clay.
55	SS	LI	0010	CASING: Stainless steel, 4".			GC-GM	Sand, silt, and pebbles, in equal proportions, 15% clay.
60	SS	LI	0011				GP	Sand and gravel, poorly graded, unconsolidated, saturated, little or no silt and clay.
65	SS	LI	0012					
70	SS	LI	0013					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.50	16:20	09/05/89
▼	13.62	10:15	09/17/89

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id: 0302

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
80	SS	LI	0014				CL	Greenish gray (5Y 5/2) silty clay with seams of sandy clay.
				CASING: Stainless steel, 4".				
85				BACKFILL: Cement and bentonite grout.				
90	SS	LI	0015					
							GP	Sand and gravel, poorly graded, unconsolidated, little or no fines.
95	SS	LI	0016	SEAL: Bentonite slurry.			TI	Gray (5Y 5/2) glacial till, consists of sand and gravel with 15% fines, well graded, tightly packed, some parts blueish and pinkish colored.

GROUNDWATER

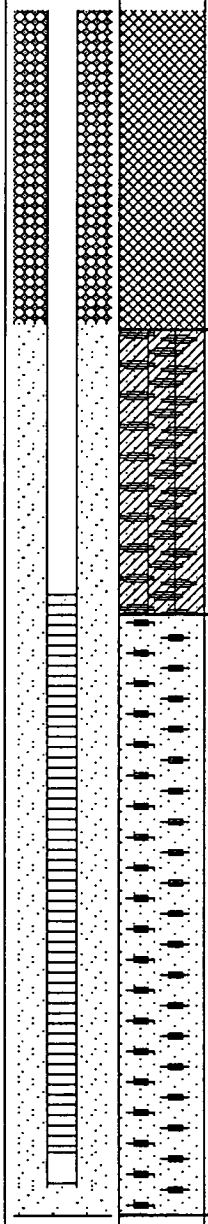
	DEPTH	HOUR	DATE
▽	19.50	16:20	09/05/89
▼	13.62	10:15	09/17/89

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 5 of 5

Borehole/Well Id 0302

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				SEAL: Bentonite slurry.				
105	SS	LI	0017				GC-GM	Greenish gray (5Y 5/2) sand and gravel with fines, well graded, slightly consolidated.
110	SS	LI	0018				SP	Gravelly sand, coarse grained, poorly graded, moist, little or no fines, sand grades downward to medium to fine grained.
115				FILTER PACK: Coarse quartz sand.				
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
120	SS	LI	0019					
								Total Depth = 120.6 feet.
125								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.50	16:20	09/05/89
▼	13.62	10:15	09/17/89

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 4

Drilling Company	Bowser Morner	**Borehole/Well Id**	0303
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597115.40
Date Started	8/30/89	**East (ft)**	1494497.22
Date Completed	9/6/89	**Ground Surface Elev. (ft)**	697.30
Logged By	Jeff Manship	**Top of Casing Elev. (ft)**	696.75
Checked By	Tom Tharp	**Total Depth (ft)**	93.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	SS	LI	0001	BACKFILL: Cement and bentonite grout.			ML	Dark brown (10YR 3/2) organic sandy silt.
5	SS	LI	0002	CASING: Stainless steel, 4".			CL	Reddish brown (10YR 4/4) sandy, gravelly clay.
10	SS	LI	0003				CL	Reddish brown (10YR 4/4) sandy, gravelly clay.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.65	11:42	09/05/89
▼	17.13	09:43	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0303

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004				GC	Medium to dark gray (2.5Y N4) clayey, sandy gravel, gravel consists of pebbles and shaley limestone fragments.
25								
30	SS	LI	0005	BACKFILL: Cement and bentonite grout.			GC-GM	Sandy gravel with silt and clay, unconsolidated .
▽ 35				CASING: Stainless steel, 4".				
40	SS	LI	0006				GC-GM	Sandy gravel with silt and clay, unconsolidated .
45	SS	LI	0007				SP	Sand, clean, poorly graded, medium to coarse grained.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.65	11:42	09/05/89
▼	17.13	09:43	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0303

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
55	SS	LI	0008				ML	Medium gray (5G 5/1) clayey silt, dense.
				CASING: Stainless steel, 4".				
60				BACKFILL: Cement and bentonite grout.				
65	SS	LI	0009				GC-GM	Blueish gray (5GY 6/1) sand and gravel; clay and silt matrix, very dense.
				SEAL: Bentonite slurry.				
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.65	11:42	09/05/89
▼	17.13	09:43	09/20/90

WESTON

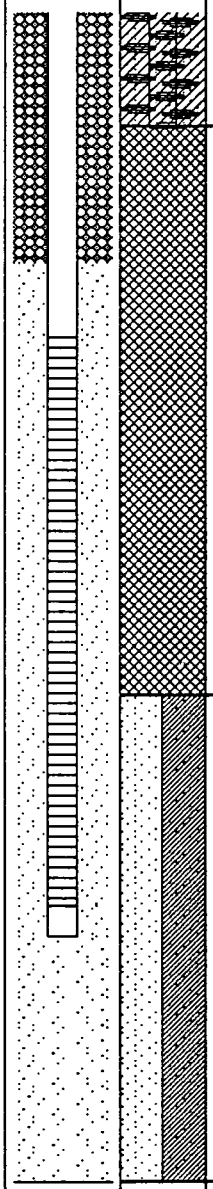
GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0303

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	SS	LI	0010	SEAL: Bentonite slurry.			TI	Glacial till, composed of sand and gravel within a clay matrix.
80				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
85	SS	LI	0011	FILTER PACK: Coarse grained quartz sand.			CL-SP	Greenish gray (5GY 4/1) clay interlayered with medium to coarse grained sand, moist.
90								
95								Total Depth = 93.5 feet.



GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.65	11:42	09/05/89
▼	17.13	09:43	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0304
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596159.94
Date Started	9/16/89	**East (ft)**	1494549.58
Date Completed	9/20/89	**Ground Surface Elev. (ft)**	693.10
Logged By	Jeff Manship	**Top of Casing Elev. (ft)**	692.40
Checked By	Tom Tharp	**Total Depth (ft)**	103.9

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout.			OH	Brownish black (5YR 3/2) organic clay.
5	SS	LI	0001	CASING: Stainless steel, 4".				
	SS	LI	0002				SP	Light brown (10YR 6/3) gravelly sand, unconsolidated, medium grained, dry.
							GC-GM	Tan (10YR 7/4) sand and gravel with silt and clay, poorly graded,
10	SS	LI	0003					
15	SS	LI	0004					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0005					
							CL	Dark reddish brown (10YR 4/4) silty clay with fine gravel, very dense, hard.
25				BACKFILL: Cement and bentonite grout.				
30	SS	LI	0006	CASING: Stainless steel, 4".				
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
35	SS	LI	0007					
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
40								
45	SS	LI	0008					

GROUNDWATER

	DEPTH	HOUR	DATE
∇	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	Sand, poorly graded, coarse grained, no fines, few pebbles, wet.
50				BACKFILL: Cement and bentonite grout.				
55	SS	LI	0009	CASING: Stainless steel, 4".				
							SP	Sand, poorly graded, medium grained, no fines, few pebbles, wet.
60								
65	SS	LI	0010					
							GC-GM	Gray (5Y 5/1) to brown (10YR 5/6) sand and gravel with silt and clay, well graded, very dense, hard.
70	SS	LI	0011					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	SS	LI	0012	BACKFILL: Cement and bentonite grout.				
	ST	GT	0075					
							GC-GM	Gray (5Y 5/1) to brown (10YR 5/6) sand and gravel with silt and clay, well graded, very dense, hard.
80				CASING: Stainless steel, 4".				
				SEAL: Bentonite slurry.				
85	SS	LI	0013					
							CL	Sandy clay.
90	SS	LI	0014					
							GC-GM	Sand and gravel with silt and clay (< 15%), sand is coarse grained, poorly graded, wet.
				FILTER PACK: #5 quartz sand.				
95	SS	LI	0015					
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				

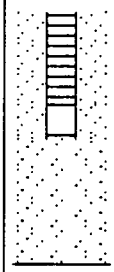
GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 5 of 5

Borehole/Well Id 0304

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				FILTER PACK: #5 quartz sand. SCREEN: Stainless steel, 4", with .01" wire wrap slot. SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
105								Total Depth = 103.9 feet.
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.95	10:55	09/19/89
▼	13.12	09:17	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0305
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596493.51
Date Started	8/21/89	**East (ft)**	1495084.47
Date Completed	8/22/89	**Ground Surface Elev. (ft)**	710.00
Logged By	Tom Tharp	**Top of Casing Elev. (ft)**	711.76
Checked By	Jim Brinkman	**Total Depth (ft)**	40.1

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				CASING: Stainless steel, 4".			CL	Gray clay, trace silt.
5	SS	LI	0001	BACKFILL: Cement and bentonite grout.			CL	Gray clay, trace silt.
10	SS	LI	0002				CL	Brown clay, trace silt.
15	SS	LI	0003				SM	Silty sand, well graded.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.50	17:25	08/21/89
▼	30.28	11:56	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0305

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004	BACKFILL: Cement and bentonite grout.			NR	No recovery.
	SS	LI	0005	CASING: Stainless steel, 4".			GC-GM	Clayey, silty gravel.
	ST	GT	0025					
25				SEAL: Bentonite.				
30	SS	VO	0030				GC-GM	Gravel intermixed with sand, silt, and clay.
	SS	LI	0006	SCREEN: Stainless steel, 4", with .01" wire wrap slot.			GC-GM	Gravel intermixed with clay, silt, and some sand.
	SS	LI	0007					
35				FILTER PACK: Quartz sand.				
	SS	LI	0008				CL	Clay regolith with gravel, sand and silt.
40	SS	LI	0009					Total Depth = 40.1 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.50	17:25	08/21/89
▼	30.28	11:56	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0306
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596672.67
Date Started	8/31/89	**East (ft)**	1494951.74
Date Completed	9/2/89	**Ground Surface Elev. (ft)**	703.90
Logged By	John McDonnell	**Top of Casing Elev. (ft)**	706.07
Checked By	Tom Tharp	**Total Depth (ft)**	41.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							SC-SW	Brown (10YR 5/3) and gray (10YR 6/7) clayey, gravelly sand, well graded, sand is fine to coarse grained, gravel is subangular to subrounded, approximately 1 inch in diameter.
5				CASING: Stainless steel, 4".				
10	SS	LI VO	0001 0010	BACKFILL: Cement and bentonite mixture.				
15							CL	Gray brown (10YR 5/6) sandy, gravelly clay, well graded.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	26.48	17:45	09/02/89
▼	23.79	12:09	09/20/90

WESTON

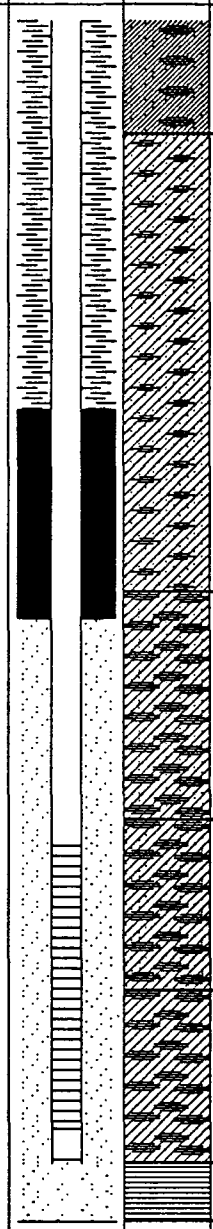
GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0306

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20	SS	LI GT	0002 0020	CASING: Stainless steel, 4".		
					SC-SW	Brown (10YR 5/8) clayey, gravelly sand, well graded, fine to coarse grained, subangular to subrounded.
25				SEAL: Bentonite pellets.		
	SS	LI	0003			
30	SS	LI	0004		GC	Light brown sandy, clayey gravel.
	SS	LI GT	0005 0032			
35	SS	LI	0006	FILTER PACK: Quartz torpedo sand.	GC	Sandy, clayey gravel, well graded.
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.	GC	Clayey gravel.
40	SS	LI GT	0007 0040		SH	Blue gray shale.
						Total Depth = 41.0 feet.
45						



GROUNDWATER

	DEPTH	HOUR	DATE
▽	26.48	17:45	09/02/89
▼	23.79	12:09	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0307
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596849.18
Date Started	9/2/89	**East (ft)**	1495024.87
Date Completed	9/4/89	**Ground Surface Elev. (ft)**	716.00
Logged By	Doug Perry	**Top of Casing Elev. (ft)**	718.02
Checked By	Tom Tharp	**Total Depth (ft)**	52.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	Topsoil.
							FL	Fill material - gravel, clay, silt.
				BACKFILL: Cement and bentonite grout.				
5	SS	LI	0001				CL	Dark gray (10YR 3/1) silty clay, some gravel, limonite staining.
				CASING: Stainless steel, 4".				
10								
	SS	LI	0002				CL	Yellow to brown (10YR 5/4) gravelly, silty clay, poorly graded, subrounded, limonite staining.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	39.50	08:20	09/02/89
▼	45.00	11:15	09/03/89

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id: 0307

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20				CASING: Stainless steel, 4".		
	SS	LI	0003		CL	Dark gray (10YR 4/1) silty clay, trace gravel, limonite staining.
25				BACKFILL: Cement and bentonite grout.		
30						
	SS	LI	0004		GM	Dark gray (10YR 4/1) sandy, silty gravel, sand is coarse grained, limonite staining.
35						
	SS	LI	0005		GW	Sandy gravel, well graded, several clay stringers.
∇ 40				SEAL: Bentonite pellets.		
	SS	LI VO	0006 0042		GW	Light yellow brown (10YR 6/4) sandy gravel, well graded.
▼ 45						

GROUNDWATER

	DEPTH	HOUR	DATE
∇	39.50	08:20	09/02/89
▼	45.00	11:15	09/03/89

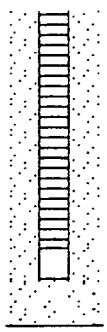
WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0307

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI VO	0007 0047	FILTER PACK: #5 torpedo quartz sand. SCREEN: Stainless steel, 4", with .01" wire wrap slot.			SH	Greenish gray (5BG 5/1) weathered shale.
50	SS	LI	0008	SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
								Total Depth = 52.0 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	39.50	08:20	09/02/89
▼	45.00	11:15	09/03/89

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0308
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596646.45
Date Started	8/28/89	**East (ft)**	1495223.89
Date Completed	9/4/89	**Ground Surface Elev. (ft)**	750.50
Logged By	John McDonnell	**Top of Casing Elev. (ft)**	752.52
Checked By	Tom Tharp	**Total Depth (ft)**	68.6
Comments:	HNU spike of 5 ppm at 60 feet. Well is usually dry.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							FL	Fill - gray brown (8YR 5/1 to 8YR 5/6) sandy clay.
5	SS	LI	0001	CASING: Stainless steel, 4".				
				BACKFILL: Cement and bentonite grout.			FL	Fill - clay with minor gravel and trash.
10	SS	LI	0002					
							FL	Fill - clay with wood and ash debris.
15	SS	LI	0003					
							FC	Fill - gravel and clay with landfill debris.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	65.17	11:35	05/24/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 3

Borehole/Well Id 0308

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004	CASING: Stainless steel, 4".				
							FL	Fill - light brown (10YR 6/2) sandy clay.
25	SS	LI	0005	BACKFILL: Cement and bentonite grout.				
							FL	Fill - reddish brown (2.5YR 5/6) gravelly clay, sharp limestone chips.
30	SS	LI	0006					
							FL	Fill - reddish brown (10YR 5/8) gravelly clay.
35	SS	LI	0007					
							FL	Fill - gravelly clay, coarse pebbles, burlap-like debris.
40	SS	LI	0008					
							FL	Fill - clayey sand and gravel.
45	SS	LI	0009					

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	65.17	11:35	05/24/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0308

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							FL	Fill - clayey, sandy gravel.
50	SS	LI	0010	CASING: Stainless steel, 4".				
							FL	Fill - clayey sandy gravel, limonite spotting.
55	SS	LI	0011	SEAL: Bentonite.				
							GC	Gray to brown clayey gravel.
60	SS	LI VO	0012 0060					
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.			SP	Sand, medium to coarse grained, angular to well rounded, thin laminations, arkosic.
▼65	SS	LI	0013					
	SS	LI VO	0014 0067	FILTER PACK: Coarse silica sand.			SH	Blue gray (2.5YR 5/0 to 7/0) shale, clayey, fossiliferous.
70								Total Depth = 68.6 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	65.17	11:35	05/24/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	Borehole/Well Id	0309
Drilling Method	Cable Tool	STATE PLANE COORDINATES	
Drilling Fluid	None	North (ft)	596503.04
Date Started	8/18/89	East (ft)	1495098.28
Date Completed	8/21/89	Ground Surface Elev. (ft)	710.10
Logged By	Tom Tharp	Top of Casing Elev. (ft)	712.19
Checked By	Jim Brinkman	Total Depth (ft)	53.1

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Portland Type 1 cement with 5% bentonite.			GC	Small gravel and clay with black organic matter.
5	SS	LI	0001	CASING: Stainless steel, 4".			OH	Black organic clay, trace silt.
10	SS	LI	0002				CL	Brown sandy, silty clay with pebbles to 1 inch in diameter.
15	SS	LI	0003				SM	Silty sand, trace clay, 2% gravel.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	33.00	09:15	08/19/89
▼	30.33	11:55	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0309

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				BACKFILL: Portland Type 1 cement with 5% bentonite.				
	SS	LI	0004				ML	Clayey silt, trace limestone gravel.
25				CASING: Stainless steel, 4".				
30								
	SS	LI	0005				GC-GM	Sandy, silty, clayey gravel, approximately 50% gravel to 1 inch in diameter.
35								
	SS	LI	0006				CL	Blue clay.
40				SEAL: Bentonite pellets.				
	SS	LI	0007				SH	Blue shale.
45	SS	LI	0008	SCREEN: Stainless steel, 4", with .01" wire wrap slot.				

GROUNDWATER

DEPTH	HOUR	DATE
33.00	09:15	08/19/89
30.33	11:55	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0309

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
50	SS	LI	0009	FILTER PACK: #5 quartz sand.				
	SS	LI	0010					Total Depth = 53.1 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	33.00	09:15	08/19/89
▼	30.33	11:55	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0310
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596682.64
Date Started	8/14/89	**East (ft)**	1494952.10
Date Completed	8/16/89	**Ground Surface Elev. (ft)**	705.53
Logged By	Tom Tharp	**Top of Casing Elev. (ft)**	705.53
Checked By	Jim Brinkman	**Total Depth (ft)**	54.8

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Portland Type 1 cement with 5% bentonite.			SM	Yellow brown silty sand, fine to coarse grained, well graded.
5	SS	LI	0001					
				CASING: Stainless steel, 4".			SW	Light brown sand, coarse to very coarse grained, well graded.
10	SS	LI	0002					
							SC-SM	Brown clayey, gravelly sand, gravel to 1 inch in diameter.
							GC	Light brown clayey, sandy gravel.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	32.00	13:00	08/15/89
▼	39.50	14:30	08/15/89

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0310

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20	SS	LI	0003			
				BACKFILL: Portland Type 1 cement with 5% bentonite.	CL	Dark gray sandy clay, moderate plasticity.
					CL	Gray sandy clay.
25				CASING: Stainless steel, 4".		
30						
	SS	LI	0004		LS	Gray limestone, crystalline, erosional remnant.
					CL	Gray silty clay, some small pebbles.
35				SEAL: Bentonite slurry.		
	SS	LI	0005			
40					LS	Gray to brown limestone, crystalline, some silt and clay, limonite alteration.
	SS	LI	0006		CL	Gray clay, moderate plasticity, some small pebbles.
45						

GROUNDWATER

	DEPTH	HOUR	DATE
▽	32.00	13:00	08/15/89
▼	39.50	14:30	08/15/89

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0310

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0007				LS	Gray limestone, fossiliferous.
50	SS	LI	0008	SCREEN: Stainless steel, 4", with .01" wire wrap slot. FILTER PACK: #5 quartz torpedo sand.				
	SS	LI	0009					
55								Total Depth = 54.8 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	32.00	13:00	08/15/89
▼	39.50	14:30	08/15/89

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0311
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597873.25
Date Started	8/3/89	**East (ft)**	1494187.71
Date Completed	8/4/89	**Ground Surface Elev. (ft)**	695.60
Logged By	John McDonnell	**Top of Casing Elev. (ft)**	694.90
Checked By	Tom Tharp	**Total Depth (ft)**	35.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							SW	Brown (10YR 4/3) to yellowish brown (10YR 6/4) gravelly sand, well graded, moderately dense, moist.
				CASING: Stainless steel, 4".				
5	SS	LI	0001	BACKFILL: Cement and bentonite grout.			SW	Brown (10YR 4/3) to yellowish brown (10YR 6/4) gravelly sand, well graded, moderately dense, moist.
10	SS	LI	0002	SEAL: Bentonite pellets.			SW	Brown (10YR 5/1) gravelly sand, very dense, well graded.
15	SS	LI	0003				CL	Brown (10YR 5/3) sandy, gravelly clay, well graded, dense.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.95	09:50	08/04/89
▼	13.50	08:10	08/05/89

WESTON

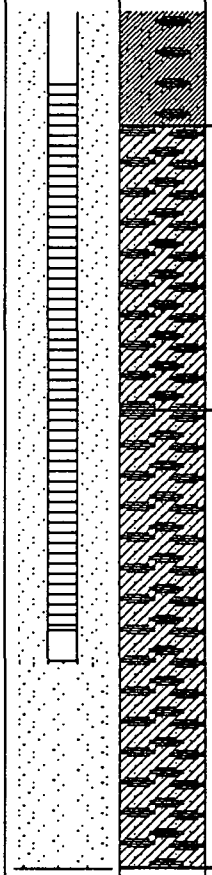
GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0311

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004					
							GC	Brown (10YR 5/3) to yellow brown (10YR 5/6) clayey gravel, some sand, very dense, moist.
25	SS	LI	0005	FILTER PACK: Coarse quartz sand.				
							GC	Brown (10YR 5/4) sandy, clayey gravel, well graded, very dense, moist.
30	SS	LI	0006	SCREEN: Stainless steel screen, 4", with .01" wire wrap slot.				
35								Total Depth = 35.0 feet.
40								
45								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.95	09:50	08/04/89
▼	13.50	08:10	08/05/89

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0312
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597747.88
Date Started	12/12/89	**East (ft)**	1495032.91
Date Completed	12/13/89	**Ground Surface Elev. (ft)**	731.20
Logged By	John McDonnell	**Top of Casing Elev. (ft)**	733.20
Checked By	Tom Tharp	**Total Depth (ft)**	33.6

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	Topsoil.
							CL	Olive sandy clay with fine gravel, sand is medium to very coarse grained.
				BACKFILL: Cement and bentonite grout.				
5	SS	LI	0001					
				CASING: Stainless steel, 4".			CL	Light to moderate brown sandy clay with fine gravel, lean.
10								
	ST	GT	0012					
15	SS	LI	0002					
				SEAL: Bentonite pellets.			GC	Clayey, sandy gravel with dark brown woody organic matter and limonite alterations.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	31.10	15:07	01/08/90
▼	29.07	13:16	09/20/90

WESTON

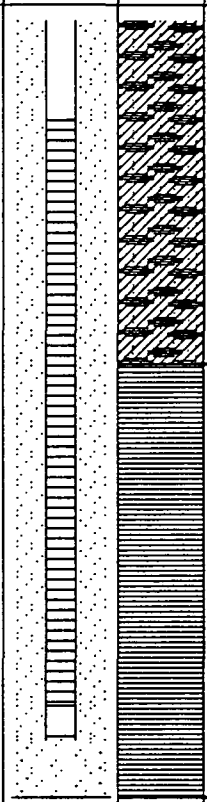
GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0312

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	SS	LI	0003					
25				SCREEN: Stainless steel screen, 4", with .01" wire wrap slot.				
							SH	Greenish gray shale.
				FILTER PACK: Coarse silica sand.				
30	SS	LI	0004					
								Total Depth = 33.6 feet.
35								
40								
45								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	31.10	15:07	01/08/90
▼	29.07	13:16	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	**Borehole/Well Id**	0313
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596850.50
Date Started	9/4/89	**East (ft)**	1495022.00
Date Completed	9/4/89	**Ground Surface Elev. (ft)**	716.00
Logged By	Doug Perry	**Top of Casing Elev. (ft)**	718.14
Checked By	Tom Tharp	**Total Depth (ft)**	41.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	Topsoil, roots.
							FL	Fill - gravel within a clayey silt matrix, gravel up to .12 feet in diameter, angular.
				BACKFILL: Cement and bentonite grout.				
5	SS	LI	0001				CL	Olive yellow (2.5YR 6/6) gravelly clay, medium plasticity, some pebbles, very dark limonite staining.
				CASING: Stainless steel, 4".				
10	SS	LI	0002				FL	Fill - dark brown (10YR 3/3) clay, some gravel.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	38.50	14:05	09/04/89
▼	35.91	12:21	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0313

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0003	BACKFILL: Cement and bentonite grout.			CL	Dark gray (5YR 3/1) gravelly clay, tight.
25				CASING: Stainless steel, 4".				
				SEAL: Bentonite.				
30	SS	LI	0004				CL	Silty clay, trace gravel.
35	SS	LI	0005	SCREEN: Stainless steel screen, 4", with .01" wire wrap slot.			GW	Sandy gravel, well graded, few clay/silt stringers.
40	SS	LI VO	0006 0040	FILTER PACK: #5 quartz sand.				
								Total Depth = 41.5 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	38.50	14:05	09/04/89
▼	35.91	12:21	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0314
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597414.47
Date Started	8/2/89	**East (ft)**	1495713.64
Date Completed	8/3/89	**Ground Surface Elev. (ft)**	742.50
Logged By	Jeff Manship	**Top of Casing Elev. (ft)**	744.47
Checked By	Tom Tharp	**Total Depth (ft)**	44.8
Comments:	Log recreated August 29, 1989 based on field logbook and archived samples.		
	Original field form was lost.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Brown (2.5YR 4/2) silty clay, some coarse sand.
5	SS	LI	0001	BACKFILL: Cement and bentonite grout. CASING: Stainless steel, 4".			CL	Yellowish brown (2.5YR 5/4) silty clay.
10	SS	LI	0002				CL	Grayish brown (2.5Y 4/2) silty clay, some pebbles.
15	SS	LI	0003				CL	Grayish brown (5Y 4/2) silty clay, some pebbles.
20								

GROUNDWATER

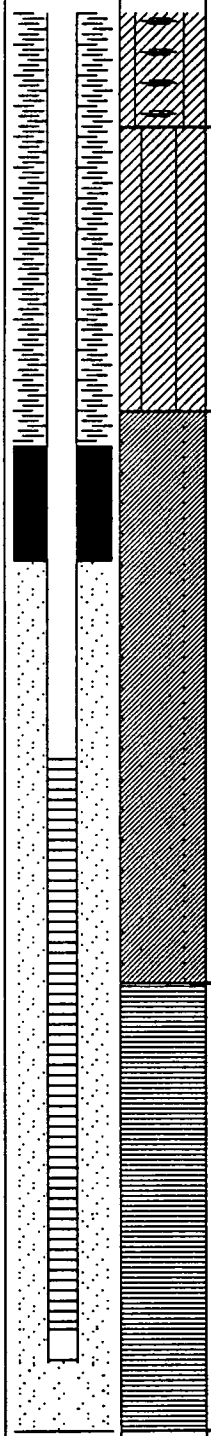
	DEPTH	HOUR	DATE
▽			
▼	38.92	12:34	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0314

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20	SS	LI	0004	BACKFILL: Cement and bentonite grout.		
					CL	Grayish brown (5Y 4/2) silty clay.
25	SS	LI	0005	CASING: Stainless steel, 4".		
				SEAL: Bentonite pellets.	CL	Grayish brown (5Y 4/2) sandy clay.
30						
35	SS	LI	0006	SCREEN: Stainless steel, 4", with .01" wire wrap slot.		
					SH	Medium gray weathered shale.
40	SS	LI	0007	FILTER PACK: Quartz sand.		
45						Total Depth = 44.8 feet.



GROUNDWATER

DEPTH	HOUR	DATE
38.92	12:34	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	Bowser Morner	**Borehole/Well Id**	0315
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597341.97
Date Started	8/6/89	**East (ft)**	1495079.79
Date Completed	8/7/89	**Ground Surface Elev. (ft)**	723.80
Logged By	Jeff Manship	**Top of Casing Elev. (ft)**	725.88
Checked By	Tom Tharp	**Total Depth (ft)**	55.6

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Medium to light gray (5GY 5/1) clay.
5	SS	LI	0001	CASING: Stainless steel, 4".				
				BACKFILL: Cement and bentonite grout.			CL	Medium to light gray (5GY 5/1) clay.
10	SS	LI	0002					
15							ML-GM	Medium brown (10YR 4/4) to grayish brown (2.5Y 4/2) sandy, gravelly silt, sand is coarsed grained.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	43.78	13:23	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 3

Borehole/Well Id 0315

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0003					
				CASING: Stainless steel, 4".			ML-GM	Medium brown (10YR 4/4) to grayish brown (2.5Y 4/2) sandy, gravelly silt, sand is coarsed grained.
25				BACKFILL: Cement and bentonite grout.				
30	SS	LI	0004					
							SM-SW	Gravel, sand, and silt.
35				SEAL: Bentonite pellets.				
40	SS	LI	0005					
				FILTER PACK: Quartz sand.				
							ML-GM	Sandy, gravelly silt (> 50% silt).
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
45								

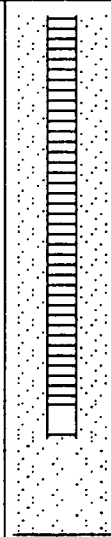
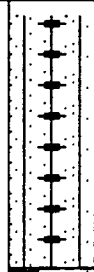
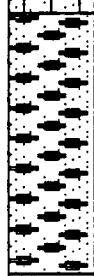
GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	43.78	13:23	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0315

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	SS	LI	0006	SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
55				FILTER PACK: Quartz sand.			GP	Sandy gravel, sand is coarse grained, some limestone fragments.
60								Total Depth = 55.6 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	43.78	13:23	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	Bowser Morner	**Borehole/Well Id**	0316
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	597110.81
Date Started	8/4/89	**East (ft)**	1495384.97
Date Completed	8/5/89	**Ground Surface Elev. (ft)**	724.70
Logged By	Jeff Manship	**Top of Casing Elev. (ft)**	726.92
Checked By	Tom Tharp	**Total Depth (ft)**	45.0
Comments:	Well is usually dry.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Yellowish brown (2.5Y 5/4) sandy clay, some pebbles.
				CASING: Stainless steel, 4".				
5	SS	LI	0001				CL	Yellowish brown (2.5Y 5/4) sandy clay, some pebbles.
				BACKFILL: Cement and bentonite grout.				
10	SS	LI	0002				CL	Brownish gray (2.5Y 4/2) silty clay, some sand lenses.
15								
				SEAL: Bentonite pellets.				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	37.13	09:42	02/14/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0316

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0003				GW	Sand and gravel, some shale fragments.
25				SCREEN: Stainless steel, 4". FILTER PACK: Quartz sand.				
30	SS	LI	0004				CL	Grayish brown (2.5Y 5/2) silty clay.
35							LS-SH	Dark gray interbedded limestone and shale.
▼				BACKFILL: Quartz sand.				
40								
45								Total Depth = 45.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	37.13	09:42	02/14/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	Borehole/Well Id	0317
Drilling Method	Cable Tool	STATE PLANE COORDINATES	
Drilling Fluid	None	North (ft)	596206.65
Date Started	8/16/89	East (ft)	1495023.69
Date Completed	8/18/89	Ground Surface Elev. (ft)	703.80
Logged By	Tom Tharp	Top of Casing Elev. (ft)	705.64
Checked By	Jim Brinkman	Total Depth (ft)	63.5

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Type 1 Portland cement, 5% bentonite slurry.			GM	Silty, sandy gravel, gravel up to 1 inch in diameter.
5	SS	LI	0001	CASING: Stainless steel, 4".			GC-GM	Sandy, silty, clayey gravel, gravel consists of limestone fragments up to 1 inch in diameter.
10	SS	LI	0002				CL	Gray to brown gravelly clay.
15	SS	LI	0003				GC	Sandy, clayey gravel, gravel consists of limestone fragments up to 1.5 inches in diameter.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.00	18:35	08/16/89
▼	24.21	12:03	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id: 0317

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004					
				BACKFILL: Type 1 Portland cement, 5% bentonite slurry.			SW	Black and white sand.
25				CASING: Stainless steel, 4".				
30	SS	LI	0005					
	SS	LI	0006				GC	Sandy, clayey gravel.
							GC	Sandy, clayey gravel, gravel up to 1 inch in diameter, limonite staining.
35								
40								
	SS	LI	0007				GC	Sand and gravel, some clay.
45				SEAL: Bentonite slurry.				

GROUNDWATER

DEPTH	HOUR	DATE
28.00	18:35	08/16/89
24.21	12:03	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0317

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0008				GM	Brown sand, some pebbles to .3 feet in diameter, < 10% silt.
50								
	SS	LI	0009				GM	Silty sand, fine to coarse grained, some pebbles.
55	SS	LI	0010					
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.			SC-SM-SP	Clayey, silty sand, fine grained, some limestone gravel.
60				FILTER PACK: #5 quartz torpedo sand.				
	SS	LI	0011				LS	Gray crystalline limestone (bedrock).
	SS	LI	0012					
								Total Depth = 63.5 feet.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.00	18:35	08/16/89
▼	24.21	12:03	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	Borehole/Well Id	0318
Drilling Method	Cable Tool	STATE PLANE COORDINATES	
Drilling Fluid	None	North (ft)	598643.83
Date Started	8/8/89	East (ft)	1497216.68
Date Completed	8/9/89	Ground Surface Elev. (ft)	810.70
Logged By	Jeff Manship	Top of Casing Elev. (ft)	812.77
Checked By	Tom Tharp	Total Depth (ft)	30.3

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				BACKFILL: Cement and bentonite grout.			NR	No sample recovery.
5								
10	SS	LI	0001	CASING: Stainless steel, 4".			CL	Gray brown (2.5Y 5/4) silty clay with pebbles.
15				SEAL: Bentonite slurry.			SH	Blueish gray (5G 3/1) shale, soft.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.72	13:30	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 2

Borehole/Well Id 0318

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0002	FILTER PACK: Quartz sand.			SH	Blueish gray (5G 3/1) shale, soft.
25				SCREEN: Stainless steel, 4", with .01" wire wrap slot.				
30	SS	LI	0003					Total Depth = 30.3 feet.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.72	13:30	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 4

Drilling Company	Bowser Morner	**Borehole/Well Id**	0319
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	595512.27
Date Started	8/20/89	**East (ft)**	1495148.29
Date Completed	8/23/89	**Ground Surface Elev. (ft)**	701.70
Logged By	Cate Grube	**Top of Casing Elev. (ft)**	703.48
Checked By	Tom Tharp	**Total Depth (ft)**	95.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Dark yellowish brown (10YR 3/4) silty clay, stiff, low plasticity, moist, trace of sand.
				BACKFILL: Cement and bentonite grout.			CL	Dark yellowish brown (10YR 3/4) sandy clay, very stiff, low plasticity, moist, trace fine to coarse gravel.
5	SS	LI	0001					
				CASING: Stainless steel, 4".			CL	Brown (10YR 3/4) sandy, gravelly clay, very stiff, low plasticity, moist.
10	SS	LI	0002					
							SP-SC	Brown (10YR 3/4) clayey, gravelly sand, poorly graded, moderately dense, moist.
15	SS	LI	0003					
							SM	Brown (10YR 5/3) silty sand, well graded, very dense.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	22.21	08:38	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0319

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	SS	LI	0004					
				BACKFILL: Cement and bentonite grout.			SC-SP	Olive brown (2.5Y 5/4) clayey, gravelly sand, dense, wet.
25	SS	LI	0005	CASING: Stainless steel, 4".				
							SC-SP	Olive brown (2.5Y 5/4) clayey, gravelly sand, poorly graded, dense, wet.
30	SS	LI	0006					
							CL	Dark gray (5Y 4/1) sandy, gravelly clay, medium stiff, low plasticity, moist.
35	SS	LI	0007					
							SC-SP	Clayey, gravelly sand, very dense, poorly graded, wet.
40	SS	LI	0008	SEAL: Bentonite pellets.				
							SC-SP	Light yellowish brown (2.5Y 5/4) clayey, gravelly sand, very dense, wet.
45	SS	LI	0009					

GROUNDWATER

DEPTH	HOUR	DATE
22.21	08:38	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0319

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SCREEN: Stainless steel, 4", with .01" wire wrap slot.			SM-SP	Light olive brown (2.5Y 5/4) silty, gravelly sand, dense, wet.
50	SS	LI	0010	FILTER PACK: 10-20 quartz sand.				
							SM-SP	Olive brown (2.5Y 4/4) silty, gravelly sand, dense, wet.
55	SS	LI	0011					
							SM	Dark grayish brown (2.5Y 4/2) silty sand, poorly graded, dense, wet.
				SEAL: Bentonite hole plug.				
60	SS	LI	0012					
							SP-SW	Dark grayish brown (2.5Y 4/2) gravelly sand, poorly to well graded, moderately dense, wet.
65	SS	LI	0013					
	SS	LI	0014				SP-SW	Olive brown (2.5Y 4/4) sand, poorly to well graded, very dense, wet.
70	SS	LI	0015				ML	Olive gray (5Y 4/2) sandy, clayey silt, moist, hard.

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	22.21	08:38	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 4 of 4

Borehole/Well Id 0319

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	SS	LI	0016				GC	Light olive brown (2.5Y 5/4) clayey, sandy gravel, very dense, wet.
80	SS	LI	0017	SEAL: bentonite hole plug.			SC-SW	Light yellowish brown (2.5Y 6/4) to olive brown (2.5Y 4/4) clayey, gravelly sand, well graded, dense, wet.
85	SS	LI	0018				SC-SW	Light yellowish brown (2.5Y 6/4) to olive brown (2.5Y 4/4) clayey, gravelly sand, well graded, dense, wet.
90	SS	LI	0019				SC-SW	Olive brown (2.5Y 4/4) clayey, gravelly sand, well graded, very dense, wet.
95	SS	LI	0020				SC-SW	Olive brown (2.5Y 4/4) clayey, gravelly sand, well graded, very dense, wet.
								Total Depth = 95.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	22.21	08:38	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	Bowser Morner	Borehole/Well Id	0320
Drilling Method	Cable Tool	STATE PLANE COORDINATES	
Drilling Fluid	None	North (ft)	595023.61
Date Started	8/15/89	East (ft)	1495353.86
Date Completed	8/19/89	Ground Surface Elev. (ft)	704.70
Logged By	Cate Grube	Top of Casing Elev. (ft)	706.44
Checked By	Tom Tharp	Total Depth (ft)	117.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							CL	Dark yellowish brown (10YR 4/4) silty clay, lean, stiff, low plasticity, slightly moist, some sand.
	SS	LI	0001				CL	Dark yellowish brown (10YR 4/6) sandy, silty clay, stiff to very stiff, medium plasticity, moist.
5				CASING: Stainless steel, 4".				
	SS	LI	0002				SC	Dark yellowish brown (10YR 4/4 to 4/6) clayey sand, soft to medium stiff, medium plasticity, very moist, trace fine to medium gravel.
10				BACKFILL: Cement and bentonite grout.				
	SS	LI	0003				SC	Yellowish brown (10YR 5/8) clayey sand, well graded, very dense, moist.
15								
	SS	LI	0004				SC-SM	Light yellowish brown (10YR 6/4) clayey, silty sand, medium dense, moist.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.55	08:42	08/19/89
▼	25.26	08:42	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0320

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20						
	SS	LI	0005	SEAL: Bentonite pellets.	CL	Light olive brown (2.5YR 5/4) gravelly, sandy, silty clay, stiff, low plasticity, moist.
25						
	SS	LI	0006		CL	Grayish brown (2.5Y 5/2) sandy clay, very stiff, low plasticity, moist.
30						
	SS	LI	0007	SCREEN: Stainless steel, 4", with .01" wire wrap slot.	CL	Dark gray (5Y 4/1) sandy clay, very stiff to hard, low plasticity, moist.
35	SS	LI	0008		SW	Brown (10YR 5/3) sand, well graded, dense, wet, trace of silt.
40				FILTER PACK: Coarse silica sand.		
	SS	LI	0009		SP-SW	Light olive brown (2.5YR 5/4) sand, interlayered poorly and well graded, dense, wet, trace of fine to medium gravel.
45				SEAL: Bentonite hole plug.		

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.55	08:42	08/19/89
▼	25.26	08:42	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0320

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	SS	LI	0010				SC-SM	Olive brown (2.5Y 4/4) sand with silt and clay, interlayered, well and poorly graded, medium dense, wet.
50								
	SS	LI	0011				SM-SP	Dark grayish brown (2.5YR 4/2) silty, gravelly sand, poorly graded, dense, wet.
55				SEAL: Bentonite hole plug.				
	SS	LI	0012				SW	Dark grayish brown (2.5Y 4/2) gravelly sand, well graded, moderately dense, wet, trace of silt.
60								
	SS	LI	0013				SP	Grayish brown (2.5Y 5/2) sand, poorly graded, coarse grained, moderately dense, wet, trace fine gravel.
65								
	SS	LI	0014				SP	Grayish brown (2.5Y 5/2) sand, poorly graded, coarse grained, moderately dense, wet, trace fine gravel.
70								
	SS	LI	0015					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.55	08:42	08/19/89
▼	25.26	08:42	09/20/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0320

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							SP	Dark grayish brown (2.5Y 4/2) sand, poorly graded, moderately dense, wet.
	SS	LI	0016				SM	Dark grayish brown (2.5Y 5/2) silty sand, well graded, moderately dense, wet, trace fine to medium gravel.
80				SEAL: Bentonite hole plug.				
	SS	LI	0017				SW	Dark grayish brown (2.5Y 5/2) sand, well graded, coarse grained, moderately dense, wet, trace fine to medium grained gravel.
85								
	SS	LI	0018				SP	Dark grayish brown (2.5Y 4/2) sand, poorly graded, fine grained, moderately dense, wet.
90								
	SS	LI	0019				SW	Dark grayish brown (2.5Y 4/2) gravelly sand, well graded, moderately dense, wet.
95								
	SS	LI	0020				SM	Dark grayish brown (2.5Y 4/2) silty sand, poorly graded, moderately dense, wet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.55	08:42	08/19/89
▼	25.26	08:42	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 5 of 5

Borehole/Well Id 0320

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
	SS	LI	0021				SM	Olive brown (2.5Y 4/4) silty sand, interlayered, well and poorly graded, moderately dense, wet.
105				SEAL: Bentonite hole plug.				
	SS	LI	0022				SC-SM	Olive brown (2.5Y 4/4) clayey, silty sand, interlayered, well and poorly graded, dense to very dense, wet.
110								
	SS	LI	0023				SM	Olive brown (2.5Y 4/4) silty sand, poorly graded, moderately dense, wet.
115								
								Total Depth = 117.0 feet.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.55	08:42	08/19/89
▼	25.26	08:42	09/20/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 2

Drilling Company	Earth Sci. Lab. Inc.	**Borehole/Well Id**	0371
Drilling Method	Percussion Point	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596196.60
Date Started		**East (ft)**	1495018.44
Date Completed	4/5/61	**Ground Surface Elev. (ft)**	703.30
Logged By	Unk	**Top of Casing Elev. (ft)**	705.76
Checked By	Tom Tharp	**Total Depth (ft)**	45.0
Comments:	Originally numbered 71-3. Also known historically as Test Well # 1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.			FL	Fill.
5								
10							CL	Clay with gravel.
							GW	Sandy gravel, some boulders.
15				2" iron pipe.				
				2" drive-point screen.			GC	Clayey sandy gravel.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 2

Borehole/Well Id 0371

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25								
							GW	Sand, gravel.
30							SP	Clean sand, minor gravel.
35							SC	Clayey sand.
							SP	Clean sand, minor gravel.
40								
45								Total Depth = 45.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 1

Drilling Company	Raymond Int.	**Borehole/Well Id**	0419
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	598413.05
Date Started	5/26/76	**East (ft)**	1495683.78
Date Completed	5/26/76	**Ground Surface Elev. (ft)**	
Logged By	Dames and Moore	**Top of Casing Elev. (ft)**	Unk
Checked By	Tom Tharp	**Total Depth (ft)**	19.0

Comments:

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				SEAL: Bentonite.			FL	Fill.
				CASING: PVC, 3".				
5				BACKFILL: Earth.				
10								
15				SEAL: Bentonite.				
				SCREEN: Steel, 3". FILTER PACK: Gravel.			SH	Weathered shale.
20								Total Depth = 19.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 2

Drilling Company	Earth Sci. Lab. Inc.	**Borehole/Well Id**	0471
Drilling Method	Precussion Point	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596265.23
Date Started		**East (ft)**	1495008.91
Date Completed	4/5/61	**Ground Surface Elev. (ft)**	702.50
Logged By	Unk	**Top of Casing Elev. (ft)**	704.73
Checked By	Tom Tharp	**Total Depth (ft)**	44.5
Comments:	Originally numbered 71-4. Also known historically as Test Well # 2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.			TS	Topsoil.
5							GW	Clean fine to coarse gravel.
10				2 inch iron pipe 42.5 feet. 2 inch drive point screen.			GW	Sandy gravel, medium to coarse.
15								Medium to coarse sand, some gravel.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 2

Borehole/Well Id 0471

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25								Caving in bottom of well.
30								
35								
40								
45								Total Depth = 44.5 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 1 of 2

Drilling Company	Earth Sci. Lab. Inc.	**Borehole/Well Id**	0571
Drilling Method	Precussion Point	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596448.77
Date Started		**East (ft)**	1494972.83
Date Completed	4/6/61	**Ground Surface Elev. (ft)**	702.60
Logged By	Unk	**Top of Casing Elev. (ft)**	704.73
Checked By	Tom Tharp	**Total Depth (ft)**	44.0
Comments:	Originally numbered 71-5. Also known historically as Test Well # 3.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.			GW	Sandy gravel.
5							GW	Medium gravel to cobbles.
10								
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager MRC Engineering	PAGE: 2 of 2

Borehole/Well Id 0571

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								No sample.
25								
							GW	Coarse gravel.
30								
								No sample.
35								
40							GW	Coarse gravel.
								Total Depth = 44.0 feet.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

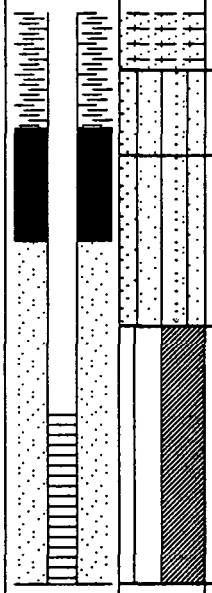
GEOLOGIC LOG

MOUND PLANT

Project Manager: Grover C. Cox

Drilling Company	Bowser and Morner	**Borehole/Well Id**	0812
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	595711.00
Date Started	9/23/83	**East (ft)**	1497082.78
Date Completed	9/23/83	**Ground Surface Elev. (ft)**	795.20
Logged By	Bowser and Morner	**Top of Casing Elev. (ft)**	798.20
Checked By	Tom Tharp	**Total Depth (ft)**	10.0
Comments:	Bowser and Morner Well # 12.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	Topsoil.
	SS	LI GT	1A	BACKFILL: Grout. SEAL: Bentonite.			ML	Brown sandy silt, very stiff, damp, trace clay.
	SS	LI GT	2A	CASING: Schedule 40 PVC, 1.25".			ML	Brown and gray sandy silt, moderately stiff, damp, trace rock fragments, trace clay.
5	SS	LI GT	3A	FILTER PACK: Ottawa sand.			CL-ML	Gray silt and clay, hard, moist, trace rock fragments, trace sand.
▼	SS	LI GT	4A	SCREEN: .02" slot, PVC, 1.25".				
10								Total Depth = 10.0 feet.
15								
20								



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	8.50		09/26/83

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Grover C. Cox

Drilling Company	Bowser and Morner	**Borehole/Well Id**	0817
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	595459.54
Date Started	9/26/83	**East (ft)**	1496685.02
Date Completed	9/26/83	**Ground Surface Elev. (ft)**	761.00
Logged By	Bowser and Morner	**Top of Casing Elev. (ft)**	762.50
Checked By	Tom Tharp	**Total Depth (ft)**	15.5
Comments:	Bowser and Morner Well # 17.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	Topsoil.
	SS	LI GT	1A	SEAL: Bentonite.			CL-ML	Brown silt and clay, very stiff, moist, some sand, trace gravel.
	SS	LI	2A	CASING: Schedule 40 PVC, 1.25".			ML	Brown and gray clayey silt, hard, moist, trace sand, trace rock fragments.
5	SS	LI GT	3A					
	SS	LI GT	4A				SH	Gray shale, moderately weathered, limey.
10				FILTER PACK: Ottawa sand.				
				SCREEN: .02" slot, PVC, 1.25".				
	SS	LI	5A					
15								Total Depth = 15.5 feet.
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Grover C. Cox

Drilling Company	Bowser and Morner	**Borehole/Well Id**	0827
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	595056.50
Date Started	9/22/83	**East (ft)**	1495796.00
Date Completed	9/22/83	**Ground Surface Elev. (ft)**	713.20
Logged By	Bowser and Morner	**Top of Casing Elev. (ft)**	716.20
Checked By	Tom Tharp	**Total Depth (ft)**	20.0
Comments:	Bowser and Morner Well # 27.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							FL	Fill - brown sandy silt, moist, trace gravel, trace clay tile.
	SS	LI GT	1A	BACKFILL: Grout. SEAL: Bentonite.			ML-GM	Brown sandy gravelly silt, hard, moist, trace clay.
	SS	LI GT	2A					
5							SM	Brown silt and sand, very stiff, moist, trace gravel, trace clay.
	SS	LI GT	3A	CASING: Schedule 40 PVC, 1.25".			GM	Brown sand and gravel, medium dense, moist, some silt, trace cobbles.
	SS	LI GT	4A					
10							SM	Brown silty sand, medium dense, moist, trace gravel.
				FILTER PACK: Ottawa sand.				
15							GM	Brown sand and gravel, dense, moist, some silt.
	SS	LI GT	5A	SCREEN: .02" slot, PVC, 1.25".				Total Depth = 20.0 feet.
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: Grover C. Cox

Drilling Company	Bowser and Morner	**Borehole/Well Id**	0832
Drilling Method	Auger	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	595113.04
Date Started	9/22/83	**East (ft)**	1495288.33
Date Completed	9/22/83	**Ground Surface Elev. (ft)**	704.10
Logged By	Bowser and Morner	**Top of Casing Elev. (ft)**	707.10
Checked By	Tom Tharp	**Total Depth (ft)**	20.0
Comments:	Bowser and Morner Well # 32.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	Topsoil.
	SS	LI GT	1A	SEAL: Bentonite.			ML	Brown sandy, clayey silt, very stiff, moist, trace gravel.
	SS	LI GT	2A	CASING: Schedule 40 PVC, 1.25".			CL	Brown sandy, silty clay, hard, moist, trace gravel.
5								
	SS	LI GT	3A				CL	Brown sandy clay, very stiff, moist, some silt, trace cobbles.
10	SS	LI GT	4A				GM	Brown sand and gravel, dense, moist, some silt, trace cobbles.
				FILTER PACK: Ottawa sand.				
	SS	LI GT	5A					(Becomes very dense at 14.0 feet.)
15								
				SCREEN: .02" slot, PVC, 1.25".				
	SS	LI GT	6A					Total Depth = 20.0 feet.
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0901
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596823.11
Date Started		**East (ft)**	1494339.27
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally numbered Buds #1; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0902
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596797.52
Date Started		**East (ft)**	1493543.91
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	50.0
Comments:	Originally numbered Buds #2; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 3

Drilling Company	Thomas Well Drilling	**Borehole/Well Id**	0903
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596526.49
Date Started		**East (ft)**	1493902.79
Date Completed	9/3/64	**Ground Surface Elev. (ft)**	TBD
Logged By	Charles Thomas	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	72.0

Comments: Originally Bud's #3; offsite water-supply well. Pre-existing well was removed, borehole reamed to 37.0', then drilled to 72.0'. New well installed.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							NR	Reamed pre-existing borehole to 37.0'.
				Well completion information is limited.				
5				CASING: 5 5/8", 72' in length.				
				BACKFILL: Unknown.				
10								
15								
▼								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	18.00		09/03/64

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 2 of 3

Borehole/Well Id 0903

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Well completion information is limited.			NR	Reamed pre-existing borehole to 37.0'.
25				BACKFILL: Unknown.				
30				CASING: 5 5/8", 72' in length.				
35								
							GW	Sand and gravel.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	18.00		09/03/64

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager

Borehole/Well Id 0903

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							GW	Sand and gravel.
				Well completion information is limited.				
50								
55				BACKFILL: Unknown.				
60				CASING: 5 5/8", 72' in length.				
65				SCREEN: Unknown.				
70				FILTER PACK: Unknown.				
								Total Depth = 72.0 feet.

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼	18.00		09/03/64

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 3

Drilling Company	Dames and Moore	**Borehole/Well Id**	0904
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596559.69
Date Started		**East (ft)**	1494557.46
Date Completed	4/14/77	**Ground Surface Elev. (ft)**	TBD
Logged By	William Crane	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	52.0
Comments:	Originally Jim's well; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is limited.			FL	Fill - topsoil and gravel.
							GC	Brown clay and gravel.
5				CASING: 6", 48' in length.				
10				BACKFILL: Unknown.				
15							GW	Sand and gravel, wet.
20							GC	Brown clay and gravel.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	12.90		04/14/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 2 of 3

Borehole/Well Id 0904

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Well completion information is limited.				
25				CASING: 6", 48' in length.				
							GW	Sand and gravel, wet.
30				BACKFILL: Unknown.			GC	Brown clay and gravel.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	12.90		04/14/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 3 of 3

Borehole/Well Id 0904

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50				SCREEN: Cook brass, 6", #30 slot, 3' in length. FILTER PACK: Unknown.			GW	Sand and gravel, wet.
55								Total Depth = 52.0 feet.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	12.90		04/14/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0905
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596442.20
Date Started		**East (ft)**	1494528.36
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Jim's Trailer well; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 3

Drilling Company	Dames and Moore	**Borehole/Well Id**	0906
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596719.01
Date Started		**East (ft)**	1494545.64
Date Completed	4/12/77	**Ground Surface Elev. (ft)**	TBD
Logged By	William Crane	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	52.0
Comments:	Originally Bud's Rental well; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is limited.			FL	Fill - topsoil and gravel.
							GC	Brown clay and gravel.
5				CASING: 6", 49' in length.				
10				BACKFILL: Unknown.				
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE
14.60		04/14/77

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 2 of 3

Borehole/Well Id 0906

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Well completion information is limited.			GC	Brown clay and gravel.
25				CASING: 6", 49' in length.				
30				BACKFILL: Unknown.			GW	Sand and gravel, wet.
35								
							GC	Brown clay and gravel.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.60		04/14/77

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 3 of 3

Borehole/Well Id 0906

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SCREEN: Cook brass, 6", #30 slot, 3' in length. FILTER PACK: Unknown.				
50							GW	Sand and gravel, wet.
								Total Depth = 52.0 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.60		04/14/77

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 3

Drilling Company	Dames and Moore	**Borehole/Well Id**	0907
Drilling Method	Cable Tool	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	596827.04
Date Started		**East (ft)**	1494529.62
Date Completed	4/8/77	**Ground Surface Elev. (ft)**	TBD
Logged By	William Crane	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	50.0
Comments:	Originally Bud's House well; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is limited.			TS	Topsoil.
							GC	Brown clay and gravel.
5				CASING: 6", 47' in length.				
10				BACKFILL: Unknown.				
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	16.20		04/14/77

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 2 of 3

Borehole/Well Id 0907

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Well completion information is limited.			GC	Brown clay and gravel.
25				CASING: 6", 47' in length.				
30				BACKFILL: Unknown.				
							GW	Sand and gravel, wet.
							GC	Brown clay and gravel.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	16.20		04/14/77

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 3 of 3

Borehole/Well Id 0907

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				SCREEN: Cook brass, 6", #20 slot, 3' in length. FILTER PACK: Unknown.			SW	Sand, saturated.
50								Total Depth = 50.0 feet.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	16.20		04/14/77

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0908
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	596273.51
Date Started		**East (ft)**	1494211.76
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Drive-in well; offsite water-supply well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0909
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597064.97
Date Started		**East (ft)**	1493902.09
Date Completed		**Ground Surface Elev. (ft)**	693.90
Logged By	Unk	**Top of Casing Elev. (ft)**	694.88
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Miamisburg Conservation District well.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0912
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	597153.32
Date Started		**East (ft)**	1494716.61
Date Completed		**Ground Surface Elev. (ft)**	708.00 (est.)
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	50.0
Comments:	Originally Miamisburg Production Well #2.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0								Borehole lithology is unknown.
				Well completion information is limited.				
				CASING: Steel, 26".				
5								
				BACKFILL: Unknown.				
10								
				SCREEN: Unknown.				
15								
				FILTER PACK: Unknown.				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.20		04/09/87

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0913
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	599598.99
Date Started		**East (ft)**	1495364.89
Date Completed		**Ground Surface Elev. (ft)**	
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Miamisburg Production Well #3.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0								Borehole lithology is unknown.
				Well completion information is limited.				
				CASING: Steel, 26".				
5								
				BACKFILL: Unknown.				
10								
				SCREEN: Unknown.				
15								
				FILTER PACK: Unknown.				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0918
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	601023.84
Date Started		**East (ft)**	1494148.25
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Miamisburg Production Well #8.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0919
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	600438.60
Date Started		**East (ft)**	1493886.48
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Miamisburg Production Well #9.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0920
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	600796.13
Date Started		**East (ft)**	1494251.45
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Miamisburg Production Well #10.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager	PAGE: 1 of 1

Drilling Company	Unk	**Borehole/Well Id**	0921
Drilling Method	Unk	**STATE PLANE COORDINATES**	
Drilling Fluid	Unk	**North (ft)**	600487.30
Date Started		**East (ft)**	1494369.45
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	Unk	**Top of Casing Elev. (ft)**	TBD
Checked By	Tom Tharp	**Total Depth (ft)**	1.0
Comments:	Originally Miamisburg Production Well #11.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 1

Drilling Company	UNK	**Borehole/Well Id**	0922
Drilling Method	UNK	**STATE PLANE COORDINATES**	
Drilling Fluid	UNK	**North (ft)**	600051.43
Date Started		**East (ft)**	1494269.44
Date Completed		**Ground Surface Elev. (ft)**	TBD
Logged By	UNK	**Top of Casing Elev. (ft)**	TBD
Checked By	P. MIDDLEBROOKS	**Total Depth (ft)**	0.0
Comments:	Originally Miamisburg Production Well # 12.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Well completion information is unknown.				Borehole lithology is unknown.
5								
10								
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 3

Drilling Company	REYNOLDS	**Borehole/Well Id**	0923
Drilling Method	CABLE TOOL	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	600283.66
Date Started	11/27/90	**East (ft)**	1493744.62
Date Completed	11/29/90	**Ground Surface Elev. (ft)**	689.5
Logged By	A. Wells	**Top of Casing Elev. (ft)**	692.17
Checked By	P. MIDDLEBROOKS	**Total Depth (ft)**	51.0
Comments:	Originally CH2M Hill MW-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	C			Concrete Protective casing with locking cap from 2 ft. bgs to 3 ft. ags.			ML	SILT WITH SAND - brown, damp, 80% silt, 10 - 20% sand, trace gravel and clay.
5	C						ML	Similar to above.
10	C						GP	POORLY GRADED GRAVEL WITH SAND - brown, damp, 80% gravel to .75 inches, 20% sand.
15	C			4 inch Schedule 40, flush-threaded, blank PVC casing			GP	Similar to above.
20								

GROUNDWATER

DEPTH	HOUR	DATE
11.50		11/12/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0923

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	C						GP	POORLY GRADED GRAVEL - light brown to tan, wet, subrounded, 90% gravel to 3 inches, 10% coarse sand.
25	C			Bentonite-cement grout, average density of 9.1 lbs/gal.			GP	POORLY GRADED GRAVEL WITH SAND - light brown to tan, wet, subrounded, 70% gravel to .50 inches, 30% coarse sand.
				Bentonite pellets				
30	C						GP	POORLY GRADED GRAVEL - tan, wet, subrounded, 90 - 100% gravel to .50 inches, trace coarse sand.
35	C			4 inch schedule 40, flush-threaded PVC screen, slotted .01			GP	POORLY GRADED GRAVEL WITH SAND - brown, wet, 50% gravel to 1.50 inches, 40% medium sand, 10% coarse sand.
40	C			Sand pack (No. 5 Torpedo Sand)			SP	POORLY GRADED SAND WITH GRAVEL - light grayish-brown, wet, 60% medium sand, 40% gravel to .50 inches.
45	C			Natural fill/formation caving.			SP	Similar to above.

GROUNDWATER

DEPTH	HOUR	DATE
11.50		11/12/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 3 of 3

Borehole/Well Id 0923

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	C						CL	CLAY - brown and gray, wet, 70% brown clay, 15% gray clay balls, 10% gravel to .16 inches, 5% medium sand.
								Total Depth = 51.0 feet. Elevation surveyed for MW-1 were: Top of PVC = 692.17 ft. above NGVO Ground Surface = 689.5 ft. above NGVO
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	11.50		11/12/90
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 1 of 2

Drilling Company	REYNOLDS	**Borehole/Well Id**	0924
Drilling Method	CABLE TOOL	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	600283.66
Date Started	12/3/90	**East (ft)**	1493744.62
Date Completed	12/29/90	**Ground Surface Elev. (ft)**	694.1
Logged By	T. Pezzetti	**Top of Casing Elev. (ft)**	697.01
Checked By	P. MIDDLEBROOKS	**Total Depth (ft)**	33.0
Comments:	Originally CH2M Hill MW-1.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	C			Concrete Protective casing with locking cap from 2 ft. bgs to 3 ft. ags.			TS	TOPSOIL - dark brown, wet, 60% clay, 40% silt.
5	C			4 inch Schedule 40, flush-threaded, blank PVC casing			CL	CLAY - brown, wet, 90% clay, trace silt and fine gravel to .15 inches.
10	C			Bentonite-cement grout, average density of 9.1 lbs/gal.			CL	Similar to above.
15	C			Bentonite pellets			GP	POORLY GRADED GRAVEL WITH SAND - tan to light brown, wet, subangular, 60 - 70% gravel to 2.50 inches, 30 - 40 % coarse sand.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇	13.80		12/04/90
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0924

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	C			4 inch schedule 40, flush-threaded PVC screen, slotted .01			GP	Similar to above.
25	C			Sand pack (No. 5 Torpedo Sand)			GP	Similar to above.
30	C			Natural fill/formation caving.			SP/SM	POORLY GRADED SAND WITH SILT - brown, wet, 80% medium sand, 20% silt and clay, trace coarse sand and gravel.
35				NOTE: Original well was lost during installation. It was subsquently grouted to within 3 ft. of ground surface and plugged with concrete. A new hole was drilled ~3 ft. north of the original hole. The lithology encountered in the new hole did not vary siginificantly, so no changes were made to the log. The diagram shows the well as completed in the second hole at Location B.				Total Depth = 33.0 feet. Elevation surveyed for MW-2 were: Top of PVC = 697.01 ft. above NGVO Ground Surface = 694.1 ft. above NGVO
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
13.80		12/04/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Drilling Company	REYNOLDS	**Borehole/Well Id**	0925
Drilling Method	CABLE TOOL	**STATE PLANE COORDINATES**	
Drilling Fluid	None	**North (ft)**	600798.62
Date Started	11/14/90	**East (ft)**	1493691.91
Date Completed	11/21/90	**Ground Surface Elev. (ft)**	698.30
Logged By	T. Pezzetti	**Top of Casing Elev. (ft)**	701.28
Checked By	P. MIDDLEBROOKS	**Total Depth (ft)**	91.0
Comments:	Originally CH2M Hill MW-3.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	C			Concrete Protective casing with locking cap from 2 ft. bgs to 3 ft. ags.			TS	TOPSOIL - 60% gravel to 1 inch, 5 - 10% very fine sand, 25 - 30% clay.
5	C						TS	Similar to above.
10	C						CL	SANDY CLAY - brown, moderately stiff, 30% very fine sand.
15	C			4 inch Schedule 40, flush-threaded, blank PVC casing			GW	WELL GRADED GRAVEL WITH SAND - light brown, subangular to subrounded, 1.25 to 3 inches, trace cobbles up to 6 inches, 15% medium to fine sand.
20								

GROUNDWATER

DEPTH	HOUR	DATE
13.00		11/14/90

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager John B. Price	PAGE: 2 of 4

Borehole/Well Id 0925

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	C						GW	WELL GRADED GRAVEL WITH SAND - gray to brown, subangular to subrounded, 0.25 to 8 inches, 20 - 25% very coarse to medium sand.
25	C							
30	C			Bentonite-cement grout, average density of 9.1 lbs/gal.			GW	WELL GRADED GRAVEL WITH SAND - gray to brown, subrounded to subangular, gravel from .125 to 8 inches, 20 - 25% medium to very coarse grained sand.
35	C						SW	WELL GRADED SAND WITH GRAVEL - gray to brown, subrounded gravel .125 to 2 inches, 60% medium to very coarse grained sand.
40	C						GP	POORLY GRADED GRAVEL WITH SAND, gray to brown, rounded to subrounded gravel from .125 to 1 inches, 30 - 35% medium to very coarse grained sand.
45	C						GP	Similar to above.

GROUNDWATER

	DEPTH	HOUR	DATE
∇	35.00		11/14/90
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id 0925

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	C						GP	Similar to above.
55	C						SP	POORLY GRADED SAND WITH GRAVEL - light brown, wet, 70 - 80% coarse sand, 20 - 30% subrounded gravel to 1 inch, trace fines.
60	C						SP	POORLY GRADED SAND - brown, wet, 90% coarse sand, 10% gravel to 1 inch.
65	C			Bentonite pellets			GP	POORLY GRADED GRAVEL WITH SAND - brown, wet, subangular to subrounded, 80 - 90% gravel to 1 inch, 10 - 20% coarse sand, trace fines.
70	C						GP	Similar to above.

GROUNDWATER

DEPTH	HOUR	DATE
13.00		11/14/90

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: John B. Price

Borehole/Well Id: 0925

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				4 inch schedule 40, flush-threaded PVC screen, slotted .01				
75	C						SW	WELL GRADED SAND - brown, wet, coarse, 90 - 100% sand, trace gravel and fines.
80	C			Sand pack (No. 5 Torpedo Sand)			GP	POORLY GRADED GRAVEL WITH SAND - gray, wet, 50% coarse sand, 50% gravel to .75 inches.
85	C						SP/SM	POORLY GRADED SAND WITH SILT - brown, wet, 80% coarse sand, 10 - 20% silt, trace clay and gravel.
90								
								Total Depth = 91.0 feet.
								Elevation surveyed for MW-3 were: Top of PVC = 701.28 ft. above NGVO Ground Surface = 698.30 ft. above NGVO
95								

GROUNDWATER

DEPTH	HOUR	DATE
13.00		11/14/90

WESTON