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Environmental Restoration Program

OPERABLE UNIT 9, HYDROGEOLOGIC INVESTIGATION: WELL INFORMATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

January 1994

Technical Memorandum
(Revision 1)

U. S. Department of Energy
Albuquerque Operations Office

Environmental Restoration Program
EG&G Mound Applied Technologies

WESTON
MANAGERS DESIGNERS/CONSULTANTS

REFERENCE USE ONLY

WESTON
MANAGERS DESIGNERS/CONSULTANTS
6501 AMERICAS PARKWAY, N.E.
SUITE 800
ALBUQUERQUE, NM 87110-1517
505-884-5050 • FAX: 505-884-5388

17 January 1994

EG&G Mound Applied Technologies, Inc.
Attention: Mr. Monte Williams, Project Officer
Bldg. OSE-2
P.O. Box 3000
Miamisburg, Ohio 45343-3000

RE: ER Program, Mound Plant
BOA No. 24251
Operable Unit 9, Hydrogeologic Investigation:
Well Information Report RFW WO # 05376-039-001-0500

Dear Mr. Williams:

Enclosed are two copies of Revision 1 of the Operable Unit (OU) 9 Hydrogeological Investigation: Well Information Report. This report contains the boring and well construction logs for monitoring wells and piezometers installed as part of the OU 1 and OU 9 field campaigns. A draft of the report was submitted in June 1993 and received no comments from the regulatory agencies. No milestone date was established for the current revision. Under the terms of the Federal Facility Agreement, this report is a technical memorandum and is considered a secondary document.

Revision 1 changed from the June 1993 draft due to completion of the locational survey. Errors have been corrected in the soil and the USCS rock types, as well as the location and elevation coordinates. A revised map of the Mound Plant groundwater monitoring network is included. The map, summary tables, and the geologic logs report the results of the survey in plant coordinates. Additional tables have been added to the appendix and allow monitoring well and piezometer coordinates to be determined in the common national datums, i.e, North American Datum of 1927 (NAD 27) and North American Datum of 1983 (NAD 83). As also described in the report, care must be taken when comparing or transcribing vertical data points, e.g., groundwater elevations, to ensure that the data are in a common datum. The additional tables provide elevations in National Geodetic Vertical Datum of 1929 (NGVD29) and North American Vertical Datum of 1988 (NAVD 88); all logs report elevations in plant datum.

Because of the large amount of changes, the report is being replaced in its entirety. Please discard the revision 0 version when replacing this report in the existing binders.

At the direction of Art Kleinrath, DOE Dayton Area Office, this progress report is being distributed to the project managers for informational purposes.

If you have any questions regarding this matter, please do not hesitate to call Bill Criswell at (505) 884-5050 or the Alternate Project Manager Mr. John Price at (513) 825-3440.

Sincerely,

ROY F. WESTON, INC.

for William M. Little

John W. Thorsen, P.E.
ER Program, Subcontractor
Project Manager

CWC/gy
Attachments

WMb 1-27-94

MOUND9\M9HID04.LT 01/17/94

RE: ER Program, Mound Plant
BOA No. 24251
Operable Unit 9, Hydrogeologic Investigation:
Well Information Report RFW WO # 05376-039-001-0500

pc w/att:

D. Spencer USEPA Reg. V (4)
J. Smith OEPA (2)
J. Kwasniewski OEPA (1)
P. Mann DOE AL (1)
A. Kleinrath DOE DAO (1)
J. Sands DOE HQ (1)
A. Bray EG&G MAT (2)
J. Rigano EG&G MAT (1)
G. Coons EG&G MAT (1)
R. Stanley EG&G MAT (1)
M. Walsh SAIC (1)
S. Coyle SAIC (1)
E. Brown ICF Kaiser (1)
J. Register IT (1)
B. Huntsman Terran (1)
D. Dumoushelle USGS (1)

Attachments

pc w/att:
D. Mally USEPA Reg. V (3)
D. Spencer USEPA Reg. V (2)
M. Hatcher OEPA (2)
J. Kwasniewki OEPA (1)
P. Mann DOE AL (1)
A. Kleinrath DOE DAO (1)
J. Sands DOE HQ (1)
C. Friedman EG&G-MAT (1)
K. Koehler EG&G-MAT (2)
M. Williams EG&G MAT (2)
J. Rigano EG&G MAT (1)
G. Coons EG&G MAT (1)
R. Stanley EG&G MAT (1)
D. Carfagno EG&G MAT (1)
M. Walsh SAIC (1)
S. Coyle SAIC (1)
E. Brown ICF Kaiser (1)
J. Register IT (1)
B. Huntsman Terran (1)

w/o att: ER Project File

WESTON
MANAGERS DESIGNERS/CONSULTANTS
6501 AMERICAS PARKWAY, N.E.
ALBUQUERQUE, NM 87110-1517
505-884-5050 • FAX: 505-884-5388

11 June 1993

EG&G Mound Applied Technologies, Inc.
Attention: Mr. Charles S. Friedman, Project Officer
Bldg. OSE-2
P.O. Box 3000
Miamisburg, Ohio 45343-3000

RE: ER Program, Mound Plant
BOA No. 24251
Operable Unit 9, Hydrogeologic Investigation Well Information Report
RFW WO # 05376-039-001-0500

Dear Mr. Friedman:

Enclosed is the Draft Operable Unit 9 Remedial Investigation Well Information Report. This report contains the boring and well construction logs for monitoring wells and piezometers recently installed as part of the OU 1 and OU 9 field campaigns. A revised map of monitoring wells and piezometers is included. The map, summary tables in the report, and the geologic logs include results of the recent locational survey of the monitoring well network. Please be advised, however, that the survey data are still being evaluated. Potential errors concerning both the precision and accuracy of the vertical and horizontal control monuments at the Mound Plant may result in significant revisions of the data published in this draft report. We are working to schedule a meeting with your staff to discuss the survey.

This OU 9 Well Information Report is a Federal Facility Agreement (FFA) deliverable. In accordance with the OU 9 schedule dated 21 April 1993, this report is due to the regulatory agencies 14 June 1993. However, the enclosed report is listed in the schedule as a supplement to Volume 2 of the Site Scoping Report. Although the document formats are similar, as you are aware, the OU 9 Well Information Report is a data report for the remedial investigation and is not properly a part of the scoping efforts. The OU 9 Well Information Report is a secondary document under the FFA.

At the direction of Art Kleinrath, DOE Dayton Area Office, this progress report is being distributed to the project managers for informational purposes.

If you have any questions regarding this matter, please do not hesitate to call Bill Criswell at (505) 884-5050 or the Alternate Project Manager, Mr. John Price, at (513) 825-3440.

Sincerely,

ROY F. WESTON, INC.

for Wilh. M. Little

John W. Thorsen, P.E.
ER Program, Subcontractor
Project Manager

CWC/rt

M9WID03.LT 6/11/93

ENVIRONMENTAL RESTORATION PROGRAM

OPERABLE UNIT 9, HYDROGEOLOGICAL INVESTIGATION: WELL INFORMATION REPORT

MOUND PLANT
MIAMISBURG, OHIO

January 1994

U.S. DEPARTMENT OF ENERGY
ALBUQUERQUE OPERATIONS OFFICE

ENVIRONMENTAL RESTORATION PROGRAM
EG&G MOUND APPLIED TECHNOLOGIES

TECHNICAL MEMORANDUM
(REVISION 1)

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Plate 1 Revised Groundwater Monitoring Network

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 Facility 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
OU	Operable Unit
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 Basic Ordering Agreement 24251 to EG&G Mound Applied Technologies, Miamisburg, Ohio.

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 21 November 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 11 October 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.

Under the terms of the FFA, DOE has initiated field work in support of the hydrogeologic characterization of the Site. This work has involved the installation of new monitoring wells and piezometers in accordance with plans described in the Operable Unit 9 Site-Wide Work Plan [Final] (DOE 1992b) and the Operable Unit 1 Proposal For Additional Work [Final] (DOE 1992c).

2. SCOPE OF WELL INFORMATION REPORT

This report presents a location map (Plate 1) and well construction and borehole lithology details for monitoring wells and piezometers installed on and adjacent to Mound Plant as part of the ongoing remedial investigations. New monitoring wells and piezometers were installed under Operable Unit (OU) 1 and OU 9. As part of the OU 9 investigations, a complete location and elevational survey was conducted of all new wells and piezometers and some existing monitoring wells. This report includes the new survey data for new and existing monitoring wells. An operational assessment of the accuracy of the survey data is included.

Additional geologic and lithologic information for Mound Plant can be found in the Site Scoping Report: Volume 2 Addendum - Stratigraphic and Lithologic Logs (DOE 1993), which contains a compilation of borehole logs performed as part of plant engineering, planning, and foundation studies. Well construction details for municipal, production and other monitoring wells not included in this report can be found in the Site Scoping Report: Volume 2 - Geologic Log and Well Information Report (DOE 1992a).

3. ER PROGRAM GROUNDWATER MONITORING NETWORK

The environmental monitoring network at Mound Plant consists of municipal, domestic, plant supply and monitoring wells installed on and adjacent to the plant. A comprehensive review of the monitoring wells on and adjacent to Mound Plant is beyond the scope of this report. Details of the history and construction of wells within this network are provided, where known, in the Site Scoping Report: Volume 2 - Geologic Log and Well Information Report (DOE 1992a). An update of new information on existing wells is summarized in Subsection 6 below.

Under OU 1, 15 new monitoring wells and 12 piezometers were installed from 19 October 1992 through 10 March 1993. All of these constructions were developed and are currently in service. A typical monitoring well construction is shown in Figure 3.1. The technical specifications are provided below. Detailed logs are provided in Appendix A. In addition to the wells and piezometers, two exploratory soil borings were installed and grouted afterward. Borehole B001 comprised a single boring. Boreholes B002 and B003 together comprise a single boring as described in the logs (Appendix A). During evaluation of data for this report, it was discovered that one of the OU 1 monitoring wells proposed had the same number as an older, unused monitoring well. The proposed well 0371 (DOE 1992c) is actually known as 0397 and is reported in this document as such. Future references to new well 0397 should state that this was originally proposed as 0371.

Under OU 9, 36 new monitoring wells and 27 piezometers were installed from 4 January to 2 May 1993. Not all of these constructions could be developed and some are not currently in service. Additional efforts are being initiated to facilitate development. The technical specifications are provided below. Detailed logs are provided in Appendix A. In addition to the wells and piezometers, two exploratory soil borings, designated 0384 and 0396, were installed and grouted. In addition, five bedrock coreholes (0348, 0349, 0350, 0352 and 0355), originally planned to be completed as monitoring wells, were left, at this writing, as open boreholes to monitor water levels in the deep bedrock.

4. WELL DESIGNATIONS

A four-digit location code is provided for each monitoring well and piezometer, as described in the field sampling plans (DOE 1992b, c). The well construction logs (Appendix A) are arranged numerically according to the location codes. For sampling handling and data management, the location codes are used in conjunction with descriptor code prefixes. The descriptor codes are not used in this report, as the four-digit location codes are unique to each well or piezometer. Additional information is available in the OU 9 Field Sampling Plan (DOE 1992b), the OU 1 Proposal For Additional Work (DOE 1992c) and the Site Scoping Report: Volume 2 - Geologic Log and Well Information Report (DOE 1992a).

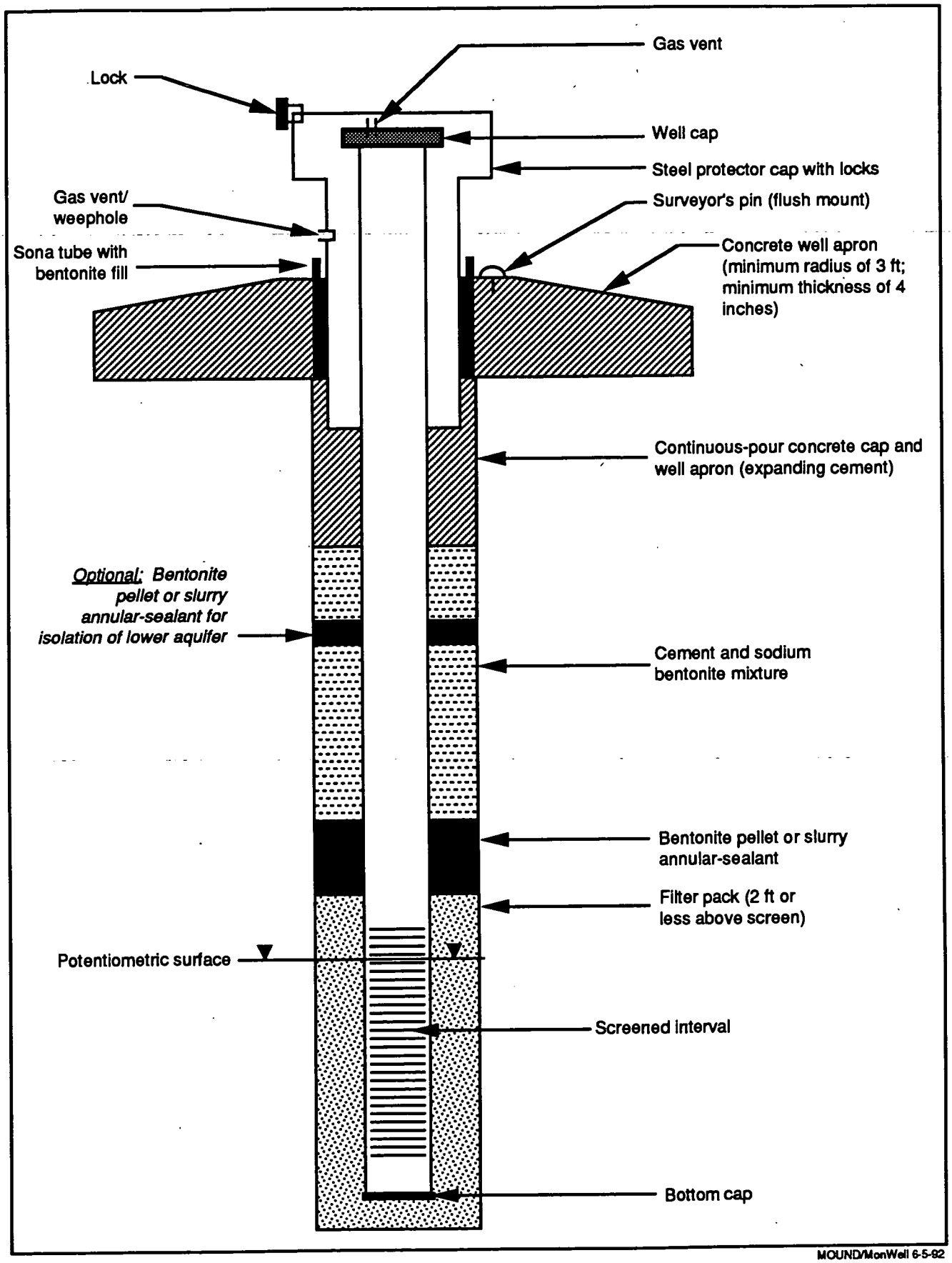


Figure 3.1. Well construction diagram.

Letter codes are used to designate installations other than monitoring wells. Exploratory soil borings installed by OU 1 are designated with the prefix "B" followed by a three-digit location identifier. All piezometers in OU 1 or OU 9 are designated by the prefix "P" followed by a three-digit location code. Soil borings conducted during the OU 9 investigations do not have the "B" designations, but follow the conventional monitoring well scheme of four-digit codes.

5. WELL LOCATIONS AND SPECIFICATIONS

Plate 1 depicts the locations of all currently known monitoring wells and piezometers at Mound Plant. This includes the new monitoring wells and piezometers installed under OU 1 and OU 9 and any existing wells still in service. Wells taken out of service or abandoned, or those that could not be located during the survey, have been eliminated from the map.

The map was generated in electronic data format from data compiled by Woolpert Consultants, Inc., Dayton, Ohio, from color aerial photographs taken on 8 December 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. The approximate locations of nonsurveyed wells are also plotted on Plate 1 (DOE 1992a).

All of the new monitoring wells and piezometers and most of the existing monitoring wells were surveyed by a contractor licensed in the state of Ohio. Significant errors in the locations and casing elevations were noted for some wells in the Operable Unit 9 Site-Wide Work Plan (DOE 1992b). As a result, all monitoring wells currently in use by the Mound Plant ER Program were resurveyed as part of the OU 9 hydrogeologic investigations.

Evaluation of the new survey indicates that it is more credible than any of the previous control surveys. It uses a combination of Global Positioning System surveys and short traverses to determine the horizontal coordinates used. Network redundancy provides a high degree of internal precision. The horizontal coordinates were recorded in North American Datum of 1983 (NAD 83) and converted to North American Datum of 1927 (NAD 27) using a program called NADCON. This program uses a mathematical model that should be accurate to within 0.5 ft at the 67 percent confidence level and is probably much better. Any two adjacent points should not have a relative error greater than 1:20,000.

Inspection of the horizontal coordinates, however, reveals that the Mound Plant control monuments are poorly located in respect to the national datums available. Errors in horizontal distances appear to

include a coordinate shift of approximately 400 ft and random errors of about 20 ft. The Mound Plant control monuments used in the ER Program basemaps are those provided by the Boundary Survey for Mound Facilities (1982) published in the Site Scoping Report: Volume 4 - Engineering Map Series (DOE 1992d). In order to depict the monitoring well and piezometer network on the Mound Plant basemap, the horizontal coordinates were transformed to the plant datum using an affine transformation program. Selected wells were used as control points for the transformation because many more points are available. The root-means-squared error of the affine transformation is 1 ft. It is estimated that the transformed coordinates vary from true coordinates by less than 2 ft 95 percent of the time. At a mapping scale of 1" = 200', this is about 0.01 inch, and well within the National Map Accuracy Standards.

For the vertical leveling, the surveyor used National Geodetic Survey benchmarks (G139, H139 and J139 Reset 1990) for reference points and a combination of differential leveling and vertical angles. Based on the survey, the benchmarks appear to be stable and represent the best local value for the national vertical datum. However, the leveling performed indicates that the Mound Plant control monuments do not reflect either National Geodetic Vertical Datum of 1929 (NGVD 29) or North American Vertical Datum of 1988 (NAVD 88). The Mound Plant control monuments are approximately 1.15 ft higher than NGVD 29 and 1.77 ft higher than NVAD 88. Additionally, the monuments apparently installed as part of the 1982 boundary survey appear less accurate than the older monuments installed in the 1940s. The surveyor noted that the newer monuments should be avoided altogether for precise leveling requirements. In order to reconcile vertical elevations of the monitoring well and piezometer network to the existing Mound Plant basemap, 1.15 ft must be added to coordinates reported in the NGVD 29 datum and 1.77 ft added to coordinates reported in the NAVD 88 datum.

Plate 1 and the logs in the appendices report horizontal and vertical coordinates of the Mound Plant monitoring wells and piezometers in the plant datum. This datum is in error against the national standards as discussed above, but is currently the only detailed base map available. Since the Mound Plant basemap may be revised and updated sometime in the future, Tables D.1 and D.2 in Appendix D report horizontal and vertical coordinates in NAD 83/NAVD 88 and NAD 27/NGVD 29. These tables must be used to properly determine coordinates of Mound Plant monitoring wells within a national datum.

6. TECHNICAL WELL INFORMATION

Tables VI.1 and VI.2 present summaries of the new monitoring wells and piezometers, respectively. These summaries include both OU 1 and OU 9 installations. Complete well and piezometer completion

Table VI.1. Well Information Summary of Monitoring Wells

NEWWELL8.WK1

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)
0322	598865.46	1497201.16	809.84	55.00	8.00	811.61	57.00	4.00	45.00	10.00
0323	597941.22	1495591.01	786.12	20.00	8.00	785.65	18.00	4.00	8.00	5.00
0324	597926.59	1495701.00	784.87	25.00	8.00	784.69	20.00	4.00	15.00	5.00
0325	597270.67	1496570.83	796.96	30.00	8.00	798.89	32.00	4.00	20.00	10.00
0326	597365.17	1497091.18	875.52	33.00	8.00	877.58	35.00	4.00	23.00	10.00
0327	601687.99	1495166.93	698.69	25.00	8.00	698.31	25.00	4.00	15.00	10.00
0328	601695.63	1495166.40	698.65	116.00	8.00	698.57	111.00	4.00	101.00	10.00
0329	601231.83	1496413.66	707.95	23.00	8.00	707.51	22.00	4.00	17.00	10.00
0330	601230.60	1496422.12	707.97	175.00	8.00	707.43	166.00	4.00	156.00	10.00
0332	599505.71	1497447.41	794.32	35.00	8.00	793.88	32.00	4.00	22.00	10.00
0333	600547.19	1494851.90	700.34	165.00	8.00	699.55	75.00	4.00	65.00	10.00
0334	600540.81	1494850.09	700.50	29.00	8.00	700.27	29.00	4.00	19.00	10.00
0335	598844.46	1494824.78	705.92	81.00	8.00	705.43	53.47	4.00	48.56	4.58
0336	600380.42	1496202.19	710.23	130.00	8.00	710.03	114.00	4.00	104.00	10.00
0337	600372.79	1496201.85	710.10	37.00	8.00	709.74	37.00	4.00	27.00	10.00
0340	597650.90	1494723.50	706.27	40.00	8.00	706.17	16.00	4.00	11.00	10.00
0341	597650.38	1494728.37	706.40	55.00	8.00	705.99	55.00	4.00	45.00	10.00
0342	596168.63	1494550.20	692.49	163.00	8.00	692.35	160.00	4.00	150.00	10.00
0343	597140.04	1494485.25	696.70	105.00	8.00	696.56	89.00	4.00	84.00	5.00
0344	595521.96	1495145.72	701.38	175.50	8.00	702.98	177.50	4.00	165.50	10.00
0345	597625.59	1496496.46	753.80	45.00	8.00	756.09	42.00	4.00	37.00	5.00
0346	597626.90	1496107.04	745.31	53.00	8.00	744.69	46.00	4.00	41.00	5.00
0347	597375.07	1495092.49	724.89	73.00	8.00	726.99	69.00	4.00	57.00	10.00
0351	596433.35	1497050.28	886.89	20.00	8.00	888.28	22.00	4.00	10.00	10.00
0353	596241.80	1495668.78	744.95	18.00	8.00	747.07	20.00	4.00	13.00	5.00
0354	595602.10	1496322.15	767.95	23.00	8.00	771.01	24.94	4.00	13.00	10.00
0356	595011.45	1495353.58	704.07	182.00	8.00	706.24	184.00	4.00	172.00	10.00
0370	596829.64	1495100.73	718.23	50.00	8.00	720.28	40.00	4.00	30.00	10.00
0371	596702.12	1495024.40	707.45	30.00	8.00	709.27	30.00	4.00	20.00	10.00
0372	596693.75	1495331.22	754.93	62.00	8.00	756.46	62.00	4.00	52.40	10.00

Table VI.1. (page 2 of 2)

NEWWELLS.WK1

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)
0373	596690.56	1495128.52	737.77	65.00	8.00	740.50	63.00	4.00	53.40	10.00
0374	596559.25	1495123.53	706.19	35.00	8.00	708.10	29.00	4.00	19.00	10.00
0375	597074.08	1494980.33	705.20	35.00	8.00	707.25	27.00	4.00	17.00	10.00
0376	596696.75	1494760.63	700.19	25.20	8.00	701.89	25.20	4.00	15.20	10.00
0377	596522.25	1494774.87	699.40	25.00	8.00	701.02	25.00	4.00	14.90	10.00
0378	596376.63	1494789.86	700.06	25.00	8.00	701.61	23.00	4.00	13.30	10.00
0379	597179.70	1495153.92	716.38	40.00	8.00	718.06	40.00	4.00	30.00	10.00
0380	597109.65	1495394.52	725.02	62.00	8.00	727.10	61.00	4.00	51.40	10.00
0381	596982.13	1495399.69	725.26	37.00	8.00	727.85	37.00	4.00	27.40	10.00
0382	596601.67	1495444.40	738.25	35.00	8.00	740.50	35.00	4.00	25.40	10.00
0383	597138.34	1494477.15	696.39	30.00	8.00	696.20	29.00	4.00	19.00	10.00
0385	597628.33	1494975.13	725.61	40.00	8.00	724.88	26.00	4.00	21.00	5.00
0386	597345.22	1494953.59	726.82	88.00	8.00	726.57	87.00	4.00	77.00	10.00
0387	597210.50	1494897.38	722.82	82.00	8.00	722.70	82.00	4.00	77.00	5.00
0388	596793.37	1494747.75	700.35	60.00	8.00	702.88	32.00	4.00	19.60	10.00
0389	597337.46	1494949.43	726.66	52.00	8.00	726.44	52.00	4.00	42.00	10.00
0390	597329.69	1494945.87	726.54	35.00	8.00	726.37	35.00	4.00	25.00	10.00
0392	597204.85	1494896.11	722.79	45.00	8.00	722.65	45.00	4.00	40.00	5.00
0393	596694.53	1495024.89	706.79	50.00	8.00	708.65	49.00	4.00	43.70	5.00
0394	596489.48	1495003.44	703.38	65.00	8.00	705.08	59.00	4.00	54.00	5.00
0395	598433.07	1496869.76	803.25	95.00	8.00	802.94	70.00	4.00	60.00	10.00

Table VI.2. Well Information Summary of Piezometers

PIEZ.WK1

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)
P001	596826.14	1495086.63	717.71	50.00	6.00	719.48	44.90	2.00	34.90	10.00
P002	596827.93	1495092.65	717.71	63.00	6.00	719.47	62.74	2.00	60.04	2.70
P003	596707.87	1495024.47	705.87	39.00	6.00	709.28	34.00	2.00	24.00	10.00
P004	596687.67	1495330.25	754.30	63.50	6.00	756.31	62.20	2.00	52.20	10.00
P005	596695.30	1495128.04	738.77	67.00	6.00	740.44	62.90	2.00	52.90	10.00
P006	596559.47	1495115.86	705.87	35.00	6.00	707.78	31.80	2.00	21.80	10.00
P007	597073.36	1494987.45	705.35	40.00	6.00	707.51	30.90	2.00	20.90	10.00
P008	596683.60	1494765.46	700.45	61.00	6.00	702.29	25.00	2.00	15.00	10.00
P009	596530.19	1494774.76	699.58	81.00	6.00	701.72	57.00	2.00	54.30	2.70
P013	596370.54	1494790.87	699.49	110.00	6.00	701.64	24.00	2.00	14.00	10.00
P014	597187.84	1495159.35	716.49	45.00	6.00	719.10	40.60	2.00	30.60	10.00
P015	596352.10	1495271.70	734.99	57.00	6.00	737.52	55.00	2.00	45.00	10.00
P016	597036.29	1493364.46	689.09	20.00	6.00	689.03	20.00	2.00	14.50	5.00
P017	596476.71	1493381.03	690.49	25.00	6.00	690.48	25.00	2.00	20.00	5.00
P018	596493.74	1494322.63	692.58	160.00	6.00	692.28	19.00	2.00	14.00	5.00
P019	597930.12	1493017.44	690.47	11.00	6.00	690.31	11.00	2.00	6.00	5.00
P020	597151.54	1492952.37	691.26	15.00	6.00	690.86	17.00	2.00	10.00	5.00
P021	597693.93	1496001.61	745.43	33.00	6.00	747.51	31.00	2.00	26.00	5.00
P022	597536.53	1495316.65	730.66	70.00	6.00	730.69	70.00	2.00	60.00	10.00
P023	597529.54	1495319.45	730.39	47.00	6.00	730.41	47.00	2.00	42.00	5.00
P024	597162.02	1495644.22	741.60	43.00	6.00	744.18	40.00	2.00	35.00	5.00
P025	596238.43	1494979.56	703.77	25.00	6.00	703.77	24.00	2.00	19.00	5.00
P026	597182.81	1494719.96	705.87	150.00	6.00	705.63	83.00	2.00	78.00	5.00
P027	596249.25	1495078.43	703.39	40.00	6.00	705.72	37.00	2.00	30.00	5.00
P028	596075.26	1494969.93	709.73	30.00	6.00	711.98	28.00	2.00	23.00	5.00
P029	595915.09	1494820.62	701.65	28.00	6.00	703.75	28.00	2.00	23.00	5.00
P030	595909.84	1494821.45	701.65	176.00	6.00	703.93	89.00	2.00	82.00	5.00
P031	596023.27	1495119.06	700.97	35.00	6.00	703.35	32.00	2.00	25.00	5.00
P032	595682.77	1495043.91	707.60	35.00	6.00	709.55	34.00	2.00	29.00	5.00
P033	595763.48	1495292.80	701.73	115.00	6.00	704.20	27.00	2.00	20.00	5.00

Table VI.2. (page 2 of 2)

PIEZ.WK1

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)
P034	595669.77	1494661.74	691.22	20.00	6.00	691.00	17.70	2.00	12.70	5.00
P035	597895.71	1493480.31	688.16	25.00	6.00	688.05	25.00	2.00	20.00	5.00
P036	597912.82	1493479.50	688.14	60.00	6.00	688.35	55.00	2.00	50.00	5.00
P037	597905.00	1493483.00	688.43	85.00	6.00	688.28	85.00	2.00	80.00	5.00
P038	597900.80	1493475.39	687.88	103.00	6.00	687.87	98.00	2.00	93.00	5.00
P039	595092.39	1493740.18	689.35	20.00	6.00	689.22	20.00	2.00	15.00	5.00
P040	595089.24	1493748.05	689.41	42.00	6.00	689.01	42.00	2.00	37.00	5.00
P041	595085.05	1493736.19	689.30	52.00	6.00	689.08	52.00	2.00	47.00	5.00
P042	595080.86	1493743.77	689.15	68.50	6.00	689.13	68.50	2.00	63.50	5.00

and construction details are given in Appendix A. Horizontal coordinates and elevations are given in plant datum.

Table VI.3 presents updated information for existing monitoring wells obtained during the current phase of the OU 9 hydrogeologic investigations. Horizontal coordinates and elevations are given in plant datum. Wells 0001, 0002, 0003, 0004, 0006, 0008, 0055, and 0122 were properly abandoned during the 1992 to 1993 field campaigns and no longer exist. Older wells 0035 and 0052 (DOE 1992a) could not be located during the survey and are assumed to have been abandoned at an earlier but unknown date. Details on other monitoring, domestic or municipal wells not included in Table II.3 remained unchanged from data provided in the Site Scoping Report: Volume 2 - Geologic Log and Well Information Report (DOE 1992a).

7. LOG REPORT SPECIFICATIONS

Appendix A of this report presents computerized, graphical representations of well construction details, borehole lithologies, and sampling information. Figure 7.1 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. Total depth is also a numeric field but requires the input of a positive numeric value. The drilling company, drilling method, drilling fluid, ground surface elevation, top of casing elevation, and logged by fields are character fields. Elevations are currently recorded in plant datum. 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 six sample types:

    SS - split spoon
    C - auger or rotary cuttings

Table VI.3. Well Information Summary of Existing Wells

OLD WELLS.WK1

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–TOC)	Casing Diameter (Inches)	Depth to Top of Screen	Screened Interval (FT)
0005	597110.75	1494205.19	692.51	60.00	–	694.13	55.50	3.00	53.50	2.00
0007	597079.87	1493605.72	693.95	94.80	–	696.23	80.00	2.00	78.00	2.00
0020	597829.62	1495207.61	748.46	40.00	–	750.95	42.00	2.00	40.00	2.00
0028	598108.72	1495264.28	786.14	19.00	–	788.61	19.00	2.00	17.00	2.00
0033	597967.49	1496503.49	775.28	33.50	–	778.51	33.50	3.00	31.50	2.00
0042	597834.49	1496351.36	762.97	25.00	–	764.05	–	–	–	–
0046	597074.65	1495004.51	706.25	45.00	8.00	708.61	–	–	29.00	3.00
0063	596573.68	1495055.91	704.87	45.00	–	707.41	37.00	8.00	34.00	3.00
0071(1)	596424.29	1494997.59	704.77	53.50	26.00	–	53.50	26.00	44.00	9.50
0076(1)	595832.03	1495095.83	704.77	64.00	–	–	64.00	26.00	47.00	15.00
0106	597106.77	1493904.02	693.95	50.00	–	695.63	50.00	2.00	48.00	2.00
0108	597014.16	1493252.30	687.23	22.00	–	690.04	22.00	2.00	20.00	2.00
0111	597970.72	1496733.76	779.31	67.00	8.00	780.79	67.00	4.00	57.00	10.00
0112	597974.29	1496515.90	774.05	35.50	8.00	775.61	37.00	4.00	35.50	10.00
0113	599083.16	1495916.58	875.81	58.00	8.00	875.07	55.70	4.00	52.25	3.00
0114	598615.69	1495593.29	874.38	55.00	8.00	873.91	53.00	4.00	49.50	3.00
0115	598602.38	1495604.15	874.50	42.00	8.00	874.07	41.50	4.00	30.50	9.50
0116	598607.41	1495599.68	874.38	89.00	8.00	873.43	80.50	4.00	69.80	10.00
0117	598073.89	1495765.36	802.39	17.50	8.00	803.59	15.50	2.00	5.50	10.00
0118	600088.12	1495735.50	707.10	41.50	8.00	706.71	40.63	4.00	30.63	10.00
0119	597543.93	1495848.91	741.97	43.00	8.00	743.18	42.68	4.00	32.68	10.00
0120	598125.35	1495747.04	821.62	33.00	8.00	822.80	32.20	2.00	20.50	10.00
0121	597999.85	1497792.97	887.50	111.50	8.00	889.27	109.00	4.00	95.50	10.00
0122	597637.00	1495225.06	742.15	41.00	8.00	744.12	40.50	4.00	31.50	10.00
0123	597471.08	1494745.82	705.35	61.00	9.00	706.87	56.50	4.00	50.00	6.00
0124	597345.57	1494710.93	705.28	55.50	8.00	706.92	55.00	4.00	45.00	10.00
0125	597319.87	1495388.82	721.80	34.00	8.00	723.24	32.78	4.00	22.50	10.00
0126	597159.58	1494700.09	705.81	60.50	8.00	707.35	53.83	4.00	43.83	10.00
0127	597116.92	1493915.42	693.93	25.70	8.00	695.89	25.00	4.00	15.00	10.00
0128	597105.98	1493916.75	693.64	55.60	8.00	695.43	55.00	4.00	45.00	10.00

Table VI.3. (page 2 of 3)

OLD WELLS.WK1

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–TOC)	Casing Diameter (Inches)	Depth to Top of Screen	Screened Interval (FT)
0129	596836.77	1494665.33	701.90	41.50	8.00	701.26	41.00	4.00	31.00	10.00
0130	596460.03	1493662.34	694.75	35.50	8.00	693.83	34.71	4.00	24.71	10.00
0137	597337.47	1495070.12	723.27	75.00	–	725.43	75.00	3.00	73.00	2.00
0138	599681.13	1495320.80	700.35	41.50	4.00	699.60	41.00	4.00	31.00	10.00
0151	597273.77	1495544.31	739.87	48.80	8.00	742.38	48.80	4.00	17.50	31.30
0152	596986.30	1494954.07	704.62	47.00	8.00	706.71	47.00	4.00	27.00	20.00
0153	596692.39	1494952.09	703.62	41.50	9.00	705.87	41.50	4.00	21.50	20.00
0154	596418.69	1494969.81	702.93	53.50	8.00	704.44	47.00	4.00	37.00	10.00
0155(1)	596407.73	1494971.57	704.57	32.70	8.00	706.05	32.70	4.00	22.70	10.00
0156	596183.82	1494547.14	692.56	36.50	4.00	691.68	36.23	4.00	26.23	10.00
0157	596173.53	1494548.21	692.66	61.80	8.00	692.07	61.80	4.00	51.80	10.00
0158	594037.32	1495277.53	702.05	39.20	8.00	703.83	39.00	4.00	29.00	10.00
0159	594038.51	1494169.57	691.54	32.00	8.00	690.79	31.00	4.00	21.00	10.00
0160	594049.08	1494168.42	691.61	50.20	8.00	691.17	50.20	4.00	40.20	10.00
0271(1)	596106.85	1495048.14	704.77	60.00	–	–	59.00	26.00	43.00	16.00
0301	597872.00	1494178.20	694.76	88.00	8.00	694.25	86.20	4.00	75.50	10.00
0302	597099.47	1493921.81	693.62	120.60	8.00	692.73	120.00	4.00	109.50	10.00
0303	597134.54	1494493.75	696.89	93.50	8.00	696.55	89.00	4.00	78.50	10.00
0304	596179.38	1494546.74	692.49	103.90	8.00	691.85	102.00	4.00	91.00	10.00
0305	596494.00	1495083.91	709.61	40.50	8.00	711.63	39.20	4.00	33.70	5.00
0306	596673.28	1494951.13	703.71	41.00	8.00	705.90	40.00	4.00	34.40	5.00
0307	596848.92	1495024.17	716.39	52.00	8.00	717.93	51.00	4.00	45.50	5.00
0308	596647.02	1495223.33	749.51	68.60	8.00	752.13	67.60	4.00	63.00	4.00
0309	596503.70	1495097.74	710.04	53.10	8.00	712.03	50.20	4.00	45.70	5.00
0310	596683.15	1494951.55	703.58	54.80	8.00	705.43	54.70	4.00	49.20	5.00
0311	597872.58	1494186.02	695.19	35.00	8.00	694.75	32.20	4.00	21.20	9.30
0312	597747.67	1495031.74	731.04	33.60	8.00	733.07	32.40	4.00	21.80	10.00
0313	596850.42	1495021.50	715.80	41.50	8.00	717.89	40.00	4.00	34.50	5.00
0314	597414.24	1495712.96	742.77	44.80	8.00	744.48	43.50	4.00	33.00	10.00
0315	597341.80	1495078.77	723.58	55.60	8.00	725.80	54.00	4.00	43.40	10.00

Table VI.3. (page 3 of 3)

OLD WELLS.WK1

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–TOC)	Casing Diameter (Inches)	Depth to Top of Screen	Screened Interval (FT)
0316	597110.33	1495384.20	724.61	45.00	8.00	726.88	37.60	4.00	22.20	10.00
0317	596207.32	1495022.91	703.50	63.50	4.00	705.37	61.30	4.00	50.80	10.00
0318	598644.24	1497216.04	809.97	30.30	8.00	812.30	28.80	4.00	18.30	10.00
0319	595512.74	1495147.81	701.44	95.00	8.00	703.21	53.30	4.00	42.80	10.00
0320	595022.59	1495353.77	704.16	117.00	8.00	706.05	42.40	4.00	31.90	10.00

(1) – Locations and elevations not available, values noted from Site Scoping Report : Volume 2 – Geologic Log and Well Information Report (DOE 1992b).

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 7.1. 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 7.1. 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 7.1. 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

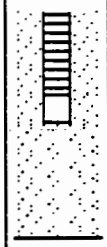
DEPTH	HOUR	DATE
20.95	10:55	09/19/89
13.12	09:17	09/20/90

WESTON

Figure 7.1. 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

Figure 7.1. Typical geologic and well information log report (page 5 of 5).

DU - Dames and Moore U-type sampler
ST - Shelby tube
RC - rock core
O - continuous core (rotosonic core)

- **A column:** Sample analysis. A letter code illustrates the type of analysis performed on each sample. There are eight 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
  GC - geochemical parameters (investigation specific)

- **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 VII.1).

- **Lith (Lithology):** A scaled illustration of lithologic types encountered during drilling using representative pattern graphics (Table VII.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 7.2) (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 types) 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 VII.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

Table VII.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 VII.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
ST	Siltstone
ST-SH	Interbedded siltstone and shale
ST-LS	Interbedded siltstone and limestone
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 7.2. Unified Soil Classification System chart (Waterways Equipment Station 1953).

"CL" can represent lithology patterns that symbolize clay, silty clay, sandy clay, or gravelly clay (Table VII.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. They are traditionally 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.

8. REFERENCES

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DOE. 1993. "Site Scoping Report: Volume 2 Addendum - Stratigraphic and Lithologic Logs [Final]." U.S. Department of Energy, Albuquerque Field Office, Albuquerque, New Mexico. April 1993.

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Kollmorgen. 1985. "Munsell Soil Color Charts." MacBeth Division of Kollmorgen Corporation, Baltimore, Maryland.

Waterways Equipment Station. 1953. Technical Memorandum No. 3-357, prepared for Office, Chief of Engineers, by Waterways Equipment Station, Vicksburg, Mississippi. March 1953.

APPENDIX A

GEOLOGIC LOGS OF MONITORING WELLS

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0322
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	598865.46
Date Started	3/30/93	East (ft)	1497201.16
Date Completed	4/1/93	Ground Surface Elev. (ft)	809.84
Logged By	DALE FLORES	Top of Casing Elev. (ft)	811.61
Checked By	PAUL DARR	Total Depth (ft)	55.0
Comments:	West of gate 8 and north of asphalt lined pond.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	B	GC	0005	Casing: Stainless steel, 4"			TS	0.0 to 0.6" - Dark yellowish brown (10Y 4/2) sandy silt, moist. Topsoil.
							FL	0.5 to 2.0' - Light olive (5Y 3/2) silty clay, trace brown staining, stiff, ~20% angular limestone clasts, slightly moist. Probable fill. 2.0 to 4.0' - Moderate yellow brown (10YR 5/4) silty, sandy gravel, trace of olive clay, 20% angular to subangular gravel 7" maximum size. Probable fill. 4.0 to 8.0' - Variegated from moderate olive brown (5Y 4/4) to moderate yellow brown (10YR 5/4) gravelly clayey silt, dense, ~10% angular gravel, dry to slightly moist. Probably fill.
				Backfill: Cement - bentonite grout				
5	B	GC	0006					
								8.0 to 10.0' - Dark yellow brown (10YR 5/4) sandy silt, trace of angular gravel up to 2", dense, piece of concrete at 10', slightly moist to moist, slight petroleum odor. Fill.
10	B	GC	0012				ML	10.0 to 12.0' - Greenish black (5GY 2/1) clayey silt, trace gravel, moderate plasticity, moist, slight petroleum odor. Probable old topsoil.
							ML	12.0 to 15.0' - Moderate yellow brown (10YR 5/4) sandy silt, non-plastic, moist. Outwash.
15	B	GC	0020				TI	15.0 to 20.0' - Moderate yellow brown (10YR 5/4) sandy silt, ~10% angular to subangular to 1", stiff, moist. Sandy till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	49.20	12:32	03/31/93
▽	26.67	16:38	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0322

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0025				TI	20.0 to 42.5' - Olive gray (5Y 3/2) sandy silt, ~10% angular to subangular gravels to 1", slightly moist to moist. Sandy till.
25	B	GC	0030					
30	B	GC	0035					
35	B	GC	0040					
40	B	GC	0045	Seal: 1/4" Bentonite chips				
				Filter Pack: 10/20 Colorado silica sand			SH	42.5 to 55.0' - Medium gray (N4) silty fissile shale, thin (1/2 - 1") interbeds of fossiliferous limestone, dry, crumbly.
45	B	GC	0050					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	49.20	12:32	03/31/93
▼	26.67	16:38	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id 0322

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Screen: Stainless steel, 4", slot # 16				
50								
55				Backfill: Collapsed borehole material				Total Depth = 55.0'.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	49.20	12:32	03/31/93
▼	26.67	16:38	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0323
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597941.22
Date Started	2/6/93	East (ft)	1495591.01
Date Completed	2/7/93	Ground Surface Elev. (ft)	786.12
Logged By	DALE FLORES	Top of Casing Elev. (ft)	785.65
Checked By	PAUL DARR	Total Depth (ft)	20.0
Comments:	Main Hill thru Guard Post 5, southwest of WD building.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 0.5' - 2" Asphalt on top of 4" of gravel road base material. 0.5 to 8.5' - Variegated colors from light olive gray (5y 6/1) to greenish black (5GY 2/1) gravelly clay, ~40% gravel and debris, debris includes wood chips, brick pieces, moist. Fill.
	B	GC	0005	Backfill: Cement - bentonite grout				
	B	GC	1005					
5								
	B	GC	0010					8.5 to 10.0' - Light olive gray (5Y 6/1) silty clay, very dense, pieces of asphalt, limestone clasts to 6", dry to slightly moist. Fill.
10				Seal: 1/4" Bentonite chips			SH	10.0 to 16.0' - Light olive gray (5Y 6/1) silty shale with thin calcareous shale lenses and micritic to fossiliferous limestone, dry. Weathered bedrock. Color change at 12.5' to pale olive (10Y 6/2) and light olive brown (5Y 5/6).
	B	GC	0015	Filter Pack: 10/20 Colorado silica sand				
				Screen: Stainless steel, 4", slot # 10				
15	B	GC	0020					16.0 to 18.0' - Medium bluish gray (5B 5/1) to olive gray (5Y 4/1), silty shale with thin beds of calcareous shale and micritic to fossiliferous limestone, moist to wet between interval 16.0 and 17.0'. Weathered bedrock. 18.0 to 20.0' - Medium gray (N5), silty shale with thin fossiliferous limestone, dry. Unweathered bedrock.
				Backfill: Collapsed borehole material				Total Depth = 20.0'.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.19	10:24	02/07/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0324
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597926.59
Date Started	2/7/93	East (ft)	1495701.00
Date Completed	2/8/93	Ground Surface Elev. (ft)	784.87
Logged By	DALE FLORES	Top of Casing Elev. (ft)	784.69
Checked By	PAUL DARR	Total Depth (ft)	25.0
Comments:	S.E. of WD building, completed as a flush mount in road way.		

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 - bentonite grout			FL	0.0 to 0.5' - 3" thick asphalt ~3" thick road gravel. Fill. 0.5 to 1.0' - Moderately yellow brown (10YR 4/2) sandy gravel, ~50% coarse sand, ~50% gravels to 1.5", moist. Fill.
	B	GC	0005				ML	1.0 to 6.0' - Moderately olive brown (5Y 4/4) sandy silt, micritic limestone lenses, silt matrix slightly fissile, dry to slightly moist. Weathered bedrock.
5								
	B	GC	0010				CL	6.0 to 11.5' - Dark greenish gray (5G 4/7) weathered clay, dense, medium to high plasticity, clast of limestone to 4", calcareous shale lenses, very moist. Weathered bedrock.
10	B	GC	0015	Seal: 1/4" Bentonite chips				11.5 to 12.0' - Dark greenish gray (5G 4/1) silty clay, trace gravel, low to moderate plasticity, moist. Weathered bedrock. 12.0 to 13.0' - Dark greenish gray (5G 4/1) gravelly clay, 40% gravel to 1", moist to wet. Weathered bedrock.
15	B	GC	0020	Filter Pack: 10/20 Colorado silica sand; Screen: Stainless steel, 4", slot # 10			ML	13.0 to 20.5' - Moderately olive brown (5Y 4/4) sandy silt, micritic limestone lenses, silty matrix slightly fissile, dry to slightly moist. Weathered bedrock.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.61	11:22	02/10/93
▽	13.38	07:51	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0324

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0025	Backfill: Collapsed borehole material			SH	20.5 to 25.0' - Medium light gray (N6) to medium gray (N5), silty shale with calcareous shale lenses, thin beds of micritic to fossiliferous limestone, dry 20.5 to 24.5', moist 24.5 to 25.0'. Unweathered bedrock.
25								Total Depth = 25.0'.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.61	11:22	02/10/93
▼	13.38	07:51	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0325
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597270.67
Date Started	4/4/93	East (ft)	1496570.83
Date Completed	4/4/93	Ground Surface Elev. (ft)	796.96
Logged By	DALE FLORES	Top of Casing Elev. (ft)	798.89
Checked By	PAUL DARR	Total Depth (ft)	30.0
Comments:	Slope of SM/PP hill east of building 49.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			SM	0.0 to 2.5' - Grayish brown (5YR 3/2) silty sand, sand fine grained, root first 6", trace of gravel, slightly moist.
				Backfill: Cement - bentonite grout			ML	2.5 to 4.0' - Moderate yellow brown (10YR 5/4) gravelly silt, ~20% angular gravel, moderate cohesivness, moist.
5							CL	4.0 to 16.0' - Light olive (10Y 5/4) to grayish olive (10Y 4/2) silty clay, dense, fractures easily, very thin calcareous shale lenses, dry. Weathered bedrock.
10								
15				Seal: 1/4" Bentonite chips				
							SH	16.0 to 19.0' - Medium light gray (N6) where dry, medium dark gray (N4) where wet silty shale, fissile, interbedded calcareous shale, fracture at 17.0', dry to wet. Bedrock.
				Filter Pack: 10/20 Colorado silica sand				19.0 to 30.0' - Medium gray (N4) shale, thin beds of fossiliferous limestone, shale fractures easily. Bedrock.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.00	10:53	04/04/93
▼	23.33	17:17	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0325

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Screen: Stainless steel, 4", slot # 10			SH	
25								
30								Total Depth = 30.0'.
35								
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
9.00	10:53	04/04/93
23.33	17:17	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0326
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597365.17
Date Started	4/3/93	East (ft)	1497091.18
Date Completed	4/3/93	Ground Surface Elev. (ft)	875.52
Logged By	DALE FLORES	Top of Casing Elev. (ft)	877.58
Checked By	PAUL DARR	Total Depth (ft)	33.0
Comments:	West of building 95 and south of HP building, near watertower.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	B	GC	0005	Casing: Stainless steel, 4" Backfill: Cement - bentonite grout			FL	0.0 to 10.0' - Variegated coloring: Olive gray (5Y 3/2) to dusky yellow brown (10YR 2/2) to moderate yellow brown (10YR 5/4) clayey silt, with angular limestone gravel, brick pieces, 1 ft. of asphalt 6.0 to 7.0', trace of roots at 9.5', organic zone 9.5 to 10.0', dry to slightly moist. Fill.
5	B	GC	0010					
10	B	GC	0015				CL	10.0 to 14.0' - Light olive gray (5Y 5/2) clay, trace gravel, moderate plasticity, root structures, brown staining, dry to slightly moist.
15	B	GC	0020				CL	14.0 to 18.0' - Moderate olive brown (5Y 4/4) and light olive gray (5Y 5/2) silty clay, limestone cobbles, exhibits remnant bedding, thin calcareous lenses, dense, dry to slightly moist. Weathered bedrock.
				Seal: 1/4" Bentonite chips			SH	18.0 to 19.3' - Medium gray (N5) to dark gray (N3) silty shale, fissile, thin beds of fossiliferous limestone and calcareous shale. Bedrock.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.62	13:43	04/03/93
▼	18.63	18:16	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0326

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Filter Pack: 10/20 Colorado silica sand Screen: Stainless steel, 4", slot # 10			SH-LS	19.3 to 33.0 - Medium gray (N5) limestone and shale, limestone lenses to 3" seperated by shale, good fractures. Bedrock.
25								
30								
35								Total Depth = 33.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.62	13:43	04/03/93
▼	18.63	18:16	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0327
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	601687.99
Date Started	4/15/93	East (ft)	1495166.93
Date Completed	4/15/93	Ground Surface Elev. (ft)	698.69
Logged By	DALE FLORES	Top of Casing Elev. (ft)	698.32
Checked By	PAUL DARR	Total Depth (ft)	25.0
Comments:	West side of Miami Ave. between Linden Ave. and Lock Ave.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 3.0' - Dusky yellow brown (10YR 2/2) silty sand, organic rich, roots first 1', trace gravel, moist. Topsoil.
				Backfill: Cement - bentonite grout				
							SP-GP	3.0 to 5.0' - Moderate yellow brown (10YR 5/4) sand and gravel with ~50% subangular to subrounded gravels to cobbles size, 50% medium to coarse sand, dry. Alluvial gravels.
5							GP-GM	5.0 to 25.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60 to 80% fine to coarse gravels alternates with sand lenses, fines vary from ~ 20 - 40% in coarse sands and gravels, cobbles to 5", first water at 13.5 ft., saturated. River alluvium.
				Seal: 1/4" Bentonite chips				
10								
				Filter Pack: 10/20 Colorado silica sand				
15				Screen: Stainless steel, 4", slot # 10				
20								

GROUNDWATER

DEPTH	HOUR	DATE
13.70	13:26	04/15/93
14.18	13:03	05/19/93

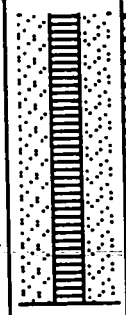
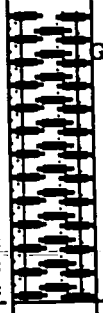
WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0327

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP-GM	
25								Total Depth = 25.0'.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.70	13:26	04/15/93
▼	14.18	13:03	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 5

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0328
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	601695.63
Date Started	4/14/93	East (ft)	1495166.40
Date Completed	4/15/93	Ground Surface Elev. (ft)	698.65
Logged By	DALE FLORES	Top of Casing Elev. (ft)	698.57
Checked By	PAUL DARR	Total Depth (ft)	116.0
Comments:	West side of Miami Ave. between Linden Ave. and Lock Ave.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 3.0' - Dusky yellow brown (10YR 2/2) silty sand, organic rich, roots first 1', trace gravel, moist. Topsoil.
	A	GC	0005	Backfill: Cement - bentonite grout				
	A	GC	1005					
							SP-GP	3.0 to 5.0' - Moderate yellow brown (10YR 5/4) sand and gravel with ~50% subangular to subrounded gravels to cobbles size, 50% medium to coarse sand, dry. Alluvial gravels.
5							GP-GM	5.0 to 35.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60 to 80% fine to coarse gravels alternate with sand lenses, fines vary from ~ 20 - 40% in coarse sands and gravels, cobbles to 5", first water at 13.5 ft., saturated. River alluvium.
10								
15								
	A	GC	0020					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.50	15:00	04/14/93
▼	14.45	13:02	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 5

Borehole/Well Id 0328

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP-GM	
25								
30								
35							SP	35.0 to 43.0' - Dusky yellow brown (10YR 2/2) to dark yellowish brown (10YR 2/2) sand, trace of fines, medium grained moderately well sorted sand, saturated,
40							GP	43.0 to 45.0' - Dusky yellow brown (10YR 2/2) fine gravel, trace fines, saturated.
45							GM	45.0 to 48.0' - Dark yellowish orange (10YR 6/6) silty gravel, 60 to 80% angular gravel, 20 to 40% silt, saturated. Outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.50	15:00	04/14/93
▼	14.45	13:02	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 5

Borehole/Well Id 0328

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50							TI	48.0 to 55.0' - Light olive gray sandy silt, fine sand, trace of clay, fine gravel, angular gravel, dense, stiff, moist. 52' to 55' till unit has interbedded saturated sand lenses. Till.
55							GP	55.0 to 75.0' - Moderate yellow brown (10YR 5/4) sandy gravels, fine to coarse gravels, silt varies from trace to ~ 30%, color orange yellow (10YR 6/6) where more silt is present, saturated.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.50	15:00	04/14/93
▼	14.45	13:02	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0328

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							GP	75.0 to 77.0' - Moderate yellow brown (10YR 5/4) gravel, fine gravels, saturated.
80, 85, 90							SP	77.0 to 92.0' - Olive gray (5Y 3/2) sand, medium grained sand, ~20 to 40% subrounded gravels, poorly graded, saturated.
							Tl	92.0 to 93.5' - Olive gray (5Y 3/2) sandy silt, trace of clay, fine angular gravel, dense, stiff, slightly moist to moist. Till.
95				Seal: 1/4" Bentonite chips Filter Pack: 10/20 Colorado silica sand			GP	93.5 to 111.0' - Olive gray (5Y 3/2) sandy gravel, coarse sand, trace fines, % gravel varies up to ~ 40%, poorly graded, saturated.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.50	15:00	04/14/93
▼	14.45	13:02	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 5

Borehole/Well Id 0328

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
				Screen: Stainless steel, 4", slot # 10				
105								
110								
				Backfill: Collapsed borehole material			CL	111.0 to 114.0' - Moderate olive brown (5Y 4/4) to olive gray (5Y 3/2) clay, some limestone clasts, exhibits remnant bedding fractures, very stiff, slightly moist to moist. Weathered bedrock.
115							SH	114.0 to 116.0' - Medium gray (N4) silty shale, fissile, thin lense of limestone, dry. Bedrock.
								Total Depth = 116.0'.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.50	15:00	04/14/93
▼	14.45	13:02	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0329
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	601231.83
Date Started	3/19/93	East (ft)	1496413.66
Date Completed	3/19/93	Ground Surface Elev. (ft)	707.95
Logged By	DALE FLORES	Top of Casing Elev. (ft)	707.51
Checked By	PAUL DARR	Total Depth (ft)	23.0
Comments:	Vacant lot south of MIM Industries between Lock and Linden Ave.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 4.0' - Light brown (5YR 5/6) silty sand, ~30% fine sand, ~20% silt, trace of debris, debris include wood pieces, leaves and road base gravel, trace of root structure, moist. Fill.
				Backfill: Cement - bentonite grout				
5								5.0 to 10.0' - Moderate yellow brown (10YR 5/4) silty gravel, 60% silty and fine sand, 40% gravel, gravel to 1/2", strong petroleum odor, dry. Fill.
10								10.0 to 15.0' - Moderate yellow brown (10YR 5/4) silty gravel, 60% silty and fine sand, 40% gravel, gravel to 1/2", strong petroleum odor, dry. Fill.
				Seal: 1/4" Bentonite chips				
15				Filter Pack: 10/20 Colorado silica sand				
				Screen: Stainless steel, 4", slot # 10			SP	16.0 to 18.0' - Moderate yellow brown (10YR 5/4) sand, medium grained, well sorted sand, no gravel, dry to moist.
20							GM-GP	18.0 to 21.5' - Moderate yellow brown (10YR 5/4) silty sandy gravel, subangular to angular gravels, ~60% gravels, gravel to 4", ~40% coarse sand and silt, poorly sorted/graded, wet to saturated.

GROUNDWATER

DEPTH	HOUR	DATE
19.00	10:17	03/19/93
19.23	13:10	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0329

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								Outwash.
				Backfill: Collapsed borehole material			TI	21.5 to 25.0' - Medium dark gray (N4) clayey silt, trace of subangular gravels, gravels to 1/2", matrix of silt and clay with ~80% silt, very dense, slightly moist. Till.
								Total Depth = 23.0'.
25								
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	19.00	10:17	03/19/93
▼	19.23	13:10	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0330
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	601230.60
Date Started	3/7/93	East (ft)	1496422.12
Date Completed	3/18/93	Ground Surface Elev. (ft)	707.97
Logged By	DALE FLORES	Top of Casing Elev. (ft)	707.43
Checked By	PAUL DARR	Total Depth (ft)	175.0
Comments:	South of MIM industries on 3rd street between Lock and Linden Ave.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	A A	GC GC	0005 1005	Casing: Stainless steel, 4" Backfill: Cement - bentonite grout			FL	0.0 to 4.0' - Light brown (5YR 5/6) silty sand, ~30% fine sand, ~20% silt, trace of debris, debris include wood pieces, leaves and road base gravel, trace of root structures, moist. Fill.
5	A	GC	0006					5.0 to 10.0' - Moderate yellow brown (10YR 5/4) silty gravel, 60% silty and fine sand, 40% gravel, gravel to 1/2", strong petroleum odor, dry. Fill.
10								10.0 to 15.0' - Moderate yellow brown (10YR 5/4) silty gravel, 60% silty and fine sand, 40% gravel, gravel to 1/2", strong petroleum odor, dry. Fill.
15	A	GC	0021				SP	16.0 to 18.0' - Moderate yellow brown (10YR 5/4) sand, medium grained, well sorted sand, no gravel, dry to moist.
20							GM-GP	18.0 to 21.5' - Moderate yellow brown (10YR 5/4) silty sandy gravel, subangular to angular gravels, ~60% gravels, gravel to 4", ~40% coarse sand and silt, poorly sorted/graded, wet to saturated. Outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 7

Borehole/Well Id 0330

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							TI	21.5 to 25.0' - Medium dark gray (N4) clayey silt, trace of subangular gravels, gravels to 1/2", matrix of silt and clay with ~80% silt, very dense, slightly moist. Till.
25							SM	25.0 to 45.0' - Olive gray (5Y 3/2) silt and silty sand, trace of angular gravels, matrix of fine sand and silt with majority of matrix fine sands (~50%), soft, has very thin sand lenses within till, very moist. Sandy till.
30								
35								
40								
45							TI	45.0 to 54.0' - Olive gray (5Y 3/2) sand, trace of angular gravels, matrix of fine sand and silt with majority of matrix fine sands

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 7

Borehole/Well Id 0330

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								(~50%), unit has become very hard, moist with saturated coarse sandy lenses from 52.5 to 52.9. Sandy till.
50								
55							TI	54.0 to 56.0' - Olive gray (5Y 3/2) silty sand, trace of angular gravel, matrix of fine sand and silt with majority of matrix fine sands (~50%), soft, very moist. Sandy till.
60							GM-GF	56.0 to 64.0' - Grayish olive (10YR 4/2) silty sandy gravel, ~40% coarse sand, ~50% subangular to subrounded gravel to 4" in diameter, ~10% silt, poorly sorted/graded, saturated. Outwash.
65							ML-SM	64.0 to 67.5' - Olive gray (5Y 3/2) silt and silty sand, trace of angular gravel, matrix of fine sand and silt with majority of matrix fine sands (~50%), dry. Sandy till.
70							GM-GF	67.5 to 74.0' - Grayish olive (10YR 4/2) silty sandy gravel, ~10% silt, ~40% coarse sand, ~50% subangular to subrounded gravel, fine to coarse grained. Outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0330

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							TI	74.0 to 75.0' - Olive gray (5Y 3/2) silty sand, trace of angular gravel, matrix of fine sand and silt with majority of matrix is fine sands (~50%), slightly moist. Sandy till.
75							SP	75.0 to 76.5' - Pale yellow (10YR 6/2) sand, medium to coarse sand, sand unit has 2" silt lense, silt lense light olive gray (5Y 4/1), moist to wet.
							TI	76.5 to 79.0' - Light olive gray (5Y 5/2) gravelly sandy silt, gravel subrounded to rounded, gravel to 1 inch, matrix made up of fine sand and silt, moderate cohesive, moist. Gravelly till.
80							SP	79.0 to 82.0' - Light olive gray (5Y 5/2) gravelly sand, coarse sand, 30% gravel, gravel to 3 inches, good sorting, poorly graded, saturated.
							GP	82.0 to 85.0' - Moderate yellow brown (10YR 5/4) sandy gravel, fine to medium sand, ~40% fine to medium gravel, trace silt, saturated from 82.0 to 84.0', becomes dryer at 84.0 feet.
85								85.0 to 95.0' - Light olive gray (5Y 5/2) sandy gravel, trace silt, coarse sand to fine gravel, gravel subrounded to rounded, trace of angular limestone cobbles, poorly graded/sorted, % gravels varies from 85.0 to 95.0' average is ~20%, saturated.
90								
95								95.0 to 111.0' - Light olive gray (5Y 5/2) sandy gravel, trace silt, coarse sand to fine gravel, gravel subrounded to rounded, trace of angular limestone cobbles, poorly graded/sorted, saturated.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0330

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105								
110								
							SP	111.0 to 115.0' - Moderate olive brown (5Y 4/4) sand, medium to coarse grained sand, trace of gravel to 1", little to no fines, saturated.
115							SP	115.0 to 135.0' - Light olive gray (5Y 5/2) gravelly sand, coarse sand, fine gravel, trace of rounded gravel to 1 1/2", little to no fines, coarse sand shows moderately good sorting, saturated.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 7

Borehole/Well Id 0330

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
130								
135							SP	135.0 to 145.0' - Light olive gray (5Y 5/2) gravelly sand, coarse sand, fine gravel, trace of rounded gravel to 3", little to no fines, coarse sand exhibits moderately good sorting, saturated.
140								
145								145.0 to 153.0' - Light olive gray (5Y 5/2) gravelly sand, coarse sand, fine gravel, trace of rounded gravel to 3", little to no fines, coarse sand exhibits moderately good sorting, saturated.
				Seal: 1/4" Bentonite chips				
150								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 7

Borehole/Well Id 0330

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Filter Pack: 10/20 Colorado silica sand			SP	153.0 to 155.0' - Light olive gray (5Y 5/2) sand, medium sand, trace of gravel at 153.0 to no gravel at 155.0', sand exhibits good sorting, little to no fines, wet.
155				Screen: Stainless steel, 4", slot # 10				155.0 to 164.5' - Light olive gray (5Y 6/1) gravelly sand, coarse sand, fine to coarse gravel, gravel content varies from 10 to 50% throughout interval, gravel to 3 1/2 inches, little to no fines, poorly sorted/graded, saturated.
160								
165							ML	164.5 to 172.0 - Olive gray (5Y 4/1), sandy silt, moderately cohesive, trace of wood fragments, some black organic banding, moist.
				Backfill: Collapsed borehole material				
170							SH	172.0 to 175.0' - Medium gray (N4) silty shale with fossiliferous limestone lenses, highly weathered, dry. Bedrock
175								Total Depth = 175.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17		04/04/93
▼	23.05	13:11	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0332
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	599505.71
Date Started	4/1/93	East (ft)	1497447.41
Date Completed	4/2/93	Ground Surface Elev. (ft)	794.32
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	793.88
Checked By	PAUL DARR	Total Depth (ft)	35.0
Comments:	In northeast corner of lower parking lot, Mound property.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 0.4' - Asphalt
				Backfill: Cement - bentonite grout				0.4 to 11.0' - Light olive gray (5Y 5/2) silty sand, fine sand, trace of clay, trace of gravels, gravels fine to coarse, angular to rounded, gravels to 3 inches in diameter. Fill.
5								
10								11.0 to 13.0' - Light bluish gray (5B 7/1) to pale olive (10YR 6/2) to light olive brown (5Y 5/6) silt and clay, very firm, trace cobbles ~5%, crumbly organic fragments present, dry. Fill.
	B	GC	0015				CL	13.0 to 16.0' - Greenish gray (5GY 6/1) silty clay, trace of limestone clasts, crumbles easily, dry. Weathered bedrock.
15								
				Seal: 1/4" Bentonite chips			ST/LS	BEDROCK 16.0 to 25.0' - Siltstone with interbedded fossiliferous limestone, thinly bedded, 90% siltstone, crumbly, dry, slightly moist at 24.0 to 25.0'. Bedrock.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.06		04/03/93
▼	16.78	18:51	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0332

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Filter Pack: 10/20 Colorado silica sand Screen: Stainless steel, 4", slot # 10			ST/LS	
25								25.0 to 30.0' - Siltstone, some calcareous siltstone, fossiliferous limestone lenses, limestone lenses more abundant, slightly moist. Bedrock.
30				Backfill: 10/20 Colorado silica sand				30.0 to 35.0' - Calcareous siltstone, interbedded fossiliferous limestone, abundant fossils, limestone lenses not as abundant as in interval 25.0 to 30.0'.
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.06		04/03/93
▼	16.78	18:51	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0333
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	600547.19
Date Started	4/5/93	East (ft)	1494851.90
Date Completed	4/7/93	Ground Surface Elev. (ft)	700.34
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	699.55
Checked By	PAUL DARR	Total Depth (ft)	165.0
Comments:	At north end of bike way parking lot off of Old Main Street, near levee. Paired with 0334.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.2' - Silty clay, grass, roots. Topsoil.
	A	GC	0005	Backfill: Cement - bentonite grout			FL	0.2 to 3.0' - Moderate yellow brown (10YR 5/4) fine to medium gravel with ~25% fine sand and silt, subrounded to subangular gravel to 3.5 inches. Fill. 3.0 to 4.0' - Dark yellowish brown (10YR 4/2) silty clay, some fine gravel. Fill. 4.0 to 7.0' - Drilled through concrete block, old foundation ? 7.0 to 13.0' - Fine to medium gravel, rounded, with some silt and clay. Fill.
5								
10								
							GP	13.0 to 15.0' - Medium gray (N5) to light gray (N7) fine gravel, rounded to subrounded, ~ 25% silt and clay, moist to wet. Wet at 15.0' (water table).
15							NR	15.0 to 35.0' - No recovery, see log for 0334 for 15.0 to 29.0' interval.
20								

GROUNDWATER

DEPTH	HOUR	DATE
15.78	13:21	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 7

Borehole/Well Id 0333

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							NR	
25								
30								
35							SP-GP	35.0 to 38.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, no fines, wet.
40							GP	38.0 to 51.0' - Fine to medium gravel, no sand or fines, very clean gravel, wet.
45								

GROUNDWATER

DEPTH	HOUR	DATE
15.78	13:21	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 7

Borehole/Well Id 0333

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
							SP-GP	51.0 to 57.0' - Moderate yellow brown (10YR 5/4) medium to coarse sand and fine gravel, trace medium gravel, 10 - 20% fines, wet.
55				Seal: 1/4" Bentonite chips				
							TI	57.0 to 62.0' - Light olive gray (5Y 5/2) silty clay, 15 to 20% subangular clast to 1", dense, firm, dry. Till.
60								
							GP	62.0 to 73.0' - Fine to medium gravel, subrounded clasts, no sand or fines, wet.
				Filter Pack: 10/20 Colorado silica sand				
65				Screen: Stainless steel, 4", slot # 10				
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.78	13:21	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0333

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Filter Pack: 10/20 Colorado silica sand Backfill: 1/4" Bentonite chips			SP-GP	73.0 to 97.5' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, some subangular gravel 4 - 8", trace fines, wet. At ~85' drilled into large limestone boulder.
75								
				Backfill: Collapsed borehole material				
80								
85								
90								
95				Backfill: 1/4" Bentonite chips				
							TI	97.5 to 99.5' - Light olive gray (5Y 5/2) silty clay, with 15 to 20% subangular clasts 2 - 3", dense, firm, dry. Till.

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	15.78	13:21	05/19/93
⊻			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0333

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100							SM	99.5 to 101.0' - Silty sand, crumbly but semi coherent, moist.
							TI	101.0 to 102.0' - Coarse sandy silt and clay with clasts to 1 - 2", dense to semi firm and soft. Sandy till to silty and clayey till.
							SP-GP	102.0 to 103.0' - Olive gray (5Y 4/1) coarse sand and fine gravel with subangular gravel to 3", ~25% very fine sand and silt. Outwash.
105							TI	103.0 to 108.0' - Light olive gray (5Y 5/2) silty clay, with 15 to 20% subangular clast 2 - 3", dense, firm, dry. Till.
				Backfill: Collapsed borehole material			SP-GP	108.0 to 110.0' - Olive gray (5Y 4/1) coarse sand and fine gravel with subangular to subrounded cobbles to 3", some fines, wet.
110							SP-GP	110.0 to 114.0' - Olive gray (5Y 4/1) coarse sand and fine gravel with subangular to subrounded cobbles to 3", trace fines, wet.
115							SP	114.0 to 119.0' - Olive gray (5Y 4/1) medium to coarse sand with thin (~1") silt lenses, subangular cobbles 3-4", wet.
120							SP-GP	119.0 to 122.0' - Light olive gray (5Y 6/1) coarse sand and fine gravel, subangular to subrounded gravels to 3", ~ 25% fines.
125							SP-GP	122.0 to 126.0' - Light olive gray (5Y 5/2) coarse sand and fine gravel, subangular to subrounded gravel to 4-5", little fines.

GROUNDWATER

DEPTH	HOUR	DATE
15.78	13:21	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 7

Borehole/Well Id 0333

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							GP	126.0 to 128.0' - Fine gravel, trace gravel to ~2.5", no sand or fines.
				Backfill: Collapsed borehole material			SP-GP	128.0 to 143.0' - Light olive gray (5Y 5/2) coarse sand and fine gravel, subangular to subrounded gravel to 4-5", little fines.
130								
135								
140								
							SP-GP	143.0 to 160.0' - Light olive gray (5Y 5/2) fine to medium gravel and coarse sand with ~30% silt and clay, subangular to subrounded gravel to 4-6". Drilled into limestone boulder at 143.0 to 143.5'.
145								
150								

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	15.78	13:21	05/19/93
⊻			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 7

Borehole/Well Id 0333

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
155				Backfill: Collapsed borehole material				
160							CL	160.0 to 163.0' - Pale olive (10YR 6/2) clay, firm, crumbly, dry, changes color to medium gray (N5) @ ~ 161.0'. Weathered bedrock.
							ST	163.0 to 165.0' - Medium gray (N5) siltstone with 1/2" fossiliferous limestone lenses, dry. Bedrock.
165								Total Depth = 165.0'.
170								
175								

GROUNDWATER

DEPTH	HOUR	DATE
15.78	13:21	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0334
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	600540.81
Date Started	4/2/93	East (ft)	1494850.09
Date Completed	4/2/93	Ground Surface Elev. (ft)	700.50
Logged By	DALE FLORES	Top of Casing Elev. (ft)	700.27
Checked By	PAUL DARR	Total Depth (ft)	29.0
Comments:	On old Main Street next to River between Center Street and Mays Ave.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 4.5' - Moderate yellow brown (10YR 5/4) silty sandy gravels, ~50 gravels to cobbles size, gravels subrounded to rounded, gravels used as fill material, good root development. Fill.
				Backfill: Cement - bentonite grout				4.5 to 5.0' - 6" of concrete under gravel, probably old foundation.
5							GP	5.0 to 15.0' - Sandy Gravels, little to no fines, moderate good grading, poorly sorted, subangular to subrounded, gravels to 2 inches. Alluvium.
10								
				Seal: 1/4" Bentonite chips				
15							SP	15.0 to 29.0' - Moderate yellow brown (10YR 5/4) gravelly sand, saturated from 15.0 to 29.0'. Alluvium.
				Filter Pack: 10/20 Colorado silica sand				
				Screen: Stainless steel, 4", slot # 10				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.76		04/04/93
▼	16.43	13:20	05/19/93

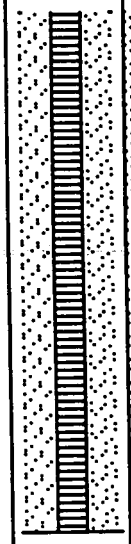
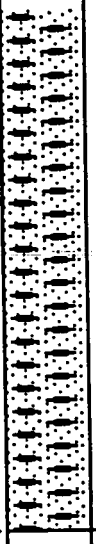
WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0334

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Filter Pack: 10/20 Colorado silica sand			SP	
25								
30								Total Depth = 29.0'.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.76		04/04/93
▼	16.43	13:20	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 4

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0335
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	598844.46
Date Started	2/15/93	East (ft)	1494824.78
Date Completed	3/29/93	Ground Surface Elev. (ft)	705.92
Logged By	D.FLORES/R.MORROW	Top of Casing Elev. (ft)	705.43
Checked By	PAUL DARR	Total Depth (ft)	81.0
Comments:	In Miamisburg City Park along sidewalk next to play ground.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4" to bottom, 10" steel casing to 28.0' Backfill: Cement - bentonite grout			FL	0.0 to 0.5' - Asphalt over 4" of gravel subgrade.
							ML	0.5 to 6.0' - Light olive brown sandy silt, matrix composed of 50% sand and 50% silt with a trace of clay, interval has some blocky limestone clasts to 2", very dense, moist.
5	A	GC	0005					6.0 to 8.0' - Moderate yellow brown sandy silt, matrix composed of 50% sand and 50% silt with a trace of clay, interval has some blocky limestone clasts to 2", light olive brown, more lenses of well sorted fine sand, very dense, moist.
							ML-SM	8.0 to 11.5' - Light olive gray, with gray staining, fine sand and silt with trace of limestone gravel, gravel to 3", stiff, nonplastic.
10								11.5 to 12.5' - Light olive gray to moderate yellowish brown with gray staining, fine sand and silt with trace of limestone gravel, gravel to 3", stiff, nonplastic.
							SM	12.0 to 13.0' - Olive green clayey silt with 10% fine sand, has trace of fossil fragments, trace of limestone clasts to 4", very stiff, non to low plasticity, slightly moist to moist.
15							ML	13.0 to 22.0' - Dark greenish gray (5GY 4/1) clayey silt, 10% fine sand, has trace of fossil fragments, trace of limestone clasts to 4", very stiff, non to low plasticity, very hard drilling, slightly moist to moist.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.50	14:42	02/23/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0335

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							LS-SH	22.0 to 27.0' - Medium dark gray (N4), silty shale with fossiliferous thinly bedded limestone beds, gradational contact from weathered clay at 20.0' to distinguishable shale at 23.0', fissile, slight moist. Bedrock.
25								Total depth 27.0' with rotosonic. Completed to total depth with air rotary.
								RUN #1: 27.0 to 35.9' RECOVERY = 100% RQD = 45%. Medium gray (N5/0) shale, predominantly homogeneous - some interbedded with limestone, very fossiliferous with partings along fossil zones, generally indistinct bedding, dry along bedding features, no fractures evident, poor RQD may indicate fracturing, however, coring chewed up broken pieces pretty well, limestone is micro to coarsely crystalline, very hard, dense, no visible porosity, dry.
30								
35								Hit water at 36.5'. RUN #2: 35.9 to 40.9' RECOVERY = 91% RQD = 48% Medium gray (N5/0) shale, predominately homogeneous - some interbedded with limestone, very fossiliferous with partings along fossil zones, generally indistinct bedding, poor RQD may indicate fracturing, however, coring ground up broken pieces, hit water in the fracture zones from 35.95 to 38.12', limestone is micro to coarsely crystalline, very hard, dense, lower core is solid, non-fractured, matrix is dry to damp.
	A	GC	0036					
40								RUN #3: 40.9 to 50.0' RECOVERY = 100% RQD = 88% Gray (N5/0) interbedded shale and limestone, predominantly homogeneous, very fossiliferous with partings along fossil zones, generally indistinct bedding, dry along bedding features, very poor RQD may indicate fracturing however coring ground up broken pieces pretty well, limestone is micro to coarsely crystalline, very hard, dense, lower core is solid, non-fractured, matrix is dry to damp.
				Seal: 1/4" Bentonite chips				
45								

GROUNDWATER

DEPTH	HOUR	DATE
36.50	14:42	02/23/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 4

Borehole/Well Id 0335

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Filter Pack : #7 Silica sand				
50				Screen: Stainless steel, 4", slot # 10			LS-SH	RUN #4: 50.0 to 60.5' RECOVERY = 100% RQD = 47% Medium light gray (N6/0) interbedded limestone and shale: generally 0.1 to 0.25' thick stringers, trace mottled, very fossiliferous, shale is very platy to fissile at times, trace soft sediment deformation, some open bedding in limestone, wet to moist along bedding, limestone is very hard, coarsely crystalline dense, generally damp.
				Backfill: #5 silica sand				
55				Backfill: 1/4" Bentonite chips				
60								RUN #5: 60.5 to 70.3' RECOVERY = 100% RQD = 67% Medium light gray (N6/0), shale interbedded with limestone, trace mottles, very fossiliferous, shale is very platy to fissile at times, trace soft sediment deformation, some open bedding in limestone, limestone is very hard, coarsely crystalline dense, generally damp, no fractures, some poorly developed bedding fractures in shale, thin 1 - 2 mm, shale lenses in limestone, wet along partings in shale.
65								
70								RUN #6: 70.3 to 81.0' RECOVERY = 100% RQD = 78% Medium light gray (N6/0), limestone interbedded with Shale, trace mottles, very fossiliferous, shale is very platy to fissile at times, trace

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.50	14:42	02/23/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 4

Borehole/Well Id 0335

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							LS-SH	soft sediment deformation, some open bedding in limestone, limestone is very hard, coarsely crystalline dense, generally damp, no fractures, some poorly developed bedding fractures in shale, thin 1 - 2 mm, shale lenses in limestone wet along partings in shale.
80								Total Depth = 81.03'.
85								
90								
95								

GROUNDWATER

DEPTH	HOUR	DATE
36.50	14:42	02/23/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0336
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	600380.42
Date Started	3/19/93	East (ft)	1496202.19
Date Completed	3/21/93	Ground Surface Elev. (ft)	710.23
Logged By	DALE FLORES	Top of Casing Elev. (ft)	710.03
Checked By	PAUL DARR	Total Depth (ft)	130.0

Comments: 3rd and Mound, in parking lot of Top Design just east of railroad track.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	A A	GC GC	0005 1005	Casing: Stainless steel, 4" Backfill: Cement - bentonite grout			FL	0.0 to 3.0' - Landscape gravel over 4 inches of asphalt, contains miscellaneous debris such as pieces of wood, peat material, mixture of peat and sand to 3.0 feet. Fill.
							SP	3.0 to 3.5' - Dark yellow brown (10YR 5/4) sand, fine sand, trace of clay, very dense, trace of angular gravel.
5							TI	3.5 to 10.0' - Moderate yellowish brown (10YR 5/4), gravelly sandy silt, fine sand, ~40 to 50% gravels up to 3", dense, moist. Gravelly till.
10							GW	10.0 to 15.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash.
15								15.0 to 20.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.00		03/20/93
▼	25.51	13:15	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 6

Borehole/Well Id 0336

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	A	GC	0025				GW	20.0 to 22.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash. First water 22.0'.
							TI	22.0 to 22.5' - Moderate yellow brown (10YR 5/4) gravelly silt, gravel (~45%), very dense, moist. Till lense.
25							GW	22.5 to 25.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash.
								25.0 35.0' - Pale yellow brown (10YR 6/2) to moderate yellow brown (10YR 5/4), silty sandy gravel, fine to coarse gravel (~60%), 30% coarse sand, trace silt, poorly graded/sorted. Outwash.
30								
35							SP	35.0 to 37.0' - Moderate yellow brown (10YR 5/4) gravelly sand, poorly sorted, saturated.
							GM-GP	37.0 to 53.0' - Pale yellow brown (10YR 6/2) to moderate yellow brown (10YR 5/4) silty sandy gravel, ~60% fine to coarse gravel up to 3 inches, 30% coarse sand, trace silt, trace cobbles to 5 inches, saturated. Outwash.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.00		03/20/93
▼	25.51	13:15	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0336

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
							TI	53.0 to 54.0' - Olive gray (5Y 4/7) gravelly sandy silt, fine sand, 30% gravel, subrounded to rounded, gravels up to 1 inch, very stiff, dense, slightly moist. Till.
55							GP-GM	54.0 to 63.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, 60% fine to coarse gravel up to 3", 30% coarse sand, 10% silt, trace of cobbles to 5 inches, saturated. Outwash.
60								
							TI	63.0 to 64.0' - Moderately yellow brown (10YR 5/4) sand, trace gravel, angular gravel, fine sand, very stiff, no plasticity, moist. Sandy till.
65								64.0 to 64.5' - Moderate yellow brown (10YR 5/4) sand, ~30% rounded gravel, very stiff, non-plastic, moist. Gravelly till. Seperated from 63.0 to 64.0 by thin gravel lense.
							GP-GM	64.5 to 85.0' - Moderate yellow brown (10YR 5/4) silty sandy gravels, ~60% fine to coarse gravel up to 3", ~30% coarse sand, trace of silt, poorly graded/sorted, saturated. Outwash.
70	A	GC	0073					

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	22.00		03/20/93
⊻	25.51	13:15	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 6

Borehole/Well Id 0336

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
80								
85							SP	85.0 to 87.0' - Moderate yellow brown (10YR 5/4) gravelly sand, coarse sand, trace gravel, poorly graded/sorted, little to no fines, saturated. Outwash.
90							GP-GM	87.0 to 105.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60% fine to coarse gravel up to 3 inches in diameter, 30% coarse sand, 10% silt, trace of cobbles to 5 inches, saturated.
95				Seal: 1/4" Bentonite chips				

GROUNDWATER

DEPTH	HOUR	DATE
22.00		03/20/93
25.51	13:15	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0336

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100	A	GC	0105					
				Filter Pack: 10/20 Colorado silica sand				
105				Screen: Stainless steel, 4", slot # 10			SP	105.0 to 110.0' - Moderate yellow brown (10YR 5/4) gravelly sand, some silt, coarser from 105.0 to 110.0', poorly sorted/graded, saturated. Outwash.
110							GP-GM	110.0 to 115.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60% fine to coarse gravel, ~30% coarse sand, some silt, poorly graded/sorted, saturated. Outwash.
115				Backfill: 10/20 Colorado silica sand			CL	115.0 to 121.0' - Greenish gray (5GY 6/1) clay, trace of angular limestone clast, very dense, very thin sand lenses were clay fractures, remnant bedding features, dry to slightly moist. Weathered bedrock.
				Backfill: 1/4" Bentonite chips				
120							GP	121.0 to 125.0' - Dark greenish gray (5GY 4/1) fossiliferous limestone gravel, angular limestone gravel to 3", lense of fine to medium sand at 124.0', some silt, interval from 121.0 to 121.75' is mixture of broken rock and gravel.
125							SH	125.0 to 130.0' - Dark greenish gray (5GY 4/1) silty shale, fissile,

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.00		03/20/93
▼	25.51	13:15	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0336

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Backfill: Consistency of native material			SH	shale has thinly bedded fossiliferous limestone lenses, moderately weathered, trace of thin calcareous shale lense, crumbles easily, dry. Bedrock.
130								Total Depth = 130.0'.
135								
140								
145								
150								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.00		03/20/93
▼	25.51	13:15	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0337
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	600372.79
Date Started	3/21/93	East (ft)	1496201.85
Date Completed	3/21/93	Ground Surface Elev. (ft)	710.10
Logged By	DALE FLORES	Top of Casing Elev. (ft)	709.74
Checked By	PAUL DARR	Total Depth (ft)	37.0
Comments:	Parking lot of Top Design at 3rd and Mound.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 3.0' - Fill.
				Backfill: Cement - bentonite grout				
							SP	3.0 to 3.5' - Dark yellow brown (10YR 4/2) sand, fine sand, trace of clay, very dense, trace of angular gravel.
5							TI	3.5 to 10.0' - Moderate yellowish brown (10YR 5/4), gravelly sandy silt, fine sand, ~40 to 50% gravels up to 3", dense, moist. Gravelly till.
10							GW	10.0 to 15.0' - Moderate yellow brown (10YR 5/4), silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash.
15								15.0 to 20.0' - Moderate yellow brown (10YR 5/4), silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash.
				Seal: 1/4" Bentonite chips				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.00	14:30	03/21/93
▼	25.28	13:16	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0337

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GW	20.0 to 22.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash. First water 22.0'.
							TI	22.0 to 22.5' - Moderate yellow brown (10YR 5/4) gravelly silt, gravel (~5%), very dense, moist. Till lense.
				Filter Pack: 10/20 Colorado silica sand			GW	22.5 to 25.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, well graded, fine sand to coarse gravel, gravel to 2 inches, gravel subangular to subrounded, slightly moist. Outwash. 25.0 35.0' - Pale yellow brown (10YR 6/2) to moderate yellow brown (10YR 5/4), silty sandy gravel, fine to coarse gravel (~60%), 30% coarse sand, trace silt, poorly graded/sorted. Outwash.
25								
				Screen: Stainless steel, 4", slot # 10				
30								
35							SP	35.0 to 37.0' - Moderate yellow brown (10YR 5/4) gravelly sand, poorly sorted, saturated.
								Total Depth = 37.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.00	14:30	03/21/93
▼	25.28	13:16	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0340
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597650.90
Date Started	4/1/93	East (ft)	1494723.50
Date Completed	4/2/93	Ground Surface Elev. (ft)	706.27
Logged By	DALE FLORES	Top of Casing Elev. (ft)	706.17
Checked By	PAUL DARR	Total Depth (ft)	40.0
Comments:	East of Arthur Ave. along west access road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 2.0' - Dusky yellow brown (10YR 2/2) to moderate yellow brown (10YR 5/4) to black, silty gravelly sand, good root development first 6", moist. Native soil.
				Backfill: Cement - bentonite grout			ML	2.0 to 6.0' - Moderate yellow brown (10YR 5/4) clayey silt, little to no gravel, trace coarse sand in matrix, stiff, very dense, moist. Native soil.
5				Seal: 1/4" Bentonite chips				
				Filter Pack: 10/20 Colorado silica sand			GM-GP	6.0 to 14.5' - Moderate yellow brown (10YR 5/4) silty sandy gravel, 50% fine to medium gravel to 2 inches, poorly sorted/graded, dry. Upper outwash.
10				Screen: Stainless steel, 4", slot # 10				
15				Backfill: 10/20 Colorado silica sand			TI	14.5 to 15.0' - Grayish olive (10YR 4/2) to moderate yellow brown (10YR 5/4) silt, trace amounts of fine angular gravel, slightly moist to moist. Till.
				Backfill: 1/4" Bentonite chips				15.0 to 24.5' - Grayish olive (10YR 4/2) to moderate yellow brown (10YR 5/4) silt, trace amounts of fine angular gravel, very dense, some coarse sand in matrix, moist. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			04/04/93
▼		13:41	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0340

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Backfill: 1/4" Bentonite chips			TI	
							SP	24.5 to 25.0' - Light brown (5YR 5/6) sand, medium sand, well sorted sand lense, moist.
25							TI	24.5 to 35.0' - Olive gray (5Y 3/2) sandy clay, very dense, trace amounts of angular gravel, more clay in matrix, dry. Till.
30								
35								35.0 to 38.0' - Olive gray (5Y 3/2) sandy clay, very dense, trace amounts of angular gravel, more clay in matrix, dry. Till.
							LS-SH	38.0 to 40.0' - Shale with thinly bedded fossiliferous limestone lenses, shale is fissile, moist from 38.5 to 39.0', crumbles easily, dry. Shale bedrock. Limestone boulders 38.0 - 38.5'.
40								Total Depth = 40.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			04/04/93
▼		13:41	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0341
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597650.38
Date Started	3/29/93	East (ft)	1494728.37
Date Completed	3/30/93	Ground Surface Elev. (ft)	706.40
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	705.99
Checked By	PAUL DARR	Total Depth (ft)	55.0
Comments:	On West access road near intersection of two gravel roads.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 1.0' - Olive gray (5Y 3/2) to dark yellow brown (10YR 4/1) very silty sand, ~10% fine to medium gravel 1/2 to 3", roots first 5", organic material, 4" chunk of asphalt, crumbly soft, slightly moist. Fill.
	A	GC	0005	Backfill: Cement - bentonite grout			SM	2.0 to 7.0' - Moderate yellow brown (10YR 5/2) to dark yellow brown (10YR 4/2) silty sand, little clay, firm, trace fine gravel, medium plasticity, dry. More fine to medium sand 6.0 to 7.0'.
	A	GC	1005					
5								
							GP	7.0 to 14.0' - Moderate yellow brown (10YR 5/4) sandy gravel, ~20% fine to medium gravel to ~3", very little silt or clay, dry. Outwash. At 13', gravel is wet to slightly saturated, moist at 11.5'.
10								
	A	GC	0014					
15							TI	14.0 to 17.0' - Moderate yellow brown (10YR 5/4) silty sand with ~20% subangular fine gravel, very firm to dense, crumbles well, dry. Sandy till. 17.0 to 24.5' - Light olive gray (5Y 5/2) silty sand, ~20% subangular fine gravels, very firm to dense, dry. NOTE: from 22.0 to 24.5' - till has more clasts 30 to 40%.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	0.85		04/04/93
▼	23.33	13:42	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0341

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	A	GT	0020					
25							SP	24.5 to 26.0' - Sand, medium grained, ~ 10% fines, well sorted, slightly moist to dry.
							GP	26.0 to 28.0' - Sand gravel, coarse to fine gravel, angular to subangular, ~20% fines (silt and clay), slightly moist to dry.
30							TI	28.0 to 39.0' - Light olive gray (5Y 5/2) silty sand, ~ 20% subangular gravel to 3", very firm to dense, dry. Sandy till.
35								
40				Seal: 1/4" Bentonite chips			GP	39.0 to 41.0' - Moderate yellow brown (10YR 5/4) sandy gravel, coarse grained sand, angular clasts to 5", ~25% fines, slightly cohesive, wet to moist.
							ST-LS	41.0 to 56.0' - Medium gray (N5) siltstone, limestone lenses to 4" thick, some fossils present, abundant fossils 50.0 to 56.0', dry to slightly moist.
45				Filter Pack: 10/20 Colorado silica sand				

GROUNDWATER

DEPTH	HOUR	DATE
0.85		04/04/93
23.33	13:42	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id 0341

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Screen: Stainless steel, 4", slot # 10			ST-LS	
50								
55								Total Depth = 55.0'.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	0.85		04/04/93
▼	23.33	13:42	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0342
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596168.63
Date Started	4/3/93	East (ft)	1494550.20
Date Completed	4/5/93	Ground Surface Elev. (ft)	692.49
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	692.35
Checked By	PAUL DARR	Total Depth (ft)	163.0

Comments: ~ 150 ft. west of Dayton - Cin. Pike Rd in open field. Adjacent to wells 0156, 0157, and 0304.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	A	GC	0005	Casing: Stainless steel, 4" Backfill: Cement - bentonite grout			TS	0.0 to 4.5' - Dark yellowish brown (10YR 4/2) silty clay, few cobbles in upper 1 to 2", roots first 6", firm to very firm, slightly moist. Topsoil.
5							SP	4.5 to 7.0' - Moderate yellowish brown (10YR 5/4) medium grained sand, trace fines, well sorted, dry to moist.
	A	GT	0010				SP-GP	7.0 to 12.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, clasts angular to subrounded, ~ 20% fines, moist at 8', wet to saturated at 10', 11 to 12' fine gravel lenses with no fines. Outwash.
	A	GC	0010					
▽10								
	A	GC	0015					12.0 to 16.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel with angular to subrounded clasts to 6", fines 20 - 30%, wet. Outwash.
15								
							GP	16.0 to 20.0' - Moderate yellowish brown (10YR 5/4) fine gravel, trace of fines, well sorted.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.94	15:30	05/19/93
▽			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 7

Borehole/Well Id 0342

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP	20.0 to 23.0' - Moderate yellowish brown (10YR 5/4) fine to medium gravel, gravel to 4 - 5".
25							SP-GP	23.0 to 28.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, 10 - 20 % fines, clasts subangular to subrounded, wet.
							GP	28.0 to 30.0' - Moderate yellowish brown (10YR 5/4) fine to medium gravel, subangular gravel to 4 - 5", 20 - 30% fines.
30							GP-SP	30.0 to 45.0' - Moderate yellowish brown (10YR 5/4) fine gravel to fine sand, rounded to subrounded clasts to 2", few subangular clasts, trace of fines.
35								
40								
45							SP-GP	45.0 to 49.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, gravel 1 to 2", no fines.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.94	15:30	05/19/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 7

Borehole/Well Id 0342

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50							GP	49.0 to 52.0' - Moderate yellowish brown (10YR 5/4) fine gravel, subrounded to rounded clasts to 2", no fines.
55, 60, 65							SP-GP	52.0 to 68.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, clasts to 3", trace of fines.
							GP-SP	68.0 to 69.0' - Moderate yellowish brown (10YR 5/4) fine to medium gravel and coarse sand, clasts to 3", ~20% fines.
70							TI	69.0 to 75.0' - Light olive gray (5Y 5/2) medium coarse sand and silt, with ~25% subangular gravel to ~ 3", semi-firm, moist. Sandy till. Till dryer and more dense - 73.5 to 75.0'. 69.0 to 73.5' till is discontinuous with lenses of outwash ~ 0.5' thick.

GROUNDWATER

DEPTH	HOUR	DATE
9.94	15:30	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 7

Borehole/Well Id 0342

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	A	GT	0075					
	A	GC	0075					
75							SP-GP	75.0 to 82.0' - Medium gray (N5) coarse sand and fine gravel, gravel to 5", 20 - 30% fines. Outwash.
80								
							SP	82.0 to 84.5' - Medium gray (N5) medium to coarse sand, ~ 10% fines, well sorted.
85							TI	84.5 to 86.0' - Medium gray (N5) silty clay with ~20% subangular gravels to 2.5, firm. Till.
							SP	86.0 to 95.0' - Medium to coarse sand, subrounded to rounded clast, few pebbles, well sorted.
90	A	GT	0095					
	A	GC	0095					
95							SM	95.0 to 98.0' - Medium gray (N5) silty sand with some clay lenses, moderate sorting, wood fragments.
							SP-GP	98.0 to 105.0' - Coarse sand and fine gravel to ~2.5", ~ 20% fines, few 1-2" thick medium to fine sand lenses.

GROUNDWATER

DEPTH	HOUR	DATE
9.94	15:30	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 7

Borehole/Well Id 0342

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105							GP	105.5 to 108.0' - Fine to coarse gravel, little fines.
110							SP-GP	108.0 to 140.0' - Medium gray (N5) coarse sand and fine gravel, subangular to subrounded gravel to 3". Color change at 117.0' to moderate yellow brown (10YR 5/4).
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.94	15:30	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0342

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
130								
135								
140				Seal: 1/4" Bentonite chips			SP	140.0 to 148.0' - Moderate yellowish brown (10YR 5/4) medium to coarse sand, trace gravel to 1/2 - 3", no fines, well sorted.
145				Filter Pack: 10/20 Colorado silica sand				
150				Screen: Stainless steel, 4", slot # 10			SP-GP	148.0 to 150.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, mostly subangular gravel to 2 - 2", ~20% fines. 150.0 to 158.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, mostly rounded gravel to 3", some gravel subangular to angular.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.94	15:30	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0342

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
155				Filter Pack: 10/20 Colorado silica sand			SP-GP	158.0 to 160.0' - Moderate yellowish brown (10YR 5/4) coarse sand and fine gravel, mostly subangular gravels to 2 - 3", ~20% fines.
160	A	GC	0160	Backfill: Collapsed borehole material			CL	160.0 to 162.0' - Grayish olive (10YR 4/2) to medium gray (N5) silty clay, dense, firm, slightly moist to dry. Weathered bedrock.
							ST	162.0 to 163.0' - Medium gray (N5) siltstone and calcareous siltstone, with four 1" lenses of limestone. Bedrock.
								Total Depth = 163.0'.
165								
170								
175								

GROUNDWATER

DEPTH	HOUR	DATE
9.94	15:30	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 5

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0343
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597140.04
Date Started	2/23/93	East (ft)	1494485.25
Date Completed	3/7/93	Ground Surface Elev. (ft)	696.70
Logged By	DALE FLORES	Top of Casing Elev. (ft)	696.57
Checked By	PAUL DARR	Total Depth (ft)	105.0

Comments: 1/2 mile north of Benner Rd on west side of Cincinnatti-Dayton Pike near Miamisburg Cabinets.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4" to bottom, 10" steel casing to 83.0'			TS	0.0 to 1.0' - Moderate yellow brown (10YR 5/4) sand, fine sand, trace of gravel, upper 4" exhibits well developed root system, moist. Topsoil.
							FL	1.0 to 4.0' - Dark yellowish brown (10YR 4/2) to moderately yellow brown (10YR 5/4) sandy silt, some debris present, debris includes broken glass and wood fragments, very dense, dry to slightly moist. Fill.
	B	GC	0005				SM	4.0 to 9.0' - Moderately yellowish brown (10YR 5/4) silty sand, fine sand, no gravel, ~50% fine sand, moderately stiff, trace of medium sand, moist.
5				Backfill: Cement - bentonite grout				
10							GP-GM	9.0 to 10.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, ~20% medium to coarse sand, ~65% well rounded gravel, some silt, moderately well graded, poorly sorted, moist to wet. Alluvium.
								10.0 to 19.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, ~20% medium to coarse sand, ~65% well rounded gravel, some silt, moderately well graded, poorly sorted, moist to wet. Alluvium.
15								
	B	GC	0020					
							GP	19.0 to 20.0' - Moderately yellow brown (10YR 5/4) sandy gravel,
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.00		03/23/93
▼	13.92	15:03	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0343

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0028				GM	trace silt, well rounded coarse sand, well rounded coarse gravel, gravel to 3 inches, saturated. River alluvium.
								20.0 to 21.5' - Moderate yellow brown (10YR 5/4) silty gravel, fine gravel, trace of rounded gravel to 1 inch, wet.
							SW	
							GM-GP	21.5 to 21.9' - Light brown sand lens, medium sand, well sorted, wet.
								21.9 to 23.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60 % medium well rounded gravel, ~20% medium to coarse sand, some silt, moderately well graded/ poorly sorted wet.
25							SP	23.0 to 29.0' - Moderate yellow brown (10YR 5/4) sand, medium sand, some biotite and muscovite flakes, wet.
							GC-GM	29.0 to 30.0' - Moderate yellow brown (10YR 5/4) silty clayey gravel, fine to coarse gravels, ~50% gravels, ~50% clayey silt, moist.
30	B	GC	0037					
		GT	0037				GP	30.0 to 34.5' - Moderate yellow brown (10YR 5/4) sandy gravel, trace silt, fine to coarse gravel, gravel subrounded to rounded, wet.
35							TI	34.5' to 35.0' - Gravelly silt, fine gravel, matrix of silt, 6" till lense, slightly moist.
							GP	35.0 to 46.0' - Moderately yellow brown (10YR 5/4) gravel, fine gravel to fine sand, trace of silt, saturated.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.00		03/23/93
▼	13.92	15:03	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0343

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	46.0 to 47.0' - Light brown (5YR 5/6) sand, coarse sand, some silt, moderately cohesive, moist.
							GP	47.0 to 53.0' - Medium dark gray (N4) sandy gravel, trace of silt, fine gravel to fine sand, wet.
50								
							SP	53.0 to 55.0' - Medium gray (N4) sand, fine sand, no gravel, sand well sorted, slightly moist.
55	B	GC	0057				TI	55.0 to 60.5' - Medium gray (N5) gravelly, silty, sand, matrix comprised of fine sand and silt, 6" limestone cobble at 59.5'. Sandy till.
60							GM	60.5 to 63.0' - Medium dark gray (N4) silty gravel, some coarse sand, ~80% gravel angular to subrounded, saturated from 60.0 to 65.0'. 63.0 to 65.0' - Medium dark gray (N4) silty gravel, some medium to coarse sand, gravel to 1", moderate good sorting of sand, poorly sorted gravels, saturated.
65	B	GC	0067				TI	65.0 to 67.0' - Moderate olive brown (5Y 4/4) silty clay, some gravel, gravels angular, moist. Till lense.
70							GM	67.0 to 75.0' - Medium dark gray (N4) silty gravel, ~80% gravel, gravel angular to subrounded, gravel to 4 inches, 20% coarse sand, saturated. Outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
∇	13.00		03/23/93
▼	13.92	15:03	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0343

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75	B	GC	0080	Seal: 1/4" Bentonite chips			ML	75.0 to 80.0' - Light olive (10Y 5/4) sandy silt, trace of angular gravel, trace of clay, trace of clay, dense, moist. Coarse sand lens at 76.0', lens saturated, 2nd sand lense at 79.5 to 79.7', lens saturated. Faint petroleum odor.
80				Filter Pack: 10/20 Colorado silica sand				80.0 to 82.0' - Light olive (10Y 5/4) sandy silt, trace of clay, trace of angular gravel, dense, contains fine grained organic material in bands - color of banding alternates between a chocolcate brown to black, moist.
		GC	0082				SM	82.0 to 83.0' - Olive gray (5Y 4/1) silty sand, fine to medium grained, ~45% olive black (5Y 2/1) wood debris, loose, ~15% silt, ~40% sand, sand is subangular quartzose material, moist.
85				Screen: Stainless steel, 4", slot # 10			SP	83.0 to 88.0' - Medium gray (N4) sand, trace organic wood material, well sorted sand, trace of gravel, moist.
90				Backfill: 10/20 Colorado silica sand			ML	88.0 to 90.0' - Greenish black (5GY 2/1) clayey silt, organic rich very dense, organic rich sand lens at 88.5', slightly moist.
				Backfill: Bentonite - cement grout			CL	90.0 to 94.0' - Grayish olive (10Y 4/2) silty clay, trace amounts of angular limestone cobbles, dry to slightly moist.
95							GP	94.0 to 95.0' - Gravel consisting of angular limestone cobbles.
							LS-SH	95.0 to 105.0' - Medium gray (N4) fissile silty shale with thinly bedded limestone 1.5 inches to 4 inches thick, fracture present along limestone beddings, limestone fossiliferous, dry.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.00		03/23/93
▼	13.92	15:03	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 5

Borehole/Well Id 0343

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105								Total Depth = 105.0'.
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.00		03/23/93
▼	13.92	15:03	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0344
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595521.96
Date Started	1/26/93	East (ft)	1495145.72
Date Completed	2/1/93	Ground Surface Elev. (ft)	701.38
Logged By	DALE FLORES	Top of Casing Elev. (ft)	702.98
Checked By	PAUL DARR	Total Depth (ft)	175.5
Comments:	South of gate 100 along new gravel road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	A	GC	0005	Casing: Stainless steel, 4"			TS	0.0 to 5.0' - Grayish brown silty clay, very dense, moderate plasticity, root structure to 8", trace fine sand, moist. Topsoil.
	A	GC	1005	Backfill: Cement - bentonite grout				
5							GM	5.0 to 14.5' - Yellowish brown silty gravel, gravel both angular blocky to 5" and rounded cobbles to 4", 70% gravel, 30% silty sand.
10	A	GC	0015					
15	A	GC	0018				GP	14.5 to 17.0' - Yellowish brown sandy gravel, 60% gravel, pebble to cobble, 40% coarse sand, trace silt, gravel to 4", first water.
							GM	17.0 to 24.0' - Yellowish brown silty gravel, gravel both angular blocky to 5" and rounded cobbles to 4", 70% gravel, 30% silty sand.
	A	GT	0025					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.63	09:06	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0344

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GM	
25	A	GT	0035				TI	24.0 to 28.0' - Moderate yellowish brown (10YR 5/4) to medium gray (N5) gravelly clay, fine to medium gravel, ~70% silty clay, ~30% pebble gravel, stiff, moist. Till unit.
30							SP	28.0 to 31.0' - Yellowish brown gravelly sand, ~80% medium to course sand, ~20% pebble gravel, little to no fines, moist but not saturated.
35	A	GT	0040				TI	31.0 to 35.0' - Medium gray (N5) silty gravelly sand, fine sand, fine to medium gravel, ~50% fine sand and silt making up matrix, 50% gravel, nonplastic, medium gray below 32.0', moist to wet. Till. 35.0 to 40.0' - Medium gray (N5) silty gravelly sand, fine sand, fine to medium gravel, more silt in matrix making till unit denser, nonplastic, moist.
40							SP	40.0 to 41.0' - Yellowish brown sand, medium sand, some gravel, gravel to 3 inches, well sorted, ~50% medium sand, moist to wet. 41.0 to 43.5' - Light grayish brown sand, coarse sand, trace pebble gravel, saturated. 43.5 to 45.0' - Moderate yellowish brown sand, well sorted fine grained sand, moist but not saturated. 45.0 to 55.0' - Moderate yellowish brown sand, well sorted medium sand, has coarse thin sand lenses, no gravel, moist.
45								

GROUNDWATER

DEPTH	HOUR	DATE
20.63	09:06	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0344

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
55	A	GT	0060				SP	55.0 to 62.5' - Moderate yellowish brown (10YR 5/4) sand, medium grained sand, well sorted, has thin coarse sand lenses throughout, some gravel, moist.
60	A	GT	0065					62.5 to 64.5' - Medium gray (N5) sand, medium sand, very well sorted, moist.
65							GM	64.5 to 65.0' - Medium gray silty gravel with significant cobble size gravel, cobbles to 6", matrix of coarse sand, pebbles and silt, occurs as 6" lens, saturated zone.
							TI	65.0 to 66.0' - Moderate yellow brown (10YR 5/4) gravelly clay, fine to medium gravel, ~70% silty clay, ~30% fine gravel, stiff, moist. Till.
							GM	66.0 to 69.0' - Dark yellowish brown silty gravel, angular to rounded gravel, pebble to cobble size, matrix of coarse sand pebbles and silt, ~50% gravel, ~50% coarse sand and silt.
70							TI	69.0 to 71.0' - Moderate olive brown, silty clay with pebble gravel, very dense, moderate plasticity, dry. Till.
							GM	71.0 to 75.0' - Dark yellowish brown silty gravel, angular to rounded gravel, pebble to cobble size, matrix of coarse sand pebbles and silt, ~50% gravel, ~50% coarse sand and silt.

GROUNDWATER

DEPTH	HOUR	DATE
20.63	09:06	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0344

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							SP-SM	75.0 to 76.0' - Medium gray (N5) silty gravelly sand, fine to medium gravel, ~50% fine sand and silt, ~50% gravel, nonplastic, moist.
							TI	76.0 to 76.5' - Grayish olive (10Y 4/2) silty clay, fine gravel, very dense, moderate plasticity, occurs as thin lens in gravel. Till.
80							GM	76.5 to 80.0' - Dark yellowish brown silty gravel, angular to rounded gravel, pebble to cobble size, matrix of coarse sand pebbles and silt, ~50% gravel, ~50% coarse sand and silt. Has interbedded till layers, has more cobble size gravel. 80.0 to 85.0' - Dark yellowish brown silty gravel, angular to rounded gravel, pebble to cobble size, matrix of coarse sand pebbles and silt, ~50% gravel, ~50% coarse sand and silt. Has thin till lens (lens is dark yellowish orange).
85							GP	86.0 to 95.0' - Dark yellowish brown sandy gravel, little to no fines, gravel pebble size to 1 1/2", vertically grades to coarse sand with no gravel between 86.0 - 95.0', saturated.
90								
95							GP	95.0 to 104.0' - Moderate olive brown sandy gravel, coarse sand, moderate good sorting, 5% gravel > 1/2", little to no fines.

GROUNDWATER

DEPTH	HOUR	DATE
20.63	09:06	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0344

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
							GM	104.0 to 105.0' - Dark yellowish brown silty gravel, angular to rounded gravel, pebble to cobble size, matrix of coarse sand pebbles and silt, ~50% gravel, ~50% coarse sand and silt, saturated.
105	A	GT	0115				SP	105.0 to 108.0' - Moderate olive brown sand, medium to coarse, 10% pebbles, medium to poor sorting, moist, no fines.
							SP-GP	108.0 to 110.0' - Light gray, pebble gravel lens with coarse sand, moist, pebble gravel to 1/2", no fines.
110							SP	110.0' - Moderate olive brown sand, medium to coarse, 10% pebbles medium to poor sorting, moist, no fines.
115								116.0 to 125.0' - Moderate olive gray (5Y 4/4) sand, medium sand, well sorted, trace pebble gravel from 116.0 to 125.0', medium sand grades into sand with no gravel, saturated.
120								125.0' for the day.
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.63	09:06	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0344

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							NR	
130							GP	129.0 to 140.0' - Moderate olive gray sandy gravel, coarse sand to fine gravel, little to no fines, moderate sorting, trace gravel > 0.5", moist.
135								
140								
145								
150							NR	150.0 to 160.5' - Lost sample out of core barrel, no recovery, most likely material is as above 145.0 to 150' - Course sand and pebble gravel, little to no fines, moderate sorting, trace gravel > 1/2", moderate olive gray, saturated.

GROUNDWATER

DEPTH	HOUR	DATE
20.63	09:06	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0344

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							NR	
155				Seal: 1/4" Bentonite chips				
160								
				Filter Pack: 10/20 Colorado silica sand				
165				Screen: Stainless steel, 4", slot # 10				
170								
175							SH	175.0 to 175.5' - Medium gray weathered silty shale with thin fossiliferous lenses of limestone, very dense, moderate plasticity.
								Total Depth = 175.5'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.63	09:06	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0345
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597625.59
Date Started	2/4/93	East (ft)	1496496.46
Date Completed	2/5/93	Ground Surface Elev. (ft)	753.80
Logged By	DALE FLORES	Top of Casing Elev. (ft)	756.09
Checked By	PAUL DARR	Total Depth (ft)	45.0
Comments:	East of Building 49, base of SMPP Hill.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 5.0' - Moderate yellowish brown (10YR 5/4) silty sand and fine gravel, angular limestone clasts to 4", root structure and zones of organic material. Probable fill.
				Backfill: Cement - bentonite grout				
	B	GC	0005					
5								
	B	GC	1010					
	B	GC	0010				TI	7.0 to 10.5' - Moderately yellowish brown (10YR 5/4) sandy silt with trace amounts of clay, dense, none to low plasticity, 20% gravel to 1", mostly angular, dry to slightly moist. At 10.5" color change to medium dark gray (N4). At 15.2' limestone clasts in till to ~4". Till.
10								
	B	GC	0015					
15								
	B	GC	0020					
20								

GROUNDWATER

DEPTH	HOUR	DATE
28.20	08:53	02/06/93
25.46	17:14	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0345

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP	20.0 to 20.5' - Medium gravel lens within till, possible water zone, moist but not saturated.
							TI	20.5 to 28.0' - Color change in till from medium dark gray (N4) to moderate olive brown (5Y 4/4).
	B	GC	0025					
25								
							SM	28.0 to 30.0' - Variegated coloring from moderate yellowish brown (10YR 5/4) to moderate olive brown (5Y 4/4) silty sand, ~10% gravel to 1" subangular to angular, slightly moist. Outwash.
30				Seal: 1/4" Bentonite chips			SP	30.0 to 35.0' - Moderate yellowish brown (10YR 5/4) gravelly sand, little silt, ~60% medium grained sand, ~40% gravel, gravel angular, trace coarse gravel to 3 1/2", moist. Sandy till.
				Filter Pack: 10/20 Colorado silica sand				
35				Screen: Stainless steel, 4", slot # 10			GM-GP	35.0 to 43.0' - Dark yellowish orange (10YR 6/6) silty sandy gravel, ~80% fine gravel, trace gravel to 2", ~20% coarse sand and silt, first water zone, saturated from 35.0 to 43.0'. Outwash.
40	B	GC	0045	Backfill: Collapsed borehole material				
							SH	43.0 to 45.0' - Silty shale with lenses of calcareous shale, fissile, dry, crumbly below 44.0', moist 43.0 to 44.0'. Bedrock.
45								Total Depth = 45.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.20	08:53	02/06/93
▼	25.46	17:14	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0346
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597626.90
Date Started	4/2/93	East (ft)	1496107.04
Date Completed	4/3/93	Ground Surface Elev. (ft)	745.31
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	744.69
Checked By	PAUL DARR	Total Depth (ft)	53.0
Comments:	In parking lot just east of building 46, by test fire.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 0.3' - Asphalt 0.3 to 1.5' - Fine gravel, "road gravel". Fill.
				Backfill: Cement - bentonite grout				1.5 to 10.5' - Dusky yellow (5Y 6/4) to light olive gray (5Y 5/2) silty clay with fine to medium gravels of limestone, angular to subangular 1 to 5", firm, slightly moist. Probable fill for parking lot.
5								
	B	GC	0010					
10							CL	10.5 to 12.0'- Green black (5GY 2/1) silty clay, moderate plasticity, firm, organic fragments, slightly moist.
							TI	12.0 to 13.5' - Dusky yellow (5Y 6/4) silty clay ~20% fine to coarse gravels, dense, dry. Till.
							CL	13.5 to 14.0' - Green black (5GY 2/1) silty clay, moderate plasticity, firm, organic fragments, slightly moist.
15							TI	14.0 to 28.0'- Variable color first 2': dusky yellow (5Y 6/4) to light olive gray (5Y 5/2) grades into uniform color below 16.0': olive gray (5Y 4/1), silt and clay with gravel to 1', subangular to angular clasts to 3", firm, dense, partly crumbly, dry. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.66		04/04/93
▼	14.05	17:23	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0346

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
	B	GT	0025					
25								
	B	GC	0030				SP	28.0 to 33.0' - Moderate yellowish brown (10YR 5/4) sand, fine to medium grained sand, trace fines, well sorted, moist to wet at 28.0' (water table) and below.
30								
	B	GT	0035				SP-GP	33.0 to 37.0' - Pale olive (10YR 6/2) to light olive gray (5Y 5/2) coarse sand and fine gravel, with ~20 - 30% silt and clay, gravel to 3", wet. Outwash.
35				Seal: 1/4" Bentonite chips				
							SP-GP	37.0 to 39.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, trace fines, wet.
				Filter Pack: 10/20 Colorado silica sand				
40							SP-GP	39.0 to 43.0' - Pale olive (10YR 6/2) to light olive gray (5Y 5/2) coarse sand and fine gravel, with ~20 - 30% silt and clay gravel to 3", wet. Outwash.
				Screen: Stainless steel, 4", slot # 10				
							SP-GP	43.0 to 48.0' - Medium blue gray (5B 5/1) coarse sand and fine gravel, with ~20 - 30% silt and clay, gravel to 3", substantial amounts of limestone clasts, drilled through limestone boulder at 45.0 to 46.5', wet to very moist.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.66		04/04/93
▼	14.05	17:23	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id 0346

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Backfill: 10/20 Colorado silica sand				
				Backfill: 1/4" Bentonite chips			CL	48.0 to 50.0'- Silty clay, dense, firm, dry at 49.0'. Weathered bedrock.
50							ST	50.0 to 53.0' - Siltstone with few thin (1 - 2") limestone lenses, fossils evident in limestone. Bedrock.
								Total Depth = 53.0'.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	15.66		04/04/93
▼	14.05	17:23	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0347
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597375.07
Date Started	2/17/93	East (ft)	1495092.49
Date Completed	2/20/93	Ground Surface Elev. (ft)	724.89
Logged By	DALE FLORES	Top of Casing Elev. (ft)	726.99
Checked By	PAUL DARR	Total Depth (ft)	73.0
Comments:	South of building 94.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	B	GC	0005	Casing: Stainless steel, 4" Backfill: Cement - bentonite grout			GP-GM	0.0 to 0.5' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~70% coarse sand and fine gravel, ~30% silt, gravel to 1", moist.
							ML	0.5 to 5.0' - Grayish olive (10Y4/2) sandy silt, weathered, very dense, trace of limestone clasts to 3", dry to slightly moist.
5	B	GC	0010				ML	5.0 to 13.5' - Yellow brown to olive gray (5Y 3/2) sandy clayey silt, ~80% fine sand to silt, some clay, dense, slight plasticity, trace of limestone clasts to 3", moist.
10	B	GC	0015					
							CL	13.5 to 15.0' - Greenish gray (5G 6/1) with moderate yellow brown staining (10YR 5/4) silty clay, moderate plasticity, some limestone cobbles to 6", moist.
15							NR	15.0 to 20.0' - No recovery, fell out of core barrel.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.00		02/18/93
▼	44.49	17:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 3

Borehole/Well Id 0347

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0025				TI	20.0 to 34.5' - Dark yellow brown (10YR 4/2) silty sand, some fine gravel, matrix composed of ~60 fine sand and ~40% silt, moist. Sandy till.
25	B	GC	0030					25.0 to 34.5' - Dark yellow brown (10YR 4/2) silty sand, some fine gravel, matrix composed of ~60 fine sand and ~40% silt, moist. Sandy till.
30	B	GC	0035					30.0 to 34.5' - Brownish gray (5Y 4/4) silty sand, some fine gravel, matrix composed of ~60 fine sand and ~40% silt, moist. Sandy till.
35	B	GC	0040				GP-GM	34.5 to 35.0' - Light brown (5YR 5/6) sandy silty gravel, ~50% subangular to angular gravel, ~50% silt and fine sand, poorly graded, poorly sorted, dry to slightly moist. 35.0 to 40.0' - Moderately yellow brown (10YR 5/4) to light brown (5YR 5/6) sandy silty gravel, ~ 50% subangular to angular gravel, ~50% silt and fine sand, poorly gravel, poorly sorted, saturated from 36.0 to 38.0', dry below 38.0'.
40							GP	40.0 to 41.0' - Dark yellowish brown (10YR 4/2) sandy gravel, coarse sand to fine gravel, little to no fines, gravel subangular to angular, gravel to 5", saturated, ~70% gravel, ~30% sand, saturated.
							GP	41.0 to 42.0' - Dark yellowish brown (10YR 4/2) fine to coarse angular gravel, poorly graded, saturated.
							GP	42.0 to 44.0' - Moderate yellow brown (10YR 5/4) sandy gravel, gravel subangular, ~50% gravel, ~50% fine sand and silt, poorly sorted/graded, limestone gravel to 6", wet.
45							GM	44.0 to 45.0' - Moderate yellow brown (10YR 5/4) silty gravel, gravel subangular, ~50% gravel, ~50% fine sand and silt, poorly sorted/graded, limestone clast to 7 inches, matrix more cohesive than 42.0 to 43.0', wet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.00		02/18/93
▽	44.49	17:01	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0347

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							GM	45.0 to 53.0' - Moderately yellow brown (10YR 5/4) silty gravel, gravel subangular, ~50% gravel, ~50% fine sand and silt, poorly sorted/graded, at 49.0' dark yellowish brown (10YR 4/2) 4" lense of sandy till, fine sand and silt in matrix of fine sand and silt, ~60% sand, ~40% silt, saturated.
50				Seal: 1/4" Bentonite chips				
							GP	53.0 to 55.5' - Moderately yellow brown (10YR 5/4) gravel, trace of silt, trace of coarse sand, ~90% fine to medium gravel, gravel subrounded, poorly graded, wet.
55				Filter Pack: 10/20 Colorado silica sand Screen: Stainless steel, 4", slot # 10			SP	55.0 to 65.0' - Moderate olive brown (5Y 4/4) sand, trace of subangular gravel, trace of subangular limestone, coarse sand, moderate good sorting, poorly graded, saturated.
60								
65							SP	65.0 to 67.0' - Moderate olive brown (5Y 4/4) sand, medium to good sorting, trace of gravel, little to no fines, saturated.
	B	GC	0067	Backfill: Collapsed bedrock material			GM	67.0 to 68.0' - Light olive gray (5Y 5/2) silty gravel, ~60% fine to medium gravel, ~40% silt and clay, 5" cobble of basalt in gravel.
70							SH	68.0 to 73.0' - Medium gray (N5) silty shale, thinly bedded fossiliferous limestone lenses, slightly weathered, fine grained shale, fractures along limestone bedding are moist. Weathered bedrock. Saturated thickness of borehole about 30', from 38.0 to 68.0'.
								Total Depth = 73.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.00		02/18/93
▼	44.49	17:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 10

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0348
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	599090.15
Date Started	3/9/93	East (ft)	1495797.13
Date Completed	3/9/93	Ground Surface Elev. (ft)	876.39
Logged By	D.WILLIAMS/J.HAGGETT	Top of Casing Elev. (ft)	876.69
Checked By	PAUL DARR	Total Depth (ft)	248.7

Comments: In DOE parking lot on main hill. Borehole left open for the installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	0.0 to 3.0' - Dark brown, silt and clay, organic-rich, little fine to medium sand, moist. Topsoil. 1.0 to 2.0' - Brown silty clay, some fine to coarse sand, some fine to coarse gravel, moderate plasticity, damp.
5							LS	2.0 to 3.0' - Gray limestone, highly weathered, fractured, dry. Bedrock. 3.0 to 5.0' - Intermixed layers of limestone and siltstone, some sand, dry. Bedrock. 4.0 to 5.0' - Intermixed layers of limestone and siltstone, some sand, dry, turning gray, then back into brown in bottom few inches. Bedrock. 5.0 to 14.77' - 8 3/4" hole reamed to 14.77'.
10								
15	B	GC	0017				LS	RUN #1 : 14.7 to 16.7' RECOVERY = 100% RQD = 0% Medium to dark gray (N4-N3) limestone, coarsely to cryptocrystalline moderately fossiliferous, some argillaceous zones which are moist. Shale layers to 1" thick, interbedded, medium gray (N4), dense, moist, cryptocrystalline, limestone is very hard, dry.
	B	GC	0020					RUN #2 : 16.7 to 25.3' RECOVERY = 100% RQD = 14%
20								

GROUNDWATER

DEPTH	HOUR	DATE
16.77		03/09/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								Medium dark gray (N4-N3) limestone, coarsely to cryptocrystalline, slightly fossiliferous. Zones of argillaceous limestone (N3), trace of fossils, soft, saturated, trace layers of soft, saturated. Shale zone (calcification), highly fractured.
25							LS	RUN #3 : 25.3 to 35.8' RECOVERY = 100% RQD = 36% Medium dark gray (N4-N3) limestone, coarsely to cryptocrystalline, moderately fossiliferous, dry. Lenses of argillaceous limestone which are iron stained, light olive gray (5Y 5/2) staining light brown (5YR 5/6) to dark yellowish orange (10YR 6/6) on crystalline limestone fracture. Thin layers of shale, dark gray (N3) to dark greenish, gray (5G 4/1), dense, moist, few fossils. Limestone (crystalline) fractures and argillaceous limestone is saturated.
30								
35							LS	RUN #4 : 35.8 to 46.5' RECOVERY = 100% RQD = 28% Crystalline and argillaceous limestone as above, with layers of argillaceous limestone becoming more prevalent and thicker. Iron stains still present. Trace shale, highly weathered, saturated. Argillaceous limestone moderately weathered to highly weathered moderately fossiliferous to few fossils, moist to saturated.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	16.77		03/09/93
⊻			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							LS	RUN #5 : 46.5 to 57.2' RECOVERY = 100% RQD = 68% Dark gray (N3) limestone, mostly argillaceous variety, slight fossiliferous, dry, moderately hard with up to 6" lenses of coarsely to finely crystalline limestone, moderately fossiliferous, dry. Thick shale layer from 49.4' (4.8' thick) with 4 1" finely crystalline limestone lenses, non fossiliferous (N4), iron staining in fracture zones, 2nd shale layer from 56.0' to end.
50								
55								
							LS	RUN #6 : 57.2 to 67.7' RECOVERY = 100% RQD = 71% Dark gray (N3) limestone, coarsely to finely crystalline, coarsely crystalline more prone to contain fossils, 2.6' dark gray (N3) shale layer, trace fossils, moist to wet starts at 60.3'. Iron stained limestone fracture zone at 62.9' little argillaceous limestone (N3), at top of run, slightly fossiliferous, moist to wet.
60								
65								
							SH	RUN #7 : 67.7 to 77.2' RECOVERY = 96% RQD = 54% Dark greenish gray (5G 4/1) shale, highly fractured and weathered zone, wet at 71.6' dark gray (N3) shale to dark greenish gray (5G 4/1), dense, homogeneous, slightly fossiliferous, moist to wet with medium dark gray (N4) limestone lenses to 4" thick, coarsely to cryptocrystalline, moderately fossiliferous, very hard, dry,
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
							SH	RUN #8 : 77.2 to 87.4' RECOVERY = 99% RQD = 73% Stringer of pale yellowish brown (10YR 6/2) smokey quartz at 77.8', dark greenish gray (5G 4/1) shale, dense, moderately to slightly fossiliferous, moist to wet. Lenses of dark to medium dark gray (N4-N3) limestone, coarsely to finely crystalline, some argillaceous, moderate to highly fossiliferous, dry to moist.
80								
85								
							SH	RUN #9 : 87.4 to 97.4' RECOVERY = 100% RQD = 90% shale Dark greenish gray (5G 4/1), dense, moderate to slightly fossiliferous. Moist to wet. Lenses of dark to medium dark gray (N4-N3) limestone, coarsely to finely crystalline, some argillaceous, moderate to highly fossiliferous, dry to moist, highly fractured limestone zone at 91.7'. Quartzitic fossil at 94' (smokey quartz),
90								
95								
							SH	RUN #10 : 97.4 to 107.6' RECOVERY = 100% RQD = 84%

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								1" high weathered, saturated shale. Quartz crystal growth on/in fossil at 100.3'. Limestone dark to medium dark gray (N4-N3), coarsely to finely crystalline, moderately fossiliferous, dry clean, very hard, dry. Argillaceous limestone is moderate to highly fossiliferous, hard, moist to wet. Layers of shale dark gray (N3) to dusky blue green (5BG 3/2), dense, moist.
105								
							LS	RUN #11 : 107.6 to 117.8' RECOVERY = 100% RQD = 89% Dark gray (N3) limestone, clean to argillaceous, very hard to hard, very fossiliferous to moderately fossiliferous, coarsely to finely crystalline. Argillaceous variety grading to shale, dark gray (N3) to dark greenish gray (5GY 4/1), dense, slightly fossiliferous, homogeneous, moist.
110								
115								
							LS	RUN #12 : 117.8 to 127.9' RECOVERY = 100% RQD = 80% Dark gray (N3) limestone, clean to argillaceous, very hard to hard, very fossiliferous to moderately fossiliferous, coarsely to finely crystalline. Argillaceous variety grading to shale, dry gray (N3) to dark greenish gray (5GY 4/1), dense, slightly fossiliferous, homogeneous, moist, possible iron staining at 119.5 and 120.1'.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
▽			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SH	RUN #13 : 127.9 to 138.8' RECOVERY = 100% RQD = 81% Medium dark gray (N4) shale, interbedded with limestone. Limestone is medium to light gray (N5-N7), fine to coarsely crystalline, very hard, slightly fossiliferous. Shale is generally homogeneous, little visual evidence of bedding, tends to break horizontally with layers of fossils, fracture at 137.0', 90 to 85 deg. open, rough surface, discontinuous. Matrix of core is dry to damp, shale is blocky and brittle at 132.0'.
130								
135								
							SH	RUN #14 : 138.3 to 148.7' RECOVERY = 100% RQD = 65% Medium dark gray (N4) shale, interbedded with limestone. Limestone is medium to light gray (N5-N7), fine to coarsely crystalline, very hard, slightly fossiliferous. Shale is generally homogeneous, little visual evidence of bedding, tends to break horizontally with layers of fossils, fracture at 137.0' 90 to 85 deg. open, rough surface, discontinuous. Matrix of core is dry to damp, decreasing fossils from run #13, shale is very platey at 146.1 to 146.8'.
140								
145								
							SH	RUN #15 : 148.7 to 159.0' RECOVERY = 100% RQD = 48% Medium dark gray (N4), predominantly shale, shale interbedded with limestone. Limestone is medium to light gray (N5-N7), fine to coarsely crystalline, very hard, slightly fossiliferous. Shale is generally homogeneous, little visual evidence of bedding, tends to
150								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								break horizontally with layers of fossils, clean to very fossiliferous, trace to some limestone laminations, limestone increasing with depth, moisture along horizontal bedding planes.
155								
160							SH	RUN #16 : 159.0 to 169.0' RECOVERY = 100% RQD = 48% Predominantly medium dark gray (N4) shale, shale interbedded with limestone, limestone is medium to light gray (N5-N7), fine to coarsely crystalline, very hard, slightly fossiliferous. Shale is generally homogeneous, little visual evidence of bedding, tends to break horizontally with layers of fossils, clean to very fossiliferous, trace to some limestone laminations, limestone increasing with depth, moisture along horizontal bedding planes.
165								
170							LS	RUN #17 : 169.0 to 179.4' RECOVERY = 100% RQD = 67% Medium gray (N5) limestone interbedded with stringers and laminations of shale (0.5 to 20 cm thick), cryptocrystalline to coarsely crystalline, clean to very argillaceous, fossiliferous. Shale is non fractured, dry.
175							SH	177.7 to 179.4' - Medium dark gray (N4) shale, massive, no distinct bedding, calcareous, trace blebs of limestone. Matrix is fossiliferous, dry.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 8 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
180							LS	RUN #18 : 179.4 to 189.7' RECOVERY = 100% RQD = 98% Predominantly limestone, very interbedded and interlaminated with shale and argillaceous material.
185								
190							SH	RUN #19 : 189.7 to 199.4' RECOVERY = 100% RQD = 88% Predominantly medium dark gray (N4) to olive gray (5Y 4/1) shale, interbedded with some limestone. Shale is slightly to moderately calcareous, some is very calcareous grading to limestone, fossiliferous, (Brachiopods) some very mottled with limestone. limestone is medium gray (N5), coarsely crystalline trace vuggy porosity at 196.2'. Limestone increasing with depth, horizontal fracture at 189.9', matrix is damp.
195								
200							SH	RUN #20 : 199.4 to 209.6' RECOVERY = 100% RQD = 95% Predominantly medium dark gray (N4) to olive gray (5Y 4/1) shale, interbedded with limestone. Shale is slightly to moderately calcareous, some is very calcareous, grading to limestone fossiliferous, some very mottled with limestone. Limestone is moderately gray, coarsely crystalline. Limestone lenses are 1 to 3 cm thick, damp to dry.
205								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 9 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
210							SH	RUN #21 : 209.6 to 219.9' RECOVERY = UNREPORTED. RQD = UNREPORTED. Predominantly medium dark gray (N4) to olive gray (5Y 4/1) shale interbedded with limestone. Shale is slightly to moderately calcareous, grading to limestone fossiliferous, some very mottled with limestone. Limestone is moderately gray, coarsely crystalline. Limestone lenses are 1 to 3 cm thick, trace trilobite fragments at 216.5', damp to dry.
215								
220							LS	RUN #22 : 219.9 to 230.3' RECOVERY = 100% RQD = 63% Predominantly Limestone: interbedded and interlaminated with shale, very fossiliferous shale segments (Brachiopods), dry.
225								
230							LS	RUN #23 : 230.3 to 240.7' RECOVERY = 100% RQD = 63%

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 10 of 10

Borehole/Well Id 0348

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								Limestone: interbedded with some shale, very fossiliferous shale segments (Brachiopods), dry.
235								
240							LS	RUN #24 : 240.7 to 248.7' RECOVERY = 100% RQD = 81% Limestone: interbedded with some shale, very fossiliferous shale segments (Brachiopods), dry.
245								
250								Total Depth 248.7'.
255								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.77		03/09/93
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WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 8

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0349
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	598063.50
Date Started	3/18/93	East (ft)	1496060.62
Date Completed	3/21/93	Ground Surface Elev. (ft)	825.03
Logged By	D.WILLIAMS/R.MARROW	Top of Casing Elev. (ft)	824.97
Checked By	PAUL DARR	Total Depth (ft)	201.3

Comments: Located in security area along side of road near WD building south, side of Main Hill. Borehole left open for installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							FL	0.0 to 5.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
5	B	GC	0005					5.0 to 10.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
10	B	GC	0010					10.0 to 15.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
15	B	GC	0015					15.0 to 20.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
20								

GROUNDWATER

DEPTH	HOUR	DATE
72.20	15:30	03/21/93

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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0020				SH	20.0 to 23.5' - Gray, clay/shale with some large pieces of gravel, hard, dry. Bedrock. End of boring at 23.5'. Cable tool advanced casing through fill to 38.0'.
25							NR	
30								
35								
	B	GC	0038				SH	RUN #1 : 38.0 to 48.5' RECOVERY = 100% RQD = 48% Dark greenish gray (5GY 4/1) to medium gray (N5/0) shale, massive, some very thinly bedded at 40.0', vertical fractures at 42.0', slightly rough to smooth, wet along fracture faces and bedding fractures, some thinly interbedded with limestone (.5 to 3 cm), coarsely crystalline, hard. Limestone is slightly to very fossiliferous, (Brachiopods) wet at 38.4', top .38' (38.0 to 38.38) may be a chunk of concrete?
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	72.20	15:30	03/21/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SH	RUN #2 : 48.5 to 52.3' RECOVERY = 100% RQD = 52% Shale as above, trace rugose coral, very blocky at times, horizontal bedding, breaks easily along bedding planes, fracture at 50', very rough stepped surface, wet along bedding.
50							SH	RUN #3 : 52.3 to 62.8' RECOVERY = 100% RQD = 65% Dark greenish gray (5GR 4/1) shale interbedded with trace to some limestone. Limestone is coarsely crystalline, very fossiliferous, very hard. Shale is thinly laminated, bedding is horizontal breaking along fossil layers, very blocky and rotten from 52.3 to 56.0', vertical fractures 52.3 to 56.0', very rough, open, wet along fractures and bedding.
55								
60							SH	RUN #4 : 62.8 to 72.8' RECOVERY = 100% RQD = 65% Predominantly shale: as above, shale is generally less fossiliferous, trace limestone (2 to 3 cm) thick, shale becoming less blocky more competent with depth, moist along bedding (horizontal), matrix is dry.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	72.20	15:30	03/21/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SH	RUN #5 : 72.8 to 83.3' RECOVERY = 100% RQD = 54% Predominantly shale, as above, shale is generally less fossiliferous, trace limestone (2 to 3 cm) thick, shale becoming less blocky more competent with depth, moist along bedding (horizontal), matrix is dry, fractures along 73.2 to 78.5', rough, open, fractures more prevalent in limestone stringers.
75								
80								
							SH	RUN #6 : 83.3 to 93.0' RECOVERY = 100% RQD = 46% Shale and limestone: interbedded, beds are .3 to 1.0' thick, lithology is as above, trace limestone (2 to 3 cm) thick, shale becoming less blocky more competent with depth, moist along bedding (horizontal), matrix is dry, shale is generally less fossiliferous, trace vertical fractures at 86.0', fractures are open to partially healed, trace shale inclusions in limestone, some very thinly laminated.
85								
90								
							SH	RUN #7 : 93.0 to 103.4' RECOVERY = 100% RQD = 78% Predominantly dark greenish gray (5GY 4/1) shale, hard, very little bedding features, slightly to moderately fossiliferous, trace very thin (2-3cm) stringers of limestone, limestone decreases with depth, no fractures, generally dry matrix.
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	72.20	15:30	03/21/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
							SH	RUN #8 : 103.4 to 113.2' RECOVERY = 100% RQD = 88% Predominantly dark greenish gray (5GY 4/1) shale, hard, very little bedding features, slightly to moderately fossiliferous, trace very thin (2-3cm) stringers of limestone, limestone decreases with depth, generally dry matrix, no fractures. Mottled and laminated with limestone from 104.0 to 105.0', 107.5 to 108.5', generally less fossiliferous, trace trilobites, matrix is dry.
105								
110								
							SH	RUN #9 : 113.2 to 118.5' RECOVERY = 100% RQD = 86% Predominantly shale, interbedded with some limestone, trace very thin (2-3cm) stringers of limestone, limestone decreases with depth, no fractures, generally dry matrix.
115								
							LS	118.5 to 120.85' - Medium light gray (N4) limestone, massive, very fossiliferous, trace shale laminations, fine to coarsely crystalline, dry.
120								
							SH	120.9 to 123.5' - Brownish gray (5YR 4/1) shale interbedded with limestone, shale is very calcareous grading to argillaceous limestone, fossils carbonaceous to some extent, very hard, no obvious bedding in shale, limestone is massive, very fossiliferous.
							SH	RUN #10 : 123.5 to 133.5' RECOVERY = 100% RQD = 92% Medium dark gray (N4) shale, massive, homogeneous - very few
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	72.20	15:30	03/21/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								obvious bedding features, some fossils (Brachiopods), thinly laminated with trace limestone.
130								
							SH	RUN #11 : 133.6 to 143.9' RECOVERY = 88% RQD = 97% Medium dark gray (N4) shale, massive, homogeneous - very few obvious bedding features, abundant fossils (Brachiopods), trace to some interbedded limestone, some silt grading to silty shale, dry.
135								
140								
							SH	RUN #12 : 143.9 to 153.4' RECOVERY = 112% RQD = 87% Shale and limestone interbedded, shale/limestone sequences are gradations with some mottles, shale is becoming predominantly medium dark gray (N4/2), and less silty, no fractures, matrix is dry.
145								
150								

GROUNDWATER

DEPTH	HOUR	DATE
72.20	15:30	03/21/93

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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SH	RUN #13 : 153.4 to 163.6' RECOVERY = 100% RQD = 92% Shale interbedded with limestone, shale/limestone sequences are gradations with some mottles, shale is becoming predominantly limestone interbedded with shale from 157.9 to 160.45'.
155								
160								
							LS	RUN #14 : 163.6 to 173.9' RECOVERY = 100% RQD = 89% Medium light gray (N6) limestone, interbedded with shale, coarsely crystalline, fossiliferous generally thinly (1-4 cm) interbedded, predominantly shale from 167.45 to 169.4', no fractures, dry.
165								
170								
							LS	RUN #15 : 173.9 to 184.25' RECOVERY = 100% RQD = 79% Medium light gray (N6), limestone and shale, interbedded with shale, coarsely crystalline, fossiliferous generally thinly (1-4 cm) interbedded, no fractures, dry.
175								

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	72.20	15:30	03/21/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 8 of 8

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
180								
185							LS	RUN #16 : 184.3 to 194.5' RECOVERY = 100% RQD = 100% Limestone and shale, interbedded and sometimes mottled together, shale medium dark gray (N4), fossiliferous horizontal bedding, some grades to argillaceous limestone, non-fractured, limestone is medium light gray (N6), extremely hard, coarsely crystalline, some fossils (Brachiopods) clean to slightly argillaceous, some very thinly interlaminated with shale, shale becoming increasingly silty with depth matrix is damp.
190								
195							LS	RUN #17 : 194.5 to 201.25' RECOVERY = 100% RQD = 100% Limestone and shale, interbedded and sometimes mottled together, shale is medium dark gray (N4), fossiliferous horizontal bedding, some grades to argillaceous limestone, non-fractured, limestone is medium light gray (N6), extremely hard, coarsely crystalline, some fossils (Brachiopods) clean to slightly argillaceous, some very thinly interlaminated with shale, shale becoming increasingly silty with depth matrix is damp.
200								
205								Total Depth = 201.25'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	72.20	15:30	03/21/93
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 10

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0350
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596438.04
Date Started	1/6/93	East (ft)	1497050.03
Date Completed	3/7/93	Ground Surface Elev. (ft)	887.40
Logged By	E.LARSEN/J.HAGGETT	Top of Casing Elev. (ft)	888.50
Checked By	PAUL DARR	Total Depth (ft)	250.5

Comments: Near south edge of SM/PP Hill, 100' WSW of security bunker facility; 100' SE. of Weston drum staging area. Borehole left open for the installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	0.0 to 0.9' - Silty sand with some gravel, roots. Topsoil.
							FL	0.9 to 1.5' - Silt, sand and gravel, chunks of limestone. Fill. Note: The 0.0 to 1.5' interval was excavated using a shovel - served as a pilot hole for initial surface casing installation. 1.5 to 3.3' - Silt, sand and gravel, chunks of limestone. Fill.
5							LS	3.3 to 6.0' - Lithology uncertain, some layering apparent, possibly weathered siltstone or limestone (no split spoon samples collected during surface casing installation). Weathered bedrock. 6.0 to 8.0' - Dark gray limestone, hard, trace fossils, actual formation probably consists of shale with numerous limestone interbeds.
10							NR	8.0 to 11.5' - Hole reamed to 13.5' to accommodate core barrel guides, no sample to describe.
15							LS	RUN #1 : 11.5 to 15.4' RECOVERY = 38% RQD = 0% Medium to dark gray (N5-N3) limestone, fossiliferous interbedded shale and limestone lenses, pieces only to 1" thick. RUN #2 : 15.4 to 23.4' RECOVERY = 88% RQD = 9% Medium dark gray (N4) limestone, thickly bedded, with thinly bedded medium gray (N5) shale, limestone is fossiliferous, limestone is hard with moist to wet shale being hard to soft.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							LS	
	B	GC	0024					RUN #3 : 23.4 to 24.2' RECOVERY = 100% RQD = 44%
25							LS	Medium dark gray (N4) limestone, thickly bedded, with thinly bedded shale medium gray (N5), limestone is hard, shale is hard to soft, shale and limestone layers to 1" and 3" thickness respectively, limestone is fossiliferous, wet. RUN #4 : 24.2 to 34.5' RECOVERY = 100% RQD = 50.6%
30								Medium gray (N5) limestone fossiliferous, in lenses 1" to 4" thick with thin (1/32) to 3" layers of dark gray (N3) shale, some shale stained to greenish gray (5G 2/1), shale is wet.
35							LS	RUN #5 : 34.7 to 45.1' RECOVERY = 100% RQD = 49.7% Medium gray (N5) limestone fossiliferous, in lenses 1" to 4" thick with thin (1/32) to 3" layers of dark gray (N3) shale, some shale stained to greenish gray (5G 2/1), 0.4' thinly banded shale/limestone lens from 40.25' to 40.65', shale is wet.
40								
45								RUN #6 : 45.1 to 55.6' RECOVERY = 100% RQD = 73%

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							LS	Gray (N5) limestone, coarsely crystalline to cryptocrystalline, mostly clean, dry. Dark gray (N3) shale layers, fossiliferous to 5" thick, nonfractured, shale is wet.
50								
55							LS	RUN #7 : 55.6 to 66.1' RECOVERY = 100% RQD = 78% Gray (N5) limestone, coarsely crystalline to cryptocrystalline, mostly clean, dry. Dark gray (N3) shale layers to 1.3' thick. At 65.25 to 66.05' limestone has 0.4' vertical fracture with small calcium deposit inside.
60								RUN #8 : 66.1 to 76.6' RECOVERY = 98% RQD = 78% Gray (N5) limestone, coarsely to cryptocrystalline, clean, some bedding (?) planes, visible with 8 to 12 deg inclinations from horizontal, mostly dry. Interbedded with dark gray (N3) shale, mostly sparsely fossiliferous with thin 1/2" bands of fossils, moist.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							LS	RUN #9 : 76.6 to 86.1' RECOVERY = RQD = Medium dark gray (N4) limestone, coarsely crystalline to cryptocrystalline, clean, fossiliferous, non fractured, dry. Interbedded greenish black (5G 2/1) to dark greenish gray (5G 4/1), homogeneous, dense, nonfossiliferous with thin layers (to 1/2") of fossils, moist.
80								
85							LS	RUN #10 : 86.1 to 96.6' RECOVERY = 98% RQD = 95% Medium dark gray (N4) limestone, and interbedded greenish black (5G 2/1) to dark greenish gray (5G 4/1) shale, limestone has abundant fossils while shale is slightly to nonfossiliferous.
90								
95							SH	RUN #11 : 96.6 to 107.1' RECOVERY = 100% RQD = 71% Greenish black (5G 2/1) to dark greenish gray (5G 4/1) shale, homogeneous, dense, medium fossil content, moist to wet, limestone

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								lenses (N4) to 3" thick, fossiliferous, banded limestone and shale is slightly weathered from 96.55 to 97.5', limestone is predominantly dry.
105								
							SH	RUN #12 : 107.1 to 117.6' RECOVERY = 99% RQD = 70% Medium yellowish green black (5GY 5/1) shale, medium fossil content, dense, homogeneous, moist to dry, interbedded with limestone dark gray to medium dark gray (N3-N4) lenses to 3" thick, fossiliferous, coarsely to cryptocrystalline.
110								
115								
							LS	RUN #13 : 117.6 to 128.1' RECOVERY = 99% RQD = 85% Dark gray green (N3) limestone, fossiliferous, dry with interbedded medium yellowish green - black (5GY 5/1) shale with slight fossil content, dense, dry.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							LS	RUN #14 : 128.1 to 138.6' RECOVERY = 97% RQD = 88% Medium gray (N5) limestone interbedded with dark greenish gray (5G 4/1) shale, shale is dense, homogeneous, with slight to moderately abundant fossils (including mollusks and trilobite parts), grading to limestone, coarse to cryptocrystalline, fossiliferous, highly weathered at 136.5', shale is slightly moist, limestone is dry.
130								
135								
							LS	RUN #15 : 138.6 to 149.1' RECOVERY = 100% RQD = 86% Medium gray (N5) limestone interbedded with shale, dark greenish gray (5G 4/1), dense, homogeneous, with slight to moderately abundant fossils (including mollusks and trilobite parts), grading to limestone, coarse to cryptocrystalline, fossiliferous, highly weathered/fractured at 141.0', zones of argillaceous limestone more frequent, shale and argillaceous limestone are moist.
140								
145								
							LS	RUN #16 : 149.1 to 159.6' RECOVERY = 97% RQD = 85% Medium gray (N5) limestone interbedded with shale, dark greenish gray (5G 4/1) shale, dense, homogeneous, sparsely fossiliferous (including mollusks and trilobite parts), grading to limestone, coarse
150								

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								to cryptocrystalline, fossiliferous, highly weathered fractures at 151.5 and 155.11', softer argillaceous zones more frequent.
155								
160							SH	RUN #17 : 159.6 to 164.8' RECOVERY = 84% RQD = 48% Medium dark gray to dark gray (N4 to N3) shale, dense, homogeneous, slightly fossiliferous, moist, interbedded with limestone lenses, medium dark gray to dark gray (N4 to N3), some argillaceous, slightly fossiliferous, coarsely to finely crystalline, mostly dry, some argillaceous zones seemed highly weathered, as they were ground up during coring.
165							SH	RUN #18 : 164.6 to 172.6' RECOVERY = 98% RQD = 99% Medium dark gray to dark gray (N4 to N3) shale, dense, homogeneous, slightly fossiliferous, moist, interbedded with limestone lenses, medium dark gray to dark gray (N4 to N3), some argillaceous, slightly fossiliferous, coarsely to finely crystalline, mostly dry, some argillaceous zones seemed highly weathered, as they were ground up during coring. Argillaceous limestone in upper and lower section of core, loss of recovery due to broken piece of core in borehole.
170								
							SH	RUN #19 : 172.8 to 179.6' RECOVERY = 100% RQD = 90% Dark gray to medium dark gray (N4-N3) shale, dense, slightly fossiliferous grading to argillaceous dark gray (N3) limestone, fossiliferous, some lenses of clean dark gray to medium dark gray (N3-N4) limestone. Note: missing .15 of core from run #18 was recovered in run #19 (highly fractured shale).
175								

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 8 of 10

Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
180							SH	RUN #20 : 179.6 to 186.6' RECOVERY = 91% RQD = 73% Dark gray (N3) shale, slightly fossiliferous, dense, moist, interbedded with moist argillaceous dark gray (N3) limestone and coarsely to finely crystalline limestone dark gray (N3), fossiliferous. Clean limestone is predominantly dry. Note: loss of yield due to pulverization of argillaceous limestone during coring.
185							SH	RUN #21 : 186.8 to 189.8' RECOVERY = 88% RQD = 54% Dark gray (N3) shale, slightly fossiliferous, dense, moist, interbedded with moist argillaceous dark gray (N3) limestone and coarsely to finely crystalline dark gray (N3) limestone, fossiliferous. Clean limestone is predominantly dry.
190							SH	RUN #22 : 189.8 to 200.2' RECOVERY = 100% RQD = 91% Dark gray (N3) shaley, argillaceous limestone, moderately fossiliferous, lenses of cleaner medium dark gray (N4) limestone, coarsely to finely crystalline, with slightly more fossil content. Argillaceous limestone is moist, while clean limestone is dry.
195								
200							SH	RUN #23 : 200.2 to 209.6' RECOVERY =100% RQD = 92% Dark gray (N3) shaley, argillaceous limestone, moderately fossiliferous, lenses of cleaner medium dark gray (N4) limestone, coarsely to finely crystalline, with slightly more fossil content. Argillaceous limestone is moist, while clean limestone is dry.
205								

GROUNDWATER

	DEPTH	HOUR	DATE
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Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
210							LS	RUN #24 : 209.7 to 220.2' RECOVERY = 100% RQD = 95% Medium dark gray (N4) limestone, argillaceous, moderately fossiliferous, moist. Coarsely to finely crystalline, dry, fossiliferous, medium to dark gray (N4-N3) shale lenses. Shale layers (2" and 12" thick) at 216.0' and 219.0' respectively, dense, homogeneous, few fossils, moist.
215								
220							LS	RUN #25 : 220.2 to 229.8' RECOVERY = 100% RQD = 93% Medium dark gray (N4) limestone, argillaceous limestone slightly to moderately fossiliferous and clean, limestone being moderately fossiliferous, moist with coarsely to finely crystalline, dry, fossiliferous, medium to dark gray (N4-N3) shale lenses. Shale layers dense, homogeneous, few fossils, moist.
225								
230							LS	RUN #26 : 229.8 to 240.1' RECOVERY = 100% RQD = 92% Medium to dark gray (N4-N3) limestone, coarsely to finely

GROUNDWATER

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Borehole/Well Id 0350

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								crystalline, fossiliferous, dry, argillaceous dark gray (N3) limestone, moist, slightly weathered in places, fossiliferous dark gray (N3) shale layers, homogeneous, slightly fossiliferous, moist, dense.
235								
240							LS	RUN #27 : 240.1 to 250.5' RECOVERY = 94% RQD = 91% Medium to dark gray (N4-N3) limestone, argillaceous and clean, coarsely to finely crystalline, fossiliferous with little interbedded dark gray (N3) shale, dense, moist. Argillaceous limestone is also moist while clean limestone is dry, clean limestone becoming more prevalent.
245								
								Total Adjusted Depth = 248.0'
250								
255								

GROUNDWATER

	DEPTH	HOUR	DATE
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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0351
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596433.35
Date Started	1/9/93	East (ft)	1497050.28
Date Completed	1/9/93	Ground Surface Elev. (ft)	886.89
Logged By	E.LARSEN/T.FRINAK	Top of Casing Elev. (ft)	888.28
Checked By	PAUL DARR	Total Depth (ft)	20.0
Comments:	Approximately 130' west of building 100.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.8' - Silty sand with some gravel, roots. Topsoil.
				Backfill: Cement - bentonite grout			FL	0.8 to 3.3' - Silt, sand, and gravel, chunks of limestone. Fill.
5				Seal: 1/4" Bentonite chips			LS	3.3 to ~6.0' - Lithology uncertain, some layering apparent - possible weathered siltstone or limestone because split spoon samples are not being collected must look into borehole to describe lithology. Weathered bedrock. ~6.0 to 7.3' - Dark gray limestone, hard, trace fossils, lithology uncertain, formation probably consists of shale with numerous limestone interbeds. 7.3 to 10.0' - Fossiliferous limestone with interbeds of calcareous siltstone.
10				Filter Pack: 10/20 Colorado silica sand Screen: Stainless steel, 4", slot # 10				10.0 to 15.0' - Gray limestone, fossiliferous (brachiopods, rugose coral, and bryozoans) with thin (<0.5") interbeds of clay to silty clay, thickest limestone bed 3.5", fracturing evident at 13.5' and possibly at 11.3 bryozoans common in clayey beds.
15								15.0 to 20.0' - Gray limestone with fracturing evident at 16.2', 17.6', and 18.5', thin clayey siltstone units at 16.0', 17.2', and 19.0' all < 1", fossiliferous limestone contains brachiopods, rugose coral, and bryozoans.
20								Total Depth = 20.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	11.95	09:30	02/06/93
▼	14.12	18:20	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 5

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0352
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596590.37
Date Started	1/23/93	East (ft)	1495445.98
Date Completed	2/6/93	Ground Surface Elev. (ft)	738.16
Logged By	D.WILLIAMS/R.MORROW	Top of Casing Elev. (ft)	738.45
Checked By	PAUL DARR	Total Depth (ft)	102.2
Comments:	Southeast of landfill. Borehole left open for the installation of a monitor well at a later date.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	0.0 to 5.0' - Dark brown clay, organic rich, moist at top, damp towards bottom, little fine sand, little fine to medium gravel, firm. Topsoil.
5							CL/ML	5.0 to 10.0' - Brown silty sandy clay, little fine to medium gravel, firm, low plasticity, damp.
10							TI	10.0 to 18.0' - Gray clayey silt with sand, fine to coarse sand, fine to coarse gravel, unsorted, hard, dense, dry. Till,
15								
20							LS	18.0 to 20.0' - Gray limestone highly weathered, interbedded with siltstone, dry.

GROUNDWATER

	DEPTH	HOUR	DATE
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▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 5

Borehole/Well Id 0352

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							NR	
							CS	RUN #1 : 21.5 to 27.5' RECOVERY = 83% RQD = 52% Medium gray (N5/0) claystone, waxy, very slightly calcareous, trace pelecypoda fossils, trace thin calcareous stringers, closed, low angle fractures (~10 deg), trace silt (<10%), damp.
25							LS	24.5 to 26.5' - Light gray (N7) to medium light gray (N6) limestone, very argillaceous grading to calcareous shale, very fossiliferous, micro to finely crystalline, tight, grades to calcareous shale with depth, Damp.
								26.5 to 27.5' - No recovery.
							LS	RUN #2 : 27.5 to 29.5' RECOVERY = 108% RQD = 37% Light gray (N7) to medium light gray (N6) limestone, grades to fissile shale at 29.1'; slightly to moderately fossiliferous, fractures are open with very rough surfaces - appears to be discontinuous, damp to dry in matrix. Shale is fissile to subfissile, trace fossils, medium gray (N5), dry, brittle to hard, some horizontal breaks along possible bedding planes.
30							SH	
							SH/LS	RUN #3 : 29.5 to 35.5' RECOVERY = 100% RQD = 32% Medium gray (N5) shale, homogeneous, slightly fissile in some stringer, no apparent bedding features, damp, very calcareous.
35							SH	
							LS	31.4 to 35.5' - Medium gray (N5), interbedded shale and limestone, limestone is .25 to .4' thick, very fossiliferous, fractured at 45 deg, open fracture, interbedded with medium dark gray shale stringers, shale is moderately fossiliferous, poorly indurated, very calcareous, damp.
40								RUN #4 : 35.5 to 42.1' RECOVERY = 114% RQD = 69% Light olive gray (5Y 6/1) shale, homogeneous, slightly to moderately calcareous, dry, trace fossils.
							LS/SH	36.0 to 42.1' - Light olive gray (5Y 6/1) to medium gray (N 5) limestone, very argillaceous grading to calcareous shale, very fossiliferous, micro crystalline to coarsely crystalline in part, bedding varies and is generally indistinguishable, 30 deg discontinuous fracture at 38.0', closed, core generally breaks along fossiliferous zones, mottled with clayey material, generally damp, some interbedding (gradational) with shale, shaley section are generally platy to fissile, some moisture damp plates (drilling water?).
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 5

Borehole/Well Id 0352

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								RUN #5 : 42.1 to 49.25' RECOVERY = 94% RQD = 56%
50							LS/SH	Medium gray (N5) interbedded limestone/shale, shale becoming medium dark gray (N4) with depth, shale becoming more competent, very fossiliferous. Limestone is vuggy in places associated with fossil beds, bedding is generally indistinct but shale sections are platy to sub fissile, no distinct fracturing, damp. RUN #6 : 49.3 to 51.3' RECOVERY = 98% RQD = 44%
							LS	Medium gray (N5) interbedded limestone/Shale, shale medium dark gray (N4), homogeneous with some thin limestone interbedded non fractured, fossiliferous, moderately calcareous, indistinct bedding, damp.
55								RUN #7 : 51.25 to 61.75' RECOVERY = 100% RQD = 58%
							SH	Predominantly limestone interbedded with thin (2cm) shale. 57.4 to 58.5' - Olive gray (5Y 4/1) to medium dark gray (N4) shale, thin (2-3 mm) stringers at limestone, non fractured, fossiliferous, slightly to moderately calcareous, no apparent bedding fractures, waxy, damp.
60	B	GC	0060				LS/SH	58.5 to 61.8' - Limestone interbedded with shale, vertical fractures at 60.0', soft shale section at 60.5', trace rust staining and slight greener than olive gray (5Y 4/1) at shale stringer at 60.5'.
							SH/LS	RUN #8 : 61.8 to 71.5' RECOVERY = 100% RQD = 77%
65								Olive gray (5Y 4/1) to medium dark gray (N4) interbedded shale and limestone, thinly interbedded very fossiliferous, bedding is horizontal breaking along fossil zones, some open horizontal fractures at 67.75' and 68.5', 20 deg fracture at 71.25', wet along fractures, shale is moderately calcareous and moderately hard, lime sections are very light.
70							LS/SH	RUN #9 : 71.5 to 73.5' RECOVERY = 93% RQD = 21%

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 5

Borehole/Well Id 0352

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							LS SH	Light to medium gray (N3 - N5) limestone interbedded with shale, some very coarsely crystalline, very hard, trace fossils, discontinuous fracture at 72.8', closed, tight, shale is moderately calcareous and moderately hard, lime sections are very light, dry to damp. RUN #10 : 73.5 to 77.5' RECOVERY = 100% RQD = 89%
80							LS	73.5 to 74.1' - Limestone: as above trace interbedded with shale, very fossiliferous, micro to finely crystalline, plains clean to very argillaceous, grades to shale, dry, wet in bedding. 74.1 to 77.5' - Shale: as above, stringers of limestone, slightly fossiliferous, waxy in part, homogeneous, moderately to very calcareous grading to limestone, no fractures, no visible bedding. RUN #11 : 77.5 to 88.0' RECOVERY = 100% RQD = 83% 77.5' - Limestone: as above, interbedded with thin to medium stringers at calcareous shale.
85							SH/LS LS SH LS/SH	84.9 to 86.7' - Medium dark gray (N4) interbedded shale and limestone, shale is platy to blocky, not very competent, bedding splits along fossiliferous layers, limestone is very hard, coarsely crystalline at times, slightly fossiliferous, beds are generally 1 cm thick, shale beds are .5 cm thick, generally dry, wet along bedding planes. 86.7 to 87.2' - Light gray (N7) limestone, very hard, mottled with shale, trace to some fossils, fine to coarsely crystalline, damp. 87.2 to 88.0' - Shale: well to moderate homogeneous, poorly defined bedding, damp to moist in matrix. RUN #12 : 88.0 to 92.0' RECOVERY = No reported RQD = Not reported
90							LS/SH	Medium light gray (N6) to olive gray (5Y 4/1) limestone interbedded with shale, fossiliferous, bedding breaks along fossil layers in shale material, mottled in part, soft sediment deformation apparent at shale/limestone contact, wet along bedding. RUN #13 : 92.0 to 102.2' RECOVERY = 100% RQD = 61%
95								Medium gray to medium dark gray (N5 to N4) limestone interbedded with shale, shale is 10 - 2 cm thick, platy to fissile, brittle, very fossiliferous, moderately calcareous, some grades to limestone, limestone is cryptocrystalline to finely crystalline, slightly to very argillaceous, massive with no visible bedding, very hard, slightly fossiliferous, generally breaks along micro laminations at argillaceous material, matrix is dry, wet along bedding planes.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 5

Borehole/Well Id 0352

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
								Total Depth = 102.2'.
105								
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0353
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596241.80
Date Started	2/8/93	East (ft)	1495668.78
Date Completed	2/9/93	Ground Surface Elev. (ft)	744.95
Logged By	DALE FLORES	Top of Casing Elev. (ft)	747.07
Checked By	PAUL DARR	Total Depth (ft)	18.0
Comments:	Northeast of spoils area along fence line.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.5' - Dark yellowish brown (10YR 4/2), sandy silt, trace clay, roots, low plasticity. Topsoil.
				Backfill: Cement - bentonite grout			TI	0.5 to 16.0' - Moderate yellowish brown (10YR 5/4), sandy silt, 10% gravels to 1", very dense, moist. Color change to olive gray (5Y 3/2) at 8.0'. Till.
5	B	GC	0005					
				Seal: 1/4" Bentonite chips				
10				Filter Pack: 10/20 Colorado silica sand				
				Screen: Stainless steel, 4", slot # 10				
15	B	GC	0020				SH	16.0 to 18.0' - Medium dark gray (N4) silty shale with thinly bedded fossiliferous limestone lenses, fissile, powdery dry. Bedrock.
								Total Depth = 18.0'.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	0.67		04/03/93
▼		18:30	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0354
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595602.10
Date Started	4/20/93	East (ft)	1496322.15
Date Completed	4/20/93	Ground Surface Elev. (ft)	767.95
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	771.01
Checked By	PAUL DARR	Total Depth (ft)	23.0

Comments: On Mound south property. Approximately 1/4 mile south of fence line, near power lines, access through gate 100.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 1.5' - Dark yellow brown (10YR 4/2) silty clay, firm, moderately plastic, abundant roots, slightly moist. Topsoil.
	B	GC	0005	Backfill: Cement - bentonite grout			CL	1.5 to 5.0' - Dusky yellow (5Y 6/4) silty clay, clasts 1/4" to 1.5 inches some fossiliferous, weathered out fossil fragments, mottled coloring at 4' to greenish gray (5G 6/1), dry to slightly moist.
5								5.0 to 11.5' - Mottled coloring throughout, dusky yellow (5Y 6/4) to greenish gray (5G 6/1) silty clay, ~50% clay remainder silt and limestone clasts, dense to very firm, crumbly, dry.
10				Seal: 1/4" Bentonite chips				
	B	GC	0012	Filter Pack: 10/20 Colorado silica sand			ST	11.5 to 12.5' - Medium bluish gray (5B 5/1) siltstone weathered to clay, limestone lenses, slightly moist to moist. Weathered bedrock.
15				Screen: Stainless steel, 4", slot # 10				12.5 to 23.0' - Medium gray (N5) siltstone, fossils present, limestone lenses throughout, slightly moist, at 14 ft. approximately 5 inch thick fracture zone, other fracture zones at 16.0', 17.0' and ~20.0', slightly moist to damp at fracture zones, otherwise dry. Bedrock.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	16.77	08:49	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0354

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
								Total Depth = 23.0'.
25								
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	16.77	08:49	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 8

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0355
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597274.72
Date Started	1/25/93	East (ft)	1496581.13
Date Completed	2/21/93	Ground Surface Elev. (ft)	796.99
Logged By	D.WILLIAMS/R.MARROW	Top of Casing Elev. (ft)	796.81
Checked By	PAUL DARR	Total Depth (ft)	201.7
Comments:	Located along pipeline clearing on hill above test fine area.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							TS	0.0 to 5.0' - Dark brown clayey silt, becomes darker towards bottom, little fine sand, trace organics, damp. Topsoil.
5							CL	4.0 to 5.0' - Brown clay little silt, little fine sand, little coarse gravel, dry, gray limestone gravel at 4.9 to 5.0'. 5.0 to 10.0' - Greenish gray clay, trace mottling, trace silt, dense, hard, dry.
							SP/GP	8.0 to 8.5' - Sand and gravel and broken rock, loose, dry.
10							CL	8.5 to 9.5' - Greenish gray clay, trace mottling, trace silt, dense, hard, traces of limestone bedrock, dry. 9.5 to 10.0' - Greenish gray clay intermixed with lenses of silt and fine sand, trace mottling, dense, hard, silt and sand are white, dry. 10.0 to 14.0' - Greenish gray clay, trace mottling, dense, hard, dry. 14.0 to 15.0' - Gray clay hard pieces of limestone softer than above, some moist to wet lenses.
15		GC GC	0015 1015				LS/ST	15.0 to 16.0' - Gray siltstone/claystone, hard, dry.
20							LS	16.0 to 17.0' - Gray limestone and siltstone/claystone, intermixed layers, dry.

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	52.20	15:00	02/21/93
⊻			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							SH	20.0 to 25.0' - Dark gray shale intermixed with lenses of silt and fine sand, hard, dry.
25							NR	25.0 to 26.0' - No recovery.
							LS	RUN #1 : 26.0 to 26.8' RECOVERY = 100% RQD = 0% Medium gray (N5/) limestone, dense, cryptocrystalline, very argillaceous grading to shale.
							LS	
30								RUN #2 : 26.8 to 34.8' RECOVERY = 96% RQD = 15% Light gray to medium gray (N7 to N5) limestone, cryptocrystalline, clean to very argillaceous, banded with thin (1-2 mm) layers of shale, slightly fossiliferous, no fractures, indistinct bedding, dry. RUN #3 : 34.8 to 35.05' RECOVERY = 100% RQD = 0%
35							LS	Light gray (N3) limestone, hard, dense, very argillaceous, dry.
							SH	RUN #4 : 35.1 to 44.1' RECOVERY = 100% RQD = 74% Dark greenish gray (5GY 4/1) shale, homogeneous, dense, non fossiliferous, no apparent bedding fractures, interbedded with coarsely crystalline limestone at 35.85 to 36.05', 36.4 to 36.65', 37.25 to 37.55', 39.5 to 39.7', non fractured, dry.
40								
45								RUN #5 : 44.1 to 54.4' RECOVERY = 100% RQD = 81%
							LS/SH	Interbedded limestone and shale: vuggy porosity in limestone at

GROUNDWATER

DEPTH	HOUR	DATE
52.20	15:00	02/21/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 8

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								52.2', damp to moist around vugs, predominantly dry.
50								
55							SH	RUN #6 : 54.4 to 57.4' RECOVERY = 100% RQD = 73% Shale, as above, interbedded with limestone stringers from 56.3' down, few fossils, poorly developed bedding, slightly fissile (trace), dry.
							SH	RUN #7 : 57.4 to 63.4' RECOVERY = 100% RQD = 0% Shale, as above, some mottled with crystalline limestone.
60								
								Depth correction 63.4 to 66.5'.
65							SH	RUN #8 : 66.5 to 76.5' RECOVERY = 100% RQD = 51% Olive gray (5Y 4/6) shale, massive, some interbedded with limestone (2-8 cm) limestone is coarsely crystalline and vuggy, indistinct bedding in shale, shale tends to block in flat smooth surface, limestone tends to be more fossiliferous, dry matrix some moisture along bedding surfaces.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 8

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							SH	RUN #9 : 76.5 to 82.2' RECOVERY = 100% RQD = 47% Shale, trace limestone at 78.4', 2 cm thick as above, dry.
80							SH	RUN #10 : 82.2 to 92.6' RECOVERY = 100% RQD = 86% Shale, as above, trace limestone, dry.
85								
90							LS	RUN #11 : 92.7 to 94.0' RECOVERY = 100% RQD = 85%
95							SH LS	Light gray (N2) limestone, banded and mottled with stringers of light olive gray (5Y 4/1) shale very fossiliferous, very fine to finely crystalline limestone, thinly layered (2-5 mm) shale stringers throughout shale tends to be more fossiliferous, bedding in shale tends to break along fossil layers, no apparent fractures, damp to dry matrix. RUN #12 : 94.0 to 95.5' RECOVERY = 100% RQD = 94%

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 8

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								Olive gray (5Y 4/1) to medium dark gray (N4) shale, mottled with trace to some limestone stringers, massive, clean to very fossiliferous, no fractures, no obvious bedding features, dry.
							SH	95.5 to 101.3' - Limestone, non fractured, very hard. RUN #13 : 101.3 to 111.2' RECOVERY = 100% RQD = 98%
105								Medium dark gray (N4) to olive gray (5Y 4/1) shale, mottled with some limestone.
110								
							SH	RUN #14 : 111.2 to 121.7' RECOVERY = 100% RQD = 92% Shale and limestone: interbedded, cored breaks easily along bedding planes associated with fossiliferous shale stringers, limestone is fine, very coarsely crystalline and massive, no distinguishable fractures, wet along bedding planes.
115								
120								
							SH	RUN 15 : 121.7 to 131.4' RECOVERY = 100% RQD = 98% Dark gray (N3) to olive gray (5Y 4/1) shale, massive, mottled with some limestone, some limestone stringers from 3 to 5 cm thick, some fossils, shale and bedding break along fossil layers, limestone is massive and very hard coarsely crystalline, dry, shale is damp.
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 8

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
130							SH	RUN #16 : 131.4 to 141.5' RECOVERY = 100% RQD = 74% Shale, interbedded with some limestone, gradational, limestone is 3 - 10 cm thick, dry.
135								
140							LS	RUN #17 : 141.5 to 151.5' RECOVERY = 100% RQD = 81% Limestone: gradational, limestone is 3 - 10 cm thick, interbedded with shale, dry.
145								
150	B	GC	0150					RUN #18 : 151.5 to 160.0' RECOVERY = 88%

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 8

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SH	RQD = 74% Shale as above mottled and interbedded with limestone, nonfractured.
155								
160							SH	RUN #19 : 156.0 to 171.0' RECOVERY = 126% RQD = 76% Shale and limestone: interbedded, shale as above nonfractured. Limestone is becoming dark gray (N3), micro crystalline, very argillaceous grading shale, dry to damp.
165								
170							SH	RUN #20 : 171.0 to 181.3' RECOVERY = 100% RQD = 97% Dark gray (N3) to medium dark gray (N3) shale, trace interbedded with limestone, predominantly homogeneous, nonfractured, poorly developed bedding, dry to damp.
175							LS	176.4 to 177.1' - Medium gray (N5) limestone, coarsely crystalline, trace interbedded and mottled with shale, slightly fossiliferous limestone is predominantly clean.
							SH	177.1 to 181.3' - Dark gray (N3) to medium dark gray (N3) shale, trace interbedded with limestone, predominantly homogeneous,

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
180								nonfractured, poorly developed bedding, dry to damp,
							SH	RUN #21 : 181.3 to 191.8' RECOVERY = 91% RQD = 51% Medium dark gray (N4) shale, mottled interbedded with limestone, thinly interbedded. Vertical fracture at 187.81', smooth, unhealed, looks like mechanical fracture, fracture is discontinuous.
185								
190								
							SH	RUN #22 : 191.8 to 201.7' RECOVERY = 97% RQD = 73% Medium dark gray (N4) shale, mottled interbedded with limestone, no fractures.
195								
200								
								Total Depth = 201.7'.
205								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

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GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 8

Drilling Company	NORTH STAR DRILLING	**Borehole/Well Id**	0356
Drilling Method	ROTOSONIC DRILL	**STATE PLANE COORDINATES**	
Drilling Fluid	WATER	**North (ft)**	595011.45
Date Started	1/18/93	**East (ft)**	1495353.58
Date Completed	1/24/93	**Ground Surface Elev. (ft)**	704.07
Logged By	DALE FLORES	**Top of Casing Elev. (ft)**	706.24
Checked By	PAUL DARR	**Total Depth (ft)**	182.0
Comments:	South property access thru gate 100.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 1.0' - Dark brown silty clay, very dense, moderate plasticity, root structures, moist. Topsoil.
				Backfill: Cement - bentonite grout			CL	1.0 to 9.0' - Rust brown to yellowish brown (10YR 5/4) silty clay, trace fine grained sand, moderate plasticity, very dense, has areas of gray and rust colored zones, moist to wet.
5	B	GC	0005					
							GC-GM	9.0 to 10.0' - Moderate yellowish brown (10YR 5/4) silty clayey gravel, some fine gravel, some coarse to fine sand, ~50% silty clay, gravel to 2", gravel subrounded to rounded, trace angular limestone.
10	B	GC	0015				SM	10.0 to 10.5' - Moderate yellowish brown (10YR 5/4) silty sand, very moist.
							GC-GM	10.5 to 14.0' - Moderate yellowish brown (10YR 5/4) silty clayey gravel, some fine gravel, some coarse to fine sand, ~50% silty clay, gravel to 2", gravel subrounded to rounded, trace angular limestone.
15							GP	14.0 to 16.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, fine gravel to coarse sand, ~20% sand and silt, gravels subrounded, some angular limestone clasts.
							SP	16.0 to 16.5' - Moderate yellowish brown (10YR 5/4) gravelly sand, coarse sand, fine gravels, saturated.
							GP	16.5 to 23.5' - Sandy gravel, ~50% fine to coarse gravel, ~30% coarse sand, ~20% silty clay, trace of cobbles to 4 inches, moist.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 8

Borehole/Well Id 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25							TI	23.5 to 32.0' - Gray to yellowish brown (10YR 5/4) silty clay, some angular to rounded gravel, fine to coarse gravel, some fine sand, matrix composed of ~50% silty clay, very stiff/dense, reddish brown staining at interface of gravel above and silty clay, moist, out of saturated zone. Till.
30							SM	32.0' to 32.5' - Silty sand, medium to fine sand, trace fine gravel.
							TI	32.5 to 34.5' - Light olive gray (5Y 5/2) silty clay, some angular to rounded gravel, fine to coarse gravel, some fine sand, matrix composed of ~50% silty clay, very stiff, very dense, moist. Till.
35							SP	34.5 to 37.0' - Moderate yellow brown (10YR 5/4) gravelly sand, fine gravel, trace of cobbles gravel, ~50% medium to coarse sand, ~40% fine gravel, saturated.
							ML	37.0 to 40.0' - Medium gray (N5) to olive brown sandy silt, fine grained sand, trace of medium grained sand, very dry, crumbly.
40							SP	40.0 to 44.5' - Sand, medium to coarse, well sorted, has silt lense 1 to 3 inches thick, saturated.
45							ML	44.5 to 45.0' - Medium gray (N5) to olive brown sandy silt, fine grained sand, trace of medium grained sand, very dry, crumbly.
							GP	45.0 to 46.0' - Moderate yellow brown (10YR 5/4) sandy gravel, trace of gravel to 1", saturated.

GROUNDWATER

DEPTH	HOUR	DATE
22.17	17:12	01/24/93
23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 8

Borehole/Well Id 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	46.0 to 47.0' - Light brown sand lense, medium grained trace gravel, saturated.
50							GP	47.0 to 52.0' - Light brown sandy gravel, loose, sand to fine gravel, saturated.
55							SP	52.0 to 57.0' - Light brown sand, medium grained sand, trace silt, trace fine gravel, saturated.
60							GP	57.0 to 69.5' - Olive brown to gray brown sandy gravel, coarse sand to fine gravel, coarse gravel lense at 62.0', gravel lense to 4" thick, little sand, saturated.
65								
70							SP	69.5 to 72.0' - Olive brown sand, trace fine gravel, moderate good sorting, saturated.
							GP	72.0 to 77.0' - Olive brown to gray brown sandy gravel, coarse sand

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 8

Borehole/Well Id 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							GP	to fine gravel, coarse gravel lense at 62.0', gravel lense to 4" thick, little sand, saturated.
80							SP	77.0 to 80.0' - Moderate yellowish brown (10YR 5/4) sand, trace fine gravel, coarse sand, wet but not saturated.
								80.0 to 85.0' - Sand, medium to coarse sand, moderate good sorting, little to no fines, trace gravel, wet.
85								85.0 to 87.0' - Brownish gray sand, medium grained sand, little to no fines, trace gravel, well sorted, wet.
								87.0 to 90.0' - Brownish gray sand, medium to coarse grained sand, trace of gravel to 1", ~10% silt holding sand together, wet.
90								90.0 to 93.0' - Brownish gray sand, medium to coarse grained sand, ~10% silt holding sand together, some gravel, saturated.
							GM-GP	93.0 to 95.0' - Moderate yellowish brown (10YR 5/4) silty sandy gravel, ~40% fine to coarse gravel saturated. Outwash.
95							GP	95.0 to 105.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, coarse sand, % sand to gravel varies, little to no fines, gravel to 2", saturated.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105							GP	105.0 to 115.0' - Moderate to light yellowish brown (10YR 5/4) sandy gravel, coarse sand, % of sand to gravel varies, little to no fines, gravel to 2", saturated.
110								
115							GP	115.0 to 125.0' - Moderate olive brown (5Y 4/4) sandy gravel, fine to coarse gravel, ~5% gravel >1", saturated.
120								
125							SP	125.0 to 135.0' - Light olive brown (5Y 5/6) sand, medium sand,

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 8

Borehole/Well Id 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	well sorted, little to no fines, pebble gravel lense at 127.0 to 127.5, wet but not saturated.
130								
135							SP	135.0 to 145.0' - Olive gray (5Y 3/2) sand, medium grained, well sorted, no fines, no gravel, moist.
140								
145							SP	145.0 to 150.0' - Olive gray (5Y 3/2) sand, coarse sand, moderate good sorting, wet.
150							GP	150.0 to 165.0' - Moderate yellowish brown (10YR 5/4) gravel, fine gravel, no fines, piece of 4" angular limestone, gravel to 1 1/2 inches, saturated.

GROUNDWATER

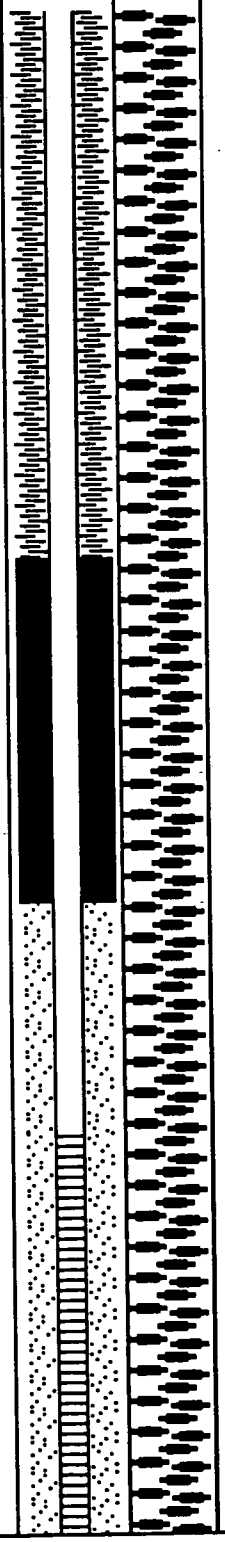
	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 8

Borehole/Well Id 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
155								
160								
165				Seal: 1/4" Bentonite chips			GP	165.0 to 181.5' - Moderate yellowish brown (10YR 5/4) gravel, fine gravel, no fines, gravel to 1.5 inches, saturated.
				Filter Pack: 10/20 Colorado silica sand				
170								
				Screen: Stainless steel, 4", slot # 10				
175								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 8 of 8

Borehole/Well Id 0356

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
180								
							SH	181.5 to 182.0' - Greenish gray (5GY 4/1) silty shale, moderately fissile, thinly bedded limestone lenses, trace fossils in limestone, dry.
								Total Depth = 182.0'.
185								
190								
195								
200								
205								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.17	17:12	01/24/93
▼	23.86	09:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0370
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596829.64
Date Started	12/7/92	East (ft)	1495100.73
Date Completed	12/7/92	Ground Surface Elev. (ft)	717.71
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	720.28
Checked By	ERIC LARSEN	Total Depth (ft)	50.0
Comments:	Monitoring well located approximately 8 ft. east of piezometer P001.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4".			FL	0.0 to 5.0' - Yellowish brown (10YR 5/6) to very dark grayish brown (10YR 3/2) clayey to silty sand, very fine grained, some gravel and wood debris. Fill.
				Backfill: Cement and bentonite grout				
5								5.0 to 10.0 - Grayish brown clayey silt to sand with gravel and debris, sand is very fine grained. Fill.
10								10.0 to 15.0' - Clayey sand, very fine grained, 10% gravel, some wood debris. Fill.
15								15.0 to 20.0' - Brown to grayish brown clayey silt to silty sand, sand is very fine grained, 15% gravel, some wood and copper wire. Fill.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.00		12/07/92
▼	33.42		01/09/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0370

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	ST	GT	0021				NR	20.0 to 25.0' - No recovery.
				Seal: Bentonite chips				
25	ST	GT	0026				FL	25.0 to 27.8' - Brown clayey to silty sand with gravel and debris, sand is very fine grained. Fill.
				Filter Pack: 20/40 quartz sand			GP	27.8 to 30.0' - Gravel, 80% gravel, 20% sand, silt, and clay. Outwash.
30				Screen: Stainless steel, 4".			NR	30.0 to 35.0' - No recovery.
35	O	GC	0036				GP	35.0 to 40.0' - Gravel, 80% gravel, 20% sand, silt, and clay. Outwash.
40	O	GC	0040	Backfill: Native sediment				40.0 to 47.8' - Gravel, very coarse grained, 90% gravel, 10% sand, average gravel size is approximately 1.8" in diameter. Outwash.
45								

GROUNDWATER

DEPTH	HOUR	DATE
34.00		12/07/92
33.42		01/09/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 3

Borehole/Well Id 0370

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Backfill: Native sediment				
							ST	47.8 to 50.0' - Gray siltstone, calcareous. Bedrock.
50								Total Depth = 50.0'.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	34.00		12/07/92
▼	33.42		01/09/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0372
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596693.75
Date Started	1/4/93	East (ft)	1495331.22
Date Completed	1/7/93	Ground Surface Elev. (ft)	754.30
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	756.46
Checked By	TOM THARP	Total Depth (ft)	62.0
Comments:	Monitoring well located 6 ft. northeast of piezometer P004.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 4.7' - Brown silty, gravelly clay, 20% gravel. Fill.
	ST	GT	0003					
				Backfill: Cement and bentonite grout				4.7 to 5.0' - Brown silty clay, contains debris and paper. Fill. 5.0 to 31.2' - Dark grayish brown silty clay to clayey silt with gravel, contains debris (paper and plastic). Fill.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	35.31		03/08/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 2 of 3

Borehole/Well Id 0372

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Casing: Stainless steel, 4"				
25				Backfill: Cement and bentonite grout				
30							FL	31.2 to 32.0' - Brown silty clay to clayey silt, competent, 10% gravel, no debris. Basal landfill liner. 32.0 to 35.0' - Yellowish brown gravelly, silty sand, very fine grained, 60% sand, 20% silt/clay, 20% gravel up to 1.8" in diameter (average diameter = 0.4"), areas of gray staining from 32.0 to 33.0'. Basal landfill liner.
35	ST	GT	0036					35.0 to 38.0' - Yellowish brown silty, gravelly sand, very fine grained, 20% gravel, zones of gray silty clay. Basal landfill liner. 38.0 to 39.5' - Yellowish brown (10YR 5/8) and grayish brown (2.5Y 5/2) clayey silt to silty sand, very fine grained, 10% gravel, zones with black residue. Basal landfill liner.
40							TI	39.5 to 40.0' - Dark grayish brown (2.5Y 4/2) silty sand, very fine grained, very compact, hard, 10% silt/clay, gravel up to 1.2" in diameter (average diameter 0.3"), angular to subangular. Till. 40.0 to 50.0' - Dark brown (10YR 3/3) clayey to silty sand, 20% gravel up to 2.0" in diameter (average diameter = 0.4"), 60% very fine grained sand, 20% silt/clay, damp at 42.0', moist at 45.0'. Till.
45				Seal: Bentonite chips				

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	35.31		03/08/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 3

Borehole/Well Id 0372

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	ST	GT	0046	Seal: Bentonite chips			TI	
50							NR	50.0 to 51.0' - No recovery. Top of bedrock estimated at 50.0'.
							ST	51.0 to 51.4' - Medium gray siltstone, local dark gray shaley partings, calcareous, fossiliferous. Bedrock.
							LS	51.4 to 52.0' - Limestone, fossiliferous.
	O	GT	0052	Filter Pack: 20/40 quartz sand			ST	52.0 to 52.5' - Medium gray siltstone, local dark gray shaley partings, calcareous, fossiliferous. Bedrock. 52.5 to 52.8' - Siltstone, calcareous, some limestone interbeds. 52.8 to 55.0' - Siltstone, calcareous. 55.0 to 60.0' - Siltstone, calcareous, interbeds of fossiliferous limestone beginning at 55.5', fracture zone at 55.5 to 56.0', dark gray staining along fractures. Bedrock.
55				Screen: Stainless steel, 4"				
	O	GT	0057					
60							NR	60.0 to 62.0' - No recovery.
								Total Depth = 62.0'.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	35.31		03/08/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0373
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596690.56
Date Started	12/14/92	East (ft)	1495128.52
Date Completed	12/15/92	Ground Surface Elev. (ft)	738.77
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	740.50
Checked By	TOM THARP	Total Depth (ft)	65.0

Comments: Monitoring well located on upper bench of site sanitary landfill , 5 ft. south of piezometer P005. Initial groundwater measurment was taken from piezometer P005.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0	ST	GT	0001	Casing: Stainless steel, 4"			FL	0.0 to 0.8' - Yellowish brown to dark gray (10YR 5/6 to 4/1) silty sand, soft, trace gravel, numerous roots, damp. Fill.
				Backfill: Cement and bentonite grout				0.8 to 21.3' - Dark gray (10YR 4/1) sandy, gravelly silt, occasional brownish yellow (10YR 6/6) mottling, firm, 40% silt, 30% very fine to medium grained sand, 25% fine to very coarse gravel, 5% clay in occasional pockets, few medium to large cobbles, scattered debris (dark brown to black charred material), pieces of red brick at 11.4', damp. Fill.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.90	16:35	12/14/92
▼	55.84		01/12/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0373

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Casing: Stainless steel, 4"			FL	21.3 to 37.2' - Yellowish brown (10YR 5/6) silty, gravelly sand, 60% very fine to very coarse grained sand, 20% fine to medium gravel, 20% silt, trace clay, occasional large cobble, dry to damp, spotty staining, little or no debris, occasional zones of clayey silt, clayey silt interval with interspersed charred material at 26.3 to 26.7', dark grayish brown organic/stained zone with root fragments at 33.2 to 33.7'. Fill.
25				Backfill: Cement and bentonite grout				
30	ST	GT	0031					
35								37.2 to 37.9' - Dark grayish brown debris zone, contains wood and metal, soil is stained. Fill. 37.9 to 41.4' - Yellowish brown to olive gray (10YR 5/8 to 5Y 4/2), silty clay, soft, moderately plastic, minor fine to coarse grained sand, very uniform. Fill.
40								41.4 to 42.7' - Olive gray (5Y 5/2) silty, gravelly sand, firm, trace clay, very fine to very coarse sand and gravel. Fill. 42.7 to 48.4' - Olive gray (5Y 5/2) sand, silt, and gravel, heterogeneous mixture, loose, non-graded, poorly sorted, 15% silt, 40% sand, 45% gravel, spotty dark brown staining in places, occasional medium to large cobbles, damp to slightly moist, dark grayish brown staining at 46.2 to 46.5' and 47.4 to 48.4', debris zone (wood) at 45.0 to 45.4', hydrocarbon odor emitted from core between 40.0 and 50.0'. Fill.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.90	16:35	12/14/92
▼	55.84		01/12/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0373

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Seal: Bentonite chips				48.4 to 49.2' - Pale olive (5Y 6/4) sand, loose, fine to very coarse grained, trace fine gravel, moist. Fill.
50							TI	49.2 to 50.8' - Light yellowish brown (2.5Y 6/4) sandy, gravelly silt, firm, 30% very fine to fine grained sand, 25% fine to coarse gravel, damp. Till.
	ST	GT	0051	Filter Pack: 20/40 quartz sand				50.8 to 51.3' - Large limestone boulder.
							GM-GP	51.3 to 62.8' - Light olive brown (2.5Y 5/4) silty, sandy gravel, loose, 55% very fine to very coarse gravel, 25% very fine to very coarse grained sand, 20% silt, numerous cobbles and boulders, trace clay, damp. Outwash.
	O	GC	0054					
55	O	GT	0055	Screen: Stainless steel, 4"				
	O	GC	0058					
60								
							ML	62.8 to 63.2' - Light brownish gray (2.5Y 6/2) clayey silt, firm, scattered minor sand and gravel, slight foliation texture, damp.
				Backfill: Native sediment			SH	63.2 to 65.0' - Gray (2.5Y 5/0) shale, weathered, stiff, slightly competent, friable in places, slightly foliated, dry. Bedrock.
65								Total Depth = 65.0'.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	55.90	16:35	12/14/92
▼	55.84		01/12/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0374
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596559.25
Date Started	12/5/92	East (ft)	1495123.53
Date Completed	12/6/92	Ground Surface Elev. (ft)	706.19
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	708.10
Checked By	ERIC LARSEN	Total Depth (ft)	35.0
Comments:	Moinitoring well located approximately 8 ft. east of piezometer P006.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 1.3' - Brown to dark brown (10YR 4/3) gravelly sand with silt and clay, sand is fine grained, 30% gravel, 30% silt/clay, roots. Topsoil.
							FL	1.3 to 4.1' - Dark brown gravelly sand with silt and clay, 30% silt/clay, 50% very fine grained sand, 20% gravel. Fill.
	ST	GT	0004	Backfill: Cement and bentonite grout				4.1 to 4.3'- Unidentified material, possibly white lime. Fill.
5								4.3 to 10.4' - Dark yellowish brown (10YR 3/6) clayey, silty sand, 60% fine to coarse grained sand, 40% silt and clay, no gravel. Fill.
	ST	GT	0009					
10							GP	10.4 to 13.0' - Brown sandy gravel, 50% gravel, 30% fine to coarse grained sand, 20% silt/clay. Outwash.
								13.0 to 18.0' - Brown sandy gravel, 60% gravel up to 2.5" in diameter (average diameter = 0.4"), 30% fine to coarse grained sand, 10% silt/clay, odorous, damp. Outwash.
	ST	GT	0014	Seal: Bentonite chips				
15								
20							GP	18.0 to 20.0' - Brown gravel, 80% gravel, matrix contains 80% sand, 20% silt/clay. Outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	19.73		01/11/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0374

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0022	Filter Pack: 20/40 quartz sand Screen: Stainless steel, 4"			GP	20.0 to 25.0' - Brown gravel, 80% gravel up to 2.0" in diameter (average diameter = 0.6"), 15% sand, 5% silt/clay, wet. Outwash.
25	O	GC	0027	Backfill: Native sediment			GP	25.0 to 33.4' - Brown sandy gravel, 70% gravel up to 3.0" in diameter (average diameter = 0.7"), 20% sand, 10% silt/clay. Outwash.
30							ST	33.4 to 35.0' - Gray siltstone, calcareous, contains calcareous nodules. Bedrock.
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	19.73		01/11/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0375
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	597074.08
Date Started	12/8/92	East (ft)	1494980.33
Date Completed	12/8/92	Ground Surface Elev. (ft)	705.20
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	707.25
Checked By	ERIC LARSEN	Total Depth (ft)	35.0
Comments:	Monitoring well located approximately 8 ft. west of piezometer P007.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			NR	0.0 to 4.0' - No recovery.
				Backfill: Cement and bentonite grout			FL	4.0 to 5.7' - Yellowish brown sand, very fine grained, 80% sand, 20% silt/clay, damp. Fill.
5	ST	GT	0005				GP	5.7 to 7.0' - Gravel, 90% gravel up to 0.6" in diameter (average diameter = 0.4") 10% sand. Outwash.
	ST	GT	0007				SP-GP	7.0 to 10.0' - Brown sand and gravel, 40% gravel up to 4.0" in diameter (average diameter = 0.8"), 40% coarse grained sand, 10% silt/clay. Outwash.
10							SP	10.0 to 11.2' - Gravelly sand, 35% gravel, 50% sand, 15% silt/clay. Outwash.
				Seal: Bentonite chips			GP	11.2 to 20.0' - Brown to yellowish brown gravel, 75% gravel, 15% sand, 10% silt/clay. Outwash.
	O	GT	0014					
15				Filter Pack: 20/40 quartz sand				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
⊽			
▼	20.98		01/11/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0375

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Screen: Stainless steel, 4"			GP	20.0 to 22.0' - Grayish brown gravel, 90% gravel. Outwash.
								22.0 to 28.5' - Brown gravel, 80% gravel up to 6.0" in diameter (average diameter = 0.5"), 10% sand, 10% silt/clay. Outwash.
	O	GT	0024					
	O	GC	0024					
25								
	O	GC	0026					
							SH	28.5 to 29.5' - Gray shale, comprised of silty clay, tight, dry. Bedrock float.
							GP	29.5 to 30.0' - Gravel, 85% gravel up to 4.0" in diameter (average diameter = 0.4"), wet. Outwash.
30				Backfill: Native sediment			GC-GM	30.0 to 31.2' - Silty, clayey, sandy gravel, wet. Outwash.
							TI	31.2 to 35.0' - Gravelly silt, very dense, competent, contains quartzose, siltstone, and limestone clasts, dry. Till.
	ST	GT	0033					
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	20.98		01/11/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0376
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596696.75
Date Started	3/5/93	East (ft)	1494760.63
Date Completed	3/5/93	Ground Surface Elev. (ft)	700.19
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	701.89
Checked By	TOM THARP	Total Depth (ft)	25.2

Comments: Monitoring well located along west access road, 10 ft. northwest of piezometer P008. Initial groundwater level was measured from piezometer P008.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 0.7' - Road gravel. Fill.
							TS	0.7 to 1.5' - Dark yellowish brown (10YR 2/2) sandy silt, firm, organic, numerous roots, damp. Topsoil.
							FL	1.5 to 2.1' - Pale yellowish brown (10YR 6/2) silty gravel, loose, some fine to coarse grained sand, wet. Fill.
5				Backfill: Cement and bentonite grout			SP	2.1 to 13.0' - Moderate to dark yellowish brown (10YR 5/4 to 4/2) gravelly sand, loose, 65% fine to very coarse grained sand, 30% fine to coarse gravel, trace silt, numerous small to large cobbles, damp, becoming very moist at 11.0'. Outwash.
10				Seal: Bentonite chips				
				Filter Pack: 20/40 quartz sand				
15							GP	13.0 to 21.7' - Moderate yellowish brown (10YR 5/4) sandy gravel, mostly loose, 60% fine to very coarse gravel, 25% medium to very coarse grained sand, 15% silt, numerous medium to very large cobbles, boulder at 14.4 to 14.8', patchy hematitic staining of grains, very moist to wet in places, saturated at 16.5'. Outwash.
	O	GC	0016	Screen: Stainless steel, 4"				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.30	10:20	03/05/93
▼	13.57		03/07/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0376

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0021					
							GM	21.7 to 25.2' - Moderate yellowish brown (10YR 5/4) silty gravel, loose, 60% very fine to very coarse gravel, 30% silt, < 10% very fine to coarse grained sand, numerous medium to very large cobbles, saturated. Outwash.
25								Total Depth = 25.2'.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.30	10:20	03/05/93
▼	13.57		03/07/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0377
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596522.25
Date Started	3/4/93	East (ft)	1494774.87
Date Completed	3/4/93	Ground Surface Elev. (ft)	699.40
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	701.02
Checked By	TOM THARP	Total Depth (ft)	25.0

Comments: Monitoring well located on west access road, 7 ft. south of piezometer P009.
Initial groundwater level was measured from piezometer P009.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 0.4' - Road gravel. Fill.
							TS	0.4 to 1.5' - Dark yellowish brown (10YR 2/2) sandy silt, firm, organic, numerous roots, damp. Topsoil.
							FL	1.5 to 2.4' - Moderate brown (5Y 3/4) sandy silt, numerous small to large cobbles. Fill.
5				Backfill: Cement and bentonite grout			SP	2.4 to 12.0' - Dark yellowish brown (10YR 4/2) gravelly sand, loose, 60% fine to very coarse grained sand, 35% fine to very coarse gravel, < 5% silt in places, numerous small to large cobbles, damp. Outwash.
10				Seal: Bentonite chips				
				Filter Pack: 20/40 quartz sand			SM-SP	12.0 to 15.0' - Pale to moderate yellowish brown (10YR 6/2 to 5/4) silty, gravelly sand, slightly soft to loose, 45 to 50% very fine to very coarse grained sand, 30 to 35% fine to coarse gravel, 20 to 25% silt, numerous small cobbles, silty zone at 13.0 to 13.4', boulder at 13.7 to 14.0', damp to moist. Outwash.
15							GP	15.0 to 25.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, loose, 65% very fine to very coarse gravel, 30% fine to coarse grained sand, 5 - 10% cobbles, few boulders, saturated at 17.0'. Outwash.
	O	GC	0017	Screen: Stainless steel, 4"				
	O	GC	1017					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.15	09:40	03/04/93
▼	13.49		03/06/93

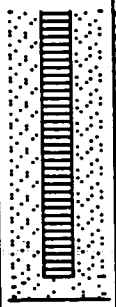
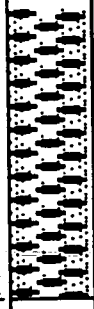
WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0377

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0023	Backfill: 20/40 quartz sand			GP	
25								Total Depth = 25.0'.
30								
35								
40								
45								

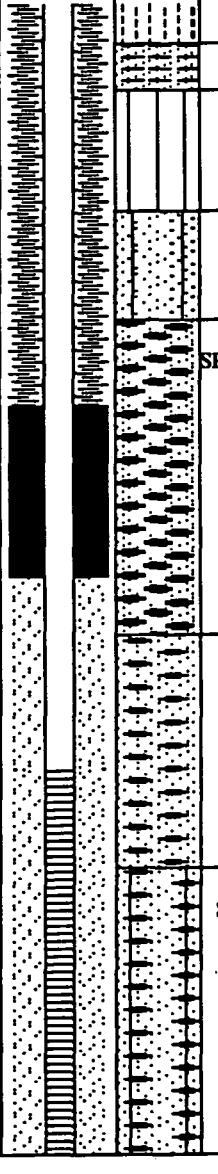
GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.15	09:40	03/04/93
▼	13.49		03/06/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0378
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596376.63
Date Started	3/3/93	East (ft)	1494789.86
Date Completed	3/3/93	Ground Surface Elev. (ft)	699.49
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	701.61
Checked By	TOM THARP	Total Depth (ft)	25.0
Comments:	Monitoring well located on west access road, 10 ft. north of piezometer P013.		
	Initial groundwater level was measured from piezometer P013.		



Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"	FL	0.0 to 0.7' - Road gravel. Fill.
					TS	0.7 to 1.6' - Dusky yellowish brown (10YR 2/2) sandy silt, minor clay, slightly firm, organic, roots, damp. Topsoil.
					ML	1.6 to 3.6' - Moderate yellowish brown (10Y 5/4) silt, soft, minor fine grained sand, trace clay, damp.
5				Backfill: Cement and bentonite grout	SM	3.6 to 5.5' - Moderate brown (5YR 4/4) silty sand, fine to coarse grained, soft to slightly loose, 15% fine to coarse gravel, damp. Outwash.
				Seal: Bentonite chips	SP-GP	5.5 to 11.0' - Moderate yellowish brown (10YR 5/4) sand and gravel, loose, 55% very fine to very coarse grained sand, 40% fine to very coarse gravel, < 5% silt, few small cobbles, damp to moist. Outwash.
10				Filter Pack: 20/40 quartz sand	SP	11.0 to 15.0' - Pale yellowish brown (10YR 6/2) gravelly sand, loose, 50% very fine to very coarse grained sand, 30% gravel, 10 to 15% silt, numerous medium to large cobbles, moist. Outwash.
				Screen: Stainless steel, 4"		
15	O	GC	0017		SM-GM	15.0 to 25.0' - Pale yellowish brown to moderate yellowish brown (10YR 6/2 to 5/4) silty sand and gravel, loose, 40 - 45% very fine to very coarse grained sand, 40 to 45% fine to coarse gravel, 10 to 20% silt, numerous small to large cobbles, boulder at 22.5 to 23.1', brownish gray staining of grains at 16.8 to 17.5', saturated at 17.0'. Outwash.
20						

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.90	10:35	03/03/93
▼	14.52		03/06/93

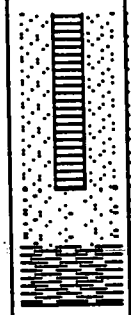
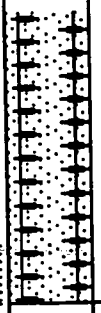
WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0378

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0022	Backfill: 20/40 quartz sand Backfill: Native sediment			SM-GM	
25								Total Depth = 25.0'.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.90	10:35	03/03/93
▼	14.52		03/06/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0379
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	597179.70
Date Started	12/4/92	East (ft)	1495153.92
Date Completed	12/5/92	Ground Surface Elev. (ft)	716.38
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	718.06
Checked By	ERIC LARSEN	Total Depth (ft)	40.0
Comments:	Monitoring well located 10 ft. southwest of piezometer P014, north of overflow pond.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 3.5' - Yellowish brown (10YR 5/8) gravelly clayey silt to silty sand, sand is very fine grained, 30% gravel up to 3.0" in diameter (average diameter = 0.3"). Fill.
								3.5 to 5.0' - Sandy gravel, 25% sand, 70% gravel up to 3.0" in diameter (average diameter = 0.5"). Fill.
				Backfill: Cement and bentonite grout				
5								5.0 to 8.0' - Yellowish brown (10YR 5/8) gravelly clayey silt to silty sand, sand is very fine grained, 25% gravel up to 2.0" in diameter (average diameter = 0.3"). Fill.
10	ST	GT	0010				TI	8.0 to 10.0' - Gray to dark gray (10YR 4/1) gravelly sand with silt and clay, very fine grained, 20% gravel up to 1.0" in diameter (average diameter = 0.3"), matrix contains 80% very fine grained sand, 20% silt/clay. Till. 10.0 to 15.0' - Dark gray (10YR 4/1) sand with gravel, 15% gravel up to 2.0" in diameter (average diameter = 0.3"), matrix contains 80% very fine grained sand, 20% silt/clay. Till.
15								15.0 to 22.2' - Dark grayish brown (10YR 4/2) silty sand with gravel, 10% gravel up to 2.0" in diameter (average diameter = 0.3"), matrix contains 70% very fine grained sand, 30% silt/clay, uniform color and composition. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	32.90	17:50	12/04/92
▼	31.39		01/11/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0379

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	ST	GT	0022				TI	22.0 to 22.7' - Yellowish brown (10YR 5/6) gravelly sand, 30% gravel, 60% very fine grained sand, 10% silt/clay. Till.
25				Seal: Bentonite chips Filter Pack: 20/40 quartz sand			GP	22.8 to 25.0' - Pale brown (10YR 6/3) sandy gravel, 30% sand, 10% silt/clay, 60% gravel up to 3.0" in diameter (average diameter = 0.4"). Outwash. 25.0 to 30.0' - Yellowish brown (10YR 5/4) sandy gravel, 75% gravel up to 3.0" diameter (average diameter 0.5"), 20% fine to coarse grained sand, 5% silt/clay. Outwash.
30	O	GC	0032	Screen: Stainless steel, 4"			SP	30.0 to 35.0' - Yellowish brown (10YR 5/4) sand with silt, clay and gravel, 15% gravel up to 4.0" in diameter (average diameter = 0.4"), matrix contains 70% sand, 30% silt/clay, iron and manganese oxide staining/deposit on some gravel. Outwash.
35	O	GC	0036				SP-GP	35.0 to 40.0' - Sand and gravel, prominant solvent odor. Outwash.
40								Total Depth = 40.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	32.90	17:50	12/04/92
⧗	31.39		01/11/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0380
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	597109.65
Date Started	12/16/92	East (ft)	1495394.52
Date Completed	12/17/92	Ground Surface Elev. (ft)	725.02
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	727.10
Checked By	TOM THARP	Total Depth (ft)	62.0

Comments: Monitoring well located northeast of overflow pond, approximately 20 ft. east of monitoring well 0316.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 1.3' - Yellowish brown (10YR 5/6) silty sand, 65% very fine to medium grained sand, 30% silt, few small cobbles at 0.0 to 0.3', soft, moist. Topsoil.
							FL	1.3 to 5.7' - Yellowish brown (10YR 5/4 - 5/6) silty, gravelly sand, 55% very fine to medium grained sand, 25% silt, 20% very fine to fine gravels, scattered coarse gravels and small cobbles, slightly firm to firm, damp. Fill.
	O	GC	0004	Backfill: Cement and bentonite grout				
5	O	GC	1004					
							TI	5.7 to 10.5' - Dark grayish brown (2.5Y 4/2) silty, gravelly sand, 45% very fine to fine grained sand, 30% silt, 20 to 25% fine to coarse gravel, < 5% clay, slightly firm, low plasticity, damp. Till.
	O	GC	0009					
10								10.5 to 15.0' - Dark grayish brown (2.5Y 4/2) silty, gravelly sand, 45% very fine to fine grained sand, 30% silt, 20 to 25% fine to coarse gravel, 5 to 7% clay, firm, low plasticity, damp. Till.
	O	GC	0014					
15							SM-GM	15.0 to 18.0' - Yellowish brown (10YR 5/4 - 5/6) silty sand and gravel, 15 to 20% silt, 40% very fine to very coarse grained sand, 40% fine to coarse gravel and very large cobbles, areas of hematitic/limonitic staining of grains, soft to loose, damp. Outwash.
	O	GC	0017					
							GM	18.0 to 19.5' - Yellowish brown (10YR 5/8) silty gravel with cobbles, soft, low to moderate plasticity, 10 to 15% clay, 25% silt, 50% medium to coarse gravel and very large cobbles (possible small
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	56.65	16:37	12/17/92
▼	38.18		03/09/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0380

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								boulders), < 10% medium to coarse grained sand in pockets, very moist. Outwash.
				Casing: Stainless steel, 4"			GM-GP	19.5 to 26.4'- Yellowish brown (10YR 5/4) silty, sandy gravel, loose, 10 to 15% silt, 20 to 25% fine to coarse grained sand, 60 to 70% very fine to very coarse gravels with numerous small to large cobbles, occasional hematitic/limonitic staining of grains, occasional zones of calcareous deposits, damp to moist. Outwash.
	O	GC	0024	Backfill: Cement and bentonite grout				
25								
							SP	26.4 to 27.7' - Dark yellowish brown (10YR 4/4) sand, fine to very coarse grained, poorly graded, loose, trace medium to coarse gravel, < 5% silt, wet. Outwash.
	O	GC	0029				TI	27.7 to 28.6' - Yellowish brown (10YR 5/8) silty, gravelly sand, firm, nonplastic, 25% silt, 15 to 20% gravel, 55% very fine to medium grained sand, trace clay, damp. Till.
30								28.6 to 33.0' - Grayish brown (2.5Y 5/2) silty, gravelly sand, very firm, slightly plastic, 30% silt, 15 to 20% fine to coarse gravels, 50% very fine to medium grained sand, scattered small cobbles, damp. Till.
	ST	GT	0031					
	O	GC	0032					
							SH-LS	33.0 to 60.0' - Dark gray (2.5Y 4/0) shale with interbedded very dark gray (2.5Y 3/0) limestone; shale is slightly weathered from 33.0 to 34.0', soft and crumbly to hard, fissile, moderately competent, numerous partings, slightly fossiliferous, dry to moist; limestone is very hard, partially crystalline, fossiliferous, massive, essentially non-fractured, occurs as intermittant thin beds, lenses and nodules, significant limestone beds at 35.0 - 35.3', 36.6 - 36.8', 40.5 - 40.8', 45.2 - 45.4', 47.3 - 47.4', 52.4 - 52.6', 53.0 - 53.4', 55.5 - 55.7', 56.1 - 56.3', 56.9 - 57.5', 57.8 - 58.3', 59.0 - 59.3'. Bedrock.
35								
40								
45				Seal: Bentonite chips				

GROUNDWATER

	DEPTH	HOUR	DATE
⧗	56.65	16:37	12/17/92
⧗	38.18		03/09/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0380

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Seal: Bentonite chips			SH-LS	
50				Filter Pack: 20/40 quartz sand				
				Screen: Stainless steel, 4"				
55								
60							NR	60.0 to 62.0' - No recovery.
				Backfill: Native sediment				Total Depth = 62.0'.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	56.65	16:37	12/17/92
▼	38.18		03/09/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0381
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596982.13
Date Started	1/7/93	East (ft)	1495399.69
Date Completed	1/8/93	Ground Surface Elev. (ft)	725.26
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	727.85
Checked By	ERIC LARSEN	Total Depth (ft)	37.0
Comments:	Monitoring well located 125 ft. south of monitoring well 0380.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.5' - Dark gray (10YR 4/1) clayey silt, roots. Topsoil.
							FL	0.5 to 3.0' - Brown (10YR 5/3) silty sand, very fine grained 10% gravel, 60 to 70% sand, 20 to 30% silt/clay, abundant roots, moist. Fill.
	O	GC	0004	Backfill: Cement and bentonite grout			TI	3.0 to 5.0' - Dark gray (10YR 4/1) silty sand, very fine grained, <10% gravel, 20 to 30% silt/clay, root debris. Till.
5	ST	GT	0004					5.0 to 25.0' - Dark gray (10YR 4/1) silty gravelly sand, very fine grained, 20% gravel up to 2.0" in diameter (average diameter = 0.4"), angular to subrounded, damp to moist. Till.
10	O	GC	0010					
	O	GC	1010					
15	O	GC	0015					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	32.79	13:10	03/18/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0381

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0020	Seal: Bentonite chips			TI	
25	O	GC	0025				ST-LS	25.0 to 29.0' - Gray calcareous siltstone with interbedded limestone, fossiliferous limestone beds from 2.0 to 2.5" thick, possible water producing zones at 26.0', 27.0', 27.7', and 29.0'. Bedrock.
	O	GT	0027	Filter Pack: 20/40 quartz sand Screen: Stainless steel, 4"				
							ST-SH	29.0 to 30.0' - Calcareous siltstone with interbedded shale, shale beds up to 0.5" thick. Bedrock.
30							ST-LS	30.0 to 37.0' - Calcareous siltstone with interbedded limestone, limestone beds up to 1.7" thick, siltstone is locally fossiliferous with occasional shale beds < 0.4" thick, no obvious water producing zones. Bedrock.
35								
								Total Depth = 37.0'.
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
32.79	13:10	03/18/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0382
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596601.67
Date Started	12/16/92	East (ft)	1495444.40
Date Completed	12/16/92	Ground Surface Elev. (ft)	738.25
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	740.50
Checked By	TOM THARP	Total Depth (ft)	35.0

Comments: Monitoring well located in flat area 10 ft. west of culvert that leads to overflow pond spillway, near southeast corner of the site sanitary landfill.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 1.0' - Yellowish brown (10YR 5/8) silty sand, soft, moist, contains roots. Topsoil.
	ST	GT	0002				FL	1.0 to 3.1' - Dark yellowish brown (10YR 3/4) silty sand, slightly firm, some gravel, damp. Fill. 3.1 to 4.3' - Dark brown sandy silt, firm, low plasticity, organic rich, minor gravels, minor clay, damp. Fill.
5	O	GC	0005	Backfill: Cement and bentonite grout			TI	4.3 to 9.8' - Yellowish brown (10YR 5/6) silty, gravelly sand, soft to slightly firm, 50% very fine to fine grained sand, 20% silt, 20 to 25% fine to coarse gravel, 5 to 10% clay, occasional medium to large cobbles, trace medium to very coarse grained sand, damp. Till.
10	O	GC	0010					9.8 to 17.2' - Dark grayish brown (2.5Y 4/2) silty, gravelly sand, soft to slightly firm, 55% very fine to fine grained sand, 25% silt, 15 to 20% fine to medium gravel, < 5% clay, occasional small cobbles, trace coarse gravel, large cobble at 15.7', damp. Till.
15	O	GC	0015					
	O	GC	0016	Seal: Bentonite chips				
	O	GC	1016					
	O	GT	0017				ST	17.2 to 18.2' - Dark gray (5Y 4/1) siltstone, hard, dry, few partings. Bedrock.
20							SH	18.2 to 19.0' - Gray to dark gray (5Y 5/1 to 4/1) shale, weathered, firm to slightly stiff, crumbly, slightly competent in places, slightly

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.00	10:45	12/16/92
▽	5.98		01/12/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0382

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							SH	foliated. Bedrock 19.0 to 31.5' - Dark gray (5Y 4/1) shale, stiff to hard, becoming hard and competent at 20.0', foliated, numerous partings and laminations, highly fossiliferous zones, carbonaceous, contains montmorillonite clays, limestone lense/interbed at 25.4 to 25.6' and at 30.4 to 30.6'. Bedrock.
	O	GT	0023	Filter Pack: 20/40 quartz sand				
25				Screen: Stainless steel, 4"				
30							LS	31.5 to 33.3' - Very dark gray (5Y 3/1) limestone, very hard, massive, fossiliferous, partially crystalline, intermittant partings of shale, no visible fractures. Bedrock.
							SH	33.3 to 35.0' - Dark gray (5Y 4/1) shale, hard, laminated in places, numerous partings, fossiliferous, carbonaceous. Bedrock.
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.00	10:45	12/16/92
▼	5.98		01/12/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0383
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597138.34
Date Started	3/24/93	East (ft)	1494477.15
Date Completed	3/24/93	Ground Surface Elev. (ft)	696.39
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	696.20
Checked By	PAUL DARR	Total Depth (ft)	30.0
Comments:	Paired with 0343. Location just north of Miamisburg Cabinet shop 80 ft. west of main Hwy.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			ML-SM	0.0 to 2.0' - Fine sand and silt, with ~10% pebbles to 1", roots present first 5", very soft, moist.
				Backfill: Cement - bentonite grout			ML	2.0 to 7.0' - Dark yellow brown (10YR 4/2) clayey silt with 10% fine sand, 30% clay, firm, moderate plastic, black organic fragments from 2 to 3.5', moist.
5								7.0 to 8.0' - Dark yellow brown (10YR 4/2) clayey silt, firm, low plasticity, some fine sand, trace clay, moist.
10				Seal: 1/4" Bentonite chips			GP	8.0 to 24.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, fine gravel, coarse to fine sand, ~30% fine sand, silt, and clay, gravel subrounded to subangular, trace of gravel to 4 inches, partly cohesive between 8.0 to 10.0' wet to saturated. Outwash.
15				Filter Pack: 10/20 Colorado silica sand				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	12.26		04/05/93
▼	13.57	15:05	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0383

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Screen: Stainless steel, 4", slot # 10				
								24.0 to 26.0' - Limestone boulders, abundant fossils.
25							GP	26.0 to 30.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, fine gravel, ~30% fine sand, silt, and clay, gravel subrounded to subangular, trace gravel to 6", wet to saturated. Outwash.
				Backfill: Collapsed borehole material Well pushed up by heaving ~1'				
30								Total Depth = 30.0'.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	12.26		04/05/93
▼	13.57	15:05	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	**Borehole/Well Id**	0385
Drilling Method	ROTOSONIC DRILL	**STATE PLANE COORDINATES**	
Drilling Fluid	WATER	**North (ft)**	597628.33
Date Started	4/17/93	**East (ft)**	1494975.13
Date Completed	4/17/93	**Ground Surface Elev. (ft)**	725.61
Logged By	DALE FLORES	**Top of Casing Elev. (ft)**	724.88
Checked By	PAUL DARR	**Total Depth (ft)**	40.0
Comments:	Access throuth gate 33, right along gravel road, completed as flush mount.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.5' - Dark yellowish brown (10YR 4/2) sandy silt, fine sand, good roots first 6", moderately cohesive, moist to wet. Topsoil
				Backfill: Cement - bentonite grout			SP	0.5 to 2.5' - Moderate yellow brown (10YR 5/4) gravelly sand, 30% gravel, 70% medium to coarse sand and silt, moderate cohesive, moist. Possible upper outwash?
	B	GC	0005				TI	2.5 to 17.5' - Moderate yellowish brown (10YR 5/4) sandy silt with 10 to 20% angular to subangular gravels, slight plasticity, trace of clay, slightly moist to moist. Sandy till.
5								
10								
15				Seal: 1/4" Bentonite chips				
							SP	17.5 to 20.0' - Moderate yellow brown (10YR 5/4) gravelly sand, medium sand, 30% fine gravel to 2", little to no fines, well sorted, moist but not saturated. Lower outwash.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0385

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0025	Filter Pack: 10/20 Colorado silica sand Screen: Stainless steel, 4", slot # 10			GP-GM	20.0 to 26.0'- Moderate yellow brown (10YR 5/4) sandy, silty, gravel, ~50% angular to subangular gravel, 30% medium to sand, 20% silt, moist to wet. 6" till lense within gravel at 23.5 to 24.0'. Outwash becoming more wet below till lense.
25				Backfill: 10/20 Colorado silica sand Backfill: 1/4" Bentonite chips			TI	26.0 to 34.0' - Moderate yellow brown (10YR 5/4) to medium gray (N4) with mottled coloring of pale yellowish orange (10YR 8/6) sandy silt, ~10 - 20% angular to subangular gravels, slight plasticity, trace clay, dark reddish brown (10R 3/4) staining throughout, slightly moist to moist. Sandy till.
30								
35							SH	34.0 to 40.0' - Medium gray (N4) shale, fissile, has very thin calcareous shale lenses, exhibits good bedding features, moderately weathered, shale more competent from 38.0 to 40.0', dry. Bedrock.
40								Total Depth = 40.0'.
45								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 4

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0386
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597345.22
Date Started	3/22/93	East (ft)	1494953.59
Date Completed	3/23/93	Ground Surface Elev. (ft)	726.82
Logged By	DALE FLORES	Top of Casing Elev. (ft)	726.57
Checked By	PAUL DARR	Total Depth (ft)	88.0
Comments:	Access thru gate 33 just west of Mound boundary fence. West of cluster 0137, 0315, 0347.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.5' - Moderate yellow brown (10YR 5/4) sand, medium to fine sand, good root development, moist. Topsoil.
				Backfill: Cement - bentonite grout			FL	0.5 to 2.0' - Dark yellowish brown (10YR 4/2) gravelly sand, medium to fine sand, some gravel, gravel well rounded, gravel to 1", trace of roots. Fill. 2.0 to 5.0' - Greenish gray (5Y 6/4) silty clay, trace of angular limestone gravel, dense, moderate plasticity, changes color at 4.5' to moderate olive brown (5Y 6/4), slightly moist. 5.0 to 6.0' - Dark brown (10YR 4/2) to moderate yellow brown (10YR 5/4) sandy gravel, trace angular limestone gravel to 4", from 5.0 to 5.5' root development present, has zones of clay, possibly buried soil horizon mixed with fill material, moist. Fill. 6.0 to 10.0' - Color variegated olive gray (5Y 4/1) to moderate olive brown (5Y 4/4) to moderate yellow brown (10YR 5/4) sandy silty clay, trace of limestone gravel, has siltstone fragments and bedding features within clay, dense, slightly moist. Fill.
5								
10	B	GC	0012				ML	10.0 to 14.5' - Moderate yellow brown (10YR 5/4) sandy silt, trace of gravels, fine to medium gravels, very dense, slightly moist.
15							CL	14.5 to 22.0' - Medium bluish gray (5B 5/1) to moderate yellow brown (10YR 5/4) clay, mottled, trace silt, stiff, dry.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	40.00		03/22/93
▽	44.05	17:56	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 4

Borehole/Well Id 0386

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							ML	22.0 to 27.0' - Dark yellow brown (10YR 4/2) silt, fine sand to silt, very dense, trace gravel, moist.
25								
							GM-GP	27.0 to 33.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, ~50% coarse sand to silt, ~50% fine to coarse gravel, gravel angular, gravel to 3 inches, poorly sorted/graded, dry. Upper outwash.
30								
	B	GT	0033				TI	33.0 to 39.5' - Dark yellow brown (10YR 4/2) sandy silty, trace angular fine gravel, dense, nonplastic, slightly moist. Till.
35	B	GT	0035					
40							GM-GP	39.5 to 71.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60% angular gravels, gravel to 4", ~40% coarse sand and silt, wet to saturated, first water. Lower outwash.
45	B	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	40.00		03/22/93
▼	44.05	17:56	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0386

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
55	B	GT	0055					
60								
65								
70				Seal: 1/4" Bentonite chips			GP	71.0 to 77.0' - Moderate yellow brown (10YR 5/4) sandy gravel, coarse sand to fine gravel, trace angular gravel to 1", trace silt, poorly graded/sorted, saturated. Lower outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	40.00		03/22/93
▼	44.05	17:56	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 4

Borehole/Well Id 0386

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75				Filter Pack: 10/20 Colorado silica sand				
				Screen: Stainless steel, 4", slot # 10			GP	77.0 to 78.0' - Moderate yellow brown (10YR 5/4) sandy gravel, coarse gravel, gravel to 5", trace silt, ~60 % angular gravel, saturated.
80	B	GT	0080				GP	78.0 to 83.0' - Moderate yellow brown (10YR 5/4) sandy gravel, coarse sand to fine gravel, trace angular gravel to 1", trace silt, poorly graded/sorted, saturated. Lower outwash.
85							SP	83.0 to 87.0' - Moderate yellow brown (10YR 5/4) sand, medium grained sand, trace of gravel to 2", moderate good sorting, saturated.
				Backfill: Collapsed bedrock material			SH	87.0 to 88.0' - Medium gray (N4) silty shale, interbedded fossiliferous limestone lenses, thinly bedded, powdery dry.
90								Total Depth = 88.0'.
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	40.00		03/22/93
▼	44.05	17:56	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 4

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0387
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597210.50
Date Started	3/30/93	East (ft)	1494897.38
Date Completed	3/31/93	Ground Surface Elev. (ft)	722.82
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	722.70
Checked By	PAUL DARR	Total Depth (ft)	82.3

Comments: ~ 300 ft. S.W. of Mound Gate #33, between main railroad and railroad spur into Mound Plant. Paired with well 0392.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.8' - Dark yellowish brown (10YR 4/2) silty sand with ~ 30% rounded subangular fine to medium gravel to 3", organic fragments, roots, slightly moist. Topsoil.
				Backfill: Cement - bentonite grout			FL	0.8 to 3.0' - Medium gravel with clasts 4 to 6", ~20 to 30% silt and fine sand. Fill. 3.0 to 11.0' - Pale olive (10YR 6/2) silty sand with some clay, trace fine gravel, very firm, moderate plastic, 8.0 to 9.0' drilled through limestone boulder. Fill.
5	A	GC	0005					
	A	GC	1005					
10								11.0 to 18.0' - Olive gray (5Y 3/2) silty sand, fine to medium grained, trace gravel to 2", soft to semi-firm, cohesive, dark redbrown staining throughout (organic material?), 17.0 to 18.0' drilled through limestone boulder, dry to moist. Fill.
15								
							SM	18.0 to 20.0' - Olive gray (5Y 3/2) silty sand, fine to medium grained, trace fine gravel to 2", subrounded to angular medium gravel to 3", moderate plastic, dry to moist.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	40.19	17:50	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0387

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							TI	20.0 to 27.0' - Moderate yellow brown (10YR 5/4) fine sand and silt with ~ 10 to 15% rounded to subangular fine gravel, some clay, moderate plastic, soft to firm, material becomes more coarse grained below 24', slightly moist. Sandy and gravelly till.
25								
							SP-GP	27.0 to 33.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine to medium gravel with some silt, gravel to 4 - 6", partially cohesive, crumbly, dry. Outwash.
30								
							SP	33.0 to 33.5' - Lens of medium to coarse sand, well sorted, little fines, dry.
							SP-GP	33.5 to 40.0' - Coarse sand and fine gravel, ~ 10 - 20% fines, gravel to 2", dry to slightly moist. 37.0 to 37.5' drilled through limestone boulders, wet to saturated at 38'.
35								
40	A	GC	0040				NR	40.0 to 45.0' - No recovery.
45							SP	45.0 to 46.0' - Moderate yellow brown (10YR 5/4) medium sand, trace fine gravel to 1/2", trace fines, well sorted.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	40.19	17:50	05/19/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 4

Borehole/Well Id 0387

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50							SP-GP	46.0 to 52.0' - Coarse sand and fine gravel with 20 to 30% coarse gravels 6 - 8", trace fines.
55							SP	52.0 to 58.0' - Coarse to medium sand with ~ 20% gravel to 1", trace fines.
60							SP-GP	58.0 to 68.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, trace medium gravel angular to subrounded 3 - 4", ~25% fines, moist to wet.
65							SP	68.0 to 69.0' - Coarse to medium sand lens with trace fines.
70				Seal: 1/4" Bentonite chips			SP-GP	69.0 to 74.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, trace medium gravel angular to subrounded 3 - 4", ~25% fines, moist to wet. 73.5 to 74.0' more coarse medium gravel, angular, up 4 to 5".

GROUNDWATER

DEPTH	HOUR	DATE
40.19	17:50	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 4

Borehole/Well Id 0387

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Filter Pack: 10/20 Colorado silica sand			SP-GP	74.0 to 82.0' - Coarse sand and fine gravel with ~10% fines, trace medium gravel, subangular, to ~3".
75								
				Screen: Stainless steel, 4", slot # 10				
80								
							ST	82.0 to 82.3' - Medium gray (N5), siltstone. Bedrock.
								Total Depth = 82.3'.
85								
90								
95								

GROUNDWATER

DEPTH	HOUR	DATE
40.19	17:50	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0388
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596793.37
Date Started	4/12/93	East (ft)	1494747.75
Date Completed	4/12/93	Ground Surface Elev. (ft)	700.35
Logged By	DALE FLORES	Top of Casing Elev. (ft)	702.88
Checked By	PAUL DARR	Total Depth (ft)	60.0
Comments:	West access road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 0.5' - Road gravel. Fill.
							TS	0.5 to 1.5' - Dusky yellow brown (10YR 2/2) sandy silt, root, moist. Topsoil.
				Backfill: Cement - bentonite grout			GP	1.5 to 21.0' - Moderate yellow brown (10YR 5/4) sandy gravel, 50% subangular to subrounded gravel, trace medium gravel, trace fines, dry. 11.0 to 11.3' silty gravel lens with trace organic material. Water at 16.0 to 20.0'. Outwash.
5	B	GC	0005					
	B	GC	1005					
10								
15				Seal: 1/4" Bentonite chips				
				Filter Pack: 10/20 Colorado silica sand				
20								

GROUNDWATER

DEPTH	HOUR	DATE
20.83	13:48	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0388

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0020	Screen: Stainless steel, 4", slot # 10				
							TI	21.0 to 22.5' - Moderate yellowish brown (10YR 5/4) gravelly sand, trace of silt, moderately dense, moist, coarse sand lense 22.0 to 22.3'. Sandy till.
							GM	22.5 to 25.0' - Moderate yellowish brown (10YR 5/4) silty gravel, ~70% fine gravel, ~30% coarse sand and silt. Outwash.
25							SP-GP	25.0 to 30.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, gravel to 1", trace silt, saturated.
30				Backfill: Collapsed borehole material				30.0 to 51.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, gravel to 1", trace silt, saturated. Has till lenses at ~ 31.5 to 32.0' and 32.5 to 33.0'.
35								
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
20.83	13:48	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id 0388

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Backfill: Collasped borehole material				
50								
							SH	51.0 to 56.0' - Medium dark gray (N4) to moderately olive brown (5Y 4/4) silty shale, fissile, remnant bedding, dry to slightly moist. Weathered bedrock.
55								56.0 to 60.0' - Medium light gray (N6) silty shale with lenses of fossiliferous limestone to 4", fissile, crumbles easily, dry. Bedrock.
60								Total Depth = 60.0'.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.83	13:48	05/19/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0389
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597337.46
Date Started	3/24/93	East (ft)	1494949.43
Date Completed	3/24/93	Ground Surface Elev. (ft)	726.66
Logged By	DALE FLORES	Top of Casing Elev. (ft)	726.44
Checked By	PAUL DARR	Total Depth (ft)	52.0

Comments: West of well cluster 0347, 0315, 0137. Lithologic descriptions taken from 0386 borehole log.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.5' - Moderate yellow brown (10YR 5/4) sand, medium to fine sand, good root development, moist. Topsoil.
				Backfill: Cement - bentonite grout			FL	0.5 to 2.0' - Dark yellowish brown (10YR 4/2) gravelly sand, medium to fine sand, some gravel, gravel well rounded, gravel to 1", trace of roots. Fill. 2.0 to 5.0' - Greenish gray (5Y 6/4) silty clay, trace of angular limestone gravel, dense, moderate plasticity, changes color at 4.5' to moderate olive brown (5Y 6/4), slightly moist. 5.0 to 6.0' - Dark brown (10YR 4/2) to moderate yellow brown (10YR 5/4) sandy gravel, trace angular limestone gravel to 4", from 5.0 to 5.5' root development present, has zones of clay, possibly buried soil horizon mixed with fill material, moist. Fill. 6.0 to 10.0' - Color variegated olive gray (5Y 4/1) to moderate olive brown (5Y 4/4) to moderate yellow brown (10YR 5/4) sandy silty clay, trace of limestone gravel, has siltstone fragments and bedding features within clay, dense, slightly moist. Fill.
5								
10							ML	10.0 to 14.5' - Moderate yellow brown (10YR 5/4) sandy silt, trace of gravels, fine to medium gravels, very dense, slightly moist.
15							CL	14.5 to 22.0' - Medium bluish gray (5B 5/1) to moderate yellow brown (10YR 5/4) clay, mottled, trace silt, stiff, dry.
20								

GROUNDWATER

DEPTH	HOUR	DATE
42.93	17:54	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 3

Borehole/Well Id 0389

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							ML	22.0 to 27.0' - Dark yellow brown (10YR 4/2) silt, fine sand to silt, very dense, trace gravel, moist.
25								
							GM	27.0 to 33.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, ~50% coarse sand to silt, ~50% fine to coarse gravel, gravel angular, gravel to 3 inches, poorly sorted/graded, dry. Upper outwash.
30								
							TI	33.0 to 39.5' - Dark yellow brown (10YR 4/2) sandy silty, trace angular fine gravel, dense, nonplastic, slightly moist. Till.
35								
				Seal: 1/4" Bentonite chips				
40				Filter Pack: 10/20 Colorado silica sand			GP-GM	39.5 to 71.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, ~60% angular gravels, gravel to 4", ~40% coarse sand and silt, wet to saturated, first water. Lower outwash.
				Screen: Stainless steel, 4", slot # 10				
45								

GROUNDWATER

DEPTH	HOUR	DATE
42.93	17:54	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id 0389

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
								Total Depth = 52.0'.
55								
60								
65								
70								

GROUNDWATER

DEPTH	HOUR	DATE
42.93	17:54	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0390
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597329.69
Date Started	3/29/93	East (ft)	1494945.87
Date Completed	3/29/93	Ground Surface Elev. (ft)	726.54
Logged By	DALE FLORES	Top of Casing Elev. (ft)	726.37
Checked By	PAUL DARR	Total Depth (ft)	35.0

Comments: West of cluster 0347, 0315, 0147. Lithologic descriptions taken from well 0386 borehole log.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.5' - Moderate yellow brown (10YR 5/4) sand, medium to fine sand, good root development, moist. Topsoil.
				Backfill: Cement - bentonite grout			FL	0.5 to 2.0' - Dark yellowish brown (10YR 4/2) gravelly sand, medium to fine sand, some gravel, gravel well rounded, gravel to 1", trace of roots. Fill. 2.0 to 5.0' - Greenish gray (5Y 6/4) silty clay, trace of angular limestone gravel, dense, moderate plasticity, changes color at 4.5' to moderate olive brown (5Y 6/4), slightly moist. 5.0 to 6.0' - Dark brown (10YR 4/2) to moderate yellow brown (10YR 5/4) sandy gravel, trace angular limestone gravel to 4", from 5.0 to 5.5' root development present, has zones of clay, possibly buried soil horizon mixed with fill material, moist. Fill. 6.0 to 10.0' - Color variegated olive gray (5Y 4/1) to moderate olive brown (5Y 4/4) to moderate yellow brown (10YR 5/4) sandy silty clay, trace of limestone gravel, has siltstone fragments and bedding features within clay, dense, slightly moist. Fill.
5								
10							ML	10.0 to 14.5' - Moderate yellow brown (10YR 5/4) sandy silt, trace of gravels, fine to medium gravels, very dense, slightly moist.
15							CL	14.5 to 22.0' - Medium bluish gray (5B 5/1) to moderate yellow brown (10YR 5/4) clay, mottled, trace silt, stiff, dry.
20								

GROUNDWATER

DEPTH	HOUR	DATE
34.61	17:55	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0390

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Seal: 1/4" Bentonite chips				
				Filter Pack: 10/20 Colorado silica sand			ML	22.0 to 27.0' - Dark yellow brown (10YR 4/2) silt, fine sand to silt, very dense, trace gravel, moist.
25				Screen: Stainless steel, 4", slot # 10			GM	27.0 to 33.0' - Moderately yellow brown (10YR 5/4) silty sandy gravel, ~50% coarse sand to silt, ~50% fine to coarse gravel, gravel angular, gravel to 3 inches, poorly sorted/graded, dry. Upper outwash.
30							TI	33.0 to 39.5' - Dark yellow brown (10YR 4/2) sandy silt, trace angular fine gravel, dense, nonplastic, slightly moist. Till.
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
34.61	17:55	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0392
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597204.85
Date Started	3/31/93	East (ft)	1494896.11
Date Completed	4/1/93	Ground Surface Elev. (ft)	722.79
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	722.65
Checked By	PAUL DARR	Total Depth (ft)	45.0

Comments: Located out gate 33 Mound Property. ~300' S.W. of gate between main railroad and spur of railroad into Mound Plant. Paired with 0387.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.8' - Dark yellowish brown (10YR 4/2) silty sand with ~ 30% rounded subangular fine to medium gravel to 3", organic fragments, roots, slightly moist. Topsoil.
				Backfill: Cement - bentonite grout			FL	0.8 to 3.0' - Medium gravel with clasts 4 to 6", ~20 to 30% silt and fine sand. Fill.
								3.0 to 11.0' - Pale olive (10YR 6/2) silty sand with some clay, trace fine gravel, very firm, moderate plastic, 8.0 to 9.0' drilled through limestone boulder. Fill.
5								
10								11.0 to 18.0' - Olive gray (5Y 3/2) silty sand, fine to medium grained, trace gravel to 2", soft to semi-firm, cohesive, dark redbrown staining throughout (organic material?), 17.0 to 18.0' drilled through limestone boulder, dry to moist. Fill.
15								
20							SM	18.0 to 20.0' - Olive gray (5Y 3/2) silty sand, fine to medium grained, trace fine gravel to 2", subrounded to angular medium gravel to 3", moderate plastic, dry to moist.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	40.17	17:48	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0392

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							TI	20.0 to 27.0' - Moderate yellow brown (10YR 5/4) fine sand and silt with ~ 10 to 15% rounded to subangular fine gravel, some clay, moderate plastic, soft to firm, material becomes more coarse grained below 24', slightly moist. Sandy and gravelly till.
25								
							SP-GP	27.0 to 33.0' - Moderate yellow brown (10YR 5/4) coarse sand and fine to medium gravel with some silt, gravel to 4 - 6", partially cohesive, crumbly, dry. Outwash.
30								
							SP	33.0 to 33.5' - Lens of medium to coarse sand, well sorted, little fines, dry.
35				Seal: 1/4" Bentonite chips Filter Pack: 10/20 Colorado silica sand			SP-GP	33.5 to 40.0' - Coarse sand and fine gravel, ~ 10 - 20% fines, gravel to 2", dry to slightly moist. 37.0 to 37.5' drilled through limestone boulders, wet to saturated at 38'.
40				Screen: Stainless steel, 4", slot # 10			NR	40.0 to 45.0' - No recovery.
45								Total Depth = 45.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	40.17	17:48	05/19/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0393
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596694.53
Date Started	11/19/92	East (ft)	1495024.89
Date Completed	1/5/93	Ground Surface Elev. (ft)	706.79
Logged By	E.LARSEN/T.FRINAK	Top of Casing Elev. (ft)	708.65
Checked By	T.THARP/E.LARSEN	Total Depth (ft)	50.0

Comments: Telescoped monitoring well installation. Located approximatley 25 ft. south of piezometer P003 in the barrow ditch bordering the western edge of the site sanitary landfill.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.7' - Grayish brown (10YR 5/2) clayey silt and sand, roots. Topsoil.
							FL	0.7 to 2.5' - Yellowish brown (10YR 5/4) silty gravelly sand, very fine to fine grained, 50% sand, 20% silt, 20% gravel, 10% clay, dark gray to black stained area at 2.40 to 2.45'. Fill. 2.5 to 3.0' - Dark grayish brown (10YR 4/2) sandy silt, 50% silt, 20 - 30% fine grained sand 10% clay, 10 - 20% gravel. Fill.
				Backfill: Cement and bentonite grout			NR	3.0 to 10.0' - No recovery
5	O	GC	0005					
10							FL	10.0 to 10.6' - Dark grayish brown (10YR 4/2) sandy silt, 50% silt, 20 - 30% fine grained sand, 10 - 20% gravel, 10% clay. Fill. 10.6 to 12.0' - Dark yellowish brown (10YR 4/4) sand, well sorted, minor gravel, trace silt, damp. Fill. 12.0 to 13.2' - Pale brown (10YR 6/3) sand and gravel, minor silt. Fill. 13.2 to 15.8' - Silty, gravelly sand, very fine grained, moist, slightly firm, dark brown to black staining on sand grains and gravels. Fill.
	O	GC	0014					
15								15.8 to 18.0' - Brown (10YR 5/3) sand, very fine to coarse grained, loose, pockets of silt, damp. Fill.
	O	GC	0018					18.0 to 18.4' - Silty, gravelly sand, very fine grained, moist, slightly firm, dark brown to black staining on sand grains and gravels. Fill.
20							TI	18.4 to 25.7' - Dark gray (10YR 4/1) sandy, gravelly silt, sand is primarily very fine grained with a few very coarse grains, mostly fine

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.20	10:55	11/19/92
▽	9.78		01/09/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id 0393

Depth	Sample T	Sample A	Sample ID	Well Materials	USCS or Rock Type	Lithologic Description
20						to medium gravel, slightly firm, slightly to moderately plastic, 20 to 25% gravel, 10-15% clay, clay content increases to 25% in places. Till.
	O	GC	0021	Casing: Stainless steel, 4"		
				Backfill: Cement and bentonite grout		
25					GP	25.7 to 26.5' - Gravels and cobbles, some sand, minor silt, cobbles up to 0.35' in diameter, saturated. Outwash.
	O	GC	0027		SP-GP	26.5 to 29.2' - Light yellowish brown (10YR 6/4) sand and gravel, poorly sorted, occasional large cobbles, loose, saturated. Outwash.
30					SP	29.2 to 31.4'- Brown (10YR 5/3) sand, predominantly medium to coarse grained, well sorted, few zones of medium to large gravel, loose, wet. Outwash.
					GP	31.4 to 36.5' - Brown to dark brown (10YR 4/3) sandy gravel, fine to very coarse grained sand, fine to coarse gravel, some medium to large cobbles, trace silt, loose, wet. Outwash.
35	O	GC	0035	Seal: Bentonite chips		
					GM-GP	36.5 to 39.0' - Yellowish brown (10YR 5/4) silty, sandy gravel, very fine to very coarse grained sand, fine to coarse gravel, numerous large cobbles, loose, very moist to wet. Outwash.
	O	GC	0039		ST-LS	39.0 to 40.0' - Gray to dark gray (2.5Y 6/0 - 4/0) siltstone, calcareous, shaley laminations and limestone interbeds. Bedrock. 40.0 to 40.5' - Limestone. 40.5 to 45.0' - Greenish gray siltstone, calcareous, competent.
40						
				Filter Pack: 20/40 quartz sand		
45				Screen: Stainless steel, 4"		45.0 to 45.3' - Siltstone, calcareous. 45.3 to 45.6' - Limestone, fossiliferous. 45.6 to 46.4' - Siltstone, calcareous, locally fossiliferous.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.20	10:55	11/19/92
▼	9.78		01/09/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 3

Borehole/Well Id 0393

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	O	GT	0048	Backfill: 20/40 quartz sand			ST-LS	46.4 to 46.9' - Limestone, fossiliferous, fragmented, possible water producing zone. 46.9 to 47.1' - Siltstone, fossiliferous, strong partings. 47.1 to 47.8' - Siltstone, calcareous. 47.8 to 48.1' - Limestone, fossiliferous. 48.1 to 48.6' - Siltstone calcareous. 48.6 to 48.8' - Limestone, fossiliferous. 48.8 to 50.0' - Siltstone, calcareous. Total Depth = 50.0'.
50								
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.20	10:55	11/19/92
▼	9.78		01/09/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0394
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596489.48
Date Started	11/20/92	East (ft)	1495003.44
Date Completed	12/3/92	Ground Surface Elev. (ft)	703.38
Logged By	E.LARSEN/T.FRINAK	Top of Casing Elev. (ft)	705.08
Checked By	T.THARP/E.LARSEN	Total Depth (ft)	65.0

Comments: Telescoped monitoring well installation. Located approximately 100 ft. west of monitoring well 0305 and 50 ft. south of east-west access road.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			TS	0.0 to 0.7' - Dark brown (10YR 3/3) sand, silt, and gravel, minor clay, roots. Topsoil.
	O	GC	0003	Backfill: Cement and bentonite grout			FL	0.7 to 2.1' - Yellowish brown (10YR 5/6) silty, gravelly sand, very fine to coarse grained, fine to coarse gravel, firm, damp. Fill. 2.1 to 5.4' - Very dark grayish brown (10YR 3/2) silty sand, fine to very coarse grained, organic rich, 10% medium to coarse gravel, 5% clay, soft, damp. Fill.
5								5.4 to 7.1' - Dark yellowish brown (10YR 4/6) sand and gravel, non-homogeneous, poorly sorted, trace silt, soft, moist. Fill.
	O	GC	0009				SP-GP	7.1 to 10.3' - Dark yellowish brown (10YR 4/4) sand and gravel, predominantly medium to coarse grained, poorly sorted fine to coarse gravel, few small cobbles, loose, damp to moist. Outwash.
10	O	GC	0011				TI	10.3 to 11.3' - Yellowish brown (10YR 5/6) sandy, gravelly silt, 50% silt, 20% very fine to medium grained sand, 20% gravel, 10% clay, slightly firm, moist. Till. 11.3 to 23.0' - Dark gray (10YR 4/1) sandy, gravelly silt, <10% clay, 40% silt, 20% very fine to very coarse gravel, 30% very fine grained sand, zone of limonite alteration from 22.7 to 23.0', firm, moist. Till.
15	O	GC	0015					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.50	09:10	11/20/92
▼	20.12		12/09/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0394

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0020	Casing: Stainless steel, 4"			TI	
				Backfill: Cement and bentonite grout			SP-GP	23.0 to 25.0 - Yellowish brown (10YR 5/4) sand and gravel, fine to very coarse grained sand, very fine to very coarse gravel, few medium cobbles, zones of minor silt, brownish yellow (10YR 6/8) limonite alteration of grains, spotty pyrolucite deposit at 25.0', very soft to loose, very moist to wet. Outwash.
25	O	GC	0025				GP	25.0 to 42.6' - Light yellowish brown (10YR 6/4) sandy gravel, very fine to very coarse grained sand, very fine to very coarse gravel, numerous medium to large cobbles, poorly sorted, 10 - 15% silt, silty gravel zone at 27.0 to 28.4', very coarse gravel and large cobble zone at 36.3 to 38.8', loose, saturated. Outwash.
	O	GC	0026					
30	O	GC	0030					
35	O	GC	0035					
40	O	GC	0040					
45	O	GC	0045				TI	42.6 to 46.7' - Dark gray (10YR 4/1) gravelly, sandy silt, 40% silt, 30% very fine grained sand (some very coarse grained sand), 20% fine to medium gravel, 10% clay, slightly plastic, firm, very moist to moist. Till.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.50	09:10	11/20/92
▼	20.12		12/09/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0394

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Seal: Bentonite chips			TI	46.7 to 50.1' - Dark gray to very dark gray (10YR 4/1 to 3/1) gravelly, sandy silt, zones of very coarse limestone gravel and cobbles, calcareous cementation of grains in places, up to 15% clay in zones and pockets, firm to stiff, dry to damp. Till.
50	O	GC	0050				SH	50.1 to 52.0' - Medium dark gray (N4) shale, hard, foliated, fissile, slightly crumbly, contains minor silt. Bedrock.
				Filter Pack: 20/40 quartz sand			LS	52.0 to 55.5' - Dark gray to brown limestone, fossiliferous, contains some greenish gray clay. Bedrock.
55				Screen: Stainless steel, 4"			SP-GP	55.5 to 57.5' - Greenish gray sand and gravel, 90% gravel up to 4" in diameter (average diameter = 0.75"), well rounded to angular, matrix consist of silty sand.
				Backfill: 20/40 quartz sand			ST-LS	57.5 to 60.0' - Greenish gray calcareous siltstone with interbeds of limestone, siltstone is crumbly, fossiliferous limestone beds up to 2" thick. Bedrock.
60				Backfill: Native sediment			SH-LS	60.0 to 61.0' - Calcareous shale to shaley limestone, fossiliferous, prominant partings. Bedrock.
							LS	61.0 to 63.8' - Limestone, fossiliferous, competent. Bedrock.
65							SH	63.8 to 65.0' - Gray shale, contains layers of calcareous siltstone and shaley limestone, fossiliferous, cracks/fractures, wet, water producing zone. Bedrock.
70								Total Depth = 65.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.50	09:10	11/20/92
▼	20.12		12/09/92

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 4

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0395
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	598433.07
Date Started	2/20/93	East (ft)	1496869.76
Date Completed	2/22/93	Ground Surface Elev. (ft)	803.25
Logged By	DALE FLORES	Top of Casing Elev. (ft)	802.94
Checked By	PAUL DARR	Total Depth (ft)	95.0
Comments:	N.W. executive parking lot.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4"			FL	0.0 to 9.0' - Grayish olive (10YR 4/2) sandy silty clay, mixed with assorted debris, debris includes asphalt pieces, concrete and rounded gravel to 1", moderate plasticity, very dense, fill material overlayed by 4" of asphalt from parking lot, dry to slightly moist. Fill.
				Backfill: Cement - bentonite grout				
5	B	GC	0005					
	B	GC	1005					
								9.0 to 14.0' - Moderate yellow brown (10YR 5/4) to grayish olive (10Y 4/2) sandy gravel, blocky limestone cobbles to 4", gravel to 1", gravels rounded, more gravel from 14.0 to 15.0', dry. Fill.
10	B	GC	0010					
								14.0 to 15.0' - Greenish black (5G 2/1) organic decomposition zone, strong odor, moist.
15	B	GC	0015					
								16.0 to 19.5' - Grayish black (5G 2/1) to grayish olive (10YR 4/2) sandy clayey gravel, ~40% gravels up to 2", ~40% fine sand, ~20% clay, trace debris, debris includes wood chips black organics and rock fragments, moist.
								19.5 to 20.0' - Limestone cobbles to 6".
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	68.63		04/03/93
▼	68.56	16:43	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 4

Borehole/Well Id 0395

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0020				NR	20.0 to 25.0' - No recovery of core.
25							FL	25.0 to 30.0' - Color variegated grayish olive (10Y 4/2) to dark greenish gray (5GY 4/1) sandy clayey gravel, moderate plasticity, ~ 50% gravel, gravel to 1", trace of rounded limestone cobbles, moderate organic odor from 29.0 to 30.0', moist. Fill.
30	B	GC	0030					30.0 to 33.0' - Greenish black (5GY 2/1) gravelly clay, trace of fossiliferous limestone cobbles to 6", trace of spotty oily sheen, moderate organic odor, saturated. Fill.
								33.0 to 35.0' - Medium gray (N5) to grayish olive (10Y 4/2) sandy silty clay, very dense, trace of roots, matrix composed of ~40 to 50% silt, ~40% clay, ~10% fine sand, trace of limestone cobbles to 6", moist but not saturated.
35	B	GC	0035					35.0 to 37.0' - Medium gray (N5) to grayish olive (10Y 4/2) sandy silty clay, very dense, trace of roots, matrix composed of ~40 to 50% silt, ~40% clay, ~10% fine sand, trace of limestone cobbles to 6", moist but not saturated.
							GP-GM	37.0 to 43.0'- Moderate yellow brown (10YR 5/4) sandy silty gravel, coarse sand, ~50% gravel, gravel subrounded to rounded, ~50% coarse sand and silt, poorly graded/sorted, saturated. Outwash.
40	B	GC	0040					
							TI	43.0 to 45.0 ' - Moderate yellow brown (10YR 5/4) sandy silt, fine sand, fine to medium gravel, angular gravel, gravel to 1", matrix composed of ~60% fine sand and silt, ~40% gravels, matrix very stiff, color change to grayish olive (10Y 4/2) at 44', slightly moist. Till.
45	B	GC	0045					45.0 to 50.0' - Moderate yellow brown (10YR 5/4) sandy silt, fine sand, fine to medium gravel, angular gravel, gravel to 1", matrix

GROUNDWATER

	DEPTH	HOUR	DATE
▽	68.63		04/03/93
▼	68.56	16:43	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0395

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								composed of ~60% fine sand and silt, ~40% gravels, matrix very stiff, color change to grayish olive (10Y 4/2) at 44', trace of limestone clasts, slightly moist. Till.
50	B	GC	0050	Seal: 1/4" Bentonite chips				50.0 to 55.0' - Grayish olive (10Y 4/2) fine grained sandy silt, matrix made up of fine sand and silt 60%, 40% gravels, angular pebble size to subrounded gravel to 1", matrix very stiff, slightly moist. Sandy till.
55	B	GC	0055	Filter Pack: 10/20 Colorado silica sand			GP-GM	55.0 to 62.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, fine to coarse gravels. gravel angular to subrounded, ~60% gravel, ~40% coarse sand and silt, moderate petroleum odor. Outwash,
60	B	GC	0060	Screen: Stainless steel, 4", slot # 10			GM	62.0 to 63.0' - Moderate yellow brown (10YR 5/4) silty gravel, fine gravel, gravel angular, ~10% silt, poorly sorted, saturated. Outwash.
65	B	GC	0065				SM	63.0 to 65.0' - Moderate yellow brown (10YR 5/4) silty sand, medium sand, loose, trace gravel to 1", good sorting, two till lenses within sand at 63.5' and 64.5', till lenses are dark yellowish orange (10YR 6/6), sand is saturated. 65.0 to 67.0' - Dark yellowish orange (10YR 6/6) silty sand, fine to medium sand with silt, trace of clay, trace of till pieces within sand, trace of gravel to 1/2 inch, wet.
70	B	GC	0070	Backfill: 10/20 Colorado silica sand			GM	67.0 to 70.0' - Moderate yellow brown (10YR 5/4) silty gravel, ~70% blocky angular limestone, ~30% sand silt clay mixture, moist but not saturated. 70.0 to 73.0' - Moderate yellow brown (10YR 5/4) silty gravel, ~30% blocky angular limestone, ~70% sand silt clay mixture, moist but not saturated.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	68.63		04/03/93
▼	68.56	16:43	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0395

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							TI	73.0 to 73.5' - Moderate brown (5YR 4/4) sandy silt, trace of coarse sand, trace of fine gravel, stiff, low plasticity, moist. Till.
75	B	GC	0075	Backfill: 1/4" Bentonite chips			GP-GM	73.5 to 77.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, fine to coarse gravels, gravel angular to subrounded, ~60% gravel, ~40% coarse sand and silt, moist. Outwash.
							TI	77.0 to 80.0' - Moderate yellow brown (10YR 5/4) sandy silt, fine sand, fine to medium gravel, gravel angular to subrounded, matrix made up of ~60% fine sand silt, ~40% gravels, matrix very stiff, moist. Sandy till.
80	B	GC	0080					80.0 to 81.0' - Moderate yellow brown (10YR 5/4) sandy silty gravel, fine sand, fine gravel, moderately stiff, matrix made up of ~50% fine sand silt, ~50% gravels, slightly moist. Gravelly till.
							ML	81.0 to 81.5' - Moderate olive brown (5Y 4/4) silt, trace of fine sand, no gravel, moderate density, dry.
							TI	81.5 to 88.0' - Moderate yellow brown (10YR 5/4) sandy silty gravel, fine sand, moderately stiff, matrix made up of ~50% fine sand and silt, ~50% gravel, slightly moist. Gravelly till.
85	B	GC	0085					
	B	GC	1085					
								88.0 to 95.0' - Moderate yellow brown (10YR 5/4) to olive gray (5Y 3/2) sandy silty gravel, fine sand, fine gravel, trace of clay, very dense, matrix made up of clayey silt and fine sand.
90	B	GC	0090					
95								Total Depth = 95.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	68.63		04/03/93
▼	68.56	16:43	05/19/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0397
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596702.12
Date Started	12/6/92	East (ft)	1495024.40
Date Completed	12/6/92	Ground Surface Elev. (ft)	706.79
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	709.27
Checked By	ERIC LARSEN	Total Depth (ft)	30.0
Comments:	Well located approximately 8 ft. south of piezometer P003.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: Stainless steel, 4".			FL	0.0 to 1.1' - Brown clayey sand and gravel. Fill.
								1.1 to 3.0' - Very dark gray (10YR 3/1) clayey silt to sand, sand is very fine grained, some limestone boulders > 6.0" in diameter, some roots. Fill.
								3.0 to 8.0' - Dark grayish brown clayey sand with debris. Fill.
	ST	GT	0004	Backfill: Cement and bentonite grout				
5								
								8.0 to 10.0' - Brown to dark brown (10YR 4/3) sand, 80% sand, 15% clay/silt, 5% gravel. Fill.
	ST	GT	0009					10.0 to 11.4' - Brown clayey, sandy gravel, average gravel size is approximately 0.6" in diameter, black at contact with lower lithology. Fill.
10								
							TI	11.4 to 15.0' - Yellowish brown (10YR 5/4) sand, very fine grained, 75% sand, 15% silt/clay, 10% gravel. Till.
	ST	GT	0014					
15				Seal: Bentonite chips				15.0 to 23.8' - Dark grayish brown (10YR 4/2) silty sand, very fine grained, matrix consists of 70% very fine sand and 30% silt/clay, 10% gravel, angular to rounded, becoming brown and damp at 23.0'. Till.
				Filter Pack: 20/40 quartz sand				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.00		01/09/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: 0397

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	ST	GT	0021	Screen: Stainless steel, 4".			TI	
	O	GC	0024				GP	23.8 to 27.3' - Yellowish brown (10YR 5/6) sandy gravel, 70% gravel, 20% sand, 10% silt/clay, wet. Outwash.
25							GP	27.3 to 27.8' - Brown gravel, average gravel size is approximately 0.2" in diameter. Outwash.
	O	GC	0028				SP	27.8 to 30.0' - Brown gravelly sand, very coarse grained, fining upward. Outwash.
30								Total Depth = 30.0'.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	25.00		01/09/93

WESTON

APPENDIX B

GEOLOGIC LOGS OF PIEZOMETERS

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P001
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596826.14
Date Started	11/8/92	East (ft)	1495086.63
Date Completed	11/9/92	Ground Surface Elev. (ft)	717.71
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	719.48
Checked By	ERIC LARSEN	Total Depth (ft)	50.0

Comments: Piezometer located 25 ft. south of the overflow pond and 75 ft. east of the north-south access road.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			NR	0.0 to 1.5' - No recovery.
				Backfill: Cement and bentonite grout			FL	1.5 to 3.6' - Grayish brown (2.5Y 5/2) gravelly sand, very fine grained, 30% gravel, 60% sand, 10% silt and clay, loose, becoming more compact with wood and debris at 2.0 to 3.4', asphalt at 3.4 to 3.6'. Fill. 3.6 to 5.0' - Dark grayish brown (2.5Y 4/2) to yellowish brown silty sand with gravel, very compacted, very fine grained. Fill. 5.0 to 6.0' - Yellowish brown (10YR 5/4) gravelly sand, predominantly very fine grained, 10% silt and clay, 70% sand, 20% gravel. Fill. 6.0 to 10.0' - Dark yellowish brown (10YR 4/2) gravelly sand, predominantly very fine grained, compacted, 70% sand, 10% silt, 20% gravel up to 2.0" in diameter (average diameter = 0.7"). Fill.
5	O	GC	0005					
10	O	GC	0010					10.0 to 15.0' - Yellowish brown (10YR 5/4) to light olive brown (2.5Y 5/4) gravelly sand, predominantly very fine grained, 10% silt/clay, 70% sand, 15 - 20% gravel. Fill.
15	O	GC	0015					15.0 to 17.5' - Light grayish brown (2.5Y 5/4) to dark grayish brown (2.5Y 4/2) gravelly sand, very fine grained, 10% silt/clay, 60% sand, 30% gravel up to 4.0" in diameter (average diameter = 0.5"), wood and black residue at 17.4 to 17.5'. Fill. 17.5 to 18.5' - Very dark grayish brown (2.5Y 3/2) sand, predominantly very fine grained, 70% sand, 15% silt, 15% gravel (average diameter = 0.3"), few cobbles covered with black to grayish white coating, unit contains wood, wire, and glass. Fill.
	O	GC	0018					
20							NR	18.5 to 20.0' - No recovery.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.50	15:25	11/08/92
▽	33.52		11/30/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							NR	20.0 to 21.5' - No recovery
25	O	GC	0025				FL	21.5 to 23.8' - Dark grayish brown (10YR 4/2) gravelly sand, 15% clay/silt, 15% very fine grained sand, 50% coarse grained sand, 20% gravel, contains asphalt and glass. Fill. 23.8 to 25.0' - Olive gray (5Y 4/2) gravelly sand, predominantly very fine grained, slight plasticity, 60% sand, 15% clay, 25% gravel and debris (wire, glass, metal, old paint brush), damp. Fill. 25.0 to 28.0' - Yellowish brown to gray silt, sweet odor and sheen on water at 27.5', unit contains glass, wire, and metal. Fill.
	O	GC	0028	Seal: Bentonite chips			NR	28.0 to 30.0' - No recovery.
30							FL	30.0 to 30.6' - Olive brown clay with debris. Fill.
							GP	30.6 to 33.2' - Brownish yellow (10YR 6/6) sandy gravel with silt and clay, 25% silt/clay, 20% fine grained sand, 55% gravel up to 4.0" in diameter (average diameter = 1.6"). Outwash.
	O	GC	0033				NR	33.2 to 35.0' - No recovery.
35	O O	GC GC	0036 1036	Filter Pack: 20/40 quartz sand Screen: PVC, 2"			GP	35.0 to 40.0' - Yellowish brown (10YR 5/6) sandy gravel, 70% gravel up to 3.0" in diameter (average diameter = 1.5"), 5% silt, 25% sand. Outwash.
40								40.0 to 47.0' - Yellowish brown (10YR 5/4) sandy gravel, 70% gravel up to 3.0" in diameter (average diameter = 0.4"). Outwash.
45	O	GC	0045	Backfill: Native sediment				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.50	15:25	11/08/92
▼	33.52		11/30/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 3

Borehole/Well Id P001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	O	GC	0047	Backfill: Native sediment			ST	47.0 to 50.0' - Gray (10YR 5/1) siltstone, calcareous, contains limestone fragments and dark shaley laminations. Bedrock.
50								Total Depth = 50.0'.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	36.50	15:25	11/08/92
▼	33.52		11/30/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P002
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596827.93
Date Started	11/9/92	East (ft)	1495092.65
Date Completed	11/22/92	Ground Surface Elev. (ft)	717.71
Logged By	T.FRINAK/E.LARSEN	Top of Casing Elev. (ft)	719.47
Checked By	E.LARSEN/T.THARP	Total Depth (ft)	63.0

Comments: Piezometer located six feet west of piezometer P001. Telescoped completion - surface casing installed to top of bedrock (approximately 48.0 ft. below ground surface).

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 1.2' - Brown (10YR 5/3) sand, predominantly very fine grained, 15% silty clay, 70% sand, 15% gravel, moist. Fill. 1.2 to 3.0' - Dark grayish brown (2.5Y 4/2) gravelly sand, predominantly very fine grained, very compacted, 10% silt/clay, 70% sand, 20% gravel up to 1.5" in diameter (average diameter = 0.4"). Fill.
				Backfill: Cement and bentonite grout			NR	3.0 to 5.0' - No recovery.
5							FL	5.0 to 7.6' - Gravelly sand, very compacted, 10% silt/clay, 40% very fine grained sand, 30% sand, 20% gravel, contains bits of asphalt, glass and wood. Fill.
							NR	7.6 to 10.0' - No recovery.
10							FL	10.0 to 12.2' - Dark grayish brown (2.5Y 4/2) silty sand and gravel, sand is very fine grained, contains asphalt and wood. 12.2 to 14.6' - Light olive brown (2.5Y 5/3) sand, 10% silt/clay, 55% very fine grained sand, 15% sand, 20% gravel and debris, debris consists of asphalt and wood. Fill.
15							NR	14.6 to 15.0' - No recovery.
							FL	15.0 to 17.1' - Light olive brown (2.5Y 5/4) sand and gravel with yellowish brown and grayish brown silt/clay, < 10% very fine grained sand, 50% sand, 25% gravel, 25% debris including glass and wood, odor emitting from core (chlorinated solvent?). Fill. 17.1 to 17.8' - Very dark brown (2.5Y 3/2) sand and gravel, contains metal filings and wood debris. Fill. 17.8 to 19.0' - Light olive brown (2.5Y 5/4) sand and gravel, contains glass and asphalt debris. Fill.
20							NR	

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	34.43		11/30/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P002

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Casing: PVC, 2"			NR	19.0 to 25.0' - No recovery.
				Backfill: Cement and bentonite grout				
25							FL	25.0 to 26.8' - Brown (2.5Y 5/3) sand, predominantly very fine grained, 20% silt/clay, 70% sand, 10% gravel, contains metal, glass and concrete. Fill. 26.8 to 28.1' - Dark grayish brown (2.5Y 4/2) clayey sand and gravel, solvent odor, contains charcoal. Fill. 28.1 to 30.0' - Brownish yellow (10YR 6/8) to dark grayish brown (2.5Y 4/2) clayey gravel, 60% gravel (average diameter = 2.0"), moist, prominant odor. Fill.
30							SP-GP	30.0 to 32.6' - Yellowish brown (10YR 5/4) to olive gray (5Y 4/2) sand and gravel, 15% clay/silt, 40% sand, 45% gravel up to 4.0" in diameter (average diameter = 2.0"), wet at 31.5'. Outwash.
							NR	32.6 to 35.0' - No recovery.
35	O	GC	0036				SP-GP	35.0 to 35.6' - Yellowish brown (10YR 5/4) to olive gray (5Y 4/2), sand and gravel, 15% clay/silt, 40% sand, 45% gravel up to 4.0" in diameter (average diameter = 2.0"). Outwash.
							GP	35.6 to 38.9' - Yellowish brown (10YR 5/4) sandy gravel, 70% gravel up to 2.0" in diameter (average diameter = 0.4"), 25% sand, 5% silt/clay, wet. Outwash.
40							NR	38.9 to 41.0' - No recovery.
45							SP-GP	41.0 to 48.0' - Yellowish brown (10YR 5/4) sand and gravel, average diameter of gravel is 0.3" from 41.0 - 43.0' and 1.2" from 43.0 - 48.0'. Outwash.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	34.43		11/30/92

WESTON

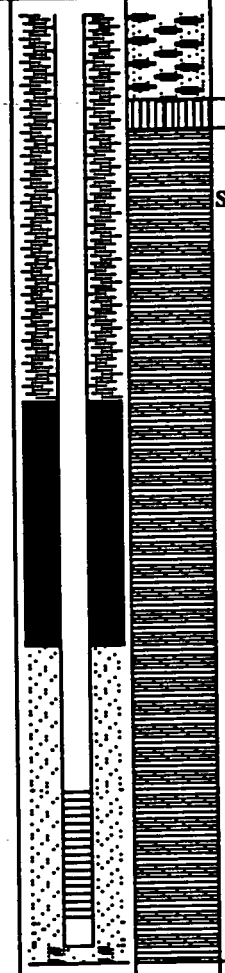
GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P002

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	O	GC	0048	Casing: PVC, 2"			ST	48.0 to 48.5' - Gray siltstone, calcareous. Bedrock.
50				Backfill: Cement and bentonite grout			SH/LS	48.5 to 63.0' - Shale with interbedded limestone, shale is medium gray (N5), very stiff to hard, becoming increasingly competent at 51.0', laminated, numerous partings, few fossils, dry; limestone is medium dark gray (N4), very hard, partially crystalline, numerous fossils in places. Bedrock.
55				Seal: Bentonite chips				
60				Filter Pack: 20/40 quartz sand				
				Screen: PVC, 2"				
				Backfill: Native sediment				Total Depth = 63.0'.
65								
70								



GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	34.43		11/30/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P003
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596707.87
Date Started	11/7/92	East (ft)	1495024.47
Date Completed	11/7/92	Ground Surface Elev. (ft)	706.79
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	709.28
Checked By	ERIC LARSEN	Total Depth (ft)	39.0

Comments: Piezometer located along western berm of the site sanitary landfill, 153 ft. north of east-west access road and 42 ft. east of north-south access road.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 2.5' - Brown silty sand, very fine grained, 15% gravel. Fill.
							NR	2.5 to 3.5' - No recovery.
				Backfill: Cement and bentonite grout			FL	3.5 to 4.6' - Brown silty sand and gravel, sand is very fine grained. Fill. 4.6 to 5.0' - Gray sandy, clayey silt, 15% gravel, 20% very fine grained sand. Fill. 5.0 to 6.4' - Light brown (10YR 5/4) silty clay, 10% gravel. Fill. 6.4 to 7.8' - Grayish brown (10YR 5/2) silty clay, approximately 15% gravel (average diameter = 0.5"), contains metal debris. Fill. 7.8 to 9.2' - Dark brown to black fill material, contains metal debris and white precipitate. Fill. 9.2 to 10.0' - Light yellowish brown silty sand and gravel, sand is coarse grained, contains metal debris. Fill. 10.0 to 10.5' - Yellowish brown silty, clayey sand and gravel. Fill.
5	O	GC	0005					
	O	GC	0006					
10							SP-GP	10.5 to 12.5' - Light brownish gray (2.5Y 6/2) sand and gravel, poorly sorted, 35% gravel up to 2.5" in diameter (average diameter = 0.5"). Outwash.
							TI	12.5 to 15.0' - Yellowish brown (10YR 5/4) silty sand, 10% clay, 20% silt, 50% fine grained sand, 5% coarse sand, 15% gravel (average diameter = 0.3"). Till. 15.0 to 15.5' - Yellowish brown (10YR 5/4) silty, gravelly sand, 10% clay, 20% silt, 40% fine grained sand, 30% gravel. Till. 15.5 to 15.8' - Pale brown (10YR 7/4) silty sand and gravel, 40% gravel. Till. 15.8 to 20.0' - Brown (10YR 4/3) silty sand with gravel, competent, 10% clay, 30% silt, 30% fine grained sand, 15% sand, 15% gravel up to 2.8" in diameter (average diameter = 0.4"). Till.
15	O	GC	0015					
	O	GC	0016					
	O	GC	1016					
				Seal: Bentonite chips				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
⊻	26.05	11:45	11/07/92
⊻	22.94		11/30/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id P003

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0021	Filter Pack: 20/40 quartz sand			TI	20.0 to 23.8' - Dark gray (10YR 4/1) gravelly sand, low plasticity, 10% clay, 10% silt, 30% fine grained sand, 20% sand, 30% gravel (average diameter = 0.6"). Till.
								23.8 to 24.4' - Dark yellowish brown (10YR 4/6) silty gravelly sand, < 5% clay, 20% silt, 30% fine grained sand, 30% sand, 20% gravel. Till.
				Screen: PVC, 2"			SM-GM	24.4 to 25.0' - Pale brown silty sand and gravel, crumbly, approximately 40% gravel up to 3.0" in diameter (average diameter = 0.8"). Outwash.
25	O	GC	0026				SP-GP	25.0 to 30.0' - Yellowish brown (10YR 5/6) sand and gravel, 60% gravel up to 4.0" in diameter (average diameter = 1.0"), wet. Outwash.
30	O	GC	0032					30.0 to 34.5' - Yellowish brown (10YR 5/3) sand and gravel, 40% sand, 60% gravel up to 1.4" in diameter (average diameter = 0.4"). Outwash.
				Backfill: 20/40 quartz sand				34.5 to 35.0' - Yellowish brown (10YR 5/3) sand and gravel, 30% coarse grained sand, 70% gravel up to 3.0" in diameter (average diameter = 1.2"), wet. Outwash.
35							GP	35.0 to 37.0' - Brown (10YR 6/4) sandy gravel, 30% coarse grained sand, 70% gravel up to 4.0" in diameter, (average diameter = 1.5"). Outwash.
	O	GC	0037				ST	37.0 to 39.0' - Gray siltstone, calcareous, dark gray shaley laminations and limestone interbeds.
40								Total Depth = 39.0'.
45								

GROUNDWATER

DEPTH	HOUR	DATE
26.05	11:45	11/07/92
22.94		11/30/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P004
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596687.67
Date Started	11/10/92	East (ft)	1495330.25
Date Completed	11/18/92	Ground Surface Elev. (ft)	754.30
Logged By	T.FRINAK/E.LARSEN	Top of Casing Elev. (ft)	756.31
Checked By	E.LARSEN/T.THARP	Total Depth (ft)	63.5

Comments: Piezometer located on east side of lined landfill. Telescoped completion - surface casing installed to top of basal landfill liner (approximatley 31.5 ft. below ground surface).

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 0.9' - Grayish brown (10YR 5/2) to brown (10YR 5/3) topsoil.
							FL	0.9 to 5.0' - Grayish brown sand with clay and silt, very competent, 15% clay/silt, 60% very fine grained sand, 5 - 10% sand, 5 - 10% gravel up to 2.0" in diameter (average diameter = 0.5"). Landfill cap.
				Backfill: Cement and bentonite grout				
5	O	GC	0005					5.0 to 10.0' - Gray clayey, silty, sandy gravel, 20 - 30% clay, 30% silt to very fine grained sand, 40% gravel/debris (plastic, wood, metal, and glass). Fill.
10	O	GC	0010					10.0 to 10.3' - Grayish brown clayey sand, very fine grained, contains debris.
	O	GC	0011					10.3 to 11.3' - Dark gray clayey sand with gravel, sand is very fine grained, contains debris, wet. Fill.
							NR	11.3 to 15.0' - No recovery.
15							FL	15.0 to 19.0' - Gray to dark gray clayey, silty sand with gravel, sand is very fine grained, contains debris, moist. Fill.
								19.0 to 19.4' - Greenish gray clay, very plastic, damp. Fill.
								19.4 to 20.0' - Dark gray fill, contains debris.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	42.70	07:47	11/18/92
▼	29.24		11/24/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P004

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0020	Casing: PVC, 2"			FL	20.0 to 25.0' - Dark grayish brown (10YR 4/2) to light olive brown (2.5Y 4/2) clayey, gravelly sand, very fine grained, 20 - 30% gravel, contains debris (orange boot covers, paper, glass, metal). Fill.
				Backfill: Cement and bentonite grout				
25	O	GC	0025					25.0 to 30.0' - Dark grayish brown (2.5Y 4/2) clayey, gravelly sand, very fine grained, 20 - 30% gravel, contains debris (rubber, glass, wire, paper). Fill.
	O	GC	1025					
30	O	GC	0030					30.0 to 31.5' - Dark gray gravel, abundant debris (metal, copper wire, glass, plastic). Fill.
	O	GC	0031					31.5 to 39.0' - Brownish yellow (10YR 6/6) sand with silt and clay, 20% silt/clay, 50% very fine grained sand, 20% sand, 10% gravel, uniform color and consistancy, contains layers and pockets of dark gray fill material, areas of dark brown to black staining, and scattered debris (metal, plastic). Basal landfill liner.
35	O	GC	0035					
	O	GC	0038					
40	O	GC	0040				TI	39.0 to 50.1' - Olive brown (2.5Y 4/4) gravelly silt, 50% silt, 10% very fine grained sand, 30% fine to coarse gravel, 10% clay, increasing to 25% at 44.0', layered textile at 39.0', soil is stained dark grayish brown (2.5Y 4/2) from 39.0 to 39.6'. Till.
45	O	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	42.70	07:47	11/18/92
▼	29.24		11/24/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P004

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Seal: Bentonite chips				
50	O	GC	0050				ST-ML	50.1 to 51.0' - Pale brown (10YR 6/3) siltstone/compacted silt, soft to stiff, crumbly, trace very fine gravel. Weathered bedrock.
				Filter Pack: 20/40 quartz sand			LS	51.0 to 52.9' - Light gray to gray (10YR 6/1) limestone, hard, trace fossils, wet along fractures. Bedrock.
				Screen: PVC, 2"			ST-SH	52.9 to 55.0' - Gray (10YR 6/1) siltstone/shale, stiff to slightly hard, slightly foliated, wet in places. Bedrock.
55							SH	55.0 to 56.0' - Gray to dark gray (10YR 5/1 to 4/1) shale, some silty clay, trace of very fine grained sand, soft to stiff, damp to moist, occasional calcareous stringers. Bedrock.
							SH-LS	56.0 to 59.0' - Gray (10YR 6/1 - 5/1) shale, stiff to hard, occasional slight foliation, intermittant fossiliferous limestone lenses or layers, dry. Bedrock.
60							SH	59.0 to 63.5' - Dark gray (2.5Y 4/0) shale, stiff to hard, fissile, foliated. Bedrock.
				Backfill: Native sediment				
65								Total depth = 63.5'.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	42.70	07:47	11/18/92
▼	29.24		11/24/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P005
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596695.30
Date Started	11/21/92	East (ft)	1495128.04
Date Completed	11/21/92	Ground Surface Elev. (ft)	738.77
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	740.44
Checked By	TOM THARP	Total Depth (ft)	67.0

Comments: Piezometer located near southern end of upper bench on site sanitary landfill, approximately 75 ft. north of piezometer P006 and 175 ft. south of southern edge of overflow pond.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.9' - Yellowish brown (10YR 5/4) silty sand, very fine to medium grained, soft, minor gravel, numerous roots, damp. Fill.
	O	GC	0003	Backfill: Cement and bentonite grout				0.9 to 17.2' - Yellowish brown to dark brown (10YR 5/6 to 3/3) sandy gravelly silt, firm, 40% silt, 25% very fine to medium grained sand, 30% fine to very coarse gravel, 5% clay, few large cobbles, mostly dry, no debris. Fill.
5								
	O	GC	0009					
10								
15								
	O	GC	0018					17.2 to 36.6' - Yellowish brown (10YR 5/4) silty, gravelly sand, firm, sand is very fine to very coarse grained, poorly sorted, very fine to medium gravel, 30% silt, 25% gravel, 50% sand, < 5% clay, dry to damp, spotty dark brown to black stringer at 21.1 to 22.2', increase in gravel content (35%) at 21.8' to 22.7',
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	58.90	15:45	11/21/92
▽	55.12		11/24/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P005

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Casing: PVC, 2"			FL	pocket of dark brown clayey silt at 25.2 to 25.4', increase in clay (15%) and silt (45%) from 30.6 to 31.5', zone of black staining and charred material at 31.9 to 32.3', increase in medium to coarse gravels at 31.5 to 32.5'. Fill.
	O	GC	0022					
				Backfill: Cement and bentonite grout				
25								
	O	GC	0029					
30								
	O	GC	0032					
35								
	O	GC	0037					36.6 to 40.0' - Yellowish brown (10YR 5/4) sandy silt with gravel, contains abundant very dark gray to black (10YR 3/1 to 2/1) debris (wood, charred material, wire, paper, fabric). Fill.
40								40.0 to 43.5' - Olive gray (5Y 5/2) clay, highly plastic, some silt, trace gravel, occasional small cobble, moist, pockets and zones of dark brown staining and debris (including wire, metal, paper, cloth, wood chips). Fill.
	O	GC	0043					43.5 to 50.0' - Light olive gray to olive gray (5Y 6/2 to 5/2) heterogeneous mixture of silt, sand, gravel and cobbles, loose, damp to moist, trace metal and paper debris at 45.0 to 45.2', spotty dark brown staining in places, layer of dark gray material at 49.0', zone of charred material at 49.7 to 50.0'. Fill.
45	O	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	58.90	15:45	11/21/92
▼	55.12		11/24/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P005

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Seal: Bentonite chips				
	O	GC	0049					
50				Filter Pack: 20/40 quartz sand			FL	50.0 to 54.0' - Heterogeneous mixture of silt, sand, gravel, cobbles, and boulders, loose, poorly sorted, dry to damp, limestone boulder at 52.7 - 53.2'. Fill.
				Screen: PVC, 2"				
55	O	GC	0055				GM-GP	54.0 to 63.2' - Light yellowish brown (2.5Y 6/4) silty, sandy gravel, fine to very coarse grained sand, very fine to very coarse gravel, numerous large cobbles, poorly sorted, loose, saturated. Outwash.
	O	GC	0056					
60								
	O	GC	0063				ML	63.2 to 63.5' - Light brownish gray (2.5Y 6/2) clayey silt, firm, some very fine to fine gravel, minor very fine to fine sand, damp.
				Backfill: Native sediment			SH	63.5 to 65.5' - Dark gray (2.5Y 4/0) shale, weathered, slightly stiff, non-competent, friable, slightly foliated. Weathered bedrock. 65.5 to 67.0' - Dark gray (2.5Y 4/0) shale, stiff to hard, mostly competent, foliated, moist, intermittant limestone clasts and lenses, clay filling fractures and voids. Bedrock.
65								
								Total Depth = 67.0'
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	58.90	15:45	11/21/92
▼	55.12		11/24/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P006
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596559.47
Date Started	10/25/92	East (ft)	1495115.86
Date Completed	10/25/92	Ground Surface Elev. (ft)	705.87
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	707.78
Checked By	TOM THARP	Total Depth (ft)	35.0
Comments:	Piezometer located on the south side of the site sanitary landfill, 45 ft. directly east of monitoring well 0063.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 0.3' - Topsoil.
							FL	0.3 to 1.4' - Brown (10YR 4/3) clayey silt with gravel, coarse to very coarse limestone gravel, firm, moist, scattered roots. Fill. 1.4 to 11.1 ' - Dark grayish brown (10YR 4/2) silty clay, minor medium to coarse grained sand, trace coarse gravel, occasional cobble, soft, moist. Fill.
				Backfill: Cement and bentonite grout				
5	O	GC	0005					
	O	GC	0007					
10	O	GC	0010					
							GP	11.1 to 21.6' - Light yellowish brown (10YR 6/4) sandy gravel, very fine to very coarse grained sand, fine to coarse gravel, subangular to subrounded, poorly sorted, trace silt, damp to moist. Outwash.
15	O	GC	0015					
	O	GC	0016					
	O	GC	1016	Seal: Bentonite chips				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.70	13:40	10/25/92
▼	22.02		11/24/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P006

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Filter Pack: 20/40 quartz sand				
				Screen: PVC, 2"			SM-SP	21.6 to 33.6' - Brown (10YR 4/3) silty, gravelly sand, very fine to coarse grained, fine to very coarse gravel, few large cobbles, poorly sorted, minor clay in pockets of silt, moist becoming slightly wet at 24.0', saturated at 24.7'. Outwash.
25	O	GC	0025					
30	O	GC	0031	Backfill: Native sediment				
	O	GC	0034				ML	33.6 to 34.3' - Olive brown (2.5Y 4/4) sandy, gravelly silt, very fine to coarse grained sand, very fine to fine gravel, firm, damp.
35							SH	34.3 to 35.0' - Dark gray (2.5Y 4/0) shale, hard, crumbly, fissile, chevron folds, lenses or clasts of cherty limestone or dolomite, contains approximately 20% silt. Bedrock.
								Total depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.70	13:40	10/25/92
▼	22.02		11/24/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P007
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	597073.36
Date Started	10/22/92	East (ft)	1494987.45
Date Completed	10/23/92	Ground Surface Elev. (ft)	705.35
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	707.51
Checked By	TOM THARP	Total Depth (ft)	40.0

Comments: Piezometer located 10 ft. west of monitoring well 0046, near the north-west corner of the overflow pond.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 0.8' - Silty sand, very fine grained, roots. Topsoil.
							FL	0.8 to 3.7' - Very dusky red (10R 2.5/2) silty sand, very fine grained, root fragments, organic material, minor limestone fragments up to 0.15' in diameter. Fill.
5	O	GC	0005	Backfill: Cement and bentonite grout			ML	3.7 to 10.3' - Brown to dark brown (10YR 4/3) clayey silt, slightly plastic.
10							SM	10.3 to 11.5' - Dark brown (10YR 3/3) silty sand with gravel, sand is very fine to medium grained, trace clay, subrounded fragments up to 0.1' in diameter, moist.
	O	GC	0013				SP	11.5 to 15.0' - Yellowish brown (10YR 5/4) gravelly sand, very fine to coarse grained, poorly sorted, some cobbles, calcareous gravel zone from 14.4 to 14.8', pockets of silt with minor clay. Outwash.
15							LS	15.0 to 15.4' - Limestone cobble or boulder, fossiliferous.
				Seal: Bentonite chips			SP	15.4 to 19.6' - Brownish yellow (10YR 6/6) gravelly sand, medium to coarse grained, poorly sorted, fine to coarse gravel, 10 - 15% cobbles up to 0.3' in diameter, moist. Outwash.
20							SM-	

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.20	11:10	10/23/92
▽	21.52		11/23/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P007

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0020	Filter Pack: 20/40 quartz sand			SC	19.6 to 20.5' - Light olive brown (2.5Y 5/4) silty, clayey sand with gravel, sand is fine to very coarse grained, some gravel to 0.2' in diameter, 20% cobbles to 0.3' diameter from 20.0 to 20.5'. Outwash.
				Screen: PVC, 2"			SP	20.5 to 25.0' - Light olive brown (2.5Y 5/4) gravelly sand, medium to coarse grained, gravels are subrounded, 5% cobbles. Outwash.
25	O	GC	0025					25.0 to 26.5' - Strong brown (7.5YR 4/6) gravelly sand, fine to medium grained, gravel up to 0.1' in diameter, trace clay, minor silt, areas of dark brown to black staining, saturated. Outwash.
	O	GC	0026				GP	26.5 to 27.7' - Yellowish brown (10YR 5/4) sandy gravel, sand is very fine to coarse grained, poorly sorted, fine to coarse gravel up to 0.15' in diameter, some silt, minor clay, saturated. Outwash.
							SM-SP	27.7 to 28.5' - Brown (10YR 5/3) silty, gravelly sand, very fine to medium grained, fine to coarse gravel, minor clay, some alteration on grains, wet. Outwash.
							SH	
30	O	GC	0030				TI	28.5 to 30.0' - Gray to dark gray (7.5YR 6/0 to 4/0) shale, laminated to fissile, hard. Remnant bedrock float.
	O	GC	0031				CL	30.0 to 30.8' - Light yellowish gray to light yellowish brown (2.5Y 6/2 to 6/4) clayey, silty gravel, fine to coarse gravels up to 0.1' diameter, moist. Till.
							ML	30.8 to 32.2' - Olive brown to dark gray (2.5Y 4/4 to 5/0) silty clay, dense, very firm, trace gravel, dry.
	O	GC	0033					
				Backfill: Native sediment			SH	32.2 to 34.0' - Light yellowish brown (2.5Y 6/4) clayey silt, minor fine to medium gravel, soft to firm, moist to wet.
35								34.0 to 35.0' - Gray to dark gray (2.5Y 6/0 to 4/0) shale, laminated, hard, dry.
							CL	35.0 to 38.6' - Gray (5Y 5/1) silty clay, very firm to hard, pockets of clay, minor gravel, dry to damp.
							ST	38.6 to 40.0' - Gray (5Y 6/1) siltstone, crumbly, fissile, partings of shale. Bedrock.
40								Total depth = 40.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	24.20	11:10	10/23/92
▼	21.52		11/23/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P008
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596683.60
Date Started	2/17/93	East (ft)	1494765.46
Date Completed	2/20/93	Ground Surface Elev. (ft)	700.45
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	702.29
Checked By	ERIC LARSEN	Total Depth (ft)	61.0
Comments:	Piezometer located on west access road, 405 ft. north of piezometer P013, and 275 ft. north of piezometer P009.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.9' - Dark brown (7.5Y 3/2) sandy gravel with silt and clay, 50% gravel, 30% sand, 20% clay/silt, odorous, wet. Fill.
	O	GC	0002				GP	0.9 to 14.0' - Light yellowish brown (10YR 6/4) sandy gravel, 60% gravel up to 3.0" in diameter, 30% fine grained sand, 10% silt, odorous, thin limonite banding at 10.0' and 13.5'. Outwash.
	O	GT	0004	Backfill: Cement and bentonite grout				
5								
	O	GC	0007					
				Seal: Bentonite chips				
10								
	O	GC	0011					
				Filter Pack: 20/40 quartz sand				14.0 to 21.2' - Yellowish brown (10YR 5/6) sandy gravel, 60 to 70% gravel, increased clay content, damp at 15.0'. Outwash.
15				Screen: PVC, 2"				
	O	GC	0019					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.55	13:23	02/20/93
▼	15.00		03/07/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GT	0020				GP	21.2 to 25.0' - Sandy gravel, 20% sand, 75% gravel up to 2.0" in diameter (average diameter = 0.3"), 5% silt/clay, wet. Outwash.
	O	GC	0021					
	O	GC	1021					
25				Backfill: Native sediment			TI	25.0 to 26.0' - Dark yellowish brown (10YR 4/4) gravelly sand, 35% gravel, 55% very fine grained sand, 10% silt/clay, compact, dry. Till.
	O	GC	0027				GP	26.0 to 28.0' - Yellowish brown (10YR 5/4) gravel, 85% gravel up to 4.0" in diameter (average diameter = 0.8"), 15% sand/silt. Outwash.
30							NR	28.0 to 35.0' - No recovery.
35							GP	35.0 to 53.0' - Yellowish brown (10YR 5/4) gravel, 85% gravel up to 4.0" in diameter (average diameter = 0.8"), 15% sand/silt. Outwash.
40	O	GC	0040					
45	O	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.55	13:23	02/20/93
▼	15.00		03/07/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 3

Borehole/Well Id P008

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	O	GC	0048					
55	O	GC	0054	Backfill: Bentonite chips			TI	53.0 to 55.0' - Dark grayish brown (2.5Y 4/2) clayey sand, fine grained, 15% gravel, tight, dry. Till.
60	O	GT	0057				ST	55.0 to 61.0' - Gray to dark gray (2.5Y 5/0 to 4/0) calcareous siltstone with shaley partings, limestone interbeds < 1.0" thick at 56.2' and 57.3', dry. Bedrock.
65								Total Depth = 61.0'.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	17.55	13:23	02/20/93
▼	15.00		03/07/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P009
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596530.19
Date Started	2/22/93	East (ft)	1494774.76
Date Completed	2/23/93	Ground Surface Elev. (ft)	699.58
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	701.72
Checked By	ERIC LARSEN	Total Depth (ft)	81.0

Comments: Piezometer located on west access road, 130 ft. north of piezometer P013, and 275 ft. south of piezometer P008.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 1.2' - Dark brown clayey sand and gravel with roots. Fill.
	O	GT	0002				SM-SP	1.2 to 2.4' - Brown silty gravelly sand, 30% gravel, odorous.
				Backfill: Cement and bentonite grout			SP-GP	2.4 to 5.0' - Sand and gravel, 50% gravel, 40% very fine to fine grained sand, 10% silt/clay, odorous. Outwash.
5	O	GC	0005				GP	5.0 to 13.5' - Brown sandy gravel, 70% gravel, 25% sand, 5% silt/clay. Outwash.
10	O	GC	0010					
	O	GC	1010					13.5 to 14.5' - Sandy gravel, 70% gravel, 20% sand, 10% clay. Outwash. 14.5 to 15.0' - Sandy gravel, 60% gravel, 35% sand, 5% clay, dry. Outwash.
15	O	GC	0015				GP	15.0 to 25.0' - Brown gravel, 80% gravel, 15% very fine grained sand, 5% silt/clay, increasing clay at 19.0', wet at 19.0'. Outwash.
	O	GC	0019					
20								

GROUNDWATER

DEPTH	HOUR	DATE
14.87		03/07/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P009

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Casing: PVC, 2"				
	O	GT	0023					
				Backfill: Cement and bentonite grout				
25	O	GC	0025				GP	25.0 to 36.0' - Brown gravel, 80% gravel up to 2.0" in diameter (average diameter = 0.4"), 15% very fine grained sand, 5% silt/clay. Outwash.
30	O	GC	0030					
35							SP-GP	36.0 to 37.2' - Sand and gravel, competent, 50% gravel, 40% sand, 10% silt. Outwash.
							GP	37.2 to 41.0' - Sandy gravel, 70% gravel up to 3.0" in diameter (average diameter = 0.4"), 25% sand, 5% silt/clay. Outwash.
40	O	GC	0040					
							SP-GP	41.0 to 59.0' - Brown sand and gravel, little to no fines, well sorted, sand is very coarse grained, gravel is < 0.2" in diameter. Outwash.
45	O	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.87		03/07/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P009

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP-GP	
				Seal: Bentonite chips				
50	O	GC	0050					
				Filter Pack: 20/40 quartz sand				
55	O	GC	0055	Screen: PVC, 2"				
	O	GC	0059				ML	59.0 to 63.0' - Gray clayey, gravelly silt with sand, very competent, sand is very fine grained, 30% gravel, angular to rounded, abundant wood fragments, some partially coalified at 62.0 to 63.0', contains clasts of limestone, fossils, and quartzose material. Alluvial deposit.
60								
	O	GC	0063	Backfill: Bentonite chips				63.0 to 71.0' - Green to greenish gray clayey, gravelly silt with sand, very competent, sand is very fine grained, 30% gravel, angular to rounded, contains limestone and some quartzose clasts, dry. Alluvial deposit.
	O	GT	0063					
65								
	O	GC	0067					
70								71.0 to 73.0' - Green to greenish gray clayey, gravelly silt with sand, very competent, sand is very fine grained, 30% gravel, angular, contains limestone clasts, dry. Alluvial deposit.

GROUNDWATER

DEPTH	HOUR	DATE
14.87		03/07/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 4 of 4

Borehole/Well Id P009

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							ML	73.0 to 76.0' - Greenish gray silt with siltstone clasts, dry, crumbly.
75				Backfill: Bentonite chips				
							ST	76.0 to 81.0' - Siltstone, some thin beds of shell fragments. Bedrock.
80								
								Total Depth = 81.0'.
85								
90								
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼	14.87		03/07/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 5

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P013
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596370.54
Date Started	2/22/93	East (ft)	1494790.87
Date Completed	2/23/93	Ground Surface Elev. (ft)	699.49
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	701.64
Checked By	ERIC LARSEN	Total Depth (ft)	110.0

Comments: Piezometer located on west access road, 405 ft. south of piezometer P008, and 130 ft. south of piezometer P009.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 1.1' - Gravel. Fill.
							TI	1.1 to 7.1' - Dark brown (10YR 3/3) clayey silty sand, very fine grained, 15% gravel, competent. Till.
				Backfill: Cement and bentonite grout				
5	O	GC	0005					
	O	GC	0007				GP	7.1 to 15.0' - Light brown sandy gravel, 70% gravel, 25% sand, 5% silt/clay, dry. Outwash.
				Seal: Bentonite chips				
10								
	O	GT	0012					
				Filter Pack: 20/40 quartz sand				
				Screen: PVC, 2"				
15	O	GC	0015				GP	15.0 to 38.0' - Yellowish brown (10YR 5/4) gravel, 80-90% gravel, 10-20% sand/silt, becoming wet at 16.0 to 17.0'. Outwash.
	O	GC	0017					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.45	08:51	02/22/93
▽	12.76		03/06/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P013

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP	
25	O	GC	0025	Backfill: Native sediment				
	O	GC	1025					
30	O	GC	0030					
35	O	GC	0035					
							TI	38.0 to 39.0' - Brown gravelly sand, very fine grained, competent, 25% gravel, 10% silt/clay. Till.
	O	GC	0039				GP	39.0 to 40.0' - Gravel, < 10% sand/silt, damp. Outwash. 40.0 to 42.0' - Gravel, coarse grained. Outwash.
40							SP-GP	42.0 to 50.0' - Sand and gravel, gravel is less than 0.4" in diameter, sand is very coarse grained, well sorted, trace silt/clay. Outwash.
45	O	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.45	08:51	02/22/93
▽	12.76		03/06/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 5

Borehole/Well Id P013

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50	O	GC	0050	Backfill: Native sediment			SP-GP	50.0 to 69.0' - Sand and gravel, sand is very coarse grained, gravel up to 1.0" in diameter, trace silt/clay. Outwash.
	O	GT	0050					
55	O	GC	0055					
60	O	GC	0060					
65	O	GC	0065					
	O	GC	0069				SP	69.0 to 69.8'- Light brown sand, fine grained, well sorted. Outwash.
70							GC	69.8 to 74.0' - Gray clayey gravel, 60 to 70% gravel primarily consisting of limestone and some quartzose pebbles. Outwash.
	O	GC	0072					
	O	GC	1072					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.45	08:51	02/22/93
▼	12.76		03/06/93

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P013

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75				Backfill: Native sediment			GP	74.0 to 75.0' - Light grayish brown gravel, 15% fine grained sand. Outwash. 75.0 to 77.0' - Brown gravel, gravels are up to 4.0" in diameter (average diameter = 0.6"). Outwash.
80	O	GC	0080				GP	77.0 to 83.5' - Brown sandy gravel, 60% gravel and cobbles up to 6.0" in diameter (average diameter = 1.2"), gravel consists of quartzose, basaltic, and limestone material, 30% sand, 10% silt/clay. Outwash.
							SP	83.5 to 85.0' - Brown sand, medium grained. Outwash.
85	O	GC	0085				SP/GP	85.0 to 86.4' - Greenish brown sand and gravel, 50% gravel, 40% sand, 10% clay/silt. Outwash.
							CL	86.4 to 86.9' - Green to greenish gray silty clay, very hard, competent, contains angular fossiliferous clasts and free fossils (Bryozoans).
							SP	86.9 to 87.4' - Brown sand, coarse grained.
90	O	GC	0088				CL	87.4 to 96.0' - Silty clay, very hard, competent, prominant laminations, contains angular limestone fragments and free fossils (Bryozoans), dry. Alluvial deposit.
95	O	GC	0094	Backfill: Bentonite chips				
	O	GC	0096				NR	96.0 to 105.0' - No recovery, change in drilling rate at 103.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
⧗	16.45	08:51	02/22/93
⧗	12.76		03/06/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 5 of 5

Borehole/Well Id P013

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				Backfill: Bentonite chips			NR	
105							CL	105.0 to 106.0' - Brown clay to silty clay, contains very angular limestone clasts. Alluvial deposit.
							ST	107.0 to 110.0' - Gray siltstone, calcareous, shale partings. Bedrock.
110								Total Depth = 110.0'.
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	16.45	08:51	02/22/93
▽	12.76		03/06/93

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P014
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	597187.84
Date Started	10/24/92	East (ft)	1495159.35
Date Completed	10/24/92	Ground Surface Elev. (ft)	716.49
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	719.10
Checked By	TOM THARP	Total Depth (ft)	45.0
Comments:	Piezometer located 25 ft. southeast of southeast retention basin near northern edge of overflow pond.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 0.3' - Topsoil
							FL	0.3 to 2.0' - Dark yellowish brown (10YR 4/4) silt, slightly firm, minor clay, trace of fine to medium gravel, zones of limonite/hematite alteration, dry. Fill.
	O	GC	0003					2.0 to 6.6' - Yellowish brown (10YR 5/6) clayey silt, firm, minor fine to coarse gravels, slightly moist. Fill.
	O	GC	1003	Backfill: Cement and bentonite grout				
5								6.6 to 10.0' - Dark gray (10YR 4/1) to brown (10YR 5/3) clayey silt, very firm, medium to very coarse gravels up to 0.2' in diameter, moist. Fill.
10	O	GC	0010				TI	10.0 to 11.9' - Dark gray (10YR 4/1) to yellowish brown (10YR 5/4) gravelly silt, firm, fine to medium gravel, minor clay, trace of very fine grained sand, slightly moist. Till.
								11.9 to 15.0' - Very dark gray (10YR 3/1) gravelly silt, firm, medium to very coarse gravel, minor clay, trace of very fine grained sand, moist. Till.
15	O	GC	0015					15.0 to 26.7' - Very dark grayish brown (10YR 3/2) gravelly silt, firm, 35% clay from 23.0' to 26.7, few pockets of fine grained sand, moist. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	35.60	15:13	10/24/92
▽	32.58		11/23/92

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id: P014

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0020					
25	O	GC	0025	Seal: Bentonite chips				
	O	GC	0027				TI	26.7 to 33.0' - Brown (10YR 5/3) to yellowish brown (10YR 5/6) gravelly silt, firm to slightly stiff, minor very coarse grained sand, fine to very coarse gravel, trace clay in upper portion, areas of hematite staining, calcareous at 29.8' and 32.1', increasing in silt/clay content at 32.5 to 33.0', dry to damp. Till.
30				Filter Pack: 20/40 quartz sand				
				Screen: PVC, 2"			GP	33.0 to 39.9' - Light yellowish brown (10YR 7/4) sandy gravel, soft to slightly firm, fine to very coarse grained sand, fine to medium gravel, trace silt, scattered limonite/hematite staining, damp, becoming wet at 36.0'. Outwash.
35	O	GC	0035					
	O	GC	0036					
	O	GC	0037					39.9 to 40.9' - Light yellowish brown (10YR 7/4) sandy gravel, firm to stiff, fine to very coarse grained sand, fine to coarse gravel, some silt, trace clay, scattered limonite/hematite staining, wet, becoming damp near base of unit. Outwash.
40	O	GC	0040					
				Backfill: Native sediment			ST	40.9 to 43.0' - Light gray (2.5Y 7/0) siltstone, hard, crumbly, dry. Bedrock.
							SH	43.0 to 45.0' - Dark gray (2.5YR 4/0) shale, hard, crumbly, fissile, chevron folds, dry. Bedrock.
45								Total depth = 45.0'.

GROUNDWATER

DEPTH	HOUR	DATE
35.60	15:13	10/24/92
32.58		11/23/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P015
Drilling Method	ROTO SONIC	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	596352.10
Date Started	10/26/92	East (ft)	1495271.70
Date Completed	10/26/92	Ground Surface Elev. (ft)	734.99
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	737.52
Checked By	TOM THARP	Total Depth (ft)	57.0

Comments: Piezometer located within the north-central portion of the spoils area, directly east of Mound production well 0071, and southeast of monitoring wells 0305/0309.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 10.0' - Dark yellowish brown (10YR 4/4) silt, clay, sand, and gravel, soft to firm, variably proportioned, occasional zones of large cobbles and boulders, dry. Fill.
				Backfill: Cement and bentonite grout				
5	O	GC	0005					
10	O	GC	0010					10.0 to 20.0' - Dark grayish brown (2.5Y 4/2) clayey silt, slightly firm, some fine to medium gravel, boulder at 13.1', moist. Fill.
	O	GC	0014					
15		GC	1014					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	49.20	11:55	10/26/92
▽	46.92		11/24/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 2 of 3

Borehole/Well Id P015

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	O	GC	0020	Casing: PVC, 2"			FL	20.0 to 25.0' - Dark gray (5Y 4/1) clay and silt, sticky, soft, some fine to medium gravel, minor sand, pockets of sludge, scattered wood fragments, moist. Fill.
	O	GC	0022					
25				Backfill: Cement and bentonite grout			TI	25.0 to 40.0' - Brown (10YR 4/3) sandy gravelly silt, soft, very fine to fine grained sand with a few very coarse grains, very fine gravel with scattered very coarse fragments, roots, minor clay content, occasional limonite/hematite staining, dry. Till.
30								
	O	GC	0034					
35								
40				Seal: Bentonite chips			GM-GP	40.0 to 50.3' - Yellowish brown (10YR 5/4 to 5/6) silty, sandy gravel, soft, very fine to very coarse grained sand, very fine to very coarse gravel, many small to medium cobbles, poorly sorted, minor pockets of clay, increasing in fine to medium gravel from 48.8' to 50.3', damp, wet at 48.0', saturated at 49.2'. Outwash.
				Filter Pack: 20/40 quartz sand				
45	O	GC	0045					

GROUNDWATER

	DEPTH	HOUR	DATE
▽	49.20	11:55	10/26/92
▽	46.92		11/24/92

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 3 of 3

Borehole/Well Id P015

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
	O	GC	0048	Filter Pack: 20/40 quartz sand			GM-GP	
50				Screen: PVC, 2"			SP	50.3 to 53.9' - Yellowish brown (10YR 5/4) sand, loose, predominantly coarse to very coarse grained, well sorted, minor very fine to fine gravel, trace silt, trace fine to medium grained sand, saturated. Outwash.
55	O	GC	0055				GM-GP	53.9 to 55.0' - Yellowish brown (10YR 5/6) silty, sandy gravel, loose, fine to very coarse grained sand, fine to very coarse gravel, many large cobbles, poorly sorted, trace clay, saturated. Outwash.
	O	GC	0056	Backfill: Native sediment			SH	55.0 to 57.0' - Gray to dark gray (7.5YR 6/0 to 4/0) shale, hard, slightly fossiliferous, 10 - 20% silt, some foliation, limonite staining along partings, dry. Bedrock.
60								Total Depth = 57.0'.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▼	49.20	11:55	10/26/92
▼	46.92		11/24/92

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P016
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597036.29
Date Started	3/16/93	East (ft)	1493364.46
Date Completed	3/16/93	Ground Surface Elev. (ft)	689.09
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	689.03
Checked By	PAUL DARR	Total Depth (ft)	20.0

Comments: On east bank of Great Miami River on MCD property ~ 50' west of bikepath as the path leaves top of levee.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 0.5' - Dark yellowish brown (10YR 4/2) silty sandy, trace roots, soft, moist. Topsoil.
							GP	0.5 to 1.0' - Sandy gravel and fine gravel, some silt, poorly sorted, moist. Alluvium.
				Backfill: Cement - Bentonite grout			SP	1.0 to 7.0' - Dark yellowish brown (10YR 4/2) sand, some silt (~20%), moderate well sorted, shell fragments, reddish brown staining present. Alluvium
5								7.0 to 9.5' - Light olive gray (5Y 5/2) to light olive brown (5Y 5/6) sand, fine to medium sand, trace silt, some clay, soft, plastic, coarse sand at ~ 8.0', moist. Alluvium.
10				Seal: 1/4" Bentonite chips			GP	9.5 to 10.0' - Sandy gravels and fine gravel, trace cobbles, coarse sand, saturated.
							SP	10.0 top 12.5' - Sand, medium to coarse, trace silt, well sorted, saturated. Alluvium.
				Filter Pack: 10/20 Colorado Silica sand			GP	12.5 to 14.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, fine gravel to 3 inches, poorly sorted, saturated. Alluvium. 14.5 to 20.0' - Medium dark gray (N4) sandy gravel, coarse gravel, trace of cobbles to 4 inches, trace of silt, saturated. Alluvium.
15				Screen: PVC, 2", slot size 0.01				
20								Total Depth = 20.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
⊻			
⊻			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P017
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596476.71
Date Started	3/6/93	East (ft)	1493381.03
Date Completed	3/6/93	Ground Surface Elev. (ft)	690.49
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	690.48
Checked By	PAUL DARR	Total Depth (ft)	25.0
Comments:	On east bank of Miami River ~ 50' west of bikepath 1/4 mile south of sewer effluent.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 1.0' - Dark brown silty sand, well sorted, roots in upper 5", shell fragments present, moist. Topsoil.
							ML-SM	1.0 to 7.0' - Dark yellowish brown (10YR 4/2) sand and silt little to no fines, well sorted, scattered shell fragments, moist.
				Backfill: Cement - Bentonite grout				
5								
							SP	7.0 to 9.0' - Moderate yellowish brown (10YR 5/4) sand, coarse sand, some fine gravel, trace fines, moist. Alluvium.
							CL	9.0 to 9.5' - Medium gray (N5) silty clay lens, plastic, moist.
10							SP-GP	9.5 to 11.5' - Moderate yellow brown (10YR 5/4) coarse sand and fine gravel, trace of fines, medium sorted sand, moist. Alluvium.
							GP	11.5 to 13.5' - Medium light gray (N6) sandy gravel, coarse sand and fine gravel, little fines, trace of cobbles to 3 inches, moist. Alluvium. 13.5 to 14.0' - Color changes to dark yellowish brown (10YR 6/6). 14.0 to 20.0' - Light brown gray (5Y 6/4) sandy gravel, coarse sand and fine gravel, little fines, trace cobbles to 3 inches, moist. Alluvium.
15				Seal: 1/4" Bentonite chips				
				Filter Pack: 10/20 Colorado Silica sand				
20								

GROUNDWATER

DEPTH	HOUR	DATE
5.80	10:31	03/21/93
7.69	14:31	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P017

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Screen: PVC, 2", slot size 0.01			SP	20.0 to 21.0' - Coarse to fine sand, poor in fines, well sorted, wet.
							GP	21.0 to 24.0' - Medium gray (N5) sandy gravel, coarse sand, trace cobbles to 3 inches, wet. Alluvium. 24.0 to 24.5' - Olive black (5Y 2/1) sandy gravel, coarse sand, fine gravel, saturated. Alluvium. 24.5 to 25.0' - Dark yellowish orange (10YR 6/6) sandy gravel, coarse sand, fine gravel, no fines, poorly sorted, saturated. Alluvium.
25								Total Depth = 25.0'.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.80	10:31	03/21/93
▼	7.69	14:31	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P018
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596493.74
Date Started	3/21/93	East (ft)	1494322.63
Date Completed	3/22/93	Ground Surface Elev. (ft)	692.58
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	692.28
Checked By	PAUL DARR	Total Depth (ft)	160.0

Comments: Near Trailer Park ~30' south of South Drive, ~ 1/2 mile south of Miamisburg city limits, off Dayton-Cincinnatti Pike.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 4.5' - Dusty brown (5YR 2/1) sandy silt, roots top 5", fine sand, soft, cohesive, slightly plastic, moist. Topsoil.
				Backfill: Cement - Bentonite grout				
5							GP	4.5 to 10.0' - Pale yellow brown (10YR 6/2) sandy gravel, some silt, fine to coarse sand, gravel to 2 inches, subangular to rounded clasts.
▽10				Seal: 1/4" Bentonite chips				10.0 to 12.0' - Moderate yellow brown (10YR 5/4) some orange staining, sandy gravel, some silt, fine to coarse sand, gravel to 2 inches, subangular to rounded clasts.
				Filter Pack: 10/20 Colorado Silica sand			ML	12.0 to 12.5' - Fine sandy silt, some clay.
							GP	12.5 to 21.0' - Sandy gravel, some silt, fine gravel, cobbles to 3 inches, wet to saturated at 13.0'.
15				Screen: PVC, 2", slot size 0.01				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.99	15:23	05/19/93
▽			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P018

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP	21.0 to 22.5' - Moderate yellow brown (10YR 5/4) sandy gravel, trace silt (~10%), coarse sand, gravel to 1 inch, medium sorting. 22.5 to 23.0' - Sandy gravel and fine gravel, ~30% silt and clay, wet. 23.0 to 26.0' - Dark yellow brown (10YR 4/2) sandy gravel, trace silt, coarse sand, fine gravel, trace gravel to 2", wet.
25				Backfill: Collapsed borehole material			SW	26.0 to 28.0' - Sand, trace fine gravel, medium to coarse sand, well sorted, moist.
30							GP	28.0 to 34.0' - Dark yellowish brown (10YR 4/2) sandy gravel, trace silt, medium to coarse sand, trace gravel to 4 inches, poor sorting.
35							SP	34.0 to 57.0' - Dark yellowish brown (10YR 4/2) gravelly sand, trace silt, medium to coarse sand, trace gravel to 2 inches, wet.
40				Backfill: 1/4" Bentonite chips				
45								

GROUNDWATER

DEPTH	HOUR	DATE
9.99	15:23	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 7

Borehole/Well Id P018

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
55								
60							GP	57.0 to 61.0' - Dark yellow brown (10YR 4/2) sandy gravel, trace silt, coarse sand, fine gravel, some cobbles to 4 inches. 61.0 to 63.0' - Dark yellow brown (10YR 4/2) sandy gravel, some silt, coarse sand, fine gravel cobbles to 3 inches.
65							TI	63.0 to 64.2' - Moderate yellow brown (10YR 4/2) sandy silt, fine sand, soft, slight plastic, moist. 64.2 to 66.0' - Dark medium gray (N4) sandy silt, trace gravel, fine sand, subangular gravel to 2 inches, firm, moderate plasticity, moist. Sandy till. 66.0 to 75.0' - Dark medium gray (N4) sand and gravel, subangular to subrounded gravel to 4 inches, some silt, trace clay, firm, cohesive, moist. Sand to gravelly till.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.99	15:23	05/19/93
▽			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 7

Borehole/Well Id P018

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75							TI	75.0 to 83.0' - Sandy silt, fine gravel, trace gravel to 2", fine sand, very firm, crumbly, slightly moist to dry. Till.
80				Backfill: Collapsed borehole material				83.0 to 85.0' - Sandy silt, trace fine gravel, trace gravel to 3", trace wood fragments (66.0 to 85.0'), fine sand, very firm, crumbly, moist to dry. Till.
85							GP	85.0 to 98.0' - Pale yellow brown (10YR 6/2) sandy gravel, some silt ~20 to 30%, some cobbles to 3", coarse sand, wet.
90								
95							GP	98.0 to 101.0' - Sandy gravel, trace fines, coarse sand, fine gravel, wet.

GROUNDWATER

DEPTH	HOUR	DATE
9.99	15:23	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P018

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100				Backfill: Collapsed borehole material				
							ML	101.0 to 103.5' - Moderate olive brown (5Y 4/4) to light olive gray (5Y 5/2) sandy silt, fine to very fine sand, well sorted, soft, moist.
							GP	103.5 to 105.0' - Sandy gravel, trace silt, coarse sand, fine gravel, cobbles to 2", well rounded clasts.
105							SW	105.0 to 112.0' - Olive gray (5Y 3/2) sand, trace silt, medium coarse sand, well sorted.
110								
							GP	112.0 to 116.0' - Sandy gravel, coarse sand, fine gravel, cobbles to 3".
115								
							SW	116.0 to 118.0' - Sand, fine to medium, well sorted.
							SP	118.0 to 126.0' - Sand some silt, very fine to fine sand, good sorting, trace wood fragments ~123.0', increase in silt and clay from 122.0 to 124.0'.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.99	15:23	05/19/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 7

Borehole/Well Id P018

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Backfill: Collapsed borehole material			GP	126.0 to 148.0' - Sandy gravel, trace cobbles to 3", subrounded, coarse sand, fine gravel.
130								
135								
140								
145								
							CL	148.0 to 155.0' - Grayish olive (10Y 4/2) clay, fossiliferous at 150.0' hard, crumbly, slightly moist first 2 inches only. Weathered bedrock.
150								

GROUNDWATER

DEPTH	HOUR	DATE
9.99	15:23	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 7

Borehole/Well Id P018

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Backfill: Collapsed borehole material				
155							ST\LS	155.0 to 160.0'- Medium dark gray siltstone with limestone layers 1 to 2 inches thick, limestone has abundant fossils.
160								Total Depth = 160.0'.
165								
170								
175								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	9.99	15:23	05/19/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P019
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597930.12
Date Started	3/1/93	East (ft)	1493017.44
Date Completed	3/1/93	Ground Surface Elev. (ft)	690.47
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	690.31
Checked By	PAUL DARR	Total Depth (ft)	11.0

Comments: Approximately 40 to 50 ft. west of north/south road that parallels west side of Great Miami River.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 1.7' - Dusky yellow brown (10YR 2/2) sand, fine grained, trace silt, trace clay, trace roots. Topsoil.
				Backfill: Cement - Bentonite grout				
				Seal: 1/4" Bentonite chips			SM	1.7 to 5.8' - Dark yellow brown (10YR 4/2) silty sand, very fine grained sand, trace clay, few fine to medium grains, scattered root fragments, damp.
5				Filter Pack: 20/40 Colorado Silica sand				
				Screen: PVC, 2", slot size 0.01			SP	5.8 to 8.0' - Dark yellow brown (10YR 4/2) sand, fine to medium grained, well sorted, very soft, wet at 6.0', saturated at 6.5'.
10							GM/GP	8.0 to 11.0' - Dark yellow brown (10YR 4/2) silty sandy gravel, loose, ~50% fine to coarse gravel, ~35% very fine to very coarse sand, ~15% silt, saturated.
								Total Depth = 11.0'.
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE
7.00	14:32	03/01/93
7.05	12:52	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P020
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	NONE	North (ft)	597151.54
Date Started	2/4/93	East (ft)	1492952.37
Date Completed	2/4/93	Ground Surface Elev. (ft)	691.26
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	690.86
Checked By	PAUL DARR	Total Depth (ft)	15.0
Comments:	West side of river, across from plant.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 4.5' - Dark brown silty sand, little fine to coarse gravel, loose, organic rich, damp. Topsoil.
				Backfill: Cement - Bentonite grout				
5				Seal: 1/4" Bentonite chips			ML	4.5 to 5.0' - Dark brown clayey silt, little fine sand, soft, low plasticity, moist.
				Filter Pack: 10/20 Colorado Silica sand				5.0 to 8.5' - Dark brown clayey silt, little fine sand, soft, low plasticity, moist.
				Screen: PVC, 2", slot size 0.01				8.5 to 9.5' - Brown clayey silt, little fine sand, soft, moist.
10							SP	9.5 to 10.0' - Gravelly sand, fine to coarse, little clay, little silt, moist to wet. 10.0 to 15.0' - Gravelly sand, fine to coarse, trace clay, little silt, saturated.
				Backfill: Collapsed borehole material				
15								Total Depth = 15.0'.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	6.87	11:30	02/05/93
▼	7.77	12:56	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P021
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597693.93
Date Started	1/21/93	East (ft)	1496001.61
Date Completed	1/21/93	Ground Surface Elev. (ft)	745.43
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	747.51
Checked By	PAUL DARR	Total Depth (ft)	33.0
Comments:	Approximately 10 ft. north of building 43.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 2.5' - Sandy gravel, fine to very coarse sand, subangular to angular gravel, loose, dry. Fill.
5				Backfill: Cement - Bentonite grout			CL	2.5 to 5.0' - Grayish brown sandy clay, fine to coarse sand, fine to coarse gravel, high plasticity, slight petroleum odor, trace black vitreous slag like material, moist.
								7.5 to 8.5' - Grayish brown sandy clay, fine to coarse sand, fine to coarse gravel, high plasticity, slight petroleum odor, trace black vitreous slag like material, moist.
10							TI	8.5 to 10.0' - Brownish gray silty clay, some fine sand, unsorted, hard, dense, large limestone clast in bottom 12 inches, fine sand lense at 10.5 feet, dry. Till.
								10.0 to 15.0' - Brownish gray silty clay, some fine sandy, unsorted, hard, dense, little fine gravel, no limestone, dry. Till.
15								15.0 to 20.0' - Dark brown silty clay, little silt, some fine sand, little fine gravel, unsorted, hard, dry. Till.
20								

GROUNDWATER

DEPTH	HOUR	DATE
11.78	13:30	01/24/93
16.93	17:13	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P021

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							TI	20.0 to 23.0' - Dark brown silty clay, little silt, some fine gravel, little fine gravel, moderately weathered, intermixed layers of gray siltstone and limestone, dry. Till.
				Seal: 1/4" Bentonite chips			ST	23.0 to 25.0' - Gray siltstone, dry. Bedrock.
25				Filter Pack: 10/20 Colorado Silica sand			SH	25.0 to 33.0' - Silty shale, dry. Bedrock.
				Screen: PVC, 2", slot # 10				
30				Backfill: Collapsed borehole material				
								Total Depth = 33.0'.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	11.78	13:30	01/24/93
▼	16.93	17:13	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P022
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597536.53
Date Started	1/11/93	East (ft)	1495316.65
Date Completed	1/12/93	Ground Surface Elev. (ft)	730.66
Logged By	TIM FRINAK	Top of Casing Elev. (ft)	730.69
Checked By	PAUL DARR	Total Depth (ft)	70.0
Comments:	Approximately 8 ft. north of P023 at Treatment Plant facility.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.7' - Gray silty clay with gravel. Fill. 0.7 to 1.6' - Dark brown (7.5YR 3/2) silty clay. Fill. 1.6 to 5.0' - Very dark gray (10YR 3/1) to brown clayey silt, ~5% gravel and debris. Fill.
				Backfill: Cement - Bentonite grout				
5								5.0 to 7.6' - Very dark gray silty sand, very fine grained, 65% sand, 30% silt/clay, <5% gravel, damp. Fill.
								7.6 to 10.0' - Light brownish gray to brown silty sand, very fine grained, 15% gravels, max 1.7 inches, average ~ 1/2 inch, 60% sand, 25% silt/clay, damp. Fill.
10								
15								15.0 to 16.2' - Streaked dark gray (10YR 4/1) to brown (10YR 5/6) silty sand, 15% gravel, contains black material (asphalt and wood debris) may be alluvial channel deposits. Fill.
							TI	16.2 to 40.0' - Dark brown (10YR 3/3) silty sand, very fine to coarse grained, competent, ~ 15 to 25% gravel, ~15% silt/clay, dry. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	46.39	13:50	01/24/93
▽	48.05	17:10	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 3

Borehole/Well Id P022

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25								
30								
35								
40							TI	40.0 to 41.2' - Gray silty sand to very fine sand, very fine to coarse grained, competent, ~15 to 25% gravel, ~15% silt/clay, dry. Till. 41.2 to 42.0' - Yellowish brown (10YR 5/6) silty sand to very fine grained sand, iron oxide cementation, dry. Till.
							GP	42.0 to 43.6' - Yellow brown sandy gravel, gravel ~ 60% max 3 inch average ~1/2 inch, matrix is 60% fine to very fine grained sand, 25% medium to coarse grained sand, 15% silt/clay, damp. Outwash.
45							ST	43.6 to 45.5' - Gray (25YR 5/1) calcareous siltstone, thin interbeds of silty, very fine grained sandstone, dry. Bedrock.
							NR	45.5 to 55.0' - No recovery.

GROUNDWATER

DEPTH	HOUR	DATE
46.39	13:50	01/24/93
48.05	17:10	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P022

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							NR	45.5 to 55.0' - No recovery.
50								
				Seal: 1/4" Bentonite chips				
55							ST-SH	55.0 to 60.0' - Predominantly calcareous siltstone with interbeds of shale, some limestone rubble. Bedrock.
				Filter Pack: 20/40 Colorado Silica sand				
60							ST-LS	60.0 to 70.0' - Calcareous siltstone with occasional interbeds of limestone, siltstone contains shaley interbeds/laminae.
				Screen: PVC, 2", slot size 0.01				
65								
70								Total Depth = 70.0'.

GROUNDWATER

DEPTH	HOUR	DATE
46.39	13:50	01/24/93
48.05	17:10	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P023
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597529.54
Date Started	1/7/93	East (ft)	1495319.45
Date Completed	1/18/93	Ground Surface Elev. (ft)	730.39
Logged By	ERIC LARSEN	Top of Casing Elev. (ft)	730.41
Checked By	PAUL DARR	Total Depth (ft)	47.0

Comments: Piezometer located approximately 60 ft. northeast of sewage treatment facility along eastern edge of parking lot.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.7' - Gray silty clay with gravel. Fill.
								0.7 to 1.6' - Dark brown (7.5YR 3/2) silty clay. Fill.
								1.6 to 5.0' - Very dark gray (10YR 3/1) to brown clayey silt, ~5% gravel and debris. Fill.
				Backfill: Cement - bentonite grout				
5								5.0 to 7.6' - Very dark gray silty sand, very fine grained, 65% sand, 30% silt/clay, <5% gravel, damp. Fill.
								7.6 to 10.0' - Light brownish gray to brown silty sand, very fine grained, 15% gravels, max 1.7 inches, average ~ 1/2 inch, 60% sand, 25% silt/clay, damp. Fill.
10								
15								15.0 to 16.2' - Streaked dark gray (10YR 4/1) to brown (10YR 5/6) silty sand, 15% gravel, contains black material (asphalt and wood debris) may be alluvial channel deposits. Fill.
							TI	16.2 to 40.0' - Dark brown (10YR 3/3) silty sand, very fine to coarse grained, competent, ~ 15 to 25% gravel, ~15% silt/clay, dry. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	46.39	13:50	01/24/93
▼	44.11	17:09	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P023

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25								
30								
35							TI	35.0 to 41.2' - Dark brown (10YR 3/3) silty sand, very fine to coarse grained, competent, ~ 15 to 25% gravel, ~15% silt/clay, dry. Till.
				Seal: 1/4" Bentonite chips				
40				Filter Pack: 10/20 Colorado silica sand				40.0 to 41.2' - Gray silty sand very fine sand, very fine to coarse grained, competent, ~15 to 25% gravel, ~15% silt/clay, dry. Till. 41.2 to 42.0' - Yellowish brown (10YR 5/6) silty sand to very fine grained sand, iron oxide cementation, dry. Till.
				Screen: PVC, 2", slot # 10			GP	42.0 to 43.6' - Yellow brown sandy gravel, gravel ~ 60% max 3 inch average ~1/2 inch, matrix is 60% fine to very fine grained sand, 25% medium to coarse grained sand, 15% silt/clay, damp. Outwash.
45							ST	43.6 to 45.5' - Gray (25YR 5/1) calcareous siltstone, thin interbeds of silty, very fine grained sandstone, dry. Bedrock.
							NR	5.5 to 55.0' - No recovery.

GROUNDWATER

DEPTH	HOUR	DATE
46.39	13:50	01/24/93
44.11	17:09	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id P023

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								Total Depth = 47.0'.
50								
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	46.39	13:50	01/24/93
▼	44.11	17:09	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P024
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597162.02
Date Started	1/21/93	East (ft)	1495644.22
Date Completed	1/22/93	Ground Surface Elev. (ft)	741.60
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	744.18
Checked By	PAUL DARR	Total Depth (ft)	43.0
Comments:	Just north of building 87.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 3.0' - Brown sandy gravel, fine to very coarse gravel, fine to medium sand, loose, dry. Fill.
5				Backfill: Cement - bentonite grout			CL	3.0 to 5.0' - Brown silty clay, some fine to medium sand, some large rocks, low plasticity, dry. Native soil. 5.0 to 6.0' - Brown silty clay, some organic matter. 6.0 to 9.0' - Dark brown silty clay, trace sand, moist.
10							TI	9.0 to 10.0' - Yellow brown sandy silt and clay, little fines to coarse gravel, poorly sorted, moderate to high plasticity, dry. Till. 10.0 to 13.0' - Brown sandy silty clay, little fine to coarse gravel, poorly sorted, moderate to high plasticity, dry. Till. 13.0 to 15.0' - Gray sandy silty clay, little fine to coarse gravel, poorly sorted, moderate to high plasticity, trace of fine sand lenses throughout, dry. Till. 15.0 to 20.0' - Gray sandy clay, some silt, little gravel, dense. Till.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.75	13:40	01/24/93
▼	12.42	16:34	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P024

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							TI	20.0 to 25.0' - Brown sandy clay, some silt, little gravel, dense, dry. Till.
25								
30				Seal: 1/4" Bentonite chips				
				Filter Pack: 10/20 Colorado silica sand				
35				Screen: PVC, 2", slot # 10			LS	35.0 to 40.0' - Gray limestone, highly weathered and fractured, some clay soft, dry between fractures, fractures wet. Limestone bedrock.
40				Backfill: Collapsed borehole material				42.0 to 43.0' - Gray limestone, highly weathered and fractured, some clay soft, dry between fractures, fractures wet. Harder and dryer than above. Limestone bedrock.
								Total Depth = 43.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.75	13:40	01/24/93
▼	12.42	16:34	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P025
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596238.43
Date Started	2/2/93	East (ft)	1494979.56
Date Completed	2/2/93	Ground Surface Elev. (ft)	703.77
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	703.77
Checked By	PAUL DARR	Total Depth (ft)	25.0
Comments:	East access road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.5' - Sandy gravel, loose, fresh, dry. Fill.
							SC	0.5 to 4.5' - Dark brown clayey sand, organic rich, little silt, little fine gravel, moist.
				Backfill: Cement - bentonite grout				
5							GP	4.5 to 5.0' - Sandy gravel, little silt, loose, slight petroleum odor, angular to subrounded, dry. 5.0 to 10.0' - Sandy gravel, little silt, loose, slight petroleum odor, angular to subrounded, dry.
10	A	GC	0011					10.0 to 11.0' - Sandy gravel, loose, little silt, slight petroleum odor, angular to subrounded, dry.
							TI	11.0 to 14.0' - Sandy clay, trace gravel, some silt, firm, dry. Till.
15				Seal: 1/4" Bentonite chips			GP	14.0 to 15.0' - Sandy gravel, some silt, fine to coarse, loose, subangular to subrounded, petroleum odor, damp. 15.0 to 20.0' - Sandy gravel, some silt, large pieces of limestone, fine to coarse, loose, subangular to subrounded, petroleum odor, damp.
				Filter Pack: 10/20 Colorado silica sand				
20				Screen: PVC, 2", slot				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	21.38	08:55	02/06/93
▽	22.18	09:14	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P025

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				size 0.01'			GP	20.0 to 25.0' - Sandy gravel, some silt, large pieces of limestone, fine to coarse, subangular to subrounded, loose, petroleum odor, wet.
				Backfill: Collapsed borehole material				
25								Total depth = 25.0'.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	21.38	08:55	02/06/93
▼	22.18	09:14	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 6

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P026
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597182.81
Date Started	4/19/93	East (ft)	1494719.96
Date Completed	4/21/93	Ground Surface Elev. (ft)	705.87
Logged By	DALE FLORES	Top of Casing Elev. (ft)	705.63
Checked By	PAUL DARR	Total Depth (ft)	150.0

Comments: Borehole drilled to interpert bedrock conditions in area. Borehole completed as piezometer. On west access road, near pump house.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.5' - Asphalt and road gravel. Fill.
							ML	0.5 to 9.5' - Dark yellowish brown (10YR 5/4) to gray brown (5YR 3/2) sandy, clayey silt, trace of roots 0.5 to 5.0', stiff, non to slightly plastic, moist to slightly moist. Native soil.
5				Backfill: Cement - bentonite grout				
								9.5 to 10.0' - Transition from sandy silt and clay to sandy gravel at 10.0'.
10							GM-GP	10.0 to 23.0' - Moderate yellowish brown (10YR 5/4) silty, sandy gravel with ~25% silt, fine to medium sand, subrounded gravels to 2".
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	12:00	04/19/93
▼	22.97	14:08	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P026

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Backfill: Cement - Bentonite grout				
							SP	23.0 to 26.0' - Moderate Yellowish brown (10YR 5/4) medium sand, well sorted, saturated, water table at ~23.0'.
25							GM-GP	26.0 to 31.5' - Moderate yellowish brown (10YR 5/4) silty sandy gravel, matrix of coarse sand and silt, gravel up to 2", saturated. Outwash.
30							SP	31.5 to 33.0' - Moderate yellowish brown (10YR 5/4) gravelly sand, trace fines, sand moderately well sorted, saturated.
							SM-SP	33.0 to 36.0' - Moderate yellowish brown (10YR 5/4) silty, gravelly sand, matrix of coarse sand and silt, gravel up to 2", saturated. Outwash.
35							ML-SP	36.0 to 48.5' - Moderate yellowish brown (10YR 5/4) coarse sand and silt.
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
23.00	12:00	04/19/93
22.97	14:08	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P026

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50							TI	48.5 to 65.0' - Variegated coloring from moderate yellowish brown (10YR 5/4) to medium gray (N5) silty clay with some gravel, very dense, dry. Till. From 55.0 to 65.0' more clay in till, color change to dark greenish gray (5GY 4/1), ~ 5 - 10% angular gravel.
55								
60								
65								65.0 to 66.5' - Till, as above with more sand and gravel in matrix.
70							GM	66.5 to 72.0' - Light olive gray (5Y 6/1) silty sandy gravel, gravel to 4", saturated. Outwash.
							TI	72.0 to 76.5' - Light olive gray (5Y 6/1) silty clay with ~25% gravel and 10 - 20% fine to medium sand, dense. Sandy and gravelly till.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	12:00	04/19/93
▼	22.97	14:08	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P026

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75				Seal: 1/4" Bentonite chips Filter Pack: 10/20 Colorado silica sand			TI	
80				Screen: PVC, 2", slot # 10			SP-GP	76.5 to 83.5' - Moderate yellowish brown (10YR 5/4) coarse sand and medium gravel, saturated.
85				Backfill: 1/4" Bentonite pellets			TI	83.5 to 86.0' - Moderate yellowish brown (10YR 5/4) silty clay with ~5% angular gravel and 10 to 20% fine to medium sand, dense. Till. 86.0 to 132.5' - Light olive gray (5Y 4/1) silty clay with 5 - 10% angular gravel, very dense, dry to slightly moist. Till.
90								
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	12:00	04/19/93
▼	22.97	14:08	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 6

Borehole/Well Id P026

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100							TI	
105								
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	12:00	04/19/93
▼	22.97	14:08	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 6

Borehole/Well Id P026

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
130							TI	
							SP	132.5 to 135.0' - Olive gray (5Y 4/1) fine grained sand, no gravel, trace silt, well sorted, slightly cohesive, wet.
135							TI	135.0 to 140.9' - Olive gray (5Y 4/1) to medium gray (N5) fine sand and silt with trace angular medium gravel, moderately cohesive, slightly moist, to moist. Sandy till.
140							SH-LS	140.9 to 150.0' - Medium gray (N5) shale with thin interbeds of fossiliferous limestone. Bedrock.
145								
150								Total Depth = 150.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	23.00	12:00	04/19/93
▼	22.97	14:08	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P027
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596249.25
Date Started	1/9/93	East (ft)	1495078.43
Date Completed	1/9/93	Ground Surface Elev. (ft)	703.39
Logged By	DALE FLORES	Top of Casing Elev. (ft)	705.72
Checked By	PAUL DARR	Total Depth (ft)	40.0
Comments:	South of Area B landfill.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 1.5' - Brown gravelly clay, root structures. Topsoil.
							FL	1.5 to 5.0' - Dark brown to olive brown gravelly clay, fine to coarse gravels, dense, moist. Fill.
				Backfill: Cement - bentonite grout				
5							CL	5.0 to 6.5' - Greenish brown clay, trace gravel, root structures, probable buried soil horizon.
							GP	6.5 to 15.0' - Light brown sandy gravel, trace clay, rounded, poorly sorted. Outwash.
10								
15								15.0 to 17.0' - Light brown sandy gravel, trace silt, pieces of angular limestone, rounded, poorly sorted. Outwash.
							TI	17.0 to 20.0' - Yellowish brown silty clay, fine to coarse sand, gravel to 2", high plasticity, very stiff. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.30	09:55	02/06/93
▼	24.71	09:57	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P027

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							SP	20.0 to 25.0' - Brown to yellowish brown gravelly sand, fine to coarse sand, gravel to 2", trace cobble, trace clay, moist to wet.
25				Seal: 1/4" Bentonite chips			SP	25.0 to 27.0' - Brown sand, fine to medium sand with trace gravel and cobbles, saturated zone.
				Filter Pack: 10/20 Colorado silica sand			SP	27.0 to 28.0' - Yellowish brown gravelly sand, gravel to 3", fine to coarse sand, fine and coarse gravel, saturated, major water bearing zone.
							SP	28.0 to 30.0' - Brown sand, fine to medium sand with occasional gravel and cobbles, saturated zone.
30				Screen: PVC, 2", slot # 10			ML	30.0 to 32.0' - Brown silt, some clay, fine grained sand, very stiff has 2" medium grained sand zone within unit, major water bearing zone.
							ML	32.0 to 33.0' - Gray sandy silt with organics, trace clay. 33.0 to 34.0' - Yellowish brown sandy silt with organics, trace clay.
35				Backfill: Collapsed borehole material			SP	34.0 to 35.0' - Light brown gravelly sand, fine to coarse sand, fine to coarse gravel, gravel to 3 inches, saturated.
40								Total Depth = 40.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	22.30	09:55	02/06/93
▼	24.71	09:57	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P028
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596075.26
Date Started	2/2/93	East (ft)	1494969.93
Date Completed	2/2/93	Ground Surface Elev. (ft)	709.72
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	711.98
Checked By	PAUL DARR	Total Depth (ft)	30.0
Comments:	East access road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 1.0' - Tan sandy gravel, angular to subangular, loose, dry. Fresh fill.
							CL	1.0 to 2.0' - Gray clay, trace silt and gravel, some black asphalt like substance, firm, moderate plasticity.
							SC	2.0 to 4.0' - Brown clayey sand, trace silt, trace organics, firm, dry.
5				Backfill: Cement - bentonite grout			GP	4.0 to 8.0' - Dark gray sandy gravel, loose, dry.
							CL	8.0 to 9.0' - Brown sandy clay, dense, hard, dry.
10							GP	9.0 to 19.5' - Loose sandy gravel, some silt, angular to subrounded, slight petroleum odor, dry.
15								
20				Seal: 1/4" Bentonite chips				

GROUNDWATER

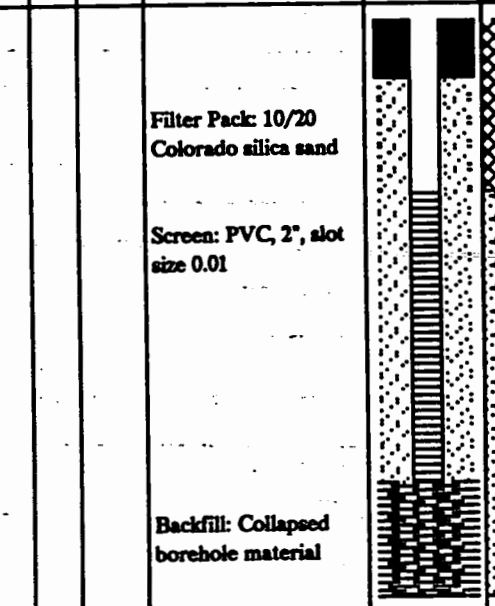
	DEPTH	HOUR	DATE
▽	28.32	16:45	02/02/93
▼	30.00	09:12	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P028

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Filter Pack: 10/20 Colorado silica sand			TI	19.5 to 21.0' - Brown silty clay, some fine to medium sand, trace gravel, moderate plasticity, dry. Till. 21.0 to 23.0' - Gray silty clay.
25				Screen: PVC, 2", slot size 0.01			SP	23.0 to 30.0' - Brown gravelly sand, trace clay and silt, sand and gravel are fine to coarse, gravel is mostly limestone, moist.
30				Backfill: Collapsed borehole material				Total Depth = 30.0'.
35								
40								
45								



GROUNDWATER

	DEPTH	HOUR	DATE
▽	28.32	16:45	02/02/93
▼	30.00	09:12	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P029
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595915.09
Date Started	3/6/93	East (ft)	1494820.62
Date Completed	3/6/93	Ground Surface Elev. (ft)	701.65
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	703.75
Checked By	PAUL DARR	Total Depth (ft)	28.0
Comments:	At end of west access road, by P030.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 2.0' - Grayish orange (10YR 7/4) gravel, fine grained. Road fill.
								2.0 to 5.0' - Dusky yellowish brown (10YR 2/2) sandy silt, some organic matter and roots, trace pebbles, fine gravel, fine sand, medium plasticity, moist.
				Backfill: Cement - bentonite grout				
5								5.0 to 6.0' - Dark yellowish brown (10YR 4/2) sandy silt, some organics matter and roots, trace pebbles, fine gravel, fine sand, medium plasticity, moist. 6.0 to 11.0' - Moderate yellow brown (10YR 5/4) gravelly sand, ~10% silt, coarse sand, gravels to 3", poorly sorted, dry to moist.
10								11.0 to 12.0' - Moderate yellow brown (10YR 5/4) sandy gravel, fine and coarse sand, moderate sorting, moist. 12.0 to 14.0' - Moderate yellow brown (10YR 5/4) coarse sand with trace rounded fine gravel, moderately sorted, moist.
								14.0 to 16.0' - Dark yellowish orange (10YR 6/6) sandy gravel, coarse sand, trace cobbles in silty/fine sand matrix.
15								16.0 to 18.0' - Dark yellowish orange (10YR 6/6) sand, some silt, fine to coarse sand, moderate sorting, large cobble clasts at interface with 18.0 to 22.0' unit, moist.
				Seal: 1/4" Bentonite chips			SM	18.0 to 22.0' - Dark yellowish orange (10YR 6/6) silty sand, ~ 10% fine gravel, fine sands, moderate plasticity, moderately cohesive, moist.
20								

GROUNDWATER

DEPTH	HOUR	DATE
18.11		03/21/93
22.11	14:00	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P029

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Filter Pack: 10/20 Colorado silica sand			SM	22.0 to 23.0' - Dark yellowish orange (10YR 6/6) silty sand, ~ 10% fine gravel, fine sands, cobbles to 4 - 5 inches, moderate plasticity, moderately cohesive, moist.
25				Screen: PVC, 2", slot size 0.01			SP	23.0 to 28.0' - Gravelly sand, ~10% silt, some subangular clasts, wet to saturated. Outwash.
30								Total Depth = 28.0'.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.11		03/21/93
▼	22.11	14:00	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P030
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595909.84
Date Started	2/9/93	East (ft)	1494821.45
Date Completed	2/17/93	Ground Surface Elev. (ft)	701.65
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	703.93
Checked By	PAUL DARR	Total Depth (ft)	176.0
Comments:	West access road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 1.0' - Pale yellowish brown (10YR 6/2) sandy gravel, loose, dry. Fill. 1.0 to 3.5' - Dusty yellowish brown (10YR 2/3) clayey silt, trace fine sand, trace fine gravel, highly organic, moist. Fill.
				Backfill: Cement - bentonite grout				3.5 to 5.0' - Dark yellowish brown (10YR 4/2) silty clay, mottled, damp, low plasticity, some rotting wood at top. Fill.
5								5.0 to 10.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, some silt, subrounded, loose, petroleum odor, some broken pieces, dry. Fill.
10								10.0 to 15.0' - Dark yellowish to moderate brown sandy gravel, some silt, loose, subrounded, petroleum odor, some broken pieces, dry. Fill.
15								
							GP	17.0 to 18.0' - Light brown sandy gravel, fine to coarse sand, wet. 18.0 to 20.0' - Dark yellowish brown (10YR 4/2) sandy gravel, fine to very coarse sand, fine to medium gravel, subrounded, saturated, four inch seam of very coarse gravel in middle at 19 ft. Outwash.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▼	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P030

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP	20.0 to 33.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, trace clay, fine to coarse sand, loose, sand and gravel are subangular to subrounded, saturated. Outwash.
25								
30								
							CL	33.0' - Light olive gray (5YR 6/1) clay seam, some sand and fine gravel, poorly sorted, firm, low plasticity.
35							GP	34.0 to 40.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, trace clay, fine to coarse sand, loose, sand and gravel are subangular to subrounded, saturated. Outwash.
40								40.0 to 45.0' - Moderate yellowish brown (10YR 5/4) sandy gravel, trace clay, fine to coarse sand, fine gravel, sand and gravel are subangular to subrounded, loose, poorly sorted, low plasticity, saturated. Outwash.
45							SP	45.0 to 55.0' - Sand, fine to coarse, loose, saturated. Till seam at 47.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▼	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P030

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							TI	Till.
50								
55							SP	55.0 to 77.0' - Sand, fine to coarse, loose, saturated.
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▼	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 7

Borehole/Well Id P030

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
							SC	77.0 to 78.0' - Clayey sand, alternating moderate yellowish brown (10YR 5/4) and medium dark gray (N4) some fine to coarse gravel, hard, stiff.
				Seal: 1/4" Bentonite chips			SP	78.0 to 84.0' - Moderate yellowish brown (10YR 5/4) sand and gravel, trace silt, trace clay, subrounded, saturated. Outwash.
80				Filter Pack: 10/20 Colorado silica sand				
				Screen: PVC, 2", slot size 0.01				84.0 to 85.0' - Moderate yellowish gray gravelly sand, trace silt, medium dense, dry.
85								85.0 to 105.0' - Medium dark gray (N4) gravelly sand, trace silt, trace clay, subrounded, saturated. Outwash.
90				Backfill: Collapsed borehole material				
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▼	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 7

Borehole/Well Id P030

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105								
110								
115							SP	115.0 to 120.0' - Medium dark gray (N4) gravelly sand, trace silt, trace clay, fine sands, fine to medium gravel, subrounded, saturated. Outwash.
120							SP	120.0 to 129.0' - Medium dark gray (N4) sand, trace gravel, fine sand, fine to coarse gravel, saturated.
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▽	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 7

Borehole/Well Id P030

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
130							SP	129.0 to 133.0' - Medium dark gray (N4) sand, trace clay and gravel, fine to coarse sand, fine gravel, saturated.
135, 140							SP	133.0 to 145.0' - Medium dark gray (N4) gravelly sand, poorly sorted, gravel is subangular to subrounded, till like but not as stiff and dense, damp to dry.
145							SP	145.0 to 149.0' - Sand, fine, wet.
							GP	149.0 to 150.0' - Sandy gravel, fine to coarse sand, fine to coarse gravel, poorly sorted, subrounded, wet.
150							SP	150.0 to 157.0' - Sand, some gravel, fine to coarse sand, fine gravel, loose, poorly sorted, wet.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▼	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 7

Borehole/Well Id P030

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
155								
160							SP	157.0 to 174.0' - Medium dark gray (N4) gravelly sand, poorly sorted, gravel is subangular to subrounded, till like, but not as stiff and dense, dry.
165								
170								
175							CS	174.0 to 176.0' - Gray claystone, weathered, dry. Bedrock.
								Total Depth = 176.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.41		03/21/93
▼	22.15	14:01	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P031
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596023.27
Date Started	1/9/93	East (ft)	1495119.06
Date Completed	1/11/93	Ground Surface Elev. (ft)	700.97
Logged By	DALE FLORES	Top of Casing Elev. (ft)	703.35
Checked By	PAUL DARR	Total Depth (ft)	35.0
Comments:	Near Mound Plant production wells.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 1.0' - Light brown to tan clay, trace gravel, good root structure, medium dense clay, moist. Topsoil.
							FL	1.0 to 5.0' - Dark brown silty clay, trace gravel, very dense, high plasticity. Fill.
				Backfill: Cement - bentonite grout				
5								5.0 to 6.0' - Silty sand, fine to medium grained sand 40 to 50% silt, moist. Fill. 6.0 to 7.0' - Light to dark brown silty clay, trace sand, trace root structure. Fill.
							GC	7.0 to 8.0' - Light brown to yellowish brown clayey gravel, trace sand, significant cobbles to 4".
							TI	8.0 to 9.0' - Yellow brown gravelly clay, moderate plasticity, angular to rounded. Till.
10							GP	9.0 to 16.0' - Sandy gravel, trace clay, gravel to cobble size, angular to rounded, 60% gravel, 30% coarse sand, 10% silty clay.
15								16.0 to 19.0' - Rust brown sandy gravel, trace clay, gravel to cobble size, angular to rounded, 60% gravel, 30% coarse sand, 10% silty clay.
							SP	19.0 to 22.0' - Light brown gravelly sand, coarse sand, fine gravel,
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.50	08:15	01/11/93
▼	22.22	09:32	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id P031

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Seal: 1/4" Bentonite chips				first water zone, saturated.
				Filter Pack: 10/20 Colorado silica sand			SM	22.0 to 24.0' - Light brown silty sand, well sorted, medium grained, saturated.
25				Screen: PVC, 2", slot # 10			GP	24.0 to 33.0' - Yellow brown sandy gravel, trace silt, trace cobbles, medium to coarse sand, fine gravel, 3" thick coarse gravel lense within unit.
30				Backfill: Collapsed borehole material				33.0 to 35.0' - Light brown sandy gravel, trace silt, gravels up to 3", poorly sorted, saturated.
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	18.50	08:15	01/11/93
▼	22.22	09:32	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P032
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595682.77
Date Started	2/1/93	East (ft)	1495043.91
Date Completed	2/1/93	Ground Surface Elev. (ft)	707.60
Logged By	DARLENE WILLIAMS	Top of Casing Elev. (ft)	709.55
Checked By	PAUL DARR	Total Depth (ft)	35.0
Comments:	East access road.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.7' - Dark brown sandy gravel, little silt. Fresh fill. 0.7 to 5.0' - Dark brown sandy gravel, trace silt, loose, trace organic material (wood) 4.8 to 5.0 ft., moist. Fill.
				Backfill: Cement - bentonite grout				
5								5.0 to 15.0' - Dark brown silty clay, some fine sand, organic rich, firm, moderate plasticity, dry to moist. Fill.
10								
15								15.0 to 20.0' - Brown sandy gravel, gravel is broken, angular, loose, poorly sorted, strong petroleum odor, dry. Fill.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.84	16:50	03/06/93
▼	27.64	09:10	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P032

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							FL	20.0 to 25.0' - Brown sandy gravel, gravel is broken, angular, loose, poorly sorted, slight petroleum odor, dry. Fill.
25				Seal: 1/4" Bentonite chips Filter Pack: 10/20 Colorado silica sand			TI	25.0 to 30.0' - Brown sandy clay, some silt, trace fine gravel, sand is fine to coarse, dense, firm, low plasticity, dry. Till.
30	A	GC	0030	Screen: PVC, 2", slot size 0.01 Backfill: Collapsed borehole material			GP	30.0 to 35.0' - Sandy gravel, sand and gravel are subrounded, poorly sorted, wet. Outwash.
35								Total Depth - 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	25.84	16:50	03/06/93
▼	27.64	09:10	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P033
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595763.48
Date Started	1/11/93	East (ft)	1495292.80
Date Completed	1/13/93	Ground Surface Elev. (ft)	701.73
Logged By	DALE FLORES	Top of Casing Elev. (ft)	704.20
Checked By	PAUL DARR	Total Depth (ft)	115.0
Comments:	300 ft. east of new access road on south property.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 8.0' - Dark brown silt, some fine sand, roots in upper 4 inches, trace of black organic particles, very dense, moist. Topsoil.
5				Backfill: Cement - bentonite grout				
							ML	8.0 to 9.0' - Light brown sandy silt, 30% fine sand.
10							GP	9.0 to 15.0' - Yellowish brown sandy gravel, trace silt, coarse to fine sand, mostly rounded gravel, but significant subangular to angular pieces, cobbles to 4", 50% gravel, 35% coarse sand, 15% silty clay.
15				Seal: 1/4" Bentonite chips				15.0 to 19.5' - Yellowish brown sandy gravel, trace silt, coarse to fine sand, mostly rounded gravel, but some subangular to angular pieces, cobbles to 4", angular pieces of limestone, 50% gravel, 35% coarse sand, 15% silty clay, first water.
				Filter Pack: 10/20 Colorado silica sand				
20							SP	

GROUNDWATER

DEPTH	HOUR	DATE
20.79		04/04/93
19.42		03/21/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P033

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							GP	19.5 to 20.0' - Sand lense, some cobbles, medium grained well sorted sand, cobbles to 2 inches.
								20.0 to 22.0' - Yellowish brown sandy gravel, trace silt, coarse to fine sand, mostly rounded gravel, but trace subangular to angular gravel to 4 inches, limestone clast to 6 inches, 50% gravel, 35% sand, 15% silty clay, saturated.
				Screen: PVC, 2", slot size 0.01			SP	22.0 to 26.0' - Brown sand, trace silt, well sorted, medium grained, wet but not saturated.
25							GP	26.0 to 26.4' - Yellow brown sandy gravel, trace silt, medium to coarse sand.
				Backfill: 1/4" Bentonie chips			TI	26.4 to 27.0' - Gray sandy gravel, medium to coarse sand.
								27.0 to 36.0' - Gray silty clay, some gravel, fine to coarse sand, fine gravel, hard, dense, crumbly, dry. Lower 6 inches rust brown, some green staining throughout. Till.
30								
35								36.0 to 39.5' - Dark gray gravelly clay, some medium sand, fine gravel, slightly moist. Till.
								39.5 to 40.0' - Yellowish brown gravelly clay, trace clay, trace sand (~10%), ~ 50% gravel, fine to coarse sand, hard, dense, crumbly, dry. Till.
40							SP	40.0 to 42.0' - Brown sand, trace gravel, 90% coarse sand, 10% gravel, little to no fines, saturated.
							SW	42.0 to 43.0' - Sand, trace gravel, fine to coarse sand, fine gravel, well graded.
							SM	43.0 to 43.5' - Light brown silty sand, well sorted, moist. Outwash.
							TI	43.5 to 45.5' - Yellow brown gray silty clay, some gravel, fine to coarse sand, fine gravel, hard, dense, slightly moist. Till. Color changes to gray at 43.9'.
45							SP	45.5 to 47.0' - Sand, medium to coarse sand, well sorted, moist.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.79		04/04/93
▼	19.42		03/21/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P033

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								Outwash.
							GP	47.0 to 48.0' - Gray brown sandy gravel, trace silt, coarse sand, gravel to 2 inches.
50							TI	48.0 to 57.0' - Gray silty clay, some gravel, fine to coarse sand, fine gravel, hard, dense, moist.
55							SP	57.0 to 57.5' - Gray 6" sand lense, coarse sand, 20% gravel, 65% coarse sand, 15% fines, saturated, water zone.
60							TI	57.5 to 73.5' - Gray silty clay, some gravel, fine to coarse sand, trace gravel, hard, dense, trace of fossils, wood particles, and limestone clasts, clasts to 3 inches, moist. Till.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.79		04/04/93
▽	19.42		03/21/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 5

Borehole/Well Id P033

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
							SP	73.5 to 74.5' - Sand, coarse, trace of pebble gravel, pebble gravel to 1 1/2", saturated.
75							TI	74.5 to 76.5' - Olive green silty clay, some gravel, fine to coarse sand, fine gravel, moist. Till.
							SP	76.5 to 77.0' - Sand, coarse, some gravel, gravel to 1 inch.
							GP	77.0 to 83.5' - Sandy gravel, trace silt, coarse sand, trace gravel to 3", gravel subangular to rounded, saturated. Outwash.
80								
							TI	83.5 to 84.0' - Till lense, very moist.
							GP	84.0 to 85.0' - Olive gray sandy gravel, trace silt, coarse sand, fine gravel, trace gravel to 3", gravel subangular to rounded. Outwash.
85							SP	85.0 to 103.0' - Brownish gray sand, trace to no fines, medium to coarse sand has lenses of coarser sand with fine to medium gravel, gravel to 1", very moist. Outwash.
90								
95								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.79		04/04/93
▽	19.42		03/21/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 5 of 5

Borehole/Well Id P033

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105							CL	103.0 to 107.0' - Olive green clay, weathered, very dense, stiff, has trace of angular limestone clasts, dry to moist.
110								107.0 to 115.0' - Olive green clay, highly weathered, very dense, stiff, some angular fossiliferous limestone, dry to moist.
115								Total Depth = 115.0'.
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	20.79		04/04/93
▽	19.42		03/21/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P034
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595669.77
Date Started	3/17/93	East (ft)	1494661.74
Date Completed	3/17/93	Ground Surface Elev. (ft)	691.22
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	691.00
Checked By	PAUL DARR	Total Depth (ft)	20.0

Comments: Near trailer park ~ 100 ft. west of Dayton - Cin. Pike Rd, ~1/2 mile south of Miamisburg city limits.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			FL	0.0 to 0.5' - Fine gravel and asphalt. Fill.
				Backfill: Cement - bentonite grout			SP	0.5 to 6.0' - Olive black (5Y 2/1) sand, 20% silt, ~ 10 to 15% clay, reddish brown staining present throughout, soft to firm, fine sand, moderate plasticity, slightly moist.
5							SM	6.0 to 8.0' - Moderate yellow brown (10YR 5/4) silty sand, some clay, trace fine gravel, soft, moist.
				Seal: 1/4" Bentonite chips			SP	8.0 to 12.0' - Gravelly sand, ~20% silt and clay, coarse sand, gravel to 2 inches, moist to slightly wet.
10				Filter Pack: 10/20 Colorado silica sand				12.0 to 18.0' - Gravelly sand, ~10% silt, gravels to 4", subangular to angular, very wet to saturated at 12 ft.
				Screen: PVC, 2", slot size 0.01				
15								
				Backfill: Collapsed borehole material			TI	18.0 to 20.0' - Moderate yellow brown (10YR 5/4) silty clay, some fine sand, trace gravel to 1", dense, firm, dry, color change to light olive gray (5Y 5/2) at 19.0'. Till.
20								Total Depth = 20.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	6.66		03/21/93
▼	8.85		05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P035
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597895.71
Date Started	3/2/93	East (ft)	1493480.31
Date Completed	3/2/93	Ground Surface Elev. (ft)	688.16
Logged By	ANDREW SPERRY	Top of Casing Elev. (ft)	688.05
Checked By	PAUL DARR	Total Depth (ft)	25.0

Comments: Northern piezometer cluster between bike path and river, west of Old Main Ave. / Cincinnati - Dayton Pike road.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 4.9' - Dark yellowish brown (10YR 5/4) clayey silty sand, moderately cohesive, fine sand, some silt and clay, moist. Topsoil.
				Backfill: Cement - bentonite grout				
5							SM	4.9 to 11.5' - Dark yellowish brown (10YR 5/4) silty sand, low cohesivness, moist to wet. Has 50% wood fragments mixed in sand. Alluvium.
10							CL	11.5 to 12.5' - Moderate yellowish brown (10YR 5/4) sandy silty clay, 50% clay, 50% sand and silt, moist. Native soil.
							SP	12.5 to 13.0'- Moderate yellow brown (10YR 5/4) sand, medium to coarse, good sorting, poorly graded, saturated.
15				Seal: 1/4" Bentonite chips			GP	13.0 to 20.0' - Moderately yellow brown (10YR 5/4) sandy gravel, medium to coarse sand, loose, 50% gravel subrounded to rounded, 50% medium to coarse sand, saturated. Alluvium.
				Filter Pack: 10/20 Colorado silica sand				
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	4.87	14:45	05/19/93
▼			

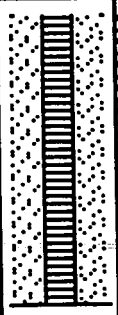
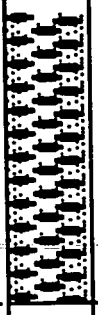
WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id P035

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Screen: PVC, 2", slot size 0.01			GP	20.0 to 30.0' - Medium dark gray (N4) gravels, little coarse sand, little to no fines, 5 to 10% coarse sand, gravel well rounded, gravels to 3", saturated. Alluvium.
25								Total Depth = 25.0'.
30								
35								
40								
45								

GROUNDWATER

DEPTH	HOUR	DATE
4.87	14:45	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P036
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597912.82
Date Started	3/19/93	East (ft)	1493479.50
Date Completed	3/19/93	Ground Surface Elev. (ft)	688.14
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	688.35
Checked By	PAUL DARR	Total Depth (ft)	60.0

Comments: Flood plain of G. Miami River access through MCD gate. Part of Piezometer cluster of 4. All four within ~10' of each other. Lithologic descriptions taken from P038 borehole log.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 4.9' - Dark yellowish brown (10YR 5/4) clayey silty sand, moderately cohesive, fine sand, some silt and clay, moist. Topsoil.
5				Backfill: Cement - bentonite grout			SM	4.9 to 11.5' - Dark yellowish brown (10YR 5/4) silty sand, low cohesivness, moist to wet. Has 50% wood fragments mixed in sand. Alluvium.
10							CL	11.5 to 12.5' - Moderate yellowish brown (10YR 5/4) sandy silty clay, 50% clay, 50% sand and silt, moist. Native soil.
							SP	12.5 to 13.0'- Moderate yellow brown (10YR 5/4) sand, medium to coarse, good sorting, poorly graded, saturated.
15							GP	13.0 to 20.0' - Moderately yellow brown (10YR 5/4) sandy gravel, medium to coarse sand, loose, 50% gravel subrounded to rounded, 50% medium to coarse sand, saturated. Alluvium.
20								

GROUNDWATER

DEPTH	HOUR	DATE
3.85		03/21/93
5.16	14:39	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 3

Borehole/Well Id P036

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								20.0 to 30.0' - Medium dark gray (N4) gravels, little coarse sand, little to no fines, 5 to 10% coarse sand, gravel well rounded, gravels to 3", saturated. Alluvium.
25								
30								30.0 to 31.0' - Moderately dark gray (N4) gravel, fine gravel, moderately well sorted, well rounded, saturated. Alluvium.
							SP	31.0 to 31.5' - Dusky yellow brown (10YR 2/2) sand, little to no fines, moist. Alluvium.
							GP-GM	32.0 to 35.0' - Yellowish brown (10YR 5/4) silty sandy gravel, coarse sand, 60% gravel subangular to subrounded, 30% coarse sand, 10% silt, poorly sorted, poorly graded, saturated. Outwash.
35							GP	35.0 to 51.0' - Moderate yellow brown (10YR 5/4) sandy gravels, fine to coarse sands, fine gravel little to no fines, limestone clasts, thin till like lense at 35.0'. Alluvium.
40				Seal: 1/4" Bentonite chips				
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	3.85		03/21/93
▼	5.16	14:39	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P036

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Filter Pack: 10/20 Colorado silica sand				
50				Screen: PVC, 2", slot size 0.01				51.0 to 55.0' - Medium gray (N5) sandy gravels, fine gravel, fine to coarse sands, little to no fines. Alluvium.
55				Backfill: Collapsed borehole material			GP-GM	55.0 to 57.0' - Olive gray (5Y 6/1) sandy silty gravel, medium coarse sand, limestone clasts, wet. Outwash.
							TI	57.0 to 58.0' - Olive gray (5Y 6/1) sandy silt, moderately cohesive, dry to slightly moist. Till.
							GM-GC	58.0 to 60.0' - Light olive gray (5Y 6/1) sandy silty clayey gravel, angular limestone clasts to 4", moist. Outwash.
60								Total Depth = 60.0'.
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	3.85		03/21/93
▼	5.16	14:39	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 4

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P037
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597905.00
Date Started	4/27/93	East (ft)	1493483.00
Date Completed	4/27/93	Ground Surface Elev. (ft)	688.43
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	688.28
Checked By	PAUL DARR	Total Depth (ft)	85.0

Comments: P037 is on east bank of G. Miami River just west of levee ~ 1 mile south of Linden Ave. bridge. Access through MCD gate.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 4.9' - Dark yellowish brown (10YR 5/4) clayey silty sand, moderately cohesive, fine sand, some silt and clay, moist. Topsoil.
				Backfill: Cement - bentonite grout				
5							SM	4.9 to 11.5' - Dark yellowish brown (10YR 5/4) silty sand, low cohesivness, moist to wet. Has 50% wood fragments mixed in sand. Alluvium.
10								
							CL	11.5 to 12.5' - Moderate yellowish brown (10YR 5/4) sandy silty clay, 50% clay, 50% sand and silt, moist. Native soil.
							SP	12.5 to 13.0'- Moderate yellow brown (10YR 5/4) sand, medium to coarse, good sorting, poorly graded, saturated.
15							GP	13.0 to 20.0' - Moderately yellow brown (10YR 5/4) sandy gravel, medium to coarse sand, loose, 50% gravel subrounded to rounded, 50% medium to coarse sand, saturated. Alluvium.
20								

GROUNDWATER

DEPTH	HOUR	DATE
5.28	19:41	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 4

Borehole/Well Id P037

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								20.0 to 30.0' - Medium dark gray (N4) gravels, little coarse sand, little to no fines, 5 to 10% coarse sand, gravel well rounded, gravels to 3", saturated. Alluvium.
25								
30								30.0 to 31.0' - Moderately dark gray (N4) gravel, fine gravel, moderately well sorted, well rounded, saturated. Alluvium.
							SP	31.0 to 31.5' - Dusky yellow brown (10YR 2/2) sand, little to no fines, moist. Alluvium.
							GP-GM	32.0 to 35.0' - Yellowish brown (10YR 5/4) silty sandy gravel, coarse sand, 60% gravel subangular to subrounded, 30% coarse sand, 10% silt, poorly sorted, poorly graded, saturated. Outwash.
35							GP	35.0 to 51.0' - Moderate yellow brown (10YR 5/4) sandy gravels, fine to coarse sands, fine gravel little to no fines, limestone clasts, thin till like lense at 35.0'. Alluvium.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.28	19:41	05/19/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P037

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								51.0 to 55.0' - Medium gray (N5) sandy gravels, fine gravel, fine to coarse sands, little to no fines. Alluvium.
55							GP-GM	55.0 to 57.0' - Olive gray (5Y 6/1) sandy silty gravel, medium coarse sand, limestone clasts, wet. Outwash.
							TI	57.0 to 58.0' - Olive gray (5Y 6/1) sandy silt, moderately cohesive, dry to slightly moist. Till.
							GM-GC	58.0 to 60.0' - Light olive gray (5Y 6/1) sandy silty clayey gravel, angular limestone clasts to 4", moist. Outwash.
60							GM-GC	60.0 to 65.0' - Light olive (5Y 5/2) clayey silty gravel, gravels angular to subrounded, fine sand, moist, becomes dryer from 64.0 to 65.0'.
65				Seal: 1/4" Bentonite chips			GM	65.0 to 66.0' - Medium olive brown (5Y 4/4) silty gravel, has blocky angular chunks of limestone. Outwash. 66.0 to 68.0' - Moderate yellow brown (10YR 5/4) silty gravel, 70% subrounded gravel, gravel to 1 1/2", 30% coarse sand and silt, trace clay, saturated. Outwash.
70							TI	68.0 to 75.5' - Medium gray (N5) to light olive gray (5Y 6/7) gravelly slightly clayey sandy silt, moderately dense, 40% gravels, gravels rounded, gravel to 2", angular limestone clasts to 2" moist, becomes dryer at 75.0'. Gravelly till.

GROUNDWATER

DEPTH	HOUR	DATE
5.28	19:41	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P037

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
				Filter Pack: 10/20 Colorado silica sand			GP	75.5 to 80.0' - Moderate yellow brown (10YR 5/4) sandy gravels, coarse sands to fine gravels, limestone cobbles to 4", saturated, Outwash.
80				Screen: PVC, 2", slot size 0.01			SP	80.0 to 83.5' - Dark yellowish brown (10YR 4/2) sand, medium grained, well sorted, no fines, no gravel, moist. Outwash.
							GP	83.5 to 85.0' - Dark yellowish brown (10YR 4/2) sandy gravel; medium sand, well sorted sand, gravel subrounded, gravel to 1", little to no fines, moist. Outwash.
85								Total Depth = 85.0'.
90								
95								

GROUNDWATER

DEPTH	HOUR	DATE
5.28	19:41	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 5

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P038
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597900.80
Date Started	3/2/93	East (ft)	1493475.39
Date Completed	3/19/93	Ground Surface Elev. (ft)	687.88
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	687.87
Checked By	PAUL DARR	Total Depth (ft)	103.0
Comments:	Flood plain of G. Miami River access through MCD gate.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			TS	0.0 to 4.9' - Dark yellowish brown (10YR 5/4) clayey silty sand, moderately cohesive, fine sand, some silt and clay, moist. Topsoil.
				Backfill: Cement - bentonite grout				
5							SM	4.9 to 11.5' - Dark yellowish brown (10YR 5/4) silty sand, low cohesivness, moist to wet. Has 50% wood fragments mixed in sand. Alluvium.
10							CL	11.5 to 12.5' - Moderate yellowish brown (10YR 5/4) sandy silty clay, 50% clay, 50% sand and silt, moist. Native soil.
							SP	12.5 to 13.0'- Moderate yellow brown (10YR 5/4) sand, medium to coarse, good sorting, poorly graded, saturated.
15							GP	13.0 to 20.0' - Moderately yellow brown (10YR 5/4) sandy gravel, medium to coarse sand, loose, 50% gravel subrounded to rounded, 50% medium to coarse sand, saturated. Alluvium.
20								

GROUNDWATER

DEPTH	HOUR	DATE
3.60		03/21/93
4.98	14:43	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 5

Borehole/Well Id P038

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								20.0 to 30.0' - Medium dark gray (N4) gravels, little coarse sand, little to no fines, 5 to 10% coarse sand, gravel well rounded, gravels to 3", saturated. Alluvium.
25								
								30.0 to 31.0' - Moderately dark gray (N4) gravel, fine gravel, moderately well sorted, well rounded, saturated. Alluvium.
30							SP	31.0 to 31.5' - Dusky yellow brown (10YR 2/2) sand, little to no fines, moist. Alluvium.
							GP-GM	32.0 to 35.0' - Yellowish brown (10YR 5/4) silty sandy gravel, coarse sand, 60% gravel subangular to subrounded, 30% coarse sand, 10% silt, poorly sorted, poorly graded, saturated. Outwash.
35							GP	35.0 to 51.0' - Moderate yellow brown (10YR 5/4) sandy gravels, fine to coarse sands, fine gravel little to no fines, limestone clasts, thin till like lense at 35.0'. Alluvium.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	3.60		03/21/93
▼	4.98	14:43	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P038

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								51.0 to 55.0' - Medium gray (N5) sandy gravels, fine gravel, fine to coarse sands, little to no fines. Alluvium.
55							GP-GM	55.0 to 57.0' - Olive gray (5Y 6/1) sandy silty gravel, medium coarse sand, limestone clasts, wet. Outwash.
							TI	57.0 to 58.0' - Olive gray (5Y 6/1) sandy silt, moderately cohesive, dry to slightly moist. Till.
							GM-GC	58.0 to 60.0' - Light olive gray (5Y 6/1) sandy silty clayey gravel, angular limestone clasts to 4", moist. Outwash.
60							GM-GC	60.0 to 65.0' - Light olive (5Y 5/2) clayey silty gravel, gravels angular to subrounded, fine sand, moist, becomes dryer from 64.0 to 65.0'.
65	B	GC	0067				GM	65.0 to 66.0' - Medium olive brown (5Y 4/4) silty gravel, has blocky angular chunks of limestone. Outwash. 66.0 to 68.0' - Moderate yellow brown (10YR 5/4) silty gravel, 70% subrounded gravel, gravel to 1 1/2", 30% coarse sand and silt, trace clay, saturated. Outwash.
70							TI	68.0 to 75.5' - Medium gray (N5) to light olive gray (5Y 6/7) gravelly slightly clayey sandy silt, moderately dense, 40% gravels, gravels rounded, gravel to 2", angular limestone clasts to 2" moist, becomes dryer at 75.0'. Gravelly till.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	3.60		03/21/93
▼	4.98	14:43	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 4 of 5

Borehole/Well Id P038

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
							GP	75.5 to 80.0' - Moderate yellow brown (10YR 5/4) sandy gravels, coarse sands to fine gravels, limestone cobbles to 4", saturated, Outwash.
80							SP	80.0 to 83.5' - Dark yellowish brown (10YR 4/2) sand, medium grained, well sorted, no fines, no gravel, moist. Outwash.
							GP	83.5 to 85.0' - Dark yellowish brown (10YR 4/2) sandy gravel, medium sand, well sorted sand, gravel subrounded, gravel to 1", little to no fines, moist. Outwash.
85				Seal: 1/4" Bentonite chips			SP	85.0 to 94.0' - Moderate yellow brown (10YR 5/4) gravelly sand, fine gravel, gravel to 1", coarse sand, little to no fines, 60% sand, 40% gravel, saturated. Outwash.
90				Filter Pack: 10/20 Colorado silica sand				
				Screen: PVC, 2", slot size 0.01				
95							SP	94.0 to 96.0' - Moderate yellow brown (10YR 5/4) coarse sand, trace of fine gravel, moderately well sorted, saturated. Outwash.
							TI	96.0 to 99.0' - Light olive gray (10YR 5/2) sandy clayey silt, very dense, no gravels, 90% fine sand and silt, a trace of clay, moist. Till.
				Backfill: Collapsed borehole material				

GROUNDWATER

	DEPTH	HOUR	DATE
▽	3.60		03/21/93
▼	4.98	14:43	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id P038

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100							CL	99.0 to 101.0' - Medium gray (N4) silty clay, weathered, firm, dense, moist. Weathered bedrock. Contains weathered out fossils.
							ST-LS	101.0 to 103.0' - Medium gray (N4) siltstone, thinly bedded fossiliferous limestone lenses 1 to 2" thick, dry. Competent bedrock.
								Total Depth = 103.0'.
105								
110								
115								
120								
125								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	3.60		03/21/93
▼	4.98	14:43	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P039
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595092.39
Date Started	3/9/93	East (ft)	1493740.18
Date Completed	3/9/93	Ground Surface Elev. (ft)	689.35
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	689.22
Checked By	PAUL DARR	Total Depth (ft)	20.0
Comments:	By G. Miami River, east of bikepath ~ 1/2 mile north of railroad crossing bridge.		
	Lithologic descriptions taken from P042 borehole log.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			SM	0.0 to 1.0' - Moderate yellow brown (10YR 5/4) silty sand, some gravels, roots first 5", moist. 1.0 to 3.5' - Silty sand, some shell fragments, well sorted, moist.
5				Backfill: Cement - bentonite grout			GP	3.5 to 8.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, rounded to subrounded, slightly moist. 8.0 to 9.0' - Dark yellowish orange (10YR 6/6) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, rounded to subrounded, saturated. 9.0 to 12.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, moderate sorting, rounded to subrounded, saturated.
10				Seal: 1/4" Bentonite chips				12.0 to 23.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace fines, coarse sand, cobbles to 4 inches, wet.
15				Filter Pack: 10/20 Colorado silica sand Screen: PVC, 2", slot size 0.01				
20								Total Depth = 20.0'.

GROUNDWATER

DEPTH	HOUR	DATE
5.37		04/04/93
6.70	14:28	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P040
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595089.24
Date Started	3/9/93	East (ft)	1493748.05
Date Completed	3/9/93	Ground Surface Elev. (ft)	689.41
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	689.01
Checked By	PAUL DARR	Total Depth (ft)	42.0
Comments:	By G. Miami River, east of bikepath ~ 1/2 mile north of railroad crossing bridge.		
	Lithologic descriptions taken from P042 borehole log.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			SM	0.0 to 1.0' - Moderate yellow brown (10YR 5/4) silty sand, some gravels, roots first 5", moist. 1.0 to 3.5' - Silty sand, some shell fragments, well sorted, moist.
5				Backfill: Cement - bentonite grout			GP	3.5 to 8.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, rounded to subrounded, slightly moist. 8.0 to 9.0' - Dark yellowish orange (10YR 6/6) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, rounded to subrounded, saturated. 9.0 to 12.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, moderate sorting, rounded to subrounded, saturated. 12.0 to 23.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace fines, coarse sand, cobbles to 4 inches, wet.
10								
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE
5.22		04/04/93
6.55	14:25	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P040

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							GW	23.0 to 23.5' - Gravel, trace sand, well sorted.
							GP	23.5 to 26.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace fines, cobbles to 6 inches, poorly sorted, clasts rounded to subangular wet.
25							GW	26.0 to 28.0' - Gravel, trace sand, fine gravel, well sorted, wet.
							SP	28.0 to 32.0' - Pale yellow brown (10YR 6/2) sand, some gravel to 2 inches, trace silt, 80% coarse sand, medium sorting.
30							GP	32.0 to 37.0' - Pale yellow brown (10YR 6/2) gravel, trace sand, gravel to 4 inches, clast rounded to subrounded, moderate sorting, wet.
				Seal: 1/4" Bentonite chips				
35				Filter Pack: 10/20 Colorado silica sand				
				Screen: PVC, 2", slot size 0.01			SP	37.0 to 38.0' - Gravelly sand. 38.0 to 43.0' - Moderate yellowish brown (10YR 5/4) gravelly sand, some silt and clay, coarse sand, fine to medium gravel, poor sorting, wet.
40								
								Total Depth = 42.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.22		04/04/93
▼	6.55	14:25	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P041
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595085.05
Date Started	3/8/93	East (ft)	1493736.19
Date Completed	3/8/93	Ground Surface Elev. (ft)	689.30
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	689.08
Checked By	PAUL DARR	Total Depth (ft)	52.0
Comments:	By G. Miami River, east of bikepath, ~ 1/2 mile north of railroad crossing bridge.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			SM	0.0 to 3.0' - Moderate yellow brown (10YR 5/4) silty sand, roots first 4 to 5", shell fragments, soft, slightly moist.
							SP	3.0 to 4.0' - Gravelly sand, some fines (~20%) coarse sand, fine gravel.
				Backfill: Cement - bentonite grout			SM	4.0 to 5.0' - Moderate yellow brown (10YR 5/4) silty sand, fine sand, soft, moist.
5							SP	5.0 to 22.0' - Pale yellowish brown (10YR 6/2) gravelly sand, trace silt, coarse sand, cobbles to 3 inches, wet to moist to 12.5'.
10								12.5 to 13.0' - Stained zones dark yellowish orange (10YR 6/6), poor sorting, saturated.
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.15		04/04/93
▼	6.48	14:19	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id P041

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							SP	22.0 to 22.5' - Color change to (10YR 6/6). 22.5 to 24.0' - Pale yellowish brown (10YR 6/2) gravelly sand, trace silt, coarse sand, cobbles to 3 inches.
							GW	24.0 to 24.5' - Gravel, fine to medium size, well sorted.
25							SP	24.5 to 37.0' - Pale yellowish brown (10YR 6/2) gravelly sand, trace silty, coarse sand, cobbles to 3 inches.
30								
35								
							GW	37.0 to 38.0' - Gravel, coarse, well sorted, wet.
40							GP	38.0 to 45.0' - Sandy gravel, trace ~10% silt, coarse gravel, cobbles to 3 inches, wet to saturated.
				Seal: 1/4" Bentonite chips			GW	43.0 to 43.5' - Gravel, coarse, well sorted, wet.
45				Filter Pack: 10/20 Colorado silica sand			GP	45.0 to 51.5' - Sandy gravel, trace ~10% silt, coarse gravel, cobbles to 5 inches, wet to saturated.

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.15		04/04/93
▼	6.48	14:19	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id P041

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
				Screen: PVC, 2", slot size 0.01				
50								
				Backfill: Colorado silica sand			ST-LS	51.5 to 52.0' - Medium gray (N5) siltstone with fossiliferous limestone lenses 1 to 3 inches thick, slightly moist. Bedrock.
								Total Depth = 52.0'.
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	5.15		04/04/93
▼	6.48	14:19	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 3

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	P042
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	595080.86
Date Started	3/7/93	East (ft)	1493743.77
Date Completed	3/8/93	Ground Surface Elev. (ft)	689.15
Logged By	GARY STOOPES	Top of Casing Elev. (ft)	689.13
Checked By	PAUL DARR	Total Depth (ft)	68.5

Comments: P042 is part of south cluster of piezometers by G. Miami River, 1/4 mile north of railroad crossing bridge, on east bank.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Casing: PVC, 2"			SM	0.0 to 1.0' - Moderate yellow brown (10YR 5/4) silty sand, some gravels, roots first 5", moist. 1.0 to 3.5' - Silty sand, some shell fragments, well sorted, moist.
5				Backfill: Cement - bentonite grout			GP	3.5 to 8.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, rounded to subrounded, slightly moist. 8.0 to 9.0' - Dark yellowish orange (10YR 6/6) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, rounded to subrounded, saturated. 9.0 to 12.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace silt and clay (~10%), coarse sand, fine to medium gravel, moderate sorting, rounded to subrounded, saturated. 12.0 to 23.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace fines, coarse sand, cobbles to 4 inches, wet.
10								
15								
20								

GROUNDWATER

DEPTH	HOUR	DATE
2.00		04/04/93
32.67	14:22	05/19/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: P042

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
							GW	23.0 to 23.5' - Gravel, trace sand, well sorted.
							GP	23.5 to 26.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace fines, cobbles to 6 inches, poorly sorted, clasts rounded to subangular wet.
25							GW	26.0 to 28.0' - Gravel, trace sand, fine gravel, well sorted, wet.
							SP	28.0 to 32.0' - Pale yellow brown (10YR 6/2) sand, some gravel to 2 inches, trace silt, 80% coarse sand, medium sorting.
30								
							GP	32.0 to 37.0' - Pale yellow brown (10YR 6/2) gravel, trace sand, gravel to 4 inches, clast rounded to subrounded, moderate sorting, wet.
35								
							SP	37.0 to 38.0' - Gravelly sand. 38.0 to 43.0' - Moderate yellowish brown (10YR 5/4) gravelly sand, some silt and clay, coarse sand, fine to medium gravel, poor sorting, wet.
40								
								43.0 to 52.0' - Pale yellow brown (10YR 6/2) gravelly sand, some silt and clay, coarse sand, gravels to 3 inches, poor sorting, partly cohesive, soft to firm, moist.
45								

GROUNDWATER

DEPTH	HOUR	DATE
2.00		04/04/93
32.67	14:22	05/19/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 3

Borehole/Well Id P042

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
50								
							ST	52.0 to 55.0' - Medium gray (N5) siltstone with fossiliferous limestone lenses 1 to 3" thick, slightly moist. Bedrock.
55							NR	55.0 to 68.5' - Core was lost; washed away by drilling fluid (water).
				Seal: 1/4" Bentonite chips				
60				Filter Pack: 10/20 Colorado silica sand				
				Screen: PVC, 2", slot size 0.01				
65								
								Total Depth = 68.5'.
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	2.00		04/04/93
▼	32.67	14:22	05/19/93

WESTON

APPENDIX C

GEOLOGIC LOGS OF SOIL BORINGS

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	**Borehole/Well Id**	B001
Drilling Method	ROTO SONIC	**STATE PLANE COORDINATES**	
Drilling Fluid	NONE	**North (ft)**	596574.00
Date Started	11/4/92	**East (ft)**	1495011.00
Date Completed	11/4/92	**Ground Surface Elev. (ft)**	705.00
Logged By	TIM FRINAK	**Top of Casing Elev. (ft)**	NA
Checked By	ERIC LARSEN	**Total Depth (ft)**	40.0

Comments: Exploratory boring located 30 ft. east of north-south access road and 3 ft. north of east-west road. Above coordinates and elevation estimated.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							FL	0.0 to 0.8' - Pale brown (10YR 9/4) clayey sand and gravel. Fill. 0.8 to 1.4' - Black asphalt mixed with sand and gravel. Fill. 1.4 to 2.5' - Yellowish brown (10YR 3/4) clayey sand and gravel. Fill. 2.5 to 5.0' - Olive brown (2.5Y 4/4) clayey sand and gravel, abundant glass and metal debris. Fill.
5	O	GC	0005					5.0 to 6.1' - Olive brown clayey sand and gravel, contains glass, concrete at 5.8 to 6.1'. Fill.
	O	GC	0007				SM	6.1 to 7.5' - Brown (10YR 4/3) silty sand, 60% sand, 20% silt, 10% gravel, 10% clay. Outwash.
							SP	7.5 to 9.5' - Brown sand, coarse grained, 80% sand, 10% silt and clay, 10% gravel with average diameter of 0.5". Outwash. 9.5 to 10.0' - Pale yellow (2.5Y 7/4) sand, predominantly fine grained, 90% sand, > 5% gravel, < 5% silt. Outwash.
10							SP-GP	10.0 to 13.5' - Pale brown (10YR 6/3) sand and gravel, 10% silt, 40% sand, 50% gravel up to 3.0" in diameter. Outwash.
	O	GC	0014				SM-SP	13.5 to 14.2' - Pale brown silty, gravelly sand, 20% silt, 50% sand, 30% gravel, wet. Outwash.
15	O	GC	0015				TI	14.2 to 15.0' - Light yellowish brown (10YR 6/4) sandy silt, competent, weak plasticity, 60% silt and clay, 30% sand, 10% gravel. Till. 15.0 to 21.8' - Dark yellowish brown (10YR 4/4) sand, competent, < 10% silt, 50% very fine grained sand, 25% sand, 5% - 15% gravel up to 3.5" in diameter (average diameter = 0.5"). Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 2 of 2

Borehole/Well Id B001

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							TI	21.8 to 22.2' - Gray (10YR 5/1) silty sand, zones of limonite alteration. Till. 22.2 to 23.6' - Brown (10YR 5/3) sand, 20% silt and clay, 50% fine grained sand, 20% sand, 10% gravel, fossiliferous limestone fragments from 23.3 to 23.6'. Till.
	O	GC	0023					
	O	GC	1023				SP	23.6 to 25.0' - Brown (10YR 5/3) gravelly sand, 10% silt and clay, 10% fine grained sand, 50% sand, 30% gravel (average diameter = 0.12"), damp at 24.0'. Outwash.
25							GM-GP	25.0 to 26.9' - Olive yellow (2.5Y 6/6) silty, sandy gravel, sand is fine grained, 50% to 70% gravel. Outwash.
							CL	26.9 to 27.3' - Olive brown (2.5Y 5/4) silty clay with fine partings.
	O	GC	0028				SP-GP	27.3 to 30.0' - Olive yellow (2.5Y 6/6) sand and gravel, 10% silt, 50% sand, 40% gravel, wet at 28.1'. Outwash.
30							GP	30.0 to 31.2' - Sandy gravel, sand is very coarse grained, 30% sand, 70% gravel up to 3.5" in diameter (average diameter = 0.5"). Outwash. 31.2 to 32.5' - Gravel, 10% coarse grained sand, 90% gravel up to 2.0" in diameter (average diameter = 0.5"). Outwash.
							GW	32.5 to 33.3' - Sandy gravel, 30% very coarse grained sand, 70% fine gravel up to 1.0" in diameter (average diameter = 0.2"), grading upward. Outwash.
							SP-GP	33.3 to 35.9' - Light yellowish brown (10YR 6/4) sand and gravel, sand is coarse grained, 80% gravel up to 3.0" in diameter (average diameter = 1.0"). Outwash. 35.9 to 36.6' - Light yellowish brown (10YR 6/4) sand and gravel, sand is coarse grained, gravel up to 1.5" in diameter (average diameter = 0.5"). Outwash.
35	O	GC	0035				GW	
	O	GC	0038				SP-GP	36.6 to 37.6' - Sandy gravel, 30% very coarse grained sand, 70% gravel up to 1.0" in diameter (average diameter = 0.2"), grading upward. Outwash.
							ST-LS	37.6 to 38.4' - Sand and gravel, sand is very coarse grained, silty matrix, gravel up to 3.0" in diameter (average diameter = 1.4"). Outwash.
40								38.4 to 40.0' - Gray (5Y 5/1) siltstone, calcareous, contains limestone interbeds. Bedrock.
								Total depth = 40.0'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	**Borehole/Well Id**	B002
Drilling Method	ROTO SONIC	**STATE PLANE COORDINATES**	
Drilling Fluid	NONE	**North (ft)**	596522.00
Date Started	11/3/92	**East (ft)**	1495024.00
Date Completed	11/3/92	**Ground Surface Elev. (ft)**	703.00
Logged By	TIM FRINAK	**Top of Casing Elev. (ft)**	NA
Checked By	ERIC LARSEN	**Total Depth (ft)**	25.0

Comments: Exploratory boring located west of monitoring well 0309 and south of east west access road near Area 2. Groundwater level not recorded boring was terminated before water was penetrated. Above coord. and elev. estimated.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0							FL	0.0 to 1.3' - Brown silt, 10% gravel up to 0.25' in diameter. Fill. 1.3 to 1.7' - Gray fossiliferous limestone boulder. Fill. 1.7 to 3.9' - Greenish gray clay and silt, pockets of gravel up to 2.0" in diameter. Fill. 3.9 to 5.0' - Dark brown (5YR 3/3) clayey sand, very fine grained, 10 - 20% clay, 80% sand. Fill. 5.0 to 8.1' - Dark brown clayey silt, approximately 10% gravel, rounded, minor limestone fragments < 4 mm in diameter. Fill. 8.1 to 9.1' - Brown (10YR 3/4) silty, clayey gravel, approximately 40 to 60% coarse gravel up to 1.0" in diameter, subangular to rounded. Fill. 9.1 to 10.0' - Brown gravelly clay, gravel is very coarse grained. Fill. 10.0 to 10.8' - Dark brownish gray (5YR 3/1) clayey, gravelly silt, 20% gravel up to 2.0 mm in diameter. Fill.
5	O	GC	0005					
10	O	GC	0010					
							SP-GP	10.8 to 11.9' - Brown to dark brown (10YR 4/4) sand and gravel, sand is very coarse grained, gravel up to 3.0" in diameter (average diameter = 4.0 mm), approximately 10% silt and clay. Outwash.
							SP	11.9 to 14.3' - Reddish brown (5YR 5/3) gravelly sand, medium to very coarse grained, poorly sorted, 20% gravel up to 3.0" in diameter, wet at 14.0'. Outwash.
15	O	GC	0015				TI	14.3 to 15.5' - Yellowish brown (10YR 5/4) clayey, silty sand, fine to very coarse grained, poorly sorted, competent, 60% sand, 30% silt/clay, 10% gravel up to 1.0" in diameter. Till. 15.5 to 18.0' - Grayish brown (10YR 5/2) sandy, clayey silt, 70% silt and clay, 30% sand, 10% gravels up to 1.0" in diameter. Till.
	O	GC	0018				SM-SP	18.0 to 20.0' - Pale brown (10YR 6/3) silty, gravelly sand, < 10% clay, 20% gravel up to 2.0" in diameter, zones of very fine sand, thin zone of limonite at contact with till (18.0'). Outwash.
	O	GC	1018					
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND PLANT

Project Manager: William Little

Borehole/Well Id B002

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20							SM-GM	20.0 to 23.2' - Yellowish brown (10YR 5/6) silty sand and gravel, 55% very fine grained sand and silt, < 5% clay, 40% gravel. Outwash.
	O	GC	0023				SP	23.2 to 24.4' - Yellowish brown (10YR 5/4) sand, medium grained, rounded, moderately to well sorted, 10% silt. Outwash.
25							SM-GM	24.4 to 25.0' - Yellowish brown (10YR 5/6) silty sand and gravel, sand is very fine grained. Outwash.
								Total Depth = 25.0'. Boring was terminated because drill bit was lost in hole. Borehole log will begin at 25.0' for offset boring B003.
30								
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	**Borehole/Well Id**	B003
Drilling Method	ROTO SONIC	**STATE PLANE COORDINATES**	
Drilling Fluid	NONE	**North (ft)**	596524.00
Date Started	11/3/92	**East (ft)**	1495072.00
Date Completed	11/3/92	**Ground Surface Elev. (ft)**	710.00
Logged By	TIM FRINAK	**Top of Casing Elev. (ft)**	NA
Checked By	ERIC LARSEN	**Total Depth (ft)**	41.5

Comments: Exploratory boring offset approximately 5 ft. east of boring B002. Boring was drilled to 25.0 ft., then cored, lithologically logged, and sampled from 25.0 to 41.5 ft. Above coordinates and elevation are estimated.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0								0.0 - 25.0' - No core sample collected.
5								
10								
15								
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND PLANT	Project Manager William Little	PAGE: 2 of 2

Borehole/Well Id B003

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25	O O	GC GC	0026 1026				SP	25.0 to 27.5' - Yellowish brown (5YR 5/4) gravelly sand, medium grained, 30% gravel, wet/saturated. Outwash. 27.5 - 29.2' - Yellowish brown gravelly sand, 60% sand, 30% gravel, 10% silt and clay, wet. Outwash.
							ML	29.2 to 29.7' - Olive (5Y 5/3) clayey silt, laminated.
30							GP	29.7 to 35.0' - Yellowish brown gravel, 80% gravel up to 3.5" in diameter (average diameter 0.75"), 17% sand, 3% silt/clay, wet/saturated. Outwash.
35	O O	GC GC	0035 0036				GC-GM	35.0 to 37.1' - Yellowish brown sand and gravel with clay and silt, sand is very fine to coarse grained, 50% gravel. Outwash.
40							ST	37.1 to 41.5' - Light gray (2.5Y 7/1) siltstone, calcareous, crumbly, weak parting, irregular, dark gray shaley laminations, fragments of calcareous paleo cocquina (biomicrite). Bedrock.
45								Total Depth = 41.5'. Borehole caved at 22.0' preventing water level measurement, estimated water table at 26.0'.

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0348
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	599090.15
Date Started	3/9/93	East (ft)	1495797.13
Date Completed	3/9/93	Ground Surface Elev. (ft)	876.39
Logged By	D.WILLIAMS/J.HAGGETT	Top of Casing Elev. (ft)	876.69
Checked By	PAUL DARR	Total Depth (ft)	248.7

Comments: In DOE parking lot on main hill. Borehole left open for the installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
0				Casing information - 10" diameter steel from surface to 10'.			TS	0.0 to 3.0' - Dark brown, silt and clay, organic-rich, little fine to medium sand, moist. Topsoil. 1.0 to 2.0' - Brown silty clay, some fine to coarse sand, some fine to coarse gravel, moderate plasticity, damp.
5							LS	2.0 to 3.0' - Gray limestone, highly weathered, fractured, dry. Bedrock. 3.0 to 5.0' - Intermixed layers of limestone and siltstone, some sand, dry. Bedrock. 4.0 to 5.0' - Intermixed layers of limestone and siltstone, some sand, dry, turning gray, then back into brown in bottom few inches. Bedrock. 5.0 to 14.77' - 8 3/4" hole reamed to 14.77'. Note: Bedrock lithology from 14.0 to 249.0' is comprised of shale intermixed with thin layers of limestone. Note: Borehole information - 10" diameter from surface to 10'; 3 7/8" diameter from 10 to 248.7'.
10				4" diameter steel from surface to 15.5'.				
15	B	GC	0017					
∇								
	B	GC	0020					Total Depth 248.7'.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
∇	16.77		03/09/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0349
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	598063.50
Date Started	3/18/93	East (ft)	1496060.62
Date Completed	3/21/93	Ground Surface Elev. (ft)	825.03
Logged By	D.WILLIAMS/R.MARROW	Top of Casing Elev. (ft)	824.97
Checked By	PAUL DARR	Total Depth (ft)	201.3

Comments: Located in security area along side of road near WD building south, side of Main Hill. Borehole left open for installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
0				Casing information - 10" diameter steel from surface to 38'.			FL	0.0 to 5.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
5	B	GC	0005					5.0 to 10.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
10	B	GC	0010					10.0 to 15.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
15	B	GC	0015					15.0 to 20.0' - Light brown sand and gravel, large pieces of rock, some with clay, dry. Fill.
20								

GROUNDWATER

DEPTH	HOUR	DATE
72.20	15:30	03/21/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0349

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0020	Casing information - 10" diameter steel from surface to 38'.			SH	20.0 to 23.5' - Gray, clay/shale with some large pieces of gravel, hard, dry. Bedrock. End of boring at 23.5'. Cable tool advanced casing through fill to 38.0'.
25							NR	Note: Bedrock lithology from 23.0 to 201.0' is comprised of shale intermixed with thin layers of limestone. Note: Borehole information - 10" diameter from surface to 38'; 3 7/8" diameter from 38' to bottom of hole at 201.3'.
30								
35								
	B	GC	0038	4" diameter steel from surface to 40'.				
40								
45								Total Depth = 201.3'.

GROUNDWATER

DEPTH	HOUR	DATE
72.20	15:30	03/21/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 1

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0350
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596438.04
Date Started	1/6/93	East (ft)	1497050.03
Date Completed	3/7/93	Ground Surface Elev. (ft)	887.40
Logged By	E.LARSEN/J.HAGGETT	Top of Casing Elev. (ft)	888.50
Checked By	PAUL DARR	Total Depth (ft)	250.5

Comments: Near south edge of SM/PP Hill, 100" WSW of security bunker facility; 100' SE. of Weston drum staging area. Borehole left open for the installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
0				Casing information - 10" diameter steel from surface to 8'.			TS	0.0 to 0.9' - Silty sand with some gravel, roots. Topsoil.
							FL	0.9 to 1.5' - Silt, sand and gravel, chunks of limestone. Fill. Note: The 0.0 to 1.5' interval was excavated using a shovel - served as a pilot hole for initial surface casing installation. 1.5 to 3.3' - Silt, sand and gravel, chunks of limestone. Fill.
5							LS	3.3 to 6.0' - Lithology uncertain, some layering apparent, possibly weathered siltstone or limestone (no split spoon samples collected during surface casing installation). Weathered bedrock. 6.0 to 8.0' - Dark gray limestone, hard, trace fossils, actual formation probably consists of shale with numerous limestone interbeds.
10				4" diameter steel from surface to 12'.				8.0 to 11.5' - Hole reamed to 13.5' to accommodate core barrel guides, no sample to describe. Note: Bedrock lithology from 8.0 to 250.0' is comprised of shale intermixed with thin layers of limestone. Note: Borehole information - 10" diameter from surface to 8'; 3 7/8" diameter from 8 to 250.5'.
15								
20								Total Depth = 250.5'

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 2

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0352
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	596590.37
Date Started	1/23/93	East (ft)	1495445.98
Date Completed	2/6/93	Ground Surface Elev. (ft)	738.16
Logged By	D.WILLIAMS/R.MORROW	Top of Casing Elev. (ft)	738.45
Checked By	PAUL DARR	Total Depth (ft)	102.2

Comments: Southeast of landfill. Borehole left open for the installation of a monitor well at a later date.

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
0				Casing information - 10" diameter steel from surface to 20'.			TS	0.0 to 5.0' - Dark brown clay, organic rich, moist at top, damp towards bottom, little fine sand, little fine to medium gravel, firm. Topsoil. Note: Borehole information - 10" diameter from surface to 20'; 3 7/8" diameter from 20 to 102'.
5							CL/ML	5.0 to 10.0' - Brown silty sandy clay, little fine to medium gravel, firm, low plasticity, damp.
10							TI	10.0 to 18.0' - Gray clayey silt with sand, fine to coarse sand, fine to coarse gravel, unsorted, hard, dense, dry. Till,
15								
							LS	18.0 to 20.0' - Gray limestone highly weathered, interbedded with siltstone, dry.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0352

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
20				4" diameter steel from surface to 21.8'.			NR	
							LS/SH	Note: Bedrock lithology from 22.0 to 102.2' is comprised of shale intermixed with thin layers of limestone.
25								
30								
35								
40								
								Total Depth = 102.2'.
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0355
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597274.72
Date Started	1/25/93	East (ft)	1496581.13
Date Completed	2/21/93	Ground Surface Elev. (ft)	796.99
Logged By	D.WILLIAMS/R.MARROW	Top of Casing Elev. (ft)	796.81
Checked By	PAUL DARR	Total Depth (ft)	201.7
Comments:	Located along pipeline clearing on hill above test fine area.		

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
0				Casing information - 10" diameter steel from surface to 26'.			TS	0.0 to 5.0' - Dark brown clayey silt, becomes darker towards bottom, little fine sand, trace organics, damp. Topsoil.
5							CL	4.0 to 5.0' - Brown clay little silt, little fine sand, little coarse gravel, dry, gray limestone gravel at 4.9 to 5.0'. 5.0 to 10.0' - Greenish gray clay, trace mottling, trace silt, dense, hard, dry.
							SP/GP	8.0 to 8.5' - Sand and gravel and broken rock, loose, dry.
10							CL	8.5 to 9.5' - Greenish gray clay, trace mottling, trace silt, dense, hard, traces of limestone bedrock, dry. 9.5 to 10.0' - Greenish gray clay intermixed with lenses of silt and fine sand, trace mottling, dense, hard, silt and sand are white, dry. 10.0 to 14.0' - Greenish gray clay, trace mottling, dense, hard, dry. 14.0 to 15.0' - Gray clay hard pieces of limestone softer than above, some moist to wet lenses.
15		GC GC	0015 1015				LS/ST	15.0 to 16.0' - Gray siltstone/claystone, hard, dry.
							LS	16.0 to 17.0' - Gray limestone and siltstone/claystone, intermixed layers, dry.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	52.20	15:00	02/21/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0355

Depth	Sample T	Sample A	Sample ID	Well Materials	Casing Info	Lith	USCS or Rock Type	Lithologic Description
20							SH	20.0 to 25.0' - Dark gray shale intermixed with lenses of silt and fine sand, hard, dry.
25							NR	25.0 to 26.0' - No recovery.
				4" diameter steel from surface to 27'.			LS/SH	Note: Bedrock lithology from 25.0 to 202.0' is comprised of shale intermixed with thin layers of limestone. Note: Borehole information - 10" diameter from surface to 26'; 3 7/8" diameter from 26 to 201.7'.
30								
35								
40								
45								Total Depth = 201.7'.

GROUNDWATER

DEPTH	HOUR	DATE
52.20	15:00	02/21/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0384
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	598393.83
Date Started	2/9/93	East (ft)	1496917.20
Date Completed	2/9/93	Ground Surface Elev. (ft)	803.02
Logged By	DALE FLORES	Top of Casing Elev. (ft)	N/A
Checked By	PAUL DARR	Total Depth (ft)	32.0

Comments: In executive parking lot just south of fire station. Borehole abandoned 02/09/93, backfilled with cement bentonite grout.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Backfill: Cement - bentonite grout			FL	0.0 to 0.5' - Asphalt 0.5 to 0.9' - Moderate olive brown (5Y 4/4) asphalt and gravel mixed with fine sand and silty clay. Fill. 0.9 to 4.0' - Grayish olive green (5GY 3/2) sandy silt with ~20% gravels, roots upper 2', thin bands of black organic material, scattered debris includes asphalt, concrete, and limestone clasts, moist. Fill.
	B	GC	0005					
								4.0 to 5.0' - Limestone clasts to 5".
5								5.0 to 6.0' - Crushed asphalt.
	B	GC	0010					6.0 to 10.5' - Color varies from moderate yellowish brown (10YR) to medium gray (N5) sandy silt with ~20% gravels, roots upper 2', thin bands of black organic material, scattered debris includes asphalt, concrete, and limestone clasts, moist. Fill.
	B	GC	1010					
10							CL	10.5 to 11.0' - Grayish olive green (5GY 3/2) gravelly silty clay, 20% gravels, moist to wet.
							OL	11.0 to 16.0' - Greenish black (5G 2/1) sandy silt, little to no gravels, organic rich, moist.
	B	GC	0015					
15								
	B	GC	0020				ML	16.0 to 20.0' - Grayish olive (10Y 4/2) sandy clayey silt, with thin beds of fossiliferous limestone and calcareous shale, low to moderate plasticity. Weathered bedrock.
20								

GROUNDWATER

DEPTH	HOUR	DATE

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id 0384

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20	B	GC	0025	Backfill: Cement - bentonite grout			ML	20.0 to 31.0' - Moderate olive brown (5Y 4/4) with grayish blue green (5BG 5/2) staining sandy clayey silt, with thin beds of fossiliferous limestone and calcareous shale, low to moderate plasticity. Color change to olive brown (5Y 5/6) at 25.0'. Weathered bedrock.
25	B	GC	0030					
30							LS	31.0 to 32.0' - Medium gray (N5) silty shale with thin fossiliferous limestone beds up to 1" thick, dry to 31.5, moist below 31.5, possible fracture zone. Bedrock.
								Total Depth = 32.0'.
35								
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Drilling Company	NORTH STAR DRILLING	Borehole/Well Id	0391
Drilling Method	ROTOSONIC DRILL	STATE PLANE COORDINATES	
Drilling Fluid	WATER	North (ft)	597632.56
Date Started	4/5/93	East (ft)	1494743.70
Date Completed	4/5/93	Ground Surface Elev. (ft)	706.00
Logged By	DALE FLORES	Top of Casing Elev. (ft)	N/A
Checked By	PAUL DARR	Total Depth (ft)	35.0

Comments: Estimated coordinates and surface elev. West access road, east of Arthur Ave. Borehole abandoned. Borehole drilled for supplemental geologic control. See logs 0340/0341 for additional descripton of lithology.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Backfill: Cement - bentonite grout			ML	0.0 to 7.0' - Dark brown silt, dense, moist.
5								
							GM/GP	7.0 to 15.0' - Moderate yellow brown (10YR 5/4) silty sandy gravel, dry. Upper outwash.
10								
15							TI	15.0 to 34.0' - Gravels in dense matrix of fine sand and silt, dry. Till.
20								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 2

Borehole/Well Id 0391

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20				Backfill: Cement - bentonite grout			TI	
25								
30								
							CL	34.0 to 35.0' - Weathered Bedrock.
35								Total Depth = 35.0'.
40								
45								

GROUNDWATER

	DEPTH	HOUR	DATE
▽			
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 1 of 7

Drilling Company	NORTH STAR DRILLING	**Borehole/Well Id**	0396
Drilling Method	ROTOSONIC DRILL	**STATE PLANE COORDINATES**	
Drilling Fluid	WATER	**North (ft)**	596659.25
Date Started	4/18/93	**East (ft)**	1493357.80
Date Completed	4/18/93	**Ground Surface Elev. (ft)**	689.57
Logged By	DALE FLORES	**Top of Casing Elev. (ft)**	N/A
Checked By	PAUL DARR	**Total Depth (ft)**	162.0

Comments: Located north of P017 on the Miami River Flood Plain. Borehole abandoned 04/18/93. Borehole collapsed from 162 ft. to 13 ft. naturally, bentonite pellets used from 13 ft. to ground surface as backfill.

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
0				Backfill: 1/4" Bentonite chips			TS	0.0 to 1.0' - Dusky yellow brown (10YR 2/2) sand, fine sand with trace of fines, slightly cohesive, good root development upper feet, moist upper 6", slightly moist below 6". Topsoil.
5, 10							SM	1.0 to 13.0' - Dusky yellow brown (10YR 2/2) silty sand, ~ 10% fines, slightly plastic, moist to wet, dark yellowish brown (10YR 4/2) below 7 ft., good sorting. Native soil horizon.
15, 20				Backfill: Collapsed borehole material			GP	13.0 to 25.0' - Pale yellowish brown (10YR 6/2) sandy gravel, trace of fines, 80% gravel pebble to 2" with trace of cobbles, matrix coarse sand and fine gravel, water table at 13.0'. River Alluvium.

GROUNDWATER

DEPTH	HOUR	DATE
13.00	09:30	04/18/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 2 of 7

Borehole/Well Id 0396

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
20								
25							GP	25.0 to 45.0' - Moderate yellow brown (10YR 5/4) sandy gravel with trace amounts of silt, sequence alternates between coarse to fine gravels, silt content varies, more silt in coarser gravels and coarse sand lenses, moderate to poor grading of gravels, sands exhibits good sorting, saturated. River deposit.
30								
35								
40								
45							SP-GP	45.0 to 84.0' - Color changes from moderate yellow brown to light olive gray (5Y 6/1) coarse sand and pebble gravel, little to no fines,

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.00	09:30	04/18/93
▼			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 3 of 7

Borehole/Well Id 0396

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
								moderate to good sorting, trace of gravel > 1", saturated.
50								
55								
60								
65								
70								

GROUNDWATER

	DEPTH	HOUR	DATE
▽	13.00	09:30	04/18/93
▼			

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0396

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
75								
80								
85							TI	84.0 to 84.65' - Olive gray (5Y 3/2) dense silt with trace of fine gravel, non-plastic, slightly moist. Till. 84.65 to 85.5' - Olive gray (5Y 3/2) fine sand with trace of silt, well sorted, no gravel, wet. 85.5 to 87.5' - Olive gray (5Y 3/2) dense silt with trace of fine gravel, non-plastic, 8" till lense very sandy at 86.0', very thin gravel lense seperates sandy till from more dense till from 86.5 to 87.5', slightly moist.
90							SW	87.5 to 95.0' - Olive gray (5Y 4/1) fine to medium well sorted sand with trace of gravel, sand becomes coarser with 40% pebble gravel at 95.0', saturated.
95							SP-GP	95.0 to 105.0' - Medium to coarse sand and pebble gravel, poorly graded, moderate sorting, 3" dense dark greenish gray (5GY 4/1) clay lense at 101.0 ft.,

GROUNDWATER

DEPTH	HOUR	DATE
13.00	09:30	04/18/93

WESTON

GEOLOGIC LOG

MOUND - OU9

Project Manager: GORDON HORN

Borehole/Well Id: 0396

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
100								
105							SP-GP	105.0 to 133.0' - Light olive gray (5Y 6/1) coarse sand and fine gravel, trace of silt, poorly sorted/graded, saturated.
110								
115								
120								
125								

GROUNDWATER

DEPTH	HOUR	DATE
13.00	09:30	04/18/93

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 6 of 7

Borehole/Well Id 0396

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
130								
							CL	133.0 to 134.0' - Dark greenish gray (5GY 4/1) clay lense, stiff, moist.
135							GP	134.0 to 139.0' - Olive gray (5Y 4/1) coarse sandy gravel, poorly graded, trace of fines, saturated.
							CL	139.0 to 140.0' - Dark greenish gray (5GY 4/1) clay lense, stiff, crumbles easily, very dry.
140							GP	140.0 to 160.0' - Olive gray (5Y 4/1) coarse sandy gravel, poorly graded, trace of fines, saturated.
145								
150								

GROUNDWATER

	DEPTH	HOUR	DATE
⧗	13.00	09:30	04/18/93
⧗			

WESTON

GEOLOGIC LOG	MOUND - OU9	Project Manager GORDON HORN	PAGE: 7 of 7

Borehole/Well Id 0396

Depth	Sample T	Sample A	Sample ID	Well Materials	Well Con	Lith	USCS or Rock Type	Lithologic Description
155								
160							SH-LS	160.0 to 162.0' - Medium gray (N4) to medium dark gray (N5) silty shale, fissile, fractures easily, moderately weathered, thin limestone lense, exhibits good bedding features in more competent layers, fossil fragments, very dry.
								Total Depth = 162.0'.
165								
170								
175								

GROUNDWATER

DEPTH	HOUR	DATE
13.00	09:30	04/18/93

WESTON

APPENDIX D

COORDINATES FOR MONITORING WELLS AND PIEZOMETERS

Table D.1 Horizontal Coordinates: North American Datum of 1983 (NAD83), Ohio Coordinate System, South Zone

Elevations: North American Vertical Datum of 1988 (NAVD88)

Table D.2 Horizontal Coordinates: North American Datum of 1927 (NAD27), Ohio Coordinate System, South Zone

Elevations: National Geodetic Vertical Datum of 1929 (NGVD29)

COORDINATE VALUES

OF

MONITORING WELLS AND PIEZOMETERS

FOR

ENVIRONMENTAL RESTORATION PROGRAM
MOUND PLANT
MIAMISBURG, OHIO

Table D.1

HORIZONTAL COORDINATES:
NORTH AMERICAN DATUM OF 1983 (NAD83)
OHIO COORDINATE SYSTEM, SOUTH ZONE
US SURVEY FOOT

ELEVATIONS:
NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)
US SURVEY FOOT

LEGEND

P024 = PIEZOMETER 024
GRD = GROUND AT SOUTHWEST CORNER OF CONCRETE
BM = ELEVATION ON CENTER OF EXISTING I.D. DISK
SL = SEISMIC REFRACTION LINE
SP = SHOT POINT

P001	597269.531	1464028.294	717.71	423
P001 BM			716.20	424
P001 GRN			715.94	425

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
P002	597271.324	1464034.310	717.70	426
P002 BM			716.36	427
P003	597151.303	1463966.099	707.51	369
P003 BM			705.78	370
P004	597131.054	1464271.692	754.54	406
P004 BM			753.05	407
P004 GRD			752.53	409
P005	597138.719	1464069.610	738.67	376
P005 BM			737.10	377
P006	597002.909	1464057.354	706.01	387
P006 BM			704.53	388
P006 GRD			704.10	389
P007	597516.720	1463929.303	705.74	441
P007 BM			704.09	442
P007 GRD			703.58	443
P008	597127.075	1463707.229	700.52	134
P008 BM			699.20	135
P008 GRD			698.68	136
P009	596973.701	1463716.444	699.95	131
P009 BM			698.43	132
P009 GRD			697.81	133
P013	596814.078	1463732.456	699.87	123
P013 BM			698.33	124
P013 GRD			697.72	125
P014	597631.152	1464101.167	717.33	454
P014 BM			715.40	455
P014 GRD			714.72	456
P015	596795.555	1464212.989	735.75	417
P015 BM			733.75	418
P015 GRD			733.22	419
P016	597479.935	1462307.237	687.26	201
P016 GRD			687.32	202
P017	596920.460	1462323.488	688.71	113
P017 GRD			688.72	114
P018	596937.325	1463264.548	690.51	156
P018 GRD			690.81	157
P019	598373.643	1461960.918	688.54	193
P019 GRD			688.70	194
P020	597595.227	1461895.449	689.09	195
P020 GRD			689.49	196
P021	598137.001	1464943.226	745.74	496
P021 BM			744.21	497
P021 GRAVEL DR			743.66	498
P022	597979.747	1464258.578	728.92	521
P022 PVMT			728.89	522
P023	597972.754	1464261.366	728.64	523
P023 PVMT			728.62	524
P024	597605.251	1464585.749	742.41	477
P024 BM			740.52	478

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
P024 GRD			739.83	479
P025	596681.960	1463920.959	702.00	578
P025 GRD			702.00	579
P026	597626.195	1463662.032	703.86	159
P026 GRD			704.10	160
P027	596692.763	1464019.777	703.95	575
P027 BM			702.32	576
P027 GRD			701.62	577
P028	596518.824	1463911.248	710.21	580
P028 BM			708.82	581
P028 GRD			707.95	582
P029	596358.713	1463761.936	701.98	121
P029 BM			700.44	122
P030	596353.463	1463762.757	702.16	118
P030 BM			700.46	119
P030 GRD			699.88	120
P031	596466.823	1464060.262	701.58	584
P031 BM			699.51	585
P031 GRD			699.20	586
P032	596126.397	1463984.960	707.78	597
P032 BM			706.35	598
P032 GRD			705.83	599
P033	596207.054	1464233.749	702.43	587
P033 BM			700.68	588
P033 GRD			699.96	589
P034	596113.464	1463603.012	689.23	143
P034 GRD			689.45	144
P035	598339.164	1462423.494	686.28	312
P035 GRD			686.39	313
P036	598356.270	1462422.697	686.58	316
P036 GRD			686.37	317
P037	598348.453	1462426.191	686.51	314
P037 GRD			686.66	315
P038	598344.255	1462418.583	686.10	310
P038 GRD			686.11	311
P039	595536.357	1462681.662	687.45	109
P039 GRD			687.58	110
P040	595533.205	1462689.528	687.24	111
P040 GRD			687.64	112
P041	595529.022	1462677.666	687.31	107
P041 GRD			687.53	108
P042	595524.825	1462685.241	687.36	105
P042 GRD			687.38	106
WELL 0005	597554.238	1463147.522	692.36	170

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0005 GRD			690.74	171
WELL 0007	597523.466	1462548.380	694.46	197
WELL 0007 GRD			692.18	198
WELL 0020	598272.799	1464149.761	749.18	529
WELL 0020 GRD			746.69	530
WELL 0028	598551.828	1464206.549	786.84	531
WELL 0028 GRD			784.37	532
WELL 0033	598410.426	1465444.967	776.74	504
WELL 0033 GRD			773.51	505
WELL 0042	598277.470	1465292.853	762.28	499
WELL 0042 GRD			761.20	500
WELL 0046	597518.007	1463946.363	706.84	444
WELL 0046 GRD			704.48	445
WELL 0063	597017.129	1463997.451	705.64	390
WELL 0063 GRD			703.10	391
WELL 0106	597550.314	1462846.523	693.86	191
WELL 0106 GRD			692.18	192
WELL 0108	597457.831	1462195.127	688.27	199
WELL 0108 GRD			685.46	200
WELL 0111	598413.616	1465675.100	779.02	507
WELL 0111 BM			778.26	508
WELL 0111 GRD			777.54	509
WELL 0112	598417.223	1465457.370	773.84	501
WELL 0112 BM			772.99	502
WELL 0112 GRD			772.28	503
WELL 0113	599525.968	1464859.011	873.30	610
WELL 0113 BM			874.06	611
WELL 0113 PVMT			874.04	612
WELL 0114	599058.647	1464535.649	872.14	600
WELL 0114 BM			872.68	601
WELL 0114 GRD			872.61	602
WELL 0115	599045.335	1464546.501	872.30	606
WELL 0115 BM			872.86	608
WELL 0115 GRD			872.73	609
WELL 0115 RIM			872.98	607
WELL 0116	599050.370	1464542.033	871.66	603
WELL 0116 BM			872.71	604
WELL 0116 GRD			872.61	605
WELL 0117	598516.927	1464707.320	801.82	563
WELL 0117 BM			801.03	566
WELL 0117 GRD			800.62	567
WELL 0118	600530.764	1464678.598	704.94	323
WELL 0118 GRD			705.33	324
WELL 0119	597987.055	1464790.533	741.41	486
WELL 0119 BM			740.73	487
WELL 0119 GRD			740.20	488
WELL 0120	598568.376	1464689.045	821.03	559
WELL 0120 BM			820.31	560
WELL 0120 GRD			819.85	561

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0121	598442.561	1466733.709	887.50	472
WELL 0121 BM			886.34	473
WELL 0121 GRD			885.73	474
WELL 0122	598080.215	1464167.088	742.35	525
WELL 0122 BM			741.34	526
WELL 0122 GRD			740.38	527
WELL 0123	597914.403	1463688.035	705.10	176
WELL 0123 BM			704.15	177
WELL 0123 GRD			703.58	178
WELL 0124	597788.924	1463653.099	705.15	179
WELL 0124 BM			704.17	180
WELL 0124 GRD			703.51	181
WELL 0125	597763.116	1464330.576	721.47	469
WELL 0125 BM			720.60	470
WELL 0125 GRD			720.03	471
WELL 0126	597602.979	1463642.164	705.58	161
WELL 0126 BM			704.62	162
WELL 0126 GRD			704.04	163
WELL 0127	597560.460	1462857.926	694.12	182
WELL 0127 BM			692.86	183
WELL 0127 GRD			692.16	184
WELL 0128	597549.513	1462859.246	693.66	185
WELL 0128 BM			692.37	186
WELL 0128 GRD			691.87	187
WELL 0129	597280.235	1463607.243	699.49	300
WELL 0129 BM			700.23	301
WELL 0129 GRD			700.13	302
WELL 0130	596903.734	1462604.629	692.06	115
WELL 0130 BM			692.98	116
WELL 0130 GRD			692.98	117
WELL 0137	597780.771	1464012.080	723.66	449
WELL 0137 GRD			721.50	450
WELL 0138	600123.923	1464263.915	697.83	320
WELL 0138 BM			698.71	321
WELL 0138 GRD			698.58	322
WELL 0151	597717.005	1464485.954	740.61	480
WELL 0151 BM			738.92	481
WELL 0151 GRD			738.10	482
WELL 0152	597429.689	1463895.903	704.94	435
WELL 0152 BM			703.50	436
WELL 0152 GRD			702.85	437
WELL 0153	597135.835	1463893.752	704.10	366
WELL 0153 BM			702.49	367
WELL 0153 GRD			701.85	368
WELL 0154	596862.185	1463911.316	702.67	401
WELL 0154 BM			701.80	402
WELL 0154 GRD			701.16	403
WELL 0156	596627.432	1463488.763	689.91	153
WELL 0156 BM			690.77	154
WELL 0156 GRD			690.79	155

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0157	596617.143	1463489.825	690.31	147
WELL 0157 BM			690.99	148
WELL 0157 GRD			690.89	149
WELL 0158	594481.231	1464217.535	702.06	633
WELL 0158 BM			700.89	635
WELL 0158 GRD			700.28	636
WELL 0159	594482.608	1463110.214	689.02	100
WELL 0159 GRD			689.77	101
WELL 0160	594493.181	1463109.077	689.40	102
WELL 0160 GRD			689.84	103
WELL 0301	598315.343	1463120.972	692.48	307
WELL 0301 BM			693.01	308
WELL 0301 GRD			692.99	309
WELL 0302	597543.005	1462864.299	690.96	188
WELL 0302 BM			691.81	189
WELL 0302 GRD			691.85	190
WELL 0303	597577.970	1463435.925	694.78	164
WELL 0303 GRD			695.12	165
WELL 0304	596622.998	1463488.361	690.08	150
WELL 0304 BM			690.79	151
WELL 0304 GRD			690.72	152
WELL 0305	596937.466	1464025.391	709.86	395
WELL 0305 BM			708.59	396
WELL 0305 GRD			707.84	397
WELL 0306	597116.731	1463892.789	704.13	360
WELL 0306 BM			702.56	361
WELL 0306 GRD			701.94	362
WELL 0307	597292.326	1463965.879	716.16	433
WELL 0307 BM			714.62	434
WELL 0308	597090.424	1464164.817	750.36	381
WELL 0308 BM			748.86	382
WELL 0308 GRD			747.74	383
WELL 0309	596947.158	1464039.216	710.26	392
WELL 0309 BM			708.74	393
WELL 0309 GRD			708.27	394
WELL 0310	597126.596	1463893.215	703.66	363
WELL 0310 BM			702.48	364
WELL 0310 GRD			701.81	365
WELL 0311	598315.918	1463128.788	692.98	303
WELL 0311 BM			693.47	305
WELL 0311 GRD			693.42	306
WELL 0312	598190.895	1463973.945	731.30	545
WELL 0312 BM			729.90	546
WELL 0312 GRD			729.27	547
WELL 0313	597293.821	1463963.212	716.12	430
WELL 0313 BM			714.68	431
WELL 0313 GRD			714.03	432
WELL 0314	597857.413	1464654.589	742.71	483
WELL 0314 BM			741.52	484
WELL 0314 GRD			741.00	485

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0315	597785.099	1464020.726	724.03	446
WELL 0315 BM			722.63	447
WELL 0315 GRD			721.81	448
WELL 0316	597553.618	1464325.847	725.11	463
WELL 0316 BM			723.60	464
WELL 0316 GRD			722.84	465
WELL 0317	596650.847	1463964.268	703.60	572
WELL 0317 BM			702.53	573
WELL 0317 GRD			701.73	574
WELL 0318	599086.921	1466157.481	810.53	513
WELL 0318 BM			809.27	514
WELL 0318 GRD			808.20	515
WELL 0319	595956.386	1464088.709	701.44	594
WELL 0319 BM			700.23	595
WELL 0319 GRD			699.67	596
WELL 0320	595466.300	1464294.274	704.28	617
WELL 0320 BM			703.12	618
WELL 0320 GRD			702.39	619
WELL 0322	599308.094	1466142.731	809.84	516
WELL 0322 BM			808.62	517
WELL 0322 GRD			808.07	518
WELL 0323	598384.307	1464532.996	783.88	676
WELL 0323 GRD			784.35	677
WELL 0324	598369.663	1464642.919	782.92	678
WELL 0324 GRD			783.10	679
WELL 0325	597713.733	1465511.875	797.12	552
WELL 0325 BM			795.76	553
WELL 0325 GRD			795.19	554
WELL 0326	597808.124	1466031.975	875.81	350
WELL 0326 BM			874.71	351
WELL 0326 GRD			873.75	352
WELL 0327	602130.413	1464111.240	696.55	337
WELL 0327 GRD			696.92	338
WELL 0328	602138.048	1464110.723	696.80	339
WELL 0328 GRD			696.88	340
WELL 0329	601674.134	1465356.995	705.74	329
WELL 0329 GRD			706.18	330
WELL 0330	601672.903	1465365.451	705.66	331
WELL 0330 GRD			706.20	332
WELL 0332	599948.182	1466389.194	792.11	519
WELL 0332 PVMT			792.55	520
WELL 0333	600989.885	1463795.759	697.78	333
WELL 0333 GRD			698.57	334
WELL 0334	600983.511	1463793.953	698.50	335
WELL 0334 GRD			698.73	336
WELL 0335	599287.504	1463767.716	703.66	318
WELL 0335 GRD			704.15	319
WELL 0336	600822.930	1465145.176	708.26	325
WELL 0336 GRD			708.46	326
WELL 0337	600815.300	1465144.829	707.97	327

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0337 GRD			708.33	328
WELL 0340	598094.198	1463665.834	704.40	172
WELL 0340 GRD			704.50	173
WELL 0341	598093.677	1463670.696	704.22	174
WELL 0341 GRD			704.63	175
WELL 0342	596612.246	1463491.807	690.58	145
WELL 0342 GRD			690.72	146
WELL 0343	597583.472	1463427.441	694.80	166
WELL 0343 GRD			694.93	167
WELL 0344	595965.608	1464086.620	701.21	591
WELL 0344 BM			700.35	592
WELL 0344 GRD			699.61	593
WELL 0345	598068.591	1465437.751	754.32	491
WELL 0345 BM			752.88	492
WELL 0345 GRD			752.03	493
WELL 0346	598069.962	1465048.556	742.92	494
WELL 0346 PVMT			743.54	495
WELL 0347	597818.357	1464034.452	725.22	451
WELL 0347 BM			723.77	452
WELL 0347 GRD			723.12	453
WELL 0348 INNER CASING	599532.979	1464739.636	874.92	613
WELL 0348 OUTER CASING			875.51	614
WELL 0348 GRD			874.62	615
WELL 0349 INNER CASING	598506.490	1465002.400	823.20	556
WELL 0349 OUTER CASING			824.23	557
WELL 0349 GRD			823.26	558
WELL 0350 INNER CASING	596881.179	1465990.338	886.73	357
WELL 0350 OUTER CASING			886.94	358
WELL 0350 GRD			885.63	359
WELL 0351	596876.491	1465990.586	886.51	354
WELL 0351 BM			885.86	355
WELL 0351 GRD			885.12	356
WELL 0352 INNER CASING	597033.757	1464387.306	736.68	413
WELL 0352 OUTER CASING			737.77	414
WELL 0352 BM			737.10	415
WELL 0352 GRD			736.39	416
WELL 0353	596685.212	1464609.777	745.30	420
WELL 0353 GRD			743.18	421
WELL 0354	596045.531	1465262.418	769.24	568
WELL 0354 BM			767.34	569
WELL 0354 GRD			766.18	570
WELL 0355 INNER CASING	597717.777	1465522.172	795.04	549
WELL 0355 OUTER CASING			796.09	550
WELL 0355 GRD			795.22	551
WELL 0356	595455.163	1464294.079	704.47	620
WELL 0356 BM			703.02	621
WELL 0356 GRD			702.30	622
WELL 0370	597273.030	1464042.387	718.51	428
WELL 0370 BM			716.46	429
WELL 0371	597145.548	1463966.034	707.50	371

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0371 BM			705.68	372
WELL 0372	597137.129	1464272.665	754.69	404
WELL 0372 BM			753.16	405
WELL 0373	597133.981	1464070.086	738.73	378
WELL 0373 BM			737.24	379
WELL 0373 GRD			737.00	380
WELL 0374	597002.695	1464065.027	706.33	384
WELL 0374 BM			704.86	385
WELL 0374 GRD			704.42	386
WELL 0375	597517.442	1463922.191	705.48	438
WELL 0375 BM			703.99	439
WELL 0375 GRD			703.43	440
WELL 0376	597140.226	1463702.410	700.12	137
WELL 0376 BM			699.02	138
WELL 0376 GRD			698.42	139
WELL 0377	596965.757	1463716.545	699.25	128
WELL 0377 BM			698.31	129
WELL 0377 GRD			697.63	130
WELL 0378	596820.161	1463731.444	699.84	126
WELL 0378 BM			698.29	127
WELL 0379	597623.010	1464095.742	716.29	457
WELL 0379 BM			715.19	458
WELL 0379 GRD			714.61	459
WELL 0380	597552.941	1464336.159	725.33	466
WELL 0380 BM			723.75	467
WELL 0380 GRD			723.25	468
WELL 0381	597425.438	1464341.258	726.08	460
WELL 0381 BM			724.28	461
WELL 0381 GRD			723.49	462
WELL 0382	597045.053	1464385.736	738.73	410
WELL 0382 BM			737.15	411
WELL 0382 GRD			736.48	412
WELL 0383	597581.778	1463419.338	694.43	168
WELL 0383 GRD			694.62	169
BORING 0384 PVMT	598836.610	1465858.675	801.25	675
WELL 0385	598071.586	1463917.303	723.11	543
WELL 0385 GRD			723.84	544
WELL 0386	597788.535	1463895.615	724.80	541
WELL 0386 GRD			725.05	542
WELL 0387	597653.856	1463839.368	720.93	535
WELL 0387 GRD			721.05	536
WELL 0388	597236.831	1463689.586	701.11	140
WELL 0388 BM			699.27	141
WELL 0388 GRD			698.58	142
WELL 0389	597780.777	1463891.460	724.67	539
WELL 0389 GRD			724.89	540
WELL 0390	597773.012	1463887.897	724.60	537
WELL 0390 GRD			724.77	538
WELL 0392	597648.203	1463838.089	720.88	533

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0392 GRD			721.02	534
WELL 0393	597137.961	1463966.517	706.88	373
WELL 0393 BM			705.58	374
WELL 0393 GRD			705.02	375
WELL 0394	596932.952	1463944.961	703.31	398
WELL 0394 BM			702.29	399
WELL 0394 GRD			701.61	400
WELL 0395	598875.853	1465811.283	801.17	511
WELL 0395 PVM'T			801.48	512
BORING 0396 GRD	597102.968	1462300.376	687.80	674

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY

COORDINATE VALUES

OF

MONITORING WELLS AND PIEZOMETERS

FOR

ENVIRONMENTAL RESTORATION PROGRAM
MOUND PLANT
MIAMISBURG, OHIO

Table D.2

HORIZONTAL COORDINATES:
NORTH AMERICAN DATUM OF 1927 (NAD27)
OHIO COORDINATE SYSTEM, SOUTH ZONE
US SURVEY FOOT

ELEVATIONS:
NATIONAL GEODETIC VERTICAL DATUM OF 1929 (NGVD29)
US SURVEY FOOT

LEGEND

P024 = PIEZOMETER 024
GRD = GROUND AT SOUTHWEST CORNER OF CONCRETE
BM = ELEVATION ON CENTER OF EXISTING I.D. DISK
SL = SEISMIC REFRACTION LINE
SP = SHOT POINT

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
P001	597237.167	1495498.245	718.33	423
P001 BM			716.82	424
P001 GRN			716.56	425
P002	597238.959	1495504.261	718.32	426
P002 BM			716.98	427
P003	597118.938	1495436.050	708.13	369
P003 BM			706.40	370
P004	597098.687	1495741.643	755.16	406
P004 BM			753.67	407
P004 GRD			753.15	409
P005	597106.354	1495539.561	739.29	376
P005 BM			737.72	377
P006	596970.544	1495527.304	706.63	387
P006 BM			705.15	388
P006 GRD			704.72	389
P007	597484.356	1495399.255	706.36	441
P007 BM			704.71	442
P007 GRD			704.20	443
P008	597094.715	1495177.196	701.14	134
P008 BM			699.82	135
P008 GRD			699.30	136
P009	596941.341	1495186.409	700.57	131
P009 BM			699.05	132
P009 GRD			698.43	133
P013	596781.718	1495202.419	700.49	123
P013 BM			698.95	124
P013 GRD			698.34	125
P014	597598.787	1495571.120	717.95	454
P014 BM			716.02	455
P014 GRD			715.34	456
P015	596763.189	1495682.938	736.37	417
P015 BM			734.37	418
P015 GRD			733.84	419
P016	597447.598	1493777.204	687.88	201
P016 GRD			687.94	202
P017	596888.125	1493793.460	689.33	113
P017 GRD			689.34	114
P018	596904.973	1494734.515	691.13	156
P018 GRD			691.43	157
P019	598341.312	1493430.901	689.16	193
P019 GRD			689.32	194
P020	597562.897	1493365.418	689.71	195
P020 GRD			690.11	196
P021	598104.628	1496413.184	746.36	496
P021 BM			744.83	497
P021 GRAVEL DR			744.28	498
P022	597947.381	1495728.534	729.54	521
P022 PVMT			729.51	522
P023	597940.387	1495731.322	729.26	523
P023 PVMT			729.24	524

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
P024	597572.882	1496055.702	743.03	477
P024 BM			741.14	478
P024 GRD			740.45	479
P025	596649.596	1495390.903	702.62	578
P025 GRD			702.62	579
P026	597593.835	1495132.007	704.48	159
P026 GRD			704.72	160
P027	596660.397	1495489.722	704.57	575
P027 BM			702.94	576
P027 GRD			702.24	577
P028	596486.460	1495381.191	710.83	580
P028 BM			709.44	581
P028 GRD			708.57	582
P029	596326.352	1495231.893	702.60	121
P029 BM			701.06	122
P030	596321.102	1495232.714	702.78	118
P030 BM			701.08	119
P030 GRD			700.50	120
P031	596434.455	1495530.203	702.20	584
P031 BM			700.13	585
P031 GRD			699.82	586
P032	596094.030	1495454.896	708.40	597
P032 BM			706.97	598
P032 GRD			706.45	599
P033	596174.683	1495703.686	703.05	587
P033 BM			701.30	588
P033 GRD			700.58	589
P034	596081.106	1495072.963	689.85	143
P034 GRD			690.07	144
P035	598306.823	1493893.474	686.90	312
P035 GRD			687.01	313
P036	598323.929	1493892.678	687.20	316
P036 GRD			686.99	317
P037	598316.112	1493896.172	687.13	314
P037 GRD			687.28	315
P038	598311.914	1493888.563	686.72	310
P038 GRD			686.73	311
P039	595504.016	1494151.609	688.07	109
P039 GRD			688.20	110
P040	595500.864	1494159.474	687.86	111
P040 GRD			688.26	112
P041	595496.681	1494147.613	687.93	107
P041 GRD			688.15	108
P042	595492.484	1494155.187	687.98	105
P042 GRD			688.00	106

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0005	597521.885	1494617.494	692.98	170
WELL 0005 GRD			691.36	171
WELL 0007	597491.125	1494018.347	695.08	197
WELL 0007 GRD			692.80	198
WELL 0020	598240.433	1495619.719	749.80	529
WELL 0020 GRD			747.31	530
WELL 0028	598519.462	1495676.509	787.46	531
WELL 0028 GRD			784.99	532
WELL 0033	598378.050	1496914.928	777.36	504
WELL 0033 GRD			774.13	505
WELL 0042	598245.095	1496762.812	762.90	499
WELL 0042 GRD			761.82	500
WELL 0046	597485.643	1495416.316	707.46	444
WELL 0046 GRD			705.10	445
WELL 0063	596984.764	1495467.401	706.26	390
WELL 0063 GRD			703.72	391
WELL 0106	597517.967	1494316.491	694.48	191
WELL 0106 GRD			692.80	192
WELL 0108	597425.496	1493665.094	688.89	199
WELL 0108 GRD			686.08	200
WELL 0111	598381.238	1497145.059	779.64	507
WELL 0111 BM			778.88	508
WELL 0111 GRD			778.16	509
WELL 0112	598384.846	1496927.331	774.46	501
WELL 0112 BM			773.61	502
WELL 0112 GRD			772.90	503
WELL 0113	599493.596	1496328.980	873.92	610
WELL 0113 BM			874.68	611
WELL 0113 PVMT			874.66	612
WELL 0114	599026.277	1496005.615	872.76	600
WELL 0114 BM			873.30	601
WELL 0114 GRD			873.23	602
WELL 0115	599012.965	1496016.467	872.92	606
WELL 0115 BM			873.48	608
WELL 0115 GRD			873.35	609
WELL 0115 RIM			873.60	607
WELL 0116	599018.001	1496011.998	872.28	603
WELL 0116 BM			873.33	604
WELL 0116 GRD			873.23	605
WELL 0117	598484.556	1496177.282	802.44	563
WELL 0117 BM			801.65	566
WELL 0117 GRD			801.24	567
WELL 0118	600498.398	1496148.605	705.56	323
WELL 0118 GRD			705.95	324
WELL 0119	597954.683	1496260.489	742.03	486
WELL 0119 BM			741.35	487
WELL 0119 GRD			740.82	488
WELL 0120	598536.005	1496159.007	821.65	559
WELL 0120 BM			820.93	560
WELL 0120 GRD			820.47	561

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0121	598410.174	1498203.669	888.12	472
WELL 0121 BM			886.96	473
WELL 0121 GRD			886.35	474
WELL 0122	598047.849	1495637.045	742.97	525
WELL 0122 BM			741.96	526
WELL 0122 GRD			741.00	527
WELL 0123	597882.042	1495158.013	705.72	176
WELL 0123 BM			704.77	177
WELL 0123 GRD			704.20	178
WELL 0124	597756.564	1495123.075	705.77	179
WELL 0124 BM			704.79	180
WELL 0124 GRD			704.13	181
WELL 0125	597730.750	1495800.531	722.09	469
WELL 0125 BM			721.22	470
WELL 0125 GRD			720.65	471
WELL 0126	597570.619	1495112.139	706.20	161
WELL 0126 BM			705.24	162
WELL 0126 GRD			704.66	163
WELL 0127	597528.113	1494327.894	694.74	182
WELL 0127 BM			693.48	183
WELL 0127 GRD			692.78	184
WELL 0128	597517.166	1494329.214	694.28	185
WELL 0128 BM			692.99	186
WELL 0128 GRD			692.49	187
WELL 0129	597247.875	1495077.210	700.11	300
WELL 0129 BM			700.85	301
WELL 0129 GRD			700.75	302
WELL 0130	596871.394	1494074.600	692.68	115
WELL 0130 BM			693.60	116
WELL 0130 GRD			693.60	117
WELL 0137	597748.407	1495482.034	724.28	449
WELL 0137 GRD			722.12	450
WELL 0138	600091.561	1495733.918	698.45	320
WELL 0138 BM			699.33	321
WELL 0138 GRD			699.20	322
WELL 0151	597684.636	1495955.909	741.23	480
WELL 0151 BM			739.54	481
WELL 0151 GRD			738.72	482
WELL 0152	597397.326	1495365.855	705.56	435
WELL 0152 BM			704.12	436
WELL 0152 GRD			703.47	437
WELL 0153	597103.471	1495363.703	704.72	366
WELL 0153 BM			703.11	367
WELL 0153 GRD			702.47	368
WELL 0154	596829.821	1495381.265	703.29	401
WELL 0154 BM			702.42	402
WELL 0154 GRD			701.78	403
WELL 0156	596595.075	1494958.724	690.53	153
WELL 0156 BM			691.39	154
WELL 0156 GRD			691.41	155

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0157	596584.787	1494959.786	690.93	147
WELL 0157 BM			691.61	148
WELL 0157 GRD			691.51	149
WELL 0158	594448.857	1495687.447	702.68	633
WELL 0158 BM			701.51	635
WELL 0158 GRD			700.90	636
WELL 0159	594450.257	1494580.142	689.64	100
WELL 0159 GRD			690.39	101
WELL 0160	594460.831	1494579.005	690.02	102
WELL 0160 GRD			690.46	103
WELL 0301	598282.994	1494590.951	693.10	307
WELL 0301 BM			693.63	308
WELL 0301 GRD			693.61	309
WELL 0302	597510.657	1494334.267	691.58	188
WELL 0302 BM			692.43	189
WELL 0302 GRD			692.47	190
WELL 0303	597545.613	1494905.898	695.40	164
WELL 0303 GRD			695.74	165
WELL 0304	596590.642	1494958.322	690.70	150
WELL 0304 BM			691.41	151
WELL 0304 GRD			691.34	152
WELL 0305	596905.101	1495495.340	710.48	395
WELL 0305 BM			709.21	396
WELL 0305 GRD			708.46	397
WELL 0306	597084.367	1495362.740	704.75	360
WELL 0306 BM			703.18	361
WELL 0306 GRD			702.56	362
WELL 0307	597259.962	1495435.830	716.78	433
WELL 0307 BM			715.24	434
WELL 0308	597058.058	1495634.767	750.98	381
WELL 0308 BM			749.48	382
WELL 0308 GRD			748.36	383
WELL 0309	596914.793	1495509.165	710.88	392
WELL 0309 BM			709.36	393
WELL 0309 GRD			708.89	394
WELL 0310	597094.233	1495363.166	704.28	363
WELL 0310 BM			703.10	364
WELL 0310 GRD			702.43	365
WELL 0311	598283.568	1494598.768	693.60	303
WELL 0311 BM			694.09	305
WELL 0311 GRD			694.04	306
WELL 0312	598158.530	1495443.903	731.92	545
WELL 0312 BM			730.52	546
WELL 0312 GRD			729.89	547
WELL 0313	597261.457	1495433.163	716.74	430
WELL 0313 BM			715.30	431
WELL 0313 GRD			714.65	432
WELL 0314	597825.043	1496124.545	743.33	483
WELL 0314 BM			742.14	484
WELL 0314 GRD			741.62	485

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0315	597752.735	1495490.680	724.65	446
WELL 0315 BM			723.25	447
WELL 0315 GRD			722.43	448
WELL 0316	597521.252	1495795.800	725.73	463
WELL 0316 BM			724.22	464
WELL 0316 GRD			723.46	465
WELL 0317	596618.483	1495434.212	704.22	572
WELL 0317 BM			703.15	573
WELL 0317 GRD			702.35	574
WELL 0318	599054.539	1497627.445	811.15	513
WELL 0318 BM			809.89	514
WELL 0318 GRD			808.82	515
WELL 0319	595924.017	1495558.641	702.06	594
WELL 0319 BM			700.85	595
WELL 0319 GRD			700.29	596
WELL 0320	595433.928	1495764.200	704.90	617
WELL 0320 BM			703.74	618
WELL 0320 GRD			703.01	619
WELL 0322	599275.712	1497612.697	810.46	516
WELL 0322 BM			809.24	517
WELL 0322 GRD			808.69	518
WELL 0323	598351.937	1496002.956	784.50	676
WELL 0323 GRD			784.97	677
WELL 0324	598337.292	1496112.879	783.54	678
WELL 0324 GRD			783.72	679
WELL 0325	597681.355	1496981.829	797.74	552
WELL 0325 BM			796.38	553
WELL 0325 GRD			795.81	554
WELL 0326	597775.745	1497501.930	876.43	350
WELL 0326 BM			875.33	351
WELL 0326 GRD			874.37	352
WELL 0327	602098.054	1495581.268	697.17	337
WELL 0327 GRD			697.54	338
WELL 0328	602105.689	1495580.750	697.42	339
WELL 0328 GRD			697.50	340
WELL 0329	601641.759	1496827.015	706.36	329
WELL 0329 GRD			706.80	330
WELL 0330	601640.528	1496835.471	706.28	331
WELL 0330 GRD			706.82	332
WELL 0332	599915.798	1497859.165	792.73	519
WELL 0332 PVMT			793.17	520
WELL 0333	600957.530	1495265.773	698.40	333
WELL 0333 GRD			699.19	334
WELL 0334	600951.156	1495263.966	699.12	335
WELL 0334 GRD			699.35	336
WELL 0335	599255.148	1495237.708	704.28	318
WELL 0335 GRD			704.77	319
WELL 0336	600790.559	1496615.187	708.88	325
WELL 0336 GRD			709.08	326
WELL 0337	600782.928	1496614.839	708.59	327

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0337 GRD			708.95	328
WELL 0340	598061.838	1495135.815	705.02	172
WELL 0340 GRD			705.12	173
WELL 0341	598061.317	1495140.677	704.84	174
WELL 0341 GRD			705.25	175
WELL 0342	596579.890	1494961.768	691.20	145
WELL 0342 GRD			691.34	146
WELL 0343	597551.116	1494897.413	695.42	166
WELL 0343 GRD			695.55	167
WELL 0344	595933.239	1495556.553	701.83	591
WELL 0344 BM			700.97	592
WELL 0344 GRD			700.23	593
WELL 0345	598036.214	1496907.709	754.94	491
WELL 0345 BM			753.50	492
WELL 0345 GRD			752.65	493
WELL 0346	598037.589	1496518.513	743.54	494
WELL 0346 PVMT			744.16	495
WELL 0347	597785.993	1495504.407	725.84	451
WELL 0347 BM			724.39	452
WELL 0347 GRD			723.74	453
WELL 0348 INNER CASING	599500.608	1496209.606	875.54	613
WELL 0348 OUTER CASING			876.13	614
WELL 0348 GRD			875.24	615
WELL 0349 INNER CASING	598474.117	1496472.362	823.82	556
WELL 0349 OUTER CASING			824.85	557
WELL 0349 GRD			823.88	558
WELL 0350 INNER CASING	596848.800	1497460.287	887.35	357
WELL 0350 OUTER CASING			887.56	358
WELL 0350 GRD			886.25	359
WELL 0351	596844.112	1497460.535	887.13	354
WELL 0351 BM			886.48	355
WELL 0351 GRD			885.74	356
WELL 0352 INNER CASING	597001.390	1495857.256	737.30	413
WELL 0352 OUTER CASING			738.39	414
WELL 0352 BM			737.72	415
WELL 0352 GRD			737.01	416
WELL 0353	596652.843	1496079.724	745.92	420
WELL 0353 GRD			743.80	421
WELL 0354	596013.157	1496732.360	769.86	568
WELL 0354 BM			767.96	569
WELL 0354 GRD			766.80	570
WELL 0355 INNER CASING	597685.400	1496992.126	795.66	549
WELL 0355 OUTER CASING			796.71	550
WELL 0355 GRD			795.84	551
WELL 0356	595422.791	1495764.005	705.09	620
WELL 0356 BM			703.64	621
WELL 0356 GRD			702.92	622
WELL 0370	597240.666	1495512.338	719.13	428
WELL 0370 BM			717.08	429
WELL 0371	597113.184	1495435.984	708.12	371

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0371 BM			706.30	372
WELL 0372	597104.763	1495742.615	755.31	404
WELL 0372 BM			753.78	405
WELL 0373	597101.615	1495540.037	739.35	378
WELL 0373 BM			737.86	379
WELL 0373 GRD			737.62	380
WELL 0374	596970.330	1495534.977	706.95	384
WELL 0374 BM			705.48	385
WELL 0374 GRD			705.04	386
WELL 0375	597485.079	1495392.144	706.10	438
WELL 0375 BM			704.61	439
WELL 0375 GRD			704.05	440
WELL 0376	597107.866	1495172.378	700.74	137
WELL 0376 BM			699.64	138
WELL 0376 GRD			699.04	139
WELL 0377	596933.397	1495186.510	699.87	128
WELL 0377 BM			698.93	129
WELL 0377 GRD			698.25	130
WELL 0378	596787.801	1495201.406	700.46	126
WELL 0378 BM			698.91	127
WELL 0379	597590.645	1495565.695	716.91	457
WELL 0379 BM			715.81	458
WELL 0379 GRD			715.23	459
WELL 0380	597520.575	1495806.112	725.95	466
WELL 0380 BM			724.37	467
WELL 0380 GRD			723.87	468
WELL 0381	597393.071	1495811.210	726.70	460
WELL 0381 BM			724.90	461
WELL 0381 GRD			724.11	462
WELL 0382	597012.685	1495855.686	739.35	410
WELL 0382 BM			737.77	411
WELL 0382 GRD			737.10	412
WELL 0383	597549.421	1494889.310	695.05	168
WELL 0383 GRD			695.24	169
BORING 0384 PVMT	598804.230	1497328.637	801.87	675
WELL 0385	598039.221	1495387.260	723.73	543
WELL 0385 GRD			724.46	544
WELL 0386	597756.170	1495365.571	725.42	541
WELL 0386 GRD			725.67	542
WELL 0387	597621.491	1495309.324	721.55	535
WELL 0387 GRD			721.67	536
WELL 0388	597204.472	1495159.555	701.73	140
WELL 0388 BM			699.89	141
WELL 0388 GRD			699.20	142
WELL 0389	597748.412	1495361.416	725.29	539
WELL 0389 GRD			725.51	540
WELL 0390	597740.648	1495357.853	725.22	537
WELL 0390 GRD			725.39	538
WELL 0392	597615.838	1495308.045	721.50	533

DESCRIPTION POINT NO.	NORTHING(Y)	EASTING(X)	ELEVATION	FIELD SURVEY
WELL 0392 GRD			721.64	534
WELL 0393	597105.596	1495436.467	707.50	373
WELL 0393 BM			706.20	374
WELL 0393 GRD			705.64	375
WELL 0394	596900.588	1495414.910	703.93	398
WELL 0394 BM			702.91	399
WELL 0394 GRD			702.23	400
WELL 0395	598843.473	1497281.246	801.79	511
WELL 0395 PVMT			802.10	512
BORING 0396 GRD	597070.633	1493770.351	688.42	674

ER PROGRAM

MOUND PLANT

Miamisburg, Ohio

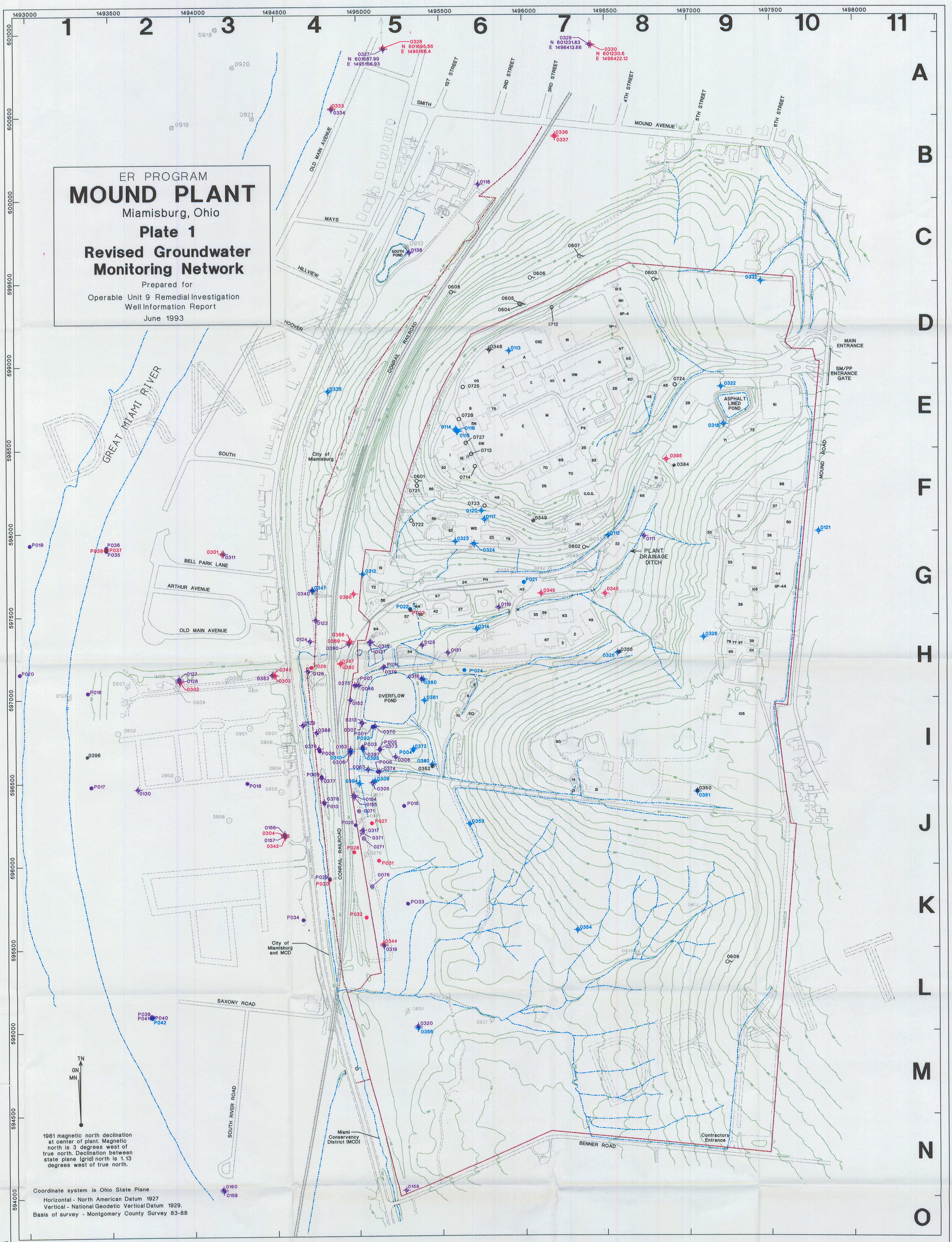
Plate 1

Revised Groundwater Monitoring Network

Prepared for

Operable Unit 9 Remedial Investigation
Well Information Report

June 1993



- Structures
- Paved roadway
- Unpaved roadway
- Railroad
- Water course
- Fence
- Retaining wall
- Mound Plant boundary
- Property boundary
- Contour line
- 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
- Piezometers
- Borehole
- Existing well completed in Upper Buried Valley aquifer
- Existing well completed in Lower Buried Valley aquifer
- Existing well completed in Bedrock
- Piezometer compleated in Upper Buried Valley aquifer
- Piezometer completed in Lower Buried Valley aquifer
- Piezometer completed in Bedrock
- Estimated well location

NOTES:

1. The electronic base map data file was obtained by WESTON from Woolpert Consultants, Inc., Dayton, Ohio. The data were photogrammetrically complied 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.

4. New monitoring wells and piezometers and the older existing ER Program monitoring wells were resurveyed in reference to control monuments established by the National Geodetic Survey. Horizontal coordinates were established in the North American Datum of 1983 (NAD 83) and transformed into NAD 27 using a program called NADCON. Because discrepancies were noted between the reported and measured Mound Plant monuments, a second transformation of the data to conform to the plant coordinates was necessary.

5. Older unused monitoring wells and piezometers, domestic wells, municipal and plant production wells were not resurveyed. The location coordinates of these wells and piezometers remain unchanged from previously published ER Program maps.

Contour interval 10 ft.

0 100 200 400 600 800 1000

Scale in Feet

WESTON

MANAGERS DESIGNERS/CONSULTANTS

J:\DGN\MOUND\M0825.DGN 060993