November 15, 2006

Mr. Mike McCann
U.S. Nuclear Regulatory Commission
Region III
2443 Warrenville Road
Suite 210
Lisle, IL 60532-4352

Battelle
The Business of Innovation
505 King Avenue
Columbus, Ohio 43201-2693
(614) 424-6424 Fax (614) 424-5263

Dear Mr. McCann:

Subject: Summary Results of Installation and Sampling of Additional Groundwater Monitoring Wells at the Battelle West Jefferson North Site

Battelle has completed the installation and sampling of twenty-two (22) additional groundwater monitoring wells at the West Jefferson North Site. The wells were installed and sampled in accordance with the plan prepared by Battelle titled "West Jefferson North Facility: Monitoring Well Cluster Location Plan" dated August 2006, its associated statement of work to the drilling contractor, and BCLDP environmental monitoring procedures. This work was conducted from early August through mid October 2006. The purpose for the installation of the twenty-two (22) additional groundwater monitoring wells was to obtain the additional data on the status of any potential radiological contamination in the three water bearing units caused by research activities. The total number of wells installed by site water bearing unit include a total of five (5) 885 msl wells, nine (9) 855 msl wells, and eight (8) 805 msl wells. All of the wells installed outside of the restricted area fence are in a down gradient direction from the restricted area of the West Jefferson North Site. Attached is Figure 1 which shows the locations of the additional wells at the West Jefferson North Site.

All of the additional groundwater monitoring wells were developed by a contractor staff geologist prior to radiological sampling. Battelle staff collected samples from the additional wells using existing BCLDP environmental monitoring procedures. The well installation and development summary titled "Groundwater Monitoring Well Installations at Battelle West Jefferson North Site, West Jefferson, Ohio" dated October 30, 2006 prepared by the drilling contractor for Battelle is presented as Attachment 1. The individual samples collected from each well were sent to a radiochemistry lab certified by USEPA for drinking water standard analyses. The samples were analyzed for:

- Wells located inside the restricted area fence (identified as clusters 2, 3, 4): gross alpha/beta, gamma spectroscopy, Sr-90, and alpha spectroscopy.
- Wells located outside the restricted area fence (identified as clusters 5, 6, 7, 8, and 9): gross alpha/beta, gamma spectroscopy, and Sr-90 analysis.

Results of the radiological analyses are presented in the attached Table 1. In almost every case the collected sample results meet the USEPA Maximum Contaminant Levels (MCL) for radionuclides in drinking water when compared to the alpha particle and beta particle/ photon emitter standards. It is noted by Battelle that two of the 885 msl groundwater monitoring wells have sample results of interest. The results for well #4-885 have elevated gross beta activity and uranium isotope activity. However the gamma spectroscopy analysis for this sample also shows natural radioactivity lines at levels greater than three times the gamma spectroscopy results for any other well inside the restricted area fence and is comparable with the gross beta result for #4-885. The well #4-885 sample was also noted to have a large amount of suspended soil fines compared to the other collected samples. The twenty-two (22) collected samples were not filtered prior to acidification/preservation as per established site procedure. The acidification/preservation combined with the large amount of suspended fines is believed to have resulted in the elevated levels of natural radioactivity. The well #8-885 gross alpha result is just above the drinking water standard. All other results for the #8-885 sample met beta particle/photon emitter standards and were considered at natural radioactivity levels for the site.

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CONCLUSIONS

Battelle is now satisfied through the performance of this work that there is no radiological contamination of any concern on the Battelle property in the three water bearing groundwater units. The shallow groundwater layer called the Bog Area Ground Water Layer was discussed in detail in our letter dated May 23, 2006 to the NRC which details the hydrogeology, remedial action history of surface soils, and evaluation of source term and is not considered to be of any future concern to Battelle. In consideration of the results of the radiological sampling of the twenty-two (22) wells, Battelle has revisited the document titled "West Jefferson North Site Dose Assessment" dated July 2006 Section 4.0 Site Groundwater Model to determine if there is a need to modify our ratio assumptions between gross beta and Sr-90. This review determined that the ratio assumptions used in the site dose assessment were conservative. In the interest of maintaining the conservative factors built into the dose model document while still demonstrating that we meet 25 mRem/year all pathways, Battelle will not be modifying the "West Jefferson North Site Dose Assessment' which was originally submitted to NRC on July 17, 2006.

If you have any questions or comments concerning this information please do not hesitate to call me at 614-424-4098.

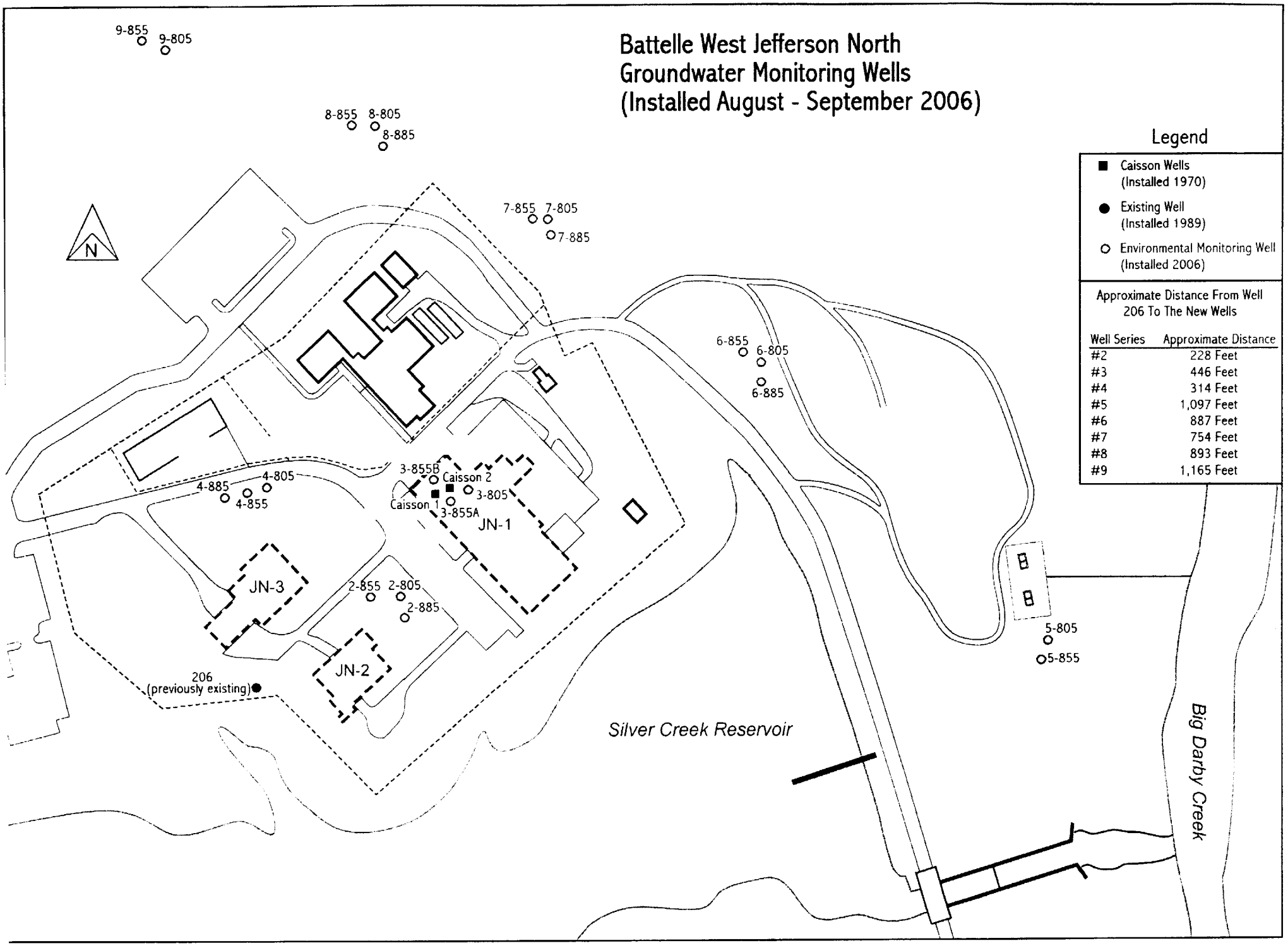
Sincerely,

Joe Jacobsen
BCLDP Radiation Safety Officer

Attachments: as stated (3)

Cc: Jon Peckenpaugh US NRC

FIGURE 1


Battelle West Jefferson North
Groundwater Monitoring Wells
(Installed August - September 2006)
Legend
Caisson Wells
(Installed 1970)
Existing Well
(Installed 1989)
Environmental Monitoring Well
(Installed 2006)
Approximate Distance From Well 206 To The New Wells
Well Series | Approximate Distance
#2 | 228 Feet
#3 | 446 Feet
#4 | 314 Feet
#5 | 1,097 Feet
#6 | 887 Feet
#7 | 754 Feet
#8 | 893 Feet
#9 | 1,165 Feet
N
9-855
9-805
8-855
8-805
8-885
7-855
7-805
7-885
6-855
6-805
6-885
3-855B
Caisson 2
3-805
Caisson 1
3-855A
JN-1
4-885
4-805
4-855
JN-3
2-855
2-805
2-885
JN-2
206
(previously existing)
5-805
5-855
Silver Creek Reservoir
Big Darby Creek

ATTACHMENT 1

Groundwater Monitoring Well Installations at Battelle West Jefferson North Site, West Jefferson, Ohio

For

Battelle
505 King Avenue
Columbus, Ohio 43201-2693

PREPARED BY:

BOWSER MORNER®

Oct. 30 2006
Report Number
138455-1006-292

Groundwater Monitoring Well Installations at the Battelle West Jefferson North Site West Jefferson, Ohio

For

Battelle
505 King Avenue
Columbus, Ohio 43201-2693

Report No. 138455-1006-292

October 30, 2006

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4518 Taylorsville Road • P.O. Box 51 • Dayton, Ohio 45401 • 937/236-8805

ENVIRONMENTAL REPORT

REPORT TO: Battelle
505 King Avenue
Columbus, Ohio 43201-2593

Attn: Mr. Patrick Weaver

REPORT DATE: October 30, 2006

REPORT NO: 138455-1006-292

REPORT ON: Groundwater Monitoring Well Installations at the Battelle West Jefferson North Site in West Jefferson, Ohio.

1.0 BACKGROUND INFORMATION

The Battelle West Jefferson facility is located at 1425 Plain City-Georgesville Road in West Jefferson, Ohio. The facility is located approximately one-half mile west of Big Darby Creek.

The glacial geology of the site is predominantly till deposits consisting of a mixture of clay and silt with lesser amounts of sand, gravel, and cobbles. The till has been described as having a very low hydraulic conductivity. However, intervals of relatively higher conductivity sand and silt layers have been encountered in previous borings made at the facility at approximate elevations of 805, 855, and 885 feet above mean sea level. These sand layers are commonly referred to by Battelle personnel as the "885 sand," "855 sand," and "basal sand" (given the occurrence of the 805 sand layer directly above the limestone bedrock).

The purpose for installing additional groundwater monitoring wells is reportedly to investigate the potential of any off-site migration of groundwater contaminants, if present. The above-referenced sand zones have been identified by Battelle as possible off-site migration pathways. Groundwater monitoring wells were, therefore, installed at the appointed locations to monitor these individual sand layers on site.

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2.0 WORK PERFORMED

Eight clusters of groundwater monitoring wells, for a total of 22 individual wells, were installed on site at areas designated by Battelle. The well locations are depicted on the Boring Location Plan included in **Appendix A**. With the exception of Locations 3, 5, and 9, each well cluster included three wells monitoring each of the three above-referenced sand intervals. Only wells monitoring the 855 and 805 sand zones were installed at Locations 5 and 9 given that the surface elevation at Location 5 is below 885 feet, and no significant sand zone was encountered at this upper elevation at Location 9. In addition, no well monitoring the 885 sand zone was installed at Location 3 due to the fact that soils at this location had reportedly been disturbed to at least this depth. However, two wells monitoring the 855 sand unit were installed at this location as directed by Battelle.

Battelle personnel were on site throughout the project to monitor field activities, including soil sampling and well installation/development procedures.

3.0 FIELD PROCEDURES

3.1 BORINGS AND SAMPLING

Between August 7 and September 19, 2006, twenty-five borings were advanced on site in areas designated by Battelle personnel. Because no significant water-bearing zones were encountered at Location 1 at the approximate elevations of 885 and 855 feet, no wells were installed in this area. Where significant water-bearing sand zones were encountered at these approximate elevations at the remaining 8 locations, wells screened to monitor these units ranged in depth from approximately 20 to 32 feet and 20 to 70 feet, respectively.

Similar to the 885 sand unit, the basal sand unit did not appear to be continuous across the north part of the Battelle site. Wells monitoring the 805 sand zone at Locations 3, 7, 8, and 9 range in depth from approximately 87.5 to 107 feet. Because no basal sand unit was encountered above bedrock at Locations 2, 4, 5, and 6, Battelle

personnel approved placing the well screen across the interface between the glacial till and weathered limestone bedrock. These wells ranged in depth from approximately 80 and 95 feet.

The boreholes were made with a Versa-Sonic drill rig. Sonic technology uses high frequency mechanical oscillations to transmit resonant vibrations and rotary power through the drill tooling to the drill bit, allowing the production of continuous core samples to be generated. A dual line of drill pipe is used, with the 4-inch diameter core barrel(s) being attached to the inner string of drill rods. After advancing the inner core barrel, the outer 6-inch diameter drill casing was advanced to the same depth. The outer casing was then left in place to hold the borehole open so that the core barrel could be removed from the hole to retrieve the samples, as necessary. Once the borehole was advanced to the desired depth, the borehole was over-drilled with 8-inch diameter drill casing. Enlarging the diameter of the borehole allowed for subsequent installation of the monitoring well at each location. As directed by Battelle, drill fluids generated from this drilling process were pumped directly onto the ground.

In order to establish the approximate depths at which each of the sand units to be monitored were situated, the deeper basal sand borehole was advanced first at each sampling location. These borings were continuously sampled beginning at the ground surface. Because sampling of some of the initial locations revealed such variability in thicknesses, lateral extent, and/or depths at which the three above-described permeable zones were encountered in the borings (even within the same sampling location area) Battelle personnel approved of collecting confirmatory samples from the 885 and/or 855 borings at each sampling location to ensure the well screens were placed at the correct depth.

Also as approved by Battelle personnel, samples for geotechnical analysis were generally collected only from the permeable sand units as encountered in the 805 sand boreholes. If the permeable material encountered in the confirmatory samples collected from the 885 and 855 sand boreholes was noted to be more or less extensive or vary significantly from that noted in the deeper borehole, samples for testing purposes were

collected from the sand unit encountered in the shallower borings. It should also be noted that, due to the variability in elevations and/or vertical/lateral extent of the sand units and as approved by on-site Battelle personnel, samples were not necessarily collected from the 10-foot intervals (i.e. 20 to 30 feet, 50 to 60 feet, and bottom 10 feet once sand is encountered) as specified in the Battelle work plan.

The depths where the core samples were collected and a detailed description of the materials that were encountered in the boreholes are noted on the boring and well construction logs included in **Appendix B**. In addition, Bowser-Morner completed an Ohio Department of Natural Resources (ODNR) Well Log and Drilling Report for each of the groundwater monitoring wells installed on site. As required by law, appropriate copies of the reports have been submitted to the state agency. For documentation purposes, copies of those forms have also been included in **Appendix C** of this report.

Individual core samples were collected at 10-foot intervals from the boreholes. The core samples were visually classified and logged by a Bowser-Morner geologist. Samples were then selectively collected at approximate one-foot intervals from the cores to be submitted to the Bowser-Morner Construction Materials Laboratory for geotechnical testing (see Section 4.0).

The drilling rig and associated drilling and sampling equipment were decontaminated using high-pressure steam prior to the on set of drilling and between each borehole. Decontamination of the equipment was performed to avoid cross-contamination between sampling locations.

3.2 WELL CONSTRUCTION AND DEVELOPMENT

The borings (1-855, 1-885, and 9-885) where no significant water-bearing zones were encountered were filled with bentonite chips and/or bentonite-cement grout upon completion. The remaining borings were converted into groundwater monitoring wells. Each well installation began by inserting a new four-inch diameter Schedule 40 PVC screen and riser pipe through the casing in the boring. The bottom of the pipe was placed in the bottom of the boring or on top of sand that may have been used to backfill the

borehole to bring the bottom of the screen up to the desired depth. The bottom approximately 5 to 10 feet of the pipe in the wells was screened. As specified by Battelle, the screen slot width is 0.01 inches. It should be noted that a two-inch diameter PVC riser pipe and well screen were used for Well No. 3-855-B. During advancement of the 6-inch drill casing at this well location, fill containing pieces of large-diameter rebar was encountered at a depth of approximately 45 feet. Despite numerous attempts, the 8-inch drill casing could not be advanced as deep as the 6-inch drill casing, which was advanced to a depth of 60 feet. Therefore, Battelle approved setting a two-inch diameter well at this location.

Sand (No. 3) was poured around the PVC pipe, between the outside of the pipe and the inside of the casing. This sand pack extended from the bottom of the boring to at least two feet above the top of the screen. A minimum of two feet of bentonite chips was placed on top of the sand pack. The chips were hydrated as necessary causing them to swell to form an impermeable layer. Bentonite, cement, and water were mixed in the field; the resulting grout was then poured on top of the pellets around the PVC pipe to the top of the ground surface. A locking, steel guard pipe was placed on top of each well and secured by ensuring that the pipe was pushed into the grout. A sloped concrete pad was constructed around each well. The construction logs of the monitoring wells are included on the boring logs in **Appendix B**.

Development of the monitoring wells was conducted between August 16 and September 21, 2006. Development procedures followed for each well were as follows:

1) The well was checked with a depth probe to determine the depth to water and total depth. The well volume was then calculated using these values.

2) In order to remove any sediment that had accumulated in the bottom of the well and along the screened interval, the well was repeatedly surged during the development process using a submersible pump.

3) Each well was pumped until water quality parameters measured in the field (i.e. pH, temperature, specific conductance) had stabilized and/or until the well was pumped dry. This process was repeated as necessary on some of the wells that were slow to recharge.

Water quality readings, the approximate purge volume, and other pertinent information were recorded on a Well Development Form at the time of development. Copies of the Well Development Forms are included in **Appendix D**.

As directed by Battelle, fluids generated during well development activities were discharged directly onto the ground.

3.3 WELL SURVEYING

Following installation of the wells, the location and elevation of the wells were surveyed. The surface and top-of-casing elevations for each well, along with latitude and longitude readings, were measured using Global Positioning System (GPS) equipment (Thales ProMark3 GPS units). The well elevations and coordinates are summarized in Table 1 following this report.

3.4 IN-SITE HYDRAULIC TESTING

Following development of the groundwater monitoring wells set in the 855 sand and basal sand units, hydraulic (slug) conductivity tests were performed in order to estimate the hydraulic conductivity of these zones. At the request of Battelle, no in-situ hydraulic conductivity testing was conducted on the 885 sand wells.

The in-situ hydraulic conductivity tests were performed by creating an abrupt change in the water level within each well using a PVC slug (1-5/8-inches in diameter by 3 feet long) and pressure transducer. The test began by inserting the pressure transducer into the well. Once the water level had returned to its original static level, the slug was lowered into the water column and left in place until the water level again reached equilibrium (rising head test). When the water level had stabilized, the test was repeated by rapidly removing the slug (falling head test). Water level measurements monitored by the pressure transducer were recorded by a Mini-Troll data logger. A minimum of two slug tests were performed at each well location.

This data was then analyzed using both the Bouwer and Rice (1976, 1989) method for slug tests in unconfined aquifers and the Hvorslev (1951) method for slug tests in

confined aquifer conditions. The results of the in-situ hydraulic conductivity testing for the 855 and basal sand wells, which are depicted as an average of all tests conducted per monitoring interval at each well location, are summarized in Table 2 following this report.

4.0 SAMPLE ANALYSES

As previously discussed, selected soil samples collected from the boreholes were submitted to the Bowser-Morner Construction Materials Laboratory for grain-size analysis by ASTM D 422 – "Particle Size Analysis of Soils." Given the amount of fine-grained material in the samples, Battelle approved using this alternate laboratory method over that originally called for in the work plan (ASTM C 117 and C 136). In addition, as directed by Battelle, a hydrometer analysis was performed on samples visually containing a considerable amount of fine-grained particles in order to distinguish silt from clay-size particles.

The results of the grain-size analyses have been summarized in Table 3 located at the end of this report. Actual copies of the laboratory reports are included in **Appendix E.**

Thank you for selecting Bowser-Morner, Inc. for this project. Your business is appreciated, and we look forward to working with you again soon. In the meantime, if you have any questions or if we can help you in any way, please let us know.

Sincerely,
BOWSER-MORNER ASSOCIATES, INC.

Dawn M. Coleman

Dawn M. Coleman
Geologist III

DMC /ebw
3-Client
3-File

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TABLES

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TABLE 1
MONITORING WELL ELEVATIONS AND COORDINATES

Well Location	Ground Elevations (ft)	Top of Casing (TOC) Elevations (ft)	Local Coordinate System, Well #206 - Benchmark (0,0 Coordinates)		Latitude	Longitude
			Northing (ft)	Easting (ft)		
#2-805	911.96	913.53	83.72	212.71	39° 58' 01.06713" N	83° 15' 00.89062" W
#2-855	912.07	913.81	93.36	200.42	39° 58' 01.16244" N	83° 15' 01.04838" W
#2-885	911.66	913.24	63.45	201.34	39° 58' 00.86687" N	83° 15' 01.03652" W
#3-805	909.27	911.26	270.99	354.43	39° 58' 02.91774" N	83° 14' 59.07042" W
#3-855A	908.85	910.66	252.37	348.60	39° 58' 02.73369" N	83° 14' 59.14526" W
#3-855B	909.80	912.04	293.53	298.21	39° 58' 03.14048" N	83° 14' 59.79249" W
#4-805	912.70	914.53	298.75	99.32	39° 58' 03.19209" N	83° 15' 02.34675" W
$4-855	912.39	914.11	297.84	85.14	39° 58' 03.18309" N	83° 15' 02.52889" W
#4-885	912.02	914.14	295.66	70.39	39° 58' 03.16158" N	83° 15' 02.71840" W
#5-805	866.38	868.30	12.99	1106.98	39° 58' 00.36798" N	83° 14' 49.40545" W
#5-855	866.56	868.87	16.24	1096.40	39° 58' 00.40003" N	83° 14' 49.54139" W
#6-805	891.02	893.11	447.05	769.02	39° 58' 04.65748" N	83° 14' 53.74578" W
#6-855	890.74	892.66	433.23	774.24	39° 58' 04.52092" N	83° 14' 53.67867" W
#6-885	890.76	892.71	418.63	781.49	39° 58' 04.37661" N	83° 14' 53.58555" W
#7-805	905.70	907.74	618.86	430.75	39° 58' 06.35541" N	83° 14' 58.09016" W
#7-855	905.61	907.39	624.15	422.96	39° 58' 06.40766" N	83° 14' 58.19014" W
#7-885	906.00	907.68	609.59	433.86	39° 58' 06.26375" N	83° 14' 58.05022" W
#8-805	902.83	904.63	872.22	195.16	39° 58' 08.85912" N	83° 15' 01.11589" W
#8-855	902.75	904.80	874.70	179.54	39° 58' 08.88364" N	83° 15' 01.31642" W
#8-885	902.45	904.35	864.73	204.45	39° 58' 08.78507" N	83° 15' 00.99660" W
#9-805	908.25	910.05	1160.77	100.05	39° 58' 11.71058" N	83° 15' 02.33741" W
#9-855	908.27	909.99	1173.99	92.07	39° 58' 11.84117" N	83° 15' 02.43992" W

TABLE 2
Summary of In-Situ Hydraulic Conductivity Tests

Well Identification	Bouwer and Rice Method Result*	Hvorslev Method Result*
#2-855	2.70×10^{-3} cm/sec	3.61×10^{-3} cm/sec
#2-805	4.75×10^{-5} cm/sec	6.53×10^{-5} cm/sec
#3-855-A	7.03×10^{-5} cm/sec	9.52×10^{-5} cm/sec
#3-855-B	5.81×10^{-6} cm/sec	1.01×10^{-5} cm/sec
#3-805	8.80×10^{-6} cm/sec	1.53×10^{-5} cm/sec
#4-855	4.14×10^{-6} cm/sec	5.59×10^{-6} cm/sec
#4-805	5.61×10^{-5} cm/sec	8.24×10^{-5} cm/sec
#5-855	4.23×10^{-4} cm/sec	6.15×10^{-4} cm/sec
#5-805	5.17×10^{-5} cm/sec	9.23×10^{-5} cm/sec
#6-855	3.66×10^{-4} cm/sec	4.99×10^{-4} cm/sec
#6-805	1.91×10^{-4} cm/sec	2.61×10^{-4} cm/sec
#7-855	1.45×10^{-4} cm/sec	1.66×10^{-4} cm/sec
#7-805	1.75×10^{-4} cm/sec	1.29×10^{-4} cm/sec
#8-855	1.19×10^{-4} cm/sec	1.36×10^{-4} cm/sec
#8-805	1.65×10^{-4} cm/sec	2.26×10^{-4} cm/sec
#9-855	8.17×10^{-6} cm/sec	1.24×10^{-5} cm/sec
#9-805	1.28×10^{-4} cm/sec	1.80×10^{-4} cm/sec

* Result is an average of all in-situ hydraulic conductivity tests conducted at that well.

TABLE 3
GRAIN SIZE DISTRIBUTION
ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing								
	#2-885 1F-1 23.5'-24.5'	#2-885 1F-2 24.5'-25.5'	#2-885 1F-3 25.5'-26.5'	#2-885 1F-4 26.5'-27.5'	#2-885 1F-5 27.5'-28.5'	#2-855 2F-1 64.0'-65.0'	#2-855 2F-2 65.0'-66.0'	#2-855 2F-3 66.0'-67.0'	#2-855 2F-4 67.0'-68.0'
2.5 in.								100	
2.0 in.						100.0		88.6	
1.5 in.						81.5	100.0	79.9	
1 in.					100.0	78.9	92.0	79.9	100.0
0.75 in.	100.0	100.0	100.0	100.0	98.1	76.0	85.9	73.6	98.6
0.5 in.	99.3	99.6	98.4	98.0	96.1	70.9	78.9	64.4	93.1
0.375 in.	98.2	98.4	96.7	96.8	94.7	68.4	73.2	60.8	88.9
#4	94.2	93.5	91.6	90.5	88.3	61.0	63.0	53.1	81.3
#10	87.3	85.7	83.2	81.2	75.5	54.0	54.0	45.9	74.3
#20	77.3	74.1	74.8	74.9	66.1	43.4	42.9	35.1	64.2
#40	66.7	60.0	62.8	66.8	55.8	32.6	33.0	24.8	51.3
#60	57.6	46.5	49.4	57.4	46.5	25.8	27.4	20.2	39.3
#100	48.0	34.2	35.2	44.4	36.5	20.9	23.7	17.1	28.8
#200	35.9	26.7	25.9	29.6	27.9	17.1	20.6	14.4	21.2
Gravel, %	5.8	6.5	8.4	9.5	11.7	39.0	37.0	46.9	18.7
Sand, %	58.3	66.8	65.7	60.9	60.4	43.9	42.4	38.7	60.1
Silt, %	30.6	22.4	20.9	26.3	24.4	12.1	15.4	11.7	15.0
Clay (<0.002mm),%	5.3	4.3	5.0	3.3	3.5	5.0	5.2	2.7	6.2

TABLE 3
GRAIN SIZE DISTRIBUTION
ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing								
	#2-855 2F-5 68.0'-69.0'	#2-855 2F-6 69.0'-70.0'	#2-805 9F-1 86.0'-87.0'	#2-805 9F-2 87.0'-88.0'	#2-805 9F-3 88.0'-89.0'	#3-805 6F-1 50.0'-51.0'	#3-805 6F-2 51.0'-52.0'	#3-805 6F-3 52.0'-53.0'	#3-805 6F-4 53.0'-54.0'
3.5 in.					100.0				
3.0 in.					68.7				
2.5 in.					68.7				
2.0 in.	100.0	100.0		100	68.7				
1.5 in.	95.7	94.0		88.6	61.3				100.0
1 in.	89.9	89.2		88.6	57.7				96.4
0.75 in.	86.6	83.9		85.6	57.7	100.0			91.0
0.5 in.	81.0	74.1		80.4	52.5	99.5	100.0	100.0	83.2
0.375 in.	77.2	68.5		76.3	50.3	97.7	99.5	98.8	79.1
#4	67.2	55.8		68.9	45.5	87.7	97.9	95.6	63.7
#10	58.2	44.4	100.0	61.9	41.0	66.0	91.0	84.2	44.6
#20	46.2	28.6	98.1	52.6	36.1	35.2	80.9	65.0	27.2
#40	36.7	18.2	96.7	48.3	33.6	19.5	60.4	35.7	12.9
#60	32.5	15.0	95.4	46.7	32.4	12.1	35.3	21.8	6.2
#100	29.7	13.3	93.8	45.7	31.5	8.6	15.2	15.2	3.7
#200	27.6	12.3	93.1	44.8	31.2	7.6	8.2	11.9	3.2
Gravel, %	34.8	44.2	0.0	31.1	23.2	12.3	2.1	4.4	36.3
Sand, %	39.6	42.6	6.9	24.1	14.3	80.1	89.7	83.7	60.5
Silt, %	21.9	9.5	30.6	34.5	24.2	3.6	4.7	8.6	2.3
Clay (<0.002mm),%	5.7	2.8	62.5	10.3	7.0	4.0	3.5	3.3	0.9

TABLE 3
GRAIN SIZE DISTRIBUTION
ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing								
	#3-805 6F-5 54.0'-55.0'	#3-805 6F-6 55.0'-56.0'	#3-805 6F-7 56.0'-57.0'	#3-805 6F-8 57.0'-58.0'	#3-805 6F-9 58.0'-59.0'	#3-805 6F-10 59.0'-60.0'	#3-805 9F-1 81.5'-82.5'	#3-805 9F-2 82.5'-83.5'	#3-805 9F-3 83.5'-85.0'
1 in.		100.0			100.0	100.0			
0.75 in.		98.0	100.0	100.0	98.8	98.5		100.0	
0.5 in.	100.0	96.6	99.6	99.6	97.3	95.4		99.5	
0.375 in.	98.9	95.1	99.2	99.6	96.3	93.9	100.0	99.5	100.0
#4	95.8	89.9	97.1	98.4	86.6	85.8	99.9	99.3	99.7
#10	76.5	69.1	91.5	93.1	66.3	70.8	99.8	99.1	99.6
#20	44.7	33.5	71.3	83.3	34.7	49.8	99.2	98.8	99.5
#40	25.7	20.1	36.3	69.0	23.4	28.7	94.8	95.6	97.5
#60	13.5	13.1	21.1	38.9	16.9	15.3	58.1	57.6	82.6
#100	9.2	9.6	14.9	17.6	12.3	10.3	20.5	23.2	30.1
#200	8.0	8.5	11.6	11.7	9.9	8.0	16.0	14.3	13.0
Gravel, %	4.2	10.1	2.9	1.6	13.4	14.2	0.1	0.7	0.3
Sand, %	87.8	81.4	85.5	86.7	76.7	77.8	83.9	85.0	86.7
Silt, %	6.5	5.8	9.0	8.1	6.0	5.2	10.8	10.2	10.7
Clay (<0.002mm),%	1.5	2.7	2.6	3.6	3.9	2.8	5.2	4.1	2.3

TABLE 3

GRAIN SIZE DISTRIBUTION

ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing								
	#4-885 1F-1 30.0'-31.0'	#4-805 6F-1 59.0'-60.0'	#4-805 7F-1 60.0'-61.0'	#4-805 7F-2 61.0'-61.5'	#4-805 9F-1 80.0'-81.0'	#4-805 9F-2 81.0'-81.5'	#5-805 2F-1 17.0'-18.0'	#5-805 2F-2 18.0'-19.0'	#5-805 8F-1 74.0'-75.0'
2.0 in.							100.0	100.0	
1.5 in.		100.0					85.1	92.1	100.0
1 in.		90.5					60.2	86.2	81.8
0.75 in.		87.8		100.0	100.0	100.0	51.8	77.7	81.8
0.5 in.	100.0	84.3		99.5	99.0	99.5	45.0	67.1	81.3
0.375 in.	99.5	82.8	100.0	99.5	98.2	99.5	43.2	61.2	79.2
#4	97.0	71.1	99.0	97.9	95.8	99.1	37.6	53.0	76.0
#10	90.3	56.0	95.0	92.5	92.3	98.7	33.3	45.7	72.1
#20	82.6	41.2	91.0	88.1	89.6	97.4	26.5	37.0	67.6
#40	76.3	33.5	85.4	82.7	84.3	93.6	21.8	31.5	64.7
#60	70.8	27.0	72.1	70.0	75.6	82.4	18.7	28.0	63.1
#100	64.7	19.2	42.2	40.6	61.3	57.9	16.8	25.6	61.5
#200	57.6	15.3	17.1	20.6	33.7	36.6	15.7	23.0	60.6
Gravel, %	3.0	28.9	1.0	2.1	4.2	0.9	62.4	47.0	24.0
Sand, %	39.4	55.8	81.9	77.3	62.1	62.5	21.9	30.0	15.4
Silt, %	41.4	11.6	14.5	17.6	27.9	30.2	13.3	19.4	18.1
Clay (<0.002mm),%	16.2	3.7	2.6	3.0	5.8	6.4	2.4	3.6	42.5

TABLE 3

GRAIN SIZE DISTRIBUTION

ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing								
	#5-805 8F-2 75.0'-76.0'	#5-805 8F-3 76.0'-77.0'	#6-885 2F-1 18.0'-19.0'	#6-885 2F-2 19.0'-20.0'	#6-855 2F-1 30.0'-31.0'	#6-855 2F-2 31.0'-32.0'	#6-855 2F-3 32.0'-33.0'	#6-855 2F-5 38.0'-39.0'	#6-805 10F-1 91.0'-92.0'
1.5 in.	100.0	100.0							
1 in.	83.8	96.0					100.0		
0.75 in.	74.4	93.3	100.0				98.8		100.0
0.5 in.	62.6	89.6	96.9			100.0	98.6		99.0
0.375 in.	58.3	83.8	91.8	100.0		99.8	98.1	100.0	97.8
#4	49.7	73.8	80.4	98.1	100.0	99.6	97.2	99.9	96.1
#10	42.6	65.3	69.6	95.9	99.5	99.3	93.1	99.7	93.8
#20	33.2	58.7	59.7	91.9	98.1	95.9	71.9	99.5	92.6
#40	30.3	55.0	50.8	86.7	93.6	80.7	43.8	99.1	91.8
#60	29.4	53.1	44.4	81.7	77.5	56.1	24.7	93.3	90.7
#100	28.8	51.7	33.8	73.6	53.8	40.0	18.7	54.3	89.0
#200	28.3	51.1	23.8	63.0	36.7				
Gravel, %	50.3	26.2	19.6	1.9	0.0	0.2	1.9	0.0	2.2
Sand, %	21.4	22.7	56.6	35.1	63.3	59.8	79.4	45.7	8.8
Silt, %	14.0	39.9	19.6	55.3	26.7	30.3	14.6	50.1	21.1
Clay (<0.002mm),%	14.3	11.2	4.2	7.7	10.0	9.7	4.1	4.2	67.9

TABLE 3

GRAIN SIZE DISTRIBUTION

ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing							
	#6-805 10F-2 92.0'-93.0'	#7-885 1F-1 28.0'-29.0'	#7-855 1F-1 51.0'-51.5'	#7-855 1F-2 56.5'-57.0'	#7-855 1F-3 58.0'-58.5'	#7-855 1F-4 59.5'-60.0'	#7-805 9F-1 86.0'-87.0'	#7-805 9F-2 87.0'-88.0'
1.5 in.	100.0							
1 in.	81.2			100.0				
0.75 in.	68.7		100.0	97.7				
0.5 in.	63.3	100.0	94.8	95.5	100.0			
0.375 in.	60.5	99.5	91.5	95.2	99.0	100.0		
#4	55.5	97.3	86.1	91.1	96.7	99.1		
#10	51.6	93.3	79.7	80.8	92.6	97.2		
#20	46.9	89.1	73.9	70.0	85.5	95.7	100.0	100.0
#40	44.9	85.7	64.4	44.6	69.6	94.0	99.9	99.9
#60	44.0	75.1	51.3	15.7	38.5	91.4	94.4	94.1
#100	43.1	50.9	27.8	8.5	26.3	83.1	69.7	65.7
#200	41.5	31.3	18.2	7.0	18.0	39.1	34.5	38.3
Gravel, %	44.5	2.7	13.9	8.9	3.3	0.9	0.0	0.0
Sand, %	14.0	66.0	67.9	84.1	78.7	60.0	65.5	61.7
Silt, %	36.3	24.0	12.0	6.3	12.6	35.4	25.3	28.5
Clay (<0.002mm),%	5.2	7.3	6.2	0.7	5.4	3.7	9.2	9.8

TABLE 3

GRAIN SIZE DISTRIBUTION

ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification: Percent Passing							
	#7-805 9F-3 88.0'-89.0'	#7-805 9F-4 89.0'-90.0'	#7-805 10F-1 90.0'-91.0'	#7-805 10F-2 93.0'-94.0'	#7-805 10F-3 94.0'-95.0'	#8-885 3F-1 26.0'-27.0'	#8-805 4F-1 39.0'-40.0'	#8-805 5F-1 40.0'-41.0'
1.5 in.				100.0				100.0
1 in.				95.5			100.0	86.9
0.75 in.				87.9	100.0		88.0	81.9
0.5 in.			100.0	82.1	93.7	100.0	86.1	66.6
0.375 in.			99.6	75.6	85.9	99.7	81.6	56.0
#4			99.1	60.5	73.3	99.2	63.3	43.3
#10			98.5	48.5	54.4	98.0	43.6	31.6
#20	100.0	100.0	96.0	43.6	43.2	96.3	27.5	16.3
#40	99.9	99.9	69.5	39.0	34.5	94.3	18.2	8.9
#60	95.3	95.3	28.6	34.3	24.6	91.6	13.0	6.2
#100	66.3	63.8	10.6	24.1	17.2	87.9	10.7	4.7
#200	35.6	29.1	8.6	15.1	9.2	80.3	9.9	3.9
Gravel, %	0.0	0.0	0.9	39.5	26.7	0.8	36.7	56.7
Sand, %	64.4	70.9	90.5	45.4	64.1	18.9	53.4	39.4
Silt, %	27.5	21.2	6.7	13.2	7.6	72.2	7.6	1.9
Clay (<0.002mm),%	8.1	7.9	1.9	1.9	1.6	8.1	2.3	2.0

TABLE 3
GRAIN SIZE DISTRIBUTION
ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing							
	#8-805 5F-2 41.0'-42.0'	#8-805 5F-3 42.0'-43.0'	#8-805 10F-1 92.0'-93.0'	#9-805 5F-1 42.0'-43.0'	#9-805 5F-2 43.0'-44.0'	#9-805 5F-3 44.0'-45.0'	#9-805 10F-1 97.0'-98.0'	#9-805 10F-2 98.0'-99.0'
2.0 in.				100.0				
1.5 in.	100.0			77.2	100.0		100.0	
1 in.	95.9		100.0	66.8	94.1		95.5	
0.75 in.	95.9	100.0	98.4	65.4	88.9	100.0	95.5	100.0
0.5 in.	93.4	97.1	97.5	57.5	79.5	99.5	88.9	98.9
0.375 in.	91.9	94.3	97.3	52.1	75.7	98.9	87.5	98.6
#4	87.5	73.5	92.1	39.0	61.7	84.8	79.8	97.5
#10	75.3	55.9	77.0	28.6	46.5	57.9	62.2	94.6
#20	53.4	47.9	52.1	21.1	30.5	43.2	39.4	90.0
#40	44.0	40.5	26.3	15.3	19.6	22.6	27.1	82.9
#60	38.6	33.9	15.7	12.1	15.3	8.7	20.8	72.5
#100	31.6	26.8	11.8	9.7	13.3	6.2	16.8	51.6
#200	25.0	19.7	9.8	7.7	11.8	5.7	13.6	28.8
Gravel, %	12.5	26.5	0.9	61.0	38.3	15.2	20.2	2.5
Sand, %	62.5	53.8	90.5	31.3	49.9	79.1	66.2	68.7
Silt, %	20.2	16.7	6.7	6.0	7.8	3.6	8.4	19.8
Clay (<0.002mm),%	4.8	3.0	1.9	1.7	4.0	2.1	5.2	9.0

TABLE 3
GRAIN SIZE DISTRIBUTION
ASTM D 422, "Particle Size Analysis of Soils"

Screen Size	Sample Identification Percent Passing				
	#9-805 10F-3 99.0'-100.0'	#9-805 11F-1 102.0'-103.0'	#9-805 11F-2 103.0'-104.0'	#9-805 11F-3 104.0'-105.0'	#9-805 11F-3 105.0'-106.0'
2.0 in.					
1.5 in.			100.0	100.0	
1 in.		100.0	94.1	96.4	100.0
0.75 in.	100.0	97.9	92.4	96.4	95.8
0.5 in.	98.8	93.9	87.8	91.3	91.5
0.375 in.	98.2	90.1	83.7	86.7	88.3
#4	94.3	80.3	73.2	75.4	76.4
#10	85.5	67.2	59.2	60.8	59.7
#20	68.7	50.3	43.3	45.2	46.3
#40	49.0	27.6	27.1	30.4	31.9
#60	32.1	13.0	13.8	18.1	17.9
#100	19.6	7.2	6.7	11.2	10.2
#200	14.9	5.5	5.3	7.9	8.1
Gravel, %	5.7	19.7	26.8	24.6	23.6
Sand, %	79.4	74.8	67.9	67.5	68.3
Silt, %	11.7	2.0	2.8	5.0	5.9
Clay (<0.002mm),%	3.2	3.5	2.5	2.9	2.2

APPENDIX A

BORING/MONITORING WELL LOCATION PLAN

BOWSER MORNER®

#9-855
#9-805
#9-885

#8-855
#8-805
#8-885

#7-855
#7-805
#7-885

#6-805
#6-855
#6-885

JN4

#4-885
#4-855
#4-805

#3-855B
#3-805
#3-855A

JN1

JN3

#2-855
#2-805
#2-885

#1-855
#1-885

JN2

#5-855
#5-805

Silver Creek Reservoir

Big Darby Creek

LEGEND

- Monitoring Wells
- Boring Location Only

N

BORING / MONITORING WELL LOCATION PLAN

Groundwater Monitoring Well Installations
at Battelle West Jefferson North Site
West Jefferson, Ohio
Client: Battelle

10-06/SR

PROJECT NO. 138455
APPROX. SCALE 1"=200'
FIGURE NO.

BOWSER MORNER.
4518 Taylorsville Road
Dayton, Ohio 45424
Ph 937-236-8805
Fax 937-233-2016

APPENDIX B

BORING

AND

WELL CONSTRUCTION LOGS

BOWSER MORNER®

CLIENT **Battelle**	JOB NO. **138455**	
PROJECT **West Jefferson North Site**	BORING STARTED **8/8/06** / BORING COMPLETED **8/9/06**	**1-885** Boring No.
	DRILLER **DS, DS** / METHOD **SONIC**	**Sheet 1 of 1**
	TYPED BY **hgw**	

WELL LOCATION
LAT. LONG.

TOP OF CASING ELEVATION

BORING LOCATION
See Boring Location Plan

COMMENTS
No well set at this location because no significant groundwater was encountered

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)
0							Brown clayey SILT with sand, trace gravel - damp	0
5	1F							5
10								10
15	2F						Gray sandy SILT, trace gravel - damp	15
20							Gray silty SAND - slightly wet	20
25	3F						Gray sandy SILT, trace gravel - damp	25
30							Bottom of borehole at 30.0 feet.	30

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	None	
AT COMPLETION		
AFTER HRS.		

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — SOIL PROBE
- E — AUGER CUTTINGS
- F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER®

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT **Battelle**	JOB NO. **138455**		
PROJECT **West Jefferson North Site**	BORING STARTED **8/7/06**	BORING COMPLETED **8/8/06**	**1-855** Boring No.
	DRILLER **DS**	METHOD **SONIC**	**Sheet 1 of 2**
	TYPED BY **hgw**		

WELL LOCATION
LAT. LONG.

TOP OF CASING ELEVATION

BORING LOCATION
See Boring Location Plan

COMMENTS
No well set at this location because no significant groundwater was encountered

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)
0							Brown silty CLAY, trace gravel - moist	0
5	1F							5
10								10
15	2F						Gray clayey SILT, trace gravel - damp	15
20								20
25	3F							25
30							Gray fine to medium silty SAND - damp	30
35	4F						Gray clayey SILT, some sand, trace gravel - damp	35
40								40
45	5F							45

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	None	
AT COMPLETION		
AFTER HRS.		

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — SOIL PROBE
- E — AUGER CUTTINGS
- F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT	JOB NO.		
Battelle	**138455**		
PROJECT	BORING STARTED **8/7/06**	BORING COMPLETED **8/8/06**	**1-855** Boring No.
West Jefferson North Site	DRILLER **DS**	METHOD **SONIC**	**Sheet 2 of 2**
	TYPED BY **hgw**		

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)
55	6F						Gray sandy SILT, some clay, trace gravel and cobbles - damp	55
60	7F							60
65							Brown silty CLAY, trace gravel and sand - damp	65
70							Bottom of borehole at 70.0 feet.	70

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT **Battelle**	JOB NO. **138455**		
PROJECT **West Jefferson North Site**	BORING STARTED **8/17/06**	BORING COMPLETED **8/18/06**	**2-885** Boring No.
	DRILLER **BK, RW**	METHOD **SONIC**	**Sheet 1 of 1**
	TYPED BY **hgw**		

WELL LOCATION
LAT. **39°58.00.87"N** LONG **83°15'01.04"W**

TOP OF CASING ELEVATION
913.24

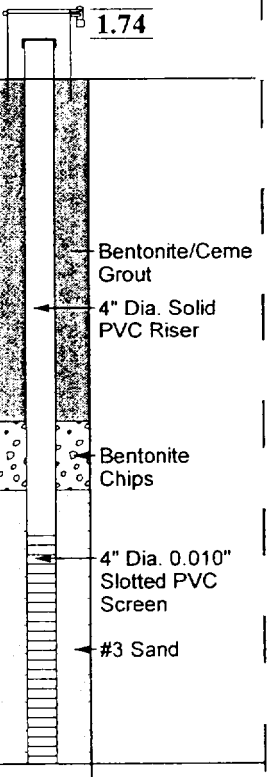
BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 20 feet without sampling
20	1F 1F-1 1F-2 1F-3 1F-4 1F-5						Gray clayey SILT, some sand, trace gravel - moist ▽ Gray fine to medium silty SAND, trace gravel - moist to wet Gray clayey SILT, some sand, trace gravel - moist
30							Bottom of borehole at 30.0 feet.

WELL DIAGRAM



WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	23.5 ▽	8/17/2006
AT COMPLETION	NT ▽	
AFTER HRS.	▽	

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER®

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/27/06

CLIENT	JOB NO.		
Battelle	**138455**		
PROJECT	BORING STARTED **8/18/06**	BORING COMPLETED **8/18/06**	**2-855** Boring No.
West Jefferson North Site	DRILLER **DS, DS**	METHOD **SONIC**	**Sheet 1 of 2**
	TYPED BY **hgw**		

WELL LOCATION
LAT. **39°58'01.16"N** LONG **83°15'01.05"W**

TOP OF CASING ELEVATION
913.81

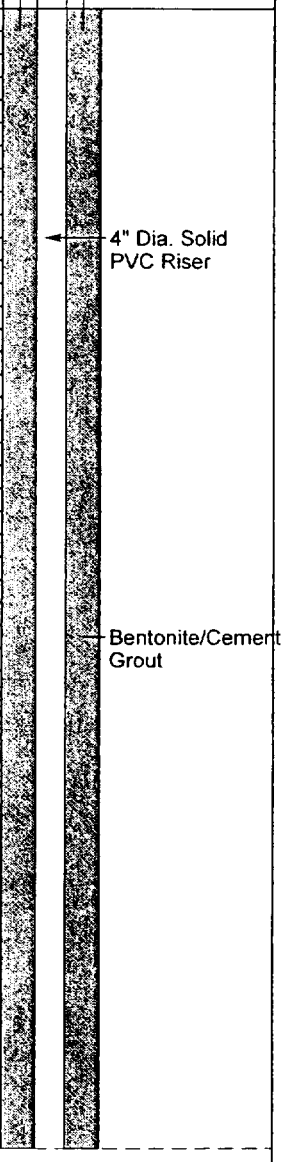
BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 50 feet without sampling
5							
10							
15							
20							
25							
30							
35							
40							
45							

WELL DIAGRAM



Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	64.0	8/18/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER

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CLIENT
Battelle

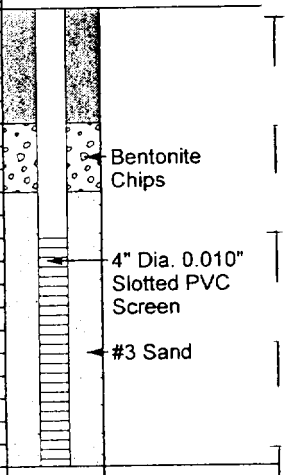
PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **8/18/06**
BORING COMPLETED **8/18/06**
DRILLER **DS, DS**
METHOD **SONIC**
TYPED BY **hgw**

2-855
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	1F						Gray clayey SILT, some sand, trace gravel - moist
60							(Intervals of fine silty sand to 62')
	2F						
65	2F-1						Brown fine to medium coarse silty SAND with small to medium gravel - wet
	2F-2						
	2F-3						
	2F-4						
	2F-5						(Increase in gravel at ~69')
70	2F-6						Bottom of borehole at 70.0 feet.



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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/7/06**	BORING COMPLETED: **8/15/06**	**2-805** Boring No.
	DRILLER: **BK, RW, SM**	METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'01.07"N** LONG. **83°15'00.89"W**

TOP OF CASING ELEVATION
913.53

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0	1F						Brown mottled with gray silty CLAY and sand, some gravel - moist (Pieces of concrete at 1.0')
5							(Becomes brown at 7.0')
10	2F						
15							Gray-brown to gray clayey SILT with sand, some gravel - moist to damp
20	3F-1						(Intervals of fine to medium gray-brown silty sand with gravel and clay at 20' to 21.5')
	3F-2						
	3F-3						
	3F-4						
25	3F-5						
	3F-6						
	3F-7						
	3F-8						
	3F-9						
30	3F-10						▽
	4F						Gray-brown to gray sandy SILT with gravel - damp
35							
40							
	5F						
45							

WELL DIAGRAM
1.57
4" Dia. Solid PVC Riser
Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH		DATE
INITIAL	30.0	▽	8/8/2006
AT COMPLETION	NT	▽	
AFTER HRS.		▽	

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **8/7/06**

BORING COMPLETED **8/15/06**

DRILLER **BK, RW, SM**

METHOD **SONIC**

TYPED BY **hgw**

2-805
Boring No.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	6F-1 6F-2 6F-3 6F-4 6F-5 6F-6						Gray-brown to gray sandy SILT with gravel - damp *(continued)*
	6F-7 6F-8 6F-9						Gray-brown fine to medium silty SAND - wet
60	6F-10						(Intervals of clay)
	7F						
65							Gray brown sandy SILT with gravel - dry
70							Reddish brown silty CLAY with gravel, some sand, trace cobble - damp
	8F						
75							
80							
	9F						
85							
	9F-1 9F-2 9F-3						Weathered LIMESTONE (Refusal at 89.0') Bottom of borehole at 89.0 feet.

DEPTH (ft. BGL)	WELL DIAGRAM
55	
60	
65	
70	
75	
80	Bentonite Chips
85	4" Dia. 0.010" Slotted PVC Screen #3 Sand

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CLIENT: **Battelle**	JOB NO.: **138455**	
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/11/06** / BORING COMPLETED: **8/14/06**	**3-855A** Boring No.
	DRILLER: **DS, DS** / METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**	

WELL LOCATION
LAT. **39°58'02.73"N** LONG **83°14'59.15"W**

TOP OF CASING ELEVATION
910.66

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 40' without sampling
40	1F						Gray sandy SILT, some clay, trace gravel alternating with gray silty sand - moist

WELL DIAGRAM

1.81

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Bentonite Chips

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	50.0	8/14/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **8/11/06**

BORING COMPLETED **8/14/06**

DRILLER **DS, DS**

METHOD **SONIC**

TYPED BY **hgw**

3-855A
Boring No.

Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)	WELL DIAGRAM
55	2F						Gray poorly graded SAND with gravel, trace silt - wet	55	#3 Sand 4" Dia. 0.010" Slotted PVC Screen
60							Bottom of borehole at 60.0 feet.	60	

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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/21/06**	BORING COMPLETED: **8/22/06**	**3-855B** Boring No.
	DRILLER: **DS**	METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'03.14"N** LONG. **83°14'59.79"W**

TOP OF CASING ELEVATION
912.04

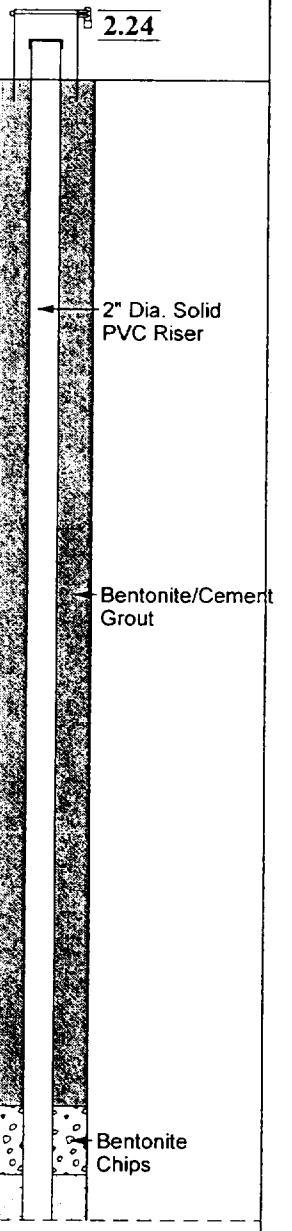
BORING LOCATION
See Boring Location Plan

COMMENTS
Unable to advance 8-inch drill casing below 45 feet due to subsurface obstruction. Therefore, a 2-inch diameter well was installed.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 50.0' without sampling
45							(Encountered pieces of concrete and rebar at 45')

WELL DIAGRAM



Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	51.5	8/22/2006
AT COMPLETION	NT	
AFTER HRS.		

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — SOIL PROBE
- E — AUGER CUTTINGS
- F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **8/21/06**

BORING COMPLETED **8/22/06**

DRILLER **DS**

METHOD **SONIC**

TYPED BY **hgw**

3-855B
Boring No.

Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)	WELL DIAGRAM
							Drilled down to 50.0' without sampling *(continued)* ▽		
							Gray clayey SILT, some sand, trace gravel - damp		
	1F						Gray fine silty SAND grading to medium sand with gravel - wet		#3 Sand
55								55	2" Dia. 0.010" Slotted PVC Screen
							Gray clayey SILT, some sand, trace gravel - damp		
60							Bottom of borehole at 60.0 feet.	60	

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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/9/06**	BORING COMPLETED: **8/11/06**	**3-805** Boring No.
	DRILLER: **DS, DS**	METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'02.92"N** LONG **83°14'59.07"W**

TOP OF CASING ELEVATION
911.26

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Brown sandy CLAY, some gravel, trace cobbles - damp
5	1F						
10							Gray sandy SILT, tracy gravel - moist
15	2F						
20							
25	3F						(Cobble at 23.0'-23.2')
30							
35	4F						
40							Gray fine to medium silty SAND - wet (fine to medium grained)
45	5F						Gray sandy SILT, some clay, trace gravel - moist
							(Less sand and clay at 47.0' to 47.3')

WELL DIAGRAM

1.99

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	38.5	8/9/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT	JOB NO.		
Battelle	**138455**		
PROJECT	BORING STARTED **8/9/06**	BORING COMPLETED **8/11/06**	**3-805** Boring No.
West Jefferson North Site	DRILLER **DS, DS**	METHOD **SONIC**	**Sheet 2 of 2**
	TYPED BY **hgw**		

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)	WELL DIAGRAM
	6F-1						Gray poorly graded silty SAND with gravel, trace cobbles - wet *(continued)*		
	6F-2								
	6F-3								
	6F-4								
55	6F-5							55	
	6F-6								
	6F-7								
	6F-8								
	6F-9								
60	6F-10						(More fine grained sand at 60'-62')	60	
	7F-1								
	7F-2								
	7F-3								
	7F-4								
65	7F-5							65	
	7F-6								
	7F-7								
	7F-8								
	7F-9						(Intervals of sandy silt, some clay at 68.5'-69')		
70	7F-10							70	
	8F								
75							Gray to brown sandy SILT - moist	75	Bentonite Chips
							(Oxidized zone at 76.0')		
80								80	
	9F-1						Gray fine silty SAND - wet		#3 Sand
	9F-2								
85	9F-3						Gray sandy SILT with limestone fragments - damp (Becomes brown at 86.0')	85	4" Dia. 0.010" Slotted PVC Screen
							Weathered LIMESTONE (Refusal at 87.5')		
							Bottom of borehole at 87.5 feet.		

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/17/06**	BORING COMPLETED: **8/17/06**	**4-885** Boring No.
	DRILLER: **DS, DS**	METHOD: **SONIC**	**Sheet 1 of 1**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'03.16"N** LONG **83°15'02.72"W**

TOP OF CASING ELEVATION
914.14

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 30 feet without sampling
30	1F-1						Gray sandy SILT, some clay, trace gravel - damp (Gravelly zone at 30.5' - 31.0' - very moist to wet)
	1F						
40							Bottom of borehole at 40.0 feet.

WELL DIAGRAM

2.12

- 4" Dia. Solid PVC Riser
- Bentonite/Cement Grout
- Bentonite Chips
- 4" Dia. 0.010" Slotted PVC Screen
- #3 Sand
- Bentonite Chips

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	30.5	8/17/2006
AT COMPLETION	NT	
AFTER HRS.		

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — SOIL PROBE
- E — AUGER CUTTINGS
- F — SONIC

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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/16/06**	BORING COMPLETED: **8/17/06**	**4-855** Boring No.
	DRILLER: **DS, DS**	METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'03.18"N** LONG **83°15'02.53"W**

TOP OF CASING ELEVATION
914.11

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 50.0' without sampling.
5							
10							
15							
20							
25							
30							
35							
40							
45							

WELL DIAGRAM

DEPTH (ft. BGL)	
0	1.72
10	4" Dia. Solid PVC Riser
25	Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	59.5	8/16/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

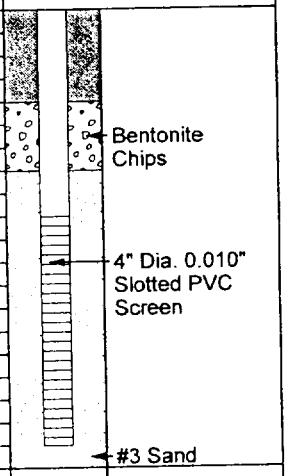
JOB NO.
138455

PROJECT
West Jefferson North Site

BORING STARTED **8/16/06**
BORING COMPLETED **8/17/06**
DRILLER **DS, DS**
METHOD **SONIC**
TYPED BY **hgw**

4-855
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	1F						Gray sandy SILT, trace clay and gravel - damp
60							Gray silty fine to medium grained SAND with gravel, trace cobble - wet
	2F						Gray sandy SILT, some clay, trace gravel - damp
65							Gray fine silty SAND - moist to wet
70							Bottom of borehole at 70.0 feet.



WELL DIAGRAM

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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/14/06**	BORING COMPLETED: **8/16/06**	**4-805** Boring No.
	DRILLER: **DS, DS**	METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'03.19"N** LONG **83°15'02.35"W**

TOP OF CASING ELEVATION
914.53

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE / RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0	1F					Brown sandy SILT, some clay, trace gravel and cobble - damp
5						
10	2F					Gray sandy SILT, some clay, trace gravel - damp
15						
20	3F					
25						
30	4F					
35						(Gray sandy silt, some gravel - wet from 37'-38.5')
40						(Becomes moist at 38.5')
45	5F					

WELL DIAGRAM

DEPTH (ft. BGL)	
0	1.83
10	4" Dia. Solid PVC Riser
35	Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	37.0	8/14/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **8/14/06**
BORING COMPLETED **8/16/06**
DRILLER **DS, DS**
METHOD **SONIC**
TYPED BY **hgw**

4-805
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	6F						Gray sandy SILT, some clay, trace gravel - damp *(continued)*
60	6F-1 7F-1 7F-2						Gray fine to medium silty SAND, some gravel - wet
65	7F						Gray sandy SILT, trace gravel - damp
70	8F						
75							
80	9F-1						Gray fine silty SAND - slightly wet
	9F-2						Gray sandy SILT, trace gravel - damp
85	10F						
90	11F						
95							Gray fine silty SAND - moist
							Gray sandy SILT, some gravel - damp
100							Weathered LIMESTONE - damp to dry
105	12F						
110							Bottom of borehole at 110.0 feet.

WELL DIAGRAM

- Bentonite Chips
- 4" Dia. 0.010" Slotted PVC Screen
- #3 Sand
- Bentonite Chips

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CLIENT: **Battelle**	JOB NO.: **138455**	
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/30/06** — BORING COMPLETED: **9/1/06**	**5-855** Boring No.
	DRILLER: **BK** — METHOD: **SONIC**	**Sheet 1 of 1**
	TYPED BY: **hgw**	

WELL LOCATION
LAT. **39°58'00.40"N** LONG **83°14'49.54"W**

TOP OF CASING ELEVATION
868.87

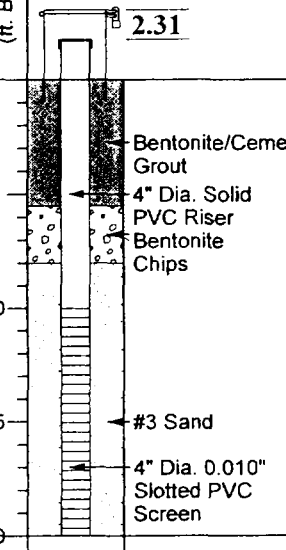
BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Brown silty CLAY, some sand, with gravel - moist
5	1F						Dark gray silty CLAY, some sand and gravel with organics - moist
10							Brown sily GRAVEL with sand, some clay - very moist to wet ▽
15	2F						
							Brown clayey SILT, some sand, and gravel - moist
20							Gray silty CLAY, some sand - moist
							Bottom of borehole at 20.0 feet.

WELL DIAGRAM



WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	10.0 ▽	8/30/2006
AT COMPLETION	NT ▽	
AFTER HRS.	▽	

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER

GINT Report Used: BATTELLE Report No: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/27/06

CLIENT: **Battelle**	JOB NO.: **138455**	
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/22/06** / BORING COMPLETED: **8/24/06**	**5-805** Boring No.
	DRILLER: **DS** / METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**	

WELL LOCATION
LAT. **39°58'00.37"N** LONG **83°14'49.41"W**

TOP OF CASING ELEVATION
868.30

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE / RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0	1F					Brown silty CLAY, some sand, with gravel - moist
5						Dark gray silty CLAY, some sand and gravel with organics - moist
10	2F					Brown silty GRAVEL with sand, some clay - wet
15						
	2F-1					
	2F-2					
20						Brown to gray -brown clayey SILT, some sand, trace gravel - moist
	3F					Reddish-brown silty CLAY, some gravel, trace sand and cobbles - moist
25						
30	4F					
35						(Cobble zone and wet at 36'-38.5')
40	5F					
45						(Transitions to brown to gray-brown at 45')

WELL DIAGRAM: 1.92 — 4" Dia. Solid PVC Riser — Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	10.0	8/22/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **8/22/06**
BORING COMPLETED **8/24/06**
DRILLER **DS**
METHOD **SONIC**
TYPED BY **hgw**

5-805
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)	WELL DIAGRAM
							Reddish-brown silty CLAY, some gravel, trace sand and cobbles - moist *(continued)*		
	6F								
55							Gray silty CLAY - moist	55	
60								60	
	7F								
65							Dark brown silty CLAY, trace sand and gravel - moist	65	Bentonite Chips
70							(Gravel increases with depth)	70	4" Dia. 0.010" Slotted PVC Screen
	8F								
75	8F-1							75	#3 Sand
	8F-2						Weathered LIMESTONE		
	8F-3								
80							Bottom of borehole at 80.0 feet.	80	

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT **Battelle**	JOB NO. **138455**		
PROJECT **West Jefferson North Site**	BORING STARTED **8/31/06**	BORING COMPLETED **8/31/06**	**6-885** Boring No.
	DRILLER **DS**	METHOD **SONIC**	**Sheet 1 of 1**
	TYPED BY **hgw**		

WELL LOCATION
LAT. **39°58'04.38"N** LONG. **83°14'53.59"W**

TOP OF CASING ELEVATION
892.71

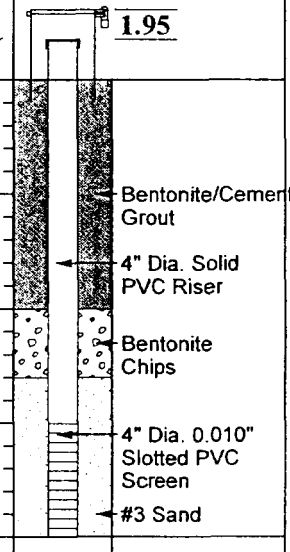
BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Bown silty CLAY with sand - wet
	1F						
5							Brown clayey SILT, some sand, trace gravel - moist
10							
	2F						Gray clayey SILT, some sand, trace gravel - moist
15							
	2F-1						Gray fine to medium silty SAND with gravel - very moist to wet
20	2F-2						Gray sandy SILT with intervals of medium sand - very moist to wet
							Bottom of borehole at 20.0 feet.

WELL DIAGRAM



WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	18.0	8/31/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **8/30/06**	BORING COMPLETED: **8/30/06**	**6-855** Boring No.
	DRILLER: **DS**	METHOD: **SONIC**	**Sheet 1 of 1**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'04.52"N** LONG **83°14'53.68"W**

TOP OF CASING ELEVATION
892.66

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 20' before sampling
20	1F						Gray clayey SILT, some sand, trace gravel - moist (3" fine silty sand seam at 24')
30	2F-1 2F-2 2F-3						(4" fine silty sand seam at 29.8') Gray SILT with fine sand grading to fine silty sand - very moist Gray clayey SILT, some sand, trace gravel - moist
35	2F-4 2F-5						Gray SILT with fine sand - very moist to wet Gray clayey SILT, some sand, trace gravel - moist
40							Bottom of borehole at 40.0 feet.

WELL DIAGRAM

1.92

- 4" Dia. Solid PVC Riser
- Bentonite/Cement Grout
- Bentonite Chips
- 4" Dia. 0.010" Slotted PVC Screen
- #3 Sand

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	37.0	8/30/2006
AT COMPLETION	NT	
AFTER HRS.		

- A — SPLIT SPOON
- B — ROCK CORE
- C — SHELBY TUBE
- D — SOIL PROBE
- E — AUGER CUTTINGS
- F — SONIC

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CLIENT	JOB NO.		
Battelle	**138455**		
PROJECT	BORING STARTED **8/24/06**	BORING COMPLETED **8/30/06**	**6-805** Boring No.
West Jefferson North Site	DRILLER **DS**	METHOD **SONIC**	**Sheet 1 of 2**
	TYPED BY **hgw**		

WELL LOCATION
LAT. **39°58'04.66"N** LONG **83°14'53.75"W**

TOP OF CASING ELEVATION
893.11

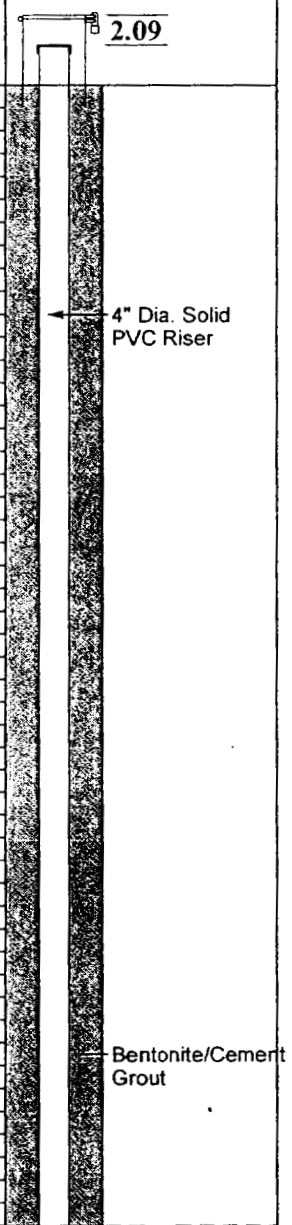
BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Brown silty CLAY, some sand, trace gravel - moist
5	1F						(Trace organics to 2.5')
10							Brown clayey SILT, some sand, trace gravel - moist (Silty sand seam at 8.0')
15	2F-1						Gray clayey SILT, some sand, some gravel - damp to moist (Increase in sand with depth and less clay at 13'-16') ▽
20	2F-2 3F-1 3F-2						Gray fine to medium silty SAND with gravel - very moist to wet
25	3F-3 3F-4 3F-5 3F-6						Gray clayey SILT with sand, trace gravel with intervals of fine silty sand
30	4F						Gray fine to medium silty SAND - moist with intervals of clayey silt
35							Gray clayey SILT, some sand, trace clay - moist (Fine silty sand seams at 35')
40	5F						
45							

WELL DIAGRAM



Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	17.0 ▽	8/24/2006
AT COMPLETION	NT ▽	
AFTER HRS.	▽	

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
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PROJECT
West Jefferson North Site

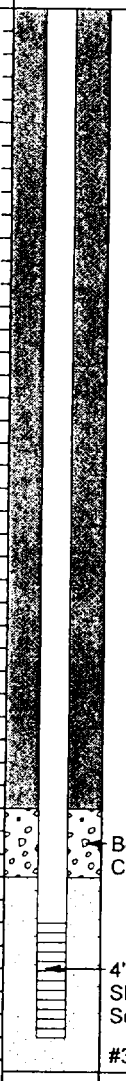
JOB NO.
138455

BORING STARTED **8/24/06**
BORING COMPLETED **8/30/06**
DRILLER **DS**
METHOD **SONIC**
TYPED BY **hgw**

6-805
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	6F						Gray clayey SILT, some sand, trace clay - moist *(continued)*
60							
65	7F						Reddish brown silty CLAY, some sand and gravel - moist
70							
75	8F						
80							(Cobble zone at 82')
85	9F						Gray silty CLAY, trace fine sand - moist
90							Dark brown to reddish brown silty CLAY with sand and gravel - moist
95	10F-1						
	10F-2						Weathered LIMESTONE
							LIMESTONE (Refusal at 96.5')
							Bottom of borehole at 96.5 feet.

WELL DIAGRAM



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CLIENT: **Battelle**	JOB NO.: **138455**		
PROJECT: **West Jefferson North Site**	BORING STARTED: **9/7/06**	BORING COMPLETED: **9/7/06**	**7-885** Boring No.
	DRILLER: **DS**	METHOD: **SONIC**	**Sheet 1 of 1**
	TYPED BY: **hgw**		

WELL LOCATION
LAT. **39°58'06.26"N** LONG. **83°14'58.05"W**

TOP OF CASING ELEVATION
907.68

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 20' without sampling
20	1F						Gray clayey SILT, some sand, trace gravel - moist
25	1F-1						(Fine silty sand seams from 28'-29')
30	2F						
40							Bottom of borehole at 40.0 feet.

WELL DIAGRAM

DEPTH (ft. BGL)	
1.68	
5	4" Dia. Solid PVC Riser
10	Bentonite/Cement Grout
20	Bentonite Chips
25	4" Dia. 0.010" Slotted PVC Screen
35	#3 Sand
40	

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	28.0	9/7/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **9/6/06**
BORING COMPLETED **9/7/06**
DRILLER **DS**
METHOD **SONIC**
TYPED BY **hgw**

7-855
Boring No.
Sheet 1 of 2

WELL LOCATION
LAT. **39°58'06.41"N** LONG **83°14'58.19"W**

TOP OF CASING ELEVATION
907.39

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 50' without sampling

WELL DIAGRAM

1.78

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Bentonite Chips

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	51.0	9/6/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **9/6/06**
BORING COMPLETED **9/7/06**
DRILLER **DS**
METHOD **SONIC**
TYPED BY **hgw**

7-855
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)	WELL DIAGRAM
	1F-1						Gray clayey SILT, some sand, trace gravel - moist ▽		#3 Sand
	1F								
55							(Seams of fine silty sand to poorly graded silty sand between 51' to 60')	55	4" Dia. 0.010" Slotted PVC Screen
	1F-2								
	1F-3								
60	1F-4						Bottom of borehole at 60.0 feet.	60	

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CLIENT: **Battelle**	JOB NO.: **138455**	
PROJECT: **West Jefferson North Site**	BORING STARTED: **9/1/06** — BORING COMPLETED: **9/6/06**	**7-805** Boring No.
	DRILLER: **DS** — METHOD: **SONIC**	**Sheet 1 of 2**
	TYPED BY: **hgw**	

WELL LOCATION
LAT. **39°58'06.36"N** LONG **83°14'58.09"W**

TOP OF CASING ELEVATION
907.74

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0	1F						Brown clayey SILT, some sand, some gravel - moist
10	2F						Gray clayey SILT, some sand, trace gravel - moist (Silt seams between 12'-15')
20	3F						(Silt and fine sand lenses mixed with clay at 22.5', 23.3', 28.4'-29.5')
30	4F						(Medium to fine silty sand - very moist to wet at 30.5'-30.9') ▽
40	5F						Gray medium to coarse silty SAND with gravel - moist
45							Gray clayey SILT with sand - damp

WELL DIAGRAM

2.04

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	30.5 ▽	9/1/2006
AT COMPLETION	NT ▽	
AFTER HRS.	▽	

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **9/1/06**
BORING COMPLETED **9/6/06**
DRILLER **DS**
METHOD **SONIC**
TYPED BY **hgw**

7-805
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
	6F						Gray clayey SILT with sand - damp *(continued)*
55	6F-1 6F-2 6F-3 6F-4						Gray medium to coarse silty SAND, some gravel - wet
60							Gray clayey SILT, some sand, trace gravel - moist
	7F						
65							
70							
	8F						
75							
80							
	9F						
85	9F-1 9F-2 9F-3 9F-4						Gray to gray-brown fine silty SAND - very moist to wet
90	10F-1						Gray clayey SILT
	10F-2						Gray poolry graded SAND with gravel and silt - wet
95	10F-3						Reddish brown silty CLAY, some sand and gravel - moist
100							
	11F						
105							
							Gray-brown silty CLAY - moist
110							Bottom of borehole at 110.0 feet.

DEPTH (ft. BGL)	WELL DIAGRAM
55	
60	
65	
70	
75	
80	Bentonite Chips
85	4" Dia. 0.010" Slotted PVC Screen
90	
95	
100	#3 Sand
105	
110	

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CLIENT
Battelle

PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **9/13/06** | BORING COMPLETED **9/13/06**

DRILLER **DS** | METHOD **SONIC**

TYPED BY **hgw**

8-885
Boring No.

Sheet 1 of 1

WELL LOCATION
LAT. **39°58'08.79"N** LONG **83°15'00.00"W**

TOP OF CASING ELEVATION
904.35

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							TOPSOIL
	1F						Brown silty CLAY, some sand, some gravel - moist
5							
10							
	2F						Gray clayey SILT, some sand, trace gravel - moist
15							
20							
	3F						
25							
	3F-1						Gray SILT, with sand - very moist
							Gray clayey SILT, trace clay and sand - very moist to wet
30							Bottom of borehole at 30.0 feet.

WELL DIAGRAM

1.9

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Bentonite Chips

4" Dia. 0.010" Slotted PVC Screen #3 Sand

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	26.0	9/13/2006
AT COMPLETION		
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT: **Battelle**	JOB NO.: **138455**	
PROJECT: **West Jefferson North Site**	BORING STARTED: **9/13/06** / BORING COMPLETED: **9/13/06**	**8-855** Boring No.
	DRILLER: **DS** / METHOD: **SONIC**	**Sheet 1 of 1**
	TYPED BY: **hgw**	

WELL LOCATION
LAT. **39°58'08.88"N** LONG **83°15'01.32"W**

TOP OF CASING ELEVATION
904.80

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE / RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0–30						Drilled down to 30' without sampling
30–40	1F					Gray clayey SILT, some sand, trace clay - moist
40–50	2F					Gray poorly graded SAND with gravel and silt - wet

WELL DIAGRAM

1.78

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Bentonite Chips

4" Dia. 0.010" Slotted PVC Screen

#3 Sand

Bottom of borehole at 50.0 feet.

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	39.0	9/13/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

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CLIENT **Battelle**	JOB NO. **138455**		
PROJECT **West Jefferson North Site**	BORING STARTED **9/8/06**	BORING COMPLETED **9/11/06**	**8-805** Boring No.
	DRILLER **DS**	METHOD **SONIC**	**Sheet 1 of 2**
	TYPED BY **hgw**		

WELL LOCATION
LAT. **39°58'08.86"N** LONG **83°15'01.12"W**

TOP OF CASING ELEVATION
904.63

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							TOPSOIL with gavel - moist
5	1F						Brown silty CLAY, some sand, some gravel - moist
10							Gray clayey SILT, some sand, trace gravel - moist
15	2F						
20	3F						(Fine silty sand seam at 22')
25							(Two silt seams with fine sand at 26' and 27')
30	4F						
35							
40	4F-1						Gray poorly graed SAND with gravel and silt, trace cobble - wet
	5F-1						
	5F-2						
	5F-3						
45	5F						Gray clayey SILT, some sand, trace gravel - moist to damp

WELL DIAGRAM

1.8

4" Dia. Solid PVC Riser

Bentonite/Cemen Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	39.0	9/8/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER®

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT
Battelle

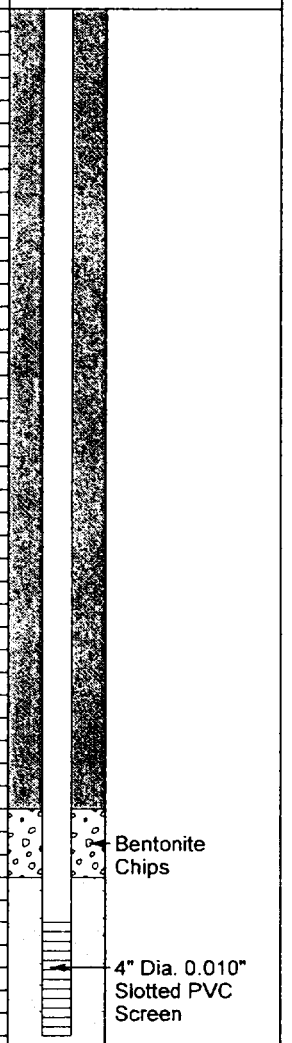
PROJECT
West Jefferson North Site

JOB NO.
138455

BORING STARTED **9/8/06**
BORING COMPLETED **9/11/06**
DRILLER **DS**
METHOD **SONIC**
TYPED BY **hgw**

8-805
Boring No.
Sheet 2 of 2

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	6F						Gray clayey SILT, some sand, trace gravel - moist to damp *(continued)*
60							
65	7F						
70							Gray well-graded SAND with gravel and silt - wet (alternates with clayey silt)
75	8F						Gray clayey SILT, some sand, trace gravel - moist
80							
85	9F						
90							
95	10F-1						Gray well-graded SAND with some silt - wet
	10F						Gray clayey SILT, some sand, trace gravel - moist
100							
105	11A						
110							Bottom of borehole at 110.0 feet.



GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT **Battelle**	JOB NO. **138455**		
PROJECT **West Jefferson North Site**	BORING STARTED **9/19/06**	BORING COMPLETED **9/19/06**	**9-885** Boring No.
	DRILLER **DS**	METHOD **SONIC**	**Sheet 1 of 1**
	TYPED BY **hgw**		

WELL LOCATION
LAT. LONG.

TOP OF CASING ELEVATION
909.42

BORING LOCATION
See Boring Location Plan

COMMENTS
No well set at this location because no groundwater was encountered.

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION	DEPTH (ft. BGL)
0							Drilled down to 20' without sampling	0
5								5
10								10
15								15
20							Gray clayey SILT, some sand, trace gravel - moist	20
25	1F							25
30								30
35	2F							35
40							Bottom of borehole at 40.0 feet.	40

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	None	
AT COMPLETION	None	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER®

CLIENT: **Battelle**	JOB NO.: **138455**	
PROJECT: **West Jefferson North Site**	BORING STARTED: **9/19/06** / BORING COMPLETED: **9/19/06**	**9-855** Boring No.
	DRILLER: **DS** / METHOD: **SONIC**	**Sheet 1 of 1**
	TYPED BY: **hgw**	

WELL LOCATION
LAT. **39°58'11.84"N** LONG **83°15'02.44"W**

TOP OF CASING ELEVATION
909.99

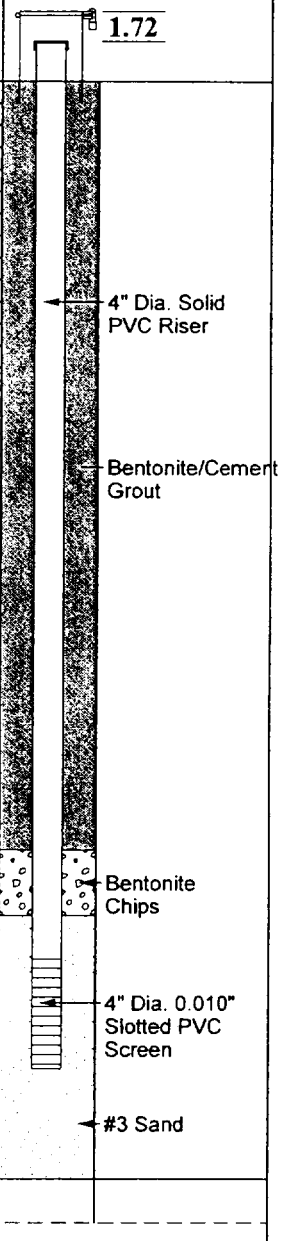
BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0							Drilled down to 40' without sampling
40	1F						Gray well-graded GRAVEL with silt and sand, trace cobbles transitioning to poorly graded sand
42							Gray clayey SILT, some sand, trace gravel - moist
50							(Fine to medium sand seam from 49'-49.5') Bottom of borehole at 50.0 feet.

WELL DIAGRAM



WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	40.0	9/19/2006
AT COMPLETION	NT	
AFTER HRS.		

A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT **Battelle**	JOB NO. **138455**		**9-805** Boring No.
PROJECT **West Jefferson North Site**	BORING STARTED **9/14/06**	BORING COMPLETED **9/15/06**	**Sheet 1 of 2**
	DRILLER **DS**	METHOD **SONIC**	
	TYPED BY **hgw**		

WELL LOCATION
LAT. **39°58'11.71"N** LONG **83°15'02.34"W**

TOP OF CASING ELEVATION
910.05

BORING LOCATION
See Boring Location Plan

COMMENTS

It has been necessary to interpolate between samples. Therefore, the contacts between the various soil strata should not be taken as absolute.

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
0	1F						Brown clayey SILT, some sand and gravel - moist
10	2F						Gray clayey SILT, some sand, trace gravel - moist
20	3F						(Medium to coarse sand seam with gravel - wet at 25'-26')
30	4F						Gray medium SAND grading to silt with fine sand - wet
							Gray clayey SILT, some sand, trace gravel - moist
40	5F-1						Gray well-graded GRAVEL with silt and sand, trace cobbles transitioning to poorly graded sand - wet
45	5F-2						Gray clayey SILT with intervals of fine silty sand - moist to very moist
	5F-3						Gray fine silty SAND - moist to very moist

WELL DIAGRAM
1.8

4" Dia. Solid PVC Riser

Bentonite/Cement Grout

Continued Next Page

WATER LEVEL MEASUREMENTS

	DEPTH	DATE
INITIAL	25.0	9/14/2006
AT COMPLETION	NT	
AFTER HRS.		

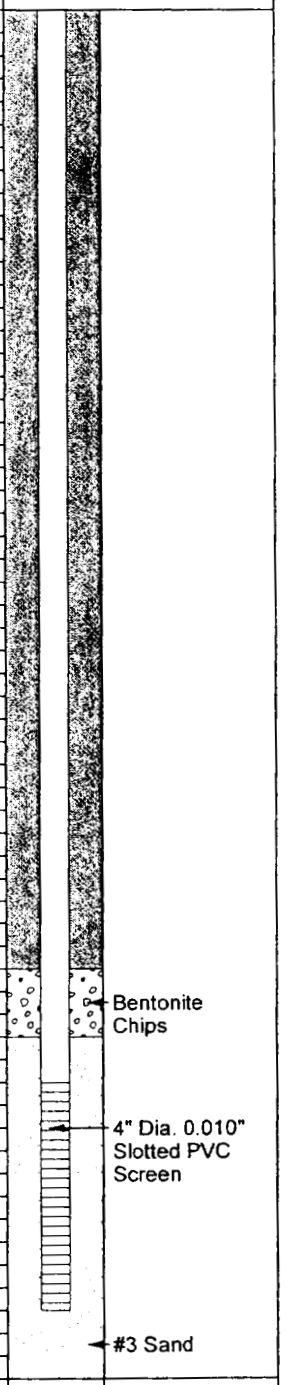
A — SPLIT SPOON
B — ROCK CORE
C — SHELBY TUBE
D — SOIL PROBE
E — AUGER CUTTINGS
F — SONIC

4518 TAYLORSVILLE ROAD
PO BOX 51
DAYTON, OHIO 45424
PH 937.236.8805
FAX 937.233.2016
BOWSER MORNER

GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

CLIENT	JOB NO.		
Battelle	**138455**		
PROJECT	BORING STARTED **9/14/06**	BORING COMPLETED **9/15/06**	**9-805** Boring No.
West Jefferson North Site	DRILLER **DS**	METHOD **SONIC**	**Sheet 2 of 2**
	TYPED BY **hgw**		

DEPTH (ft. BGL)	SAMPLE NO.	SAMPLE TYPE	RECOVERY	N VALUE (blows/ft)	PID (ppm)	GRAPHIC LOG	LITHOLOGIC DESCRIPTION
55	6F						Gray clayey SILT, some sand, trace gravel - moist
60							
65	7F						
70							
75	8F						
80							
85	9F						
90							
95	10F						
100	10F-1						Gray fine silty SAND with gravel transitioning to poolry graded sand - wet
	10F-2						
	10F-3						
105	11F-1						
	11F-2						
	11F-3						
	11F-4						Gray clayey SILT, some sand, trace gravel - moist
							Gray fine silty SAND
110							Gray clayey SILT, some sand, trace gravel - moist
							Bottom of borehole at 110.0 feet.



GINT Report Used: BATTELLE Report No.: 138455.GPJ GINT Template Used: BATTELLE.GDT Date Printed: 10/25/06

APPENDIX C

ODNR WELL LOG AND DRILLING REPORTS

BOWSER MORNER

corrected w/ state
h

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006063

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758200.68 +/- 0 ft.

S ☒ Y 717271.67 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 911.66 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#2-885

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 38 ft. Date 8/18/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/13/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 30 ft.
Casing Diameter 4 in. Length 20 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 20 ft. and 30 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 400#

Method of Installation Poured (gravity)

Depth: Placed From: 18 ft. To: 30 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used .5 bg gel/4 bg cement

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 18 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	13
GRAY	SILTY	CLAY	13	23
GRAY		SAND AND GRAVEL	23	29
GRAY		CLAY	29	30
		Water Encountered At	23	30

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 8/18/2006 Total Depth of Well 30 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

Corrected w/state
ls

WELL LOG AND DRILLING REPORT

DNR 7802.05e

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006062

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758200.01 +/- 0 ft.

S ☒ Y 717301.59 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 912.06 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#2-855

Comments on water quality/quantity and well construction:

WELL TEST*

Pre-Pumping Static Level 38 ft. Date 8/18/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/13/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 70 ft.
Casing Diameter 4 in. Length 60 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
2:

Joints 1: Threaded
2:

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 60 ft. and 70 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 400#

Method of Installation Poured (gravity)

Depth: Placed From: 58 ft. To: 70 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 1 bg ge//10 bg cement

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 58 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	13
GRAY	HARD	CLAY	13	50
GRAY	SILTY	SAND	50	53.5
GRAY		CLAYGRAVELSILT	53.5	66
BROWN		SAND AND GRAVEL	66	70
		Water Encountered At	38	70

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 8/18/2006 Total Depth of Well 70 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

corrected by state

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006060

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758212.21 +/- 0 ft.

S ☒ Y 717291.84 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 911.95 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#2-805

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 38 ft. Date 8/15/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/13/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.25 inches Depth 89 ft.
Casing Diameter 4 in. Length 82 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 84 ft. and 89 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 300#

Method of Installation Poured (gravity)

Depth: Placed From: 82 ft. To: 89 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 2 bgs gel/36 bgs cement

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 82 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	13
GRAY	HARD	CLAY	13	54
GRAY	FINE	SAND	54	65
GRAY	HARD	SILT AND CLAY	65	70
BROWN	SILTY	CLAY	70	87
		LIMESTONE	87	89
		Water Encountered At	35	89

Aquifer Type (Formation producing the most water.) SILT & CLAY

Date of Well Completion 8/15/2006 Total Depth of Well 89 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

corrected of sht 2

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006110

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAINS CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758349.5 +/- 0 ft.

S ☒ Y 717459.35 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 908.85 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#3-855A

Comments on water quality/quantity and well construction:

WELL TEST*

Pre-Pumping Static Level 29 ft. Date 8/11/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/16/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 60 ft.
Casing Diameter 4 in. Length 50 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 50 ft. and 60 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 48 ft. To: 60 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 470# cement/76#bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 48 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		FILL MATERIAL	0	4
GRAY	SILTY	CLAY	4	29
GRAY	SILTY	SAND	29	31
GRAY	SILTY	CLAY	31	49
GRAY	SILTY	SAND AND GRAVEL	49	60
		Water Encountered At	29	60

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 8/22/2006 Total Depth of Well 60 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

corrected 4 state

WELL LOG AND DRILLING REPORT

DNR 7802.05e

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006146

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758299.45 +/- 0 ft.

S ☒ Y 717500.93 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 909.08 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#3-855B

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 29 ft. Date 8/11/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/17/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 60 ft.
Casing Diameter 4 in. Length 50 ft. Thickness 0. in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 50 ft. and 60 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 48 ft. To: 60 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 470# cement/50# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 48 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		FILL MATERIAL	0	4
GRAY	SILTY	CLAY	4	29
GRAY	SILTY	SAND	29	31
GRAY	SILTY	CLAY	31	49
GRAY	SILTY	SAND AND GRAVEL	49	60
		Water Encountered At	29	60

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 8/22/2006 Total Depth of Well 60 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

Corrected w/ slotted

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006109

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758355.48 +/- 0 ft.

S ☒ Y 717477.92 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 909.26 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#3-805

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 29 ft. Date 8/11/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/16/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 87.5 ft.
Casing Diameter 4 in. Length 80 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 85 ft.

Type MACHINE SLOTTED Material PVC

Set Between 80 ft. and 85 ft.

GRAVEL PACK (Filter Pack)

Material/Size Global #5 sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 78 ft. To: 87.5 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 12 bgs cement/1 bg benton

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 78 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		FILL MATERIAL	0	4
GRAY	SILTY	CLAY	4	29
GRAY	SILTY	SAND	29	31
GRAY	SILTY	CLAY	31	49
GRAY	SILTY	SAND AND GRAVEL	49	74
GRAY		SILT	74	77
GRAY		GRAVEL AND SILT	77	82
GRAY	SILTY	SAND	82	85
BROWN	SILTY	CLAY & GRAVEL	85	87.5
		Water Encountered At	29	85

Aquifer Type (Formation producing the most water.) SAND

Date of Well Completion 8/11/2006 Total Depth of Well 85 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

corrected of state
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DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006218

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758086.44 +/- 0 ft.

S ☒ Y 717507.01 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 912.38 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#4-855

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 37 ft. Date 8/17/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/19/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 70 ft.
Casing Diameter 4 in. Length 59 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 59 ft. and 69 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 450#

Method of Installation Poured (gravity)

Depth: Placed From: 57 ft. To: 70 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 400# cement/40 # bentonit

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 57 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		FILL MATERIAL	0	4
BROWN	SILTY	CLAY	4	13
GRAY	SILTY	CLAY	13	59
GRAY		SAND AND GRAVEL	59	61
GRAY	SILTY	CLAY	61	65
GRAY	SANDY	SILT	65	70
		Water Encountered At	37	69

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 8/17/2006 Total Depth of Well 69 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006220

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and or Lot No. _____

Use of Well MUNICIPAL

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758071.67 +/- 0 ft.

S ☒ Y 717504.95 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 912.02 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#4-885

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 30 ft. Date 8/18/2006

Measured from GROUND LEVEL

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/19/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 40 ft.
Casing Diameter 4 in. Length 27 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 27 ft. and 32 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 650#

Method of Installation Poured (gravity)

Depth: Placed From: 25 ft. To: 40 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 150#cement/25# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 25 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		FILL MATERIAL	0	4
BROWN	SILTY	CLAY	4	13
GRAY	SILTY	CLAY	13	40
		Water Encountered At	30	32

Aquifer Type (Formation producing the most water.) CLAY

Date of Well Completion 8/18/2006 Total Depth of Well 32 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006148

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758100.63 +/- 0 ft.

S ☒ Y 717507.8 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 912.69 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#4-805

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 37 ft. Date 8/16/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/17/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 110 ft.
Casing Diameter 4 in. Length 77 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
2: _____

Joints 1: Threaded
2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 77 ft. and 82 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 450#

Method of Installation Poured (gravity)

Depth: Placed From: 75 ft. To: 82 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 470# cement/50# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 75 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		FILL MATERIAL	0	4
BROWN	SILTY	CLAY	4	13
GRAY	SILTY	CLAY	13	70
GRAY	GRAVELLY	SILT	70	79
GRAY		SAND	79	83
GRAY		SILT	83	100.5
		LIMESTONE	100.5	110
		Water Encountered At	37	82

Aquifer Type (Formation producing the most water.) SAND

Date of Well Completion 8/16/2006 Total Depth of Well 82 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006250

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1759095.27 +/- 0 ft.

S ☒ Y 717217.02 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 866.56 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#5-855

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 1 ft. Date 9/1/2006

Measured from _____

Pumping test method _____

Test Rate _____ *gpm* Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/23/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 20 ft.
Casing Diameter 4 in. Length 10 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 10 ft. and 20 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 8 ft. To: 20 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 94# cement/25# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 8 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	5.5
GRAY	SILTY	CLAY	5.5	10
BROWN	SILTY	SAND AND GRAVEL	10	11
BROWN	SILTY	CLAY	11	18
GRAY	SILTY	CLAY	18	20
		Water Encountered At	1	20

Aquifer Type (Formation producing the most water.) CLAY

Date of Well Completion 9/1/2006 Total Depth of Well 20 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006249

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1759105.82 +/- 0 ft.

S ☒ Y 717213.69 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 866.37 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#5-805

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 36 ft. Date 8/24/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/23/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 80 ft.
Casing Diameter 4 in. Length 70 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 70 ft. and 80 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 68 ft. To: 80 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 460# cement/50# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 68 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	3
DARK GRAY	SILTY	CLAY	3	10
BROWN	SILTY	GRAVEL AND SAND	10	19
GRAY-BROWN	CLAYEY	SILT	19	21
BROWN	SILTY	CLAY	21	55
GRAY	SILTY	CLAY	55	65
DARK BROWN	SILTY	CLAY	65	76
		LIMESTONE	76	80
		Water Encountered At	36	80

Aquifer Type (Formation producing the most water.) CLAY

Date of Well Completion 8/24/2006 Total Depth of Well 80 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006254

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758783.73 +/- 0 ft.

S ☒ Y 717621.99 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 890.75 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source _____

Source of Coordinates: GPS

Well location written description:
#6-885

Comments on water quality/quantity and well construction:

WELL TEST*

Pre-Pumping Static Level 18 ft. Date 8/31/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/23/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 20 ft.
Casing Diameter 4 in. Length 15 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 15 ft. and 20 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 250#

Method of Installation Poured (gravity)

Depth: Placed From: 13 ft. To: 20 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 94$ cement/12# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 13 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	4
BROWN	CLAYEY	SILT	4	12
GRAY	CLAYEY	SILT	12	18
GRAY	SILTY	SAND	18	20
		Water Encountered At	18	20

Aquifer Type (Formation producing the most water.) SAND

Date of Well Completion 8/31/2006 Total Depth of Well 20 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006253

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758776.6 +/- 0 ft.

S ☒ Y 717636.66 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 890.73 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#6-855

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 17 ft. Date 8/30/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/23/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 40 ft.
Casing Diameter 4 in. Length 30 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 30 ft. and 40 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 400#

Method of Installation Poured (gravity)

Depth: Placed From: 28 ft. To: 40 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 184# cement/25# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 28 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	4
BROWN	CLAYEY	SILT	4	12
GRAY	CLAYEY	SILT	12	30
GRAY	SANDY	SILT	30	33
GRAY	CLAYEY	SILT	33	37
GRAY	CLAYEY	SILT	37	40
		Water Encountered At	37	40

Aquifer Type (Formation producing the most water.) SILT

Date of Well Completion 8/30/2006 Total Depth of Well 40 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006251

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758771.49 +/- 0 ft.

S ☒ Y 717650.52 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 891.02 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#6-805

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 16 ft. Date 8/30/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/23/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 96.5 ft.
Casing Diameter 4 in. Length 90 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 90 ft. and 95 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 88 ft. To: 96.5 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 460# cement/50# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 88 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	SILTY	CLAY	0	8
BROWN	CLAYEY	SILT	8	10
GRAY	CLAYEY	SILT	10	17
GRAY	SILTY	SAND	17	22
GRAY	CLAYEY	SILT	22	27
GRAY	SILTY	SAND	27	30
GRAY	CLAYEY	SILT	30	63
BROWN	SILTY	CLAY	63	84
GRAY	SILTY	CLAY	84	89
DARK BROWN	SILTY	CLAY	89	93
		LIMESTONE	93	96.5

Aquifer Type (Formation producing the most water.) CLAY

Date of Well Completion 8/30/2006 Total Depth of Well 95 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006277

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758437.72 +/- 0 ft.

S ☒ Y 717815.83 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 905.99 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#7-885

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 28 ft. Date 9/7/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/24/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 40 ft.
Casing Diameter 4 in. Length 25 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 25 ft. and 30 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 300#

Method of Installation Poured (gravity)

Depth: Placed From: 23 ft. To: 30 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 282# cement/12# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 23 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	CLAYEY	SILT	0	12
GRAY	CLAYEY	SILT	12	40
		Water Encountered At	28	30

Aquifer Type (Formation producing the most water.) SILT

Date of Well Completion 9/7/2006 Total Depth of Well 30 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006258

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758426.02 +/- 0 ft.

S ☒ Y 717830.48 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 905.6 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#7-855

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level _____ ft. Date 9/7/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/23/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 50 ft.
Casing Diameter 4 in. Length 50 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 50 ft. and 60 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 400#

Method of Installation Poured (gravity)

Depth: Placed From: 48 ft. To: 60 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 376# cement/25# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 48 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	CLAYEY	SILT	0	10
GRAY	CLAYEY	SILT	10	45
GRAY	SILTY	SAND	45	47
GRAY	CLAYEY	SILT	47	55
GRAY	SILTY	SAND	55	58
GRAY	CLAYEY	SILT	58	60
		Water Encountered At	86	60

Aquifer Type (Formation producing the most water.) SAND

Date of Well Completion 9/7/2006 Total Depth of Well 60 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006256

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758434.69 +/- 0 ft.

S ☒ Y 717825.13 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 905.69 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#7-805

Comments on water quality/quantity and well construction:
#7-805

WELL TEST *

Pre-Pumping Static Level 30.5 ft. Date 9/6/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/23/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 110 ft.
Casing Diameter 4 in. Length 85 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 85 ft. and 95 ft.

GRAVEL PACK (Filter Pack)

Material/ Size #5 Global sand Vol/Wt. Used 900#

Method of Installation Poured (gravity)

Depth: Placed From: 83 ft. To: 110 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 650# cement/ 75# bentonit

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 83 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	CLAYEY	SILT	0	10
GRAY	CLAYEY	SILT	10	45
GRAY	SILTY	SAND	45	47
GRAY	CLAYEY	SILT	47	54
GRAY	SILTY	SAND	54	58
GRAY	CLAYEY	SILT	58	86
GRAY-BROWN	SILTY	SAND	86	91
GRAY	CLAYEY	SILT	91	93
GRAY		SILTSANDGRAVEL	93	95
BROWN	SILTY	CLAY	95	107
GRAY-BROWN	SILTY	CLAY	107	110
		Water Encountered At	86	95

Aquifer Type (Formation producing the most water.) SILT/SAND/GRAVEL

Date of Well Completion 9/6/2006 Total Depth of Well 95 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006287

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758210.45 +/- 0 ft.

S ☒ Y 718072.85 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 902.44 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#8-885

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 26 ft. Date 9/13/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/24/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 30 ft.
Casing Diameter 4 in. Length 25 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 25 ft. and 30 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 250#

Method of Installation Poured (gravity)

Depth: Placed From: 23 ft. To: 30 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 280# cement/12# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 23 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		SOIL	*0*	*1*
BROWN	SILTY	CLAY	1	13
GRAY	CLAYEY	SILT	13	26
GRAY	SANDY	SILT	26	27
GRAY	CLAYEY	SILT	27	30
		Water Encountered At	26	30

Aquifer Type (Formation producing the most water.) SILT

Date of Well Completion 9/13/2006 Total Depth of Well 30 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006286

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758185.63 +/- 0 ft.

S ☒ Y 718083.03 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 902.75 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#8-855

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 39 ft. Date 9/13/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/24/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 50 ft.
Casing Diameter 4 in. Length 39 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 39 ft. and 44 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 400#

Method of Installation Poured (gravity)

Depth: Placed From: 37 ft. To: 44 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 330#cement/25# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 37 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		SOIL	0	1
BROWN	SILTY	CLAY	1	11
GRAY	CLAYEY	SILT	11	39
GRAY	SILTY	SAND AND GRAVEL	39	43
GRAY	CLAYEY	SILT	43	50
		Water Encountered At	39	44

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 9/13/2006 Total Depth of Well 44 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006282

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and/or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758201.22 +/- 0 ft.

S ☒ Y 718080.42 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 902.83 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#8-805

Comments on water quality/quantity and well construction:

WELL TEST*

Pre-Pumping Static Level 39 ft. Date 9/8/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE (Filed Electronically) Date 10/24/2006

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 110 ft.
Casing Diameter 4 in. Length 90 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 90 ft. and 95 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 350#

Method of Installation Poured (gravity)

Depth: Placed From: 88 ft. To: 98 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 700# cement/50# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 88 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
		SOIL	0	1
BROWN	SILTY	CLAY	1	11
GRAY	SILTY	CLAY	11	39
GRAY	GRAVELLY	SAND AND SILT	39	43
DARK GRAY	CLAYEY	SILT	43	69
GRAY	SILTY	SAND AND GRAVEL	69	73
GRAY	CLAYEY	SILT	73	92
GRAY	SILTY	SAND	92	93
GRAY	CLAYEY	SILT	93	110
		Water Encountered At	39	95

Aquifer Type (Formation producing the most water.) SAND AND GRAVEL

Date of Well Completion 9/11/2006 Total Depth of Well 95 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006293

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section: _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758100.65 +/- 0 ft.

S ☒ Y 718282.02 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 908.26 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#9-855

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 40 ft. Date 9/19/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/25/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 50 ft.
Casing Diameter 4 in. Length 40 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 5 ft.

Type MACHINE SLOTTED Material PVC

Set Between 40 ft. and 45 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 450#

Method of Installation Poured (gravity)

Depth: Placed From: 38 ft. To: 50 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 375# cement/13# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 38 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	CLAYEY	SILT	0	11
GRAY	CLAYEY	SILT	11	30
GRAY		SAND	30	32
GRAY	CLAYEY	SILT	32	40
GRAY	SANDY	GRAVEL	40	43
GRAY	CLAYEY	SILT	43	50
		Water Encountered At	40	43.5

Aquifer Type (Formation producing the most water.) GRAVEL

Date of Well Completion 9/19/2006 Total Depth of Well 45 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

DNR 7802.05e

WELL LOG AND DRILLING REPORT

Ohio Department of Natural Resources
Division of Water, 2045 Morse Road, Columbus, Ohio 43229-6605
Voice (614) 265-6740 Fax (614) 265-6767

Well Log Number: 2006292

Page 1 of 1 for this record.

WELL LOCATION

County MADISON Township JEFFERSON

BATTELLE
Owner/Builder

1425 PLAIN CITY-GEORGESVILLE RD
Address of Well Location

City W JEFFERSON Zip Code +4 43162

Permit No. _____ Section; _____ and or Lot No. _____

Use of Well MONITOR

Coordinates of Well (Use only one of the below coordinate systems)

State Plane Coordinates

N ☐ X 1758108.52 +/- 0 ft.

S ☒ Y 718369.74 +/- 0 ft.

Latitude, Longitude Coordinates

Latitude: 0 Longitude: 0

Elevation of Well in feet: 908.25 +/- 0 ft.

Datum Plane: ☐ NAD27 ☒ NAD83 Elevation Source GPS

Source of Coordinates: GPS

Well location written description:
#9-805

Comments on water quality/quantity and well construction:

WELL TEST *

Pre-Pumping Static Level 30 ft. Date 9/15/2006

Measured from _____

Pumping test method _____

Test Rate _____ gpm Duration of Test _____ hrs.

Feet of Drawdown _____ ft. Sustainable Yield _____ gpm

*(Attach a copy of the pumping test record, per section 1521.05, ORC)

Is Copy Attached? ☐ Yes ☒ No Flowing Well? ☐ Yes ☒ No

PUMP/PITLESS

Type of pump _____ Capacity _____ gpm

Pump set at _____ ft. Pitless Type _____

Pump installed by _____

I hereby certify the information given is accurate and correct to the best of my knowledge.

Drilling Firm BOWSER-MORNER,DAYTON

Address 4518 N TAYLORSVILLE RD

City, State, Zip DAYTON OH 45401

Signed TIM AUGUSTINE Date 10/25/2006
(Filed Electronically)

ODH Registration Number _____

CONSTRUCTION DETAILS

Drilling Method: ROTOSONIC

BOREHOLE/CASING (Measured from ground surface)

1 Borehole Diameter 8.75 inches Depth 110 ft.
Casing Diameter 4 in. Length 87 ft. Thickness 0.237 in.

2 Borehole Diameter _____ inches Depth _____ ft.
Casing Diameter _____ in. Length _____ ft. Thickness _____ in.

Casing Height Above Ground 2 ft.

Type 1: PVC
Type 2: _____

Joints 1: Threaded
Joints 2: _____

SCREEN

Diameter 4 in. Slot Size 0.01 in. Screen Length 10 ft.

Type MACHINE SLOTTED Material PVC

Set Between 87 ft. and 97 ft.

GRAVEL PACK (Filter Pack)

Material/Size #5 Global sand Vol/Wt. Used 500#

Method of Installation Poured (gravity)

Depth: Placed From: 85 ft. To: 100 ft.

GROUT

Material Bentonite/cement slurry Vol/Wt. Used 650# cement/37# bentonite

Method of Installation Pumped w/Tremie pipe

Depth: Placed From: 0 ft. To: 85 ft.

DRILLING LOG*

FORMATIONS INCLUDE DEPTH(S) AT WHICH WATER IS ENCOUNTERED.

Color	Texture	Formation	From	To
BROWN	CLAYEY	SILT	0	11
GRAY	CLAYEY	SILT	11	30
GRAY	SILTY	SAND	30	32
GRAY	CLAYEY	SILT	32	42
GRAY	SANDY	GRAVEL	42	45
GRAY	CLAYEY	SILT	45	47.5
GRAY	SILTY	SAND	47.5	50.5
GRAY	SILTY	CLAY	50.5	97
GRAY	SILTY	SAND	97	106
GRAY	CLAYEY	SILT	106	108
GRAY	SILTY	SAND	108	109
GRAY	CLAYEY	SILT	109	110
		Water Encountered At	30	97

Aquifer Type (Formation producing the most water.) SAND

Date of Well Completion 9/15/2006 Total Depth of Well 97 ft.

Completion of this form is required by section 1521.05, Ohio Revised Code - file within 30 days after completion of drilling.
Distribute copies of this record to Customer, and Local Health Deptartment.

APPENDIX D

WELL DEVELOPMENT FORMS

BOWSER MORNER®

WELL DEVELOPMENT FORM

Site: Battelle WO# 158455

Well Identification: #2-805 Date: 8-17-06

Development Method: Submersible pump Well Depth 92.30

Static Water Level (start): 31.03 Static Water Level (end): 36.55

One Well Volume: 40.0 gal Purge Volume: 180 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(92.30) - (31.03) = 61.27 x (0.653) = 40.01

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
0835	5	17.43	5.89	0.739	15.65	+999
0840		17.28	6.23	0.730	9.29	+999
0845		17.21	6.49	0.726	8.86	+999
0850		17.02	6.71	0.722	8.77	650
0855		17.03	6.83	0.719	8.67	382
0900		16.91	6.92	0.719	8.67	202
0905	180	16.78	6.96	0.716	8.51	128

COMMENTS: _____

DEVELOPED BY: DC / RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #2-855 Date: 8-21-06

Development Method: Submersible Pump Well Depth 71.55'

Static Water Level (start): 38.71' Static Water Level (end): —

One Well Volume: 21.4 gal Purge Volume: 21.4 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(71.55) - (38.71) = 32.84 x (0.653) = 21.4

Start 1346

Stopped - well pumped dry @ 101

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1347		21.55	7.20	0.699	0.0	105

COMMENTS: Let recharge & pumped dry second time

DEVELOPED BY: DL

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #2-885 Date: 8-21-06

Development Method: Submersible Pump Well Depth 31.60

Static Water Level (start): 5.84 Static Water Level (end): —

One Well Volume: 16.8 gal Purge Volume: 16.8 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

Pump @ ~5 gpm

(31.60) – (5.84) = 25.8 x (0.653) = 16.8

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
Start 1241						
1241		19.75	6.25	0.624	~~170~~ 0.00	~~+999~~ 170
1246		16.14	6.71	0.650	0.0	+999
1251		16.10	6.82	0.670	0.0	+999

Pumped dry @ 1300

COMMENTS: Restart pump several times & surge - well does not recharge fast enough to keep up w/ pump

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #3-805 Date: 8-16-06

Development Method: Submersible Pump Well Depth 86.74'

Static Water Level (start): 35.91' Static Water Level (end): 60.54 (5 min)

One Well Volume: 33.2 gal Purge Volume: ~35' gal

Pump Rate ~6 gal/min.

start @ 1335
restart @ 1355

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(86.74) – (35.91) = 50.83 x (0.653) = 33.2

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1400	0	17.76	5.86	0.734	6.86	+999
1407	42	17.61	6.61	0.747	0.70	"
1420	120	17.40	7.07	0.764	0.00	"
1428	168	17.16	7.34	0.776	1.73	760
1438	228	17.42	7.45	0.781	1.69	365
1444	264	17.48	7.28	0.791	2.42	142
1449	294	17.09	7.40	0.799	3.59	181
1454	324	17.03	7.39	0.793	4.08	145
1459	354	17.10	7.47	0.798	5.02	138

STOP

COMMENTS:

DEVELOPED BY: DA/RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138155

Well Identification: #3-855-A Date: 8-16-06

Development Method: Submersible Pump Well Depth 61.10'

Static Water Level (start): 35.42 Static Water Level (end): 35.52

One Well Volume: 16.8 gal Purge Volume: 171 gal

(depth) - (swl) = head head x conversion factor = 1 well volume

Pump Rate at 3 gal/min

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(61.10) - (35.42) = 25.68 x (0.653) = 16.8

Start 1524

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1538		17.82	7.77	0.786	5.44	+999
1548		17.78	7.65	0.755	0.38	+999
1553		17.50	7.63	0.756	1.59	+999
1558		16.82	7.53	0.754	2.40	826
1603		16.84	7.49	0.735	3.39	+999
1608		16.82	7.45	0.732	3.70	+999
1613		16.85	7.42	0.727	4.35	377
1618		16.68	7.46	0.727	4.25	283
1623	171	16.87	7.35	0.723	4.13	238

STOP

COMMENTS: _____

DEVELOPED BY: DC/RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #3-855-B Date: 8-24-05

Development Method: Submersible Pump Well Depth 61.5

Static Water Level (start): 36.61 Static Water Level (end): 49.08

One Well Volume: 4.1 gal Purge Volume: 114 gal

Pump Rate ~2 gpm

(depth) - (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(61.5) - (36.61) = 24.9 x (0.163) = ~~24.9~~ 4.1

Start 0923

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
0923		20.34	6.56	0.758	3.60	198
0939		18.58	10.43	0.978	11.22	+999
0947		19.06	10.26	0.731	8.05	+999
1003		19.58	9.60	0.655	7.43	+999
1008		19.60	9.77	0.673	7.22	+999
1016		19.27	9.80	0.684	6.95	+999
1021		21.27	9.29	0.673	6.53	+999
1028		19.62	9.18	0.656	6.46	+999
1033		20.39	9.12	0.667	6.23	+999
1038	114	19.58	9.13	0.659	6.30	+999

well pumped dry

COMMENTS: Pump dry 3 times & let recharge

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Bothelle WO# 138455

Well Identification: #4-805 Date: 8-18-06

Development Method: Submersible Pump Well Depth 84.5'

Static Water Level (start): 38.36 Static Water Level (end): 59.90'

One Well Volume: 30.1 gal Purge Volume: 192 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(84.5) – (38.36) = 46.1 x (0.653) = 30.1

Pump rate ~ 6 gal/min

Start 0944

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
0945		16.53	7.76	0.781	13.97	+999
0950		17.91	7.20	0.874	12.38	271
0955	60	17.61	7.38	1.11	12.12	485
					~~13.16~~	
1005		16.98	7.27	0.755	13.16	+999
1008		16.91	7.16	0.740	12.57	+999
1013		16.41	7.12	0.743	12.81	+999
1018		16.72	7.11	0.738	12.68	+999
1026		16.60	7.16	0.738	12.44	468
1032		16.96	7.17	0.732	11.81	335
1035		16.66	7.11	0.728	11.76	198
1038	137	16.50	7.07	0.724	11.63	108

COMMENTS: Started development on 8-17-06 - pumped ~60 gallons from well with muddy water before pump stopped working

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #4-855 Date: 8-18-06

Development Method: Submersible Well Depth 70.63'

Static Water Level (start): 39.21 Static Water Level (end): 37.25

One Well Volume: 20.5 gal Purge Volume: 252 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

Pump @ ~43pm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(70.63)-(39.21)= 31.4 x(0.653)= 20.5

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1123		22.65	7.45	0.700	14.52	583
1145		17.87	7.55	0.728	9.45	674
1150		17.49	7.41	0.751	11.59	+999
1155		16.72	7.35	0.750	11.87	+999
1200		16.77	7.34	0.759	11.54	+999
1205		16.78	7.29	0.752	11.62	+999
1215		17.03	7.36	0.766	10.16	260
1221		16.95	7.25	0.763	10.33	256
1226	252	16.94	7.23	0.760	10.41	201

COMMENTS: _____

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138155

Well Identification: #4-885 Date: 8-18-06

Development Method: Submersible Pump Well Depth 34.70'

Static Water Level (start): 0.90 Static Water Level (end): _____

One Well Volume: 22.1 gal Purge Volume: ~6 gal

(depth) – (swl) = head head x conversion factor = 1 well volume ~ 4 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(34.7)-(0.9)= 33.8 x(0.653)= 22.1

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1441		26.89	7.46	0.687	7.54	46.4
1447		21.66	7.48	0.702	2.98	+999
1452	~6	21.58	7.48	0.721	3.35	+999

start 1440

restart pump

dry 1447

COMMENTS: Let well recharge several times & pumped dry again – no add'l readings possible due to slow recharge time of sediment in well

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #5-805 Date: 9-6-06

Development Method: Submersible Pump Well Depth 82.20

Static Water Level (start): 5.12 Static Water Level (end): 5.25

One Well Volume: 50.3 gal Purge Volume: 231 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

Pump @ ~~3~~ 3.5 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

Start 0912

(82.20) - (5.12) = 77.08 x (0.653) = 50.3

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	~~D.O. (mg/L)~~	~~TURBIDITY (NTU)~~
0913		62.6	7.93	431		
0918		68.2	6.54	430		
0923		67.4	6.71	433		
0928		68.9	6.72	458		
0933		68.7	6.70	456		
0938		68.9	6.76	436		
0948		68.4	6.79	438		
0958		69.1	6.72	457		
1008		69.3	6.73	459		
1018	231	69.8	6.75	458		

COMMENTS: _____

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #5-855 Date: 9-5-06

Development Method: Submersible Pump Well Depth 21.90

Static Water Level (start): 13.41 Static Water Level (end): _____

One Well Volume: 5 gal Purge Volume: 60 gal

Start 1440

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(21.90) – (13.41) = 8.5 x (0.653) = 5.5

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1441		68.4	7.42	924	—	—
1449		66.6	7.16	975		
1454		66.3	7.24	~~963~~ 1015		
1501		66.3	7.06	1072		

COMMENTS: Well pumping dry - slot recharge & pump duty ~ 3 to 4 times

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #6-805 Date: 9-6-06

Development Method: Submersible Pump Well Depth 97.32

Static Water Level (start): 24.50 Static Water Level (end): 25.54

One Well Volume: 47.6 gal Purge Volume: 108 gal

Pump rate ~ 2 gpm

(depth) - (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(97.32) - (24.50) = 72.82 x (0.653) = 47.6

Start 1440

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	~~D.O. (mg/L)~~	~~TURBIDITY (NTU)~~
1441		63.7	7.56	650		
1448		64.4	7.41	663		
1454		65.1	7.56	632		
1459		65.5	7.40	645		
1504		65.5	7.52	633		
1509		65.6	7.61	638		
1514		65.0	7.85	622		
1519		65.1	7.61	652		
1524		64.8	7.64	648		
1529		64.9	7.62	639		
1534	108	65.2	7.67	628		

COMMENTS: _____

DEVELOPED BY: DC/RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #6-855 Date: 9-6-06

Development Method: Submersible Pump Well Depth 41.60

Static Water Level (start): 8.91 Static Water Level (end): 39.20

One Well Volume: 33.3 gal Purge Volume: 45 gal

(depth) - (swl) = head head x conversion factor = 1 well volume

Pump Rate ~ 2 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(41.60) - (8.91) = 32.69 x (0.653) = 33.3

Start 1542

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	~~D.O (mg/L)~~	~~TURBIDITY (NTU)~~
1543		68.0	7.73	738		
1548		70.2	7.48	794		
1553		67.7	8.11	804		
1558		68.3	8.00	~~826~~ 795		
1603		68.7	8.03	786		
1608		68.9	8.02	756		
1624 ~~1615~~		70.2	8.42	740		
~~1834~~		68.4	8.25	686		

1606 pump stop

1611 pump stop

1615 pump stop Water at 40.4 1626 stop

COMMENTS: Pumped dry several times & let recharge

DEVELOPED BY: DC/RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #6-885 Date: 9-6-06

Development Method: Submersible Pump Well Depth 21.50

Static Water Level (start): 8.50 Static Water Level (end): _____

One Well Volume: 8.5 gal Purge Volume: 100 gal

(depth) - (swl) = head head x conversion factor = 1 well volume

Pump rate ~ 2 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(21.50) - (8.50) = 13.00 x (0.653) = 8.5

Start 1315

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	~~D.O (mg/L)~~	~~TURBIDITY (NTU)~~
1316		63.7	7.37	578		
1320		65.6	7.39	574		
1325		65.9	7.37	586		
1330		66.8	7.52	575		
1335		64.1	7.57	590		
1340		68.1	7.13	594		
1345		68.8	7.58	559		
1350		68.2	7.40	578		
1355		68.6	7.46	572		
1400		68.5	7.51	579		
1405	100	68.4	7.59	582		

COMMENTS: ~~DC/RW~~

DEVELOPED BY: DC/RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #7-805 Date: 9-11-06

Development Method: Submersible Pump Well Depth 97.35

Static Water Level (start): 33.93 Static Water Level (end): ~~9~~ 60.40

One Well Volume: 41.4 gal Purge Volume: 246 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

Pump rate ~ 3 ± 4 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

1337 (97.35) – (33.93) = 63.4 x (0.653) = 41.4

TIME	VOLUME REMOVED (gallons)	TEMP (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
~~1338~~		25.5	7.82	719		
~~1348~~		15.4	7.79	739		
~~1358~~		16.8	7.83	731		
1401		17.1	7.70	718		
1406		17.0	7.78	738		
1411		17.3	7.76	728		
1417		17.3	7.84	726		
1422	135	17.3	7.77	718		
~~1427~~	—					
1436		18.2	7.96	715		
1442		17.0	7.87	724		
1452		18.0	7.82	724		
1457		17.7	7.72	720		
1502		17.8	7.85	724		
1507		18.0	7.78	723		
1512	111	17.5	7.82	721		

pump stopped 1436 / restart @ 1435

COMMENTS: Well did not completely clear up due to fine silty sand along screen

DEVELOPED BY: DC / RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #7-855 Date: 9-11-06

Development Method: Submersible pump Well Depth 61.25

Static Water Level (start): 31.22 Static Water Level (end): _____

One Well Volume: 19.6 gal Purge Volume: 225 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

Pump Rate ~ 3 to 4 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(61.25) – (31.22) = 30.0 x (0.653) = 19.6

Start 1524

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1525		20.8	7.91	756		
1530		16.2	7.91	765		
1539		16.5	7.82	750		
1548		16.1	7.54	724		
1553		15.9	7.60	720		
1558		15.0	7.64	730		
1604		15.3	7.66	725		
1609		15.1	7.66	733		
1614		15.5	7.57	731		
1619		15.2	7.68	742		
1624		15.2	7.59	726		
1629		15.8	7.57	729		
1634		15.7	7.59	725		
1639	225	15.6	7.59	738		

COMMENTS: Well still slightly turbid at completion of development

DEVELOPED BY: DC / RW

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #7-885 Date: 9-13-06

Development Method: Submersible Pump Well Depth 32.15

Static Water Level (start): 1.0' Static Water Level (end): 31.50

One Well Volume: 20.4 gal Purge Volume: ~60 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(32.15)-(1.0)= 31.2 x(0.653)= 20.4

Start 1023

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1024		20.1	7.38	811		
1029		17.3	7.65	795		
1034	44	18.6	7.68	797		
Purged dry @ 1037	—					
1043		15.1	7.88	790		
restart 1047		15.2	7.83	~~798~~ 798		

COMMENTS: Purged dry several times & allowed to recharge

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #8-805 Date: 9-19-06 9-20-06

Development Method: Submersible Pump Well Depth 97.40

Static Water Level (start): 35.68' Static Water Level (end): _____

One Well Volume: 40.3 gal Purge Volume: ~240 gal

(depth) - (swl) = head head x conversion factor = 1 well volume

Pump Rate ~4 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

Start 1341

(97.40) - (35.68) = 61.7 x (0.653) = 40.3

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
~~1342~~		~~19.95~~	~~6.51~~	0.724		
~~Restart 1350~~						
0940		13.82	6.70	0.706		
0945		12.47	7.02	0.729		
0950		12.87	7.12	0.738		
0956		13.37	7.21	0.738		
1001		12.93	7.26	0.717		
1006		13.75	7.30	0.731		
1013		14.14	7.38	0.720		
1024		14.20	7.46	0.733		
1029		14.20	7.46	0.738		
1034	220					
↓						
Well pumping dry - pumped down several more times before stopping						

Restart 1354 Start 0939

COMMENTS: _____

DEVELOPED BY: DC / DS

WELL DEVELOPMENT FORM

Site: Battelle WO# 1384551

Well Identification: #8-855 Date: 9-20-06

Development Method: Submersible Pump Well Depth 45.02

Static Water Level (start): 31.57 Static Water Level (end): 32.45

One Well Volume: 8.8 gal Purge Volume: 144 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

Whole pump

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

(45.02)-(31.57)= 13.5 x(0.653)= 8.8

Start 1107

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1108		15.19	7.58	0.670		
1113		12.61	7.64	0.673		
1118		12.60	7.63	0.677		
1123		12.51	7.67	0.687		
1128		12.62	7.52	0.687		
1133		12.59	7.52	0.689		
1138		12.41	7.54	0.692		
1143	144	12.47	7.56	0.692		

COMMENTS: _____

DEVELOPED BY: DC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #8-885 Date: 9-19-06

Development Method: Submersible Pump Well Depth 32.07

Static Water Level (start): 22.44 Static Water Level (end): 31.90

One Well Volume: 6.3 gal Purge Volume: ~25 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

Pump ~ 2 gpm

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

Start 1048

(32.07) – (22.44) = 9.6 x (0.653) = 6.3

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1048		15.30	6.63	0.755		
1052		14.05	6.12	0.725		
1055	18	14.01	6.38	0.806		

well pumped @ 1055

COMMENTS: Pumped well dry 2 times – slow to recharge

DEVELOPED BY: D. Polanco

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #9-805 Date: 9-21-06

Development Method: Submersible Pump Well Depth 110.10

Static Water Level (start): 40.09 Static Water Level (end): _____

One Well Volume: 45.7 gal Purge Volume: 168 gal

(depth) – (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft ~ 4 gpm

(110.10)-(40.09)= 70.0 x(0.653)= 45.7

Start 0955

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
0955		12.52	7.46	0.664		
1000		12.48	7.49	0.672		
1006		13.32	7.53	0.663		
1017		12.70	7.69	0.665		
1022		13.09	7.63	0.677		
1027	128					
1100		14.06	7.73	0.666		
		14.63	7.89	0.911		
	40					

Stopped pumping

Start 1059

Pump another ~10 min pumped water level down to ~105' - sit until ~2 pm recharge - then sampled

COMMENTS: _____

DEVELOPED BY: DC / SC

WELL DEVELOPMENT FORM

Site: Battelle WO# 138455

Well Identification: #9-855 Date: 9-21-06

Development Method: Submersible Pump Well Depth 47.15

Static Water Level (start): 28.38 Static Water Level (end): _____

One Well Volume: 12.3 gal Purge Volume: 130 gal

Pump Rate ~ 2 gpm

(depth) - (swl) = head head x conversion factor = 1 well volume

conversion factor: 2" well diameter = 0.163 gal/ft 4" well diameter = 0.653 gal/ft

start (47.15) - (28.38) = 18.8 x (0.653) = 12.3

TIME	VOLUME REMOVED (gallons)	TEMP. (°C)	pH (S.U.)	SPECIFIC CONDUCTIVITY (mS/cm)	D.O. (mg/L)	TURBIDITY (NTU)
1120		17.42	7.78	0.683		
1125		~~15.3~~ 14.03	7.83	0.704		
1130		13.64	7.75	0.693		
1135		13.36	7.85	0.704		
1140		13.17	7.67	0.698		
1145		13.26	7.67	0.699		
1150		13.20	7.75	0.699		
1155		13.10	7.72	0.689		
1200		13.23	7.69	0.688		
1205		13.12	7.70	0.684		
1210		13.20	7.67	0.677		
1215		13.21	7.63	0.689		
1220		13.26	7.67	0.679		
1225	130					

COMMENTS: _____

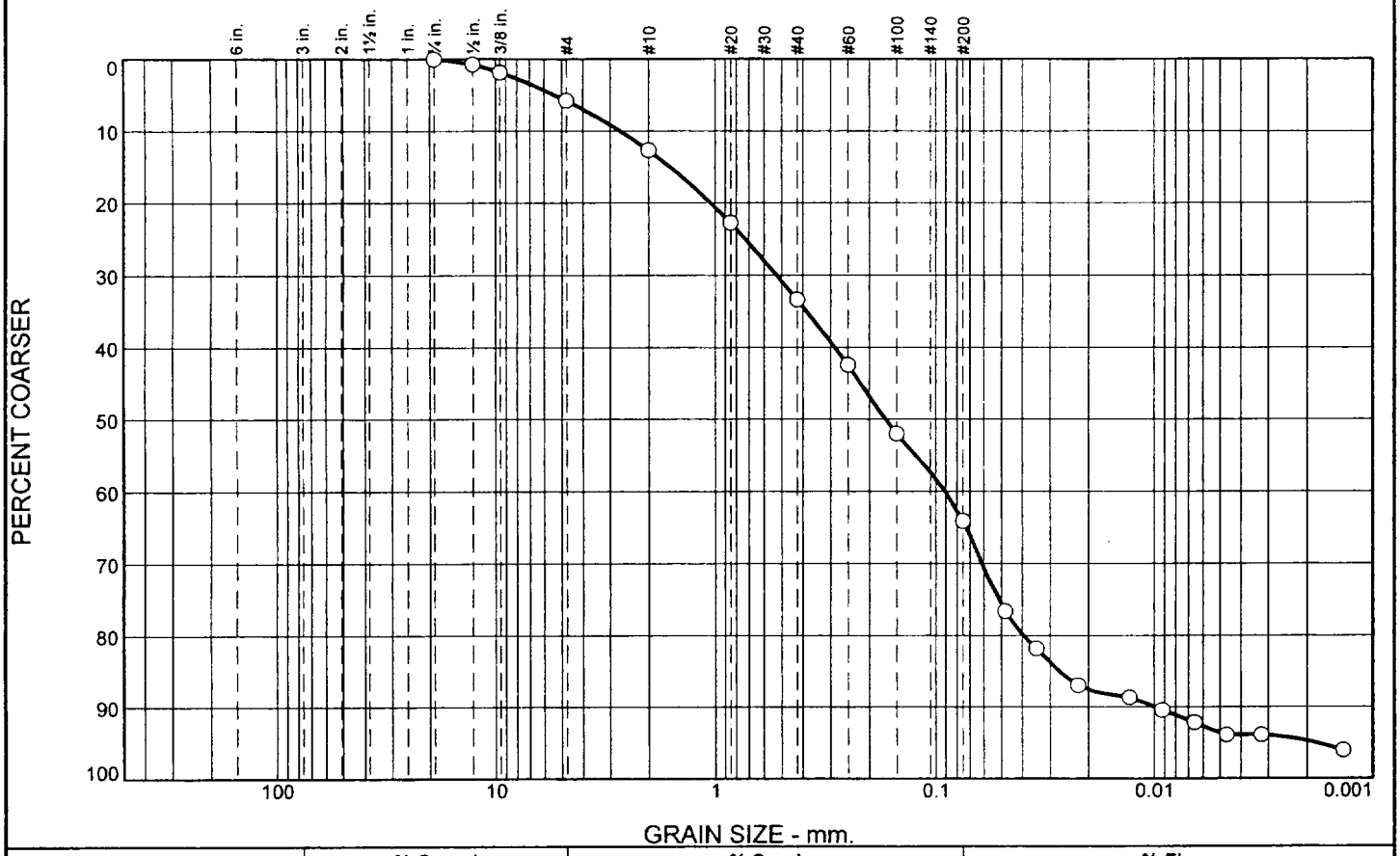
DEVELOPED BY: DC/SC

APPENDIX E

LABORATORY REPORTS

BOWSER MORNER®

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.8	6.9	20.6	30.8	30.6	5.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.3		
.375	98.2		
#4	94.2		
#10	87.3		
#20	77.3		
#40	66.7		
#60	57.6		
#100	48.0		
#200	35.9		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.5940 D_{60}= 0.2852 D_{50}= 0.1684
D_{30}= 0.0612 D_{15}= 0.0271 D_{10}= 0.0099
C_u= 28.68 C_c= 1.32

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 10.9%

Location: No. 2-885/1F-1, 23.5'-24.5' **Date:** 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/5/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-885/1F-1, 23.5'-24.5'
Material Description: gray silty SAND (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 10.9%

Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1155.70	231.02	0.00	.75	0.00	100.0
			.50	6.70	99.3
			.375	16.87	98.2
			#4	53.25	94.2
			#10	117.25	87.3
50.73	0.00	0.00	#20	5.85	77.3
			#40	12.00	66.7
			#60	17.27	57.6
			#100	22.85	48.0
			#200	29.88	35.9

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 87.3
Weight of hydrometer sample =50.73
Hygroscopic moisture correction:
Moist weight and tare = 48.52
Dry weight and tare = 48.43
Tare weight = 28.46
Hygroscopic moisture = 0.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -6.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.5	19.0	13.5	0.0132	19.0	13.2	0.0480	23.4
2.00	22.5	16.0	10.5	0.0132	16.0	13.7	0.0346	18.2
5.00	22.5	13.0	7.5	0.0132	13.0	14.2	0.0223	13.0
15.00	22.5	12.0	6.5	0.0132	12.0	14.3	0.0129	11.3
30.00	22.5	11.0	5.5	0.0132	11.0	14.5	0.0092	9.6
60.00	22.5	10.0	4.5	0.0132	10.0	14.7	0.0065	7.8
120.00	22.5	9.0	3.5	0.0132	9.0	14.8	0.0047	6.1
250.00	22.5	9.0	3.5	0.0132	9.0	14.8	0.0032	6.1
1440.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0014	4.0

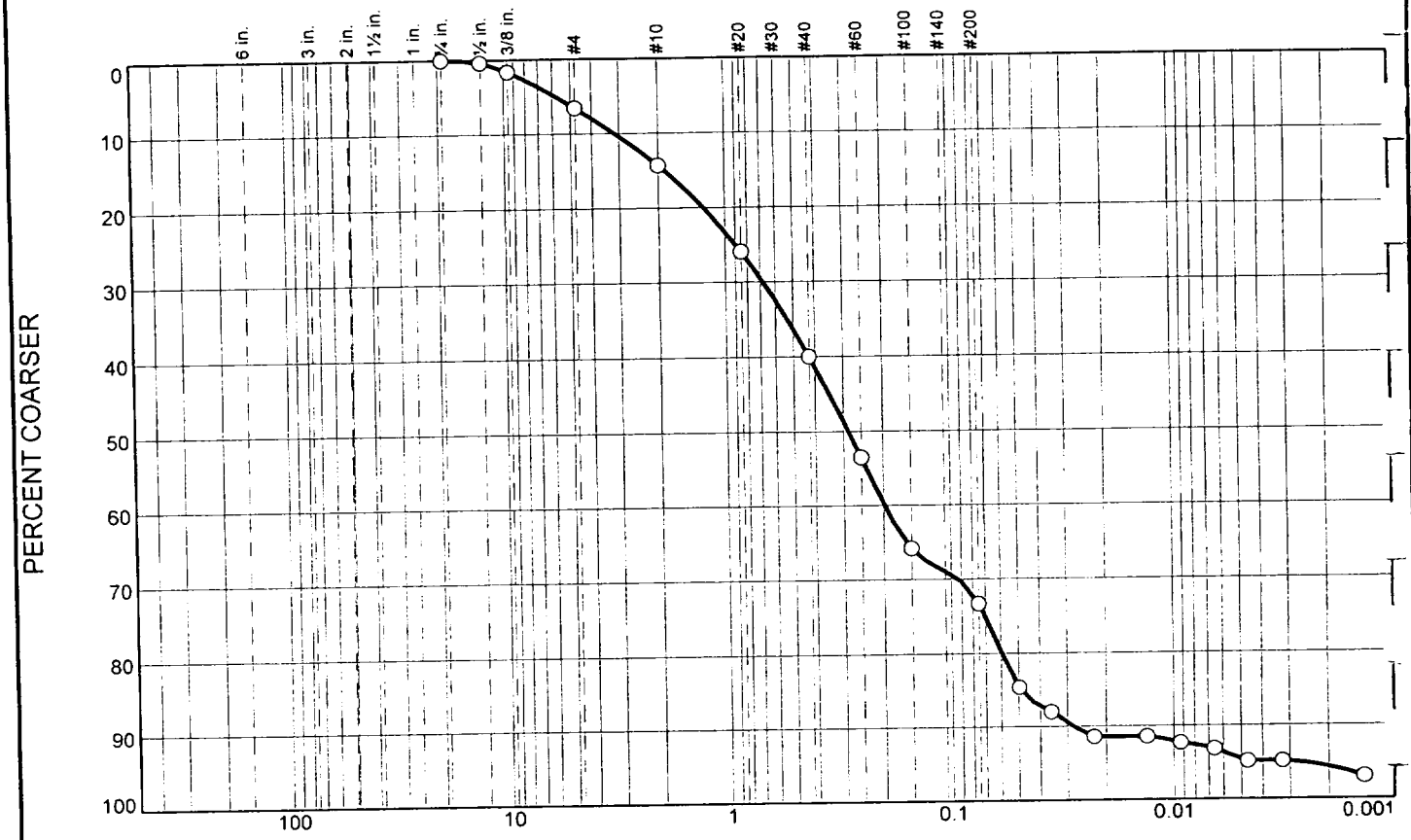
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.8	5.8	6.9	20.6	30.8	58.3	30.6	5.3	35.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0099	0.0271	0.0396	0.0612	0.1684	0.2852	1.0436	1.5940	2.6902	5.3396

Fineness Modulus	C_u	C_c
1.56	28.68	1.32

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	6.5	7.8	25.7	33.3	22.4	4.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.6		
.375	98.4		
#4	93.5		
#10	85.7		
#20	74.1		
#40	60.0		
#60	46.5		
#100	34.2		
#200	26.7		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.8694 D_{60}= 0.4246 D_{50}= 0.2843
D_{30}= 0.0926 D_{15}= 0.0484 D_{10}= 0.0279
C_u= 15.21 C_c= 0.72

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 10.1%

Location: No. 2-885/1F-2, 24.5'-25.5'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

GRAIN SIZE DISTRIBUTION TEST DATA

9/7/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-885/1F-2, 24.5'-25.5'
Material Description: gray silty SAND (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 10.1%

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1473.40	226.26	0.00	.75	0.00	100.0
			.50	4.73	99.6
			.375	20.32	98.4
			#4	81.17	93.5
			#10	177.89	85.7
50.45	0.00	0.00	#20	6.87	74.1
			#40	15.13	60.0
			#60	23.08	46.5
			#100	30.31	34.2
			#200	34.74	26.7

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =85.7
Weight of hydrometer sample =50.45
Hygroscopic moisture correction:
Moist weight and tare = 48.93
Dry weight and tare = 48.85
Tare weight = 28.81
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

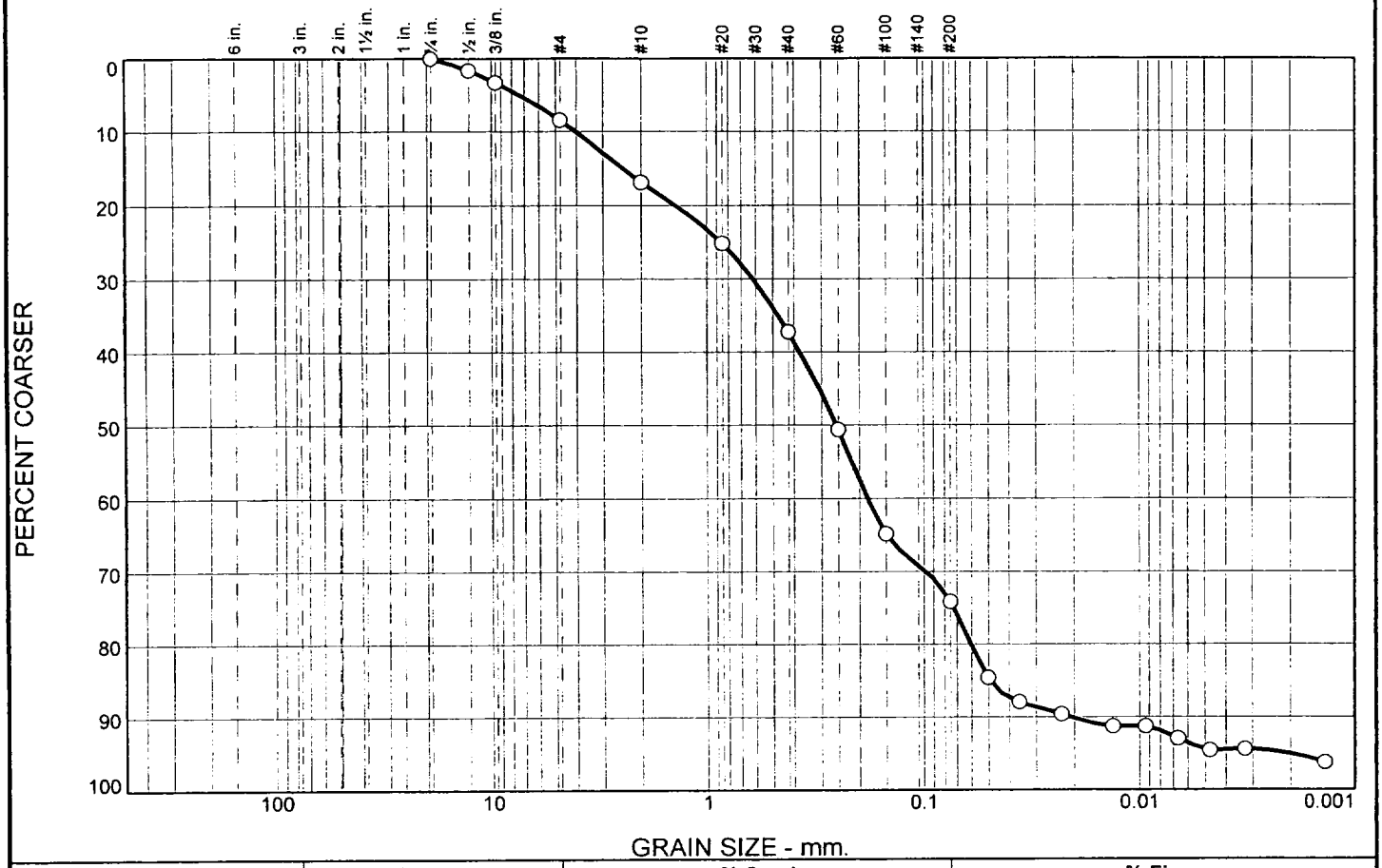
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.5	14.0	9.0	0.0132	14.0	14.0	0.0495	15.4
2.00	22.5	12.0	7.0	0.0132	12.0	14.3	0.0354	12.0
5.00	22.5	10.0	5.0	0.0132	10.0	14.7	0.0227	8.6
15.00	22.5	10.0	5.0	0.0132	10.0	14.7	0.0131	8.6
30.00	22.5	9.5	4.5	0.0132	9.5	14.7	0.0093	7.7
60.00	22.5	9.0	4.0	0.0132	9.0	14.8	0.0066	6.9
120.00	22.5	8.0	3.0	0.0132	8.0	15.0	0.0047	5.2
250.00	22.5	8.0	3.0	0.0132	8.0	15.0	0.0032	5.2
1440.00	21.5	7.0	1.8	0.0134	7.0	15.1	0.0014	3.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	6.5	6.5	7.8	25.7	33.3	66.8	22.4	4.3	26.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0279	0.0484	0.0591	0.0926	0.2843	0.4246	1.2493	1.8694	3.1112	5.7683

Fineness Modulus	C_u	C_c
1.88	15.21	0.72

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	8.4	8.4	20.4	36.9	20.9	5.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	98.4		
.375	96.7		
#4	91.6		
#10	83.2		
#20	74.8		
#40	62.8		
#60	49.4		
#100	35.2		
#200	25.9		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.4241 D_{60}= 0.3752 D_{50}= 0.2552
D_{30}= 0.0974 D_{15}= 0.0490 D_{10}= 0.0204
C_u= 18.37 C_c= 1.24

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 9.7%

Location: No. 2-885/1F-3, 25.5'-26.5'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

GRAIN SIZE DISTRIBUTION TEST DATA

9/7/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-885/1F-3, 25.5'-26.5'
Material Description: gray silty SAND (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 9.7%

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1476.60	*226.73*	*0.00*	.75	0.00	100.0
			.50	19.90	98.4
			.375	40.97	96.7
			#4	104.97	91.6
			#10	210.44	83.2
50.31	0.00	0.00	#20	5.03	74.8
			#40	12.33	62.8
			#60	20.43	49.4
			#100	29.00	35.2
			#200	34.62	25.9

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =83.2
Weight of hydrometer sample =50.31
Hygroscopic moisture correction:
Moist weight and tare = 48.08
Dry weight and tare = 48.01
Tare weight = 27.97
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

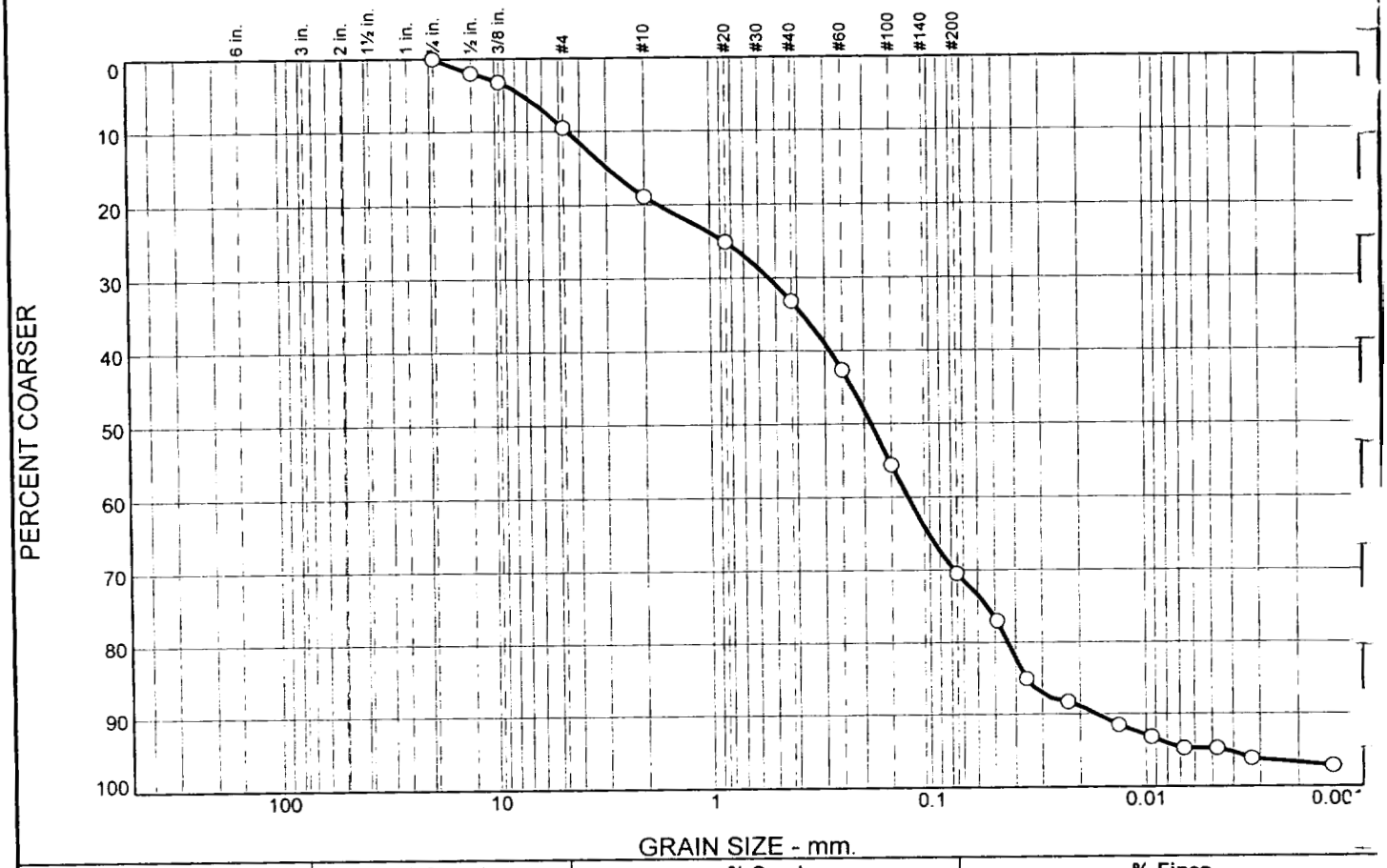
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	14.0	9.3	0.0134	14.0	14.0	0.0501	15.4
2.00	21.5	12.0	7.3	0.0134	12.0	14.3	0.0359	12.1
5.00	21.5	11.0	6.3	0.0134	11.0	14.5	0.0228	10.4
15.00	*21.5*	*10.0*	5.3	0.0134	10.0	14.7	0.0132	8.8
30.00	21.5	10.0	5.3	0.0134	10.0	14.7	0.0094	8.8
60.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0067	7.1
120.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0047	5.5
250.00	22.0	8.0	3.4	0.0133	8.0	15.0	0.0033	5.7
1440.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0014	3.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	8.4	8.4	8.4	20.4	36.9	65.7	20.9	5.0	25.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0204	0.0490	0.0602	0.0974	0.2552	0.3752	1.3929	2.4241	3.9956	7.3463

Fineness Modulus	C_u	C_c
1.89	18.37	1.24

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Cla
0.0	0.0	9.5	9.3	14.4	37.2	26.3	3.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	98.0		
.375	96.8		
#4	90.5		
#10	81.2		
#20	74.9		
#40	66.8		
#60	57.4		
#100	44.4		
#200	29.6		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.9400 D_{60}= 0.2836 D_{50}= 0.1853
D_{30}= 0.0773 D_{15}= 0.0355 D_{10}= 0.0167
C_u= 17.01 C_c= 1.26

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 10.0%

Location: No. 2-885/1F-4, 26.5'-27.5'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

GRAIN SIZE DISTRIBUTION TEST DATA

9/7/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-885/1F-4, 26.5'-27.5'
Material Description: gray silty SAND (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 10.0%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1354.50	228.17	0.00	.75	0.00	100.0
			.50	22.24	98.0
			.375	35.77	96.8
			#4	106.84	90.5
			#10	212.23	81.2
50.63	0.00	0.00	#20	3.88	74.9
			#40	8.95	66.8
			#60	14.85	57.4
			#100	22.91	44.4
			#200	32.19	29.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =81.2
Weight of hydrometer sample =50.63
Hygroscopic moisture correction:
Moist weight and tare = 51.02
Dry weight and tare = 50.94
Tare weight = 27.97
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

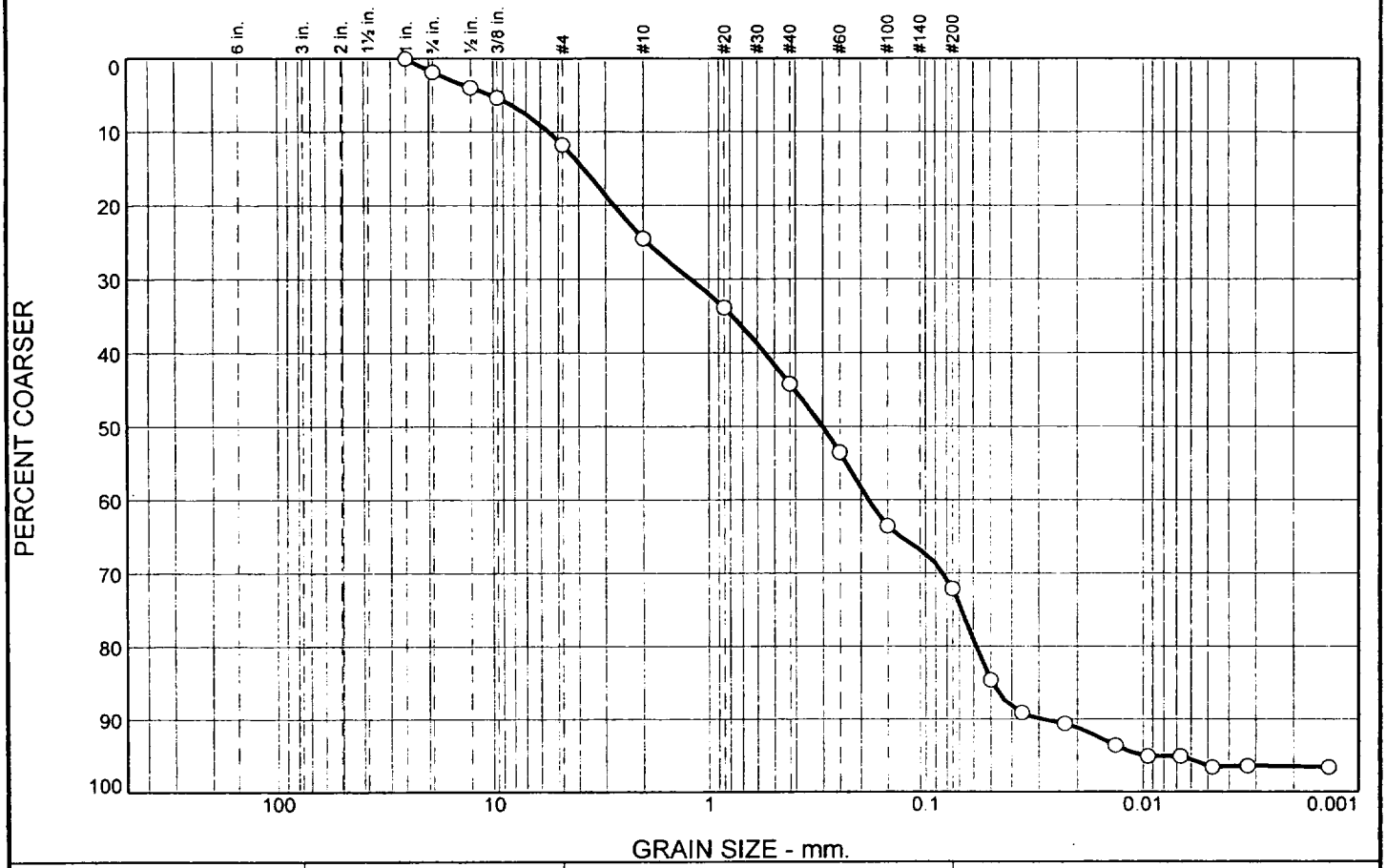
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	19.0	14.3	0.0134	19.0	13.2	0.0486	23.0
2.00	21.5	14.0	9.3	0.0134	14.0	14.0	0.0354	14.9
5.00	21.5	12.0	7.3	0.0134	12.0	14.3	0.0227	11.7
15.00	21.5	10.0	5.3	0.0134	10.0	14.7	0.0132	8.5
30.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0094	6.9
60.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0067	5.3
120.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0047	5.3
250.00	22.0	7.0	2.4	0.0133	7.0	15.1	0.0033	3.9
1440.00	21.5	6.5	1.8	0.0134	6.5	15.2	0.0014	2.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	9.5	9.5	9.3	14.4	37.2	60.9	26.3	3.3	29.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0167	0.0355	0.0433	0.0773	0.1853	0.2836	1.7290	2.9400	4.5414	7.3519

Fineness Modulus	C_u	C_c
1.76	17.01	1.26

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.9	9.8	12.8	19.7	27.9	24.4	3.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	98.1		
.50	96.1		
.375	94.7		
#4	88.3		
#10	75.5		
#20	66.1		
#40	55.8		
#60	46.5		
#100	36.5		
#200	27.9		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.7766 D_{60}= 0.5526 D_{50}= 0.3000
D_{30}= 0.0824 D_{15}= 0.0490 D_{10}= 0.0285
C_u= 19.41 C_c= 0.43

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 8.4%

Location: No. 2-885/1F-5, 27.5'-28.5'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

GRAIN SIZE DISTRIBUTION TEST DATA

9/7/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-885/1F-5, 27.5'-28.5'
Material Description: gray silty SAND (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 8.4%

Sieve Analysis

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1404.30	225.29	0.00	1.0	0.00	100.0
			.75	21.90	98.1
			.50	46.43	96.1
			.375	62.87	94.7
			#4	138.49	88.3
			#10	288.63	75.5
50.61	0.00	0.00	#20	6.28	66.1
			#40	13.21	55.8
			#60	19.44	46.5
			#100	26.17	36.5
			#200	31.90	27.9

Hydrometer Analysis

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =75.5
Weight of hydrometer sample =50.61
Hygroscopic moisture correction:
Moist weight and tare = 50.35
Dry weight and tare = 50.28
Tare weight = 30.01
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

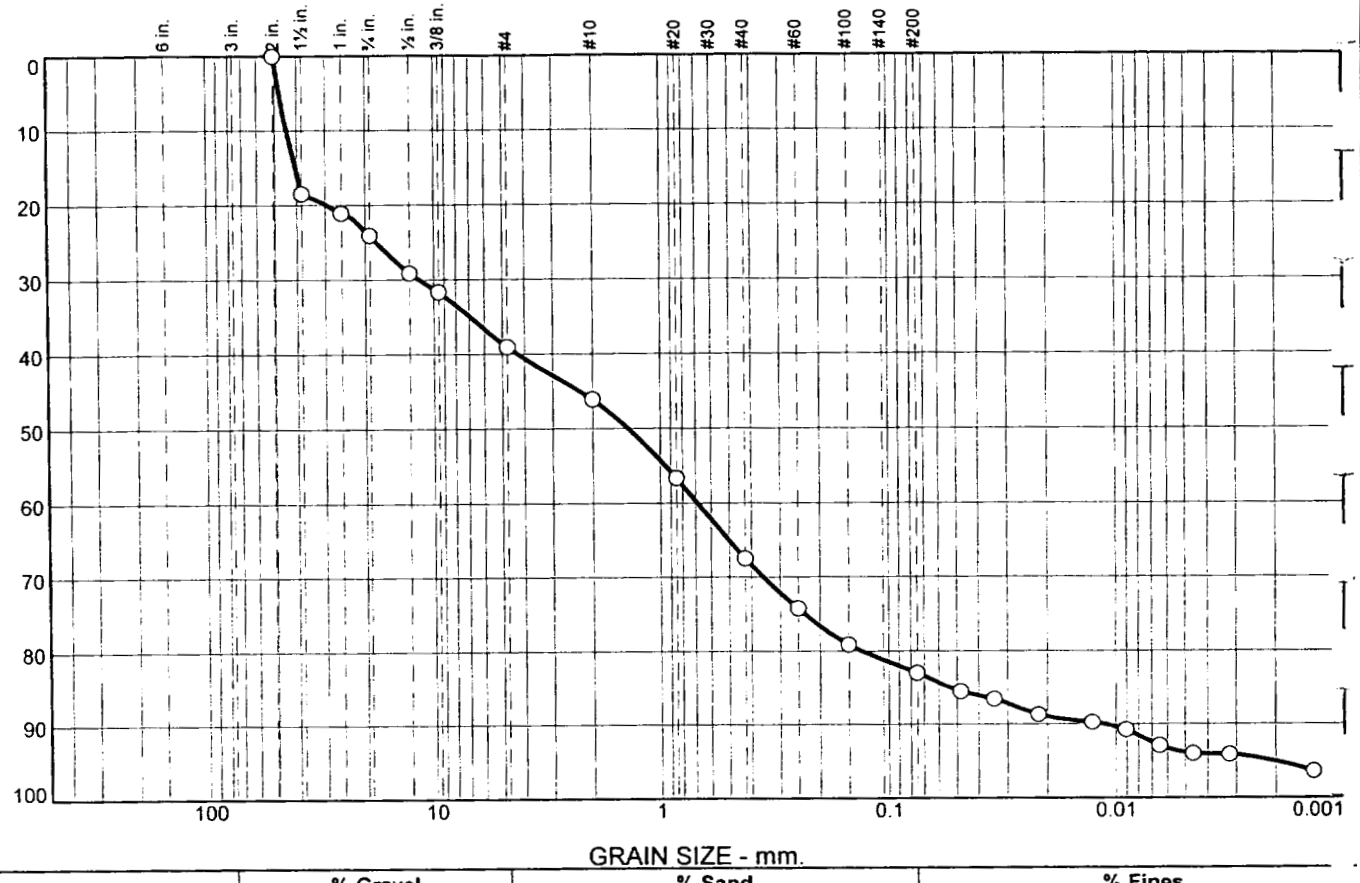
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	15.0	10.3	0.0134	15.0	13.8	0.0498	15.4
2.00	21.5	12.0	7.3	0.0134	12.0	14.3	0.0359	10.9
5.00	21.5	11.0	6.3	0.0134	11.0	14.5	0.0228	9.4
15.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0133	6.4
30.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0095	4.9
60.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0067	4.9
120.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0048	3.4
250.00	22.0	7.0	2.4	0.0133	7.0	15.1	0.0033	3.6
1440.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0014	3.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.9	9.8	11.7	12.8	19.7	27.9	60.4	24.4	3.5	27.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0285	0.0490	0.0582	0.0824	0.3000	0.5526	2.7330	3.7766	5.4791	10.1296

Fineness Modulus	C_u	C_c
2.24	19.41	0.43

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	24.0	15.0	7.0	21.4	15.5	12.1	5.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.5	81.5		
1.0	78.9		
.75	76.0		
.50	70.9		
.375	68.4		
#4	61.0		
#10	54.0		
#20	43.4		
#40	32.6		
#60	25.8		
#100	20.9		
#200	17.1		

* (no specification provided)

Material Description

brown silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 41.0140 D_{60}= 4.2680 D_{50}= 1.3765
D_{30}= 0.3533 D_{15}= 0.0527 D_{10}= 0.0110
C_u= 388.95 C_c= 2.67

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 7.1%

Location: No. 2-855/2F-1, 64.0'-65.0' **Date:** 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/11/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-855/2F-1, 64.0'-65.0'
Material Description: brown silty SAND with gravel (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 7.1%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1880.00	233.35	0.00	2.0	0.00	100.0
			1.5	303.82	81.5
			1.0	347.06	78.9
			.75	395.37	76.0
			.50	479.28	70.9
			.375	520.73	68.4
			#4	642.40	61.0
			#10	757.90	54.0
50.75	0.00	0.00	#20	9.94	43.4
			#40	20.13	32.6
			#60	26.52	25.8
			#100	31.12	20.9
			#200	34.70	17.1

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =54.0
Weight of hydrometer sample =50.75
Hygroscopic moisture correction:
Moist weight and tare = 50.81
Dry weight and tare = 50.75
Tare weight = 30.41
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

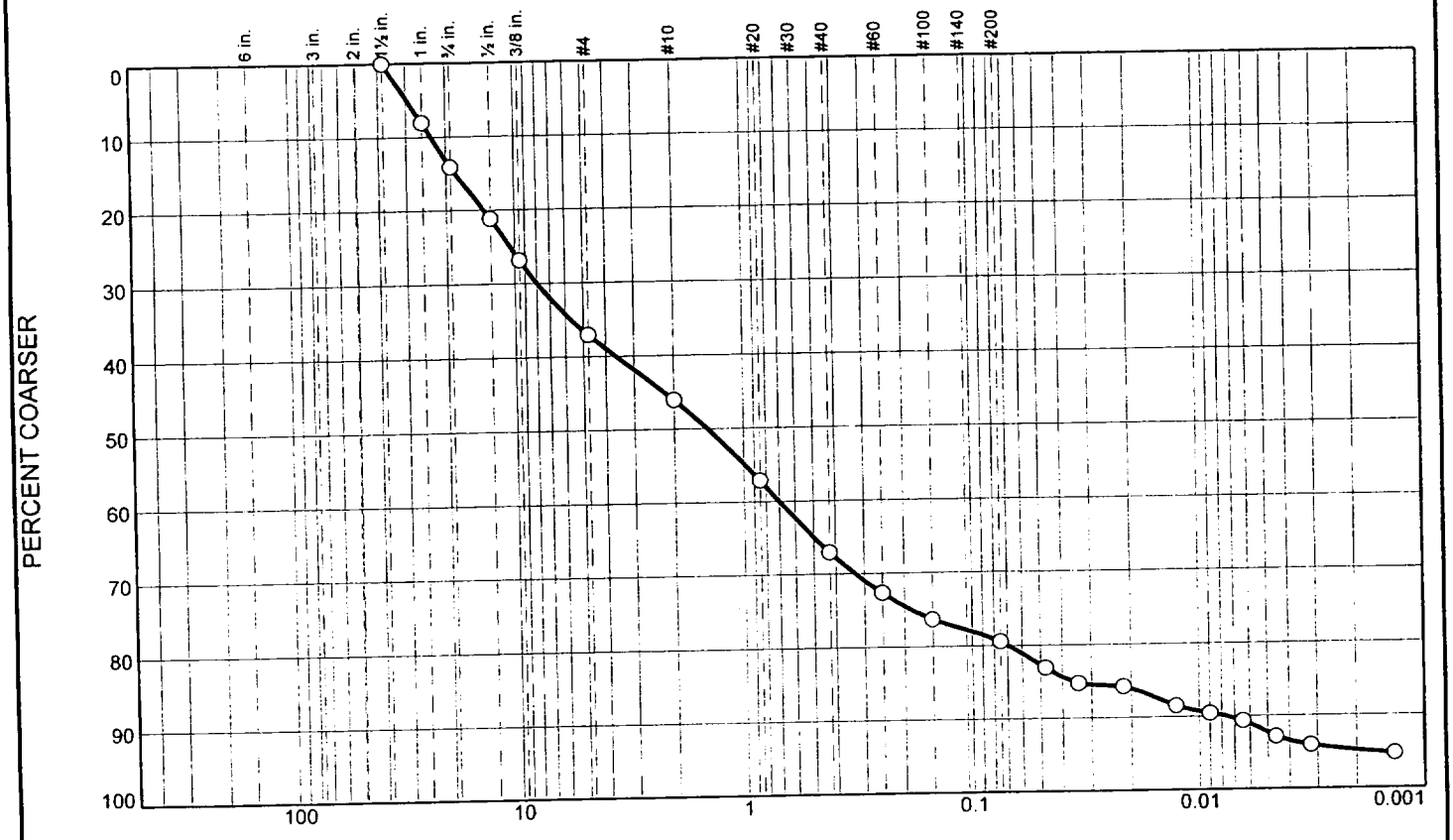
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	18.0	13.7	0.0132	18.0	13.3	0.0480	14.6
2.00	23.0	17.0	12.7	0.0132	17.0	13.5	0.0342	13.5
5.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0219	11.4
15.00	23.0	14.0	9.7	0.0132	14.0	14.0	0.0127	10.3
30.00	23.0	13.0	8.7	0.0132	13.0	14.2	0.0090	9.2
60.00	23.0	11.0	6.7	0.0132	11.0	14.5	0.0065	7.1
120.00	23.0	10.0	5.7	0.0132	10.0	14.7	0.0046	6.0
250.00	22.5	10.0	5.5	0.0132	10.0	14.7	0.0032	5.9
1440.00	22.0	8.0	3.4	0.0133	8.0	15.0	0.0014	3.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	24.0	15.0	39.0	7.0	21.4	15.5	43.9	12.1	5.0	17.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0110	0.0527	0.1315	0.3533	1.3765	4.2680	29.0970	41.0140	44.4258	47.5981

Fineness Modulus	C_u	C_c
4.23	388.95	2.67

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.1	22.9	9.0	21.0	12.4	15.4	5.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	92.0		
.75	85.9		
.50	78.9		
.375	73.2		
#4	63.0		
#10	54.0		
#20	42.9		
#40	33.0		
#60	27.4		
#100	23.7		
#200	20.6		

* (no specification provided)

Material Description

brown silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 18.1208 D_{60}= 3.5884 D_{50}= 1.4264
D_{30}= 0.3282 D_{15}= 0.0359 D_{10}= 0.0075
C_u= 479.93 C_c= 4.01

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 7.6%

Location: No. 2-855/2F-2, 65.0'-66.0'

Date: 08-30-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/1/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-855/2F-2, 65.0'-66.0'
Material Description: brown silty SAND with gravel (visual)
Date: 08-30-06
Testing Remarks: As Received
Moisture Content: 7.6%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1448.50	237.67	0.00	1.5	0.00	100.0
			1.0	97.23	92.0
			.75	170.30	85.9
			.50	256.03	78.9
			.375	324.75	73.2
			#4	448.06	63.0
			#10	556.80	54.0
50.12	0.00	0.00	#20	10.31	42.9
			#40	19.52	33.0
			#60	24.72	27.4
			#100	28.14	23.7
			#200	31.04	20.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =54.0
Weight of hydrometer sample =50.12
Hygroscopic moisture correction:
Moist weight and tare = 50.34
Dry weight and tare = 50.26
Tare weight = 27.97
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
***Specific gravity of solids* =2.65**
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

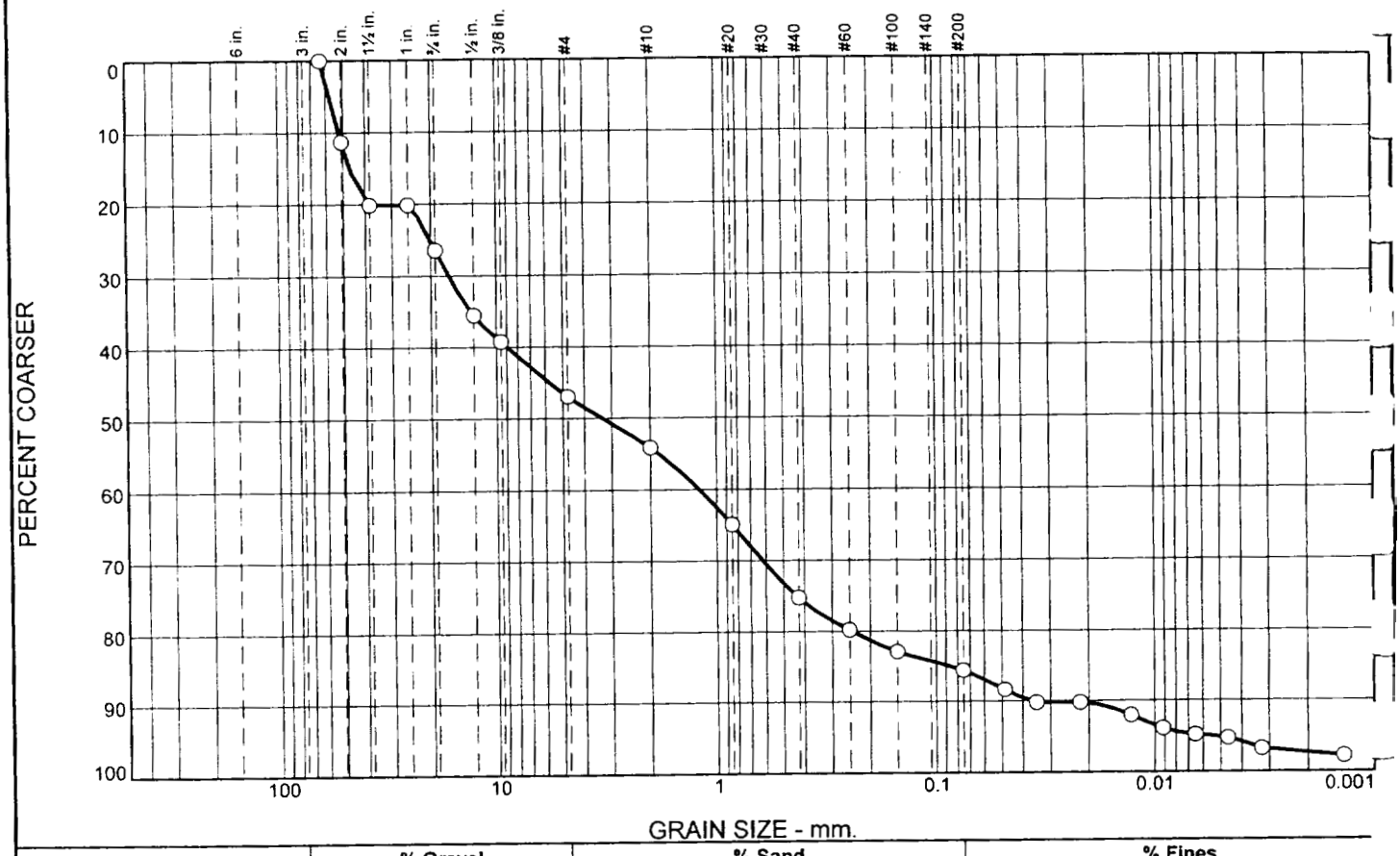
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	20.0	15.7	0.0132	20.0	13.0	0.0475	16.9
2.00	23.0	18.0	13.7	0.0132	18.0	13.3	0.0340	14.8
5.00	23.0	17.5	13.2	0.0132	17.5	13.4	0.0216	14.2
15.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0126	11.5
30.00	23.0	14.0	9.7	0.0132	14.0	14.0	0.0090	10.5
60.00	23.0	13.0	8.7	0.0132	13.0	14.2	0.0064	9.4
120.00	23.0	11.0	6.7	0.0132	11.0	14.5	0.0046	7.2
250.00	22.5	10.0	5.5	0.0132	10.0	14.7	0.0032	6.0
1440.00	22.0	9.0	4.4	0.0133	9.0	14.8	0.0014	4.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	14.1	22.9	37.0	9.0	21.0	12.4	42.4	15.4	5.2	20.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0075	0.0359	0.0690	0.3282	1.4264	3.5884	13.5324	18.1208	23.1692	29.4465

Fineness Modulus	C_u	C_c
3.84	479.93	4.01

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	26.4	20.5	7.2	21.1	10.4	11.7	2.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.5	100.0		
2.0	88.6		
1.5	79.9		
1.0	79.9		
.75	73.6		
.50	64.4		
.375	60.8		
#4	53.1		
#10	45.9		
#20	35.1		
#40	24.8		
#60	20.2		
#100	17.1		
#200	14.4		

* (no specification provided)

Material Description

brown silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 46.5318 D_{60}= 8.8956 D_{50}= 3.3012
D_{30}= 0.6164 D_{15}= 0.0857 D_{10}= 0.0368
C_u= 241.65 C_c= 1.16

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 6.9%

Location: NO. 2-855/2F-3, 66.0'-67.0'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/5/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: NO. 2-855/2F-3, 66.0'-67.0'
Material Description: brown silty SAND with gravel (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 6.9%

Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1663.10	236.95	0.00	2.5	0.00	100.0
			2.0	161.91	88.6
			1.5	286.63	79.9
			1.0	286.63	79.9
			.75	376.93	73.6
			.50	507.11	64.4
			.375	559.40	60.8
			#4	669.20	53.1
			#10	771.80	45.9
50.11	0.00	0.00	#20	11.77	35.1
			#40	23.06	24.8
			#60	28.01	20.2
			#100	31.41	17.1
			#200	34.39	14.4

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 45.9
Weight of hydrometer sample =50.11
Hygroscopic moisture correction:
Moist weight and tare = 52.22
Dry weight and tare = 52.17
Tare weight = 31.20
Hygroscopic moisture = 0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	17.0	12.7	0.0132	17.0	13.5	0.0483	11.6
2.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0346	9.8
5.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0219	9.8
15.00	23.0	13.0	8.7	0.0132	13.0	14.2	0.0128	8.0
30.00	23.0	11.0	6.7	0.0132	11.0	14.5	0.0091	6.1
60.00	23.0	10.0	5.7	0.0132	10.0	14.7	0.0065	5.2
120.00	23.0	9.5	5.2	0.0132	9.5	14.7	0.0046	4.7
250.00	22.5	8.0	3.5	0.0132	8.0	15.0	0.0032	3.2
1440.00	22.0	7.0	2.4	0.0133	7.0	15.1	0.0014	2.2

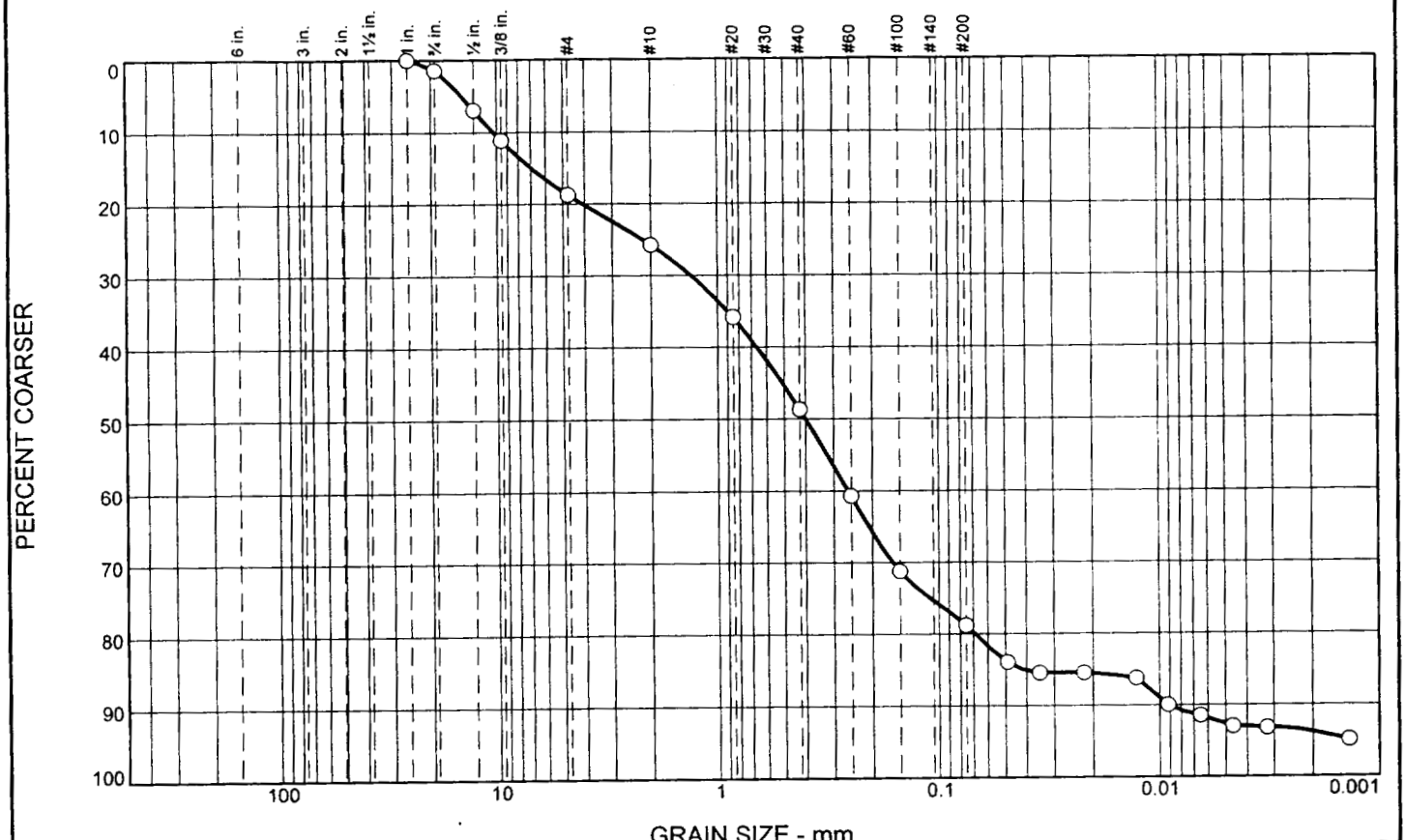
Fractional Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	26.4	20.5	46.9	7.2	21.1	10.4	38.7	11.7	2.7	14.4

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0368	0.0857	0.2416	0.6164	3.3012	8.8956	38.4072	46.5318	52.3062	57.8031

Fineness Modulus	C_u	C_c
4.77	241.65	1.16

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.4	17.3	7.0	23.0	30.1	15.0	6.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	98.6		
.50	93.1		
.375	88.9		
#4	81.3		
#10	74.3		
#20	64.2		
#40	51.3		
#60	39.3		
#100	28.8		
#200	21.2		

* (no specification provided)

Material Description

brown silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.9419 D_{60}= 0.6614 D_{50}= 0.3998
D_{30}= 0.1614 D_{15}= 0.0413 D_{10}= 0.0091
C_u= 72.57 C_c= 4.32

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 9.9%

Location: No. 2-855/2F-4, 67.0'-68.0'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/5/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-855/2F-4, 67.0'-68.0'
Material Description: brown silty SAND with gravel (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 9.9%

Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1377.69	226.65	0.00	1.0	0.00	100.0
			.75	16.40	98.6
			.50	79.65	93.1
			.375	128.26	88.9
			#4	215.18	81.3
			#10	296.11	74.3
50.29	0.00	0.00	#20	6.85	64.2
			#40	15.54	51.3
			#60	23.68	39.3
			#100	30.80	28.8
			#200	35.94	21.2

Hydrometer Test Data

Hydrometer test uses material passing #10
Percent passing #10 based upon complete sample = 74.3
Weight of hydrometer sample =50.29
Hygroscopic moisture correction:
Moist weight and tare = 48.94
Dry weight and tare = 48.56
Tare weight = 28.22
Hygroscopic moisture = 1.9%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C = -5.0
Meniscus correction only = 0.0
Specific gravity of solids = 2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L = 16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0489	16.0
2.00	23.0	14.0	9.7	0.0132	14.0	14.0	0.0348	14.5
5.00	23.0	14.0	9.7	0.0132	14.0	14.0	0.0220	14.5
15.00	23.0	13.5	9.2	0.0132	13.5	14.1	0.0127	13.8
30.00	23.0	11.0	6.7	0.0132	11.0	14.5	0.0091	10.0
60.00	23.0	10.0	5.7	0.0132	10.0	14.7	0.0065	8.5
120.00	23.0	9.0	4.7	0.0132	9.0	14.8	0.0046	7.0
250.00	22.5	9.0	4.5	0.0132	9.0	14.8	0.0032	6.8
1440.00	22.0	8.0	3.4	0.0133	8.0	15.0	0.0014	5.1

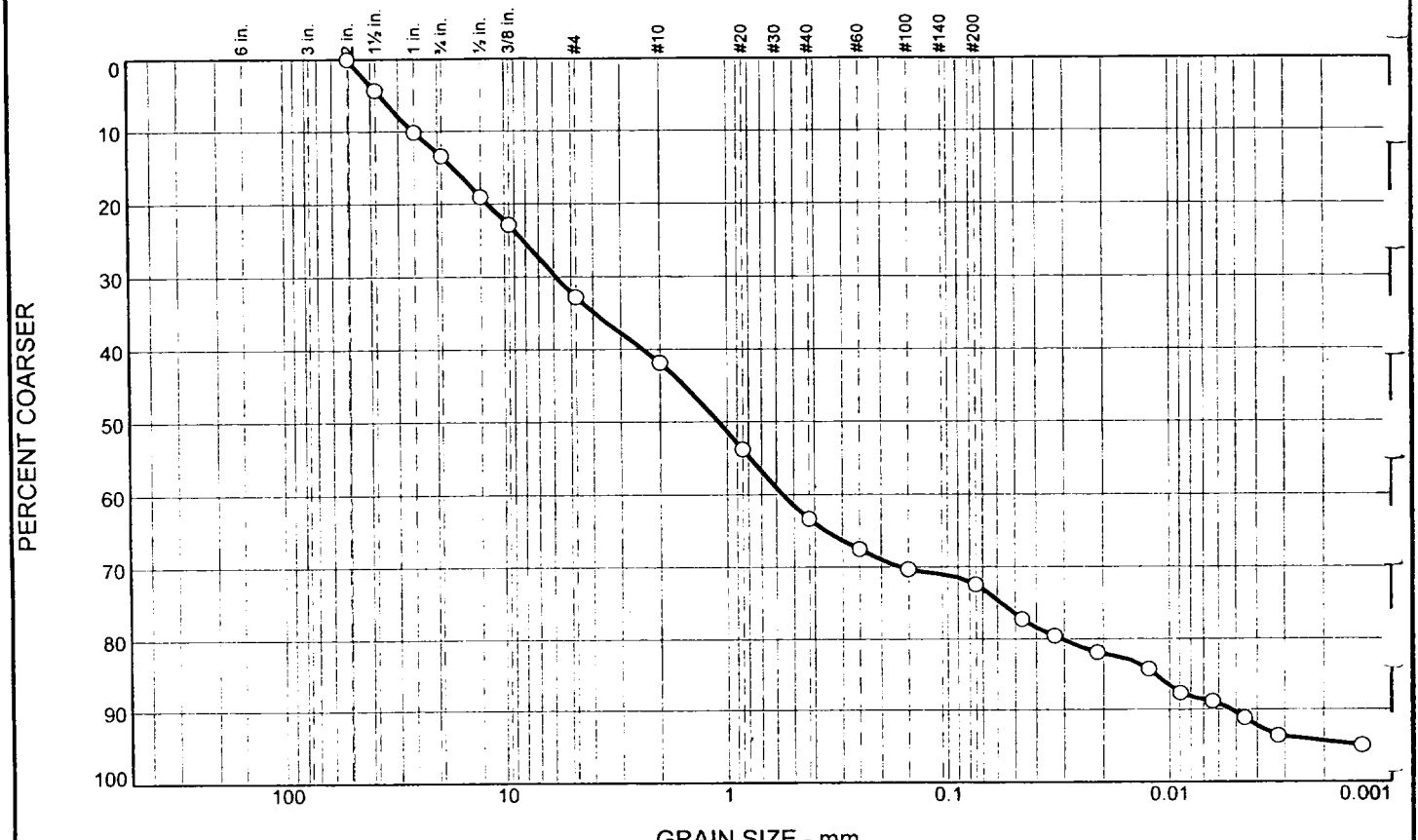
Soil Fraction Components

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.4	17.3	18.7	7.0	23.0	30.1	60.1	15.0	6.2	21.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0091	0.0413	0.0682	0.1614	0.3998	0.6614	4.0658	6.9419	10.3394	14.3676

Fineness Modulus	C_u	C_c
2.56	72.57	4.32

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	13.4	19.4	9.0	21.5	9.1	21.9	5.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.5	95.7		
1.0	89.9		
.75	86.6		
.50	81.0		
.375	77.2		
#4	67.2		
#10	58.2		
#20	46.2		
#40	36.7		
#60	32.5		
#100	29.7		
#200	27.6		

* (no specification provided)

Material Description

brown silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 16.8642 D_{60}= 2.3667 D_{50}= 1.0887
D_{30}= 0.1628 D_{15}= 0.0115 D_{10}= 0.0052
C_u= 452.85 C_c= 2.14

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 7.1%

Location: No. 2-855/2F-5, 68.0'-69.0' **Date:** 08-30-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/1/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-855/2F-5, 68.0'-69.0'
Material Description: brown silty SAND with gravel (visual)
Date: 08-30-06
Testing Remarks: As Received
Moisture Content: 7.1%

Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1809.50	230.22	0.00	2.0	0.00	100.0
			1.5	68.18	95.7
			1.0	159.74	89.9
			.75	211.66	86.6
			.50	300.47	81.0
			.375	360.52	77.2
			#4	517.29	67.2
			#10	660.20	58.2
50.42	0.00	0.00	#20	10.37	46.2
			#40	18.66	36.7
			#60	22.27	32.5
			#100	24.69	29.7
			#200	26.50	27.6

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =58.2
Weight of hydrometer sample =50.42
Hygroscopic moisture correction:
Moist weight and tare = 48.78
Dry weight and tare = 48.72
Tare weight = 28.52
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

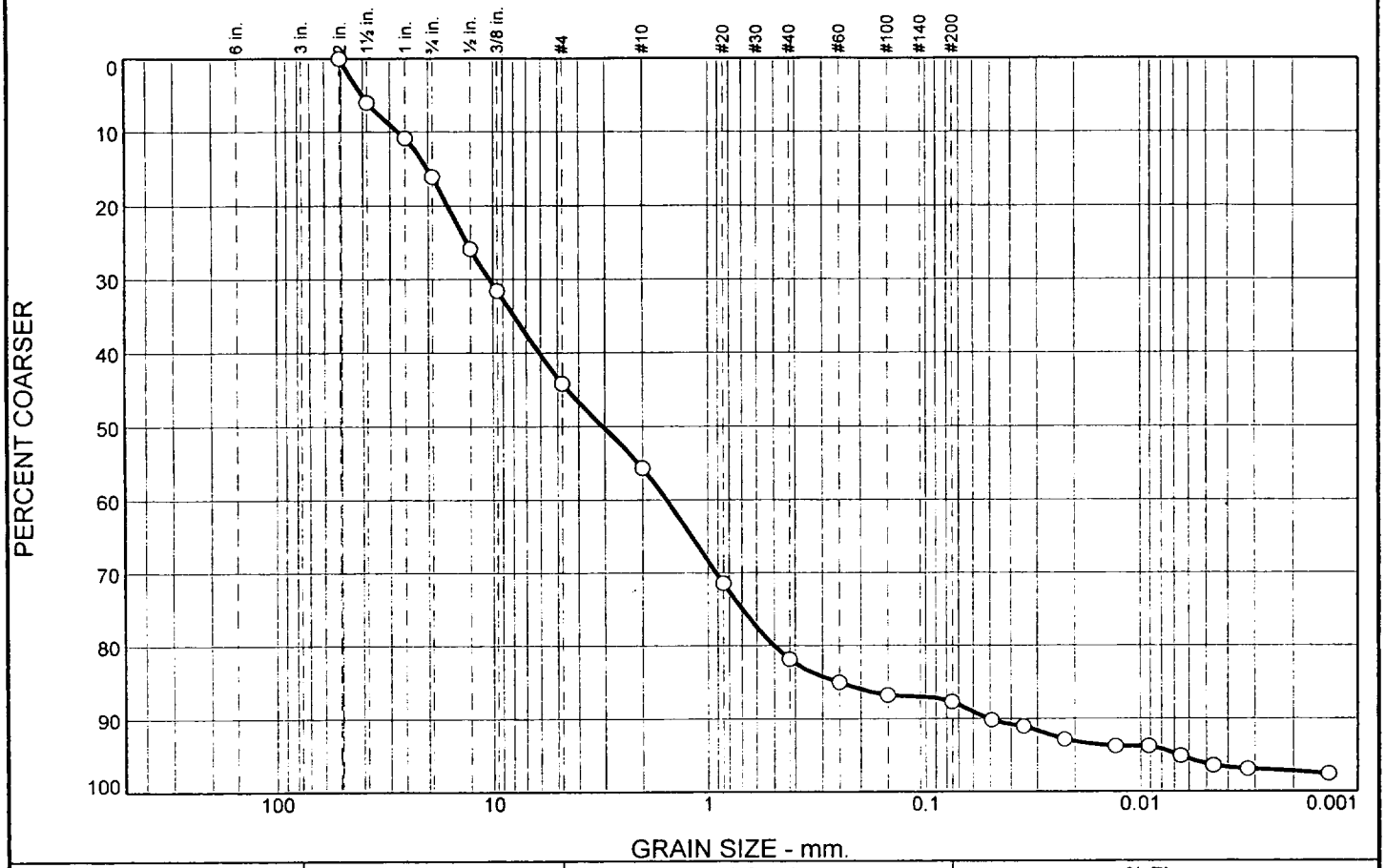
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	24.0	19.7	0.0132	24.0	12.4	0.0462	22.8
2.00	23.0	22.0	17.7	0.0132	22.0	12.7	0.0331	20.4
5.00	23.0	20.0	15.7	0.0132	20.0	13.0	0.0212	18.1
15.00	23.0	18.0	13.7	0.0132	18.0	13.3	0.0124	15.8
30.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0089	12.3
60.00	23.0	14.0	9.7	0.0132	14.0	14.0	0.0064	11.2
120.00	23.0	12.0	7.7	0.0132	12.0	14.3	0.0045	8.9
250.00	22.5	10.0	5.5	0.0132	10.0	14.7	0.0032	6.4
1440.00	22.0	9.0	4.4	0.0133	9.0	14.8	0.0014	5.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	13.4	19.4	32.8	9.0	21.5	9.1	39.6	21.9	5.7	27.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0052	0.0115	0.0307	0.1628	1.0887	2.3667	11.8108	16.8642	25.6386	36.4260

Fineness Modulus	C_u	C_c
3.58	452.85	2.14

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	16.1	28.1	11.4	26.2	5.9	9.5	2.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.5	94.0		
1.0	89.2		
.75	83.9		
.50	74.1		
.375	68.5		
#4	55.8		
#10	44.4		
#20	28.6		
#40	18.2		
#60	15.0		
#100	13.3		
#200	12.3		

* (no specification provided)

Material Description

brown GRAVEL with silt and sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 19.9976 D_{60}= 6.0805 D_{50}= 3.0603
D_{30}= 0.9150 D_{15}= 0.2503 D_{10}= 0.0506
C_u= 120.07 C_c= 2.72

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 7.4%

Location: No. 2-855/2F-6, 69.0'-70.0'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

GRAIN SIZE DISTRIBUTION TEST DATA

9/7/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-855/2F-6, 69.0'-70.0'
Material Description: brown GRAVEL with silt and sand (visual)
Date: 9-5-06
Testing Remarks: As Received
Moisture Content: 7.4%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1563.80	221.59	0.00	2.0	0.00	100.0
			1.5	80.24	94.0
			1.0	145.09	89.2
			.75	215.58	83.9
			.50	347.20	74.1
			.375	423.29	68.5
			#4	592.68	55.8
			#10	746.90	44.4
50.02	0.00	0.00	#20	17.76	28.6
			#40	29.51	18.2
			#60	33.11	15.0
			#100	35.05	13.3
			#200	36.12	12.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =44.4
Weight of hydrometer sample =50.02
Hygroscopic moisture correction:
Moist weight and tare = 48.43
Dry weight and tare = 48.31
Tare weight = 28.28
Hygroscopic moisture =0.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

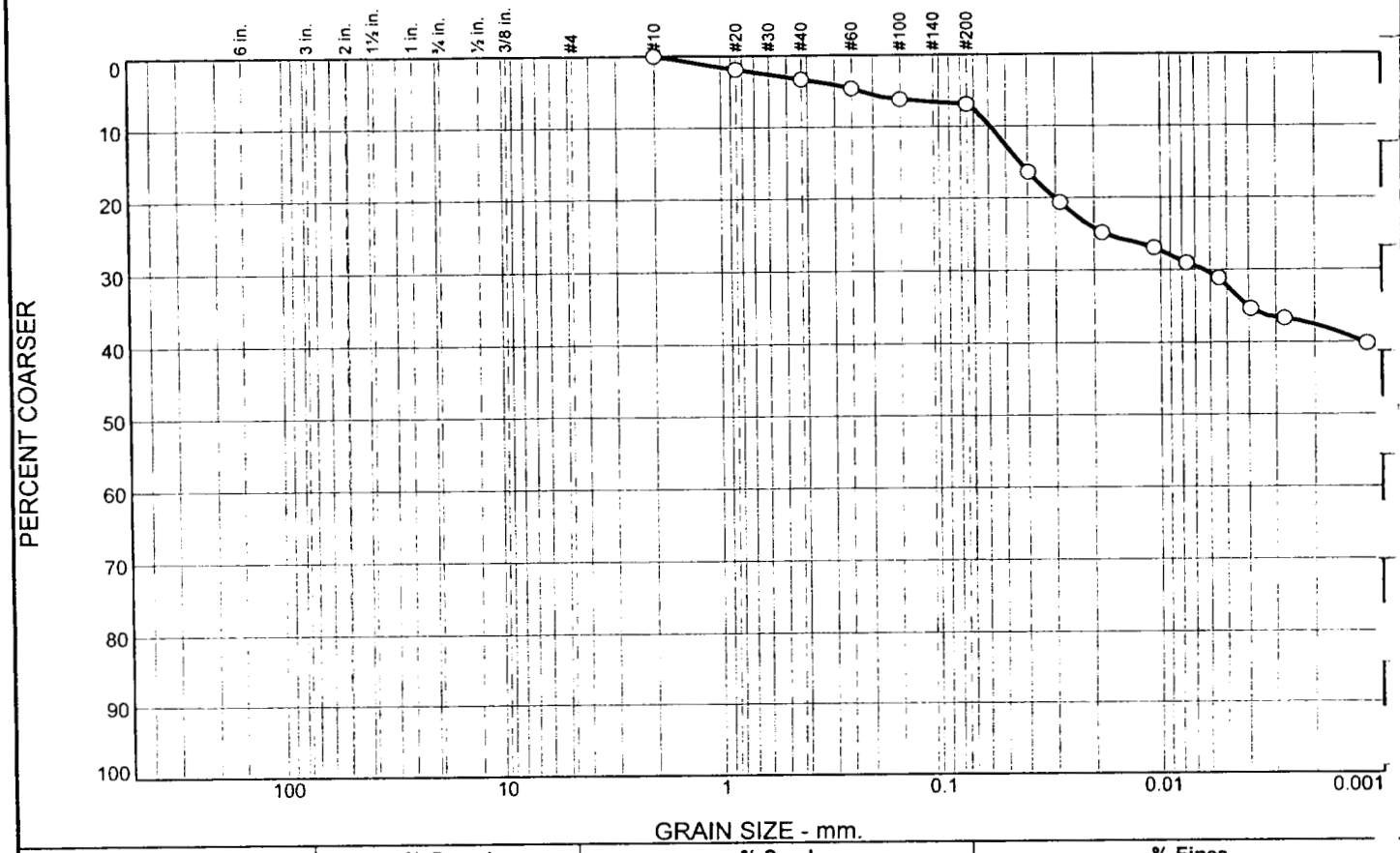
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.5	16.0	11.0	0.0132	16.0	13.7	0.0489	9.8
2.00	22.5	15.0	10.0	0.0132	15.0	13.8	0.0348	8.9
5.00	22.5	13.0	8.0	0.0132	13.0	14.2	0.0223	7.2
15.00	22.5	12.0	7.0	0.0132	12.0	14.3	0.0129	6.3
30.00	22.5	12.0	7.0	0.0132	12.0	14.3	0.0091	6.3
60.00	22.5	10.5	5.5	0.0132	10.5	14.6	0.0065	4.9
120.00	22.5	9.0	4.0	0.0132	9.0	14.8	0.0047	3.6
250.00	22.5	8.5	3.5	0.0132	8.5	14.9	0.0032	3.2
1440.00	21.5	8.0	2.8	0.0134	8.0	15.0	0.0014	2.5

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	16.1	28.1	44.2	11.4	26.2	5.9	43.5	9.5	2.8	12.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0506	0.2503	0.4998	0.9150	3.0603	6.0805	16.1751	19.9976	27.1024	40.3069

Fineness Modulus	C_u	C_c
4.64	120.07	2.72

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	3.3	3.6	30.6	62.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	98.1		
#40	96.7		
#60	95.4		
#100	93.8		
#200	93.1		

* (no specification provided)

Material Description

brown CLAY (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 28.2%

Location: No. 2-805/9F-1, 86.0'-87.0'

Date: 08-30-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/1/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-805/9F-1, 86.0'-87.0'
Material Description: brown CLAY (visual)
Date: 08-30-06
Testing Remarks: As Received
Moisture Content: 28.2%

Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1166.60	238.23	0.00	#10	0.00	100.0
50.02	0.00	0.00	#20	0.93	98.1
			#40	1.66	96.7
			#60	2.31	95.4
			#100	3.08	93.8
			#200	3.44	93.1

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =50.02
Hygroscopic moisture correction:
Moist weight and tare = 48.04
Dry weight and tare = 47.00
Tare weight = 27.97
Hygroscopic moisture =5.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

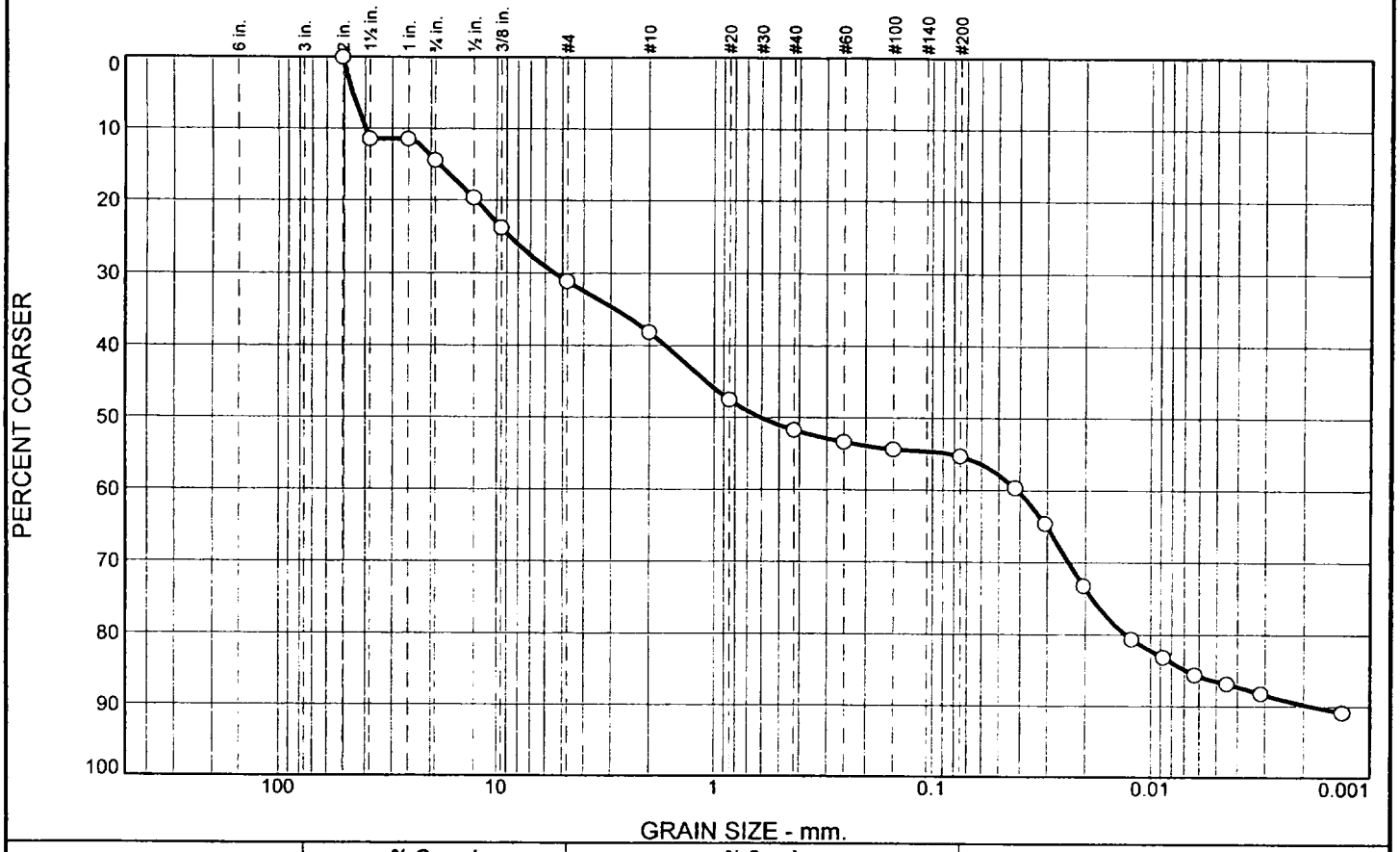
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	44.0	39.7	0.0132	44.0	9.1	0.0396	83.6
2.00	23.0	42.0	37.7	0.0132	42.0	9.4	0.0285	79.4
5.00	23.0	40.0	35.7	0.0132	40.0	9.7	0.0184	75.2
15.00	23.0	39.0	34.7	0.0132	39.0	9.9	0.0107	73.1
30.00	23.0	38.0	33.7	0.0132	38.0	10.1	0.0076	71.0
60.00	23.0	37.0	32.7	0.0132	37.0	10.2	0.0054	68.9
120.00	23.0	35.0	30.7	0.0132	35.0	10.6	0.0039	64.7
250.00	22.5	34.5	30.0	0.0132	34.5	10.6	0.0027	63.3
1440.00	22.0	33.0	28.4	0.0133	33.0	10.9	0.0012	59.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	3.3	3.6	6.9	30.6	62.5	93.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
									0.2256

Fineness Modulus
0.14

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.4	16.7	7.0	13.6	3.5	34.5	10.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.5	88.6		
1.0	88.6		
.75	85.6		
.50	80.4		
.375	76.3		
#4	68.9		
#10	61.9		
#20	52.6		
#40	48.3		
#60	46.7		
#100	45.7		
#200	44.8		

* (no specification provided)

Material Description

brown gravelly SILT with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 18.1969 D_{60}= 1.6735 D_{50}= 0.6019
D_{30}= 0.0238 D_{15}= 0.0069 D_{10}= 0.0018
C_u= 917.04 C_c= 0.18

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 10.8%

Location: No. 2-805/9F-2, 87.0'-88.0' **Date:** 08-30-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/11/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-805/9F-2, 87.0'-88.0'
Material Description: brown gravelly SILT with sand (visual)
Date: 08-30-06
Testing Remarks: As Received
Moisture Content: 10.8%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1341.50	232.00	0.00	2.0	0.00	100.0
			1.5	126.55	88.6
			1.0	126.55	88.6
			.75	159.49	85.6
			.50	217.24	80.4
			.375	263.45	76.3
			#4	344.73	68.9
			#10	422.73	61.9
50.60	0.00	0.00	#20	7.64	52.6
			#40	11.09	48.3
			#60	12.42	46.7
			#100	13.28	45.7
			#200	14.00	44.8

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =61.9
Weight of hydrometer sample =50.60
Hygroscopic moisture correction:
Moist weight and tare = 53.69
Dry weight and tare = 53.48
Tare weight = 32.70
Hygroscopic moisture =1.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

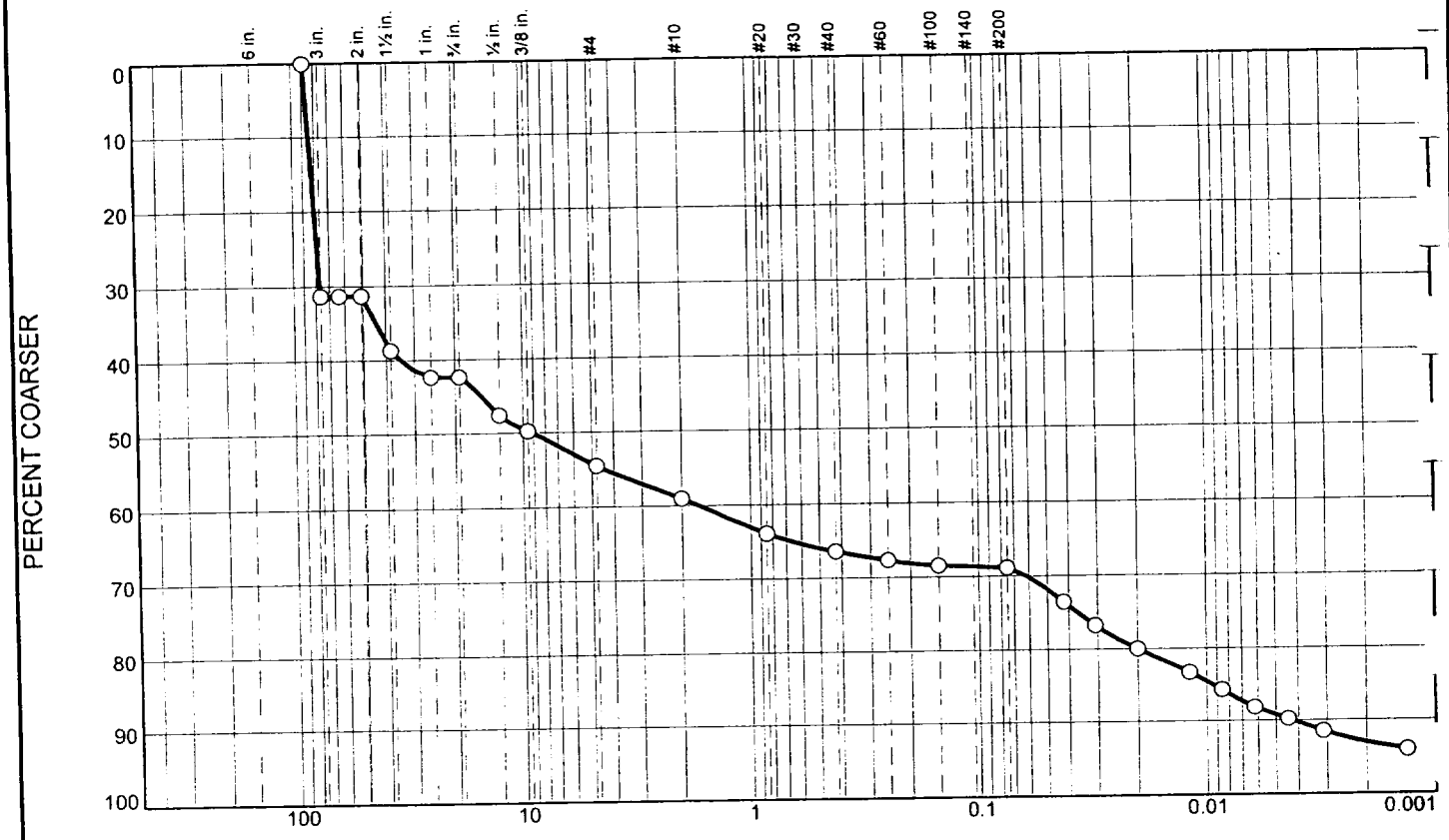
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	37.0	32.7	0.0132	37.0	10.2	0.0421	40.4
2.00	23.0	33.0	28.7	0.0132	33.0	10.9	0.0307	35.4
5.00	23.0	26.0	21.7	0.0132	26.0	12.0	0.0204	26.8
15.00	23.0	20.0	15.7	0.0132	20.0	13.0	0.0123	19.4
30.00	23.0	18.0	13.7	0.0132	18.0	13.3	0.0088	16.9
60.00	23.0	16.0	11.7	0.0132	16.0	13.7	0.0063	14.4
120.00	23.0	15.0	10.7	0.0132	15.0	13.8	0.0045	13.2
250.00	22.5	14.0	9.5	0.0132	14.0	14.0	0.0031	11.8
1440.00	22.0	12.0	7.4	0.0133	12.0	14.3	0.0013	9.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	14.4	16.7	31.1	7.0	13.6	3.5	24.1	34.5	10.3	44.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0018	0.0069	0.0131	0.0238	0.6019	1.6735	12.3224	18.1969	40.2654	45.7855

Fineness Modulus	C_u	C_c
3.18	917.04	0.18

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
31.3	11.0	12.2	4.5	7.4	2.4	24.2	7.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
3.5	100.0		
3.0	68.7		
2.5	68.7		
2.0	68.7		
1.5	61.3		
1	57.7		
.75	57.7		
.50	52.5		
.375	50.3		
#4	45.5		
#10	41.0		
#20	36.1		
#40	33.6		
#60	32.4		
#100	31.5		
#200	31.2		

* (no specification provided)

Material Description

white gravelly SILT (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 83.6083 D_{60}= 34.3559 D_{50}= 9.0725
D_{30}= 0.0613 D_{15}= 0.0093 D_{10}= 0.0042
C_u= 8238.64 C_c= 0.03

Classification

USCS= GM AASHTO= A-4(0)

Remarks

As Received
Moisture Content: 6.1%

Location: No. 2-805/9F-3, 88.0'-89.0'

Date: 9-5-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/11/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 2-805/9F-3, 88.0'-89.0'
Material Description: white gravelly SILT (visual)
Date: 9-5-06
USCS Classification: GM
AASHTO Classification: A-4(0)
Testing Remarks: As Received
Moisture Content: 6.1%
Tested by: BB
Checked by: SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1500.00	228.79	0.00	3.5	0.00	100.0
			3.0	397.63	68.7
			2.5	397.63	68.7
			2.0	397.63	68.7
			1.5	491.54	61.3
			1	537.80	57.7
			.75	537.80	57.7
			.50	604.10	52.5
			.375	631.80	50.3
			#4	692.80	45.5
			#10	750.10	41.0
50.69	0.00	0.00	#20	6.01	36.1
			#40	9.14	33.6
			#60	10.66	32.4
			#100	11.69	31.5
			#200	12.15	31.2

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =41.0
Weight of hydrometer sample =50.69
Hygroscopic moisture correction:
Moist weight and tare = 50.12
Dry weight and tare = 50.06
Tare weight = 30.01
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	23.0	37.0	32.7	0.0132	37.0	10.2	0.0421	26.5
2.00	23.0	33.0	28.7	0.0132	33.0	10.9	0.0307	23.3
5.00	23.0	29.0	24.7	0.0132	29.0	11.5	0.0200	20.0
15.00	23.0	25.0	20.7	0.0132	25.0	12.2	0.0119	16.8
30.00	23.0	22.0	17.7	0.0132	22.0	12.7	0.0086	14.3
60.00	23.0	19.0	14.7	0.0132	19.0	13.2	0.0062	11.9

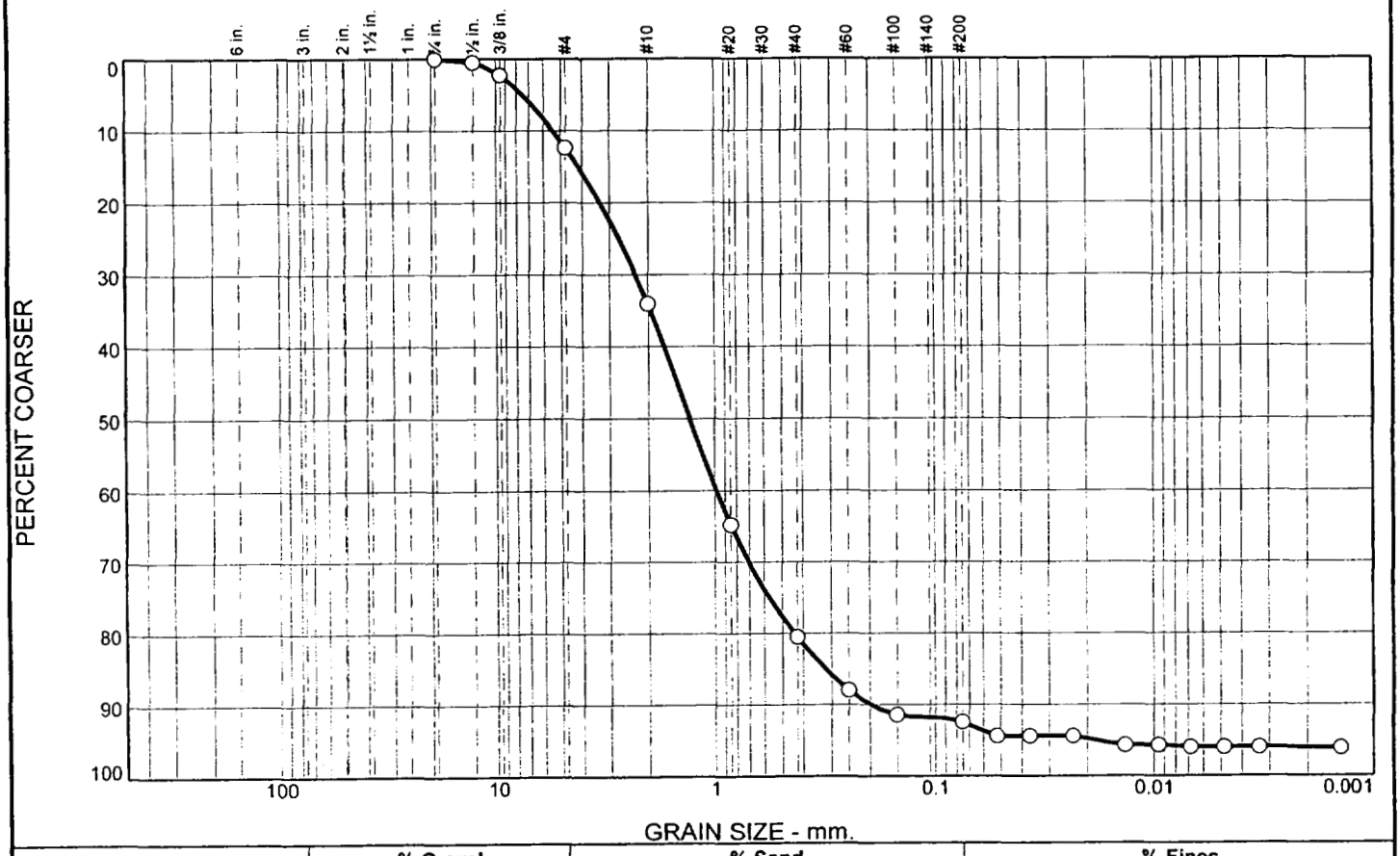
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
120.00	23.0	17.0	12.7	0.0132	17.0	13.5	0.0044	10.3
250.00	22.5	15.0	10.5	0.0132	15.0	13.8	0.0031	8.5
1440.00	22.0	12.0	7.4	0.0133	12.0	14.3	0.0013	6.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
31.3	11.0	12.2	23.2	4.5	7.4	2.4	14.3	24.2	7.0	31.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0042	0.0093	0.0200	0.0613	9.0725	34.3559	81.7209	83.6083	85.3989	87.1495

Fineness Modulus	C_u	C_c
5.38	8238.64	0.03

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	12.3	21.7	46.5	11.9	3.6	4.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.5		
.375	97.7		
#4	87.7		
#10	66.0		
#20	35.2		
#40	19.5		
#60	12.1		
#100	8.6		
#200	7.6		

* (no specification provided)

Material Description

brown well-graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.1400 D_{60}= 1.6879 D_{50}= 1.2929
D_{30}= 0.7052 D_{15}= 0.3170 D_{10}= 0.1979
C_u= 8.53 C_c= 1.49

Classification

USCS= SW-SM AASHTO=

Remarks

As Received
Moisture Content: 9.9%

Location: No. 3-805/6F-1, 50.0'-51.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-1, 50.0'-51.0'
Material Description: brown well-graded SAND with silt
Date: 09-11-06
USCS Classification: SW-SM
Testing Remarks: As Received
Moisture Content: 9.9%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1110.70	232.04	0.00	.75	0.00	100.0
			.50	4.13	99.5
			.375	19.86	97.7
			#4	108.10	87.7
			#10	299.15	66.0
50.07	0.00	0.00	#20	23.31	35.2
			#40	35.25	19.5
			#60	40.89	12.1
			#100	43.54	8.6
			#200	44.29	7.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =66.0
Weight of hydrometer sample =50.07
Hygroscopic moisture correction:
Moist weight and tare = 50.38
Dry weight and tare = 50.32
Tare weight = 28.22
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

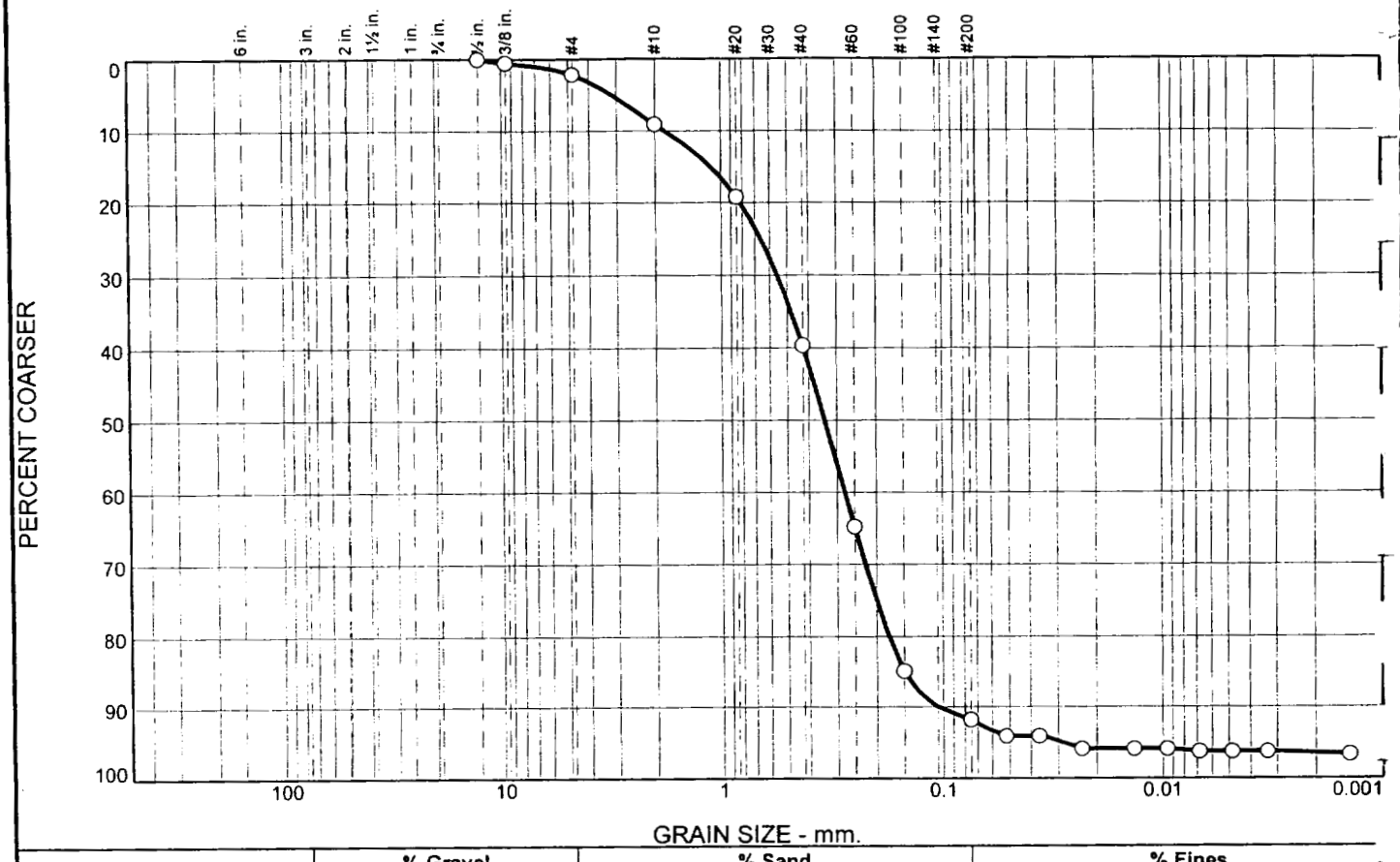
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	8.0	4.3	0.0134	8.0	15.0	0.0518	5.7
2.00	21.5	8.0	4.3	0.0134	8.0	15.0	0.0367	5.7
5.00	21.5	8.0	4.3	0.0134	8.0	15.0	0.0232	5.7
15.00	21.5	7.0	3.3	0.0134	7.0	15.1	0.0135	4.3
30.00	21.5	7.0	3.3	0.0134	7.0	15.1	0.0095	4.3
60.00	20.5	7.0	3.1	0.0136	7.0	15.1	0.0068	4.0
120.00	20.5	7.0	3.1	0.0136	7.0	15.1	0.0048	4.0
250.00	20.5	7.0	3.1	0.0136	7.0	15.1	0.0033	4.0
1440.00	20.0	7.0	3.0	0.0136	7.0	15.1	0.0014	3.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	12.3	12.3	21.7	46.5	11.9	80.1	3.6	4.0	7.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1979	0.3170	0.4371	0.7052	1.2929	1.6879	3.2950	4.1400	5.3889	7.4429

Fineness Modulus	C_u	C_c
3.48	8.53	1.49

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	6.9	30.6	52.2	4.7	3.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.5		
#4	97.9		
#10	91.0		
#20	80.9		
#40	60.4		
#60	35.3		
#100	15.2		
#200	8.2		

* (no specification provided)

Material Description

brown poorly graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.1043 D_{60}= 0.4212 D_{50}= 0.3380
D_{30}= 0.2236 D_{15}= 0.1488 D_{10}= 0.1052
C_u= 4.00 C_c= 1.13

Classification

USCS= SP-SM AASHTO=

Remarks

As Received
Moisture Content: 16.2%

Location: No. 3-805/6F-2, 51.0'-52.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/11/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-2, 51.0'-52.0'
Material Description: brown poorly graded SAND with silt
Date: 09-11-06
USCS Classification: SP-SM
Testing Remarks: As Received
Moisture Content: 16.2%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1031.20	228.66	0.00	.50	0.00	100.0
			.375	4.21	99.5
			#4	17.14	97.9
			#10	72.53	91.0
50.38	0.00	0.00	#20	5.60	80.9
			#40	16.94	60.4
			#60	30.85	35.3
			#100	41.96	15.2
			#200	45.82	8.2

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =91.0
Weight of hydrometer sample =50.38
Hygroscopic moisture correction:
Moist weight and tare = 48.44
Dry weight and tare = 48.40
Tare weight = 28.22
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

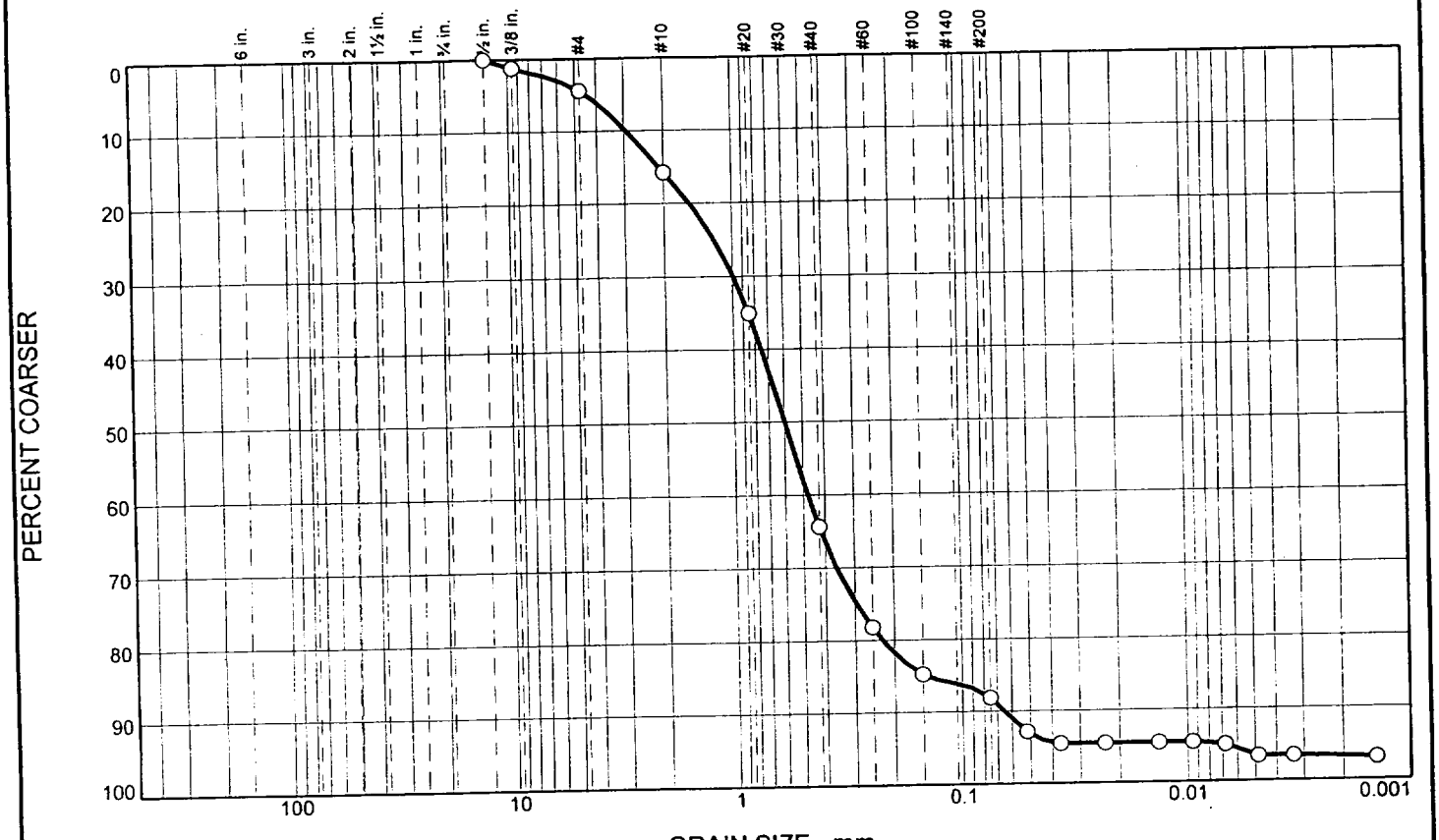
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0518	6.0
2.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0367	6.0
5.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0233	4.1
15.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0135	4.1
30.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0095	4.1
60.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0068	3.7
120.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0048	3.7
250.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0033	3.7
1440.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0014	3.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.1	2.1	6.9	30.6	52.2	89.7	4.7	3.5	8.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1052	0.1488	0.1755	0.2236	0.3380	0.4212	0.8137	1.1043	1.7930	3.1364

Fineness Modulus	C_u	C_c
1.92	4.00	1.13

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.4	11.4	48.5	23.8	8.6	3.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	98.8		
#4	95.6		
#10	84.2		
#20	65.0		
#40	35.7		
#60	21.8		
#100	15.2		
#200	11.9		

* (no specification provided)

Material Description

brown SAND with silt (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.1001 D_{60}= 0.7492 D_{50}= 0.5966
D_{30}= 0.3565 D_{15}= 0.1442 D_{10}= 0.0645
C_u= 11.61 C_c= 2.63

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 12.6%

Location: No. 3-805/6F-3, 52.0'-53.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-3, 52.0'-53.0'
Material Description: brown SAND with silt (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 12.6%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1080.80	230.13	0.00	.50	0.00	100.0
			.375	10.25	98.8
			#4	37.47	95.6
			#10	134.08	84.2
50.72	0.00	0.00	#20	11.61	65.0
			#40	29.22	35.7
			#60	37.57	21.8
			#100	41.54	15.2
			#200	43.57	11.9

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =84.2
Weight of hydrometer sample =50.72
Hygroscopic moisture correction:
Moist weight and tare = 50.92
Dry weight and tare = 50.86
Tare weight = 27.97
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

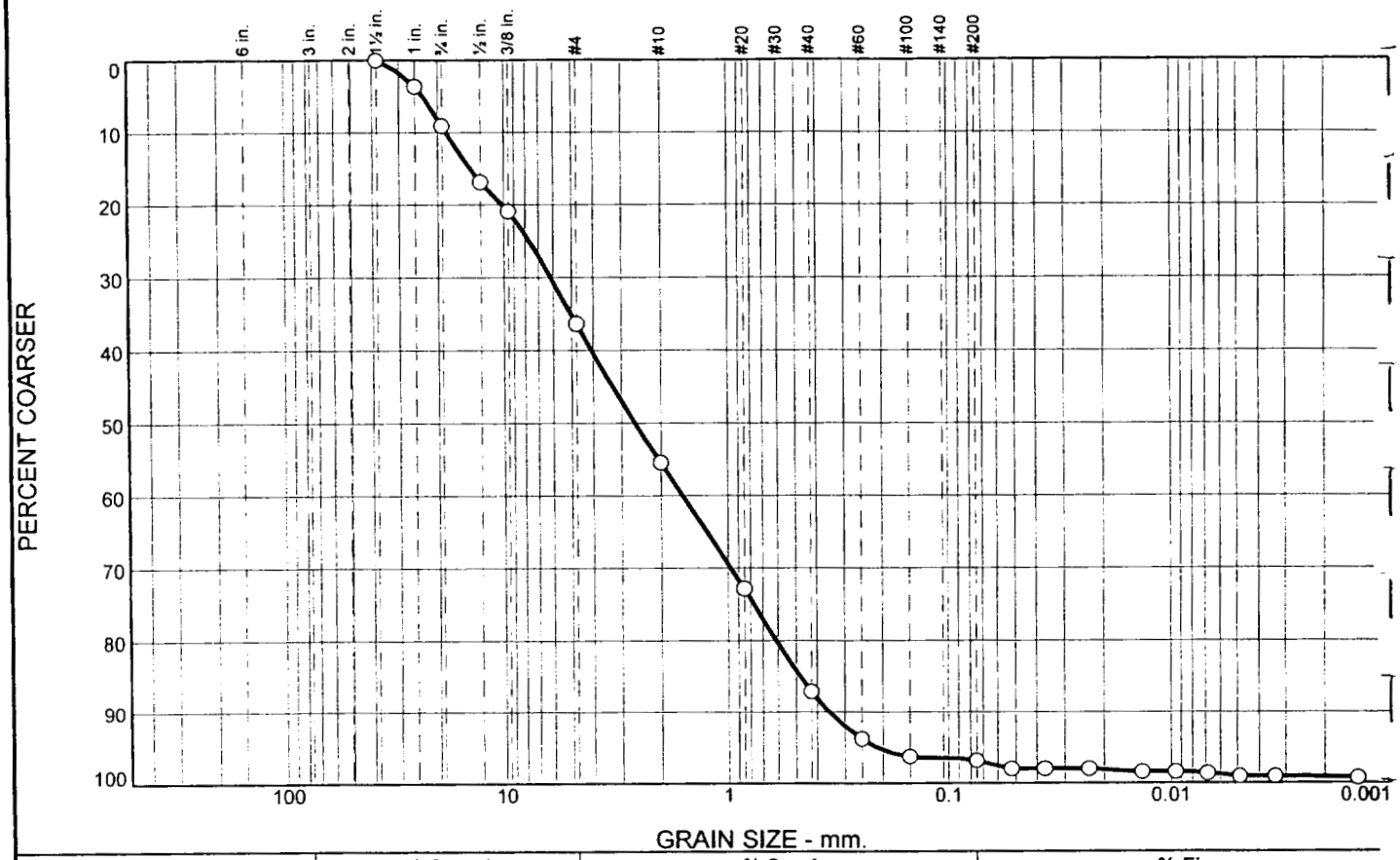
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0516	7.1
2.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0367	5.5
5.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0232	5.5
15.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0134	5.5
30.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0095	5.5
60.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0068	5.1
120.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0048	3.4
250.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0033	3.4
1440.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0014	3.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.4	4.4	11.4	48.5	23.8	83.7	8.6	3.3	11.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0645	0.1442	0.2249	0.3565	0.5966	0.7492	1.5401	2.1001	2.9261	4.4353

Fineness Modulus	C_u	C_c
2.53	11.61	2.63

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	9.0	27.3	19.1	31.7	9.7	2.3	0.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	96.4		
.75	91.0		
.50	83.2		
.375	79.1		
#4	63.7		
#10	44.6		
#20	27.2		
#40	12.9		
#60	6.2		
#100	3.7		
#200	3.2		

* (no specification provided)

Material Description

brown poorly graded SAND with gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 14.1679 D_{60}= 4.0690 D_{50}= 2.5953
D_{30}= 0.9705 D_{15}= 0.4761 D_{10}= 0.3517
C_u= 11.57 C_c= 0.66

Classification

USCS= SP AASHTO=

Remarks

As Received
Moisture Content: 8.5%

Location: No. 3-805/6F-4, 53.0'-54.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-4, 53.0'-54.0'
Material Description: brown poorly graded SAND with gravel
Date: 09-11-06
USCS Classification: SP
Testing Remarks: As Received
Moisture Content: 8.5%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1040.70	228.15	0.00	1.5	0.00	100.0
			1.0	29.32	96.4
			.75	73.50	91.0
			.50	136.80	83.2
			.375	169.64	79.1
			#4	295.03	63.7
			#10	450.26	44.6
50.46	0.00	0.00	#20	19.67	27.2
			#40	35.81	12.9
			#60	43.45	6.2
			#100	46.23	3.7
			#200	46.84	3.2

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =44.6
Weight of hydrometer sample =50.46
Hygroscopic moisture correction:
Moist weight and tare = 52.05
Dry weight and tare = 52.00
Tare weight = 31.66
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

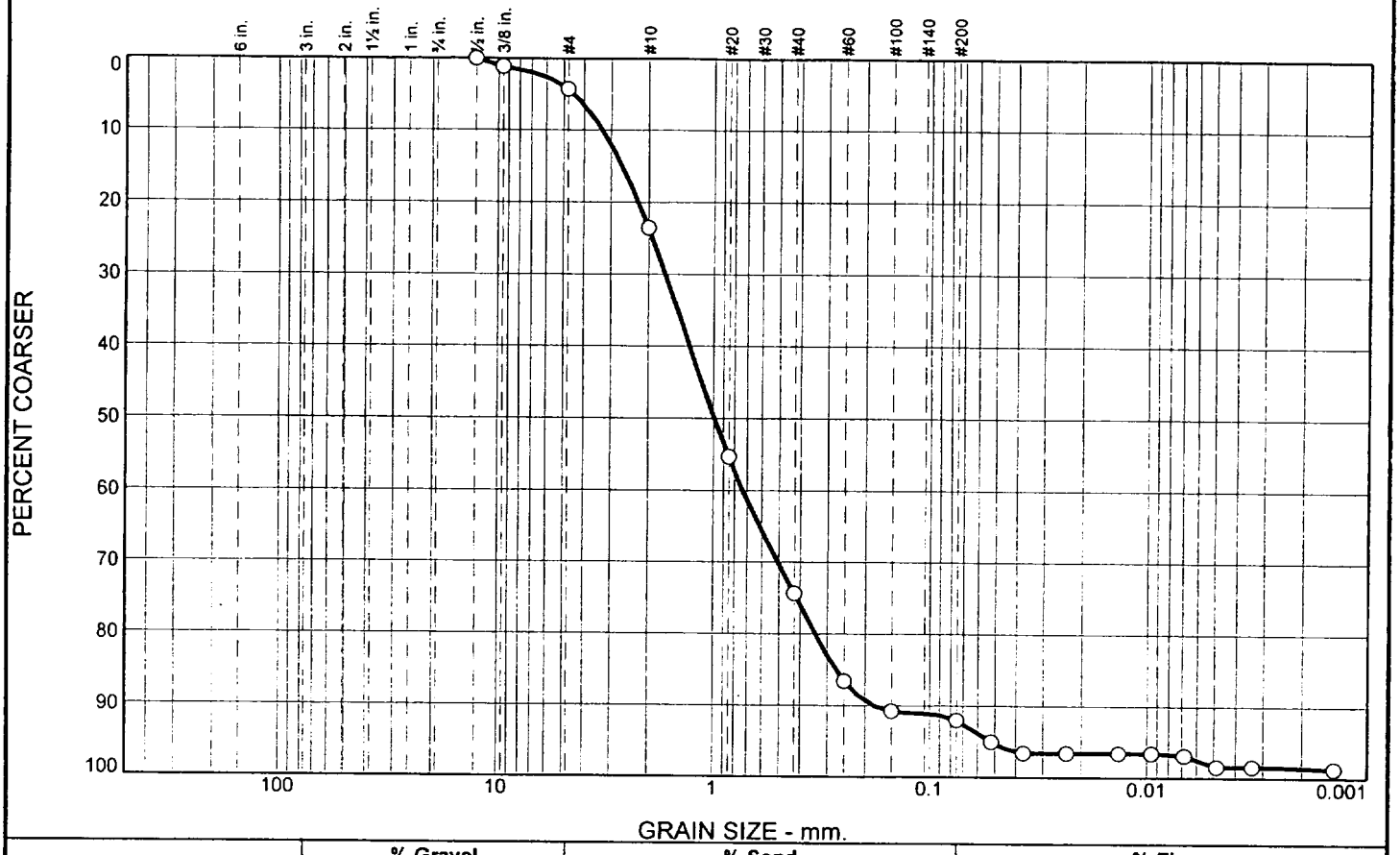
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0521	2.0
2.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0369	2.0
5.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0233	2.0
15.00	21.5	6.5	1.8	0.0134	6.5	15.2	0.0135	1.6
30.00	21.5	6.5	1.8	0.0134	6.5	15.2	0.0095	1.6
60.00	20.5	6.5	1.6	0.0136	6.5	15.2	0.0068	1.4
120.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0048	0.9
250.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0034	0.9
1440.00	19.5	6.0	0.9	0.0137	6.0	15.3	0.0014	0.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	9.0	27.3	36.3	19.1	31.7	9.7	60.5	2.3	0.9	3.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.3517	0.4761	0.6093	0.9705	2.5953	4.0690	10.1047	14.1679	18.2056	23.3309

Fineness Modulus	C_u	C_c
4.53	11.57	0.66

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.2	19.3	50.8	17.7	6.5	1.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	98.9		
#4	95.8		
#10	76.5		
#20	44.7		
#40	25.7		
#60	13.5		
#100	9.2		
#200	8.0		

* (no specification provided)

Material Description

brown well-graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.6520 D_{60}= 1.2863 D_{50}= 0.9892
D_{30}= 0.5044 D_{15}= 0.2724 D_{10}= 0.1815
C_u= 7.09 C_c= 1.09

Classification

USCS= SW-SM AASHTO=

Remarks

As Received
Moisture Content: 9.3%

Location: No. 3-805/6F-5, 54.0'-55.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/200(

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-5, 54.0'-55.0'
Material Description: brown well-graded SAND with silt
Date: 09-11-06
USCS Classification: SW-SM
Testing Remarks: As Received
Moisture Content: 9.3%

Tested by: BB **Checked by:** SV

[redacted]

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
977.20	226.68	0.00	.50	0.00	100.0
			.375	8.40	98.9
			#4	31.74	95.8
			#10	176.42	76.5
50.66	0.00	0.00	#20	21.05	44.7
			#40	33.67	25.7
			#60	41.75	13.5
			#100	44.54	9.2
			#200	45.36	8.0

[redacted]

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =76.5
Weight of hydrometer sample =50.66
Hygroscopic moisture correction:
Moist weight and tare = 48.76
Dry weight and tare = 48.69
Tare weight = 28.46
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

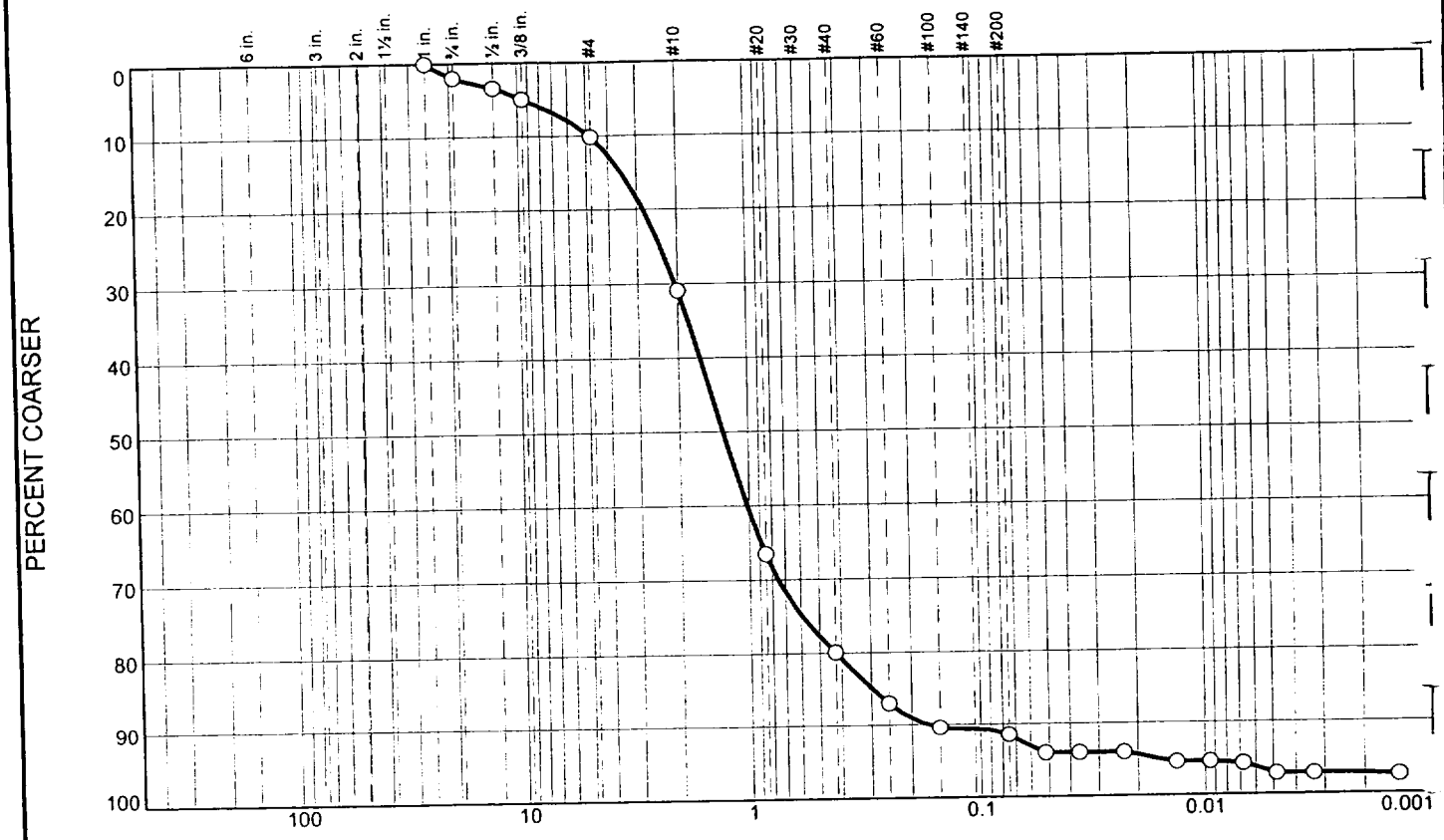
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0518	5.0
2.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0369	3.5
5.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0233	3.5
15.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0135	3.5
30.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0095	3.5
60.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0068	3.1
120.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0048	1.6
250.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0034	1.6
1440.00	19.5	6.0	0.9	0.0137	6.0	15.3	0.0014	1.3

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.2	4.2	19.3	50.8	17.7	87.8	6.5	1.5	8.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1815	0.2724	0.3405	0.5044	0.9892	1.2863	2.2286	2.6520	3.2770	4.4350

Fineness Modulus	C_u	C_c
3.06	7.09	1.09

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.0	8.1	20.8	49.0	11.6	5.8	2.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	98.0		
.50	96.6		
.375	95.1		
#4	89.9		
#10	69.1		
#20	33.5		
#40	20.1		
#60	13.1		
#100	9.6		
#200	8.5		

* (no specification provided)

Material Description

brown well-graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.4902 D_{60}= 1.6080 D_{50}= 1.2873
D_{30}= 0.7509 D_{15}= 0.2940 D_{10}= 0.1688
C_u= 9.53 C_c= 2.08

Classification

USCS= SW-SM AASHTO=

Remarks

As Received
Moisture Content: 10.0%

Location: No. 3-805/6F-6, 55.0'-56.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-6, 55.0'-56.0'
Material Description: brown well-graded SAND with silt
Date: 09-11-06
USCS Classification: SW-SM
Testing Remarks: As Received
Moisture Content: 10.0%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1075.50	225.25	0.00	1.0	0.00	100.0
			.75	17.04	98.0
			.50	28.93	96.6
			.375	42.05	95.1
			#4	86.14	89.9
			#10	262.75	69.1
50.02	0.00	0.00	#20	25.76	33.5
			#40	35.46	20.1
			#60	40.57	13.1
			#100	43.08	9.6
			#200	43.86	8.5

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =69.1
Weight of hydrometer sample =50.02
Hygroscopic moisture correction:
Moist weight and tare = 49.35
Dry weight and tare = 49.28
Tare weight = 28.81
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

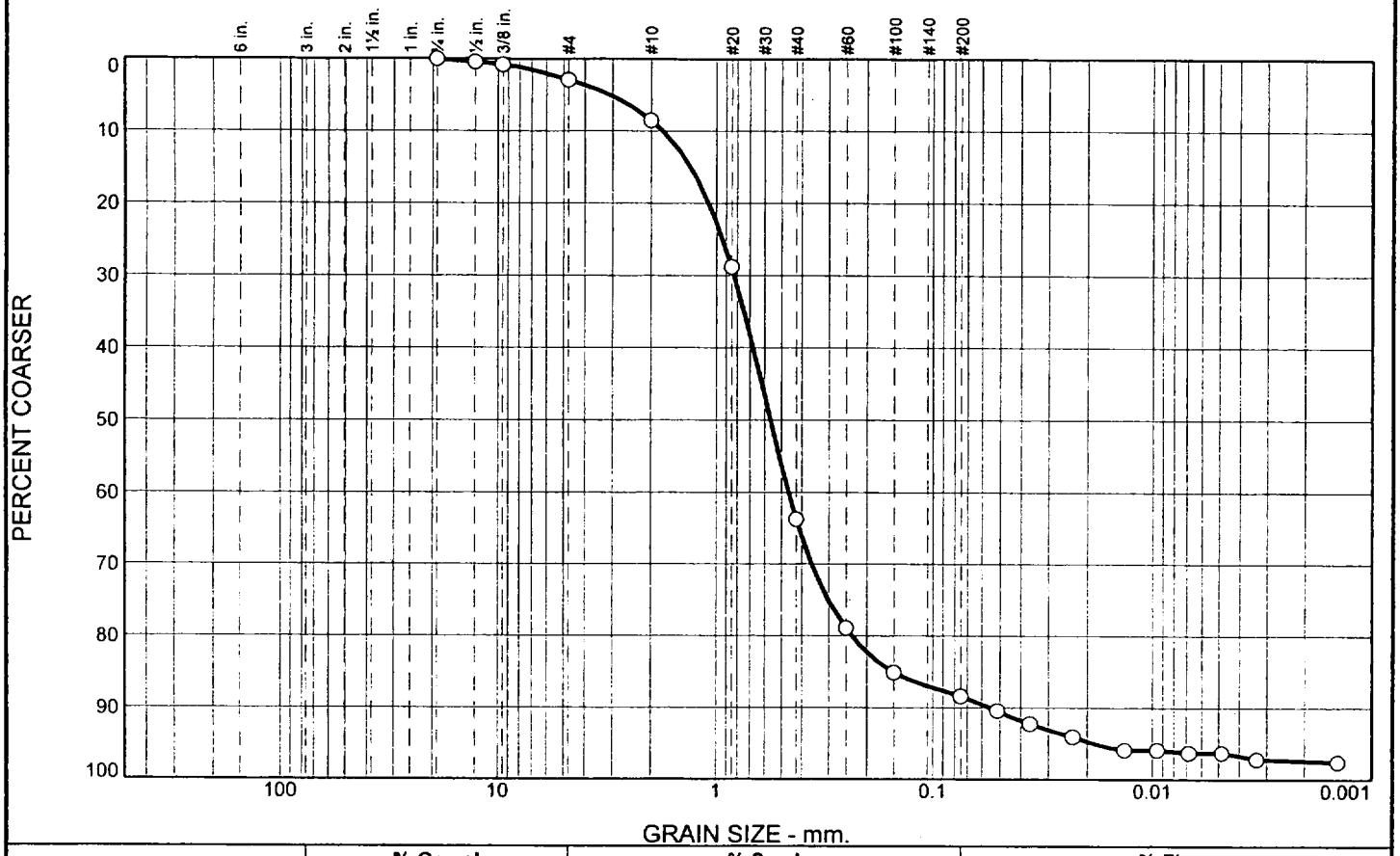
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0516	5.9
2.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0365	5.9
5.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0231	5.9
15.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0134	4.6
30.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0095	4.6
60.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0068	4.2
120.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0048	2.9
250.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0033	2.9
1440.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0014	2.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.0	8.1	10.1	20.8	49.0	11.6	81.4	5.8	2.7	8.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1688	0.2940	0.4216	0.7509	1.2873	1.6080	2.8077	3.4902	4.8022	9.4348

Fineness Modulus	C_u	C_c
3.46	9.53	2.08

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.9	5.6	55.2	24.7	9.0	2.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.6		
.375	99.2		
#4	97.1		
#10	91.5		
#20	71.3		
#40	36.3		
#60	21.1		
#100	14.9		
#200	11.6		

* (no specification provided)

Material Description

brown SAND with silt (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.3099 D_{60}= 0.6758 D_{50}= 0.5612
D_{30}= 0.3591 D_{15}= 0.1519 D_{10}= 0.0549
C_u= 12.30 C_c= 3.47

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 11.2%

Location: No. 3-805/6F-7, 56.0'-57.0' **Date:** 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-7, 56.0'-57.0'
Material Description: brown SAND with silt (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 11.2%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1021.90	226.63	0.00	.75	0.00	100.0
			.50	3.50	99.6
			.375	6.10	99.2
			#4	23.05	97.1
			#10	67.36	91.5
50.60	0.00	0.00	#20	11.21	71.3
			#40	30.53	36.3
			#60	38.93	21.1
			#100	42.36	14.9
			#200	44.16	11.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =91.5
Weight of hydrometer sample =50.60
Hygroscopic moisture correction:
Moist weight and tare = 49.65
Dry weight and tare = 49.57
Tare weight = 27.97
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

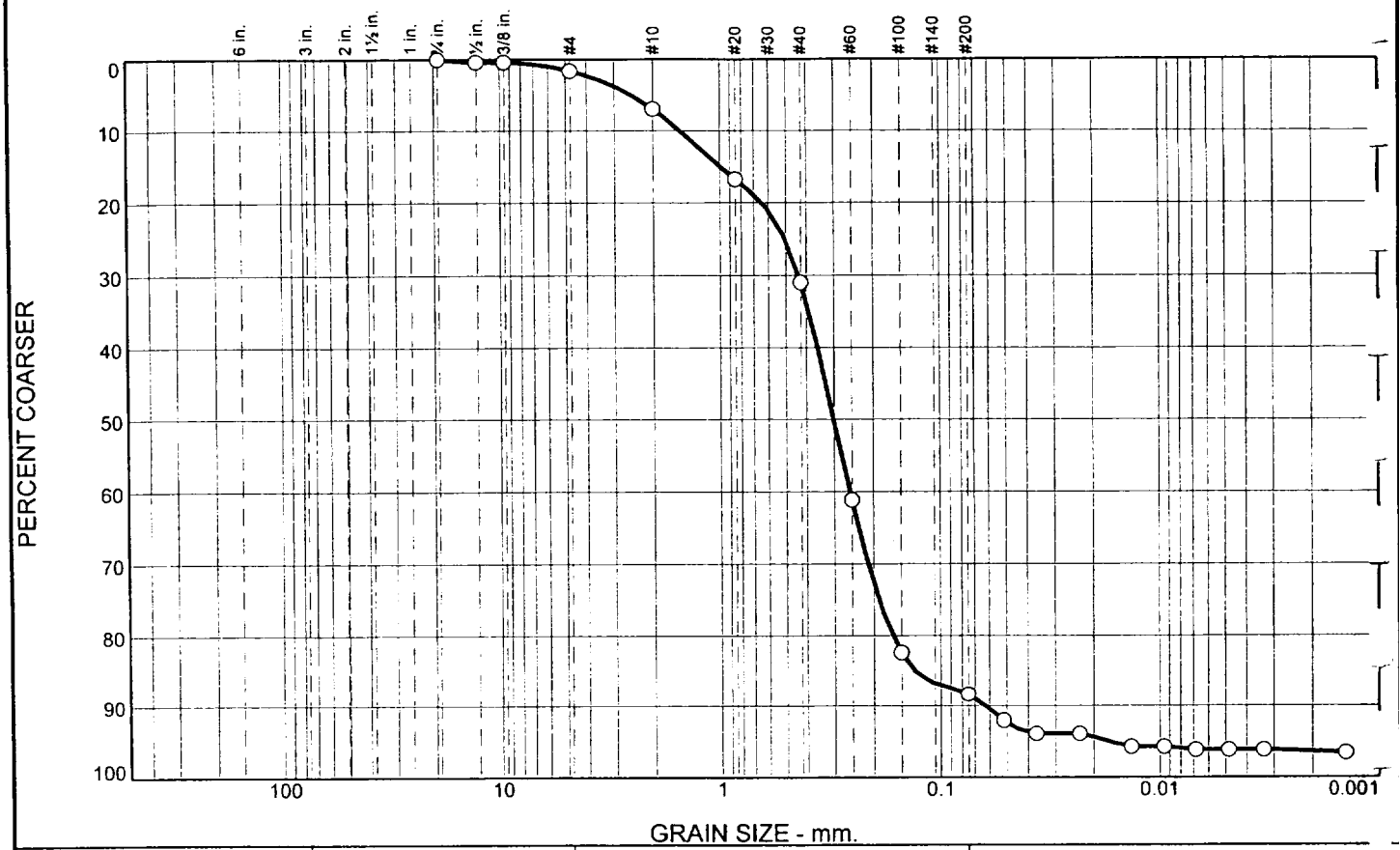
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	10.0	5.3	0.0134	10.0	14.7	0.0513	9.6
2.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0365	7.8
5.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0232	6.0
15.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0135	4.2
30.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0095	4.2
60.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0068	3.8
120.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0048	3.8
250.00	20.5	6.5	1.6	0.0136	6.5	15.2	0.0033	2.8
1440.00	19.5	6.5	1.4	0.0137	6.5	15.2	0.0014	2.5

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.9	2.9	5.6	55.2	24.7	85.5	9.0	2.6	11.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0549	0.1519	0.2344	0.3591	0.5612	0.6758	1.0794	1.3099	1.7571	3.0602

Fineness Modulus	C_u	C_c
2.35	12.30	3.47

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.6	5.3	24.1	57.3	8.1	3.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.6		
.375	99.6		
#4	98.4		
#10	93.1		
#20	83.3		
#40	69.0		
#60	38.9		
#100	17.6		
#200	11.7		

* (no specification provided)

Material Description

brown SAND with silt (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.9909 D_{60}= 0.3557 D_{50}= 0.3009
D_{30}= 0.2112 D_{15}= 0.1296 D_{10}= 0.0625
C_u= 5.69 C_c= 2.00

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 12.8%

Location: No. 3-805/6F-8, 57.0'-58.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-8, 57.0'-58.0'
Material Description: brown SAND with silt (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 12.8%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1008.60	232.85	0.00	.75	0.00	100.0
			.50	3.15	99.6
			.375	3.15	99.6
			#4	12.26	98.4
			#10	53.77	93.1
50.29	0.00	0.00	#20	5.28	83.3
			#40	12.98	69.0
			#60	29.29	38.9
			#100	40.76	17.6
			#200	43.96	11.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =93.1
Weight of hydrometer sample =50.29
Hygroscopic moisture correction:
Moist weight and tare = 50.21
Dry weight and tare = 50.16
Tare weight = 30.01
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

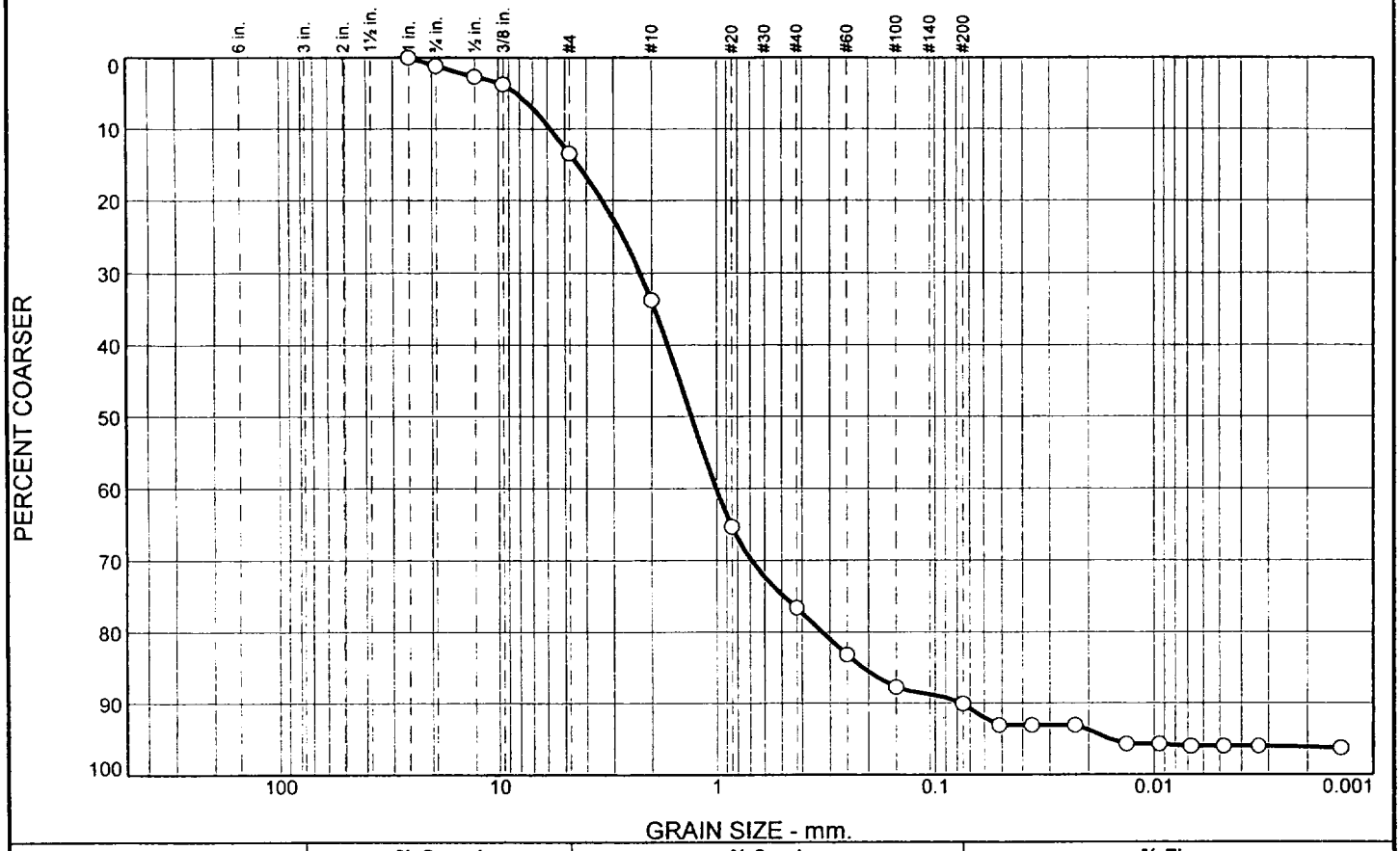
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	9.0	4.3	0.0134	9.0	14.8	0.0516	8.0
2.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0367	6.1
5.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0232	6.1
15.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0135	4.2
30.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0095	4.2
60.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0068	3.8
120.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0048	3.8
250.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0033	3.8
1440.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0014	3.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.6	1.6	5.3	24.1	57.3	86.7	8.1	3.6	11.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0625	0.1296	0.1638	0.2112	0.3009	0.3557	0.6396	0.9909	1.5074	2.4975

Fineness Modulus	C_u	C_c
1.74	5.69	2.00

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.2	12.2	20.3	42.9	13.5	6.0	3.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	98.8		
.50	97.3		
.375	96.3		
#4	86.6		
#10	66.3		
#20	34.7		
#40	23.4		
#60	16.9		
#100	12.3		
#200	9.9		

* (no specification provided)

Material Description

brown poorly graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.3419 D_{60}= 1.6831 D_{50}= 1.3098
D_{30}= 0.6901 D_{15}= 0.2115 D_{10}= 0.0758
C_u= 22.22 C_c= 3.73

Classification

USCS= SP-SM AASHTO=

Remarks

As Received
Moisture Content: 8.6%

Location: No. 3-805/6F-9, 58.0'-59.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-9, 58.0'-59.0'
Material Description: brown poorly graded SAND with silt
Date: 09-11-06
USCS Classification: SP-SM
Testing Remarks: As Received
Moisture Content: 8.6%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1060.90	221.58	0.00	1.0	0.00	100.0
			.75	9.72	98.8
			.50	22.25	97.3
			.375	31.04	96.3
			#4	112.29	86.6
			#10	282.79	66.3
50.82	0.00	0.00	#20	24.20	34.7
			#40	32.88	23.4
			#60	37.90	16.9
			#100	41.41	12.3
			#200	43.21	9.9

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =66.3
Weight of hydrometer sample =50.82
Hygroscopic moisture correction:
Moist weight and tare = 48.40
Dry weight and tare = 48.33
Tare weight = 28.34
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

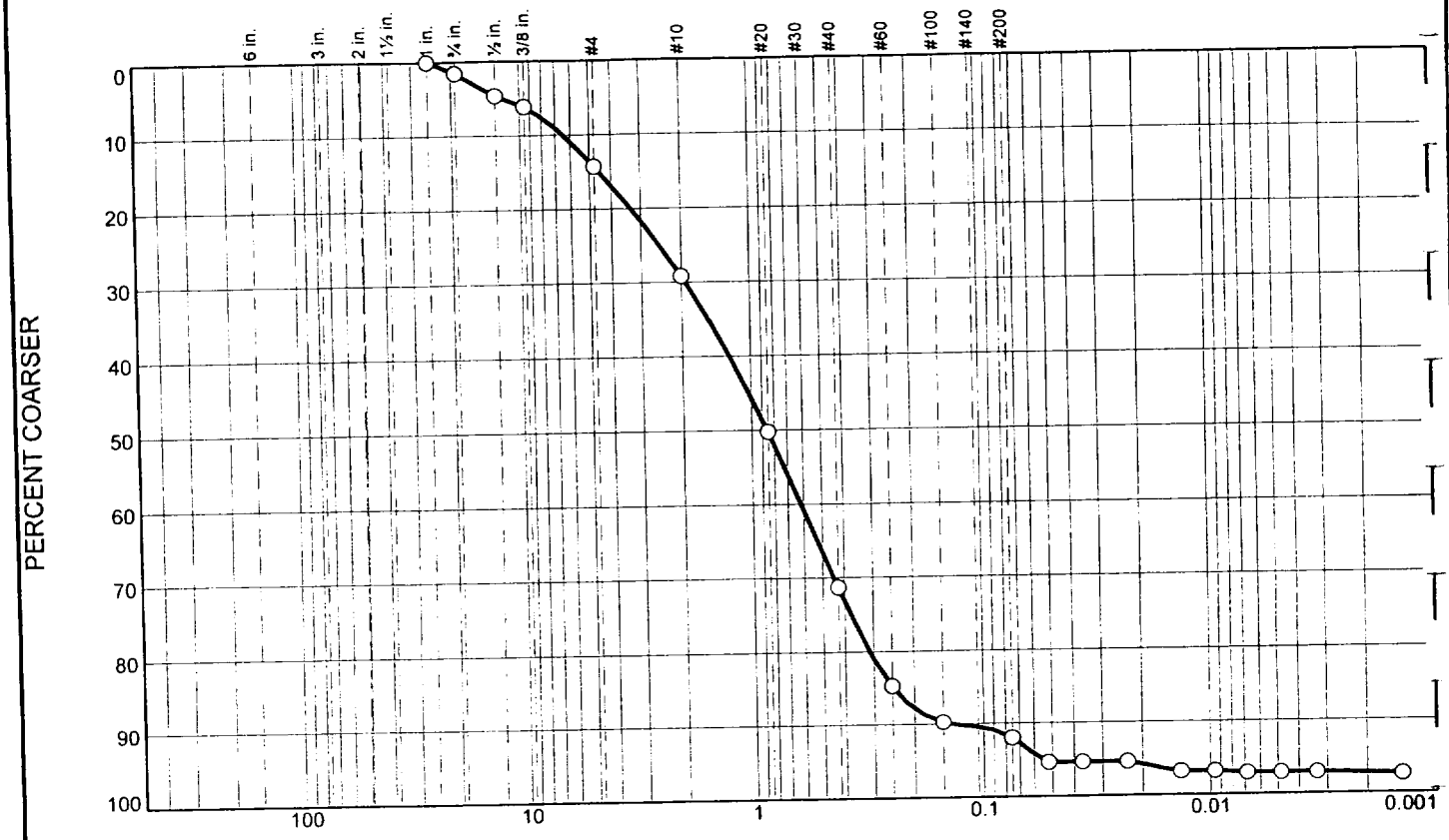
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	10.0	5.3	0.0134	10.0	14.7	0.0513	6.9
2.00	21.5	10.0	5.3	0.0134	10.0	14.7	0.0363	6.9
5.00	21.5	10.0	5.3	0.0134	10.0	14.7	0.0229	6.9
15.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0134	4.3
30.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0095	4.3
60.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0068	4.0
120.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0048	4.0
250.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0033	4.0
1440.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0014	3.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.2	12.2	13.4	20.3	42.9	13.5	76.7	6.0	3.9	9.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0758	0.2115	0.3227	0.6901	1.3098	1.6831	3.3511	4.3419	5.7600	8.1878

Fineness Modulus	C_u	C_c
3.42	22.22	3.73

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.5	12.7	15.0	42.1	20.7	5.2	2.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	98.5		
.50	95.4		
.375	93.9		
#4	85.8		
#10	70.8		
#20	49.8		
#40	28.7		
#60	15.3		
#100	10.3		
#200	8.0		

* (no specification provided)

Material Description

brown well-graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.5177 D_{60}= 1.2403 D_{50}= 0.8553
D_{30}= 0.4437 D_{15}= 0.2451 D_{10}= 0.1350
C_u= 9.19 C_c= 1.18

Classification

USCS= SW-SM AASHTO=

Remarks

As Received
Moisture Content: 8.8%

Location: No. 3-805/6F-10, 59.0'-60.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805/6F-10, 59.0'-60.0'
Material Description: brown well-graded SAND with silt
Date: 09-11-06
USCS Classification: SW-SM
Testing Remarks: As Received
Moisture Content: 8.8%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1017.30	229.69	0.00	1.0	0.00	100.0
			.75	12.16	98.5
			.50	36.44	95.4
			.375	48.25	93.9
			#4	112.21	85.8
			#10	229.69	70.8
50.22	0.00	0.00	#20	14.90	49.8
			#40	29.87	28.7
			#60	39.34	15.3
			#100	42.91	10.3
			#200	44.53	8.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =70.8
Weight of hydrometer sample =50.22
Hygroscopic moisture correction:
Moist weight and tare = 51.58
Dry weight and tare = 51.51
Tare weight = 31.21
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

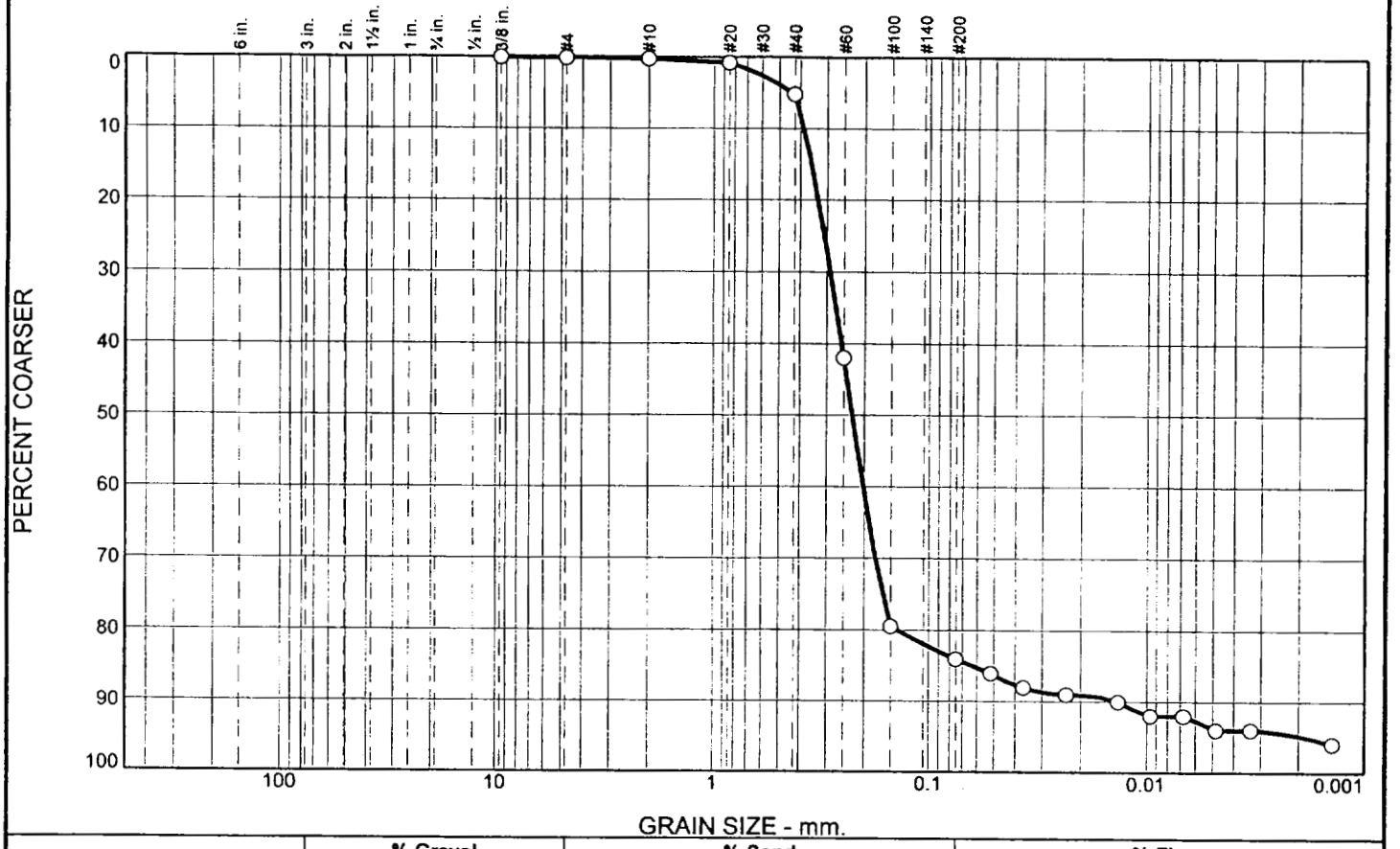
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0518	4.7
2.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0367	4.7
5.00	21.5	8.0	3.3	0.0134	8.0	15.0	0.0232	4.7
15.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0135	3.2
30.00	21.5	7.0	2.3	0.0134	7.0	15.1	0.0095	3.2
60.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0068	2.9
120.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0048	2.9
250.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0033	2.9
1440.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0014	2.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.5	12.7	14.2	15.0	42.1	20.7	77.8	5.2	2.8	8.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1350	0.2451	0.3106	0.4437	0.8553	1.2403	3.2929	4.5177	6.4302	11.8651

Fineness Modulus	C_u	C_c
3.20	9.19	1.18

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.1	5.0	78.8	10.8	5.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.9		
#10	99.8		
#20	99.2		
#40	94.8		
#60	58.1		
#100	20.5		
#200	16.0		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.3529 D_{60}= 0.2556 D_{50}= 0.2277
D_{30}= 0.1772 D_{15}= 0.0627 D_{10}= 0.0135
C_u= 18.93 C_c= 9.09

Classification

USCS= AASHTO=

Remarks

As Received: 15.2%

Location: No. 3-805, 9F-1, 81.5'-82.5'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805, 9F-1, 81.5'-82.5'
Material Description: gray silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received: 15.2%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2128.20	231.16	0.00	.375	0.00	100.0
			#4	1.53	99.9
			#10	4.37	99.8
50.60	0.00	0.00	#20	0.29	99.2
			#40	2.50	94.8
			#60	21.14	58.1
			#100	40.18	20.5
			#200	42.51	16.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.8
Weight of hydrometer sample =50.60
Hygroscopic moisture correction:
Moist weight and tare = 49.99
Dry weight and tare = 49.99
Tare weight = 28.42
Hygroscopic moisture =0.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

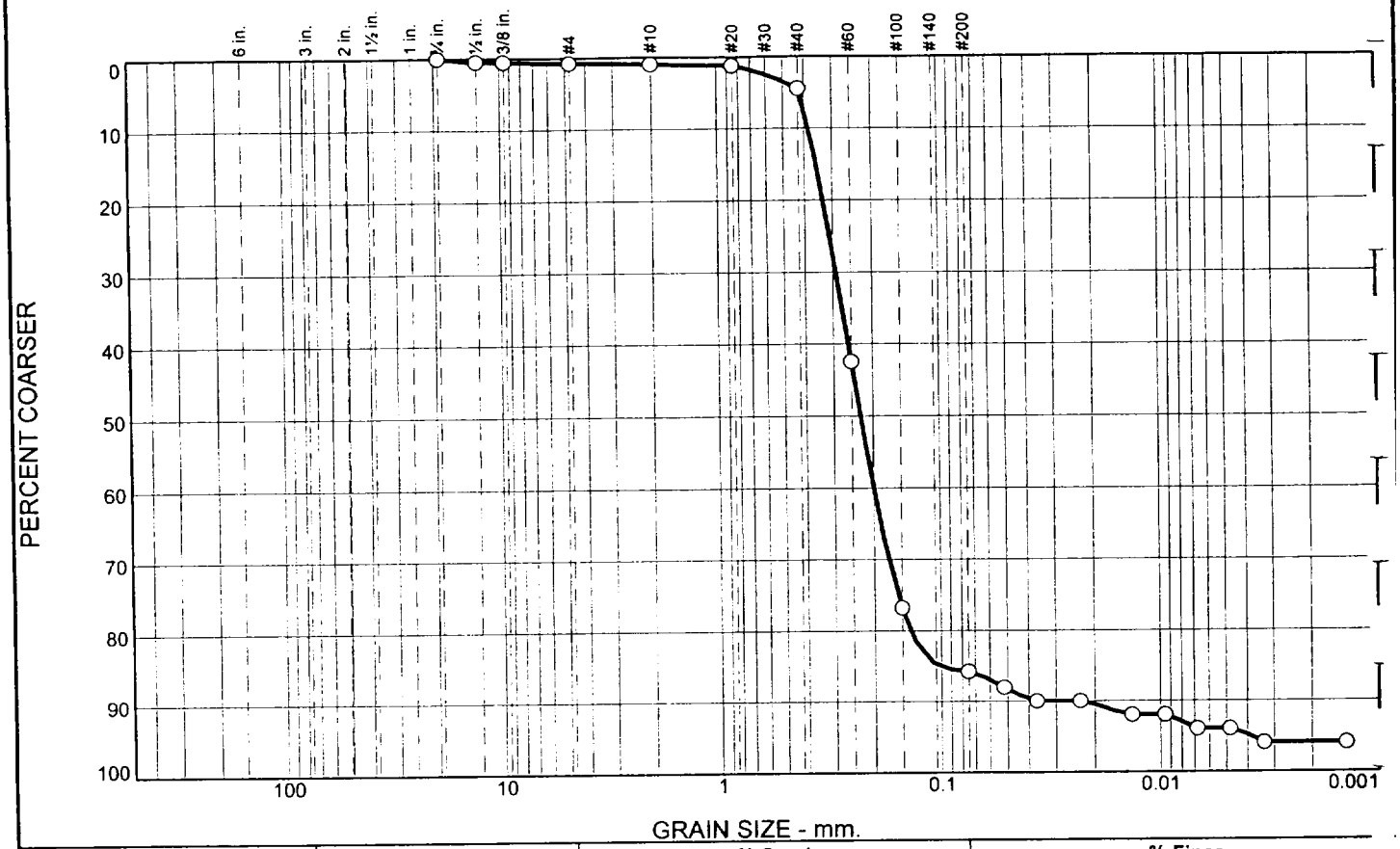
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	11.0	7.1	0.0136	11.0	14.5	0.0516	13.9
2.00	20.5	10.0	6.1	0.0136	10.0	14.7	0.0367	12.0
5.00	20.5	9.5	5.6	0.0136	9.5	14.7	0.0233	11.0
15.00	20.5	9.0	5.1	0.0136	9.0	14.8	0.0135	10.0
30.00	20.5	8.0	4.1	0.0136	8.0	15.0	0.0096	8.0
60.00	20.5	8.0	4.1	0.0136	8.0	15.0	0.0068	8.0
120.00	20.5	7.0	3.1	0.0136	7.0	15.1	0.0048	6.0
250.00	20.5	7.0	3.1	0.0136	7.0	15.1	0.0033	6.0
1440.00	20.5	6.0	2.1	0.0136	6.0	15.3	0.0014	4.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.1	0.1	0.1	5.0	78.8	83.9	10.8	5.2	16.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0135	0.0627	0.1393	0.1772	0.2277	0.2556	0.3280	0.3529	0.3837	0.4328

Fineness Modulus	C_u	C_c
1.10	18.93	9.09

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.7	0.2	3.5	81.3	10.2	4.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.5		
.375	99.5		
#4	99.3		
#10	99.1		
#20	98.8		
#40	95.6		
#60	57.6		
#100	23.2		
#200	14.3		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.3525 D_{60}= 0.2573 D_{50}= 0.2278
D_{30}= 0.1717 D_{15}= 0.1004 D_{10}= 0.0227
C_u= 11.34 C_c= 5.05

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 15.8%

Location: No. 3-805, 9F-2, 82.5'-83.5'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805, 9F-2, 82.5'-83.5'
Material Description: brown silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 15.8%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2264.00	233.34	0.00	.75	0.00	100.0
			.50	9.86	99.5
			.375	9.86	99.5
			#4	14.32	99.3
			#10	19.23	99.1
50.08	0.00	0.00	#20	0.11	98.8
			#40	1.76	95.6
			#60	20.96	57.6
			#100	38.35	23.2
			#200	42.86	14.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.1
Weight of hydrometer sample =50.08
Hygroscopic moisture correction:
Moist weight and tare = 51.74
Dry weight and tare = 51.69
Tare weight = 31.65
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

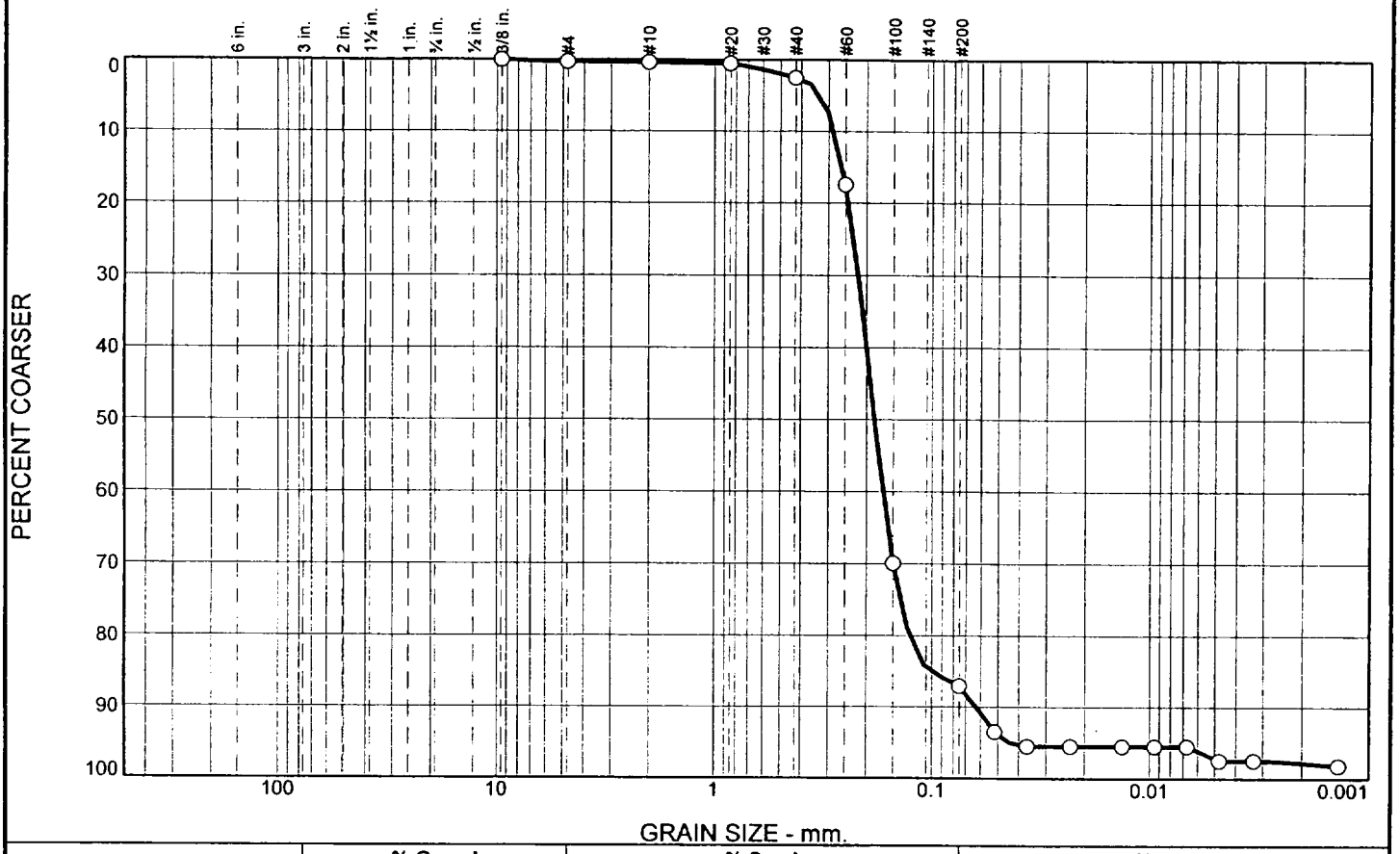
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	11.0	6.1	0.0136	11.0	14.5	0.0516	12.0
2.00	20.5	10.0	5.1	0.0136	10.0	14.7	0.0367	10.0
5.00	20.5	10.0	5.1	0.0136	10.0	14.7	0.0232	10.0
15.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0135	8.1
30.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0095	8.1
60.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0068	6.1
120.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0048	6.1
250.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0033	4.1
1440.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0014	4.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.7	0.7	0.2	3.5	81.3	85.0	10.2	4.1	14.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0227	0.1004	0.1372	0.1717	0.2278	0.2573	0.3290	0.3525	0.3811	0.4194

Fineness Modulus	C_u	C_c
1.10	11.34	5.05

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.1	2.1	84.5	10.7	2.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	99.6		
#20	99.5		
#40	97.5		
#60	82.6		
#100	30.1		
#200	13.0		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.2583 D_{60}= 0.1997 D_{50}= 0.1830
D_{30}= 0.1498 D_{15}= 0.1008 D_{10}= 0.0626
C_u= 3.19 C_c= 1.79

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 15.7%

Location: No. 3-805, 9F-3, 83.5'-85.0' **Date:** 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 3-805, 9F-3, 83.5'-85.0'
Material Description: brown silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 15.7%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
2206.70	237.64	0.00	.375	0.00	100.0
			#4	4.98	99.7
			#10	7.54	99.6
50.19	0.00	0.00	#20	0.06	99.5
			#40	1.06	97.5
			#60	8.57	82.6
			#100	35.02	30.1
			#200	43.66	13.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.6
Weight of hydrometer sample =50.19
Hygroscopic moisture correction:
Moist weight and tare = 49.29
Dry weight and tare = 49.29
Tare weight = 28.78
Hygroscopic moisture =0.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

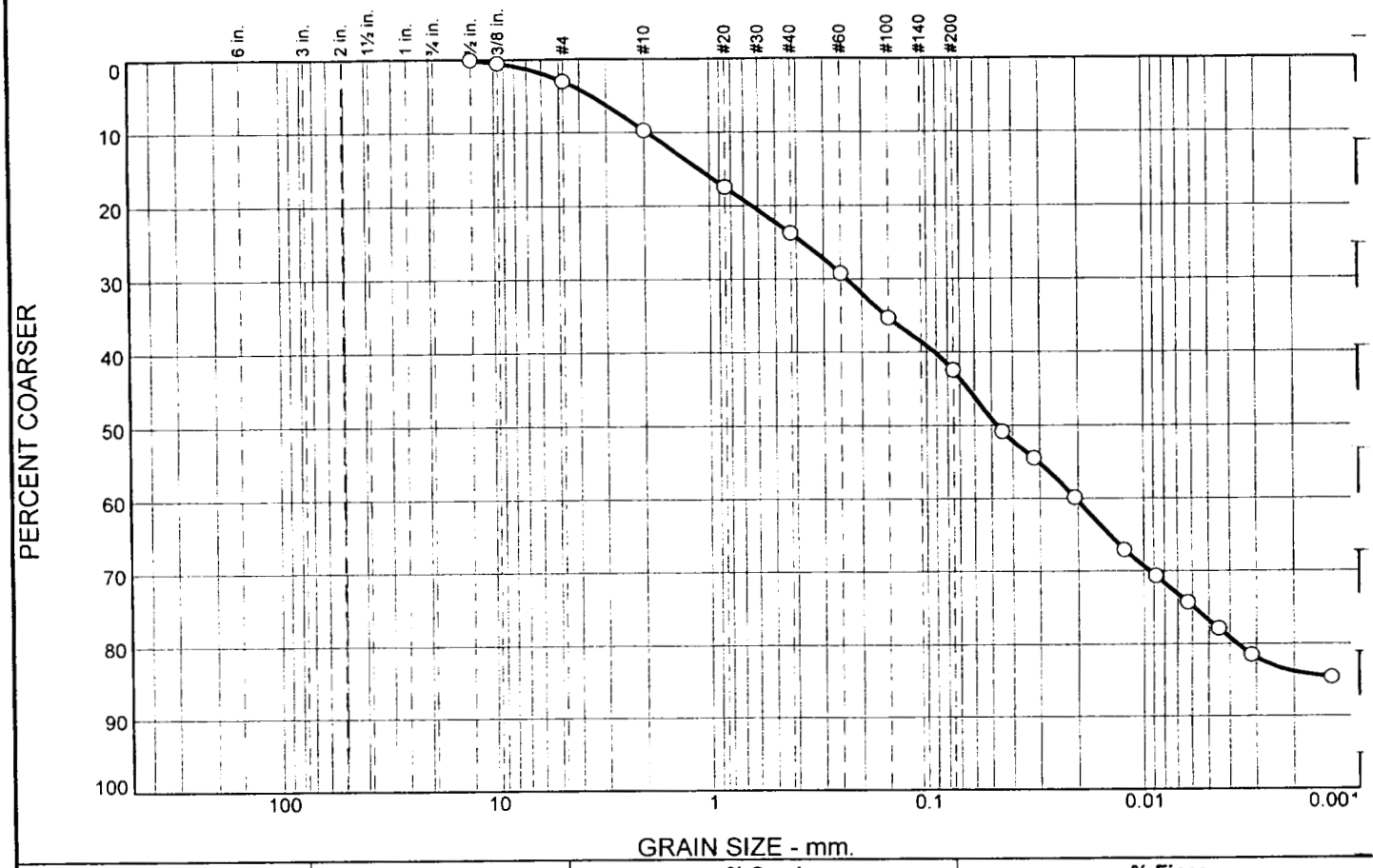
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	9.0	3.3	0.0134	9.0	14.8	0.0516	6.5
2.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0367	4.5
5.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0232	4.5
15.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0134	4.5
30.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0095	4.5
60.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0067	4.5
120.00	21.5	7.0	1.3	0.0134	7.0	15.1	0.0048	2.6
250.00	21.5	7.0	1.3	0.0134	7.0	15.1	0.0033	2.6
1440.00	22.0	6.5	0.9	0.0133	6.5	15.2	0.0014	1.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	0.1	2.1	84.5	86.7	10.7	2.3	13.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0626	0.1008	0.1260	0.1498	0.1830	0.1997	0.2422	0.2583	0.2813	0.3256

Fineness Modulus	C_u	C_c
0.80	3.19	1.79

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Cla
0.0	0.0	3.0	6.7	14.0	18.7	41.4	16.

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.5		
#4	97.0		
#10	90.3		
#20	82.6		
#40	76.3		
#60	70.8		
#100	64.7		
#200	57.6		

* (no specification provided)

Material Description

gray sandy SILT (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.1133 D_{60}= 0.0914 D_{50}= 0.0471
D_{30}= 0.0093 D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 11.5%

Location: No. 4-885, 1F-1, 30.0'-31.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 4-885, 1F-1, 30.0'-31.0'
Material Description: gray sandy SILT (visual)
Date: 09-11-06
Testing Remarks: As Received Moisture Content: 11.5%

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1520.50	230.31	0.00	.50	0.00	100.0
			.375	5.95	99.5
			#4	38.44	97.0
			#10	124.94	90.3
50.49	0.00	0.00	#20	4.34	82.6
			#40	7.86	76.3
			#60	10.93	70.8
			#100	14.32	64.7
			#200	18.31	57.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =90.3
Weight of hydrometer sample =50.49
Hygroscopic moisture correction:
Moist weight and tare = 54.11
Dry weight and tare = 53.91
Tare weight = 28.23
Hygroscopic moisture =0.8%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

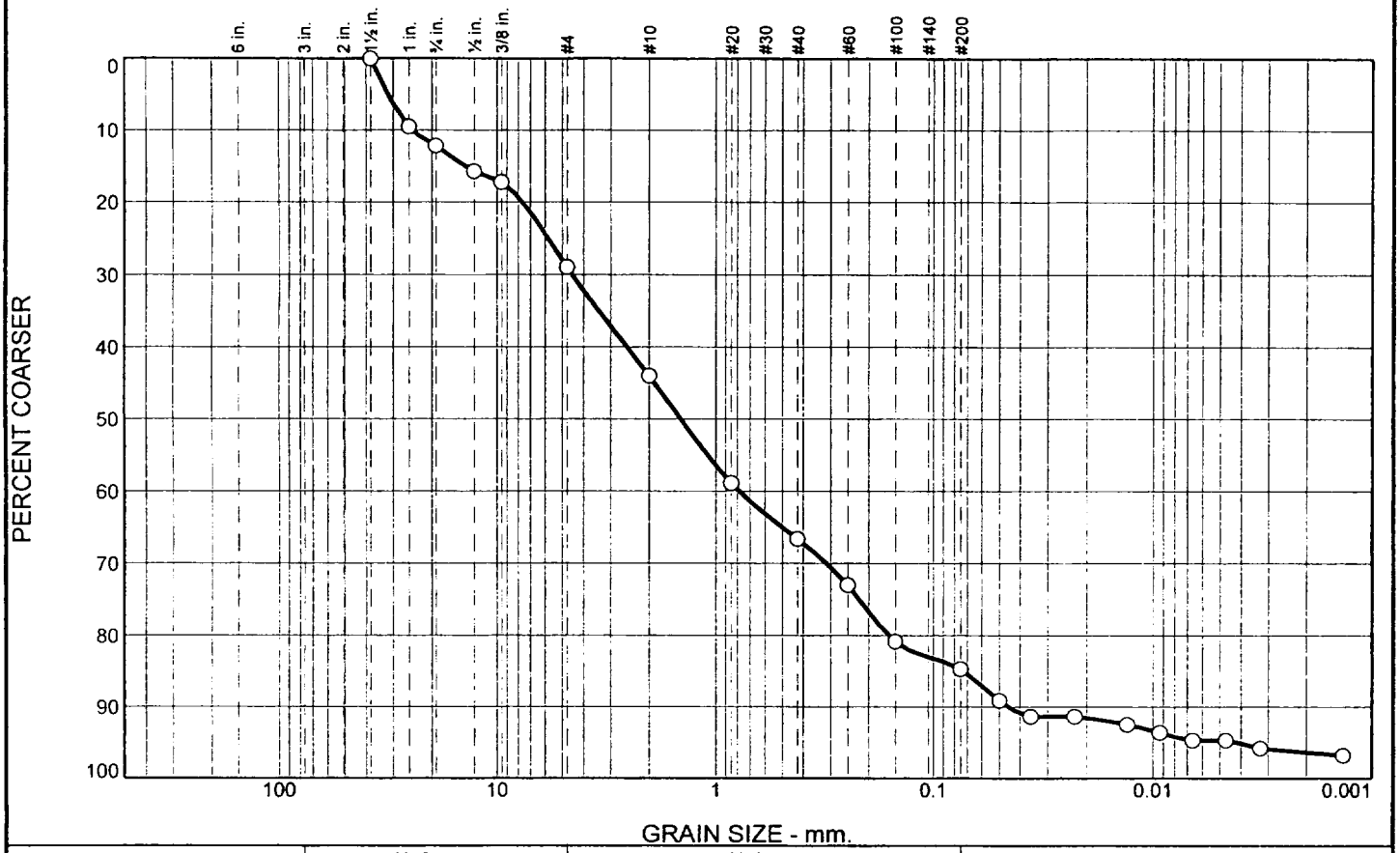
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	32.0	27.3	0.0134	32.0	11.0	0.0445	49.2
2.00	21.5	30.0	25.3	0.0134	30.0	11.4	0.0319	45.6
5.00	21.5	27.0	22.3	0.0134	27.0	11.9	0.0206	40.2
15.00	21.5	23.0	18.3	0.0134	23.0	12.5	0.0122	33.0
30.00	21.5	21.0	16.3	0.0134	21.0	12.9	0.0088	29.4
60.00	21.5	19.0	14.3	0.0134	19.0	13.2	0.0063	25.8
120.00	21.5	17.0	12.3	0.0134	17.0	13.5	0.0045	22.2
250.00	21.5	15.0	10.3	0.0134	15.0	13.8	0.0032	18.5
1440.00	20.5	13.5	8.6	0.0136	13.5	14.1	0.0013	15.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.0	3.0	6.7	14.0	18.7	39.4	41.4	16.2	57.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
		0.0037	0.0093	0.0471	0.0914	0.6396	1.1133	1.9307	3.4974

Fineness Modulus
1.09

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.2	16.7	15.1	22.5	18.2	11.6	3.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	90.5		
.75	87.8		
.50	84.3		
.375	82.8		
#4	71.1		
#10	56.0		
#20	41.2		
#40	33.5		
#60	27.0		
#100	19.2		
#200	15.3		

* (no specification provided)

Material Description

gray silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 13.9800 D_{60}= 2.5205 D_{50}= 1.4364
D_{30}= 0.3100 D_{15}= 0.0722 D_{10}= 0.0453
C_u= 55.69 C_c= 0.84

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 9.2%

Location: No. 4-805/6F-1, 59.0'-60.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 4-805/6F-1, 59.0'-60.0'
Material Description: gray silty SAND with gravel (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 9.2%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1074.70	229.69	0.00	1.5	0.00	100.0
			1.0	80.14	90.5
			.75	102.69	87.8
			.50	132.67	84.3
			.375	145.42	82.8
			#4	244.63	71.1
			#10	371.42	56.0
50.54	0.00	0.00	#20	13.42	41.2
			#40	20.36	33.5
			#60	26.17	27.0
			#100	33.25	19.2
			#200	36.72	15.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =56.0
Weight of hydrometer sample =50.54
Hygroscopic moisture correction:
Moist weight and tare = 49.69
Dry weight and tare = 49.63
Tare weight = 28.32
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

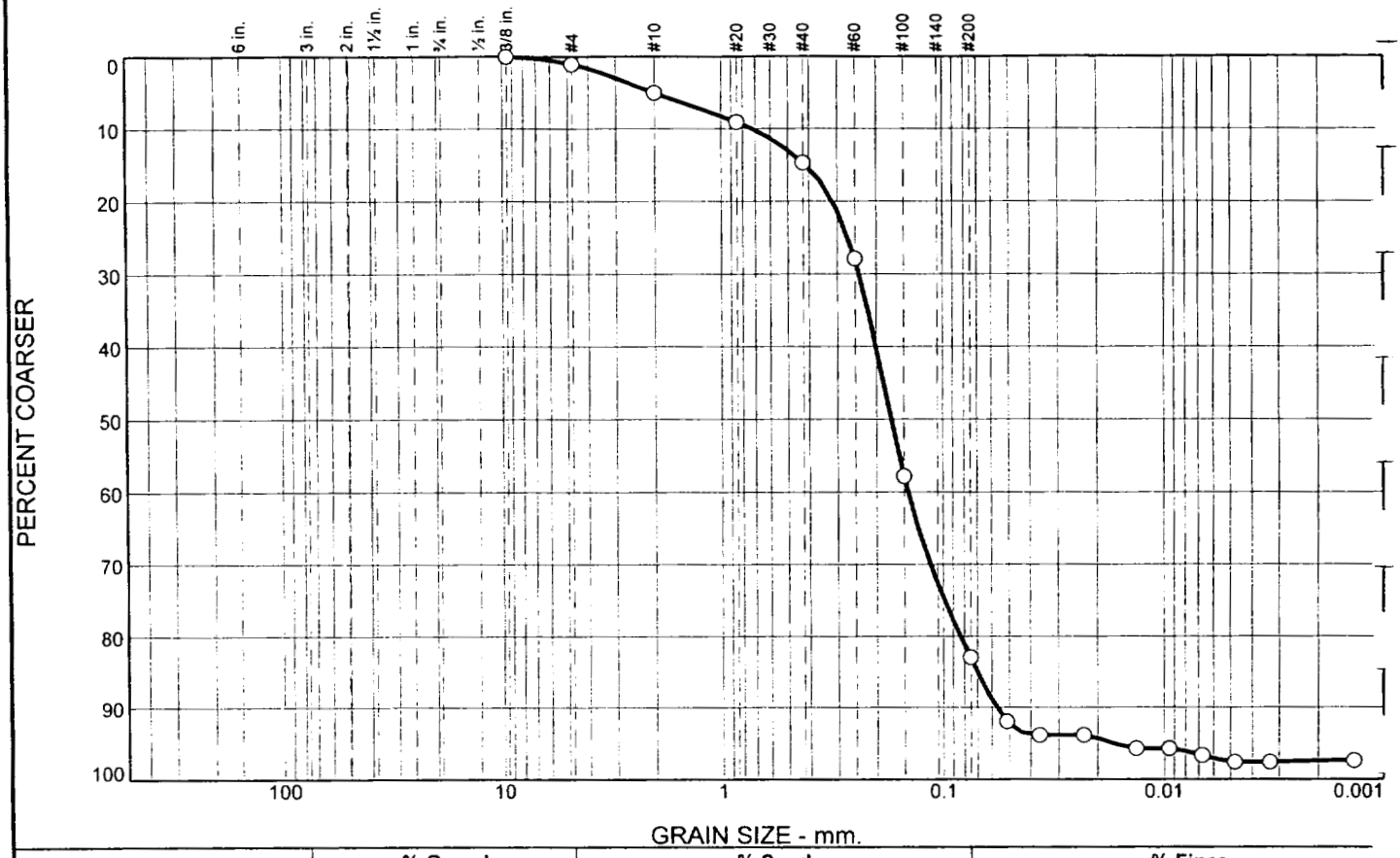
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	15.0	9.8	0.0134	15.0	13.8	0.0498	10.9
2.00	21.5	13.0	7.8	0.0134	13.0	14.2	0.0356	8.7
5.00	21.5	13.0	7.8	0.0134	13.0	14.2	0.0225	8.7
15.00	21.5	12.0	6.8	0.0134	12.0	14.3	0.0131	7.6
30.00	21.5	11.0	5.8	0.0134	11.0	14.5	0.0093	6.4
60.00	21.5	10.0	4.8	0.0134	10.0	14.7	0.0066	5.3
120.00	21.5	10.0	4.8	0.0134	10.0	14.7	0.0047	5.3
250.00	21.5	9.0	3.8	0.0134	9.0	14.8	0.0033	4.2
1440.00	22.0	8.0	2.9	0.0133	8.0	15.0	0.0014	3.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	12.2	16.7	28.9	15.1	22.5	18.2	55.8	11.6	3.7	15.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0453	0.0722	0.1609	0.3100	1.4364	2.5205	7.5877	13.9800	24.4394	31.6311

Fineness Modulus	C_u	C_c
3.67	55.69	0.84

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.0	4.0	9.6	68.3	14.5	2.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.0		
#10	95.0		
#20	91.0		
#40	85.4		
#60	72.1		
#100	42.2		
#200	17.1		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.4131 D_{60}= 0.2009 D_{50}= 0.1712
D_{30}= 0.1142 D_{15}= 0.0696 D_{10}= 0.0571
C_u= 3.52 C_c= 1.14

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 12.2%

Location: No. 4-805/7F-1, 60.0'-61.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 4-805/7F-1, 60.0'-61.0'
Material Description: brown silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 12.2%

Tested by: BB **Checked by:** SV

[redacted]

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
998.40	228.19	0.00	.375	0.00	100.0
			#4	7.88	99.0
			#10	38.51	95.0
50.71	0.00	0.00	#20	2.16	91.0
			#40	5.15	85.4
			#60	12.21	72.1
			#100	28.16	42.2
			#200	41.58	17.1

[redacted]

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =95.0
Weight of hydrometer sample =50.71
Hygroscopic moisture correction:
Moist weight and tare = 48.25
Dry weight and tare = 48.24
Tare weight = 28.22
Hygroscopic moisture =0.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

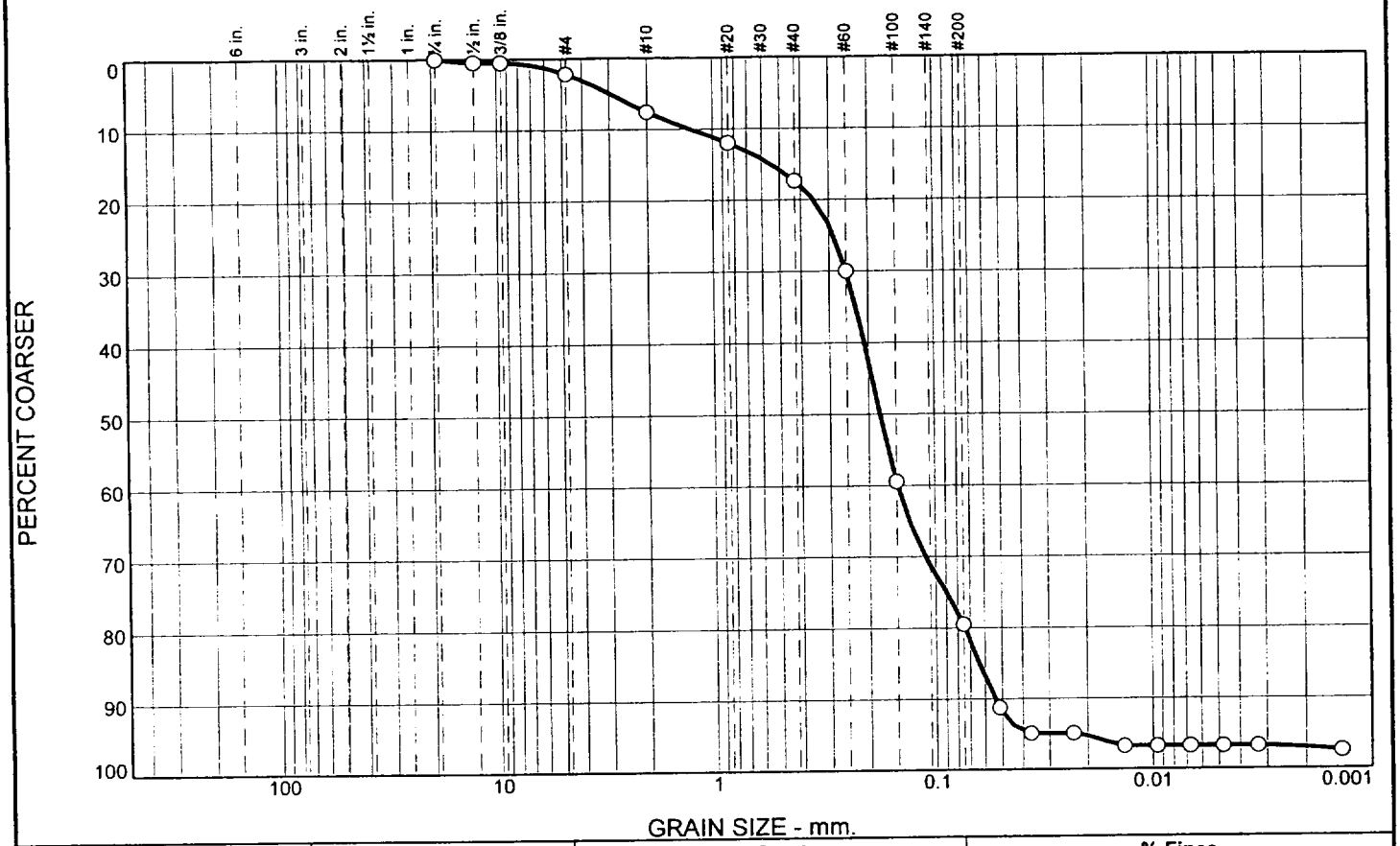
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	10.0	4.3	0.0134	10.0	14.7	0.0513	8.0
2.00	21.5	9.0	3.3	0.0134	9.0	14.8	0.0365	6.2
5.00	21.5	9.0	3.3	0.0134	9.0	14.8	0.0231	6.2
15.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0134	4.3
30.00	21.5	8.0	2.3	0.0134	8.0	15.0	0.0095	4.3
60.00	21.5	7.5	1.8	0.0134	7.5	15.1	0.0067	3.4
120.00	21.5	7.0	1.3	0.0134	7.0	15.1	0.0048	2.4
250.00	21.5	7.0	1.3	0.0134	7.0	15.1	0.0033	2.4
1440.00	22.0	7.0	1.4	0.0133	7.0	15.1	0.0014	2.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.0	1.0	4.0	9.6	68.3	81.9	14.5	2.6	17.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0571	0.0696	0.0832	0.1142	0.1712	0.2009	0.3128	0.4131	0.7210	2.0000

Fineness Modulus	C_u	C_c
1.03	3.52	1.14

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.1	5.4	9.8	62.1	17.6	3.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.5		
.375	99.5		
#4	97.9		
#10	92.5		
#20	88.1		
#40	82.7		
#60	70.0		
#100	40.6		
#200	20.6		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.5414 D_{60}= 0.2084 D_{50}= 0.1775
D_{30}= 0.1109 D_{15}= 0.0632 D_{10}= 0.0538
C_u= 3.87 C_c= 1.10

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 11.3%

Location: No. 4-805/7F-2, 61.0'-61.5'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 4-805/7F-2, 61.0'-61.5'
Material Description: brown silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 11.3%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
963.10	221.69	0.00	.75	0.00	100.0
			.50	3.63	99.5
			.375	3.63	99.5
			#4	15.55	97.9
			#10	55.82	92.5
50.39	0.00	0.00	#20	2.40	88.1
			#40	5.34	82.7
			#60	12.23	70.0
			#100	28.28	40.6
			#200	39.19	20.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =92.5
Weight of hydrometer sample =50.39
Hygroscopic moisture correction:
Moist weight and tare = 49.90
Dry weight and tare = 49.87
Tare weight = 28.52
Hygroscopic moisture =0.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

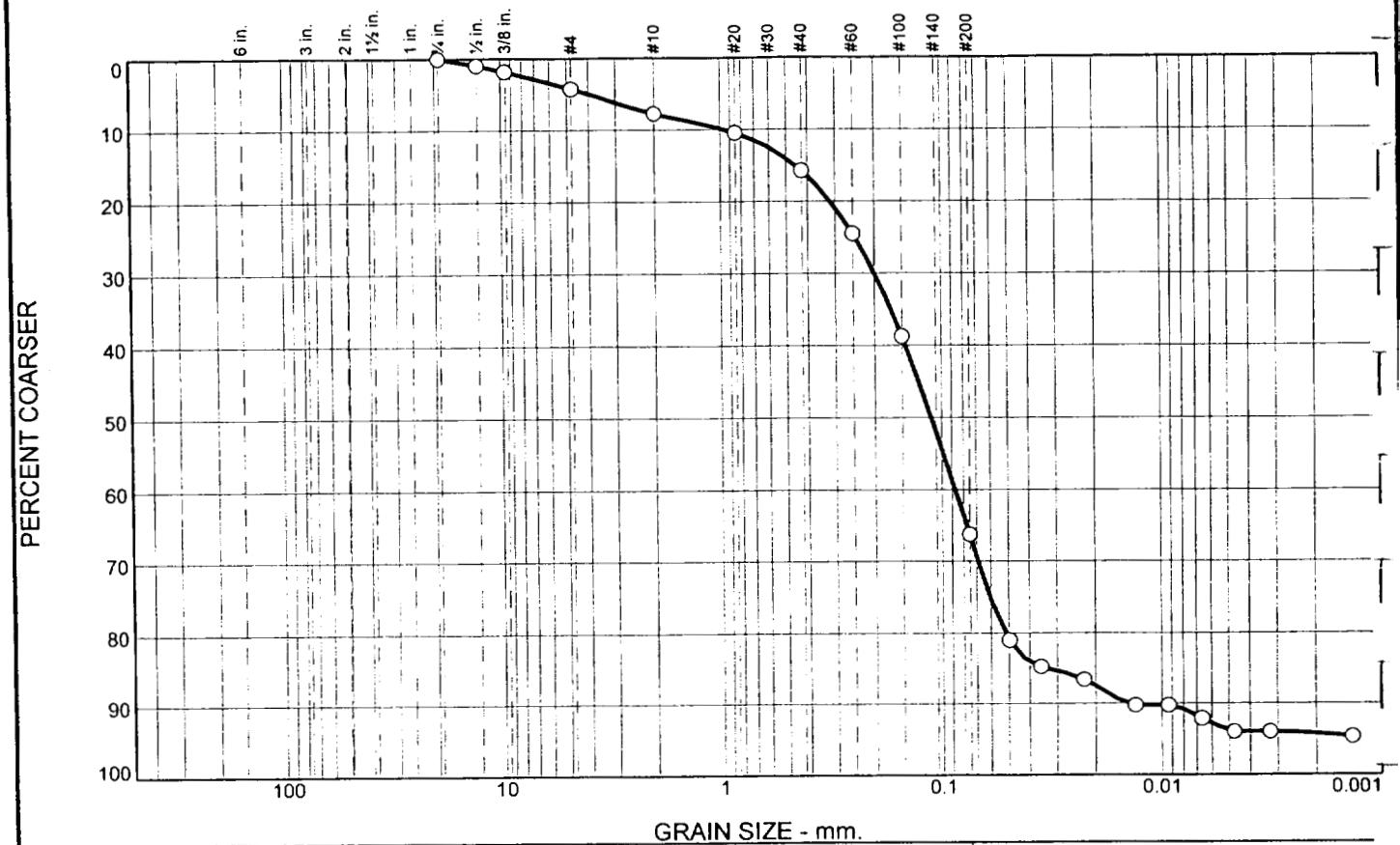
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	10.0	4.8	0.0134	10.0	14.7	0.0513	8.8
2.00	21.5	8.0	2.8	0.0134	8.0	15.0	0.0367	5.1
5.00	21.5	8.0	2.8	0.0134	8.0	15.0	0.0232	5.1
15.00	21.5	7.0	1.8	0.0134	7.0	15.1	0.0135	3.3
30.00	21.5	7.0	1.8	0.0134	7.0	15.1	0.0095	3.3
60.00	21.5	7.0	1.8	0.0134	7.0	15.1	0.0067	3.3
120.00	21.5	7.0	1.8	0.0134	7.0	15.1	0.0048	3.3
250.00	21.5	7.0	1.8	0.0134	7.0	15.1	0.0033	3.3
1440.00	22.0	6.5	1.4	0.0133	6.5	15.2	0.0014	2.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.1	2.1	5.4	9.8	62.1	77.3	17.6	3.0	20.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0538	0.0632	0.0736	0.1109	0.1775	0.2084	0.3485	0.5414	1.2455	2.9382

Fineness Modulus	C_u	C_c
1.16	3.87	1.10

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.2	3.5	8.0	50.6	27.9	5.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.0		
.375	98.2		
#4	95.8		
#10	92.3		
#20	89.6		
#40	84.3		
#60	75.6		
#100	61.3		
#200	33.7		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.4512 D_{60}= 0.1445 D_{50}= 0.1109
D_{30}= 0.0686 D_{15}= 0.0326 D_{10}= 0.0140
C_u= 10.30 C_c= 2.32

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 13.5%

Location: No. 4-805/9F-1, 80.0'-81.0'

Date: 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 4-805/9F-1, 80.0'-81.0'
Material Description: brown silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 13.5%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1056.21	232.88	0.00	.75	0.00	100.0
			.50	7.97	99.0
			.375	15.01	98.2
			#4	34.69	95.8
			#10	63.63	92.3
50.03	0.00	0.00	#20	1.47	89.6
			#40	4.31	84.3
			#60	9.06	75.6
			#100	16.80	61.3
			#200	31.74	33.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =92.3
Weight of hydrometer sample =50.03
Hygroscopic moisture correction:
Moist weight and tare = 48.40
Dry weight and tare = 48.34
Tare weight = 27.97
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

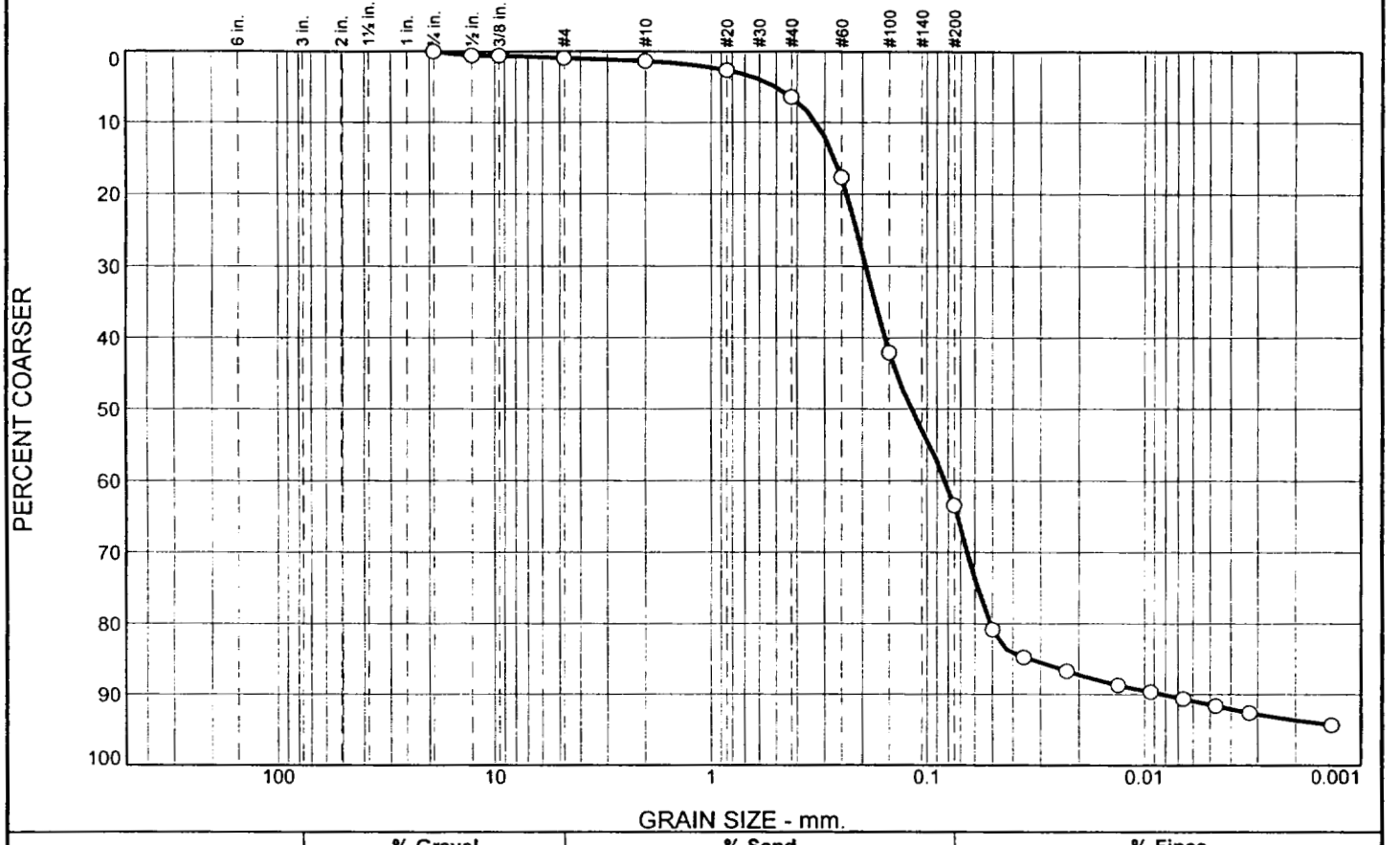
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	16.0	10.3	0.0134	16.0	13.7	0.0495	19.0
2.00	21.5	14.0	8.3	0.0134	14.0	14.0	0.0354	15.3
5.00	21.5	13.0	7.3	0.0134	13.0	14.2	0.0225	13.5
15.00	21.5	11.0	5.3	0.0134	11.0	14.5	0.0132	9.8
30.00	21.5	11.0	5.3	0.0134	11.0	14.5	0.0093	9.8
60.00	21.5	10.0	4.3	0.0134	10.0	14.7	0.0066	7.9
120.00	21.5	9.0	3.3	0.0134	9.0	14.8	0.0047	6.1
250.00	21.5	9.0	3.3	0.0134	9.0	14.8	0.0033	6.1
1440.00	22.0	8.5	2.9	0.0133	8.5	14.9	0.0014	5.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	4.2	4.2	3.5	8.0	50.6	62.1	27.9	5.8	33.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0140	0.0326	0.0516	0.0686	0.1109	0.1445	0.3142	0.4512	0.9466	3.9263

Fineness Modulus	C_u	C_c
0.94	10.30	2.32

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	0.4	5.1	57.0	30.2	6.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.5		
.375	99.5		
#4	99.1		
#10	98.7		
#20	97.4		
#40	93.6		
#60	82.4		
#100	57.9		
#200	36.6		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.2687 D_{60}= 0.1574 D_{50}= 0.1178
D_{30}= 0.0648 D_{15}= 0.0334 D_{10}= 0.0082
C_u= 19.16 C_c= 3.25

Classification

USCS= AASHTO=

Remarks

As Received
Moisture Content: 14.1%

Location: No. 4-805/9F-2, 81.0'-81.5' **Date:** 09-11-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 4-805/9F-2, 81.0'-81.5'
Material Description: brown silty SAND (visual)
Date: 09-11-06
Testing Remarks: As Received
Moisture Content: 14.1%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1005.10	226.69	0.00	.75	0.00	100.0
			.50	4.09	99.5
			.375	4.09	99.5
			#4	7.09	99.1
			#10	10.40	98.7
50.49	0.00	0.00	#20	0.64	97.4
			#40	2.60	93.6
			#60	8.32	82.4
			#100	20.85	57.9
			#200	31.76	36.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =98.7
Weight of hydrometer sample =50.49
Hygroscopic moisture correction:
Moist weight and tare = 53.18
Dry weight and tare = 53.13
Tare weight = 31.67
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

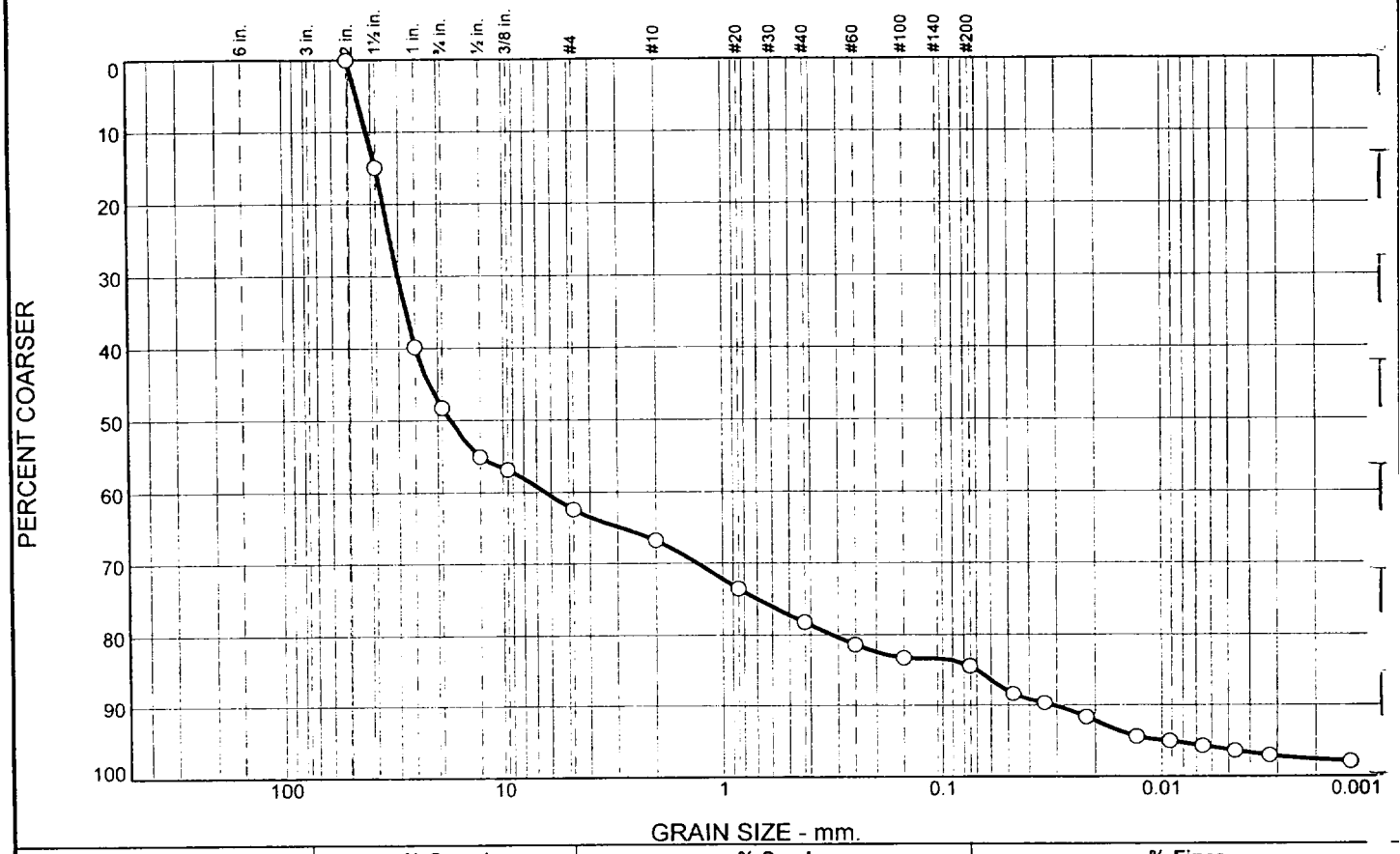
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.5	15.0	9.8	0.0134	15.0	13.8	0.0498	19.2
2.00	21.5	13.0	7.8	0.0134	13.0	14.2	0.0356	15.3
5.00	21.5	12.0	6.8	0.0134	12.0	14.3	0.0227	13.3
15.00	21.5	11.0	5.8	0.0134	11.0	14.5	0.0132	11.3
30.00	21.5	10.5	5.3	0.0134	10.5	14.6	0.0093	10.4
60.00	21.5	10.0	4.8	0.0134	10.0	14.7	0.0066	9.4
120.00	21.5	9.5	4.3	0.0134	9.5	14.7	0.0047	8.4
250.00	21.5	9.0	3.8	0.0134	9.0	14.8	0.0033	7.4
1440.00	22.0	8.0	2.9	0.0133	8.0	15.0	0.0014	5.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.9	0.9	0.4	5.1	57.0	62.5	30.2	6.4	36.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0082	0.0334	0.0512	0.0648	0.1178	0.1574	0.2360	0.2687	0.3268	0.5022

Fineness Modulus	C_u	C_c
0.62	19.16	3.25

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	48.2	14.2	4.3	11.5	6.1	13.3	2.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.50	85.1		
1.0	60.2		
.75	51.8		
.50	45.0		
.375	43.2		
#4	37.6		
#10	33.3		
#20	26.5		
#40	21.8		
#60	18.7		
#100	16.8		
#200	15.7		

* (no specification provided)

Material Description

brown silty GRAVEL with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 38.0330 D_{60}= 25.2628 D_{50}= 17.4086
D_{30}= 1.2916 D_{15}= 0.0688 D_{10}= 0.0308
C_u= 821.26 C_c= 2.15

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 9.7%

Location: No. 5-805/2F-1, 17.0'-18.0'

Date: 9-14-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 5-805/2F-1, 17.0'-18.0'
Material Description: brown silty GRAVEL with sand (visual)
Date: 9-14-06
Testing Remarks: As Received Moisture Content: 9.7%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1703.20	225.32	0.00	2.0	0.00	100.0
			1.50	220.11	85.1
			1.0	587.57	60.2
			.75	711.70	51.8
			.50	813.00	45.0
			.375	839.80	43.2
			#4	921.80	37.6
			#10	986.30	33.3
50.94	0.00	0.00	#20	10.38	26.5
			#40	17.60	21.8
			#60	22.36	18.7
			#100	25.20	16.8
			#200	26.97	15.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =33.3
Weight of hydrometer sample =50.94
Hygroscopic moisture correction:
Moist weight and tare = 49.99
Dry weight and tare = 49.36
Tare weight = 28.22
Hygroscopic moisture =3.0%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

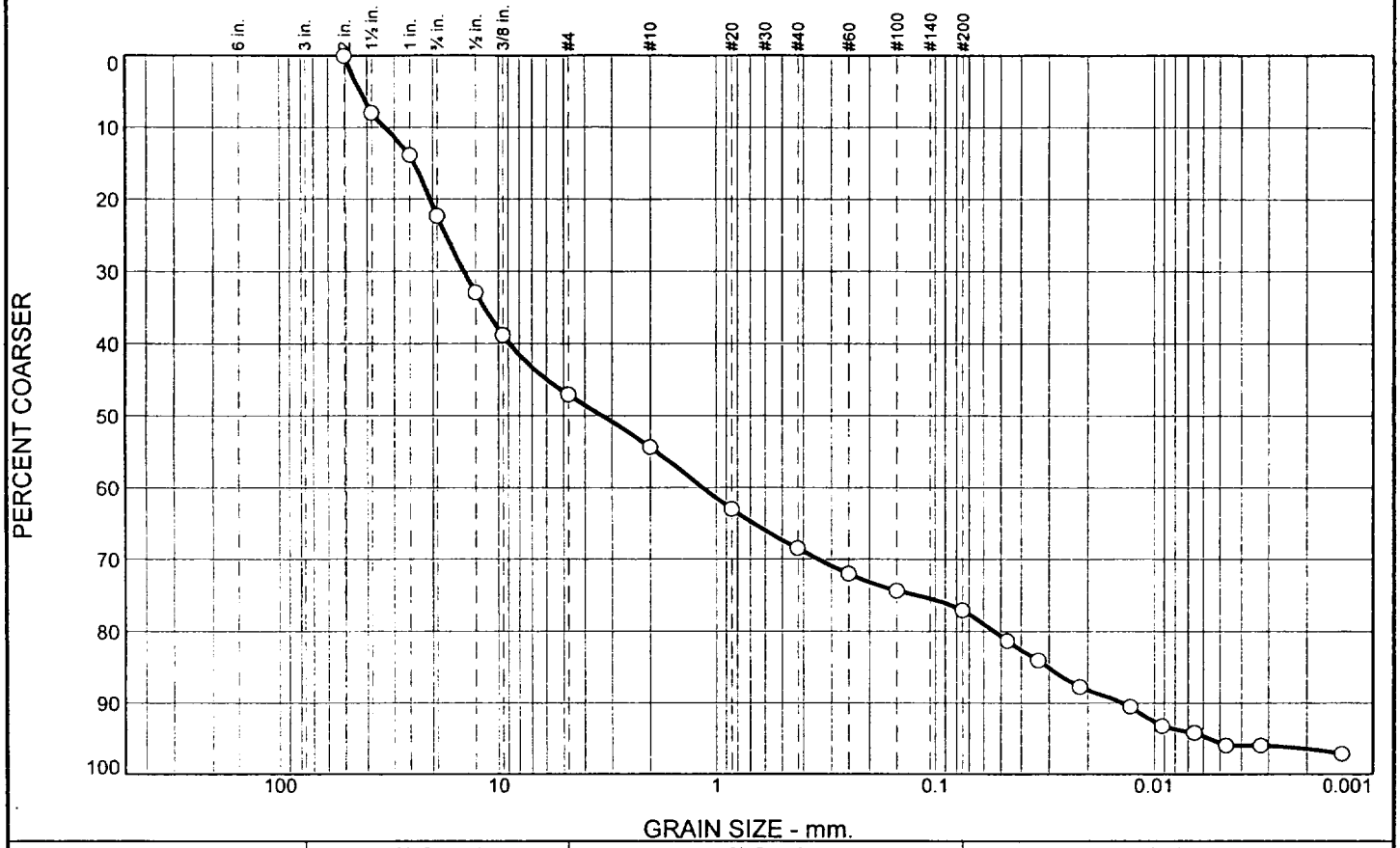
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	22.0	17.4	0.0133	22.0	12.7	0.0474	11.7
2.00	22.0	20.0	15.4	0.0133	20.0	13.0	0.0340	10.4
5.00	22.0	17.0	12.4	0.0133	17.0	13.5	0.0219	8.3
15.00	22.0	13.0	8.4	0.0133	13.0	14.2	0.0129	5.7
30.00	22.0	12.0	7.4	0.0133	12.0	14.3	0.0092	5.0
60.00	22.0	11.0	6.4	0.0133	11.0	14.5	0.0065	4.3
120.00	22.0	10.0	5.4	0.0133	10.0	14.7	0.0047	3.6
250.00	22.0	9.0	4.4	0.0133	9.0	14.8	0.0032	3.0
1440.00	21.0	8.0	3.2	0.0135	8.0	15.0	0.0014	2.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	48.2	14.2	62.4	4.3	11.5	6.1	21.9	13.3	2.4	15.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0308	0.0688	0.3177	1.2916	17.4086	25.2628	35.1456	38.0330	41.5232	45.7794

Fineness Modulus	C_u	C_c
5.58	821.26	2.15

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	22.3	24.7	7.3	14.2	8.5	19.4	3.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.50	92.1		
1.0	86.2		
.75	77.7		
.50	67.1		
.375	61.2		
#4	53.0		
#10	45.7		
#20	37.0		
#40	31.5		
#60	28.0		
#100	25.6		
#200	23.0		

* (no specification provided)

Material Description

brown silty GRAVEL with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 24.1736 D_{60}= 8.8548 D_{50}= 3.3026
D_{30}= 0.3407 D_{15}= 0.0302 D_{10}= 0.0136
C_u= 649.05 C_c= 0.96

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 9.5%

Location: No. 5-805/2F-2, 18.0'19.0'

Date: 9-14-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 5-805/2F-2, 18.0'19.0'
Material Description: brown silty GRAVEL with sand (visual)
Date: 9-14-06
Testing Remarks: As Received Moisture Content: 9.5%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1934.50	226.73	0.00	2.0	0.00	100.0
			1.50	135.46	92.1
			1.0	235.97	86.2
			.75	380.47	77.7
			.50	561.95	67.1
			.375	662.20	61.2
			#4	803.00	53.0
			#10	927.60	45.7
50.07	0.00	0.00	#20	9.50	37.0
			#40	15.50	31.5
			#60	19.35	28.0
			#100	21.96	25.6
			#200	24.90	23.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample **=45.7**
Weight of hydrometer sample =50.07
Hygroscopic moisture correction:
Moist weight and tare = 53.98
Dry weight and tare = 53.88
Tare weight = 31.67
Hygroscopic moisture =0.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

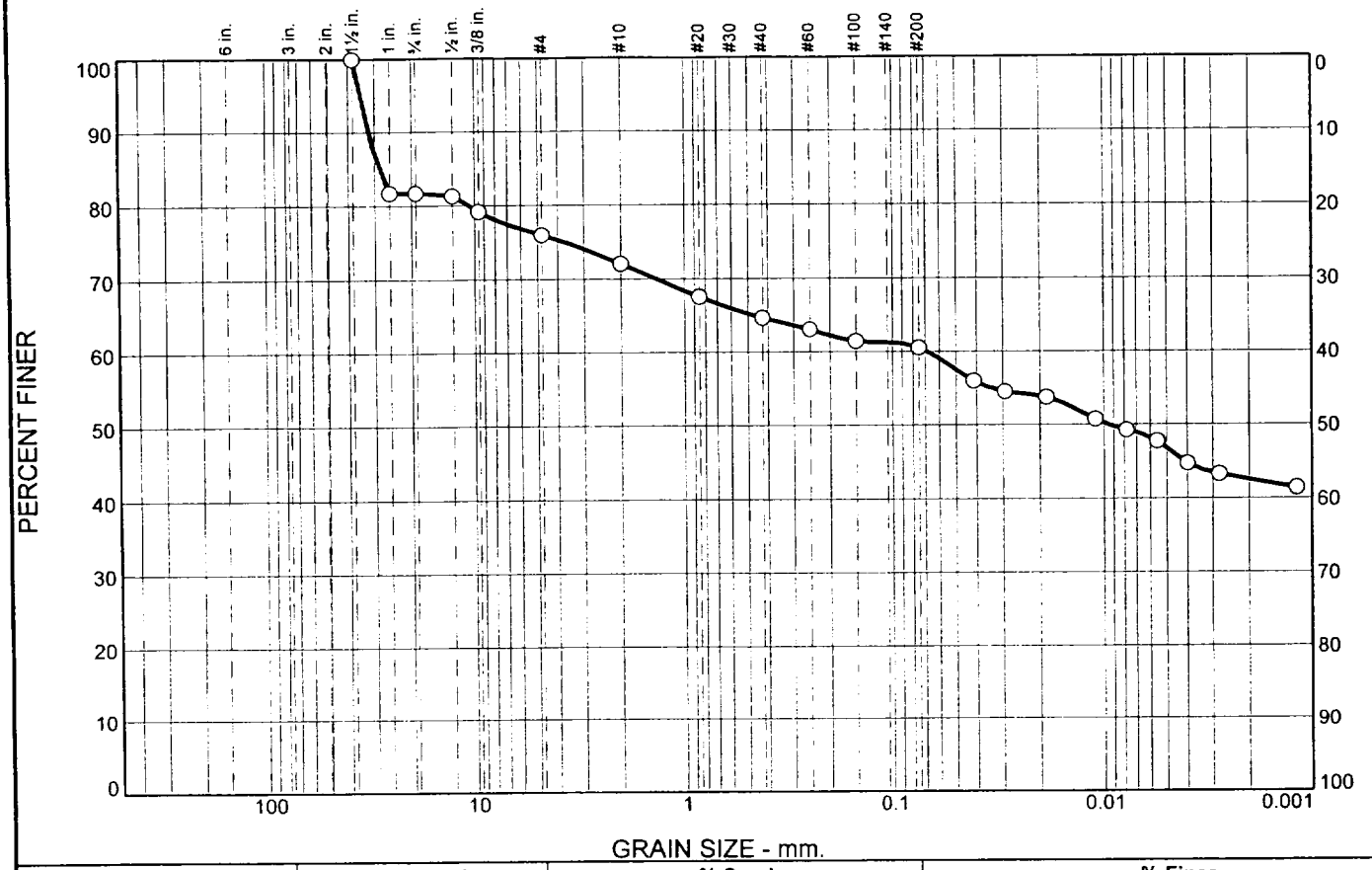
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	25.0	20.4	0.0133	25.0	12.2	0.0465	18.7
2.00	22.0	22.0	17.4	0.0133	22.0	12.7	0.0335	16.0
5.00	22.0	18.0	13.4	0.0133	18.0	13.3	0.0217	12.3
15.00	22.0	15.0	10.4	0.0133	15.0	13.8	0.0128	9.5
30.00	22.0	12.0	7.4	0.0133	12.0	14.3	0.0092	6.8
60.00	22.0	11.0	6.4	0.0133	11.0	14.5	0.0065	5.9
120.00	22.0	9.0	4.4	0.0133	9.0	14.8	0.0047	4.0
250.00	22.0	9.0	4.4	0.0133	9.0	14.8	0.0032	4.0
1440.00	21.0	8.0	3.2	0.0135	8.0	15.0	0.0014	2.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	22.3	24.7	47.0	7.3	14.2	8.5	30.0	19.4	3.6	23.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0136	0.0302	0.0534	0.3407	3.3026	8.8548	20.4656	24.1736	33.2163	43.0693

Fineness Modulus	C_u	C_c
4.40	649.05	0.96

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.2	5.8	3.9	7.4	4.1	18.1	42.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	81.8		
.75	81.8		
.50	81.3		
.375	79.2		
#4	76.0		
#10	72.1		
#20	67.6		
#40	64.7		
#60	63.1		
#100	61.5		
#200	60.6		

* (no specification provided)

Material Description

brown gravelly CLAY with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 28.5081 D_{60}= D_{50}= 0.0094
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 29.4%

Location: No. 5-805/8F-1, 74.0'-75.0'

Date: 9-14-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

10/12/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 5-805/8F-1, 74.0'-75.0'
Material Description: brown gravelly CLAY with sand (visual)
Date: 9-14-06
Testing Remarks: As Received Moisture Content: 29.4%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
689.10	228.69	0.00	1.5	0.00	100.0
			1.0	84.02	81.8
			.75	84.02	81.8
			.50	85.92	81.3
			.375	95.69	79.2
			#4	110.34	76.0
			#10	128.51	72.1
50.69	0.00	0.00	#20	3.17	67.6
			#40	5.19	64.7
			#60	6.33	63.1
			#100	7.48	61.5
			#200	8.09	60.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =72.1
Weight of hydrometer sample =50.69
Hygroscopic moisture correction:
Moist weight and tare = 56.28
Dry weight and tare = 55.02
Tare weight = 31.22
Hygroscopic moisture =5.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

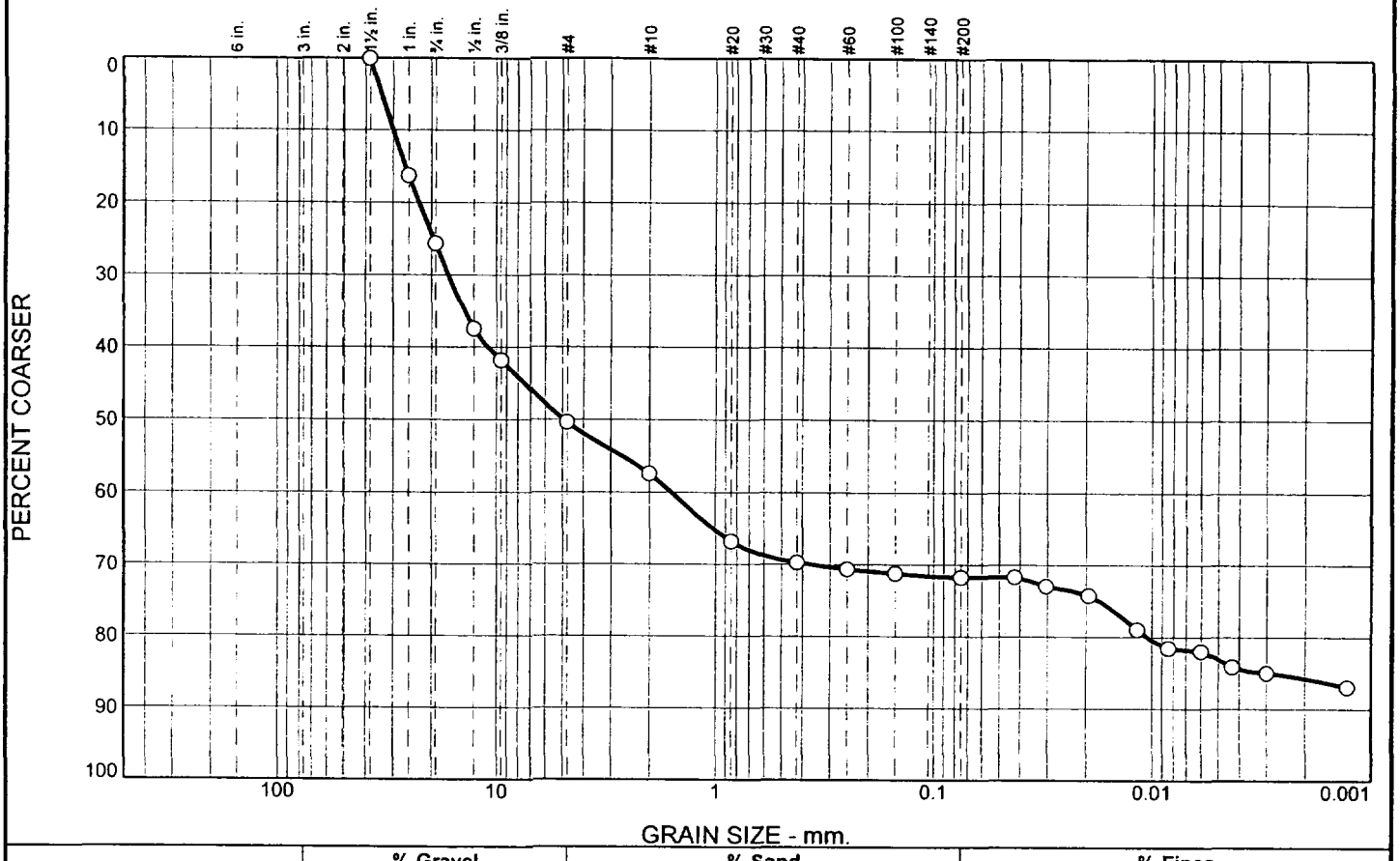
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	41.5	37.4	0.0133	41.5	9.5	0.0410	56.0
2.00	22.0	40.5	36.4	0.0133	40.5	9.7	0.0292	54.5
5.00	22.0	40.0	35.9	0.0133	40.0	9.7	0.0186	53.8
15.00	22.0	38.0	33.9	0.0133	38.0	10.1	0.0109	50.8
30.00	22.0	37.0	32.9	0.0133	37.0	10.2	0.0078	49.3
60.00	22.0	36.0	31.9	0.0133	36.0	10.4	0.0055	47.8
120.00	22.0	34.0	29.9	0.0133	34.0	10.7	0.0040	44.8
250.00	22.0	33.0	28.9	0.0133	33.0	10.9	0.0028	43.3
1440.00	21.0	32.0	27.7	0.0135	32.0	11.0	0.0012	41.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	18.2	5.8	24.0	3.9	7.4	4.1	15.4	18.1	42.5	60.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
				0.0094		10.5710	28.5081	31.8789	34.9600

Fineness Modulus
2.30

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	25.6	24.7	7.1	12.3	2.0	14.0	14.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.50	100.0		
1.0	83.8		
.75	74.4		
.50	62.6		
.375	58.3		
#4	49.7		
#10	42.6		
#20	33.2		
#40	30.3		
#60	29.4		
#100	28.8		
#200	28.3		

* (no specification provided)

Material Description

brown silty GRAVEL with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 26.2820 D_{60}= 10.8996 D_{50}= 4.8947
D_{30}= 0.3617 D_{15}= 0.0030 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 20.3%

Location: No. 5-805/8F-2, 75.0'-76.0'

Date: 9-14-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 5-805/8F-2, 75.0'-76.0'
Material Description: brown silty GRAVEL with sand (visual)
Date: 9-14-06
Testing Remarks: As Received Moisture Content: 20.3%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
844.40	232.14	0.00	1.50	0.00	100.0
			1.0	99.36	83.8
			.75	156.86	74.4
			.50	228.94	62.6
			.375	255.56	58.3
			#4	308.01	49.7
			#10	351.40	42.6
50.50	0.00	0.00	#20	11.09	33.2
			#40	14.56	30.3
			#60	15.66	29.4
			#100	16.38	28.8
			#200	16.96	28.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =42.6
Weight of hydrometer sample =50.50
Hygroscopic moisture correction:
Moist weight and tare = 54.56
Dry weight and tare = 54.02
Tare weight = 30.02
Hygroscopic moisture =2.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

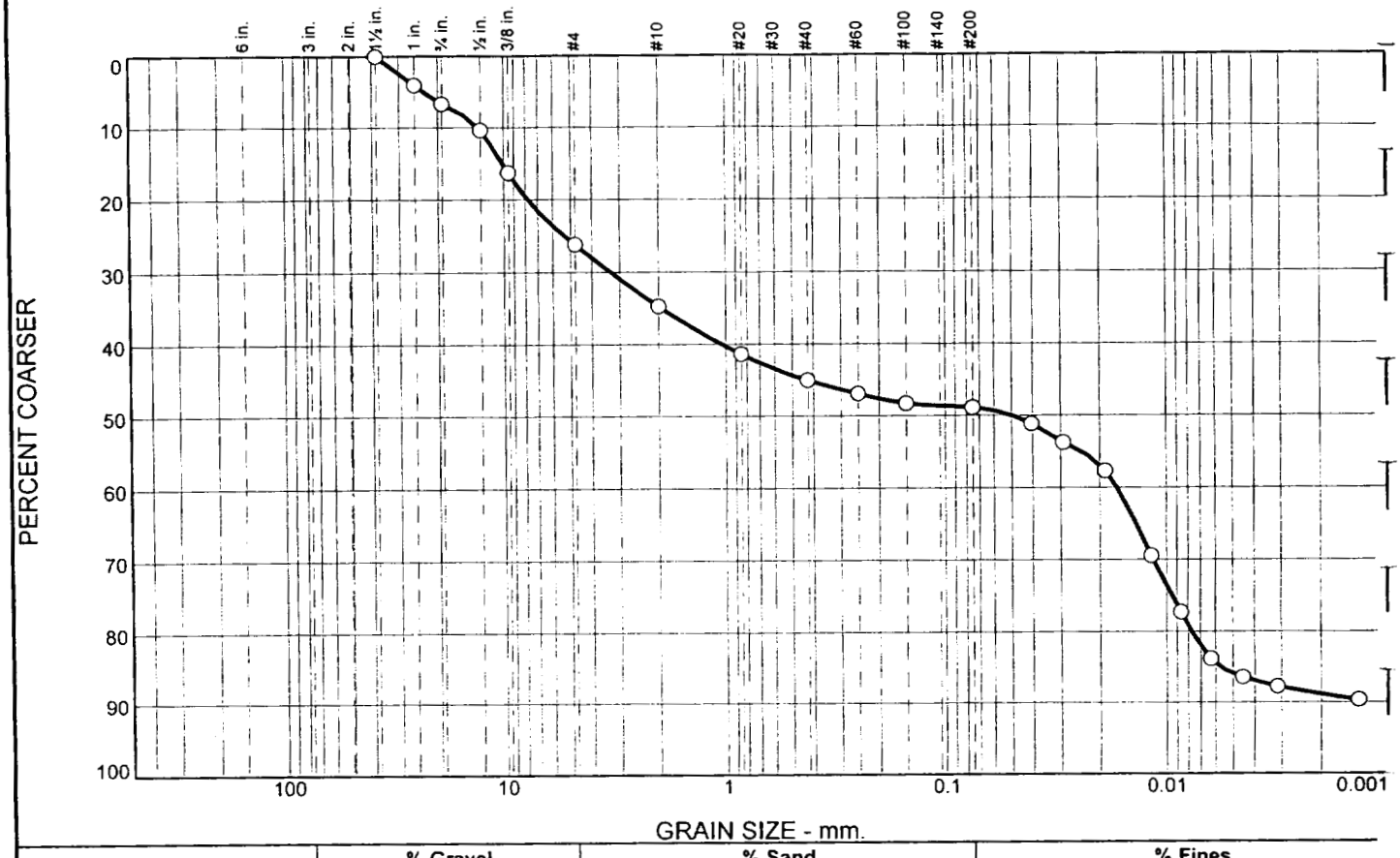
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	37.5	32.9	0.0133	37.5	10.1	0.0424	28.4
2.00	22.0	36.0	31.4	0.0133	36.0	10.4	0.0303	27.1
5.00	22.0	34.5	29.9	0.0133	34.5	10.6	0.0194	25.8
15.00	22.0	29.0	24.4	0.0133	29.0	11.5	0.0117	21.1
30.00	22.0	26.0	21.4	0.0133	26.0	12.0	0.0084	18.5
60.00	22.0	25.5	20.9	0.0133	25.5	12.1	0.0060	18.0
120.00	22.0	23.0	18.4	0.0133	23.0	12.5	0.0043	15.9
250.00	22.0	22.0	17.4	0.0133	22.0	12.7	0.0030	15.0
1440.00	21.0	20.0	15.2	0.0135	20.0	13.0	0.0013	13.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	25.6	24.7	50.3	7.1	12.3	2.0	21.4	14.0	14.3	28.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0030	0.0105	0.3617	4.8947	10.8996	22.7212	26.2820	29.9440	33.8362

Fineness Modulus
4.47

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.7	19.5	8.5	10.3	3.9	39.9	11.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	96.0		
.75	93.3		
.50	89.6		
.375	83.8		
#4	73.8		
#10	65.3		
#20	58.7		
#40	55.0		
#60	53.1		
#100	51.7		
#200	51.1		

* (no specification provided)

Material Description

brown/white gravelly SILT with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 10.0925 D_{60}= 1.0328 D_{50}= 0.0492
D_{30}= 0.0114 D_{15}= 0.0057 D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 20.3%

Location: No. 5-805/8F-3, 76.0'-77.0'

Date: 9-15-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 5-805/8F-3, 76.0'-77.0'
Material Description: brown/white gravelly SILT with sand (visual)
Date: 9-15-06
Testing Remarks: As Received Moisture Content: 20.3%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
856.90	226.24	0.00	1.5	0.00	100.0
			1.0	25.44	96.0
			.75	42.02	93.3
			.50	65.32	89.6
			.375	102.38	83.8
			#4	164.92	73.8
			#10	218.72	65.3
50.55	0.00	0.00	#20	5.14	58.7
			#40	7.99	55.0
			#60	9.44	53.1
			#100	10.51	51.7
			#200	10.98	51.1

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =65.3
Weight of hydrometer sample =50.55
Hygroscopic moisture correction:
Moist weight and tare = 49.61
Dry weight and tare = 49.38
Tare weight = 27.97
Hygroscopic moisture =1.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

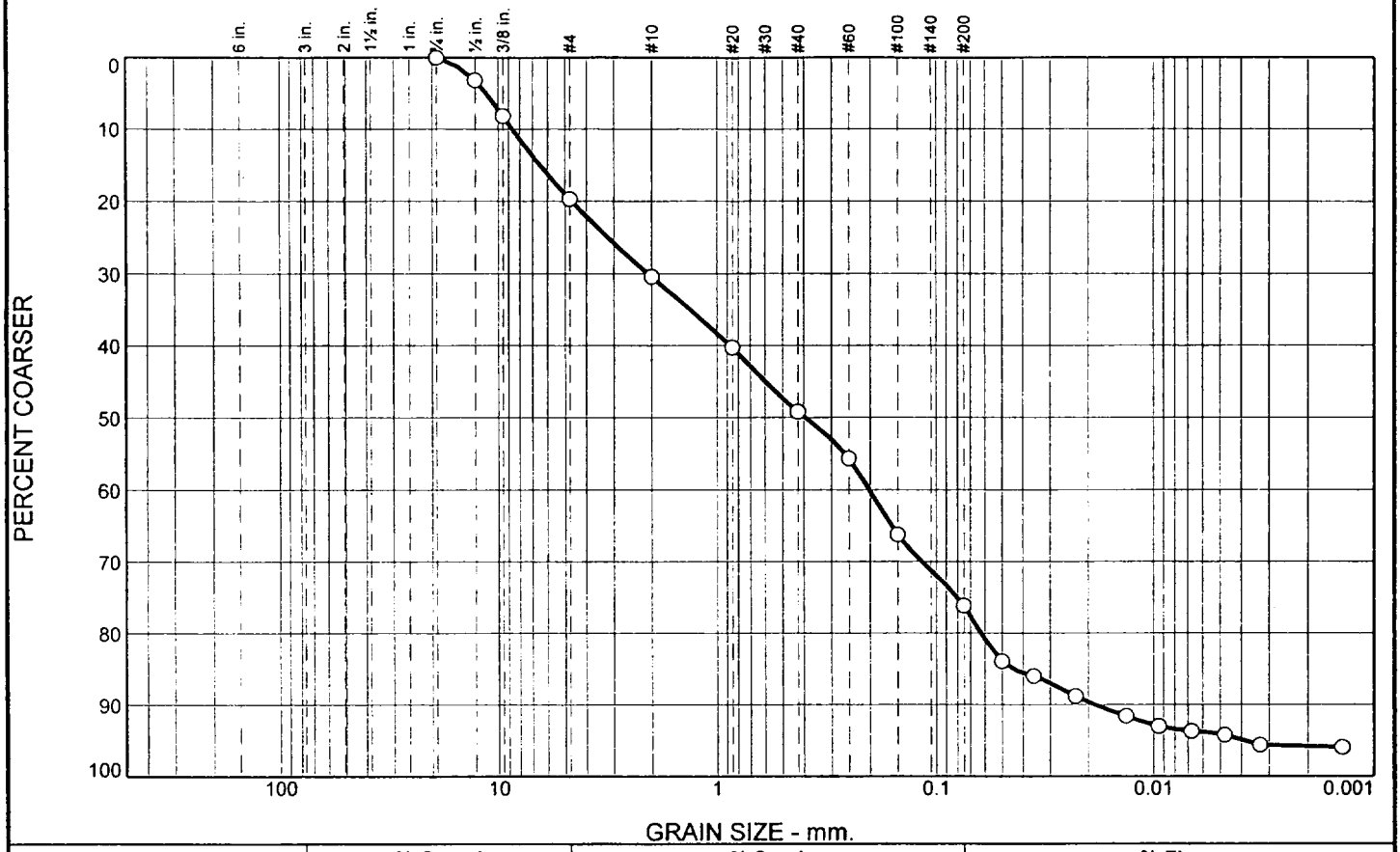
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	43.0	37.4	0.0133	43.0	9.2	0.0405	48.9
2.00	22.0	41.0	35.4	0.0133	41.0	9.6	0.0291	46.2
5.00	22.0	38.0	32.4	0.0133	38.0	10.1	0.0189	42.3
15.00	22.0	29.0	23.4	0.0133	29.0	11.5	0.0117	30.6
30.00	22.0	23.0	17.4	0.0133	23.0	12.5	0.0086	22.7
60.00	22.0	18.0	12.4	0.0133	18.0	13.3	0.0063	16.2
120.00	22.0	16.0	10.4	0.0133	16.0	13.7	0.0045	13.6
250.00	22.0	15.0	9.4	0.0133	15.0	13.8	0.0031	12.3
1440.00	20.0	14.0	8.0	0.0136	14.0	14.0	0.0013	10.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	6.7	19.5	26.2	8.5	10.3	3.9	22.7	39.9	11.2	51.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
	0.0057	0.0077	0.0114	0.0492	1.0328	7.7422	10.0925	12.9999	23.0332

Fineness Modulus
2.59

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	19.6	10.8	18.8	27.0	19.6	4.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	96.9		
.375	91.8		
#4	80.4		
#10	69.6		
#20	59.7		
#40	50.8		
#60	44.4		
#100	33.8		
#200	23.8		

* (no specification provided)

Material Description

gray silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.4408 D_{60}= 0.8680 D_{50}= 0.3929
D_{30}= 0.1161 D_{15}= 0.0446 D_{10}= 0.0185
C_u= 46.90 C_c= 0.84

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 7.7%

Location: No. 6-885/2F-1, 18.0'-19.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-885/2F-1, 18.0'-19.0'
Material Description: gray silty SAND with gravel (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 7.7%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
991.00	237.82	0.00	.75	0.00	100.0
			.50	23.64	96.9
			.375	61.46	91.8
			#4	147.91	80.4
			#10	229.02	69.6
50.18	0.00	0.00	#20	7.11	59.7
			#40	13.53	50.8
			#60	18.17	44.4
			#100	25.81	33.8
			#200	32.99	23.8

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =69.6
Weight of hydrometer sample =50.18
Hygroscopic moisture correction:
Moist weight and tare = 50.20
Dry weight and tare = 50.15
Tare weight = 28.24
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

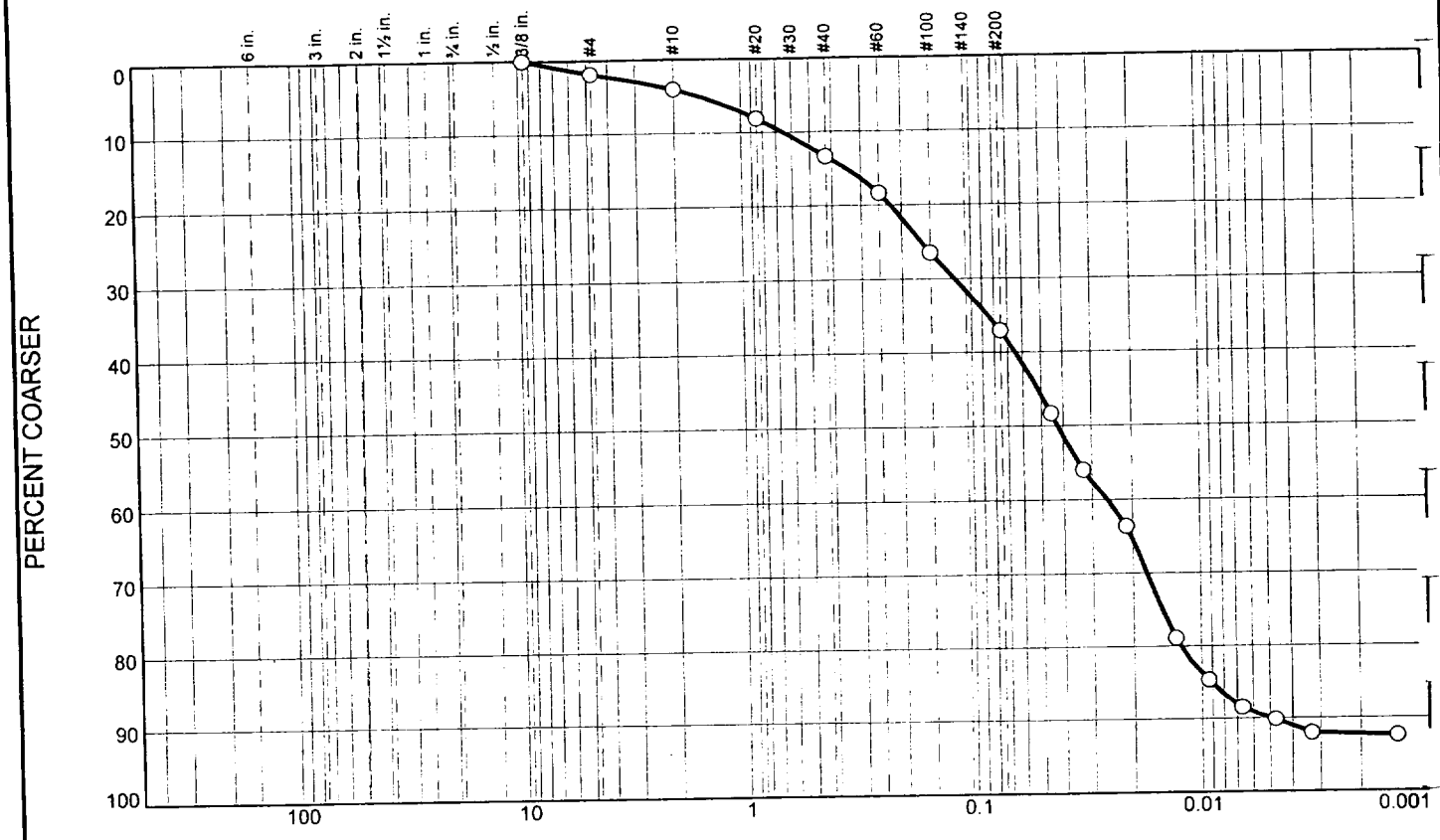
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	16.5	11.6	0.0136	16.5	13.6	0.0500	16.1
2.00	20.5	15.0	10.1	0.0136	15.0	13.8	0.0357	14.0
5.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0228	11.2
15.00	20.5	11.0	6.1	0.0136	11.0	14.5	0.0133	8.4
30.00	20.5	10.0	5.1	0.0136	10.0	14.7	0.0095	7.0
60.00	20.5	9.5	4.6	0.0136	9.5	14.7	0.0067	6.3
120.00	21.0	9.0	4.2	0.0135	9.0	14.8	0.0047	5.8
250.00	21.0	8.0	3.2	0.0135	8.0	15.0	0.0033	4.4
1440.00	20.0	8.0	3.0	0.0136	8.0	15.0	0.0014	4.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	19.6	19.6	10.8	18.8	27.0	56.6	19.6	4.2	23.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0185	0.0446	0.0623	0.1161	0.3929	0.8680	4.6309	6.4408	8.6227	11.2874

Fineness Modulus	C_u	C_c
2.57	46.90	0.84

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.9	2.2	9.2	23.7	55.3	7.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	98.1		
#10	95.9		
#20	91.9		
#40	86.7		
#60	81.7		
#100	73.6		
#200	63.0		

* (no specification provided)

Material Description

gray sandy SILT (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.3434 D_{60}= D_{50}= 0.0422
D_{30}= 0.0172 D_{15}= 0.0090 D_{10}= 0.0048
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 13.5%

Location: No. 6-885/2F-2, 19.0'-20.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-885/2F-2, 19.0'-20.0'
Material Description: gray sandy SILT (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 13.5%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
921.30	229.69	0.00	.375	0.00	100.0
			#4	12.80	98.1
			#10	28.15	95.9
50.38	0.00	0.00	#20	2.11	91.9
			#40	4.85	86.7
			#60	7.48	81.7
			#100	11.74	73.6
			#200	17.31	63.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =95.9
Weight of hydrometer sample =50.38
Hygroscopic moisture correction:
Moist weight and tare = 52.49
Dry weight and tare = 52.42
Tare weight = 30.02
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

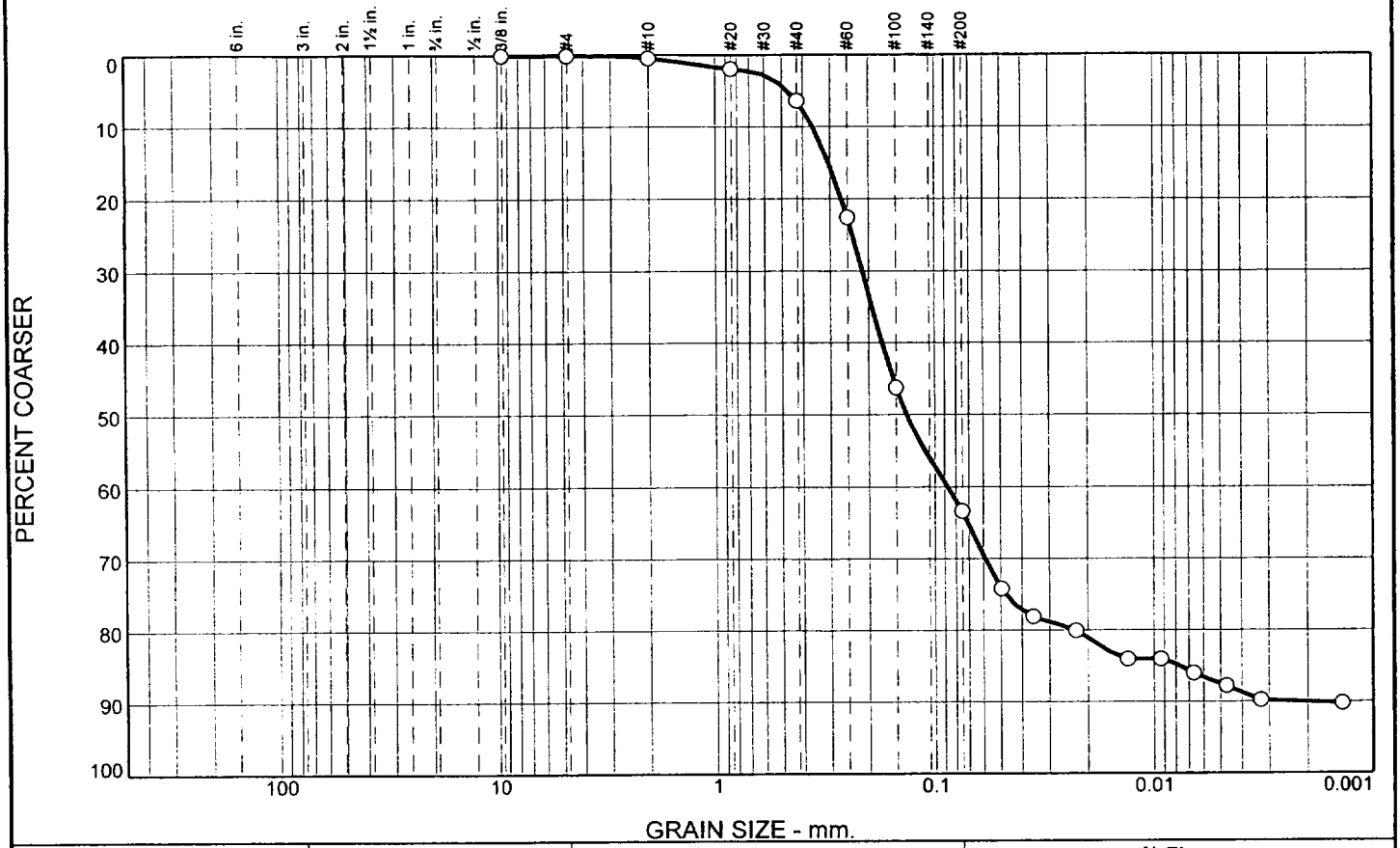
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	32.0	27.1	0.0136	32.0	11.0	0.0451	51.7
2.00	20.5	28.0	23.1	0.0136	28.0	11.7	0.0328	44.1
5.00	20.5	24.0	19.1	0.0136	24.0	12.4	0.0213	36.4
15.00	20.5	16.0	11.1	0.0136	16.0	13.7	0.0129	21.1
30.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0093	15.4
60.00	20.5	11.0	6.1	0.0136	11.0	14.5	0.0067	11.6
120.00	21.0	10.0	5.2	0.0135	10.0	14.7	0.0047	9.9
250.00	21.0	9.0	4.2	0.0135	9.0	14.8	0.0033	8.0
1440.00	20.0	9.0	4.0	0.0136	9.0	14.8	0.0014	7.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.9	1.9	2.2	9.2	23.7	35.1	55.3	7.7	63.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0048	0.0090	0.0123	0.0172	0.0422		0.2221	0.3434	0.6491	1.5432

Fineness Modulus
0.65

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.5	5.9	56.9	26.7	10.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	100.0		
#10	99.5		
#20	98.1		
#40	93.6		
#60	77.5		
#100	53.8		
#200	36.7		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.3033 D_{60}= 0.1736 D_{50}= 0.1341
D_{30}= 0.0588 D_{15}= 0.0077 D_{10}= 0.0020
C_u= 86.45 C_c= 9.91

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 9.5%

Location: No. 6-855/2F-1, 30.0'-31.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-855/2F-1, 30.0'-31.0'
Material Description: brown silty SAND (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 9.5%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
939.70	232.21	0.00	.375	0.00	100.0
			#4	0.25	100.0
			#10	3.28	99.5
50.44	0.00	0.00	#20	0.75	98.1
			#40	3.00	93.6
			#60	11.18	77.5
			#100	23.18	53.8
			#200	31.86	36.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.5
Weight of hydrometer sample =50.44
Hygroscopic moisture correction:
Moist weight and tare = 50.61
Dry weight and tare = 50.55
Tare weight = 27.97
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

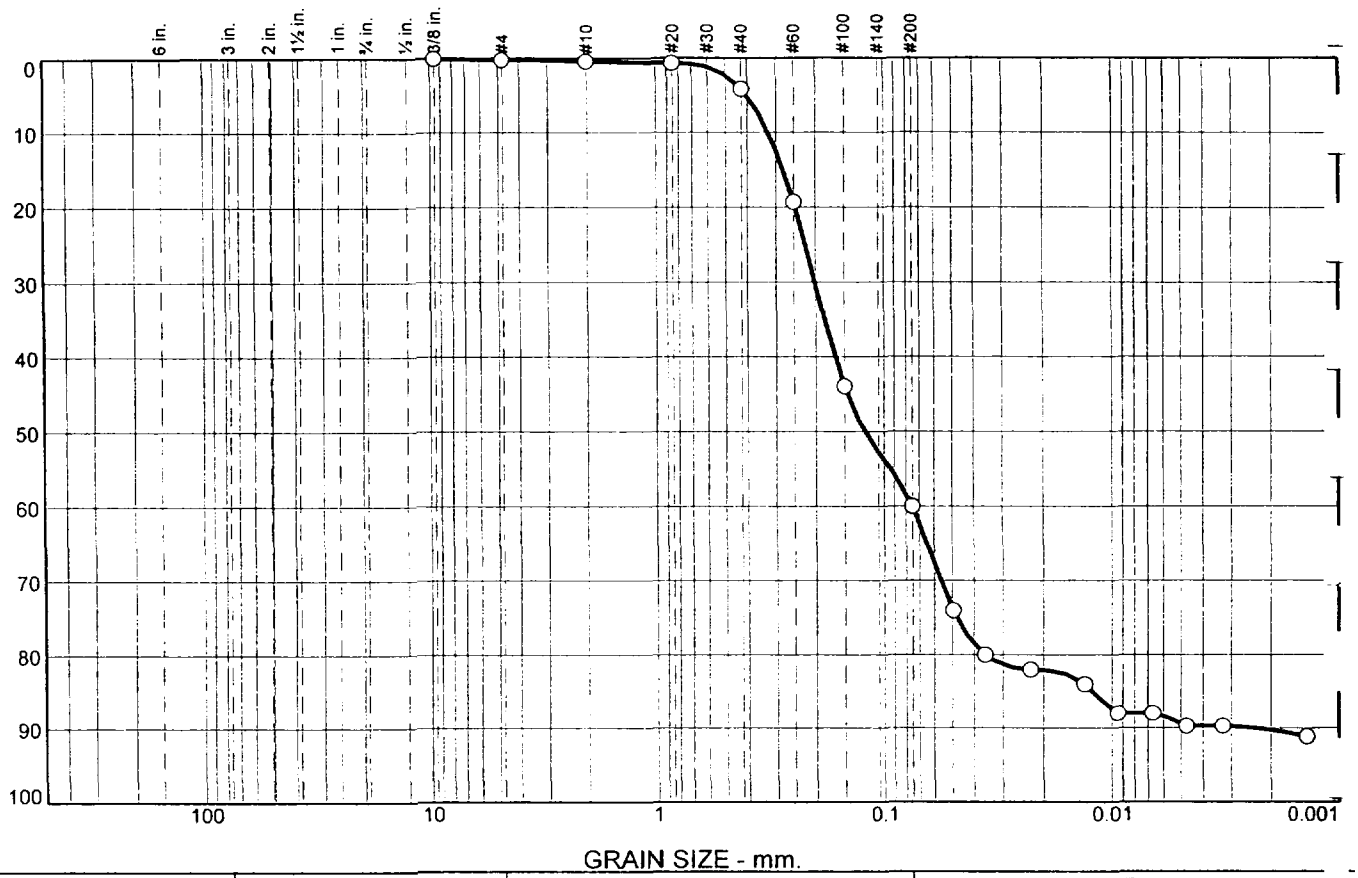
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	18.0	13.1	0.0136	18.0	13.3	0.0495	25.9
2.00	20.5	16.0	11.1	0.0136	16.0	13.7	0.0355	21.9
5.00	20.5	15.0	10.1	0.0136	15.0	13.8	0.0226	19.9
15.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0132	16.0
30.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0093	16.0
60.00	20.5	12.0	7.1	0.0136	12.0	14.3	0.0066	14.0
120.00	21.0	11.0	6.2	0.0135	11.0	14.5	0.0047	12.2
250.00	21.0	10.0	5.2	0.0135	10.0	14.7	0.0033	10.2
1440.00	20.0	10.0	5.0	0.0136	10.0	14.7	0.0014	9.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.5	5.9	56.9	63.3	26.7	10.0	36.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0020	0.0077	0.0229	0.0588	0.1341	0.1736	0.2653	0.3033	0.3589	0.4656

Fineness Modulus	C_u	C_c
0.66	86.45	9.91

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.2	0.2	3.7	55.9	30.3	9.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.8		
#10	99.6		
#20	99.3		
#40	95.9		
#60	80.7		
#100	56.1		
#200	40.0		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.2773 D_{60}= 0.1647 D_{50}= 0.1214
D_{30}= 0.0561 D_{15}= 0.0121 D_{10}= 0.0024
C_u= 69.69 C_c= 8.08

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 10.7%

Location: No. 6-855/2F-2, 31.0'-32.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-855/2F-2, 31.0'-32.0'
Material Description: gray silty SAND (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 10.7%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
926.60	226.98	0.00	.375	0.00	100.0
			#4	1.54	99.8
			#10	2.69	99.6
50.35	0.00	0.00	#20	0.14	99.3
			#40	1.90	95.9
			#60	9.54	80.7
			#100	21.99	56.1
			#200	30.11	40.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.6
Weight of hydrometer sample =50.35
Hygroscopic moisture correction:
Moist weight and tare = 49.24
Dry weight and tare = 49.12
Tare weight = 28.55
Hygroscopic moisture =0.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

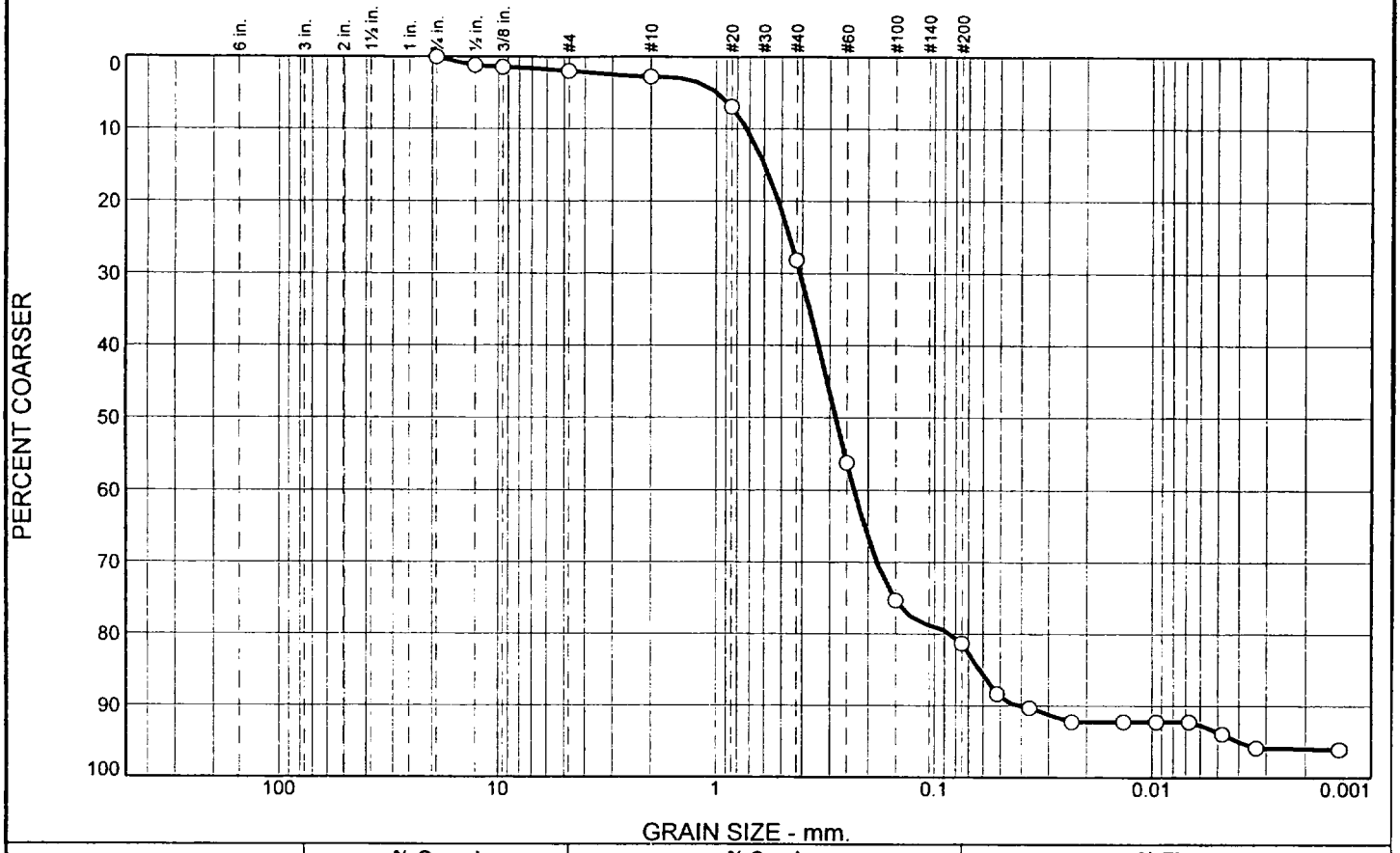
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	18.0	13.1	0.0136	18.0	13.3	0.0495	26.0
2.00	20.5	15.0	10.1	0.0136	15.0	13.8	0.0357	20.0
5.00	20.5	14.0	9.1	0.0136	14.0	14.0	0.0227	18.0
15.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0132	16.1
30.00	20.5	11.0	6.1	0.0136	11.0	14.5	0.0094	12.1
60.00	20.5	11.0	6.1	0.0136	11.0	14.5	0.0067	12.1
120.00	21.0	10.0	5.2	0.0135	10.0	14.7	0.0047	10.3
250.00	21.0	10.0	5.2	0.0135	10.0	14.7	0.0033	10.3
1440.00	20.0	9.5	4.5	0.0136	9.5	14.7	0.0014	8.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.2	0.2	0.2	3.7	55.9	59.8	30.3	9.7	40.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0024	0.0121	0.0356	0.0561	0.1214	0.1647	0.2459	0.2773	0.3227	0.4028

Fineness Modulus	C_u	C_c
0.58	69.69	8.08

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.9	0.9	25.3	53.2	14.6	4.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	98.8		
.375	98.6		
#4	98.1		
#10	97.2		
#20	93.1		
#40	71.9		
#60	43.8		
#100	24.7		
#200	18.7		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.5965 D_{60}= 0.3375 D_{50}= 0.2812
D_{30}= 0.1818 D_{15}= 0.0619 D_{10}= 0.0405
C_u= 8.33 C_c= 2.42

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 11.4%

Location: No. 6-855/2F-3, 32.0'-33.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-855/2F-3, 32.0'-33.0'
Material Description: brown silty SAND (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 11.4%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
962.00	238.09	0.00	.75	0.00	100.0
			.50	8.39	98.8
			.375	10.35	98.6
			#4	13.94	98.1
			#10	20.05	97.2
50.74	0.00	0.00	#20	2.16	93.1
			#40	13.22	71.9
			#60	27.88	43.8
			#100	37.84	24.7
			#200	40.98	18.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =97.2
Weight of hydrometer sample =50.74
Hygroscopic moisture correction:
Moist weight and tare = 50.11
Dry weight and tare = 50.06
Tare weight = 28.81
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

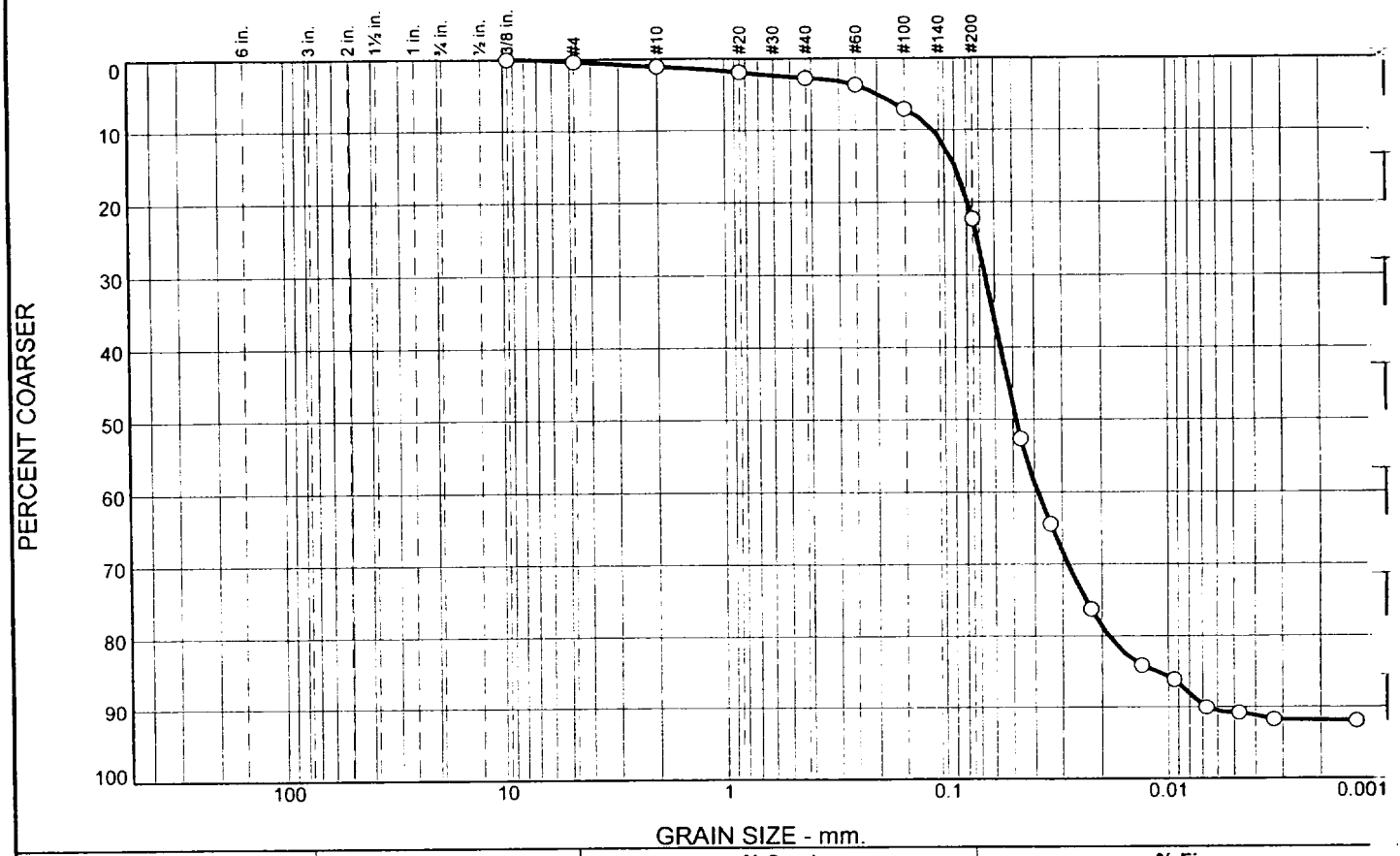
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	11.0	6.1	0.0136	11.0	14.5	0.0516	11.7
2.00	20.5	10.0	5.1	0.0136	10.0	14.7	0.0367	9.7
5.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0233	7.8
15.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0135	7.8
30.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0095	7.8
60.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0067	7.8
120.00	21.0	8.0	3.2	0.0135	8.0	15.0	0.0048	6.1
250.00	21.0	7.0	2.2	0.0135	7.0	15.1	0.0033	4.2
1440.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0014	4.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	1.9	1.9	0.9	25.3	53.2	79.4	14.6	4.1	18.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0405	0.0619	0.0838	0.1818	0.2812	0.3375	0.5149	0.5965	0.7213	0.9868

Fineness Modulus	C_u	C_c
1.46	8.33	2.42

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.8	1.6	19.5	69.7	8.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.7		
#10	98.9		
#20	98.1		
#40	97.3		
#60	96.3		
#100	92.9		
#200	77.8		

* (no specification provided)

Material Description

brown SILT with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0895 D_{60}= D_{50}= 0.0483
D_{30}= 0.0282 D_{15}= 0.0110 D_{10}= 0.0067
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 14.8%

Location: No. 6-855/2F-4, 37.0'-38.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-855/2F-4, 37.0'-38.0'
Material Description: brown SILT with sand (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 14.8%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
794.50	113.71	0.00	.375	0.00	100.0
			#4	2.32	99.7
			#10	7.18	98.9
50.42	0.00	0.00	#20	0.42	98.1
			#40	0.84	97.3
			#60	1.33	96.3
			#100	3.07	92.9
			#200	10.80	77.8

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =98.9
Weight of hydrometer sample =50.42
Hygroscopic moisture correction:
Moist weight and tare = 51.03
Dry weight and tare = 50.94
Tare weight = 28.33
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

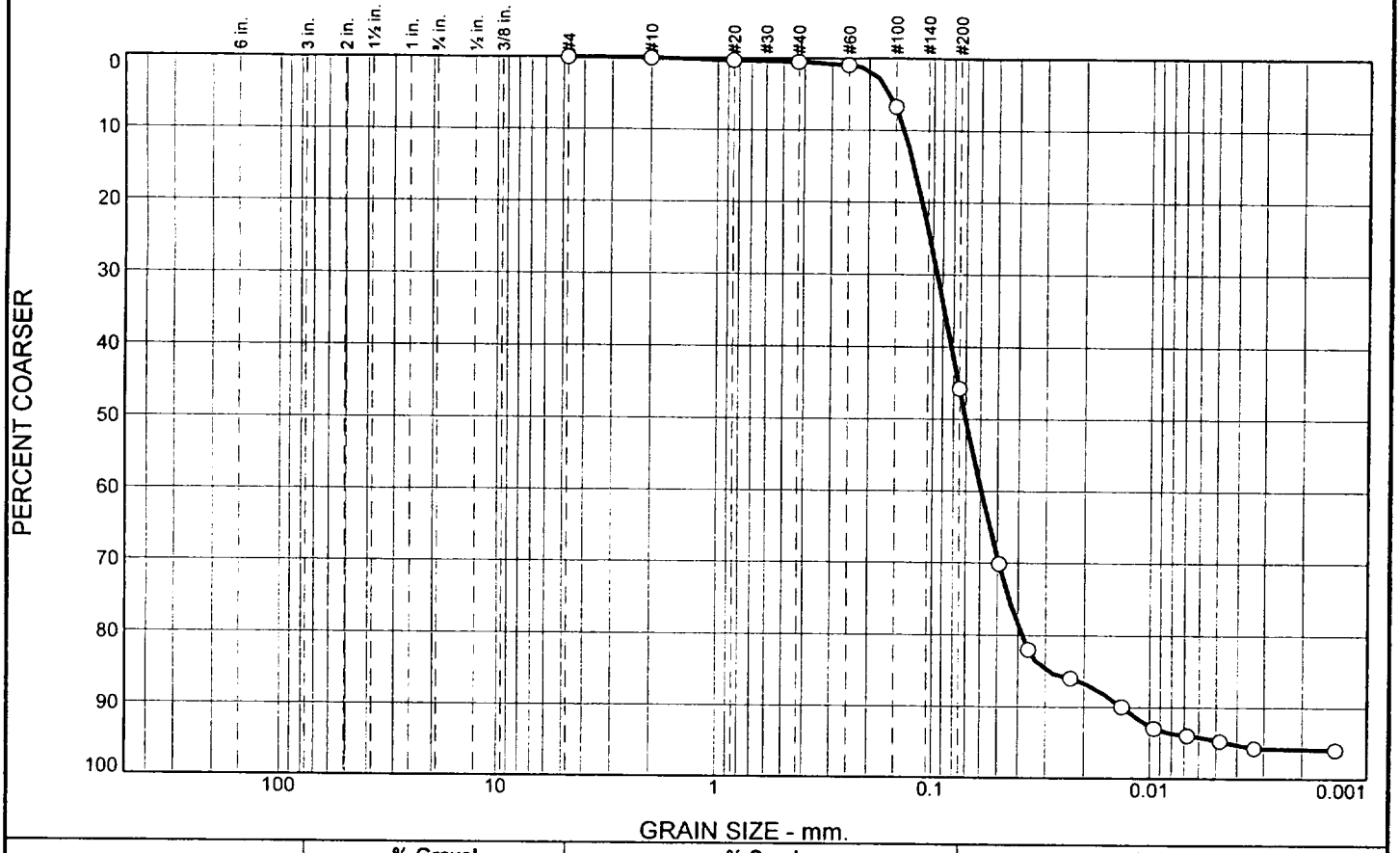
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	29.0	24.1	0.0136	29.0	11.5	0.0461	47.4
2.00	20.5	23.0	18.1	0.0136	23.0	12.5	0.0339	35.6
5.00	20.5	17.0	12.1	0.0136	17.0	13.5	0.0223	23.8
15.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0132	15.9
30.00	20.5	12.0	7.1	0.0136	12.0	14.3	0.0094	13.9
60.00	20.5	10.0	5.1	0.0136	10.0	14.7	0.0067	10.0
120.00	21.0	9.5	4.7	0.0135	9.5	14.7	0.0047	9.2
250.00	21.0	9.0	4.2	0.0135	9.0	14.8	0.0033	8.2
1440.00	20.5	9.0	4.1	0.0136	9.0	14.8	0.0014	8.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.3	0.3	0.8	1.6	19.5	21.9	69.7	8.1	77.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0067	0.0110	0.0185	0.0282	0.0483		0.0786	0.0895	0.1117	0.1983

Fineness Modulus
0.15

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.1	0.4	45.2	50.1	4.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#10	99.9		
#20	99.7		
#40	99.5		
#60	99.1		
#100	93.3		
#200	54.3		

* (no specification provided)

Material Description

gray sandy SILT (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1232 D_{60}= 0.0819 D_{50}= 0.0701
D_{30}= 0.0490 D_{15}= 0.0293 D_{10}= 0.0133
C_u= 6.15 C_c= 2.20

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 15.6%

Location: No. 6-855/2F-5, 38.0'-39.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-855/2F-5, 38.0'-39.0'
Material Description: gray sandy SILT (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 15.6%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
722.80	112.11	0.00	#4	0.00	100.0
			#10	0.54	99.9
50.40	0.00	0.00	#20	0.10	99.7
			#40	0.20	99.5
			#60	0.42	99.1
			#100	3.35	93.3
			#200	23.01	54.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =99.9
Weight of hydrometer sample =50.40
Hygroscopic moisture correction:
Moist weight and tare = 48.95
Dry weight and tare = 48.91
Tare weight = 28.46
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
***Hydrometer effective depth equation:* L =16.294964 - 0.164 x Rm**

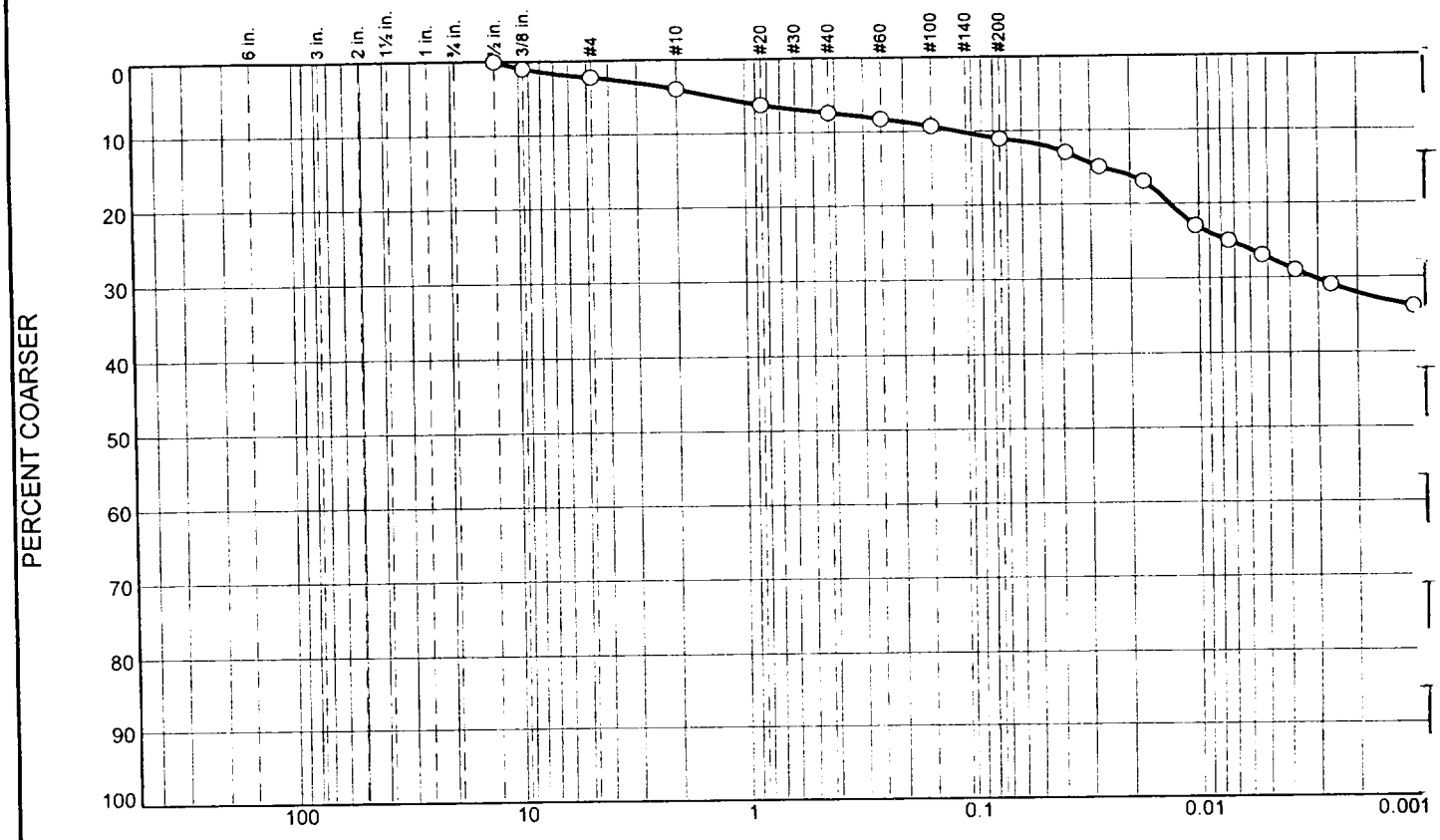
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	20.0	15.1	0.0136	20.0	13.0	0.0489	29.9
2.00	20.5	14.0	9.1	0.0136	14.0	14.0	0.0359	18.0
5.00	20.5	12.0	7.1	0.0136	12.0	14.3	0.0230	14.0
15.00	20.5	10.0	5.1	0.0136	10.0	14.7	0.0134	10.1
30.00	20.5	8.5	3.6	0.0136	8.5	14.9	0.0096	7.1
60.00	20.5	8.0	3.1	0.0136	8.0	15.0	0.0068	6.1
120.00	21.0	7.5	2.7	0.0135	7.5	15.1	0.0048	5.3
250.00	21.0	7.0	2.2	0.0135	7.0	15.1	0.0033	4.3
1440.00	20.5	7.0	2.1	0.0136	7.0	15.1	0.0014	4.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.1	0.4	45.2	45.7	50.1	4.2	54.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0133	0.0293	0.0385	0.0490	0.0701	0.0819	0.1124	0.1232	0.1372	0.1595

Fineness Modulus	C_u	C_c
0.08	6.15	2.20

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.2	1.7	3.5	3.6	21.1	67.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.0		
#4	97.8		
#10	96.1		
#20	93.8		
#40	92.6		
#60	91.8		
#100	90.7		
#200	89.0		

* (no specification provided)

Material Description

brown CLAY (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= D_{60}= D_{50}=
D_{30}= D_{15}= D_{10}=
C_u= C_c=

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 31.5%

Location: No. 6-805/10F-1, 91.0'-92.0'

Date: 9-15-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB

Checked By: SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-805/10F-1, 91.0'-92.0'
Material Description: brown CLAY (visual)
Date: 9-15-06
Testing Remarks: As Received Moisture Content: 31.5%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
690.80	232.89	0.00	.50	0.00	100.0
			.375	4.49	99.0
			#4	10.19	97.8
			#10	18.04	96.1
50.78	0.00	0.00	#20	1.18	93.8
			#40	1.81	92.6
			#60	2.26	91.8
			#100	2.81	90.7
			#200	3.74	89.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =96.1
Weight of hydrometer sample =50.78
Hygroscopic moisture correction:
Moist weight and tare = 48.94
Dry weight and tare = 47.77
Tare weight = 28.44
Hygroscopic moisture =6.1%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

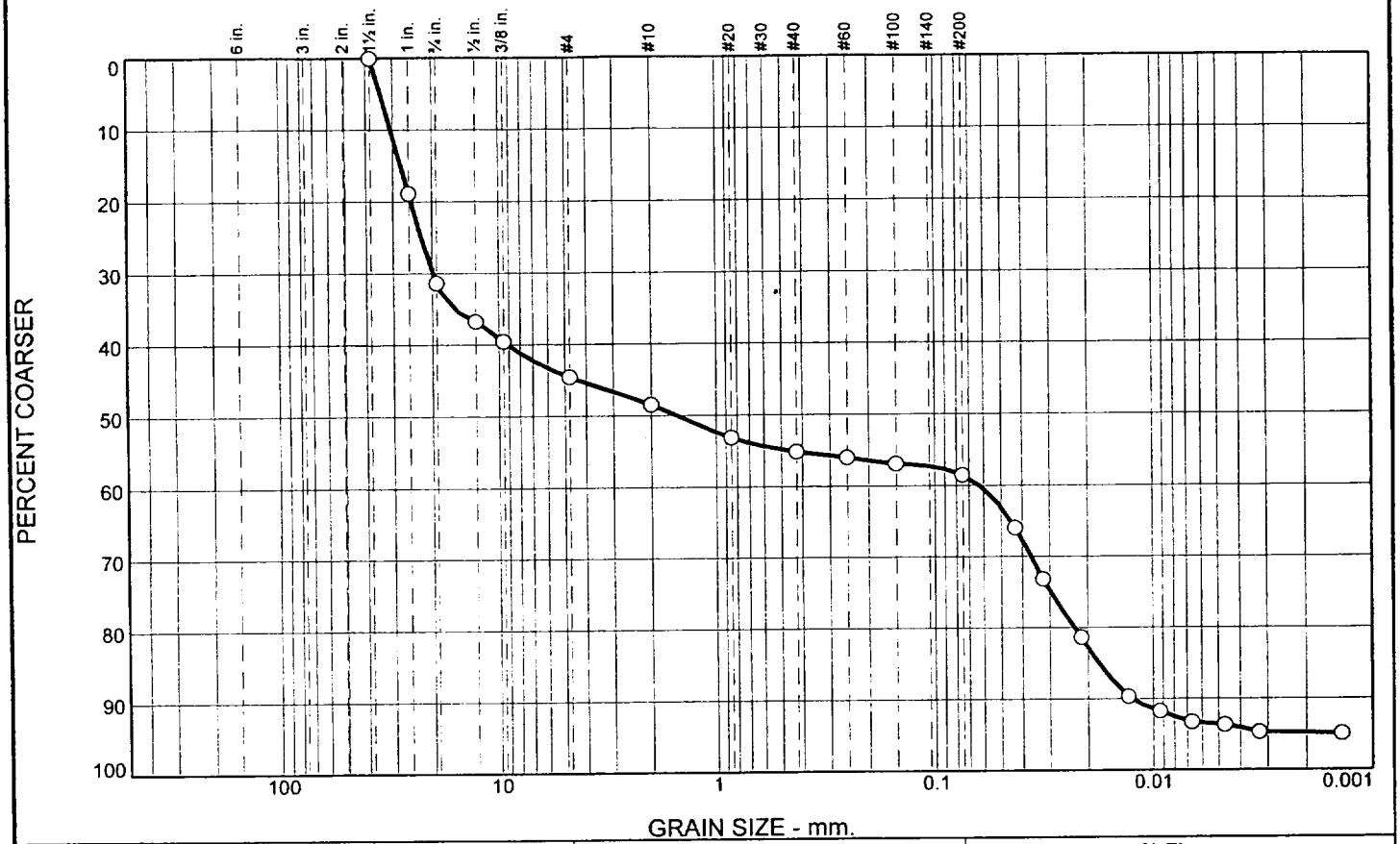
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	22.0	49.0	43.4	0.0133	49.0	8.3	0.0383	87.1
2.00	22.0	48.0	42.4	0.0133	48.0	8.4	0.0273	85.1
5.00	22.0	47.0	41.4	0.0133	47.0	8.6	0.0174	83.1
15.00	22.0	44.0	38.4	0.0133	44.0	9.1	0.0104	77.1
30.00	22.0	43.0	37.4	0.0133	43.0	9.2	0.0074	75.0
60.00	22.0	42.0	36.4	0.0133	42.0	9.4	0.0053	73.0
120.00	22.0	41.0	35.4	0.0133	41.0	9.6	0.0038	71.0
250.00	22.0	40.0	34.4	0.0133	40.0	9.7	0.0026	69.0
1440.00	20.0	39.0	33.0	0.0136	39.0	9.9	0.0011	66.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.2	2.2	1.7	3.5	3.6	8.8	21.1	67.9	89.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
								0.1130	1.3487

Fineness Modulus
0.36

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	31.3	13.2	3.9	6.7	3.4	36.3	5.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	81.2		
.75	68.7		
.50	63.3		
.375	60.5		
#4	55.5		
#10	51.6		
#20	46.9		
#40	44.9		
#60	44.0		
#100	43.1		
#200	41.5		

* (no specification provided)

Material Description

brown silty GRAVEL (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 27.4979 D_{60}= 9.0802 D_{50}= 1.5092
D_{30}= 0.0364 D_{15}= 0.0177 D_{10}= 0.0125
C_u= 726.14 C_c= 0.01

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 11.2%

Location: No. 6-805/10F-2, 92.0'-93.0'

Date: 9-19-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 6-805/10F-2, 92.0'-93.0'
Material Description: brown silty GRAVEL (visual)
Date: 9-19-06
Testing Remarks: As Received Moisture Content: 11.2%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
881.90	221.69	0.00	1.5	0.00	100.0
			1.0	124.24	81.2
			.75	206.97	68.7
			.50	242.49	63.3
			.375	260.98	60.5
			#4	293.87	55.5
			#10	319.84	51.6
50.24	0.00	0.00	#20	4.53	46.9
			#40	6.49	44.9
			#60	7.34	44.0
			#100	8.20	43.1
			#200	9.81	41.5

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =51.6
Weight of hydrometer sample =50.24
Hygroscopic moisture correction:
Moist weight and tare = 55.21
Dry weight and tare = 55.09
Tare weight = 31.67
Hygroscopic moisture =0.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

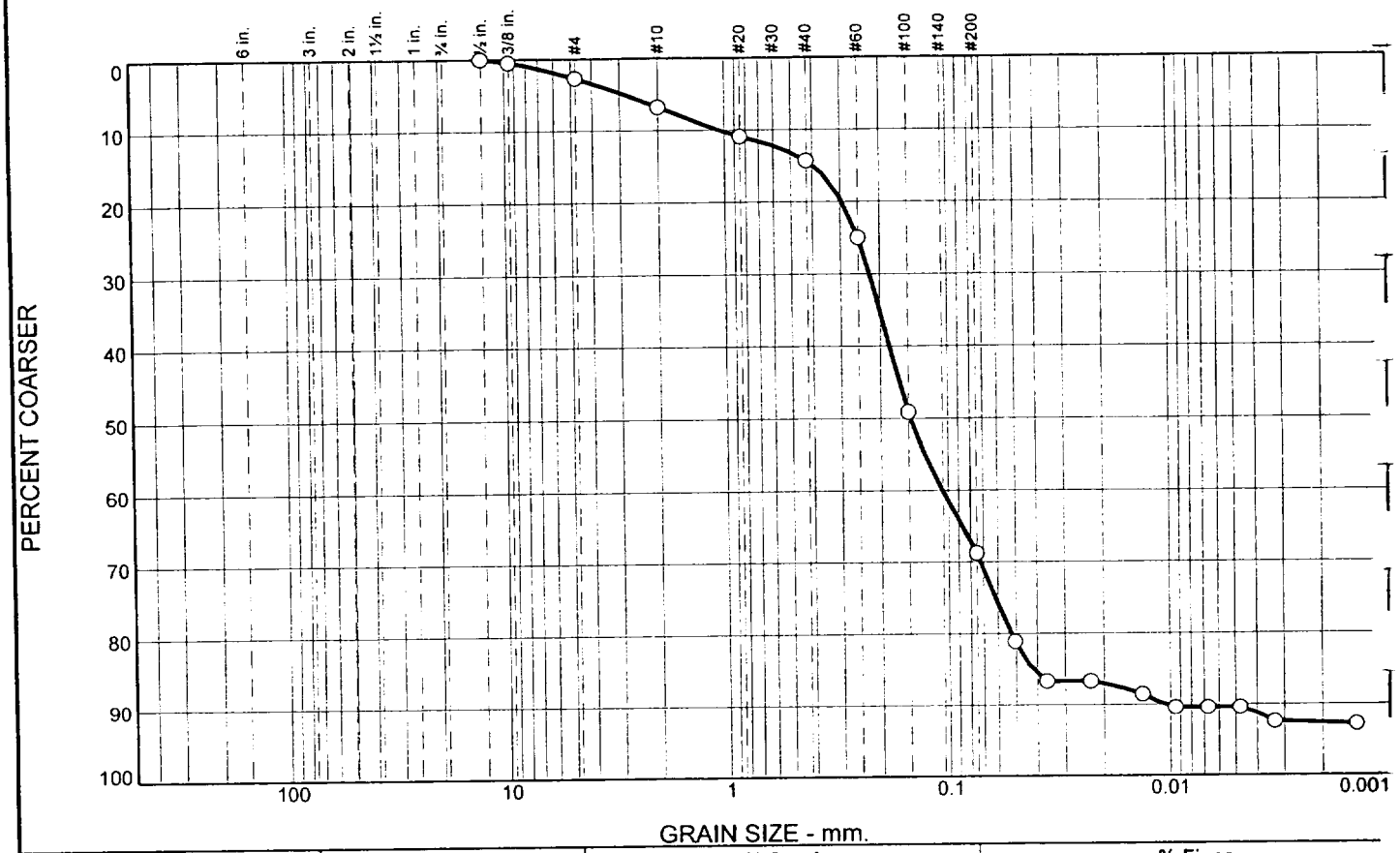
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.5	38.0	33.1	0.0136	38.0	10.1	0.0430	34.1
2.00	20.5	31.0	26.1	0.0136	31.0	11.2	0.0321	26.9
5.00	20.5	23.0	18.1	0.0136	23.0	12.5	0.0215	18.6
15.00	20.5	15.0	10.1	0.0136	15.0	13.8	0.0130	10.4
30.00	20.5	13.0	8.1	0.0136	13.0	14.2	0.0093	8.3
60.00	20.5	11.5	6.6	0.0136	11.5	14.4	0.0066	6.8
120.00	21.0	11.0	6.2	0.0135	11.0	14.5	0.0047	6.4
250.00	21.0	10.0	5.2	0.0135	10.0	14.7	0.0033	5.3
1440.00	20.0	10.0	5.0	0.0136	10.0	14.7	0.0014	5.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	31.3	13.2	44.5	3.9	6.7	3.4	14.0	36.3	5.2	41.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0125	0.0177	0.0231	0.0364	1.5092	9.0802	24.7937	27.4979	30.5948	34.1206

Fineness Modulus	C_u	C_c
3.81	726.14	0.01

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.7	4.0	7.6	54.4	24.0	7.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.5		
#4	97.3		
#10	93.3		
#20	89.1		
#40	85.7		
#60	75.1		
#100	50.9		
#200	31.3		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.3948 D_{60}= 0.1818 D_{50}= 0.1467
D_{30}= 0.0719 D_{15}= 0.0419 D_{10}= 0.0104
C_u= 17.46 C_c= 2.73

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 16.6%

Location: No. 7-885/1F-1, 28.0'-29.0'

Date: 9-20-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-885/1F-1, 28.0'-29.0'
Material Description: gray silty SAND (visual)
Date: 9-20-06
Testing Remarks: As Received Moisture Content: 16.6%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
931.20	228.22	0.00	.50	0.00	100.0
			.375	3.27	99.5
			#4	18.87	97.3
			#10	47.42	93.3
50.46	0.00	0.00	#20	2.23	89.1
			#40	4.09	85.7
			#60	9.85	75.1
			#100	22.91	50.9
			#200	33.55	31.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =93.3
Weight of hydrometer sample =50.46
Hygroscopic moisture correction:
Moist weight and tare = 49.20
Dry weight and tare = 49.07
Tare weight = 28.32
Hygroscopic moisture =0.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

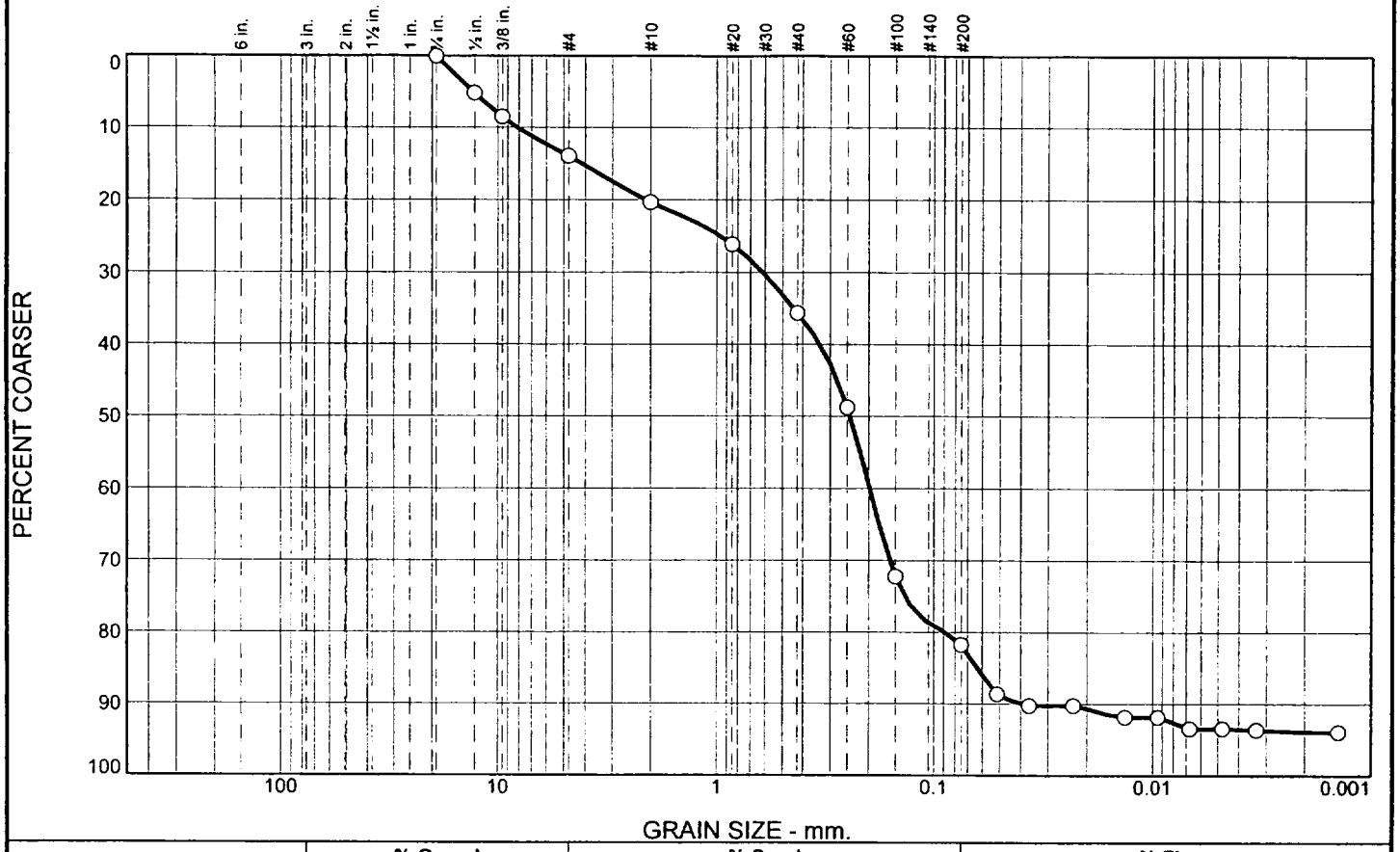
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	14.0	10.2	0.0135	14.0	14.0	0.0504	18.9
2.00	21.0	11.0	7.2	0.0135	11.0	14.5	0.0363	13.3
5.00	21.0	11.0	7.2	0.0135	11.0	14.5	0.0229	13.3
15.00	21.0	10.0	6.2	0.0135	10.0	14.7	0.0133	11.5
30.00	21.0	9.0	5.2	0.0135	9.0	14.8	0.0095	9.6
60.00	21.0	9.0	5.2	0.0135	9.0	14.8	0.0067	9.6
120.00	21.0	9.0	5.2	0.0135	9.0	14.8	0.0047	9.6
250.00	20.5	8.0	4.1	0.0136	8.0	15.0	0.0033	7.6
1440.00	19.5	8.0	3.9	0.0137	8.0	15.0	0.0014	7.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.7	2.7	4.0	7.6	54.4	66.0	24.0	7.3	31.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0104	0.0419	0.0524	0.0719	0.1467	0.1818	0.2927	0.3948	1.0465	2.8336

Fineness Modulus	C_u	C_c
0.99	17.46	2.73

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	13.9	6.4	15.3	46.2	12.0	6.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	94.8		
.375	91.5		
#4	86.1		
#10	79.7		
#20	73.9		
#40	64.4		
#60	51.3		
#100	27.8		
#200	18.2		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.1055 D_{60}= 0.3338 D_{50}= 0.2425
D_{30}= 0.1592 D_{15}= 0.0629 D_{10}= 0.0393
C_u= 8.50 C_c= 1.93

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 10.7%

Location: No. 7-855/1F-1, 51.0'-51.5' **Date:** 9-20-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-855/1F-1, 51.0'-51.5'
Material Description: gray silty SAND (visual)
Date: 9-20-06
Testing Remarks: As Received Moisture Content: 10.7%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
932.40	230.20	0.00	.75	0.00	100.0
			.50	36.37	94.8
			.375	59.54	91.5
			#4	97.77	86.1
			#10	142.32	79.7
50.70	0.00	0.00	#20	3.69	73.9
			#40	9.75	64.4
			#60	18.09	51.3
			#100	33.02	27.8
			#200	39.10	18.2

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =79.7
Weight of hydrometer sample =50.70
Hygroscopic moisture correction:
Moist weight and tare = 52.69
Dry weight and tare = 52.56
Tare weight = 31.20
Hygroscopic moisture =0.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

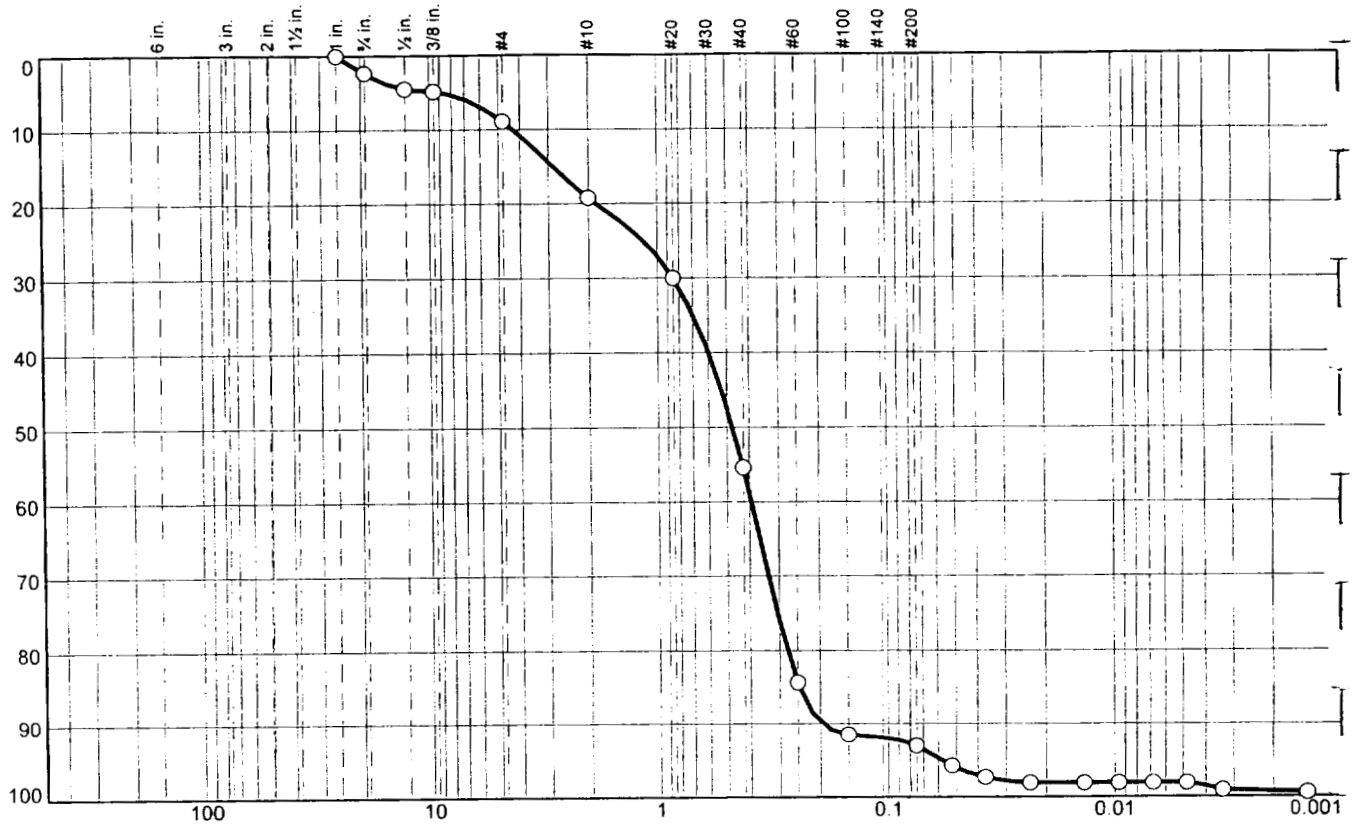
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	11.0	7.2	0.0135	11.0	14.5	0.0513	11.4
2.00	21.0	10.0	6.2	0.0135	10.0	14.7	0.0365	9.8
5.00	21.0	10.0	6.2	0.0135	10.0	14.7	0.0231	9.8
15.00	21.0	9.0	5.2	0.0135	9.0	14.8	0.0134	8.2
30.00	21.0	9.0	5.2	0.0135	9.0	14.8	0.0095	8.2
60.00	21.0	8.0	4.2	0.0135	8.0	15.0	0.0067	6.6
120.00	21.0	8.0	4.2	0.0135	8.0	15.0	0.0048	6.6
250.00	20.5	8.0	4.1	0.0136	8.0	15.0	0.0033	6.4
1440.00	19.5	8.0	3.9	0.0137	8.0	15.0	0.0014	6.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	13.9	13.9	6.4	15.3	46.2	67.9	12.0	6.2	18.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0393	0.0629	0.0883	0.1592	0.2425	0.3338	2.0858	4.1055	8.0914	12.8857

Fineness Modulus	C_u	C_c
2.10	8.50	1.93

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.3	6.6	10.3	36.2	37.6	6.3	0.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	97.7		
.50	95.5		
.375	95.2		
#4	91.1		
#10	80.8		
#20	70.0		
#40	44.6		
#60	15.7		
#100	8.5		
#200	7.0		

* (no specification provided)

Material Description

gray poorly graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.8425 D_{60}= 0.5970 D_{50}= 0.4712
D_{30}= 0.3315 D_{15}= 0.2449 D_{10}= 0.1960
C_u= 3.05 C_c= 0.94

Classification

USCS= SP-SM AASHTO=

Remarks

As Received Moisture Content: 13.0%

Location: No. 7-855/1F-2, 56.5'-57.0'

Date: 9-20-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-855/1F-2, 56.5'-57.0'
Material Description: gray poorly graded SAND with silt
Date: 9-20-06
USCS Classification: SP-SM
Testing Remarks: As Received Moisture Content: 13.0%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
933.00	232.98	0.00	1.0	0.00	100.0
			.75	16.33	97.7
			.50	31.51	95.5
			.375	33.79	95.2
			#4	62.21	91.1
			#10	134.23	80.8
50.69	0.00	0.00	#20	6.79	70.0
			#40	22.69	44.6
			#60	40.82	15.7
			#100	45.37	8.5
			#200	46.31	7.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =80.8
Weight of hydrometer sample =50.69
Hygroscopic moisture correction:
Moist weight and tare = 53.31
Dry weight and tare = 53.21
Tare weight = 28.55
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

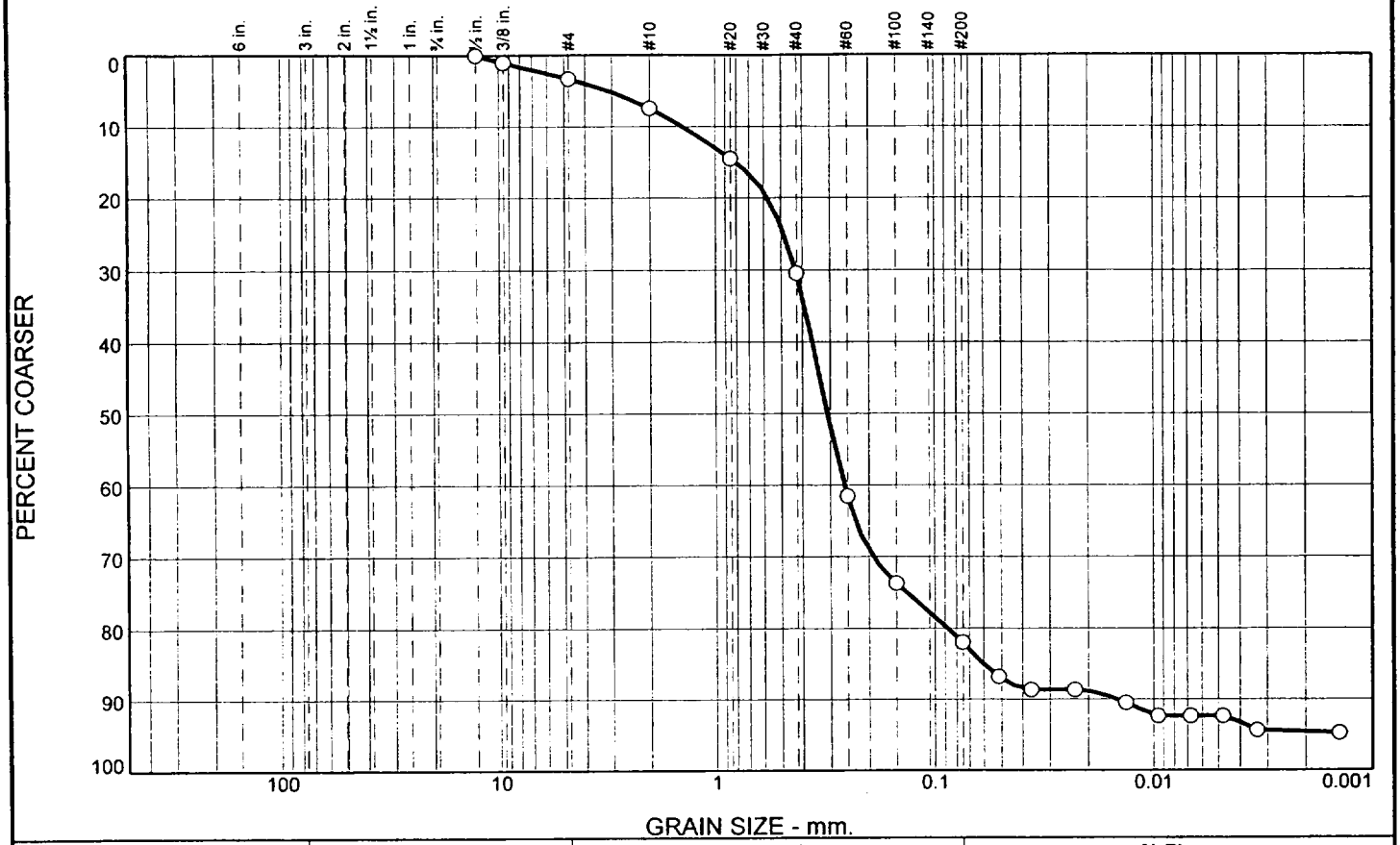
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	8.0	2.7	0.0135	8.0	15.0	0.0522	4.3
2.00	21.0	7.0	1.7	0.0135	7.0	15.1	0.0371	2.7
5.00	21.0	6.5	1.2	0.0135	6.5	15.2	0.0235	1.9
15.00	21.0	6.5	1.2	0.0135	6.5	15.2	0.0136	1.9
30.00	21.0	6.5	1.2	0.0135	6.5	15.2	0.0096	1.9
60.00	21.0	6.5	1.2	0.0135	6.5	15.2	0.0068	1.9
120.00	21.0	6.5	1.2	0.0135	6.5	15.2	0.0048	1.9
250.00	20.5	6.0	0.6	0.0136	6.0	15.3	0.0034	0.9
1440.00	19.5	6.0	0.4	0.0137	6.0	15.3	0.0014	0.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.3	6.6	8.9	10.3	36.2	37.6	84.1	6.3	0.7	7.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1960	0.2449	0.2761	0.3315	0.4712	0.5970	1.8448	2.8425	4.2767	8.7437

Fineness Modulus	C_u	C_c
2.65	3.05	0.94

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.3	4.1	23.0	51.6	12.6	5.4

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.0		
#4	96.7		
#10	92.6		
#20	85.5		
#40	69.6		
#60	38.5		
#100	26.3		
#200	18.0		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.8032 D_{60}= 0.3595 D_{50}= 0.3072
D_{30}= 0.1915 D_{15}= 0.0600 D_{10}= 0.0146
C_u= 24.66 C_c= 6.99

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 12.4%

Location: No. 7-855/1F-3, 58.0'-58.5'

Date: 9-20-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-855/1F-3, 58.0'-58.5'
Material Description: gray silty SAND (visual)
Date: 9-20-06
Testing Remarks: As Received Moisture Content: 12.4%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
925.00	235.13	0.00	.50	0.00	100.0
			.375	7.03	99.0
			#4	22.76	96.7
			#10	51.22	92.6
50.54	0.00	0.00	#20	3.84	85.5
			#40	12.56	69.6
			#60	29.54	38.5
			#100	36.16	26.3
			#200	40.70	18.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =92.6
Weight of hydrometer sample =50.54
Hygroscopic moisture correction:
Moist weight and tare = 48.75
Dry weight and tare = 48.65
Tare weight = 28.24
Hygroscopic moisture =0.5%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

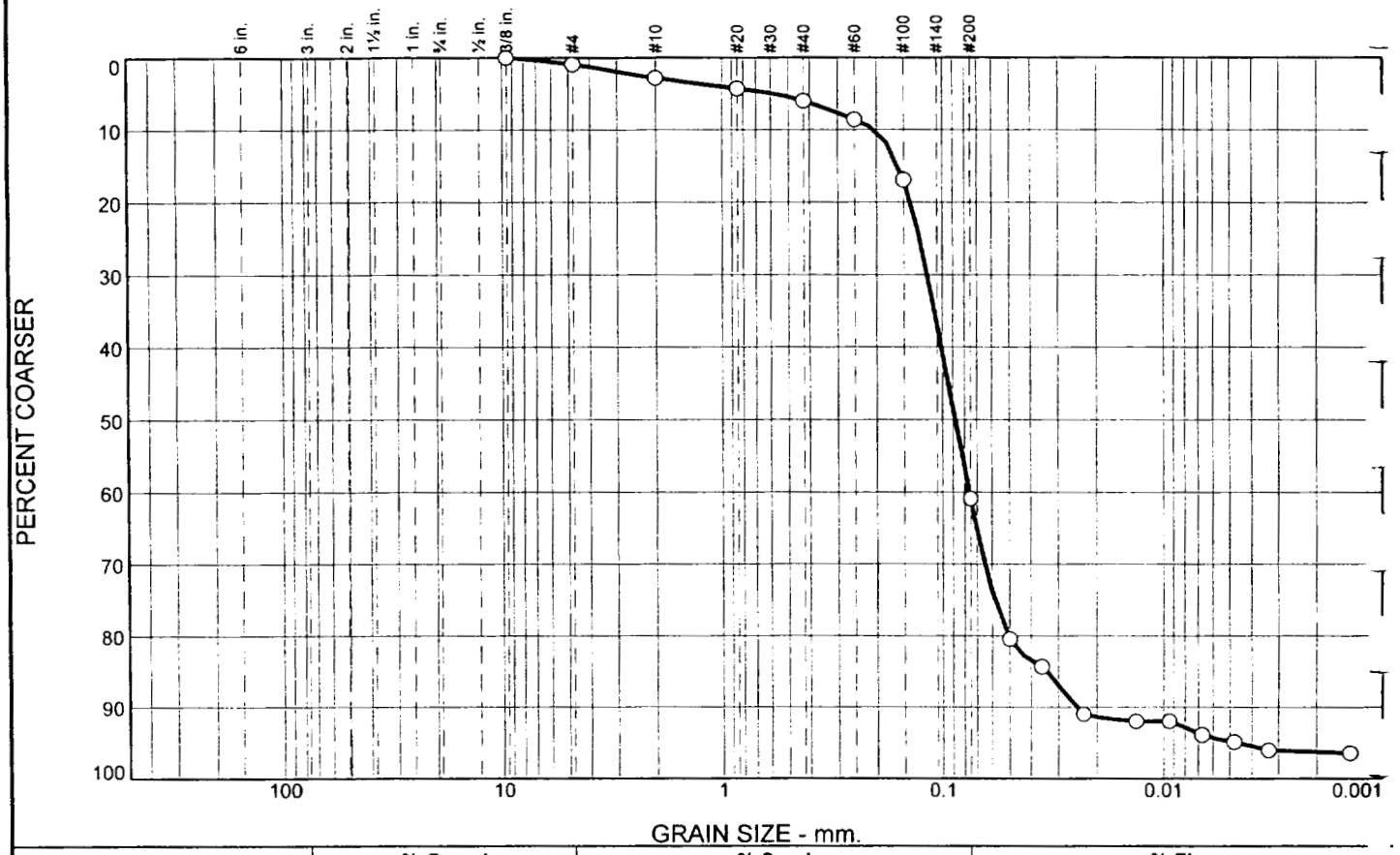
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	11.0	7.2	0.0135	11.0	14.5	0.0513	13.2
2.00	21.0	10.0	6.2	0.0135	10.0	14.7	0.0365	11.4
5.00	21.0	10.0	6.2	0.0135	10.0	14.7	0.0231	11.4
15.00	21.0	9.0	5.2	0.0135	9.0	14.8	0.0134	9.5
30.00	21.0	8.0	4.2	0.0135	8.0	15.0	0.0095	7.7
60.00	21.0	8.0	4.2	0.0135	8.0	15.0	0.0067	7.7
120.00	21.0	8.0	4.2	0.0135	8.0	15.0	0.0048	7.7
250.00	20.5	7.0	3.1	0.0136	7.0	15.1	0.0033	5.6
1440.00	19.5	7.0	2.9	0.0137	7.0	15.1	0.0014	5.3

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	3.3	3.3	4.1	23.0	51.6	78.7	12.6	5.4	18.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0146	0.0600	0.0875	0.1915	0.3072	0.3595	0.5722	0.8032	1.4078	3.1077

Fineness Modulus	C_u	C_c
1.66	24.66	6.99

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	1.9	3.2	54.9	35.4	3.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.375	100.0		
#4	99.1		
#10	97.2		
#20	95.7		
#40	94.0		
#60	91.4		
#100	83.1		
#200	39.1		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1581 D_{60}= 0.1010 D_{50}= 0.0878
D_{30}= 0.0645 D_{15}= 0.0336 D_{10}= 0.0248
C_u= 4.07 C_c= 1.66

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 10.9%

Location: No. 7-855/1F-4, 59.5'-60.0' **Date:** 9-20-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-855/1F-4, 59.5'-60.0'
Material Description: gray silty SAND (visual)
Date: 9-20-06
Testing Remarks: As Received Moisture Content: 10.9%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
761.50	228.16	0.00	.375	0.00	100.0
			#4	4.85	99.1
			#10	14.93	97.2
50.85	0.00	0.00	#20	0.76	95.7
			#40	1.67	94.0
			#60	3.03	91.4
			#100	7.36	83.1
			#200	30.37	39.1

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =97.2
Weight of hydrometer sample =50.85
Hygroscopic moisture correction:
Moist weight and tare = 49.01
Dry weight and tare = 48.89
Tare weight = 27.97
Hygroscopic moisture =0.6%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 **x Rm**

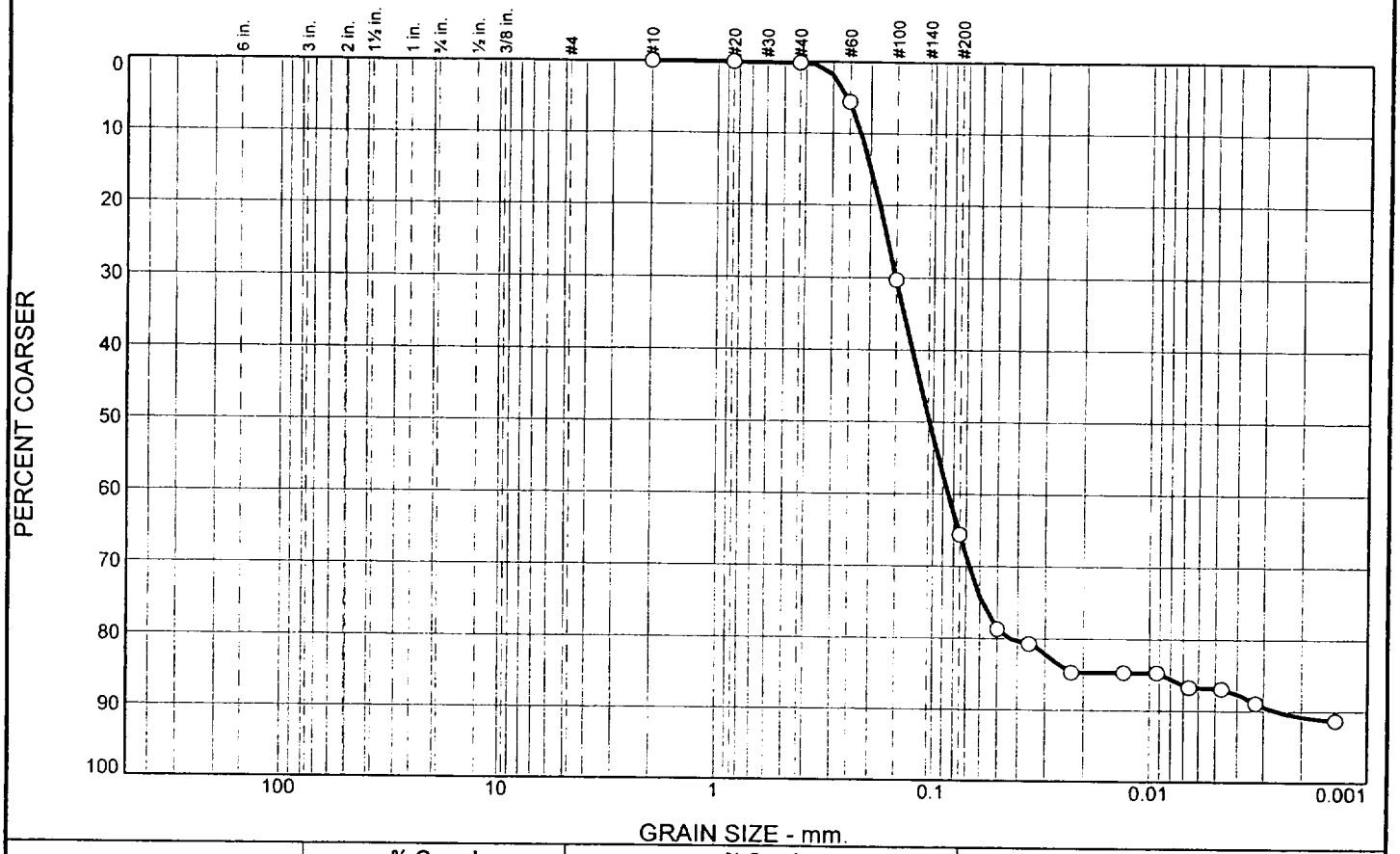
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	16.0	10.2	0.0135	16.0	13.7	0.0498	19.6
2.00	21.0	14.0	8.2	0.0135	14.0	14.0	0.0357	15.7
5.00	21.0	10.5	4.7	0.0135	10.5	14.6	0.0230	9.0
15.00	21.0	10.0	4.2	0.0135	10.0	14.7	0.0133	8.0
30.00	21.0	10.0	4.2	0.0135	10.0	14.7	0.0094	8.0
60.00	21.0	9.0	3.2	0.0135	9.0	14.8	0.0067	6.1
120.00	21.0	8.5	2.7	0.0135	8.5	14.9	0.0047	5.1
250.00	20.5	8.0	2.1	0.0136	8.0	15.0	0.0033	4.0
1440.00	19.5	8.0	1.9	0.0137	8.0	15.0	0.0014	3.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.9	0.9	1.9	3.2	54.9	60.0	35.4	3.7	39.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0248	0.0336	0.0507	0.0645	0.0878	0.1010	0.1396	0.1581	0.2031	0.5812

Fineness Modulus	C_u	C_c
0.37	4.07	1.66

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	65.4	25.3	9.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.9		
#60	94.4		
#100	69.7		
#200	34.5		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.1985 D_{60}= 0.1258 D_{50}= 0.1041
D_{30}= 0.0674 D_{15}= 0.0087 D_{10}= 0.0026
C_u= 48.18 C_c= 13.81

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 12.2%

Location: No. 7-805/9F-1, 86.0'-87.0'

Date: 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/200(

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-805/9F-1, 86.0'-87.0'
Material Description: brown silty SAND (visual)
Date: 9-21-06
Testing Remarks: As Received Moisture Content: 12.2%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
891.90	226.98	0.00	#10	0.00	100.0
50.73	0.00	0.00	#20	0.01	100.0
			#40	0.07	99.9
			#60	2.82	94.4
			#100	15.35	69.7
			#200	33.25	34.5

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =50.73
Hygroscopic moisture correction:
Moist weight and tare = 48.97
Dry weight and tare = 48.72
Tare weight = 28.47
Hygroscopic moisture =1.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

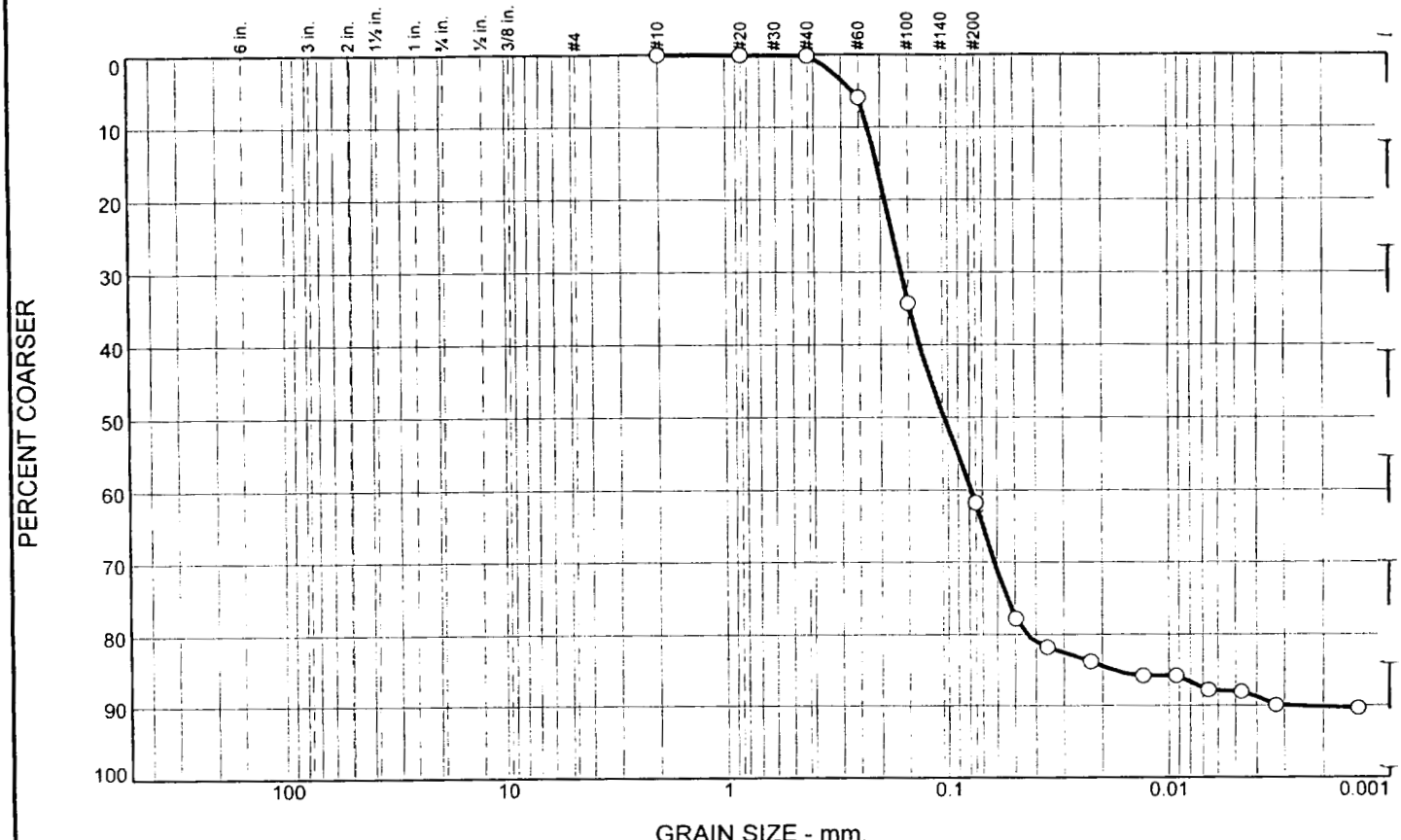
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	16.0	10.7	0.0135	16.0	13.7	0.0498	21.3
2.00	21.0	15.0	9.7	0.0135	15.0	13.8	0.0354	19.3
5.00	21.0	13.0	7.7	0.0135	13.0	14.2	0.0227	15.3
15.00	21.0	13.0	7.7	0.0135	13.0	14.2	0.0131	15.3
30.00	21.0	13.0	7.7	0.0135	13.0	14.2	0.0093	15.3
60.00	21.0	12.0	6.7	0.0135	12.0	14.3	0.0066	13.3
120.00	20.5	12.0	6.6	0.0136	12.0	14.3	0.0047	13.1
250.00	20.5	11.0	5.6	0.0136	11.0	14.5	0.0033	11.1
1440.00	19.5	10.0	4.4	0.0137	10.0	14.7	0.0014	8.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	65.4	65.5	25.3	9.2	34.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0026	0.0087	0.0435	0.0674	0.1041	0.1258	0.1803	0.1985	0.2212	0.2549

Fineness Modulus	C_u	C_c
0.32	48.18	13.81

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	61.6	28.5	9.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.9		
#60	94.1		
#100	65.7		
#200	38.3		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.2073 D_{60}= 0.1336 D_{50}= 0.1036
D_{30}= 0.0617 D_{15}= 0.0174 D_{10}= 0.0028
C_u= 48.14 C_c= 10.27

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 12.5%

Location: No. 7-805/9F-2, 87.0'-88.0'

Date: 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-805/9F-2, 87.0'-88.0'
Material Description: brown silty SAND (visual)
Date: 9-21-06
Testing Remarks: As Received Moisture Content: 12.5%
Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
910.80	228.19	0.00	#10	0.00	100.0
50.69	0.00	0.00	#20	0.01	100.0
			#40	0.07	99.9
			#60	3.00	94.1
			#100	17.38	65.7
			#200	31.28	38.3

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =50.69
Hygroscopic moisture correction:
Moist weight and tare = 51.85
Dry weight and tare = 51.68
Tare weight = 31.67
Hygroscopic moisture =0.8%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

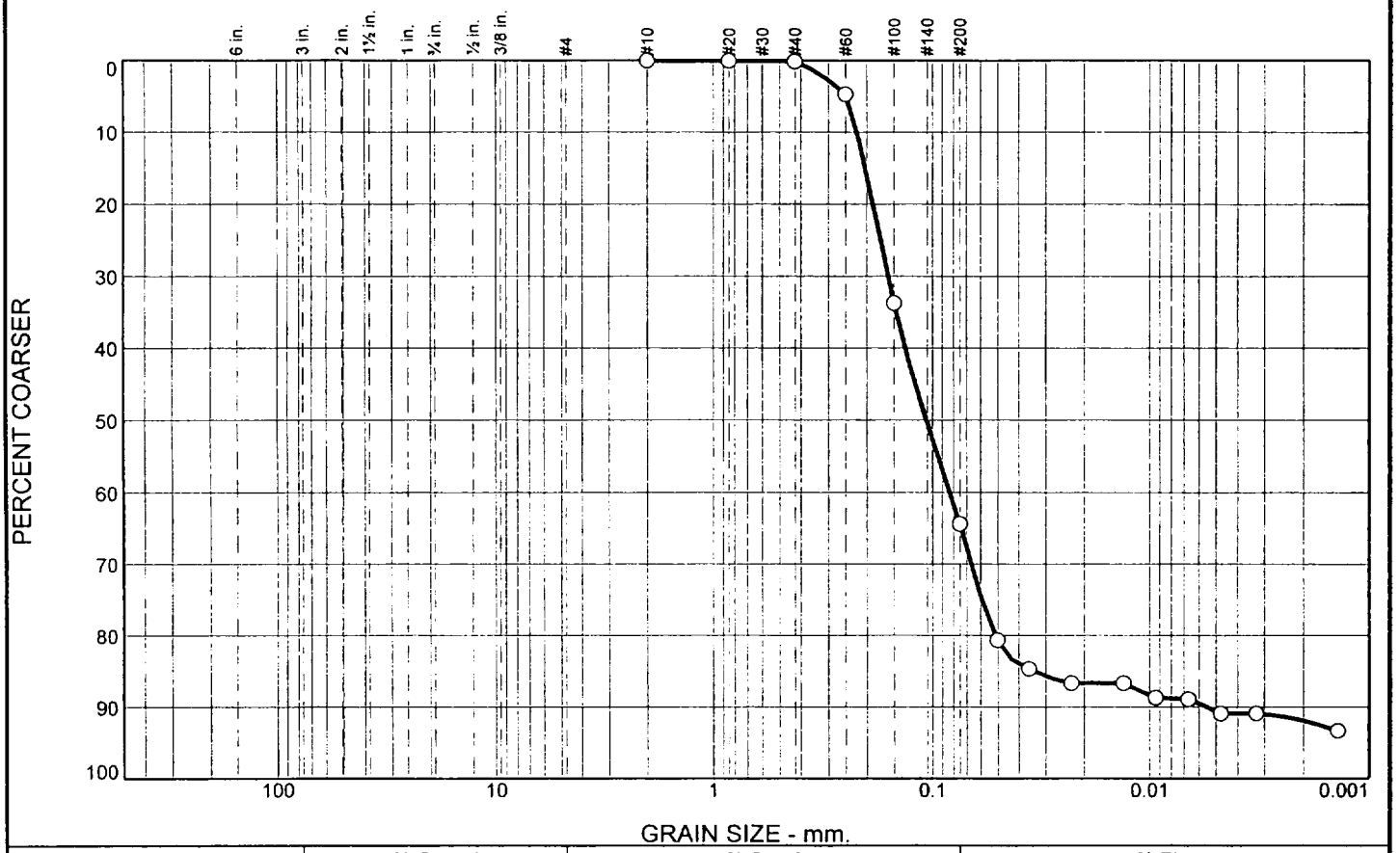
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	17.0	11.2	0.0135	17.0	13.5	0.0495	22.2
2.00	21.0	15.0	9.2	0.0135	15.0	13.8	0.0354	18.3
5.00	21.0	14.0	8.2	0.0135	14.0	14.0	0.0226	16.3
15.00	21.0	13.0	7.2	0.0135	13.0	14.2	0.0131	14.3
30.00	21.0	13.0	7.2	0.0135	13.0	14.2	0.0093	14.3
60.00	21.0	12.0	6.2	0.0135	12.0	14.3	0.0066	12.3
120.00	20.5	12.0	6.1	0.0136	12.0	14.3	0.0047	12.1
250.00	20.5	11.0	5.1	0.0136	11.0	14.5	0.0033	10.1
1440.00	19.5	11.0	4.9	0.0137	11.0	14.5	0.0014	9.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	61.6	61.7	28.5	9.8	38.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0028	0.0174	0.0441	0.0617	0.1036	0.1336	0.1906	0.2073	0.2276	0.2658

Fineness Modulus	C_u	C_c
0.38	48.14	10.27

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	64.3	27.5	8.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.9		
#60	95.3		
#100	66.3		
#200	35.6		

* (no specification provided)

Material Description

brown silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.2029 D_{60}= 0.1334 D_{50}= 0.1066
D_{30}= 0.0662 D_{15}= 0.0337 D_{10}= 0.0055
C_u= 24.28 C_c= 5.99

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 12.7%

Location: No. 7-805/9F-3, 88.0'-89.0' **Date:** 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/200

Client: Battelle

Project: Monitoring Well Installations

Project Number: 138455

Location: No. 7-805/9F-3, 88.0'-89.0'

Material Description: brown silty SAND (visual)

Date: 9-21-06

Testing Remarks: As Received Moisture Content: 12.7%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
910.00	238.44	0.00	#10	0.00	100.0
50.45	0.00	0.00	#20	0.01	100.0
			#40	0.07	99.9
			#60	2.38	95.3
			#100	17.01	66.3
			#200	32.47	35.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =50.45
Hygroscopic moisture correction:
Moist weight and tare = 49.27
Dry weight and tare = 49.10
Tare weight = 28.82
Hygroscopic moisture =0.8%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

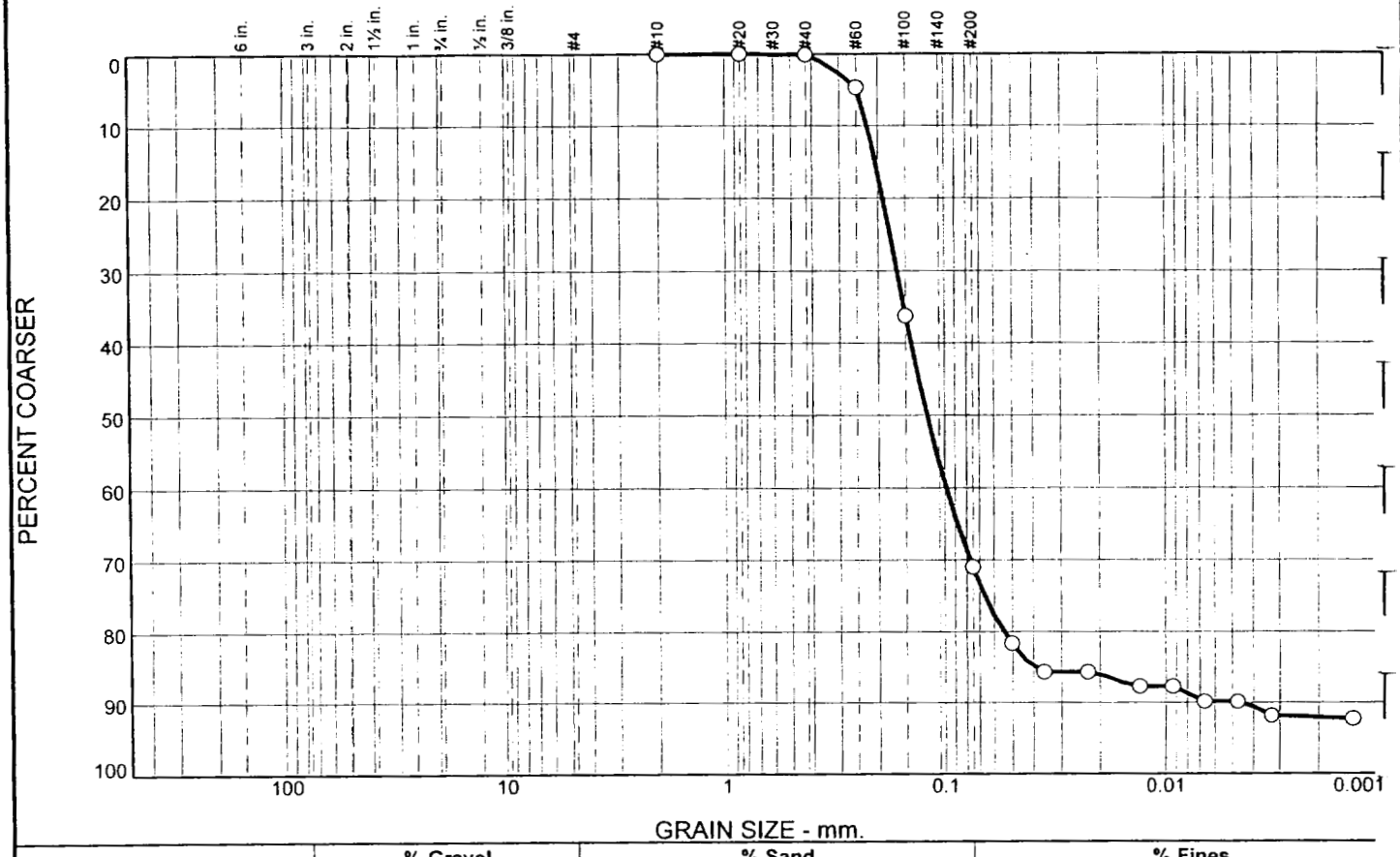
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	15.0	9.7	0.0135	15.0	13.8	0.0501	19.3
2.00	21.0	13.0	7.7	0.0135	13.0	14.2	0.0359	15.3
5.00	21.0	12.0	6.7	0.0135	12.0	14.3	0.0228	13.3
15.00	21.0	12.0	6.7	0.0135	12.0	14.3	0.0132	13.3
30.00	21.0	11.0	5.7	0.0135	11.0	14.5	0.0094	11.3
60.00	20.5	11.0	5.6	0.0136	11.0	14.5	0.0067	11.1
120.00	20.5	10.0	4.6	0.0136	10.0	14.7	0.0047	9.1
250.00	20.5	10.0	4.6	0.0136	10.0	14.7	0.0033	9.1
1440.00	19.5	9.0	3.4	0.0137	9.0	14.8	0.0014	6.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	64.3	64.4	27.5	8.1	35.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0055	0.0337	0.0514	0.0662	0.1066	0.1334	0.1870	0.2029	0.2219	0.2481

Fineness Modulus	C_u	C_c
0.37	24.28	5.99

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.0	0.1	70.8	21.2	7.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#10	100.0		
#20	100.0		
#40	99.9		
#60	95.3		
#100	63.8		
#200	29.1		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.2045 D_{60}= 0.1416 D_{50}= 0.1198
D_{30}= 0.0771 D_{15}= 0.0393 D_{10}= 0.0045
C_u= 31.75 C_c= 9.41

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 12.5%

Location: No. 7-805/9F-4, 89.0'-90.0' **Date:** 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle

Project: Monitoring Well Installations

Project Number: 138455

Location: No. 7-805/9F-4, 89.0'-90.0'

Material Description: gray silty SAND (visual)

Date: 9-21-06

Testing Remarks: As Received Moisture Content: 12.5%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
925.60	235.15	0.00	#10	0.00	100.0
50.74	0.00	0.00	#20	0.01	100.0
			#40	0.03	99.9
			#60	2.36	95.3
			#100	18.37	63.8
			#200	36.00	29.1

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =100.0
Weight of hydrometer sample =50.74
Hygroscopic moisture correction:
Moist weight and tare = 49.33
Dry weight and tare = 48.98
Tare weight = 28.33
Hygroscopic moisture =1.7%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

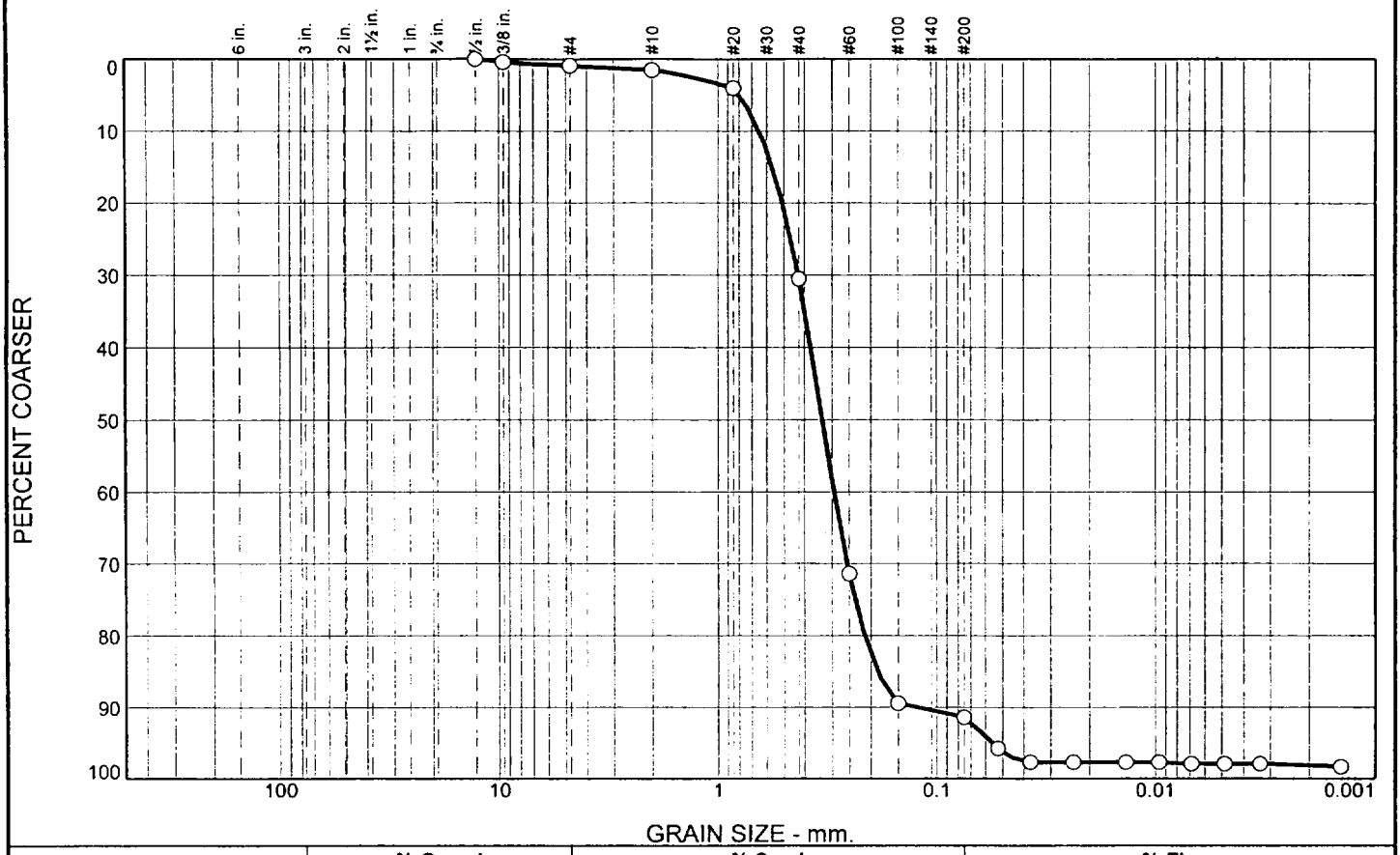
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	15.0	9.2	0.0135	15.0	13.8	0.0501	18.4
2.00	21.0	13.0	7.2	0.0135	13.0	14.2	0.0359	14.4
5.00	21.0	13.0	7.2	0.0135	13.0	14.2	0.0227	14.4
15.00	21.0	12.0	6.2	0.0135	12.0	14.3	0.0132	12.4
30.00	21.0	12.0	6.2	0.0135	12.0	14.3	0.0093	12.4
60.00	20.5	11.0	5.1	0.0136	11.0	14.5	0.0067	10.2
120.00	20.5	11.0	5.1	0.0136	11.0	14.5	0.0047	10.2
250.00	20.5	10.0	4.1	0.0136	10.0	14.7	0.0033	8.1
1440.00	19.5	10.0	3.9	0.0137	10.0	14.7	0.0014	7.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.0	0.0	0.0	0.1	70.8	70.9	21.2	7.9	29.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0045	0.0393	0.0543	0.0771	0.1198	0.1416	0.1894	0.2045	0.2227	0.2477

Fineness Modulus	C_u	C_c
0.39	31.75	9.41

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	0.6	29.0	60.9	6.7	1.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.6		
#4	99.1		
#10	98.5		
#20	96.0		
#40	69.5		
#60	28.6		
#100	10.6		
#200	8.6		

* (no specification provided)

Material Description

brown poorly graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.5638 D_{60}= 0.3743 D_{50}= 0.3311
D_{30}= 0.2554 D_{15}= 0.1856 D_{10}= 0.1211
C_u= 3.09 C_c= 1.44

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 15.8%

Location: No. 7-805/10F-1, 90.0'-91.0' **Date:** 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-805/10F-1, 90.0'-91.0'
Material Description: brown poorly graded SAND with silt
Date: 9-21-06
Testing Remarks: As Received Moisture Content: 15.8%
Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
858.40	230.14	0.00	.50	0.00	100.0
			.375	2.50	99.6
			#4	5.57	99.1
			#10	9.46	98.5
50.21	0.00	0.00	#20	1.25	96.0
			#40	14.77	69.5
			#60	35.62	28.6
			#100	44.80	10.6
			#200	45.81	8.6

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =98.5
Weight of hydrometer sample =50.21
Hygroscopic moisture correction:
Moist weight and tare = 49.00
Dry weight and tare = 48.95
Tare weight = 28.22
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

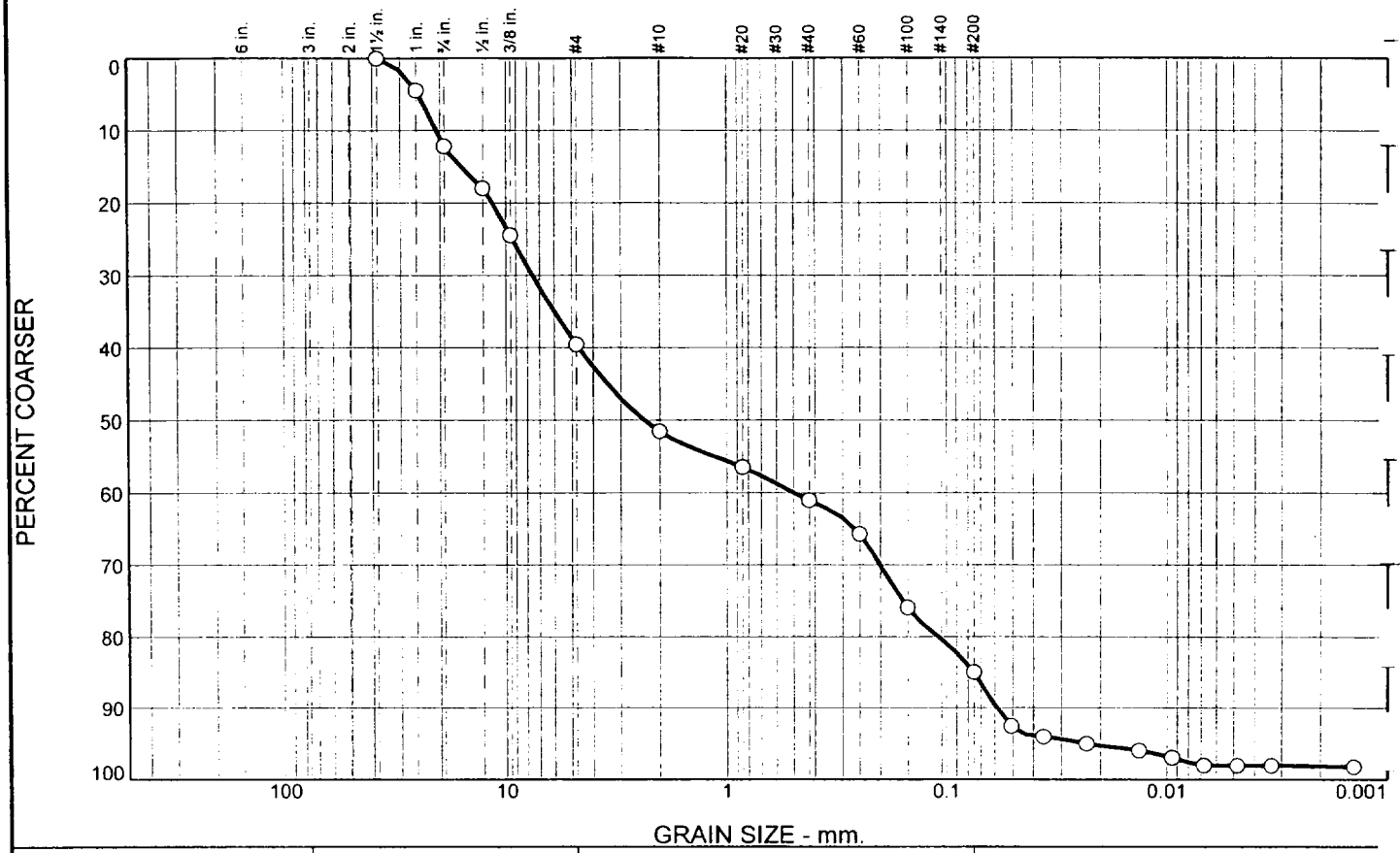
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	7.0	2.2	0.0135	7.0	15.1	0.0525	4.3
2.00	21.0	6.0	1.2	0.0135	6.0	15.3	0.0373	2.3
5.00	21.0	6.0	1.2	0.0135	6.0	15.3	0.0236	2.3
15.00	21.0	6.0	1.2	0.0135	6.0	15.3	0.0136	2.3
30.00	21.0	6.0	1.2	0.0135	6.0	15.3	0.0096	2.3
60.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0069	2.1
120.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0048	2.1
250.00	20.5	6.0	1.1	0.0136	6.0	15.3	0.0034	2.1
1440.00	19.5	6.0	0.9	0.0137	6.0	15.3	0.0014	1.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.9	0.9	0.6	29.0	60.9	90.5	6.7	1.9	8.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1211	0.1856	0.2128	0.2554	0.3311	0.3743	0.5062	0.5638	0.6477	0.7975

Fineness Modulus	C_u	C_c
1.65	3.09	1.44

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.1	27.4	12.0	9.5	23.9	13.2	1.9

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	95.5		
.75	87.9		
.50	82.1		
.375	75.6		
#4	60.5		
#10	48.5		
#20	43.6		
#40	39.0		
#60	34.3		
#100	24.1		
#200	15.1		

* (no specification provided)

Material Description

brown silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 15.9560 D_{60}= 4.6265 D_{50}= 2.3336
D_{30}= 0.2003 D_{15}= 0.0746 D_{10}= 0.0588
C_u= 78.64 C_c= 0.15

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 8.6%

Location: No. 7-805/10F-2, 93.0'-94.0' **Date:** 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/22/2006

Client: Battelle

Project: Monitoring Well Installations

Project Number: 138455

Location: No. 7-805/10F-2, 93.0'-94.0'

Material Description: brown silty SAND with gravel (visual)

Date: 9-21-06

Testing Remarks: As Received Moisture Content: 8.6%

Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
947.40	233.30	0.00	1.5	0.00	100.0
			1.0	31.83	95.5
			.75	86.71	87.9
			.50	127.93	82.1
			.375	174.24	75.6
			#4	282.18	60.5
			#10	367.66	48.5
50.22	0.00	0.00	#20	5.11	43.6
			#40	9.84	39.0
			#60	14.69	34.3
			#100	25.30	24.1
			#200	34.59	15.1

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =48.5
Weight of hydrometer sample =50.22
Hygroscopic moisture correction:
Moist weight and tare = 55.29
Dry weight and tare = 55.22
Tare weight = 30.42
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

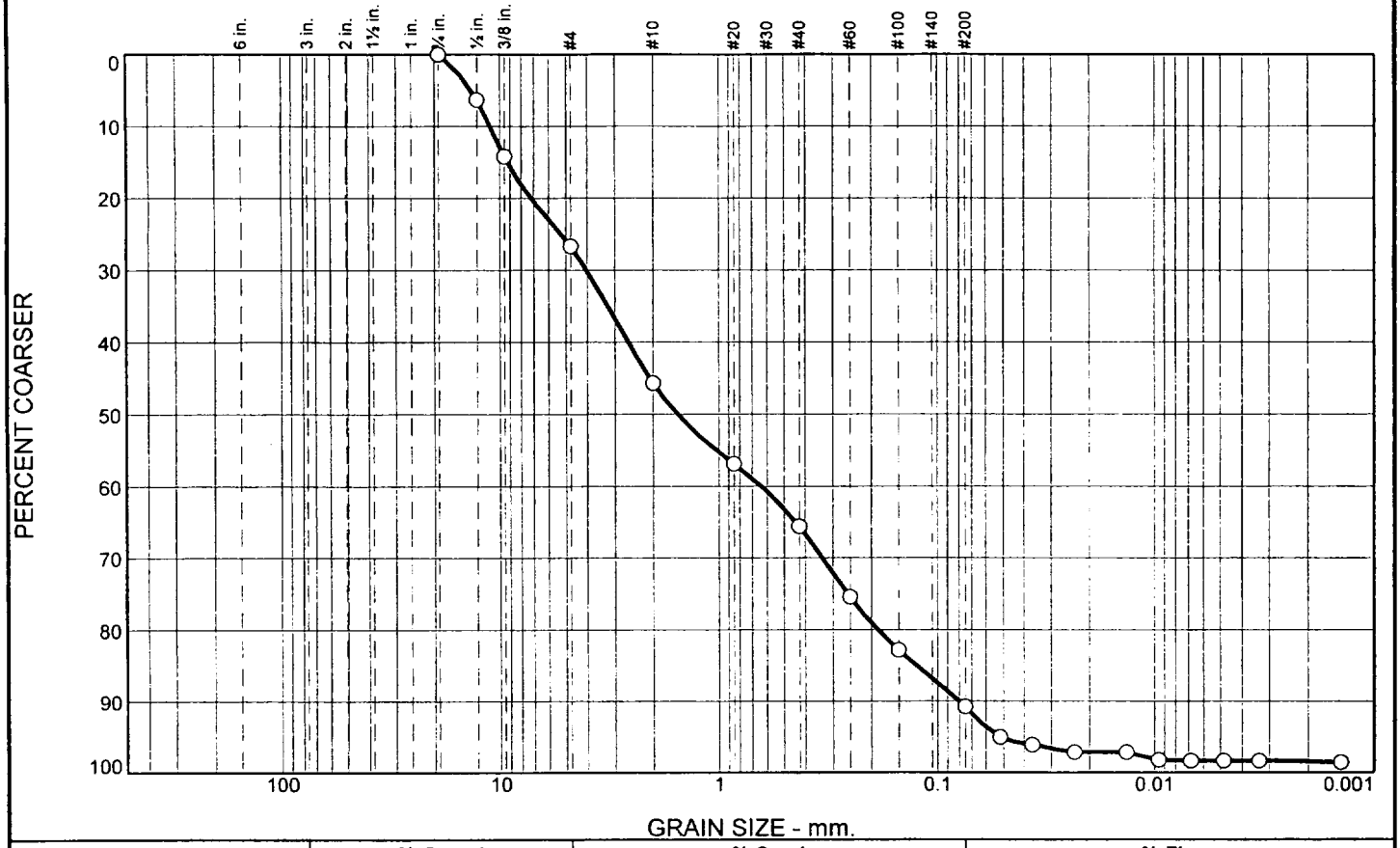
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	13.5	7.7	0.0135	13.5	14.1	0.0506	7.4
2.00	21.0	12.0	6.2	0.0135	12.0	14.3	0.0361	6.0
5.00	21.0	11.0	5.2	0.0135	11.0	14.5	0.0229	5.0
15.00	21.0	10.0	4.2	0.0135	10.0	14.7	0.0133	4.0
30.00	21.0	9.0	3.2	0.0135	9.0	14.8	0.0095	3.1
60.00	20.5	8.0	2.1	0.0136	8.0	15.0	0.0068	2.0
120.00	20.5	8.0	2.1	0.0136	8.0	15.0	0.0048	2.0
250.00	20.5	8.0	2.1	0.0136	8.0	15.0	0.0033	2.0
1440.00	19.5	8.0	1.9	0.0137	8.0	15.0	0.0014	1.8

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	12.1	27.4	39.5	12.0	9.5	23.9	45.4	13.2	1.9	15.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0588	0.0746	0.1089	0.2003	2.3336	4.6265	11.4253	15.9560	20.7350	24.8245

Fineness Modulus	C_u	C_c
3.79	78.64	0.15

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	26.7	18.9	19.9	25.3	7.6	1.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	93.7		
.375	85.9		
#4	73.3		
#10	54.4		
#20	43.2		
#40	34.5		
#60	24.6		
#100	17.2		
#200	9.2		

* (no specification provided)

Material Description

brown poorly graded SAND with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 9.2029 D_{60}= 2.6014 D_{50}= 1.5351
D_{30}= 0.3332 D_{15}= 0.1241 D_{10}= 0.0797
C_u= 32.63 C_c= 0.54

Classification

USCS= SP-SM AASHTO=

Remarks

As Received Moisture Content: 7.8%

Location: No. 7-805/10F-3, 94.0'-95.0' **Date:** 9-21-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/21/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 7-805/10F-3, 94.0'-95.0'
Material Description: brown poorly graded SAND with silt and gravel
Date: 9-21-06
USCS Classification: SP-SM
Testing Remarks: As Received Moisture Content: 7.8%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1020.90	228.23	0.00	.75	0.00	100.0
			.50	49.77	93.7
			.375	112.06	85.9
			#4	211.37	73.3
			#10	361.54	54.4
50.90	0.00	0.00	#20	10.51	43.2
			#40	18.65	34.5
			#60	27.90	24.6
			#100	34.82	17.2
			#200	42.25	9.2

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =54.4
Weight of hydrometer sample =50.90
Hygroscopic moisture correction:
Moist weight and tare = 52.07
Dry weight and tare = 51.98
Tare weight = 30.01
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.5
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

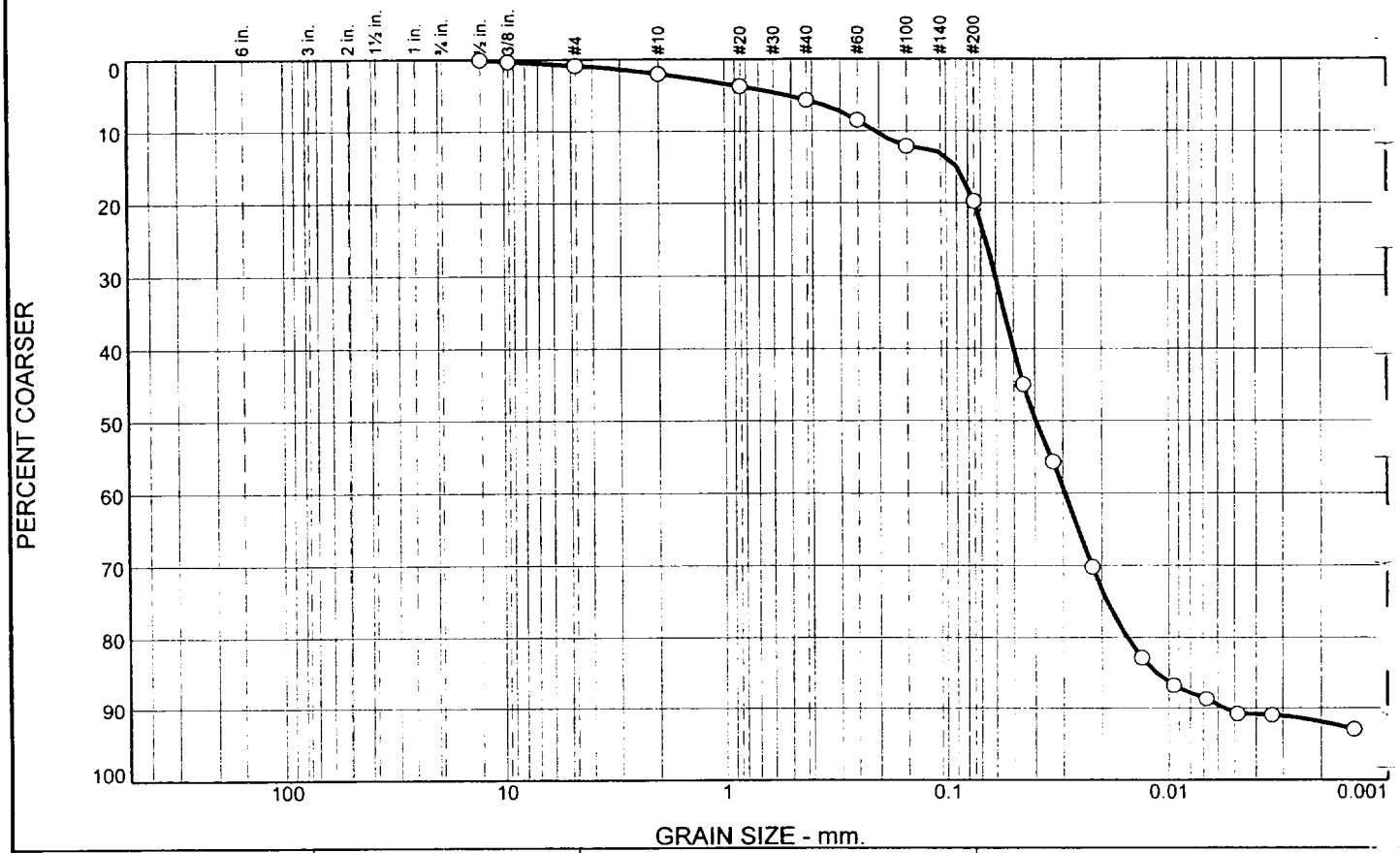
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	21.0	10.0	4.7	0.0135	10.0	14.7	0.0516	5.0
2.00	21.0	9.0	3.7	0.0135	9.0	14.8	0.0367	3.9
5.00	21.0	8.0	2.7	0.0135	8.0	15.0	0.0233	2.9
15.00	21.0	8.0	2.7	0.0135	8.0	15.0	0.0135	2.9
30.00	21.0	7.0	1.7	0.0135	7.0	15.1	0.0096	1.8
60.00	20.5	7.0	1.6	0.0136	7.0	15.1	0.0068	1.7
120.00	20.5	7.0	1.6	0.0136	7.0	15.1	0.0048	1.7
250.00	20.5	7.0	1.6	0.0136	7.0	15.1	0.0033	1.7
1440.00	19.5	7.0	1.4	0.0137	7.0	15.1	0.0014	1.5

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	26.7	26.7	18.9	19.9	25.3	64.1	7.6	1.6	9.2

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0797	0.1241	0.1866	0.3332	1.5351	2.6014	7.1780	9.2029	11.0487	13.4598

Fineness Modulus	C_u	C_c
3.52	32.63	0.54

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.8	1.2	3.7	14.0	72.2	8.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.50	100.0		
.375	99.7		
#4	99.2		
#10	98.0		
#20	96.3		
#40	94.3		
#60	91.6		
#100	87.9		
#200	80.3		

* (no specification provided)

Material Description

gray silt with sand (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.0894 D_{60}= D_{50}= 0.0395
D_{30}= 0.0222 D_{15}= 0.0113 D_{10}= 0.0055
C_u= C_c=

Classification

USCS= ML AASHTO=

Remarks

As Received Moisture Content: 17.5%

Location: No. 8-885/3F-1, 26.0'-27.0' **Date:** 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 8-885/3F-1, 26.0'-27.0'
Material Description: gray silt with sand (visual)
Date: 9-25-06
USCS Classification: ML
Testing Remarks: As Received Moisture Content: 17.5%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
823.50	226.35	0.00	.50	0.00	100.0
			.375	1.72	99.7
			#4	4.97	99.2
			#10	11.83	98.0
50.64	0.00	0.00	#20	0.90	96.3
			#40	1.91	94.3
			#60	3.34	91.6
			#100	5.24	87.9
			#200	9.15	80.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =98.0
Weight of hydrometer sample =50.64
Hygroscopic moisture correction:
Moist weight and tare = 51.88
Dry weight and tare = 51.80
Tare weight = 30.02
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

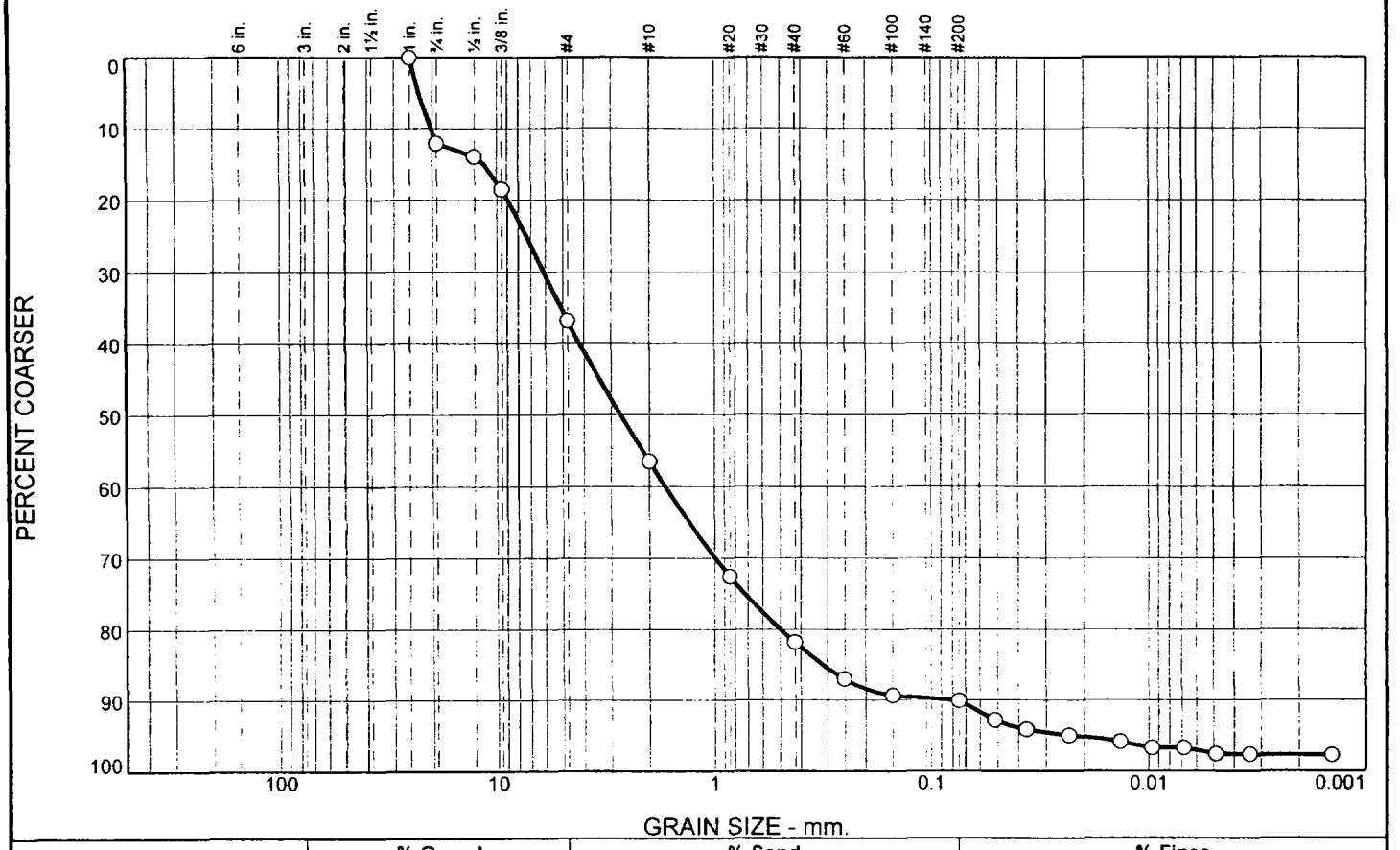
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	33.5	28.4	0.0137	33.5	10.8	0.0451	55.1
2.00	19.5	28.0	22.9	0.0137	28.0	11.7	0.0332	44.4
5.00	19.5	20.5	15.4	0.0137	20.5	12.9	0.0221	29.8
15.00	19.5	14.0	8.9	0.0137	14.0	14.0	0.0133	17.2
30.00	19.5	12.0	6.9	0.0137	12.0	14.3	0.0095	13.3
60.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0067	11.4
120.00	19.0	10.0	4.8	0.0138	10.0	14.7	0.0048	9.2
250.00	18.5	10.0	4.6	0.0139	10.0	14.7	0.0034	9.0
1440.00	18.5	9.0	3.6	0.0139	9.0	14.8	0.0014	7.1

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	0.8	0.8	1.2	3.7	14.0	18.9	72.2	8.1	80.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0055	0.0113	0.0154	0.0222	0.0395			0.0894	0.2074	0.5217

Fineness Modulus
0.30

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	12.0	24.7	19.7	25.4	8.3	7.6	2.3

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	88.0		
.50	86.1		
.375	81.6		
#4	63.3		
#10	43.6		
#20	27.5		
#40	18.2		
#60	13.0		
#100	10.7		
#200	9.9		

* (no specification provided)

Material Description

gray well-graded SAND with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 11.3871 D_{60}= 4.1817 D_{50}= 2.7152
D_{30}= 0.9903 D_{15}= 0.3141 D_{10}= 0.0794
C_u= 52.66 C_c= 2.95

Classification

USCS= SW-SM AASHTO=

Remarks

As Received Moisture Content: 7.1%

Location: No. 8-805/4F-1, 39.0'-40.0' **Date:** 9-28-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: B **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 8-805/4F-1, 39.0'-40.0'
Material Description: gray well-graded SAND with silt and gravel
Date: 9-28-06
USCS Classification: SW-SM
Testing Remarks: As Received Moisture Content: 7.1%
Tested by: B **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1034.30	228.14	0.00	1.0	0.00	100.0
			.75	97.12	88.0
			.50	112.14	86.1
			.375	148.47	81.6
			#4	296.17	63.3
			#10	455.05	43.6
50.74	0.00	0.00	#20	18.74	27.5
			#40	29.51	18.2
			#60	35.58	13.0
			#100	38.31	10.7
			#200	39.16	9.9

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =43.6
Weight of hydrometer sample =50.74
Hygroscopic moisture correction:
Moist weight and tare = 52.16
Dry weight and tare = 52.10
Tare weight = 28.34
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

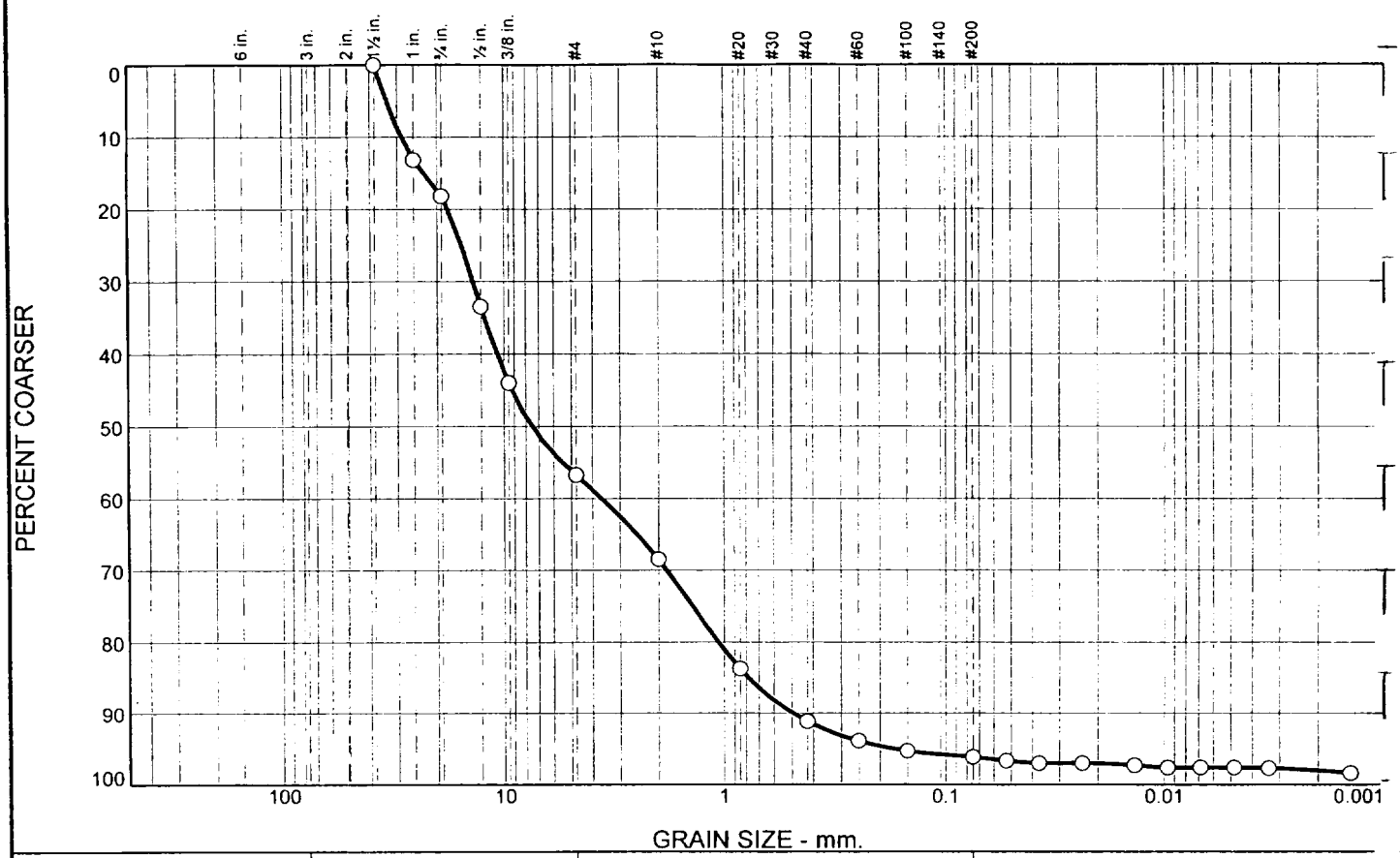
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	13.5	8.4	0.0137	13.5	14.1	0.0515	7.2
2.00	19.5	12.0	6.9	0.0137	12.0	14.3	0.0368	5.9
5.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0234	5.0
15.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0136	4.2
30.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0097	3.3
60.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0068	3.3
120.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0049	2.5
250.00	19.0	8.0	2.8	0.0138	8.0	15.0	0.0034	2.4
1440.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0014	2.3

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	12.0	24.7	36.7	19.7	25.4	8.3	53.4	7.6	2.3	9.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0794	0.3141	0.4945	0.9903	2.7152	4.1817	8.8977	11.3871	20.4110	22.9780

Fineness Modulus	C_u	C_c
4.39	52.66	2.95

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	18.1	38.6	11.7	22.7	5.0	1.9	2.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	86.9		
.75	81.9		
.50	66.6		
.375	56.0		
#4	43.3		
#10	31.6		
#20	16.3		
#40	8.9		
#60	6.2		
#100	4.7		
#200	3.9		

* (no specification provided)

Material Description

gray poorly graded GRAVEL with sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 22.7363 D_{60}= 10.7345 D_{50}= 7.4638
D_{30}= 1.8270 D_{15}= 0.7756 D_{10}= 0.4909
C_u= 21.87 C_c= 0.63

Classification

USCS= GP AASHTO=

Remarks

As Received Moisture Content: 4.7%

Location: No. 8-805/5F-1, 40.0'-41.0' **Date:** 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 8-805/5F-1, 40.0'-41.0'
Material Description: gray poorly graded GRAVEL with sand
Date: 9-25-06
USCS Classification: GP
Testing Remarks: As Received Moisture Content: 4.7%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1063.90	221.71	0.00	1.5	0.00	100.0
			1.0	110.58	86.9
			.75	152.60	81.9
			.50	281.61	66.6
			.375	370.30	56.0
			#4	477.30	43.3
			#10	576.42	31.6
50.66	0.00	0.00	#20	24.45	16.3
			#40	36.38	8.9
			#60	40.78	6.2
			#100	43.08	4.7
			#200	44.43	3.9

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =31.6
Weight of hydrometer sample =50.66
Hygroscopic moisture correction:
Moist weight and tare = 52.11
Dry weight and tare = 52.05
Tare weight = 31.22
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

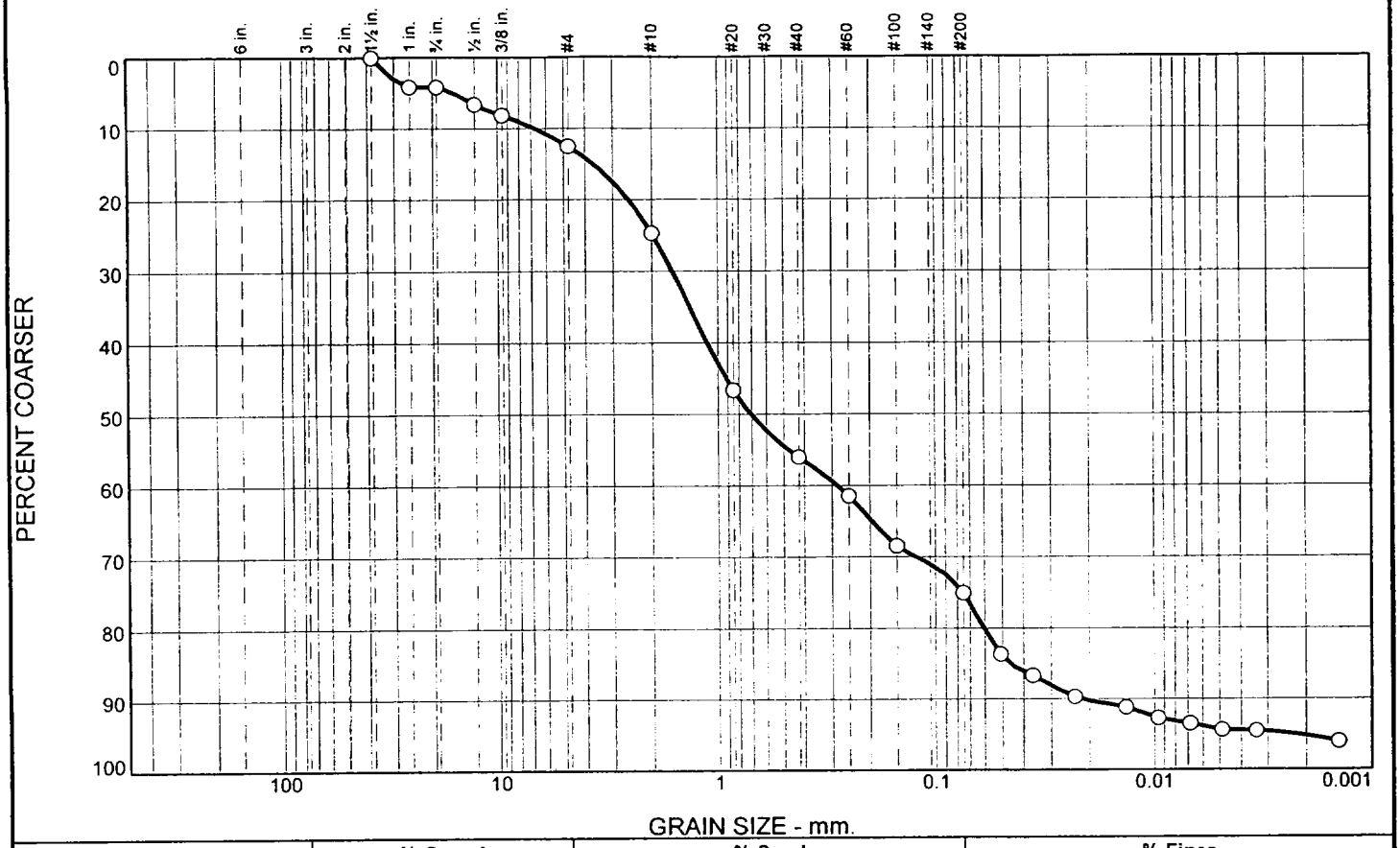
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	10.5	5.4	0.0137	10.5	14.6	0.0524	3.3
2.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0372	3.0
5.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0235	3.0
15.00	19.5	9.5	4.4	0.0137	9.5	14.7	0.0136	2.7
30.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0097	2.4
60.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0068	2.4
120.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0048	2.4
250.00	19.0	9.0	3.8	0.0138	9.0	14.8	0.0034	2.3
1440.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0014	1.7

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	18.1	38.6	56.7	11.7	22.7	5.0	39.4	1.9	2.0	3.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.4909	0.7756	1.0612	1.8270	7.4638	10.7345	17.8016	22.7363	28.7450	33.3741

Fineness Modulus	C_u	C_c
5.39	21.87	0.63

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.1	8.4	12.2	31.3	19.0	20.2	4.8

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	95.9		
.75	95.9		
.50	93.4		
.375	91.9		
#4	87.5		
#10	75.3		
#20	53.4		
#40	44.0		
#60	38.6		
#100	31.6		
#200	25.0		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 3.6506 D_{60}= 1.1168 D_{50}= 0.7040
D_{30}= 0.1226 D_{15}= 0.0457 D_{10}= 0.0215
C_u= 52.07 C_c= 0.63

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 9.4%

Location: No. 8-805-5F-2, 41.0'-42.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 8-805-5F-2, 41.0'-42.0'
Material Description: gray silty SAND (visual)
Date: 9-25-06
Testing Remarks: As Received Moisture Content: 9.4%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1024.00	238.24	0.00	1.5	0.00	100.0
			1.0	32.57	95.9
			.75	32.57	95.9
			.50	51.76	93.4
			.375	63.60	91.9
			#4	98.16	87.5
			#10	193.89	75.3
50.11	0.00	0.00	#20	14.56	53.4
			#40	20.81	44.0
			#60	24.44	38.6
			#100	29.11	31.6
			#200	33.50	25.0

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =75.3
Weight of hydrometer sample =50.11
Hygroscopic moisture correction:
Moist weight and tare = 50.76
Dry weight and tare = 50.69
Tare weight = 27.97
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

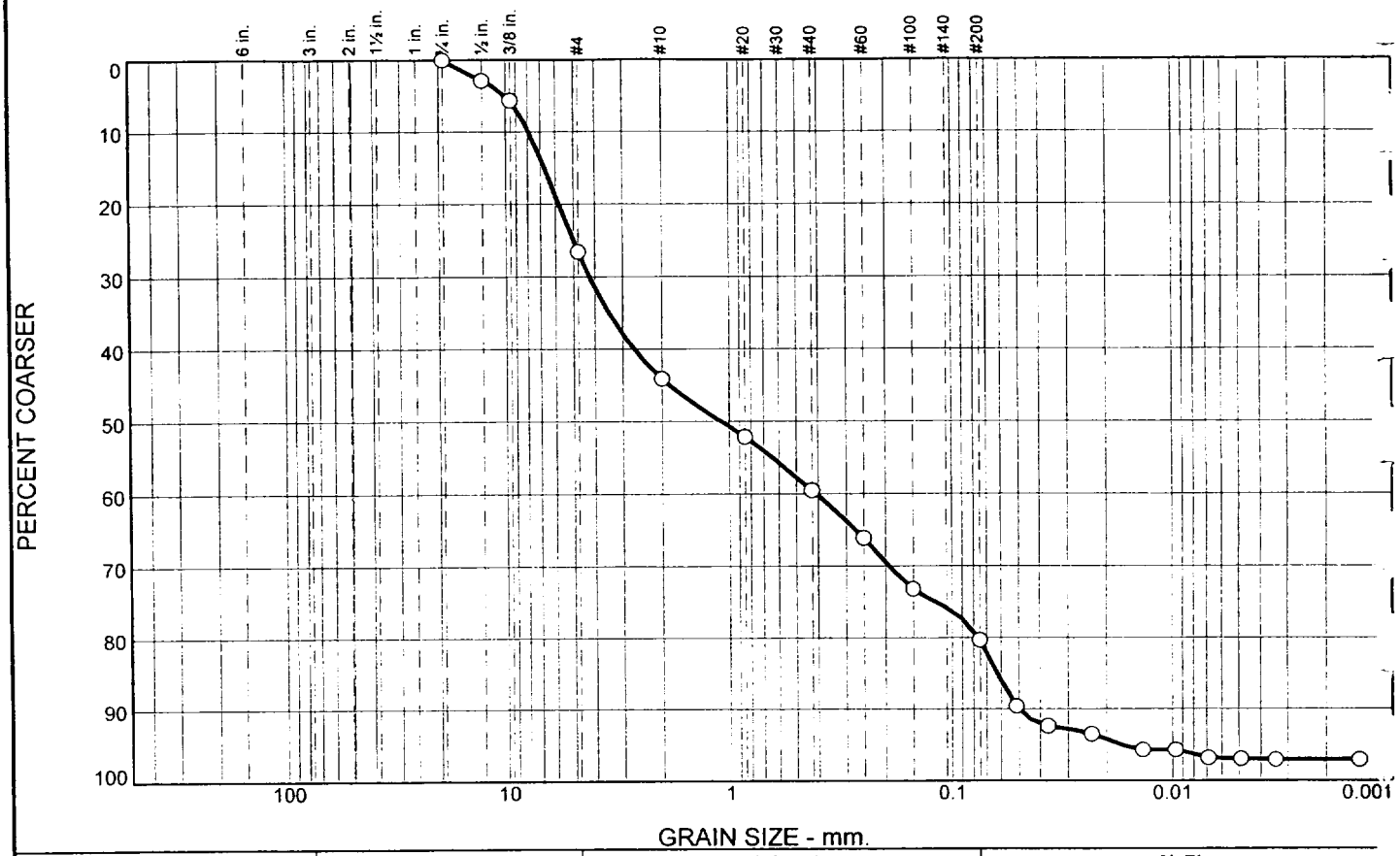
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	16.0	10.9	0.0137	16.0	13.7	0.0508	16.4
2.00	19.5	14.0	8.9	0.0137	14.0	14.0	0.0363	13.4
5.00	19.5	12.0	6.9	0.0137	12.0	14.3	0.0232	10.3
15.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0135	8.8
30.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0096	7.3
60.00	19.5	9.5	4.4	0.0137	9.5	14.7	0.0068	6.6
120.00	19.0	9.0	3.8	0.0138	9.0	14.8	0.0049	5.7
250.00	18.5	9.0	3.6	0.0139	9.0	14.8	0.0034	5.5
1440.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0014	4.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.1	8.4	12.5	12.2	31.3	19.0	62.5	20.2	4.8	25.0

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0215	0.0457	0.0604	0.1226	0.7040	1.1168	2.5373	3.6506	6.7067	15.7900

Fineness Modulus	C_u	C_c
2.65	52.07	0.63

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	26.5	17.6	15.4	20.8	16.7	3.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	97.1		
.375	94.3		
#4	73.5		
#10	55.9		
#20	47.9		
#40	40.5		
#60	33.9		
#100	26.8		
#200	19.7		

* (no specification provided)

Material Description

gray silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.6894 D_{60}= 2.6664 D_{50}= 1.0758
D_{30}= 0.1926 D_{15}= 0.0623 D_{10}= 0.0499
C_u= 53.39 C_c= 0.28

Classification

USCS= SM AASHTO=

Remarks

As Received Moisture Content: 9.6%

Location: No. 8-805/5F-3, 42.0'-43.0' **Date:** 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 8-805/5F-3, 42.0'-43.0'
Material Description: gray silty SAND with gravel (visual)
Date: 9-25-06
USCS Classification: SM
Testing Remarks: As Received Moisture Content: 9.6%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
932.50	231.96	0.00	.75	0.00	100.0
			.50	20.30	97.1
			.375	39.65	94.3
			#4	185.94	73.5
			#10	308.77	55.9
50.31	0.00	0.00	#20	7.19	47.9
			#40	13.87	40.5
			#60	19.79	33.9
			#100	26.18	26.8
			#200	32.62	19.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =55.9
Weight of hydrometer sample =50.31
Hygroscopic moisture correction:
Moist weight and tare = 50.19
Dry weight and tare = 50.13
Tare weight = 28.24
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

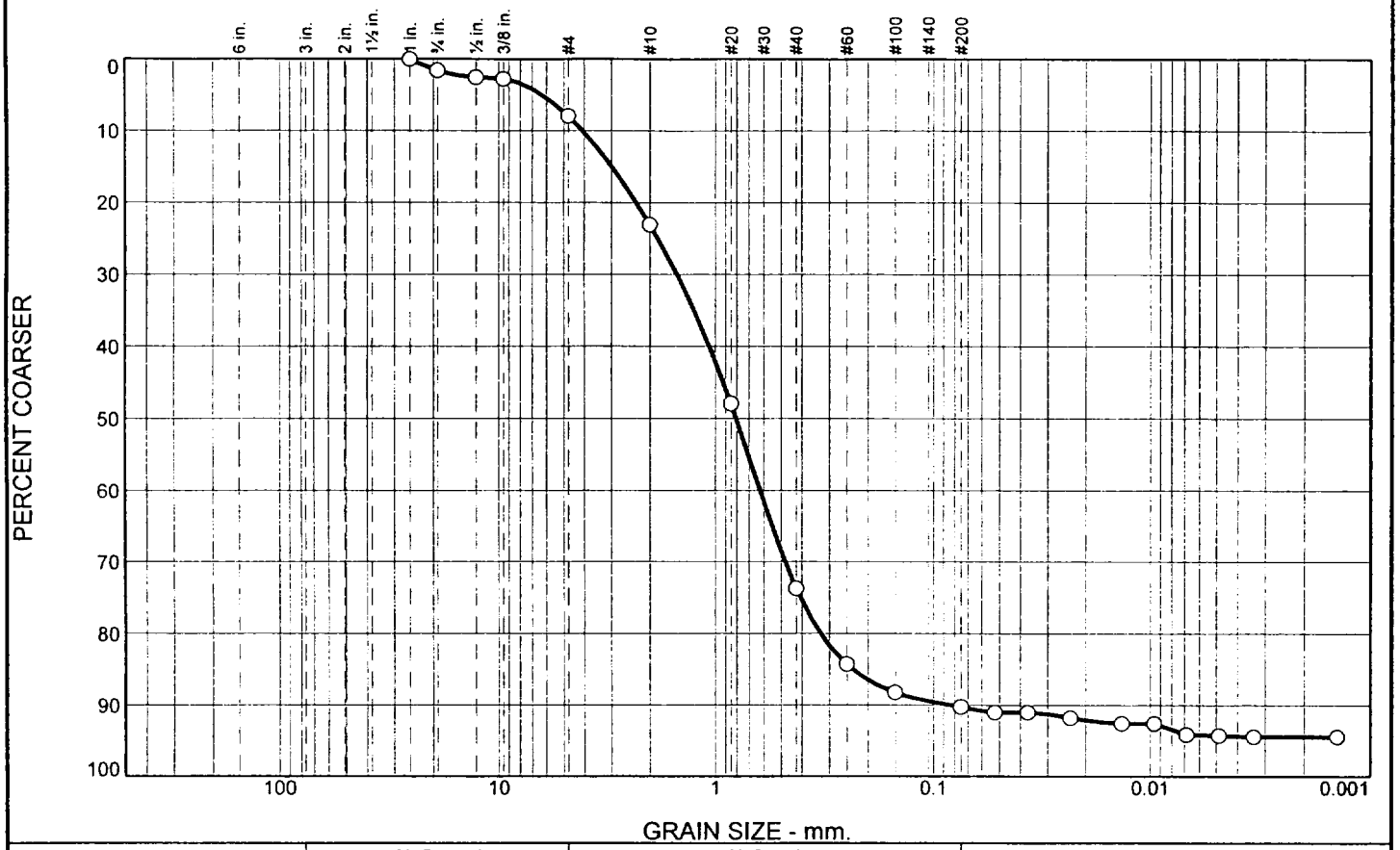
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	14.5	9.4	0.0137	14.5	13.9	0.0512	10.4
2.00	19.5	12.0	6.9	0.0137	12.0	14.3	0.0368	7.6
5.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0234	6.5
15.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0136	4.3
30.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0097	4.3
60.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0069	3.2
120.00	19.0	8.0	2.8	0.0138	8.0	15.0	0.0049	3.1
250.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0034	3.0
1440.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0014	3.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	26.5	26.5	17.6	15.4	20.8	53.8	16.7	3.0	19.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0499	0.0623	0.0762	0.1926	1.0758	2.6664	5.7782	6.6894	7.8649	9.9552

Fineness Modulus	C_u	C_c
3.16	53.39	0.28

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	1.6	6.3	15.1	50.7	16.5	4.2	5.6

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	98.4		
.50	97.5		
.375	97.3		
#4	92.1		
#10	77.0		
#20	52.1		
#40	26.3		
#60	15.7		
#100	11.8		
#200	9.8		

* (no specification provided)

Material Description

gray well-graded SAND with silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 2.9726 D_{60}= 1.0660 D_{50}= 0.8031
D_{30}= 0.4773 D_{15}= 0.2341 D_{10}= 0.0828
C_u= 12.88 C_c= 2.58

Classification

USCS= SW-SM AASHTO=

Remarks

As Received Moisture Content: 8.2%

Location: No. 8-805/10F-1, 92.0'-93.0' **Date:** 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 8-805/10F-1, 92.0'-93.0'
Material Description: gray well-graded SAND with silt
Date: 9-25-06
USCS Classification: SW-SM
Testing Remarks: As Received Moisture Content: 8.2%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
984.00	228.54	0.00	1.0	0.00	100.0
			.75	12.08	98.4
			.50	18.95	97.5
			.375	20.43	97.3
			#4	59.67	92.1
			#10	173.94	77.0
50.25	0.00	0.00	#20	16.21	52.1
			#40	33.09	26.3
			#60	39.97	15.7
			#100	42.55	11.8
			#200	43.88	9.8

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =77.0
Weight of hydrometer sample =50.25
Hygroscopic moisture correction:
Moist weight and tare = 48.87
Dry weight and tare = 48.81
Tare weight = 28.22
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

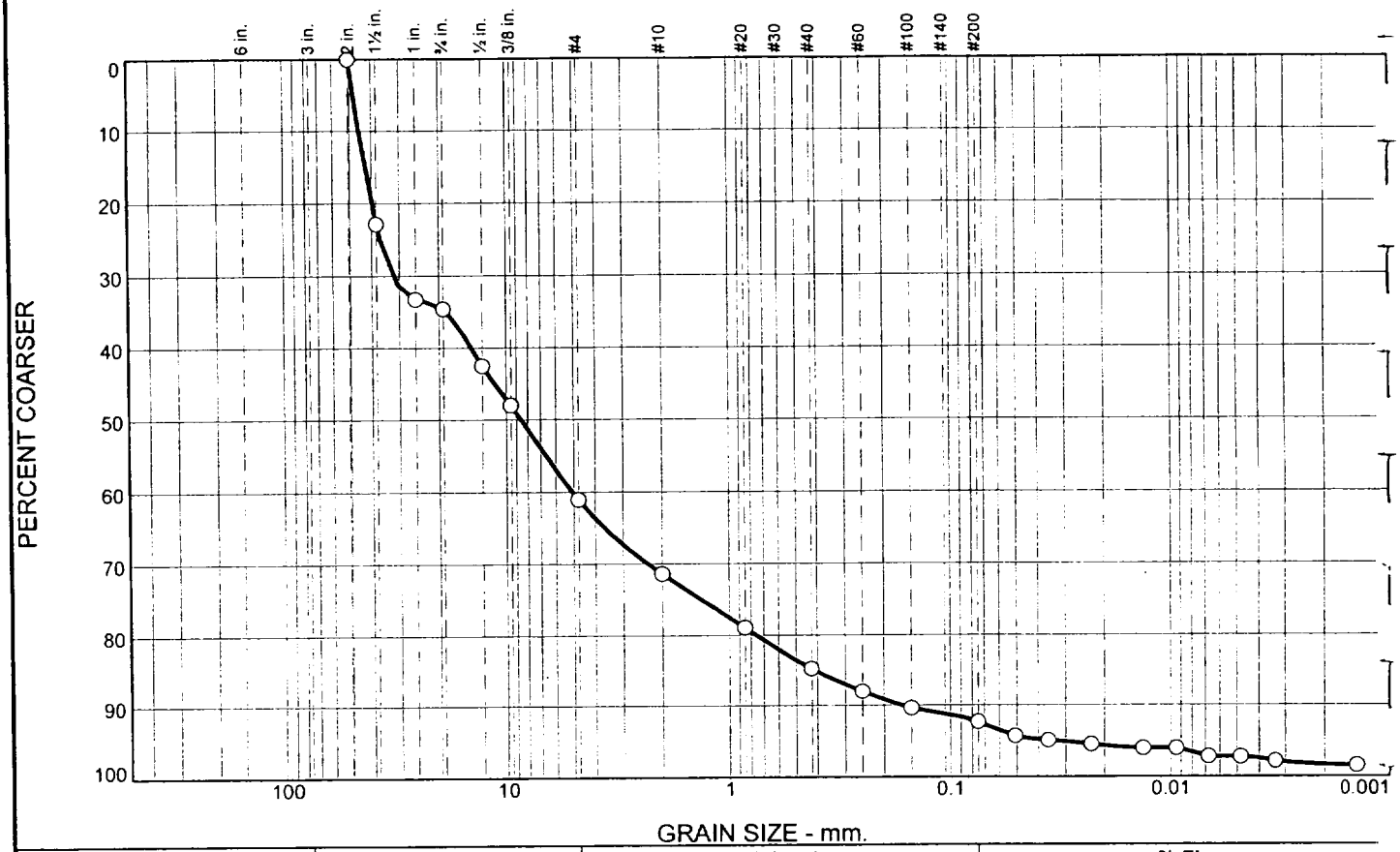
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0523	9.0
2.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0370	9.0
5.00	19.5	10.5	5.4	0.0137	10.5	14.6	0.0234	8.2
15.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0136	7.5
30.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0096	7.5
60.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0068	5.9
120.00	19.0	9.0	3.8	0.0138	9.0	14.8	0.0049	5.8
250.00	18.5	9.0	3.6	0.0139	9.0	14.8	0.0034	5.6
1440.00	18.5	9.0	3.6	0.0139	9.0	14.8	0.0014	5.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	1.6	6.3	7.9	15.1	50.7	16.5	82.3	4.2	5.6	9.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0828	0.2341	0.3284	0.4773	0.8031	1.0660	2.2987	2.9726	4.0550	6.2532

Fineness Modulus	C_u	C_c
3.00	12.88	2.58

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	34.6	26.4	10.4	13.3	7.6	6.0	1.7

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
2.0	100.0		
1.5	77.2		
1.0	66.8		
.75	65.4		
.50	57.5		
.375	52.1		
#4	39.0		
#10	28.6		
#20	21.1		
#40	15.3		
#60	12.1		
#100	9.7		
#200	7.7		

* (no specification provided)

Material Description

gray well-graded GRAVEL with silt and sand

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 42.6671 D_{60}= 14.2003 D_{50}= 8.5416
D_{30}= 2.3102 D_{15}= 0.4080 D_{10}= 0.1645
C_u= 86.32 C_c= 2.28

Classification

USCS= GW-GM AASHTO=

Remarks

As Received Moisture Content: 5.7%

Location: No. 9-805/5F-1, 42.0'-43.0'

Date: 9-27-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/27/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/5F-1, 42.0'-43.0'
Material Description: gray well-graded GRAVEL with silt and sand
Date: 9-27-06
USCS Classification: GW-GM
Testing Remarks: As Received Moisture Content: 5.7%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
819.40	119.62	0.00	2.0	0.00	100.0
			1.5	159.69	77.2
			1.0	232.55	66.8
			.75	241.96	65.4
			.50	297.28	57.5
			.375	335.49	52.1
			#4	427.04	39.0
			#10	499.40	28.6
50.00	0.00	0.00	#20	13.19	21.1
			#40	23.31	15.3
			#60	28.91	12.1
			#100	33.13	9.7
			#200	36.54	7.7

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =28.6
Weight of hydrometer sample =50.00
Hygroscopic moisture correction:
Moist weight and tare = 48.69
Dry weight and tare = 48.64
Tare weight = 28.22
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

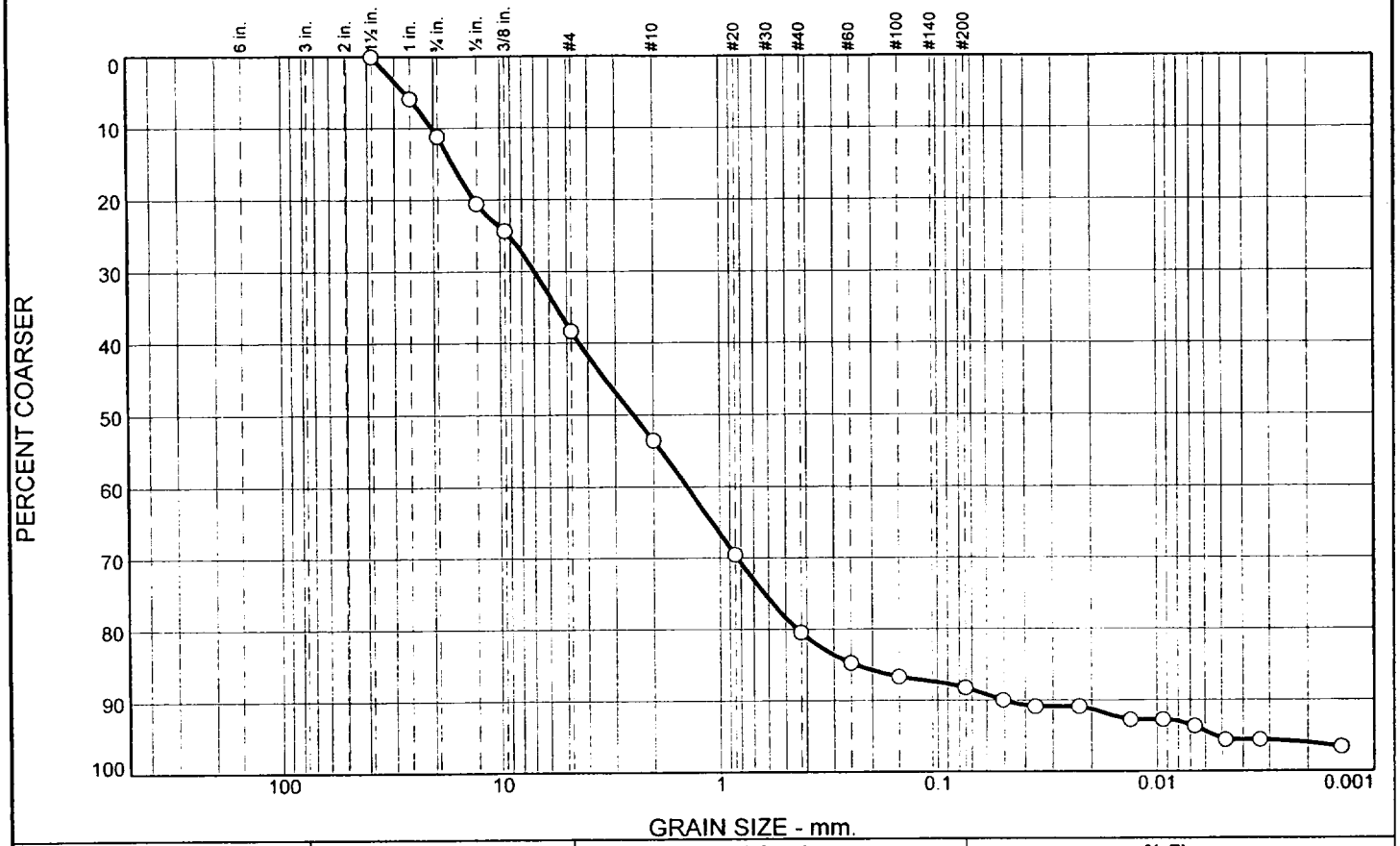
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	15.0	10.0	0.0136	15.0	13.8	0.0508	5.7
2.00	20.0	14.0	9.0	0.0136	14.0	14.0	0.0361	5.1
5.00	20.0	13.0	8.0	0.0136	13.0	14.2	0.0230	4.6
15.00	20.0	12.0	7.0	0.0136	12.0	14.3	0.0133	4.0
30.00	20.0	12.0	7.0	0.0136	12.0	14.3	0.0094	4.0
60.00	20.0	10.0	5.0	0.0136	10.0	14.7	0.0067	2.8
120.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0048	2.8
250.00	19.5	9.0	3.9	0.0137	9.0	14.8	0.0033	2.2
1440.00	19.0	8.0	2.8	0.0138	8.0	15.0	0.0014	1.6

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	34.6	26.4	61.0	10.4	13.3	7.6	31.3	6.0	1.7	7.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1645	0.4080	0.7523	2.3102	8.5416	14.2003	39.8458	42.6671	45.3555	48.0382

Fineness Modulus	C_u	C_c
5.71	86.32	2.28

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	11.1	27.2	15.2	26.9	7.8	7.8	4.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	94.1		
.75	88.9		
.50	79.5		
.375	75.7		
#4	61.7		
#10	46.5		
#20	30.5		
#40	19.6		
#60	15.3		
#100	13.3		
#200	11.8		

* (no specification provided)

Material Description

gray SAND with silt and gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 16.2436 D_{60}= 4.3667 D_{50}= 2.4614
D_{30}= 0.8287 D_{15}= 0.2363 D_{10}= 0.0499
C_u= 87.43 C_c= 3.15

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 7.1%

Location: No. 9-805/5F-2, 43.0'-44.0'

Date: 9-27-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations
Project No: 138455

Tested By: BB

GRAIN SIZE DISTRIBUTION TEST DATA

9/27/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/5F-2, 43.0'-44.0'
Material Description: gray SAND with silt and gravel (visual)
Date: 9-27-06
Testing Remarks: As Received Moisture Content: 7.1%
Tested by: BB

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
954.70	120.00	0.00	1.5	0.00	100.0
			1.0	49.07	94.1
			.75	92.98	88.9
			.50	171.43	79.5
			.375	203.14	75.7
			#4	319.69	61.7
			#10	446.62	46.5
50.89	0.00	0.00	#20	17.54	30.5
			#40	29.49	19.6
			#60	34.15	15.3
			#100	36.28	13.3
			#200	37.97	11.8

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =46.5
Weight of hydrometer sample =50.89
Hygroscopic moisture correction:
Moist weight and tare = 54.21
Dry weight and tare = 54.14
Tare weight = 30.42
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

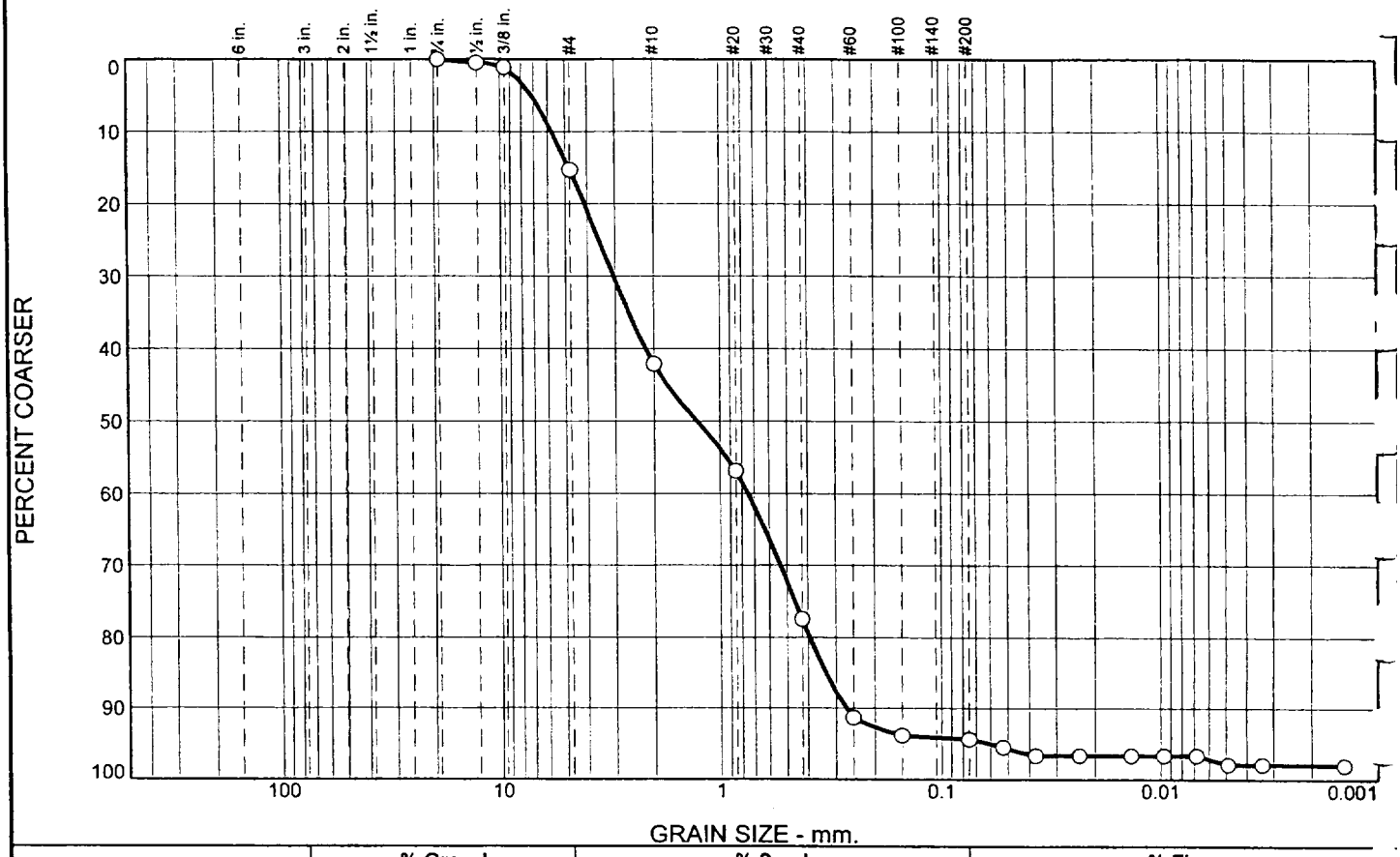
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	16.0	11.0	0.0136	16.0	13.7	0.0505	10.0
2.00	20.0	15.0	10.0	0.0136	15.0	13.8	0.0359	9.1
5.00	20.0	15.0	10.0	0.0136	15.0	13.8	0.0227	9.1
15.00	20.0	13.0	8.0	0.0136	13.0	14.2	0.0133	7.3
30.00	20.0	13.0	8.0	0.0136	13.0	14.2	0.0094	7.3
60.00	20.0	12.0	7.0	0.0136	12.0	14.3	0.0067	6.4
120.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0048	4.4
250.00	19.5	10.0	4.9	0.0137	10.0	14.7	0.0033	4.4
1440.00	19.0	9.0	3.8	0.0138	9.0	14.8	0.0014	3.4

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	11.1	27.2	38.3	15.2	26.9	7.8	49.9	7.8	4.0	11.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0499	0.2363	0.4414	0.8287	2.4614	4.3667	13.0793	16.2436	20.0952	26.8883

Fineness Modulus	C_u	C_c
4.34	87.43	3.15

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	15.2	26.9	35.3	16.9	3.6	2.1

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	99.5		
.375	98.9		
#4	84.8		
#10	57.9		
#20	43.2		
#40	22.6		
#60	8.7		
#100	6.2		
#200	5.7		

* (no specification provided)

Material Description

gray poorly graded SAND with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 4.7884 D_{60}= 2.1771 D_{50}= 1.2648
D_{30}= 0.5335 D_{15}= 0.3322 D_{10}= 0.2698
C_u= 8.07 C_c= 0.48

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 8.8%

Location: No. 9-805/5F-3, 44.0'-45.0'

Date: 9-27-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/27/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/5F-3, 44.0'-45.0'
Material Description: gray poorly graded SAND with silt and gravel
Date: 9-27-06
Testing Remarks: As Received Moisture Content: 8.8%
Tested by: BB **Checked by:** SV

Sieve Test Data

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
856.20	97.20	0.00	.75	0.00	100.0
			.50	3.56	99.5
			.375	8.34	98.9
			#4	115.72	84.8
			#10	319.38	57.9
50.15	0.00	0.00	#20	12.78	43.2
			#40	30.60	22.6
			#60	42.63	8.7
			#100	44.79	6.2
			#200	45.22	5.7

Hydrometer Test Data

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =57.9
Weight of hydrometer sample =50.15
Hygroscopic moisture correction:
Moist weight and tare = 50.12
Dry weight and tare = 50.07
Tare weight = 27.97
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

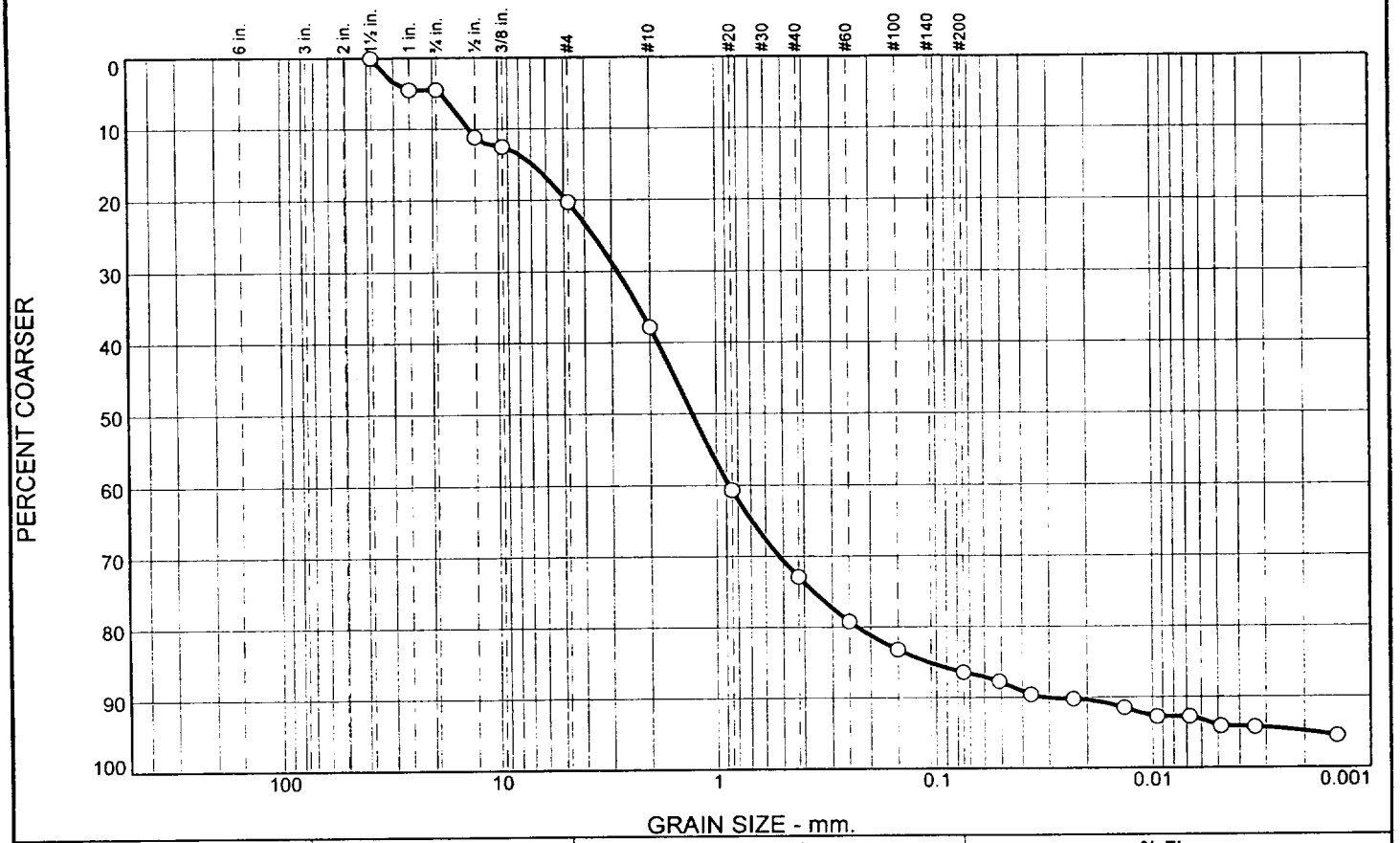
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	20.0	9.0	4.0	0.0136	9.0	14.8	0.0525	4.6
2.00	20.0	8.0	3.0	0.0136	8.0	15.0	0.0373	3.4
5.00	20.0	8.0	3.0	0.0136	8.0	15.0	0.0236	3.4
15.00	20.0	8.0	3.0	0.0136	8.0	15.0	0.0136	3.4
30.00	20.0	8.0	3.0	0.0136	8.0	15.0	0.0096	3.4
60.00	20.0	8.0	3.0	0.0136	8.0	15.0	0.0068	3.4
120.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0049	2.1
250.00	19.5	7.0	1.9	0.0137	7.0	15.1	0.0034	2.1
1440.00	19.0	7.0	1.8	0.0138	7.0	15.1	0.0014	2.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	15.2	15.2	26.9	35.3	16.9	79.1	3.6	2.1	5.7

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2698	0.3322	0.3923	0.5335	1.2648	2.1771	4.0932	4.7884	5.7059	7.0948

Fineness Modulus	C_u	C_c
3.53	8.07	0.48

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.5	15.7	17.6	35.1	13.5	8.4	5.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	95.5		
.75	95.5		
.50	88.9		
.375	87.5		
#4	79.8		
#10	62.2		
#20	39.4		
#40	27.1		
#60	20.8		
#100	16.8		
#200	13.6		

* (no specification provided)

Material Description

gray silty SAND with gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.8553 D_{60}= 1.8390 D_{50}= 1.2799
D_{30}= 0.5177 D_{15}= 0.1086 D_{10}= 0.0313
C_u= 58.76 C_c= 4.66

Classification

USCS= SM AASHTO=

Remarks

As Received Moisture Content: 8.2%

Location: No. 9-805/10F-1, 97.0'-98.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/10F-1, 97.0'-98.0'
Material Description: gray silty SAND with gravel (visual)
Date: 9-25-06
USCS Classification: SM
Testing Remarks: As Received Moisture Content: 8.2%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1054.90	236.92	0.00	1.5	0.00	100.0
			1.0	36.63	95.5
			.75	36.63	95.5
			.50	91.18	88.9
			.375	102.12	87.5
			#4	165.43	79.8
			#10	309.35	62.2
50.07	0.00	0.00	#20	18.37	39.4
			#40	28.24	27.1
			#60	33.33	20.8
			#100	36.56	16.8
			#200	39.14	13.6

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =62.2
Weight of hydrometer sample =50.07
Hygroscopic moisture correction:
Moist weight and tare = 48.82
Dry weight and tare = 48.74
Tare weight = 28.45
Hygroscopic moisture =0.4%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

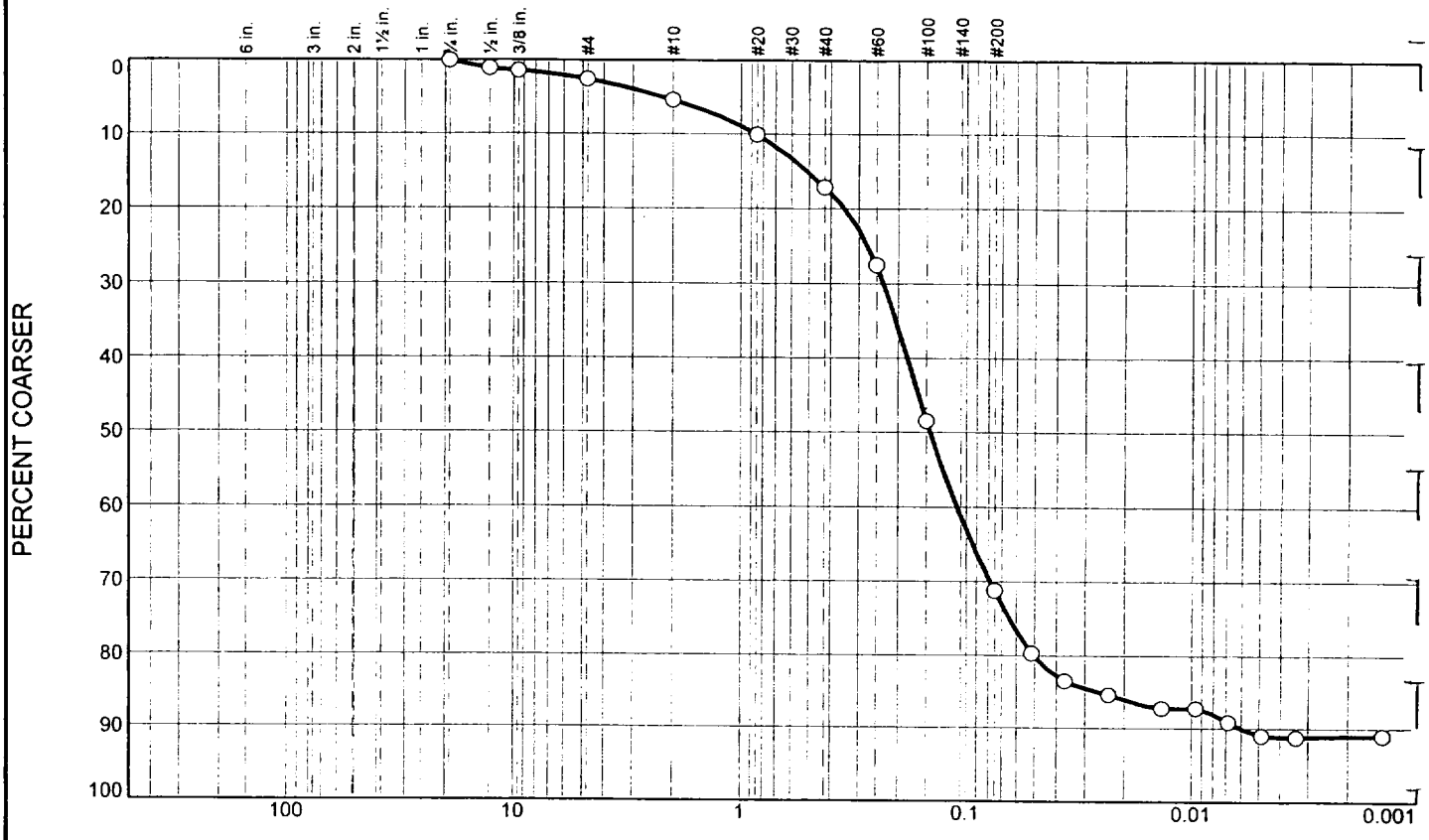
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	15.0	9.9	0.0137	15.0	13.8	0.0511	12.3
2.00	19.5	13.5	8.4	0.0137	13.5	14.1	0.0364	10.4
5.00	19.5	13.0	7.9	0.0137	13.0	14.2	0.0231	9.8
15.00	19.5	12.0	6.9	0.0137	12.0	14.3	0.0134	8.5
30.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0095	7.3
60.00	19.5	11.0	5.9	0.0137	11.0	14.5	0.0067	7.3
120.00	19.0	10.0	4.8	0.0138	10.0	14.7	0.0048	5.9
250.00	18.5	10.0	4.6	0.0139	10.0	14.7	0.0034	5.8
1440.00	18.5	9.0	3.6	0.0139	9.0	14.8	0.0014	4.5

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.5	15.7	20.2	17.6	35.1	13.5	66.2	8.4	5.2	13.6

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0313	0.1086	0.2299	0.5177	1.2799	1.8390	4.8161	6.8553	13.7210	18.0864

Fineness Modulus	C_u	C_c
3.51	58.76	4.66

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.5	2.9	11.7	54.1	19.8	9.0

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	98.9		
.375	98.6		
#4	97.5		
#10	94.6		
#20	90.0		
#40	82.9		
#60	72.5		
#100	51.6		
#200	28.8		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 0.5071 D_{60}= 0.1821 D_{50}= 0.1442
D_{30}= 0.0784 D_{15}= 0.0258 D_{10}= 0.0060
C_u= 30.37 C_c= 5.64

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 13.5%

Location: No. 9-805/10F-2, 98.0'-99.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: MC **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/10F-2, 98.0'-99.0'
Material Description: gray silty SAND (visual)
Date: 9-25-06
Testing Remarks: As Received Moisture Content: 13.5%
Tested by: MC **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
963.70	227.61	0.00	.75	0.00	100.0
			.50	8.08	98.9
			.375	10.59	98.6
			#4	18.74	97.5
			#10	39.70	94.6
50.16	0.00	0.00	#20	2.46	90.0
			#40	6.21	82.9
			#60	11.70	72.5
			#100	22.79	51.6
			#200	34.89	28.8

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =94.6
Weight of hydrometer sample =50.16
Hygroscopic moisture correction:
Moist weight and tare = 66.27
Dry weight and tare = 66.19
Tare weight = 32.71
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

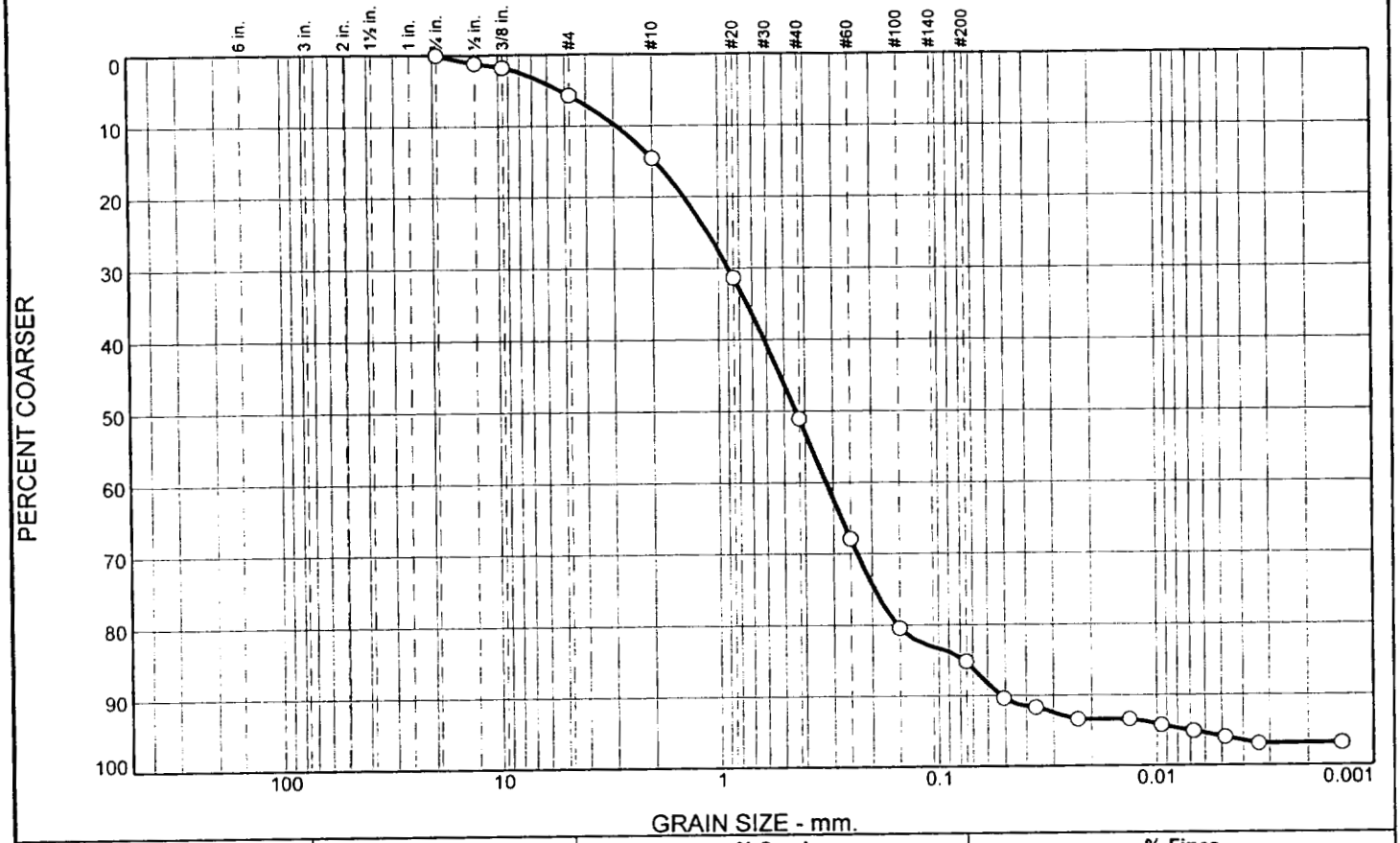
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.0	15.0	10.8	0.0138	15.0	13.8	0.0514	20.3
2.00	19.0	13.0	8.8	0.0138	13.0	14.2	0.0368	16.5
5.00	19.0	12.0	7.8	0.0138	12.0	14.3	0.0234	14.7
15.00	19.0	11.0	6.8	0.0138	11.0	14.5	0.0136	12.8
30.00	19.0	11.0	6.8	0.0138	11.0	14.5	0.0096	12.8
60.00	19.0	10.0	5.8	0.0138	10.0	14.7	0.0068	10.9
120.00	19.0	9.0	4.8	0.0138	9.0	14.8	0.0049	9.0
250.00	18.5	9.0	4.6	0.0139	9.0	14.8	0.0034	8.8
1440.00	19.0	9.0	4.8	0.0138	9.0	14.8	0.0014	9.0

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	2.5	2.5	2.9	11.7	54.1	68.7	19.8	9.0	28.8

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0060	0.0258	0.0504	0.0784	0.1442	0.1821	0.3452	0.5071	0.8536	2.2095

Fineness Modulus	C_U	C_C
1.01	30.37	5.64

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.7	8.8	36.5	34.1	11.7	3.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
.75	100.0		
.50	98.8		
.375	98.2		
#4	94.3		
#10	85.5		
#20	68.7		
#40	49.0		
#60	32.1		
#100	19.6		
#200	14.9		

* (no specification provided)

Material Description

gray silty SAND (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 1.9340 D_{60}= 0.6141 D_{50}= 0.4392
D_{30}= 0.2332 D_{15}= 0.0759 D_{10}= 0.0525
C_u= 11.69 C_c= 1.69

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 11.5%

Location: No. 9-805/10F-3, 99.0'-100.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: MC **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/10F-3, 99.0'-100.0'
Material Description: gray silty SAND (visual)
Date: 9-25-06
Testing Remarks: As Received Moisture Content: 11.5%
Tested by: MC **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
986.00	226.71	0.00	.75	0.00	100.0
			.50	8.98	98.8
			.375	13.55	98.2
			#4	43.28	94.3
			#10	110.20	85.5
100.02	0.00	0.00	#20	19.67	68.7
			#40	42.72	49.0
			#60	62.44	32.1
			#100	77.09	19.6
			#200	82.62	14.9

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =85.5
Weight of hydrometer sample =100.02
Hygroscopic moisture correction:
Moist weight and tare = 59.87
Dry weight and tare = 59.82
Tare weight = 27.96
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

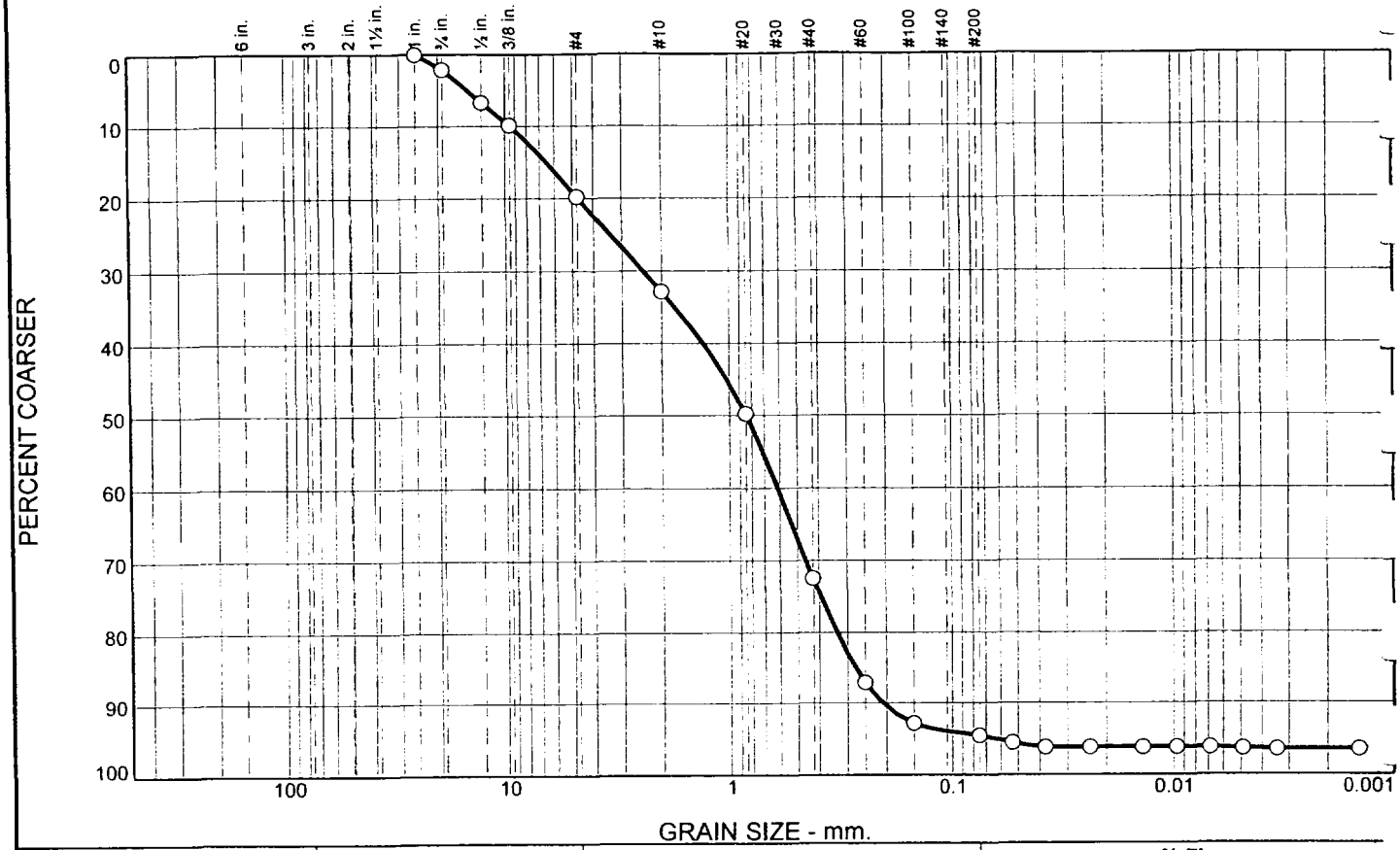
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.0	17.5	11.3	0.0138	17.5	13.4	0.0506	9.6
2.00	19.0	16.0	9.8	0.0138	16.0	13.7	0.0361	8.3
5.00	19.0	14.0	7.8	0.0138	14.0	14.0	0.0231	6.6
15.00	19.0	14.0	7.8	0.0138	14.0	14.0	0.0133	6.6
30.00	19.0	13.0	6.8	0.0138	13.0	14.2	0.0095	5.8
60.00	19.0	12.0	5.8	0.0138	12.0	14.3	0.0068	4.9
120.00	19.0	11.0	4.8	0.0138	11.0	14.5	0.0048	4.1
250.00	18.5	10.0	3.6	0.0139	10.0	14.7	0.0034	3.1
1440.00	19.0	10.0	3.8	0.0138	10.0	14.7	0.0014	3.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	0.0	5.7	5.7	8.8	36.5	34.1	79.4	11.7	3.2	14.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.0525	0.0759	0.1541	0.2332	0.4392	0.6141	1.4317	1.9340	2.8968	5.2234

Fineness Modulus	C_u	C_c
2.27	11.69	1.69

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.1	17.6	13.1	39.6	22.1	2.0	3.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	97.9		
.50	93.3		
.375	90.1		
#4	80.3		
#10	67.2		
#20	50.3		
#40	27.6		
#60	13.0		
#100	7.2		
#200	5.5		

* (no specification provided)

Material Description

gray poorly graded SAND with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 6.4932 D_{60}= 1.2994 D_{50}= 0.8411
D_{30}= 0.4564 D_{15}= 0.2744 D_{10}= 0.2070
C_u= 6.28 C_c= 0.77

Classification

USCS= SP-SM AASHTO=

Remarks

As Received Moisture Content: 8.4%

Location: No. 9-805/11F-1, 102.0'-103.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/11F-1, 102.0'-103.0'
Material Description: gray poorly graded SAND with silt and gravel
Date: 9-25-06
USCS Classification: SP-SM
Testing Remarks: As Received Moisture Content: 8.4%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1005.30	232.21	0.00	1.0	0.00	100.0
			.75	16.52	97.9
			.50	51.75	93.3
			.375	76.31	90.1
			#4	152.40	80.3
			#10	253.66	67.2
50.35	0.00	0.00	#20	12.66	50.3
			#40	29.66	27.6
			#60	40.59	13.0
			#100	44.96	7.2
			#200	46.24	5.5

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =67.2
Weight of hydrometer sample =50.35
Hygroscopic moisture correction:
Moist weight and tare = 49.00
Dry weight and tare = 48.93
Tare weight = 28.52
Hygroscopic moisture =0.3%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

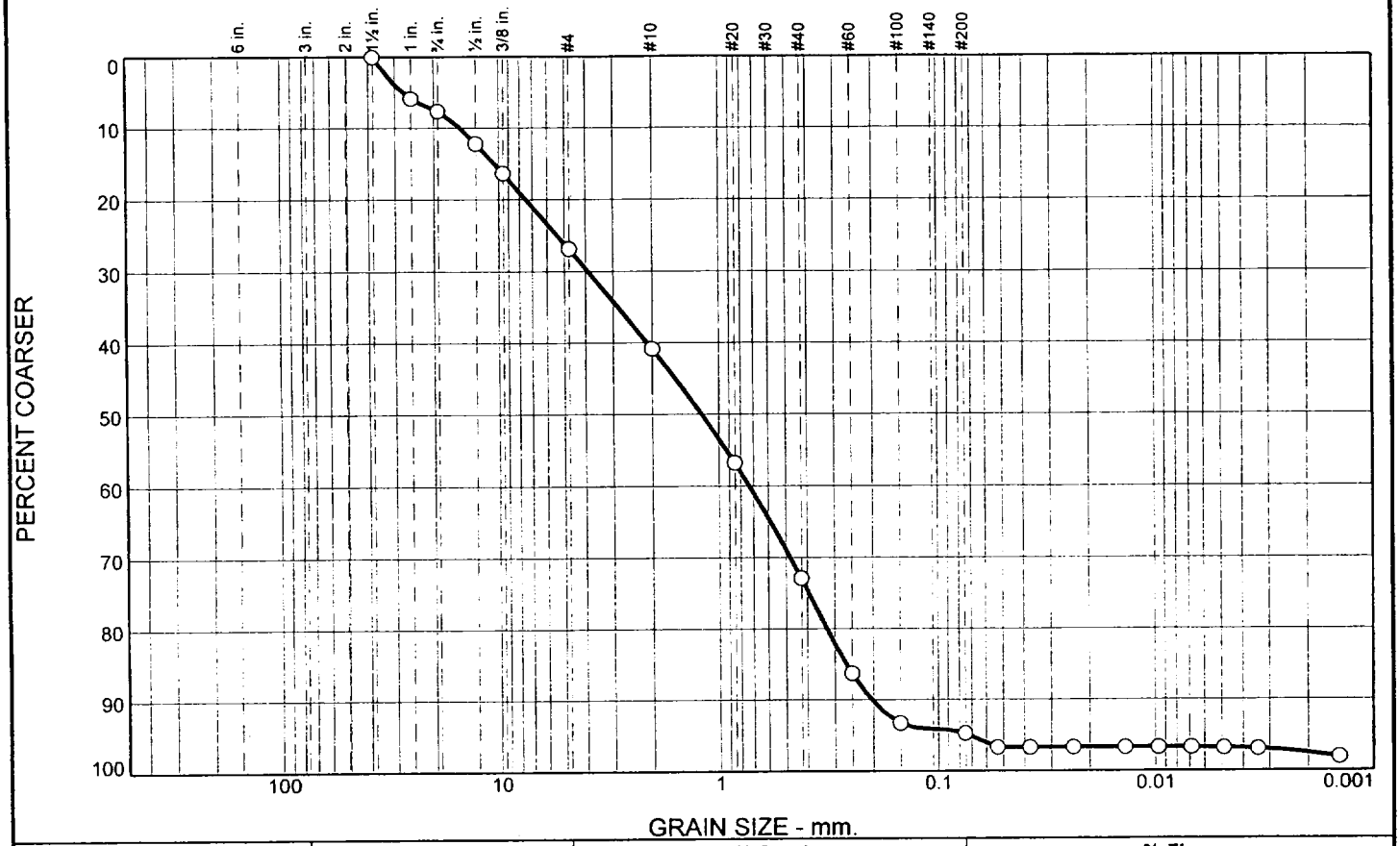
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	8.5	3.4	0.0137	8.5	14.9	0.0530	4.5
2.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0376	3.8
5.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0238	3.8
15.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0137	3.8
30.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0097	3.8
60.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0069	3.8
120.00	19.0	8.0	2.8	0.0138	8.0	15.0	0.0049	3.7
250.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0034	3.5
1440.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0014	3.5

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	2.1	17.6	19.7	13.1	39.6	22.1	74.8	2.0	3.5	5.5

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2070	0.2744	0.3328	0.4564	0.8411	1.2994	4.6612	6.4932	9.4208	14.6714

Fineness Modulus	C_u	C_c
3.40	6.28	0.77

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	7.6	19.2	14.0	32.1	21.8	2.8	2.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	94.1		
.75	92.4		
.50	87.8		
.375	83.7		
#4	73.2		
#10	59.2		
#20	43.3		
#40	27.1		
#60	13.8		
#100	6.7		
#200	5.3		

* (no specification provided)

Material Description

gray poorly graded SAND with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 10.4274 D_{60}= 2.0996 D_{50}= 1.1949
D_{30}= 0.4752 D_{15}= 0.2647 D_{10}= 0.2034
C_u= 10.32 C_c= 0.53

Classification

USCS= SP-SM AASHTO=

Remarks

As Received Moisture Content: 7.9%

Location: No. 9-805/11F-2, 103.0'-104.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle

Project: Monitoring Well Installations

Project No: 138455

Tested By: BB **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/11F-2, 103.0'-104.0'
Material Description: gray poorly graded SAND with silt and gravel
Date: 9-25-06
USCS Classification: SP-SM
Testing Remarks: As Received Moisture Content: 7.9%
Tested by: BB **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1010.70	237.77	0.00	1.5	0.00	100.0
			1.0	45.42	94.1
			.75	59.09	92.4
			.50	94.05	87.8
			.375	126.28	83.7
			#4	207.46	73.2
			#10	315.54	59.2
50.65	0.00	0.00	#20	13.61	43.3
			#40	27.42	27.1
			#60	38.88	13.8
			#100	44.89	6.7
			#200	46.11	5.3

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =59.2
Weight of hydrometer sample =50.65
Hygroscopic moisture correction:
Moist weight and tare = 51.89
Dry weight and tare = 51.84
Tare weight = 30.42
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =5.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

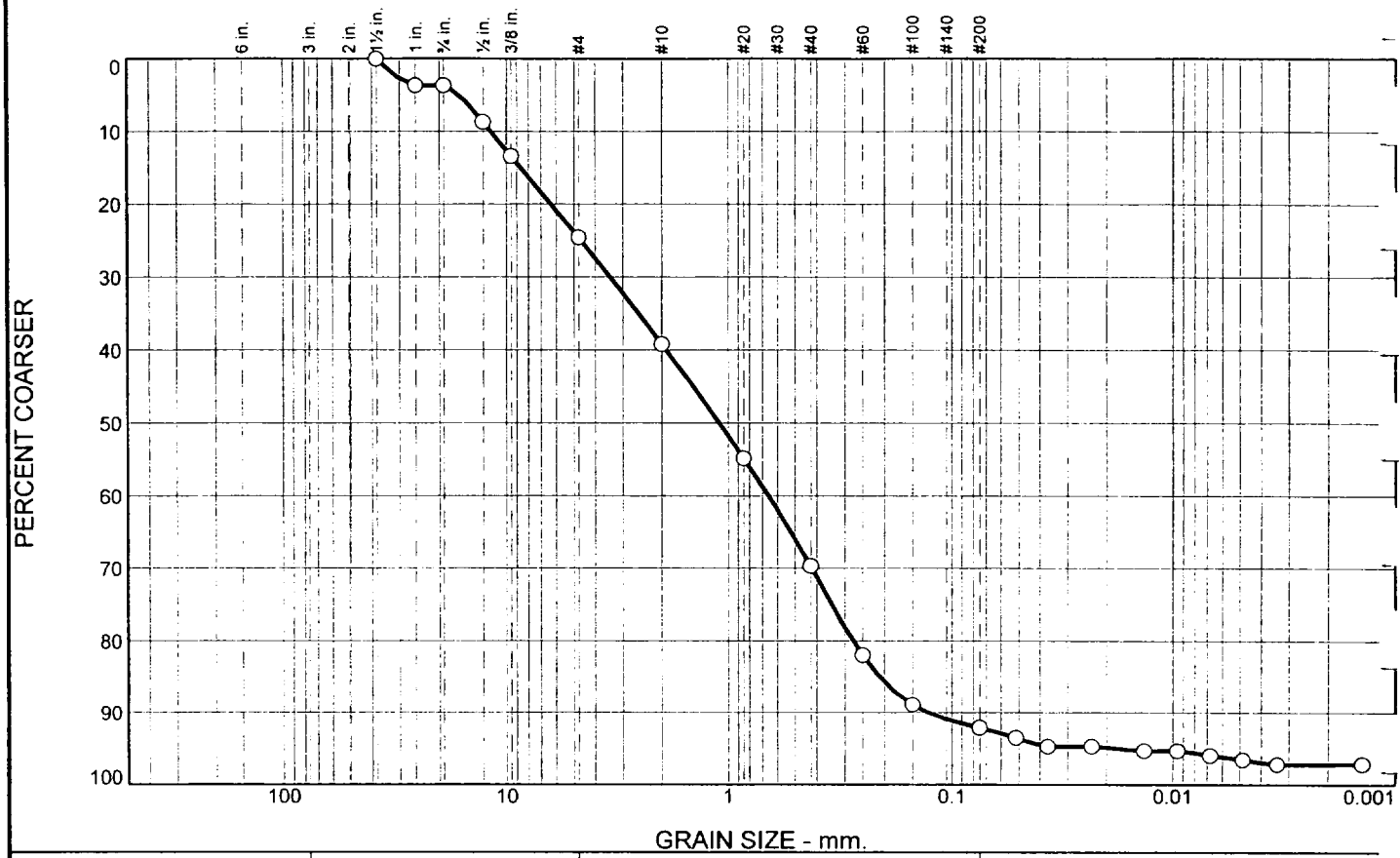
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0531	3.3
2.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0376	3.3
5.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0238	3.3
15.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0137	3.3
30.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0097	3.3
60.00	19.5	8.0	2.9	0.0137	8.0	15.0	0.0069	3.3
120.00	19.0	8.0	2.8	0.0138	8.0	15.0	0.0049	3.2
250.00	18.5	8.0	2.6	0.0139	8.0	15.0	0.0034	3.1
1440.00	18.5	7.0	1.6	0.0139	7.0	15.1	0.0014	1.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	7.6	19.2	26.8	14.0	32.1	21.8	67.9	2.8	2.5	5.3

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.2034	0.2647	0.3245	0.4752	1.1949	2.0996	7.4495	10.4274	14.9757	27.6220

Fineness Modulus	C_u	C_c
3.79	10.32	0.53

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.6	21.0	14.6	30.4	22.5	5.0	2.5

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.5	100.0		
1.0	96.4		
.75	96.4		
.50	91.3		
.375	86.7		
#4	75.4		
#10	60.8		
#20	45.2		
#40	30.4		
#60	18.1		
#100	11.2		
#200	7.9		

* (no specification provided)

Material Description

gray SAND with silt and gravel (visual)

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 8.5989 D_{60}= 1.9053 D_{50}= 1.0922
D_{30}= 0.4185 D_{15}= 0.2089 D_{10}= 0.1272
C_u= 14.98 C_c= 0.72

Classification

USCS= AASHTO=

Remarks

As Received Moisture Content: 7.4%

Location: No. 9-805/11F-3, 104.0'-105.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: MC **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/26/2006

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/11F-3, 104.0'-105.0'
Material Description: gray SAND with silt and gravel (visual)
Date: 9-25-06
Testing Remarks: As Received Moisture Content: 7.4%
Tested by: MC **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1060.60	229.64	0.00	1.5	0.00	100.0
			1.0	30.30	96.4
			.75	30.30	96.4
			.50	71.88	91.3
			.375	110.93	86.7
			#4	204.11	75.4
			#10	325.36	60.8
100.06	0.00	0.00	#20	25.70	45.2
			#40	50.12	30.4
			#60	70.33	18.1
			#100	81.69	11.2
			#200	87.01	7.9

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =60.8
Weight of hydrometer sample =100.06
Hygroscopic moisture correction:
Moist weight and tare = 64.45
Dry weight and tare = 64.37
Tare weight = 31.65
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =4.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type =152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

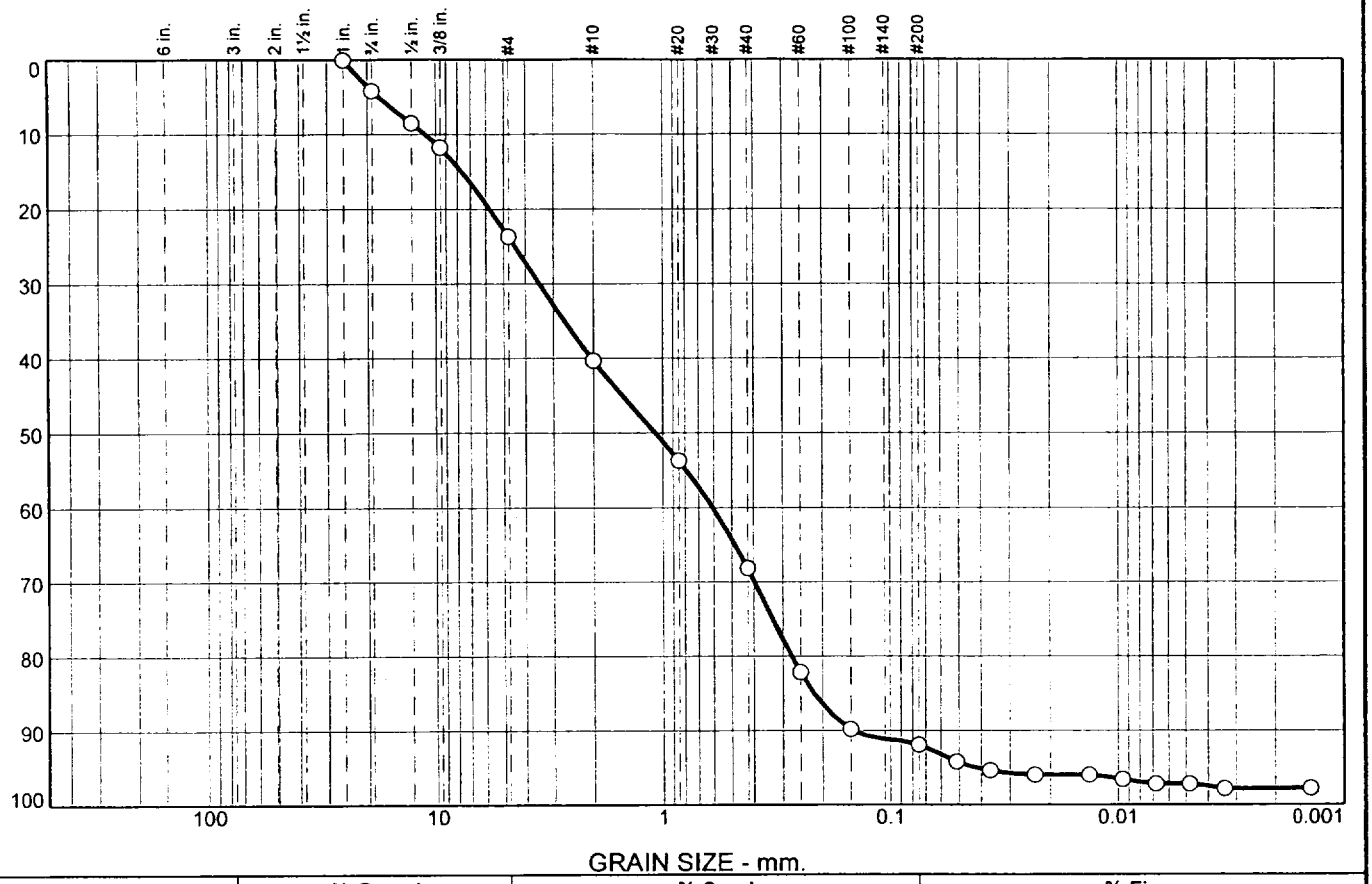
Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.0	15.0	10.8	0.0138	15.0	13.8	0.0514	6.6
2.00	19.0	13.0	8.8	0.0138	13.0	14.2	0.0368	5.3
5.00	19.0	13.0	8.8	0.0138	13.0	14.2	0.0233	5.3
15.00	19.0	12.0	7.8	0.0138	12.0	14.3	0.0135	4.7
30.00	19.0	12.0	7.8	0.0138	12.0	14.3	0.0095	4.7
60.00	19.0	11.0	6.8	0.0138	11.0	14.5	0.0068	4.1
120.00	19.0	10.0	5.8	0.0138	10.0	14.7	0.0048	3.5
250.00	18.5	9.0	4.6	0.0139	9.0	14.8	0.0034	2.8
1440.00	19.0	9.0	4.8	0.0138	9.0	14.8	0.0014	2.9

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	3.6	21.0	24.6	14.6	30.4	22.5	67.5	5.0	2.9	7.9

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1272	0.2089	0.2746	0.4185	1.0922	1.9053	6.2983	8.5989	11.7002	16.1717

Fineness Modulus	C_u	C_c
3.55	14.98	0.72

GRAIN SIZE DISTRIBUTION REPORT



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	4.2	19.4	16.7	27.8	23.8	5.9	2.2

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
1.0	100.0		
.75	95.8		
.50	91.5		
.375	88.3		
#4	76.4		
#10	59.7		
#20	46.3		
#40	31.9		
#60	17.9		
#100	10.2		
#200	8.1		

* (no specification provided)

Material Description

gray poorly graded SAND with silt and gravel

Atterberg Limits

PL= LL= PI=

Coefficients

D_{85}= 7.6101 D_{60}= 2.0360 D_{50}= 1.0712
D_{30}= 0.3956 D_{15}= 0.2174 D_{10}= 0.1456
C_u= 13.98 C_c= 0.53

Classification

USCS= SP-SM AASHTO=

Remarks

As Received Moisture Content: 7.1%

Location: No. 9-805/11F-4, 105.0'-106.0'

Date: 9-25-06

BOWSER-MORNER, INC.

Dayton, Ohio

Client: Battelle
Project: Monitoring Well Installations

Project No: 138455

Tested By: MC **Checked By:** SV

GRAIN SIZE DISTRIBUTION TEST DATA

9/25/200

Client: Battelle
Project: Monitoring Well Installations
Project Number: 138455
Location: No. 9-805/11F-4, 105.0'-106.0'
Material Description: gray poorly graded SAND with silt and gravel
Date: 9-25-06
USCS Classification: SP-SM
Testing Remarks: As Received Moisture Content: 7.1%
Tested by: MC **Checked by:** SV

Dry Sample and Tare (grams)	Tare (grams)	Cumulative Pan Tare Weight (grams)	Sieve Opening Size	Cumulative Weight Retained (grams)	Percent Finer
1025.60	225.25	0.00	1.0	0.00	100.0
			.75	33.47	95.8
			.50	67.87	91.5
			.375	93.69	88.3
			#4	189.14	76.4
			#10	322.59	59.7
100.22	0.00	0.00	#20	22.47	46.3
			#40	46.66	31.9
			#60	70.21	17.9
			#100	83.08	10.2
			#200	86.59	8.1

Hydrometer test uses material passing#10
Percent passing #10 based upon complete sample =59.7
Weight of hydrometer sample =100.00
Hygroscopic moisture correction:
Moist weight and tare = 62.01
Dry weight and tare = 61.93
Tare weight = 28.22
Hygroscopic moisture =0.2%
Automatic temperature correction
Composite correction (fluid density and meniscus height) at 20 deg. C =6.0
Meniscus correction only =0.0
Specific gravity of solids =2.65
Hydrometer type = 152H
Hydrometer effective depth equation: L =16.294964 - 0.164 x Rm

Elapsed Time (min.)	Temp. (deg. C.)	Actual Reading	Corrected Reading	K	Rm	Eff. Depth	Diameter (mm.)	Percent Finer
1.00	19.0	16.0	9.8	0.0138	16.0	13.7	0.0511	5.8
2.00	19.0	14.0	7.8	0.0138	14.0	14.0	0.0366	4.6
5.00	19.0	13.0	6.8	0.0138	13.0	14.2	0.0233	4.0
15.00	19.0	13.0	6.8	0.0138	13.0	14.2	0.0134	4.0
30.00	19.0	12.0	5.8	0.0138	12.0	14.3	0.0095	3.4
60.00	19.0	11.0	4.8	0.0138	11.0	14.5	0.0068	2.8
120.00	19.0	11.0	4.8	0.0138	11.0	14.5	0.0048	2.8
250.00	18.5	10.0	3.6	0.0139	10.0	14.7	0.0034	2.2
1440.00	19.0	10.0	3.8	0.0138	10.0	14.7	0.0014	2.2

Cobbles	Gravel			Sand				Fines		
	Coarse	Fine	Total	Coarse	Medium	Fine	Total	Silt	Clay	Total
0.0	4.2	19.4	23.6	16.7	27.8	23.8	68.3	5.9	2.2	8.1

D_{10}	D_{15}	D_{20}	D_{30}	D_{50}	D_{60}	D_{80}	D_{85}	D_{90}	D_{95}
0.1456	0.2174	0.2733	0.3956	1.0712	2.0360	5.7314	7.6101	10.9832	17.8143

Fineness Modulus	C_u	C_c
3.53	13.98	0.53

TABLE 1

SUMMARY OF RADIOLOGICAL ANALYSES OF GROUNDWATER MONITORING WELLS
WEST JEFFERSON SITE - CY 2006

pCi/L

Aug-06 NUCLIDE	WELL #2-885	WELL #2-855	WELL #2-805	WELL #3-855A	WELL #3-855B	WELL #3-805	WELL #4-885	WELL #4-855	WELL #4-805
Gross Alpha	*8.00E+00* *	3.00E+00	*5.00E+00* *	*1.00E+01* *	3.00E+00	3.00E+00	*6.00E+00* *	*5.00E+00* *	3.00E+00
Gross Beta	*1.50E+01* *	*1.30E+01* *	*7.00E+00* *	*6.00E+00* *	*9.70E+01* *	*8.00E+00* *	*3.83E+02* *	*6.00E+00* *	4.00E+00
Co-60	1.94E+00	1.58E+00	1.94E+00	1.43E+00	1.80E+00	1.22E+00	2.79E+00	1.31E+00	1.30E+00
Sr-90	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Sb-125	5.49E+00	3.62E+00	5.12E+00	3.33E+00	4.98E+00	3.18E+00	7.06E+00	3.81E+00	3.67E+00
Cs-134	1.79E+00	1.31E+00	1.81E+00	1.15E+00	1.58E+00	1.08E+00	2.25E+00	1.13E+00	1.18E+00
Cs-137	2.04E+00	1.39E+00	2.08E+00	1.39E+00	1.87E+00	1.23E+00	2.87E+00	1.29E+00	1.34E+00
Eu-152	1.18E+01	7.74E+00	1.06E+01	6.53E+00	9.62E+00	6.07E+00	1.39E+01	6.55E+00	6.47E+00
Eu-154	3.97E+00	2.66E+00	3.91E+00	2.37E+00	3.73E+00	2.38E+00	5.01E+00	2.53E+00	2.50E+00
Am-241	2.30E+01	7.60E+00	2.15E+01	6.58E+00	2.06E+01	6.53E+00	2.85E+01	6.66E+00	7.25E+00
Pu-238 (a)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Pu-239 (a)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
U-234 (a)	*6.97E+00* *	*3.76E+00* *	*5.98E+00* *	*1.38E+01* *	*8.22E+00* *	1.00E+00	*4.45E+01* *	1.00E+00	1.00E+00
U-235 (a)	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	*5.07E+00* *	1.00E+00	1.00E+00
U-238 (a)	*4.76E+00* *	*2.95E+00* *	*3.18E+00* *	*6.07E+00* *	*8.07E+00* *	1.00E+00	*4.55E+01* *	1.00E+00	1.00E+00

* *DENOTES CALCULATED VALUE, ALL OTHER VALUES ARE LESS THAN OR EQUAL TO MDA*

(a) DENOTES ANALYSIS PERFORMED BY ALPHA SPECTROSCOPY

Sep-06 NUCLIDE	WELL #5-855	WELL #5-805	WELL #6-885	WELL #6-855	WELL #6-805	WELL #7-885	WELL #7-855	WELL #7-805	WELL #8-885	WELL #8-855	WELL #8-805	WELL #9-855	WELL #9-805
Gross Alpha	*4.00E+00* *	*3.00E+00* *	*4.00E+00* *	*1.40E+01* *	*5.00E+00* *	*9.00E+00* *	*9.00E+00* *	*4.00E+00* *	*1.70E+01* *	*5.00E+00* *	*3.00E+00* *	*9.00E+00* *	*9.00E+00* *
Gross Beta	4.00E+00	*4.00E+00* *	4.00E+00	*7.00E+00* *	4.00E+00	*9.00E+00* *	*8.00E+00* *	*1.70E+01* *	*1.00E+01* *	*5.00E+00* *	*1.00E+01* *	*1.40E+01* *	*3.60E+01* *
Co-60	1.26E+00	1.85E+00	1.28E+00	1.39E+00	2.30E+00	2.23E+00	1.57E+00	1.92E+00	1.26E+00	2.30E+00	1.64E+00	1.84E+00	1.36E+00
Sr-90	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00	1.00E+00
Sb-125	3.01E+00	4.69E+00	3.90E+00	4.13E+00	5.68E+00	5.82E+00	4.14E+00	4.91E+00	3.34E+00	6.22E+00	4.37E+00	4.95E+00	3.52E+00
Cs-134	1.09E+00	1.61E+00	1.34E+00	1.46E+00	1.97E+00	2.21E+00	1.49E+00	1.64E+00	1.06E+00	1.98E+00	1.40E+00	1.84E+00	1.31E+00
Cs-137	1.19E+00	1.76E+00	1.36E+00	1.56E+00	2.31E+00	2.64E+00	1.49E+00	*6.01E+00* *	1.24E+00	2.13E+00	1.75E+00	2.01E+00	1.27E+00
Eu-152	4.85E+00	8.89E+00	6.76E+00	7.17E+00	1.12E+01	1.10E+01	8.43E+00	9.50E+00	6.48E+00	1.17E+01	7.96E+00	1.12E+01	6.60E+00
Eu-154	2.28E+00	3.28E+00	2.48E+00	2.86E+00	3.99E+00	4.53E+00	2.84E+00	3.33E+00	2.28E+00	4.01E+00	2.82E+00	3.86E+00	2.54E+00
Am-241	6.16E+00	1.92E+01	8.69E+00	8.15E+00	2.34E+01	2.46E+01	9.51E+00	1.85E+01	*8.60E+00* *	2.38E+01	8.61E+00	2.12E+01	*1.24E+01* *

* *DENOTES CALCULATED VALUE, ALL OTHER VALUES ARE LESS THAN OR EQUAL TO MDA*

FedEx Express **US Airbill**

FedEx Tracking Number 8596 7510 1306

Recipient's Copy

From This portion can be removed for Recipient's records.

Date 11/15/06 FedEx Tracking Number 859675101306

Sender's Name Joe Jacobsen Phone 614 424-4098

Company BATTELLE COLUMBUS LABS

Address 1425 STATE ROUTE 142 NE

Dept./Floor/Suite/Room

City WEST JEFFERSON State OH ZIP 43162

Your Internal Billing Reference

To

Recipient's Name Mike McCann Phone 630 829-9856

Company USNRC Region III

Recipient's Address 2443 Warrenville Road Suite 210

We cannot deliver to P.O. boxes or P.O. ZIP codes. Dept./Floor/Suite/Room

Address N/A

To request a package be held at a specific FedEx location, print FedEx address here.

City Lisle State IL ZIP 60532-4352

0348399899

8596 7510 1306

4a Express Package Service *Packages up to 150 lbs.*

- ☐ FedEx Priority Overnight — Next business morning.* Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☑ FedEx Standard Overnight — Next business afternoon.* Saturday Delivery NOT available.
- ☐ FedEx First Overnight — Earliest next business morning delivery to select locations.* Saturday Delivery NOT available.
- ☐ FedEx 2Day — Second business day.* Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx Express Saver — Third business day.* Saturday Delivery NOT available.

FedEx Envelope rate not available. Minimum charge: One-pound rate. * To most locations.

4b Express Freight Service *Packages over 150 lbs.*

- ☐ FedEx 1Day Freight* — Next business day.** Friday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx 2Day Freight — Second business day.** Thursday shipments will be delivered on Monday unless SATURDAY Delivery is selected.
- ☐ FedEx 3Day Freight — Third business day.** Saturday Delivery NOT available.

* Call for Confirmation. ** To most locations.

5 Packaging

- ☐ FedEx Envelope*
- ☑ FedEx Pak* — Includes FedEx Small Pak, FedEx Large Pak, and FedEx Sturdy Pak.
- ☐ FedEx Box
- ☐ FedEx Tube
- ☐ Other

* Declared value limit $500.

6 Special Handling — Include FedEx address in Section 3.

- ☐ **SATURDAY Delivery** — Not available for FedEx Standard Overnight, FedEx First Overnight, FedEx Express Saver, or FedEx 3Day Freight.
- ☐ **HOLD Weekday at FedEx Location** — Not available for FedEx First Overnight.
- ☐ **HOLD Saturday at FedEx Location** — Available ONLY for FedEx Priority Overnight and FedEx 2Day to select locations.

Does this shipment contain dangerous goods? One box must be checked.

- ☑ No
- ☐ Yes — As per attached Shipper's Declaration.
- ☐ Yes — Shipper's Declaration not required.
- ☐ Dry Ice — Dry Ice, 9, UN 1845 ____ x ____ kg
- ☐ Cargo Aircraft Only

Dangerous goods (including dry ice) cannot be shipped in FedEx packaging.

7 Payment *Bill to:* — Enter FedEx Acct. No. or Credit Card No. below. Obtain Recip. Acct. No. ☐

- ☑ Sender — Acct. No. in Section 1 will be billed.
- ☐ Recipient
- ☐ Third Party
- ☐ Credit Card
- ☐ Cash/Check

Total Packages	Total Weight	Total Charges
1	≈5 lbs.	Credit Card Auth.

†Our liability is limited to $100 unless you declare a higher value. See the current FedEx Service Guide for details.

8 *NEW* Residential Delivery Signature Options If you require a signature, check Direct or Indirect.

- ☐ No Signature Required — Package may be left without obtaining a signature for delivery.
- ☐ Direct Signature — Anyone at recipient's address may sign for delivery. *Fee applies.*
- ☐ Indirect Signature — If no one is available at recipient's address, anyone at a neighboring address may sign for delivery. *Fee applies.*

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