SOIL SURVEY REPORT

I-49 MISSOURI ROUTE H TO ARKANSAS STATE LINE McDONALD COUNTY, MISSOURI MoDOT Project No. J7P0601

FOR

MISSOURI DEPARTMENT OF TRANSPORTATION

BY

HNTB CORPORATION

FEBRUARY 2004



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FOR

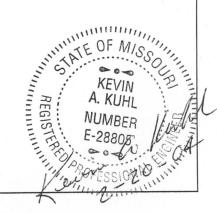
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TABLE OF CONTENTS

1.0	INTRODUCTION - PROJECT DESCRIPTION
2.0	SOIL TYPES AND GEOLOGIC FORMATIONS
3.0	FIELD INVESTIGATIONS
4.0	GRADING RECOMMENDATIONS 4.1 Earthwork Factors
5.0	SLOPES 5.1 Fill Slopes 5.2 Cut Slopes 5.2.1 Soil 5.2.2 Rock
6.0	ROADWAY DRAINAGE STRUCTURES
7.0	PAVEMENT RECOMMENDATIONS 7.1 Traffic Evaluation 7.2 Pavement Subgrade Evaluation 7.3 Structural Coefficients and Material Values 7.4 Pavement Section Alternatives 7.4.1 I-49 Pavement Alternatives 7.4.2 Route 90 Pavement Alternatives
8.0	FIGURES FIGURES 1 THROUGH 20 – As-Drilled Boring Location Plan And Roadway Profiles
9.0	BORING LOGS 9.1 As-Drilled Boring Coordinates 9.2 Roadway Boring Logs 9.3 Roadway Core Boring Logs 9.4 Roadway Structure Boring Logs
10.0	TEST DATA 10.1 Summary of Laboratory Test Data 10.2 Grain Size Curves 10.3 Standard Compaction Results 10.4 Unconfined Compression Strength Results 10.5 California Bearing Ratio Results
11.0	MoDOT TRAFFIC INFORMATION

1.0 INTRODUCTION – PROJECT DESCRIPTION

The I-49 project is located in McDonald County, Missouri beginning south of Pineville, Missouri extending south to the Missouri/Arkansas State Line. Beginning at Station 723+96 and ending at Station 988+32, this portion of roadway extends approximately 5.1 miles in length. Immediately north of this project is the MoDOT project Job No. J7P0601. A copy of the Soil Survey and Plans were made available to HNTB. These documents were used in the current analysis and portions of the recommendations included in the following paragraphs.

Proposed construction consists of grading and paving for four lanes of fully-controlled access highway on a complete relocation. The two southbound and two northbound lanes will be separated by a 60-foot wide median. The following bridge structures are as follows:

- Route I-49 Northbound over U.S. 71 Southbound (Bridge No. A6380)
- Existing Route 90 over Route I-49 (Bridge No. 7000)
- Three Box Bridges located at Project Centerline Stations 794+88, 936+98, 986+85

For these bridge structures, recommendations are provided in separate reports. These recommendations include foundation type, depth, and allowable bearing capacities.

The project will also require drainage structures such as box culverts, reinforced concrete pipes (RCP's) and median drains to reestablish drainage.

This report covers the roadway portion of the project which includes grading, drainage structure, roadway slope, and pavement design recommendations.

The field investigations for this soil survey were performed October 2002 through August 2003. The drilling, sampling, and testing were performed under a subcontract with Terracon Consultants, Inc., Springdale, Arkansas.

As-drilled boring coordinates are included in Section 9.0 along with the boring logs. Boring logs for the above listed bridges are included in their respective reports.

The following page contains a vicinity map showing the proposed construction (bolded lines). Shown also is the MoDOT project just north of that contained in this report.

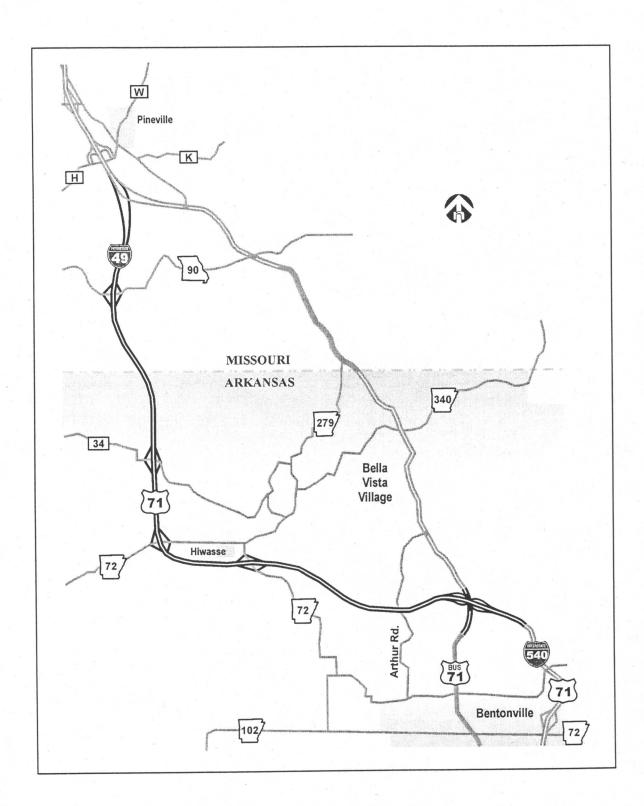


Figure 1: Vicinity Map

2.0 SOIL TYPES AND GEOLOGIC FORMATIONS

The Clarksville Stony Loam and Gravelly Loam Soil Series; residual soils derived from cherty limestone were encountered in this survey. A thin A horizon consisting of silts and chert gravel with some organics present, exists along the alignment, but these soils were limited. The A Horizon total thickness ranges from 0 to 12 inches. The C horizon beneath the A Horizon ranges from light brown to reddish brown clayey gravel and sand to fat clays (CH) and lean clays (CL) with differing percentages of residual sand and gravel content. Chert gravel content ranges from 4 to 90 percent. The thickness of the residual soil overlying rock ranges from 1.5 to 65 feet, with an average thickness of 16.7 feet. General group index of the soils ranges from 0 to 19, based on the MHTD Geology and Soils Manual (1962).

Representative samples were selected for testing at locations along the proposed route of I-49. Test assignments were made by HNTB Corporation and tested by Terracon Consultants, Inc. in general accordance with AASHTO and/or ASTM Standards. A total of 91 moisture content tests were performed with results ranging from 0.7 to 34.8 percent. Six dry density tests were performed with results ranging from 94 pcf to 110.2 pcf. Sixty Atterberg Limit tests were performed with liquid limits ranging from 20 to 56 and plastic limits ranging from 16 to 34. A total of 13 standard proctor tests were performed with optimum moisture contents ranging from 9.4 to 23.7 percent and maximum dry densities ranging from 94.2 pcf to 124.2 pcf. Thirty-eight sieve analysis tests were performed. Gradation curves, test data sheets, and summary table are contained in Section 10.0. Included on the summary table are AASHTO classifications.

Corrosivity testing including pH and conductivity or resistivity was performed on twelve random soil samples. Based on these results, the site soils are considered to be non-corrosive where bridge piles are installed, and a non-aggressive environment for concrete.

The project is underlain by three Mississippian Age bedrock units, the Reeds Spring Formation also known as the Boone Formation, St. Joe Group, and Chattanooga Formation. Most of the roadway cuts will encounter the Reeds Spring Formation which is known to contain Karstic features and caves, cavities, sinkholes, and springs are possible. The Reeds Spring Formation, St. Joe Group, and Chattanooga Formation are generally described as:

Reeds Spring Formation

The Reeds Spring Formation consists of nearly equal parts of alternating bands of hard, finely crystalline, gray or bluish-gray, slightly argillaceous limestone and chert. The chert is nodular and irregularly bedded and is characteristically colored a bluish-black with a distinctive light gray border. However, much of the chert in the formation is colored light tan or mottled tan and gray. Chert is most abundant in the upper part of the formation and makes up from 1/3 to 2/3 of the formation. The thickness in the southernmost part of the state is reportedly 225 feet.

St. Joe Group

Above the Chattanooga is the Compton-Pierson or St. Joe Group. This formation forms many of the prominent bluff and overhangs in the area and can be described as a gray, carbonate, fossiliferous limestone relatively chert free. The thickness reported in the literature ranges from 30 up to 110 feet in thickness. Many of the karstic features are associated with this layer of rock.

Chattanooga Formation

The Chattanooga is a fissile, gray to dark gray, carbonaceous shale. Local concentrations of pyrite nodules and concretions are common. Fresh exposures exhibit a jointed structure giving the shale a tendency to break into prismatic blocks. The formation breaks down quickly and is covered in most areas. In McDonald County, the shale reportedly has a maximum thickness of 20 to 30 feet. Chattanooga shale was encountered at elevations ranging from 1060.1 to 996.5, the lower elevation occurring at the southern end of the project.

3.0 FIELD INVESTIGATIONS

Boring locations were staked in the field by the Missouri Department of Transportation (MoDOT). A series of three borings were taken generally every 200 feet along the alignment through each cut. One boring was drilled at approximate centerline, one offset approximately 120 feet right and one 120 feet left. These borings were advanced by auger to rock. The bedrock was cored to 10 feet below planned grade in at least one boring in each cut area.

For each planned culvert location, borings were generally drilled at the centerline of the alignment and one drilled at the inlet and outlet of the culvert based on preliminary locations. Changes have been made in the location of these structures, therefore the as-drilled boring locations are some distance from the revised locations.

Borings were accomplished using either a tracked CME 850, a truck mounted CME 75, or a track mounted CME 55 drill rig. All borings were logged in the field by a geologist or geotechnical engineer using ASTM visual/manual methods. Logs for these borings are included as Section 9.0 of this report.

Site features located during field operations included identifying rock outcrops, and springs and ponds. Rock outcrops were encountered near station 734+00 (borings MC-18 and MC-19). Photos including a geologic description of the outcrops are included in Roadway Structure Boring Logs, Section 9.0. The noted springs are shown on Figures 3 and 5 at Stations and Offsets of 755+80, 150 feet right of centerline and 768+60, 390 feet right of centerline. Boring MC-85 was drilled at the edge of a pond as shown on Figure 7. This pond extends from approximate Station 805+10 to 806+20.

During field investigations a cave was encountered which was positioned within the alignment. The cave was situated in that portion of the original alignment south of Route 90. The current alignment has been altered from the original location in order to miss the cave. During the subsurface investigations, other karstic features were not

encountered. The borings labeled with suffix of A or B were drilled to provide recommendations for the current alignment.

4.0 GRADING RECOMMENDATIONS

Placement procedures as covered in the MoDOT Standard Specifications are recommended. Embankments should be compacted to at least 95% maximum density near optimum moisture. The laboratory results indicate that the in-situ soil moisture contents are below optimum moisture, therefore, moisture addition will be required to achieve adequate compaction. Lift thickness and compaction requirements for both soil and rock are covered under MoDOT Standard Specifications

The A soil horizon and topsoil contain organics, are poorly drained and exhibit unstable conditions. After clearing and grubbing the area should be stripped according to MoDOT standard specifications. The stripped materials should be stockpiled and used as final cover on slopes to facilitate growth of vegetation.

Where rock outcrops in fill areas, or in other areas where water or wet conditions are present, it is recommended that at least a 2-foot thick rock fill blanket be placed at the base of fills. This will provide a "bleeder blanket" to allow passage of any seepage waters, and should extend and daylight from outside slope to outside of slope. The rock fill material is available from the limestone and chert cuts and should meet the requirements of Section 611.10 of the Standard Specifications.

Where fill is to be placed on existing slopes that are steeper than 3 to 1 (H:V), the fills shall be benched into the soils as stated in the MoDOT Standards or as the Engineer deems necessary.

It is recommended that all limestone or chert excavated from the project be considered as Class C excavation and allowed for use in the 2-foot thick rock fill base under pavements and fills. Some of the limestone or chert may be found to be too weathered and deteriorated during excavation for this use. The rock fill base should extend from ditch to ditch, or be connected to underdrains if daylighting of the rock base is not possible. Personnel skilled in the identification and characterization of rock materials should be consulted during construction on the proper use of Class C rock materials as pavement base. It appears there is sufficient quantity of Rock Fill Base Material available from Class C excavation, although some staging or stockpiling may be necessary. Design estimates should verify the quantity. If sufficient quantities are not available, a provision should be included for contractor furnished material. The rock fill base should consist of locally excavated Class C material placed according to the present standards of Rock Fill Base (Standard Specification 303).

In cut excavations, undergrading in rock and soil should include the removal and replacement of two feet below final pavement subgrade. Undergraded areas should be replaced with Rock Fill Base.

4.1 Earthwork Factors

Shrinkage as taken from the MoDOT Soils and Geology Manual for Clarksville Horizon C soils ranges from 0.98 to 1.28 which depends on the percentage of gravel.

Based on review of the laboratory data, past experience on similar projects, and consideration of other factors involved with large earthwork projects such as erosion, stripping, internal consolidation, and external consolidation an earthwork factor of 0.80 for soil is recommended.

Rock materials, on the other hand, swell in volume when taken from cut to fill. A swell factor of 1.20 is recommended.

Earthwork Summary

- Soil 0.80 (1 cubic yard of soil cut equals 0.8 cubic yards of embankment)
- Rock 1.20 (1 cubic yard of rock excavation equals 1.2 cubic yards of embankment)

5.0 SLOPES

5.1 Fill Slopes

Project borings indicate excavations will be Class A soil material and Class C rock. Class C consists of limestone and chert.

Highly plastic clays (CH classification soils) are considered the most challenging of the soil types. Laboratory tests indicated CH soils are present throughout the soil profile. Most of the fills range in thickness from 40 to 70 feet, but can extend to 115 feet. Utilizing the CH soil, all fill slopes should not be constructed steeper than 3:1 (H:V). If steeper slopes are desired, Class C rock can be placed in fill slopes not steeper than 2:1 (H:V), however the entire embankment should be constructed of the Class C rock material.

It is assumed there will be no sorting of soil and rock materials in the fills other than the rock blanket at the base of the embankments and the 2-foot rock fill pavement base, therefore composite fills should be constructed no steeper than 3:1 (H:V). Care should be taken during construction to avoid internal pockets of rock material surrounded by relatively impervious clay on all sides prohibiting drainage of moisture.

5.2 Cut Slopes 5.2.1 Soil

Soil backslopes along the alignment should be cut no steeper than 3:1 (H:V). Where pinnacled rock is encountered within the primarily soil cuts, the rock can be cut back as for a soil or placed as for rock cuts if stable. To prevent erosion and promote stability, ditches along the top and descending down around the sides of cut slopes should be provided to prevent flow down the face of the cuts.

5.2.2 Rock

Rock encountered in cuts can be excavated with maximum 30-foot heights at a 1/4:1 (H:V) slope. Every 30 feet, a 10-foot wide bench should be constructed. Benches should be graded back from the rock face at a 2% down slope. Benching should be constructed horizontally along the project alignment at the elevations given in the following report section. At the interface of the rock cut slope and soil, the soil should be cut 10 feet back from the face of the rock cut slope and cut no steeper than 3:1 (H:V).

A minimum eight-foot flat bottom ditch width is to be used at the toe of all cuts. The ditch depth of four feet from the shoulder should be sufficient to contain rock fall. Presplit

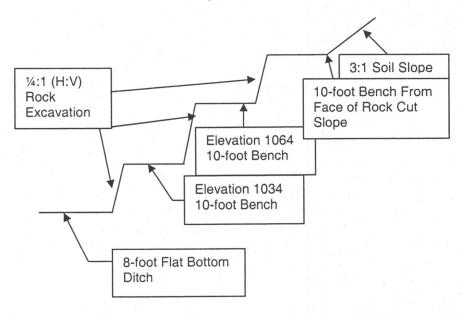
blasting is recommended at all final rock faces to promote long term stability, safety, and reduced maintenance.

The I-49 Northbound Bridge over US-71 Southbound spill slopes are anticipated to be in rock cut. End Bents 1 and 4 were set back from the toe of slope at a 2:1 (H:V). Benching of the spill slopes should be constructed according to MoDOT project J7P0601C soil survey report which indicates ½:1 (H:V) rock cuts with benches in rock cuts over 30 feet at approximately half the depth of cut. Minimum width of benches recommended in the soil survey is 15 feet.

Recommended Cut Slopes

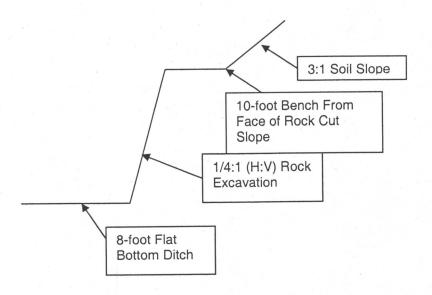
Cut - Northbound Lanes - Station 730 to 740

Rock to be cut at 1/2:1 (H:V) from ditch, 10-foot wide benches at Elevations 1034 and 1064, and 3:1 (H:V) soil backslope. The benches shall be down sloped at 2% from the rock face. At the rock cut interface with the soil slope, the soil should be cut 10 feet back from the face of the rock cut slope.



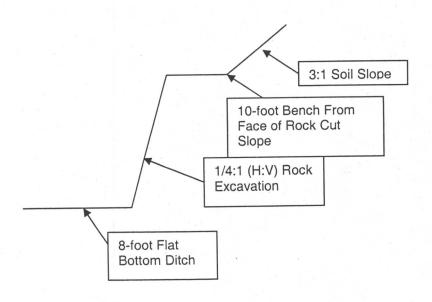
Cut – Northbound Lanes – Station 751 to 756

Rock to be cut at 1/4:1 (H:V) from ditch, and 3:1 (H:V) soil backslope. No bench within the rock face is necessary. At the rock cut interface with the soil slope, the soil should be cut 10 feet back from the face of the rock cut slope.



Cut - Southbound Lanes - Station 730 to 738

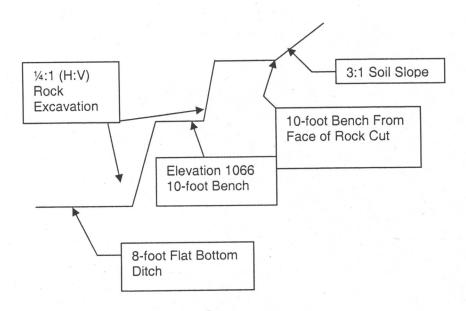
Rock to be cut at $\frac{1}{4}$:1 (H:V) from ditch, and 3:1 (H:V) soil backslope. No bench within the rock face is necessary. At the rock cut interface with the soil slope, the soil excavation should be cut 10 feet back from the face of the rock cut slope.



Cut - I-49 Mainline - Station 773 to 793

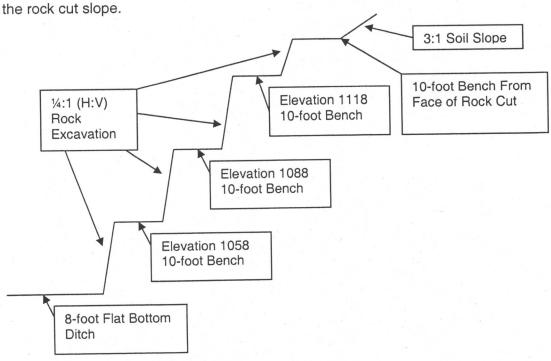
Rock to be cut at 1/4:1 (H:V) from ditch, a 10-foot wide bench at Elevation 1066, and 3:1 (H:V) soil backslope. The benches shall be down sloped at 2% from the rock face. At

the rock cut interface with the soil slope, the soil should be 10 feet back from the face of the rock cut slope.



Cut - I-49 Mainline - Station 798 to 817

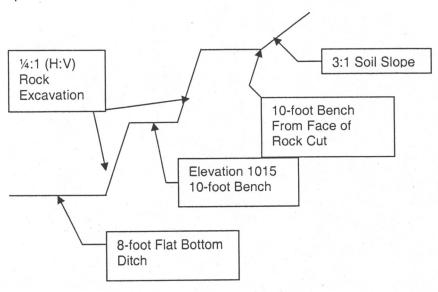
Rock to be cut at 1/4:1 (H:V), 10-foot wide benches at Elevations 1058, 1088 and 1118, and 3:1 (H:V) soil backslope. The benches shall be down sloped at 2% from the rock face. At the interface with the soil slope, the soil should be 10 feet back from the face of



Cut - I-49 Mainline - Station 819 to 830

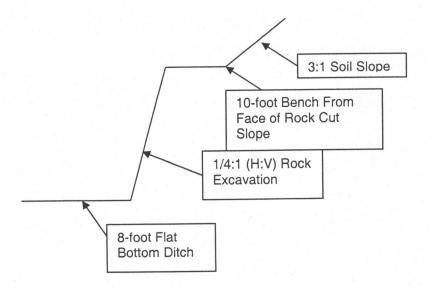
Rock to be cut at 1/4:1 (H:V), a 10-foot wide bench at Elevation 1015, and 3:1 (H:V) soil backslope. The bench shall be down sloped at 2% from the rock face. At the rock cut

interface with the soil slope, the soil should be 10 feet back from the face of the rock cut slope.



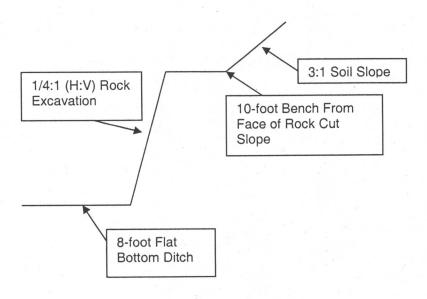
Cut - I-49 Mainline - Station 836 to 840

Rock to be cut at 1/4:1 (H:V) from ditch, and 3:1 (H:V) soil backslope. No bench within the rock face is necessary. At the rock cut interface with the soil slope, the soil should be 10 feet back from the face of the rock cut slope.



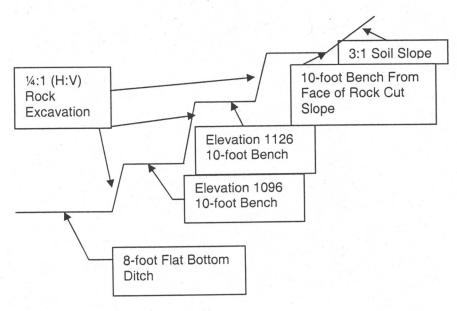
Cut - I-49 Mainline - Station 903 to 907

Rock to be cut at 1/4:1 (H:V) from ditch, and 3:1 (H:V) soil backslope. No bench within the rock face is necessary. At the rock cut interface with the soil slope, the soil should be 10 feet back from the face of the rock cut slope.



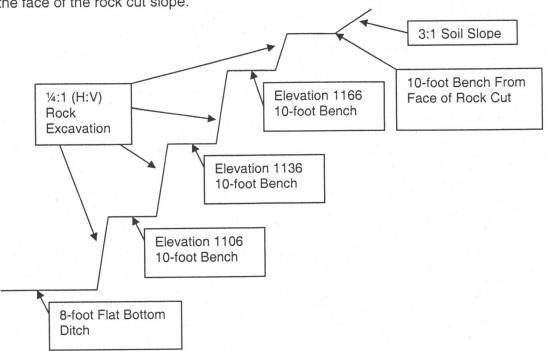
Cut - I-49 Mainline - Station 912 to 935

Rock to be cut at 1/4:1 (H:V) from ditch, 10-foot wide benches at Elevations 1096 and 1126, and 3:1 (H:V) soil backslope. The benches shall be down sloped at 2% from the rock face. At the rock cut interface with the soil slope, the soil should be 10 feet back from the face of the rock cut slope.



Cut - I-49 Mainline - Station 939 to 980

Rock to be cut at 1/4:1 (H:V), 10-foot wide benches at Elevations 1106, 1136 and 1166, and a 3:1 (H:V) soil backslope. The benches shall be down sloped at 2% from the rock face. At the rock cut interface with the soil slope, the soil should be 10 feet back from the face of the rock cut slope.



6.0 ROADWAY DRAINAGE STRUCTURES

To reestablish drainage, box culverts, reinforced concrete pipe (RCP's), and median drainpipes are planned.

Review of the roadway structure borings indicates top of rock or shale to range from 1.5 to 25.5 feet below present site grade. This suggests that rock or shale may be encountered during excavation for the drainage structures. Rock excavation should be anticipated.

For box culverts, based upon the subsurface conditions, bottom slabs should be required. Standard Specification Section 206 applies to box culvert construction.

For reinforced concrete pipe culverts, backfilling and bedding material are important factors in long term performance. These items are covered under MoDOT Standard Specification 726.

7.0 PAVEMENT RECOMMENDATIONS

The new I-49 will be 4 lanes in width, and divided by a median. A roadway which crosses I-49 is Route 90 which is two lanes in width. Alternative flexible and rigid pavement sections as well as values used in the design of these pavements, are presented.

Each lane of I-49 is 12 feet wide, 24 feet in each direction, and separated by a 60-foot wide median. Interior shoulder widths are typically 4 feet and exterior shoulder widths are typically 10 feet. The total roadway width in each direction including shoulders is typically 38 feet.

Route 90 generally consists of two 12-foot wide lanes and two 8-foot shoulders for a total roadway width of 40 feet.

Chapter 6 of the MoDOT "Pavement Development Manual", roadway borings, and laboratory data were used in the following analysis. Pavement sections were determined utilizing DARWin 3.1, a program based on the "AASHTO Guide for Design of Pavement Structures".

7.1 Traffic Information

Traffic loading projections for design were based on information provided by Missouri Department of Transportation. The two-directional average daily traffic (ADT) was determined to be 17,200 vehicles per day (VPD) for the year 2007, truck traffic making up 22% of this volume. A 20-year design life was used to determine the anticipated 18-kip Equivalent Single Axle Loads (ESAL's). The value used for annual truck volume growth rate is 3.3 percent based on back-calculation of the traffic information provided. Section 11.0 contains a copy of the design traffic information provided by MoDOT.

7.2 Pavement Subgrade Evaluation

Roadbed soil resilient modulus for pavement design was derived by correlation with laboratory California Bearing Ratio (CBR) values. Other testing performed along with the CBR tests were standard compaction, sieve analyses, Atterberg limits, and moisture content. These results are included in Section 10.0.

Project uncorrected CBR's ranged from 1.7 to 9.5 at 0.1 inches of penetration. The higher CBR's are associated with the soils that behave more like sands than clays. Representative samples of the site materials were selected for testing and include Fat Clays, Sandy Lean Clays, and Clayey Sands with varying percentages of sand and gravel.

A design CBR value of 2.4 was selected for use in the pavement designs for I-49 and Route 90. This chosen based upon field boring information, laboratory data, correlation with data provided in the "Project Development Manual", and experience with similar soils.

7.3 Structural Coefficients and Material Values

For design of flexible pavements, the following coefficients were used:

- Reliability = 90%
- Standard Deviation = 0.45
- Initial Serviceability = 4.5
- Terminal Serviceability = 2.5

- Resilient Modulus = 3600 psi (based on a laboratory CBR-value of 2.4 for 0.1" penetration)
- Layer Coefficient for Surface Course Material = 0.44
- Layer Coefficient for Base Course Material = 0.36
- Drainage Coefficient = 1.15

For design of rigid pavement, the following structural coefficients were used:

- Reliability = 90%
- Standard Deviation = 0.35
- Initial Serviceability = 4.5
- Terminal Serviceability = 2.5
- Modulus of Subgrade Reaction = 76 psi/in (based on laboratory CBRvalue of 2.4 for 0.1" penetration)
- 28-day Mean Modulus of Elasticity (PCCP) = 3,122,018 psi
- 28-day Mean Modulus of Rupture (PCCP) = 550 psi (assuming 3000 psi concrete)
- Load Transfer (J) = 2.8 (assume plain concrete with doweled joints)

7.4 Pavement Section Alternatives

7.4.1 I-49 Pavement Alternatives

Two pavement alternatives were evaluated: one rigid and one flexible. 1) The rigid alternate is a Portland Cement Concrete Pavement (PCCP) with a 2-foot thick rock base. 2) The flexible alternate is an Asphaltic Cement Concrete (ACC) pavement with a 2-foot thick rock base.

The following table presents the summary of pavement design thickness for both the flexible and rigid alternatives.

NRPCCP*	ACC**
00.250.700	16,771,334
N/A	3600
76	N/A
N/A	6.37
12.0	
	1.75
	13.25
	29,350,709 N/A 76 N/A

^{*} NRPCCP—Non-reinforced Portland Cement Concrete Pavement

7.4.2 Route 90 Pavement Alternatives

Two pavement alternatives were evaluated: one rigid and one flexible. 1) The rigid alternate is a Portland Cement Concrete Pavement (PCCP) with a 4-inch thick Type 5 Base. 2) The flexible alternate is an Asphaltic Cement Concrete (ACC) pavement with a 4-inch thick Type 5 Base.

The following table presents the summary of pavement design thickness for both the flexible and rigid alternatives.

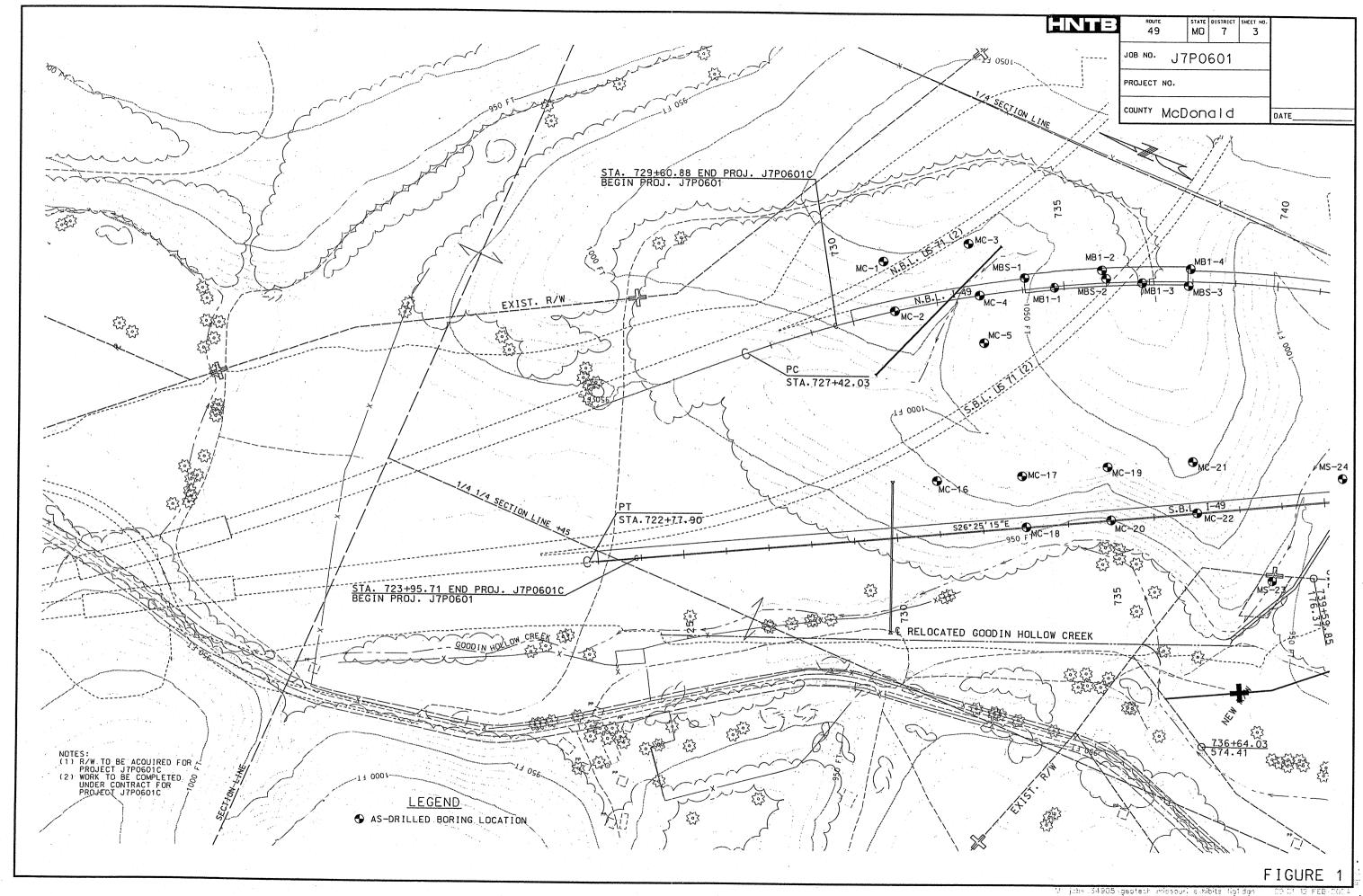
ITEM	NRPCCP*	ACC**
Design E-18's (20-year one way)	1,303,599	744,914
Resilient Modulus, M _R (psi)	N/A	3600
Modulus of Subgrade Reaction, k (psi/in)	76	N/A
Flexible Structural Number, SN (inches)	N/A	4.17
Pavement Thickness, inches	8.0	
Asphalt Surface Course, inches		1.75
Asphalt Base Course, inches		8.0
Type 5 Base, inches	4	4

^{*} NRPCCP—Non-reinforced Portland Cement Concrete Pavement

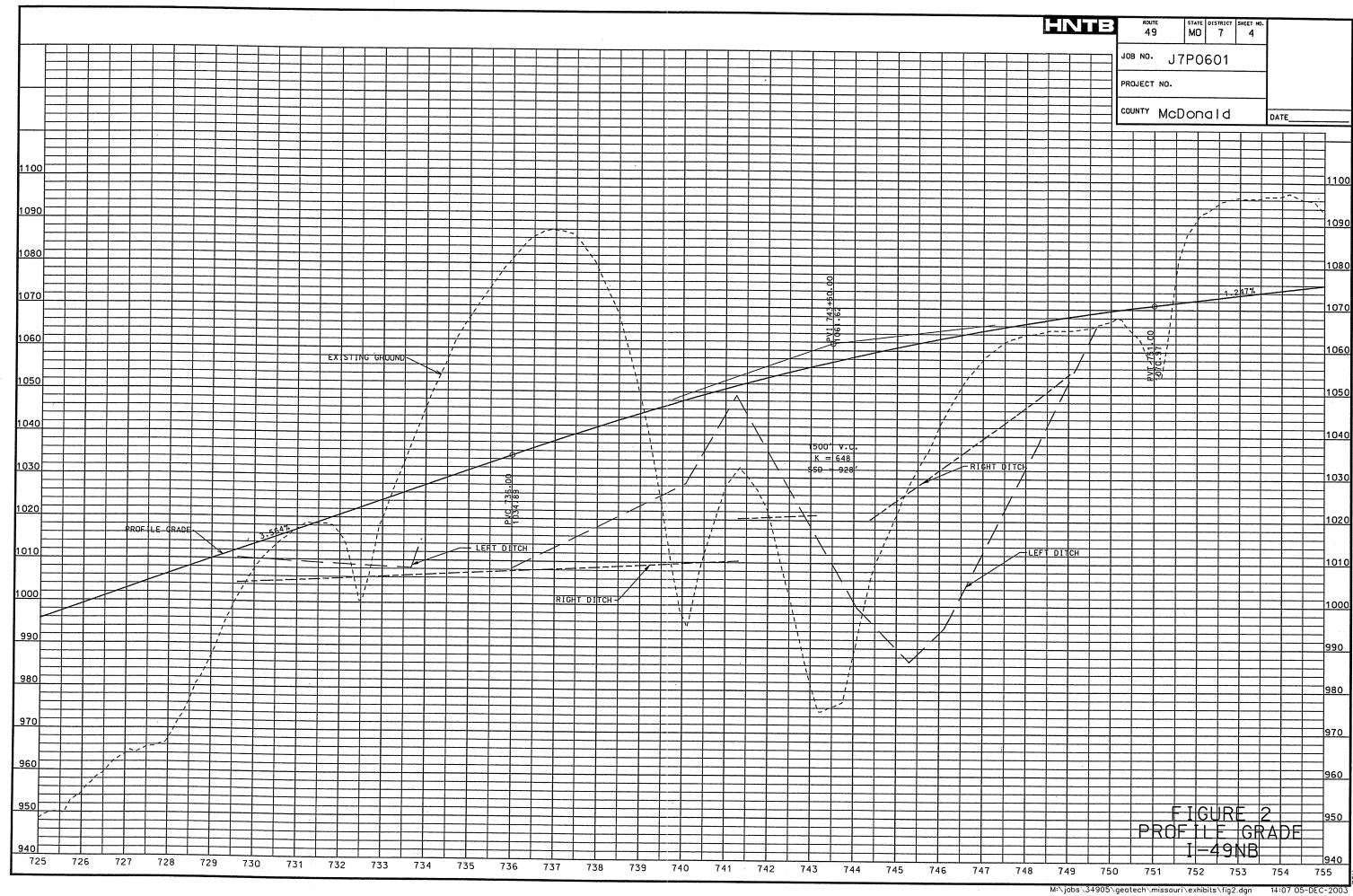
^{**} ACC—Asphaltic Cement Concrete

^{**} ACC—Asphaltic Cement Concrete

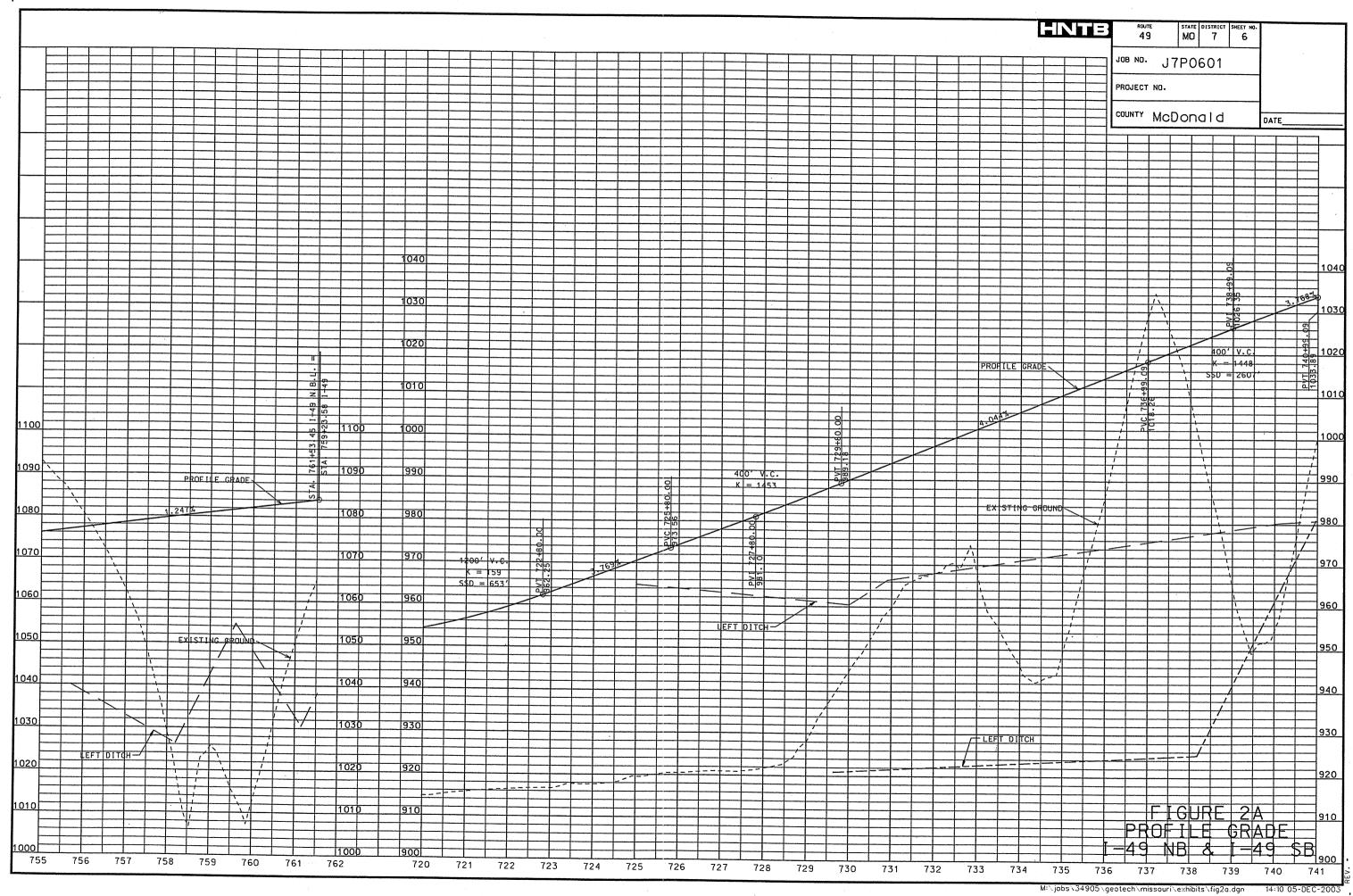
8.0 FIGURES
FIGURES 1 THROUGH 20 – As-Drilled Boring Location Plan and Roadway Profiles



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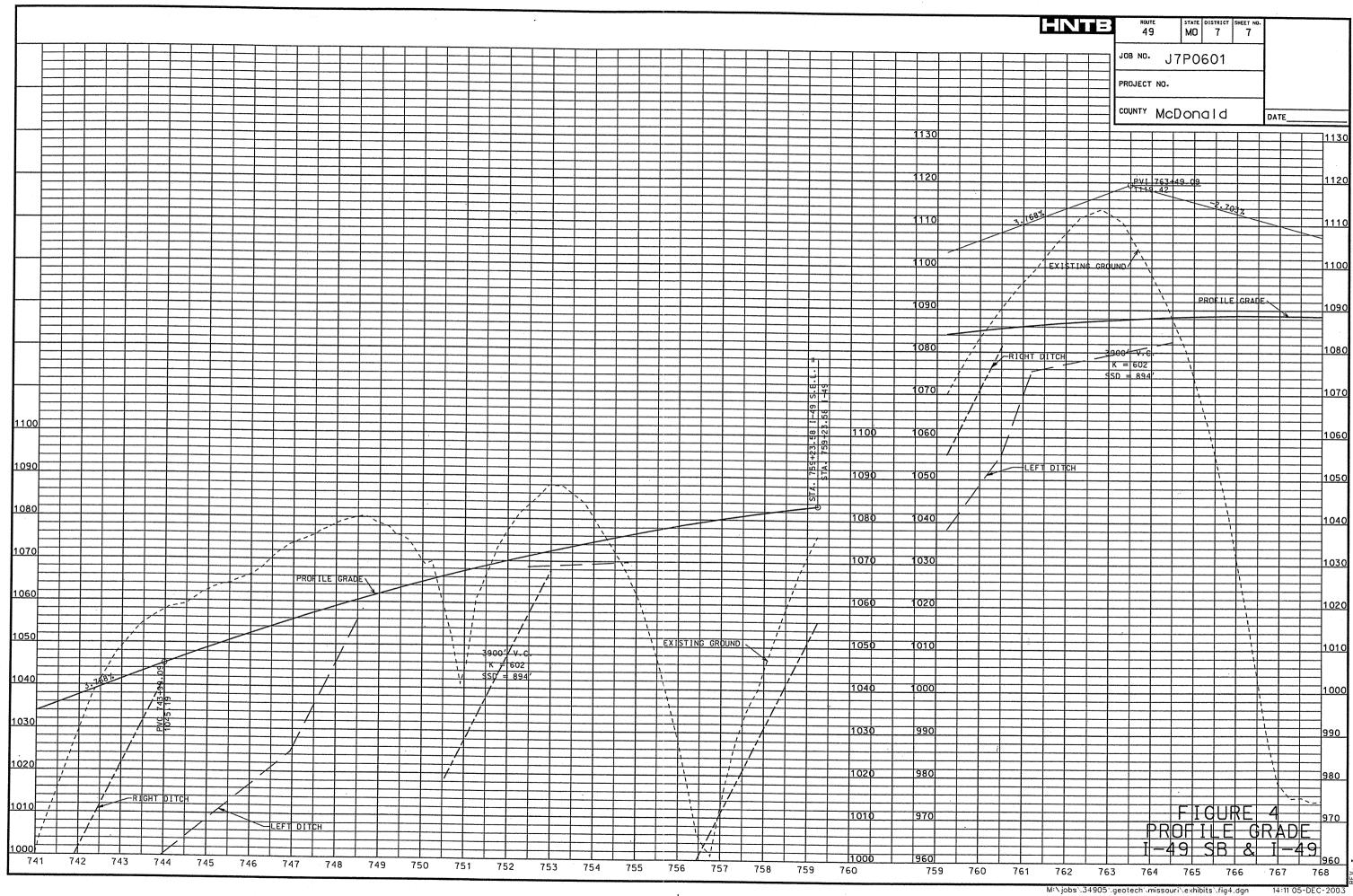
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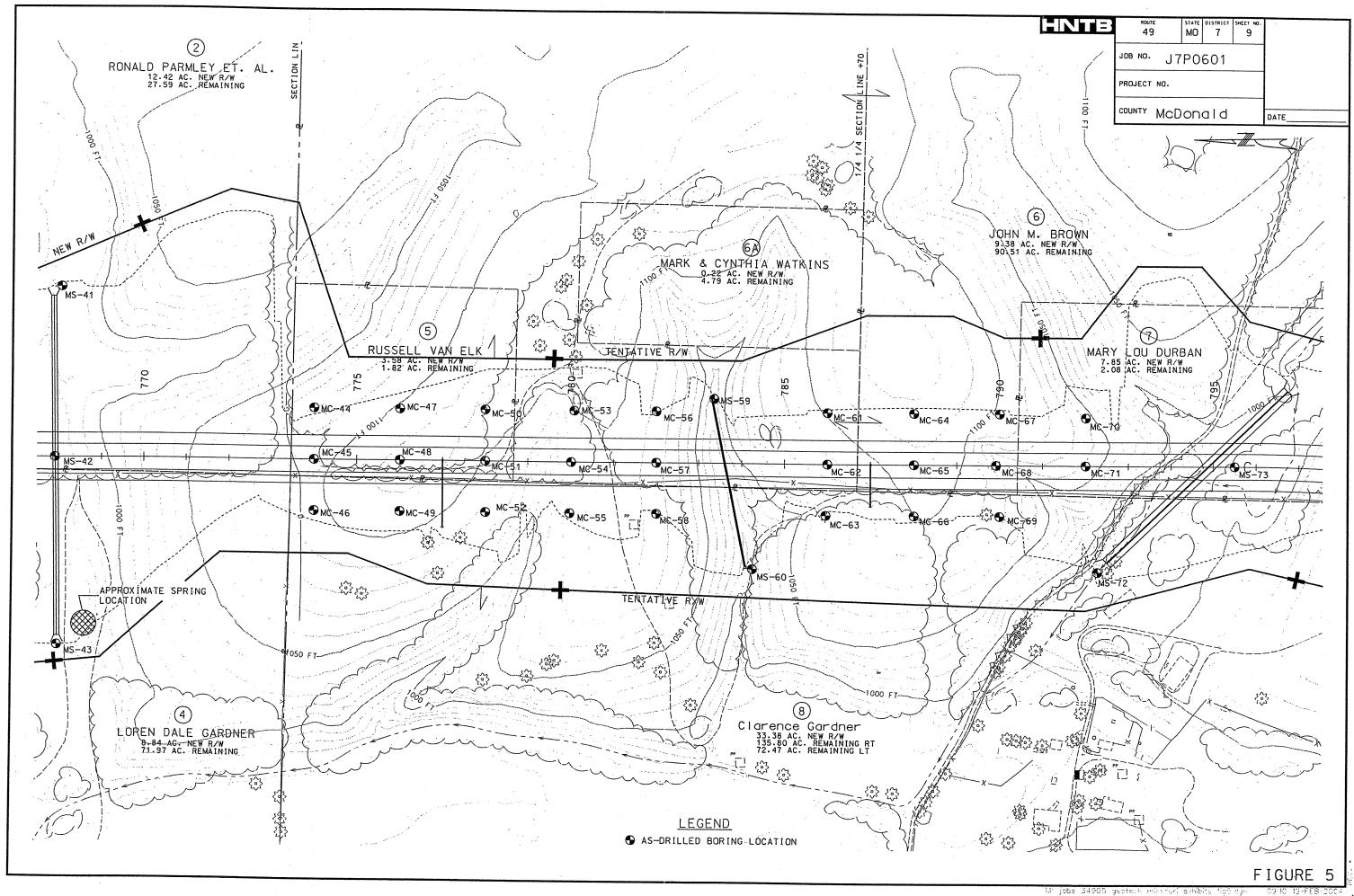
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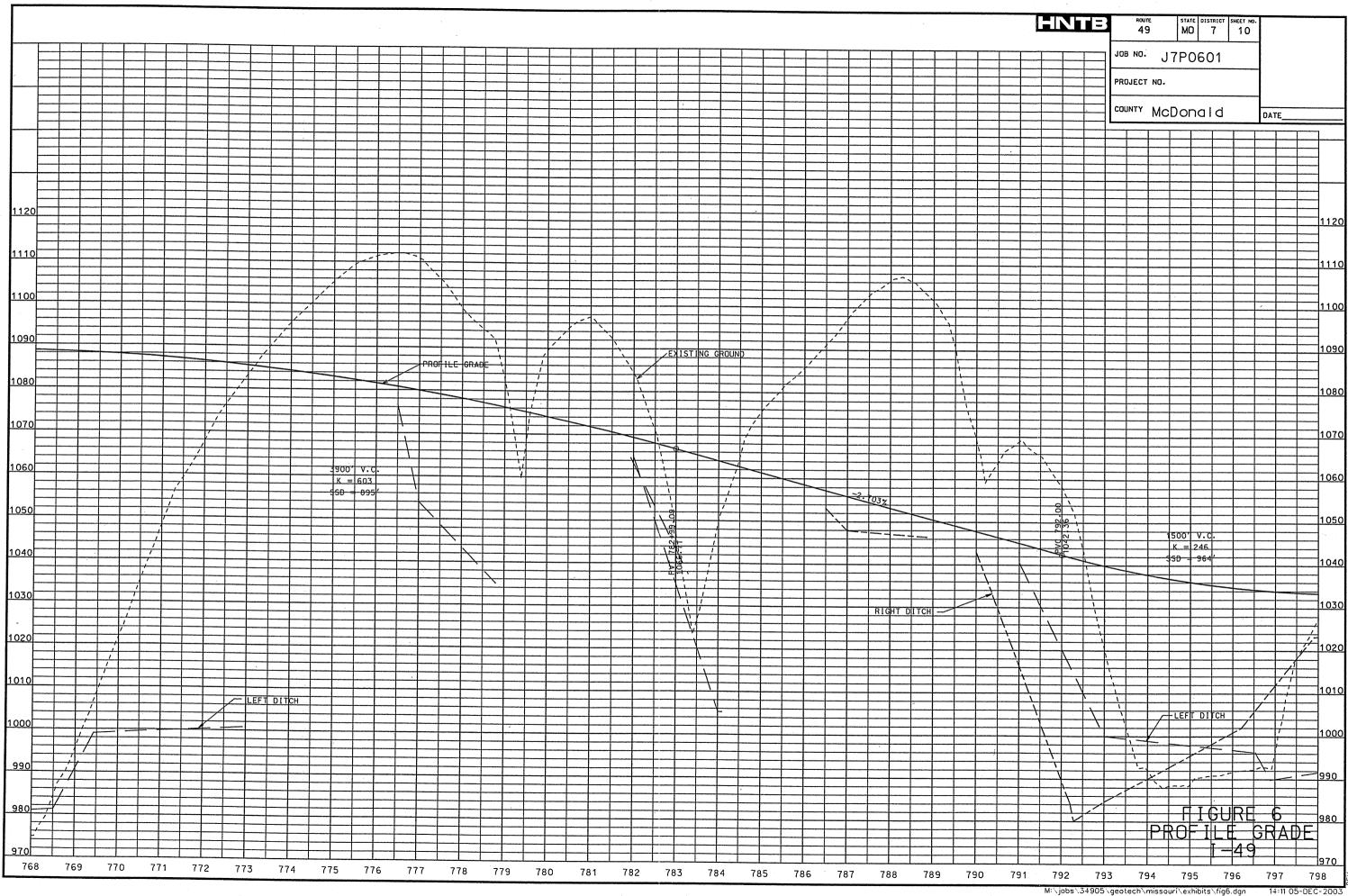
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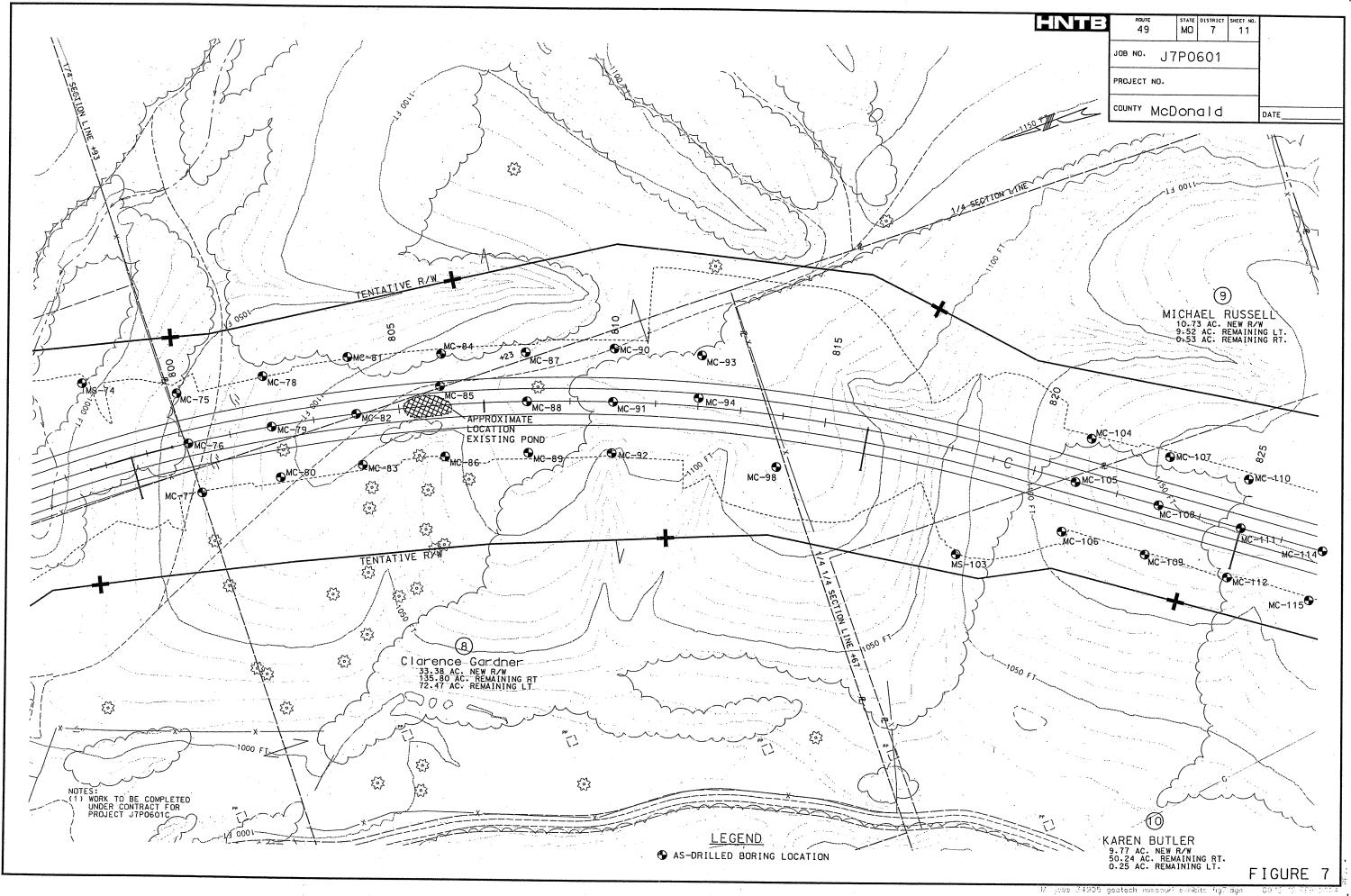
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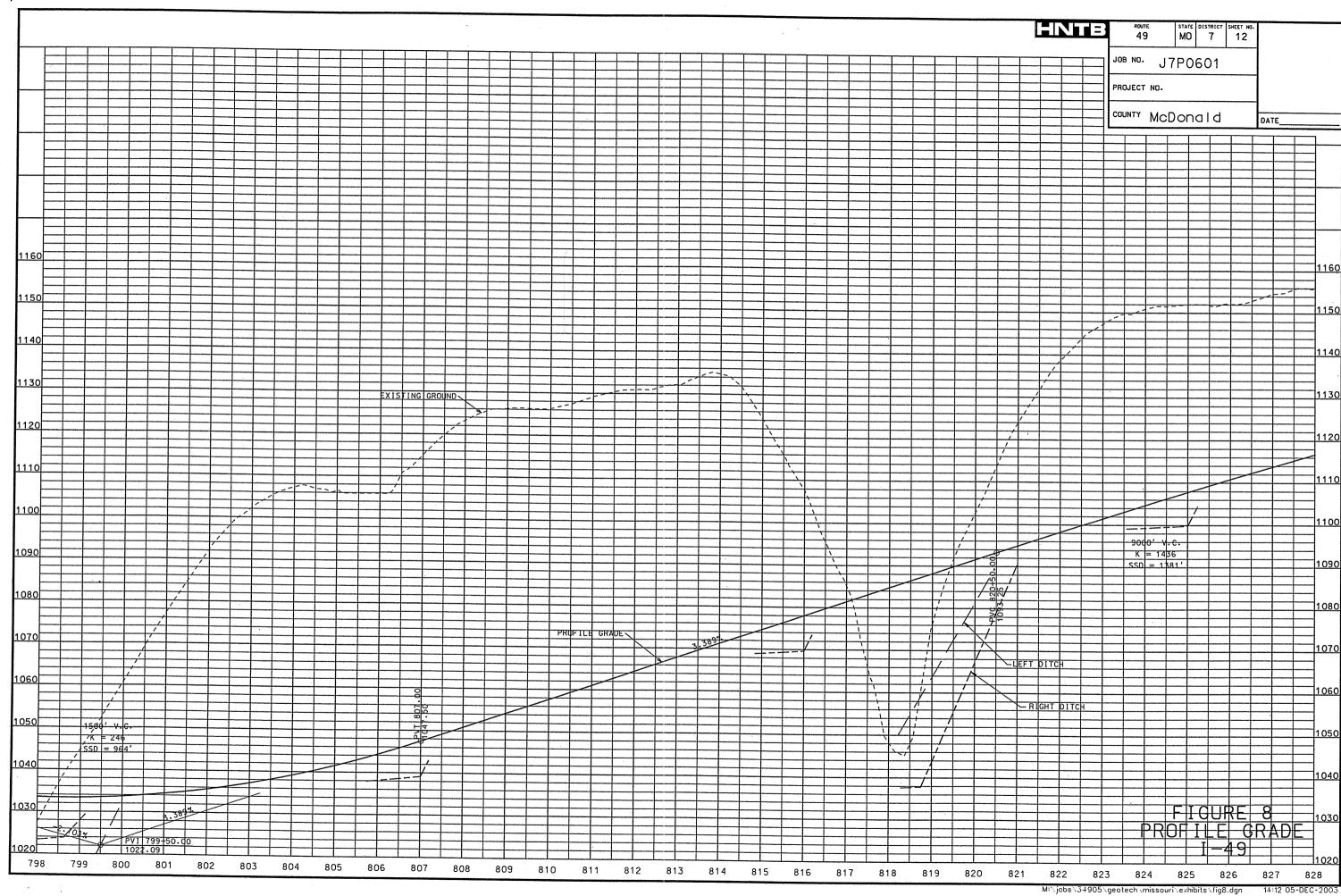
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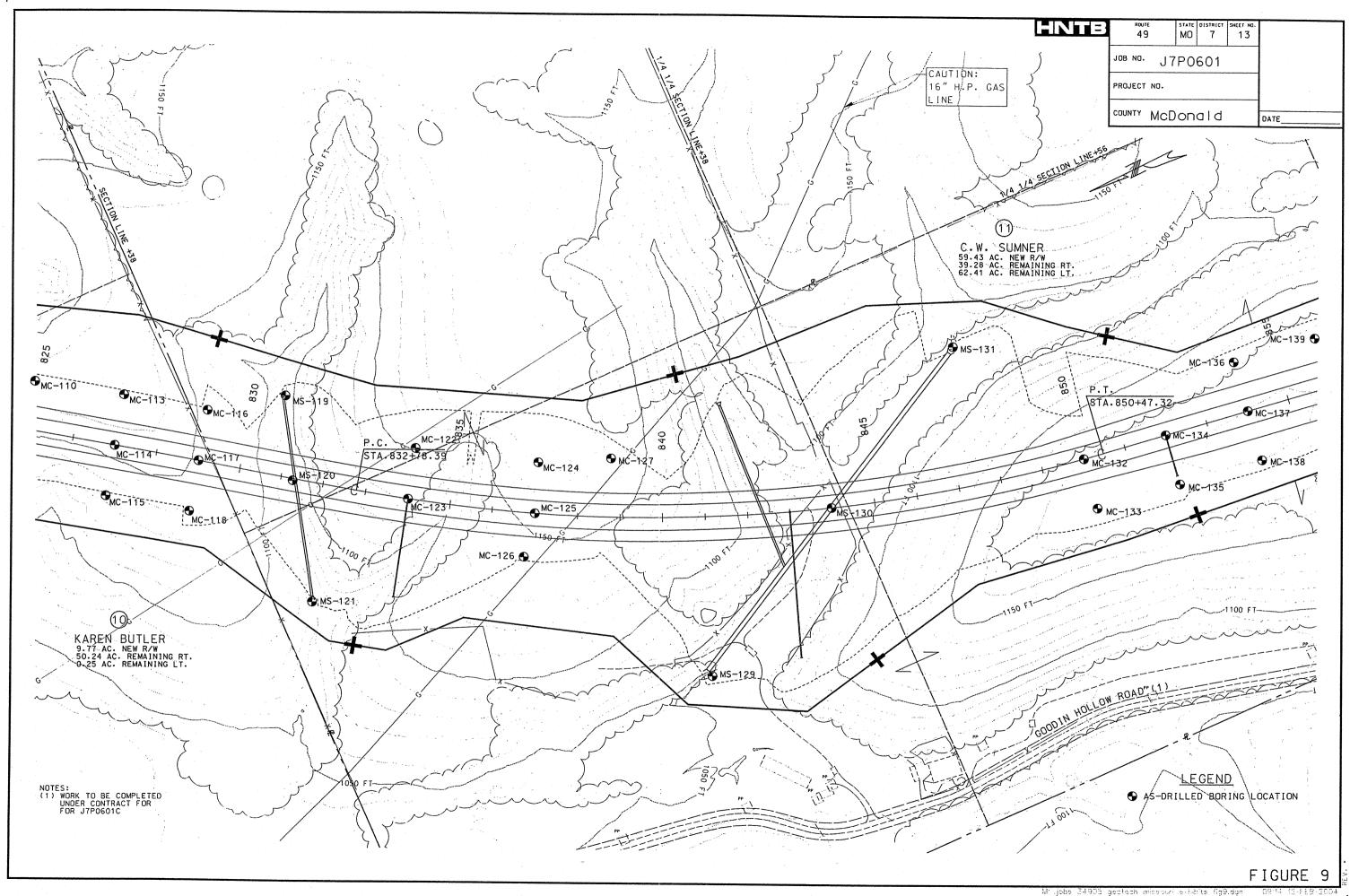
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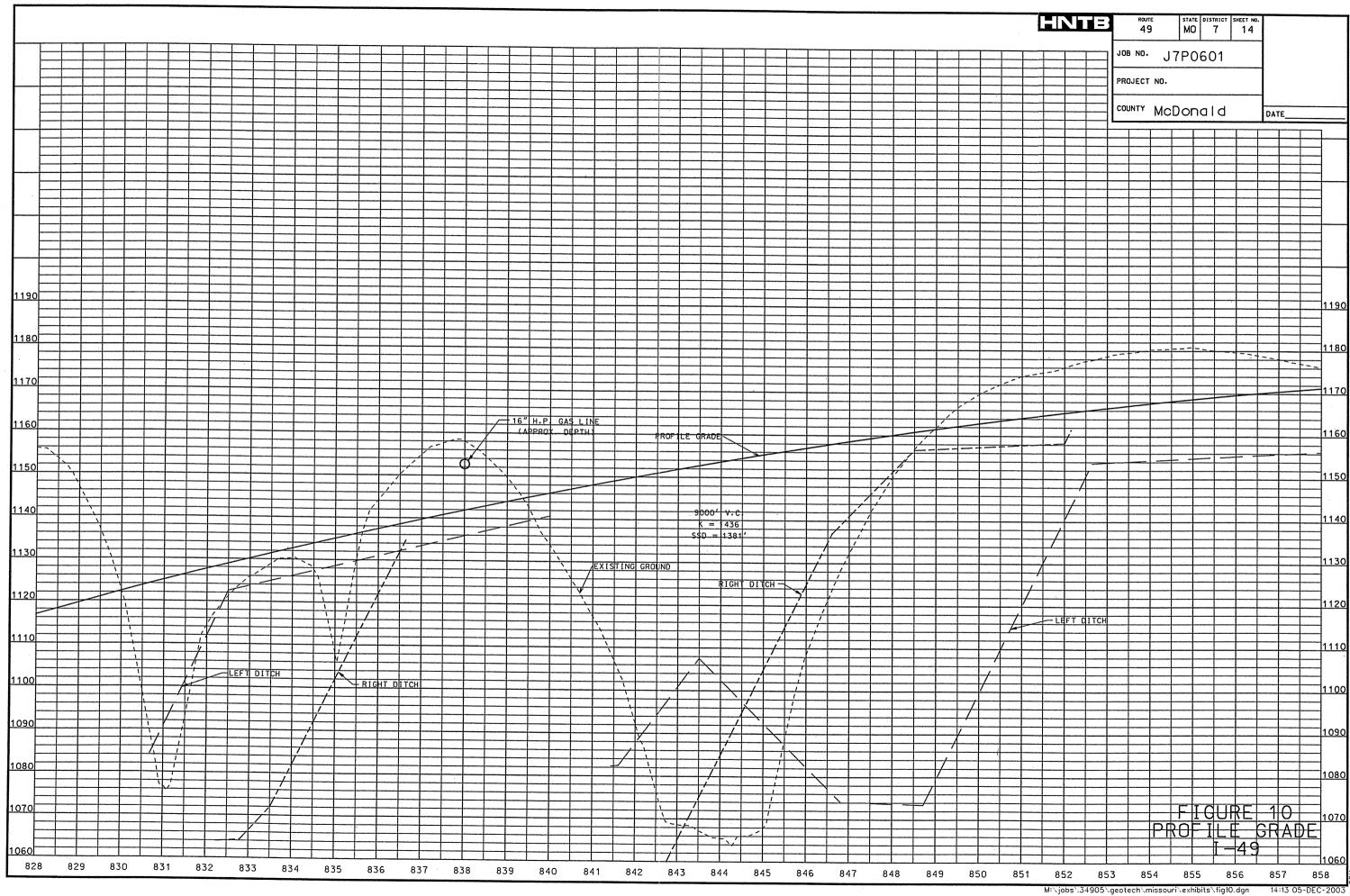
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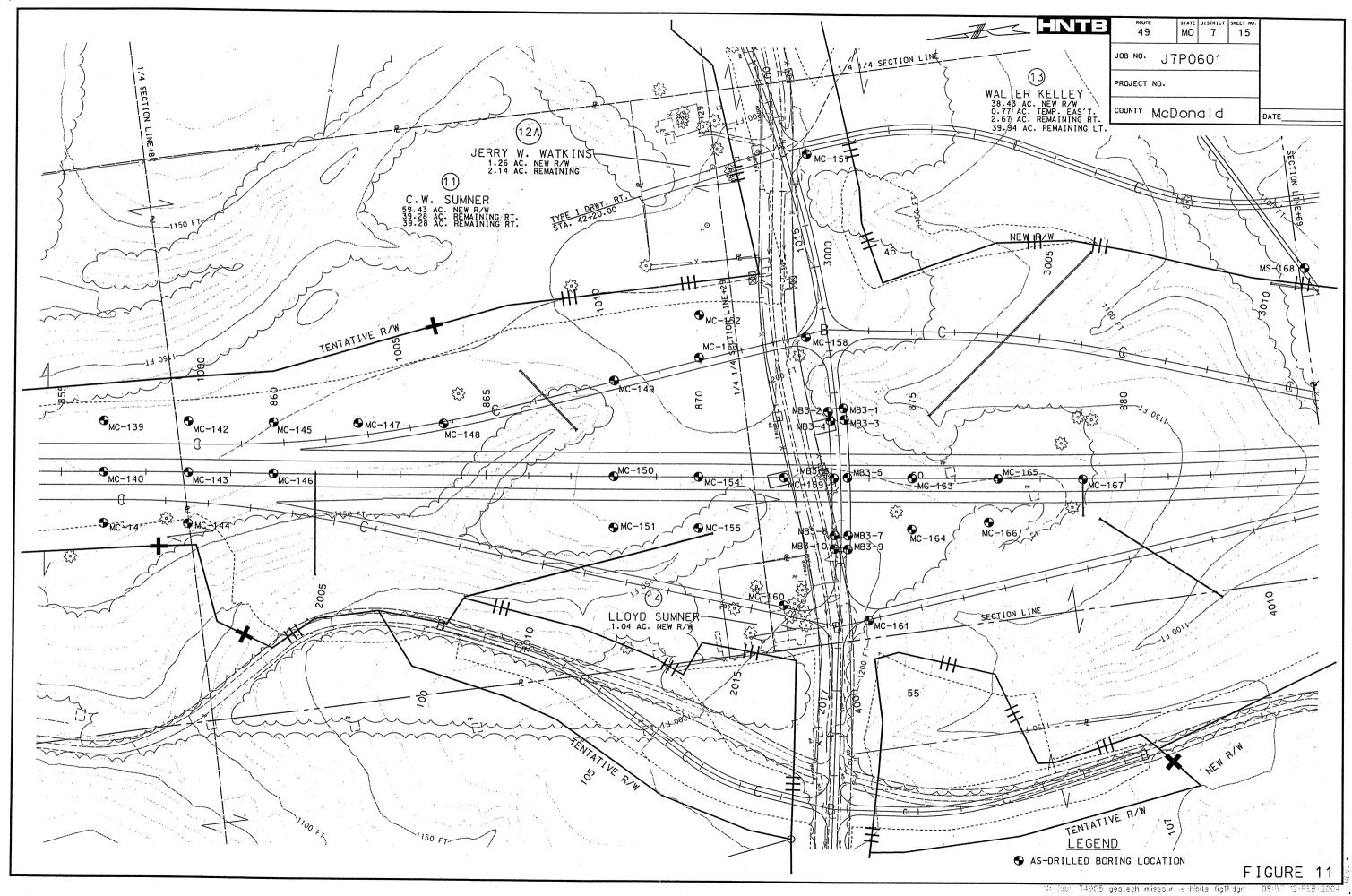
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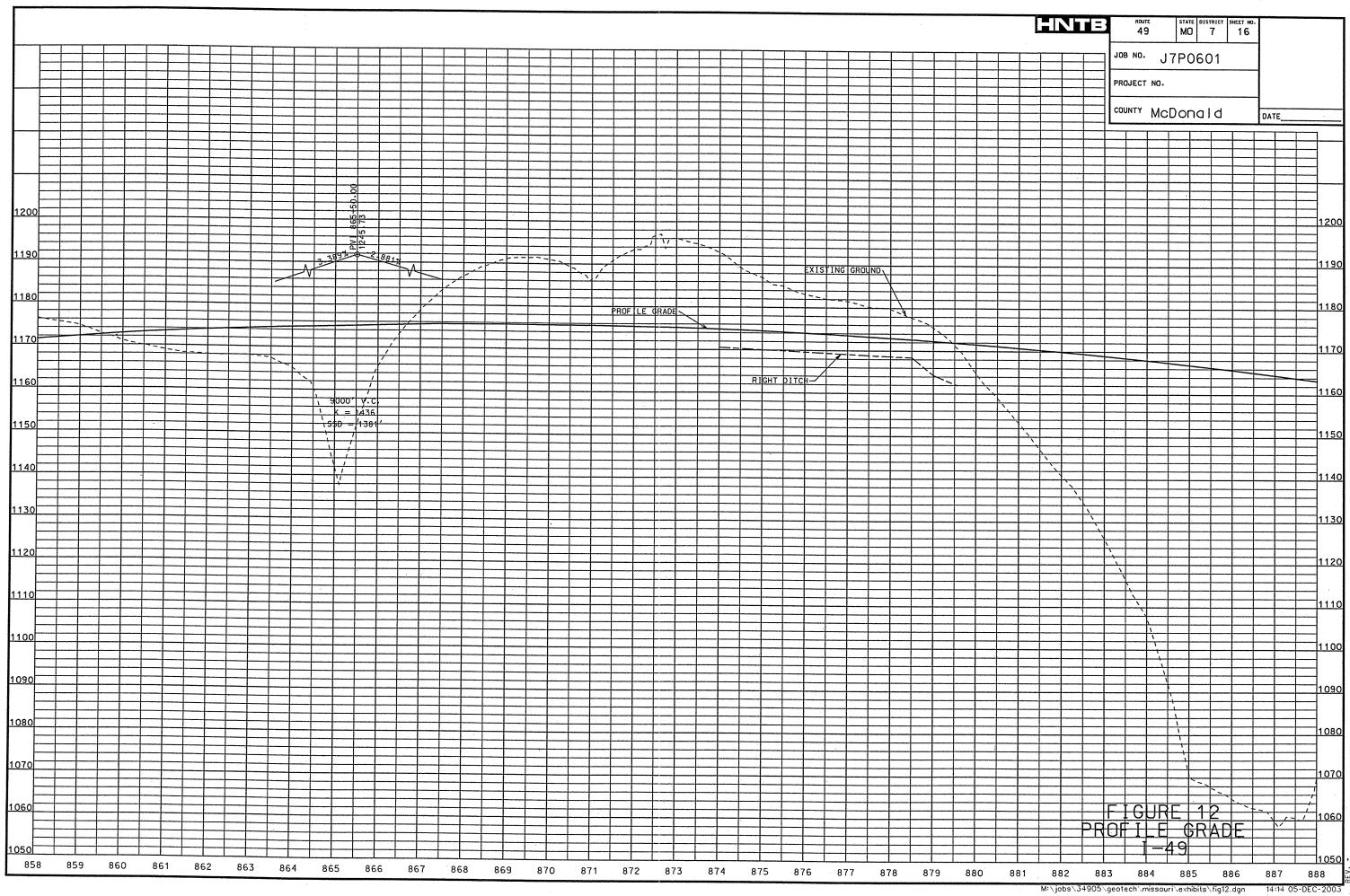
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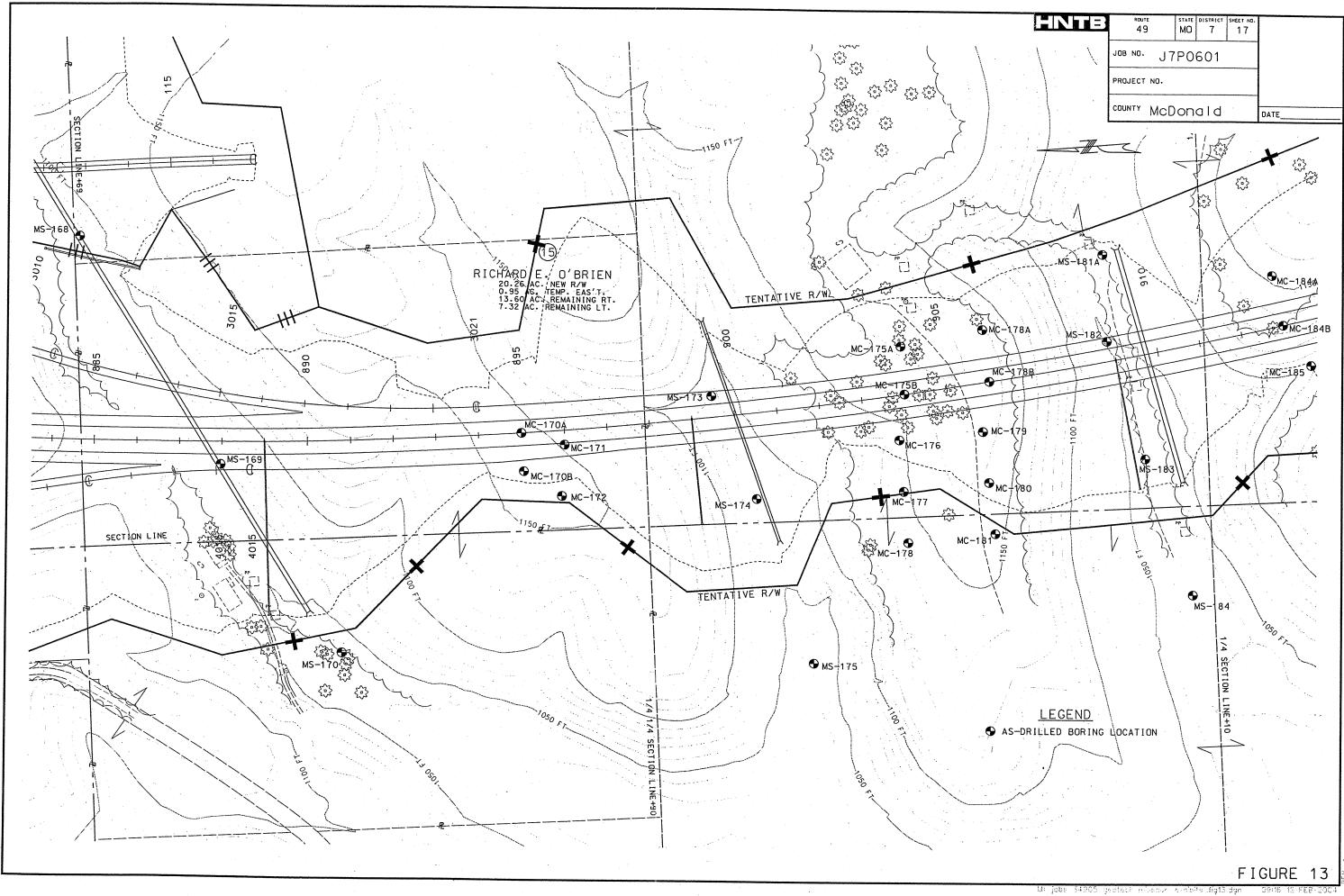
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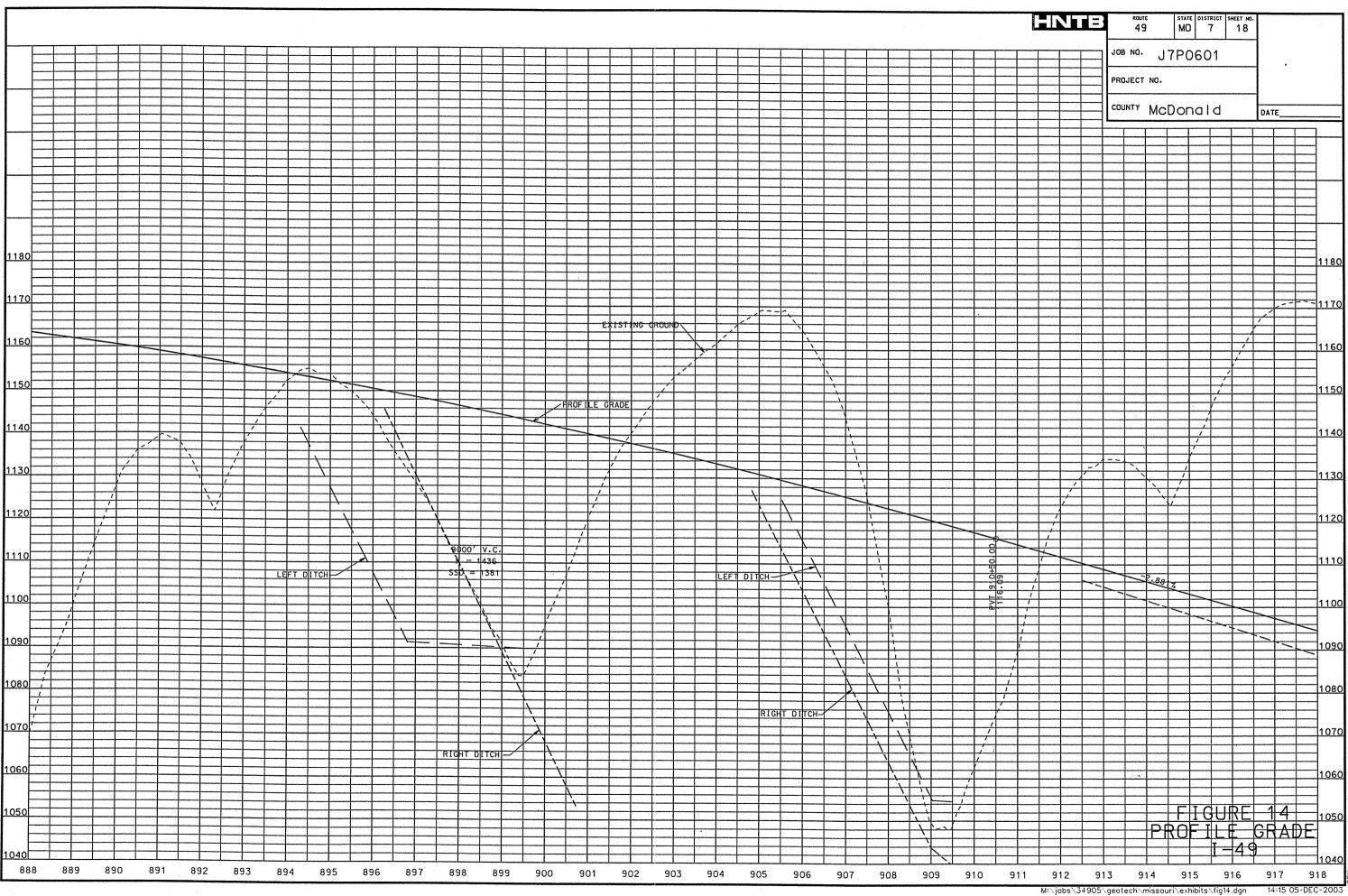
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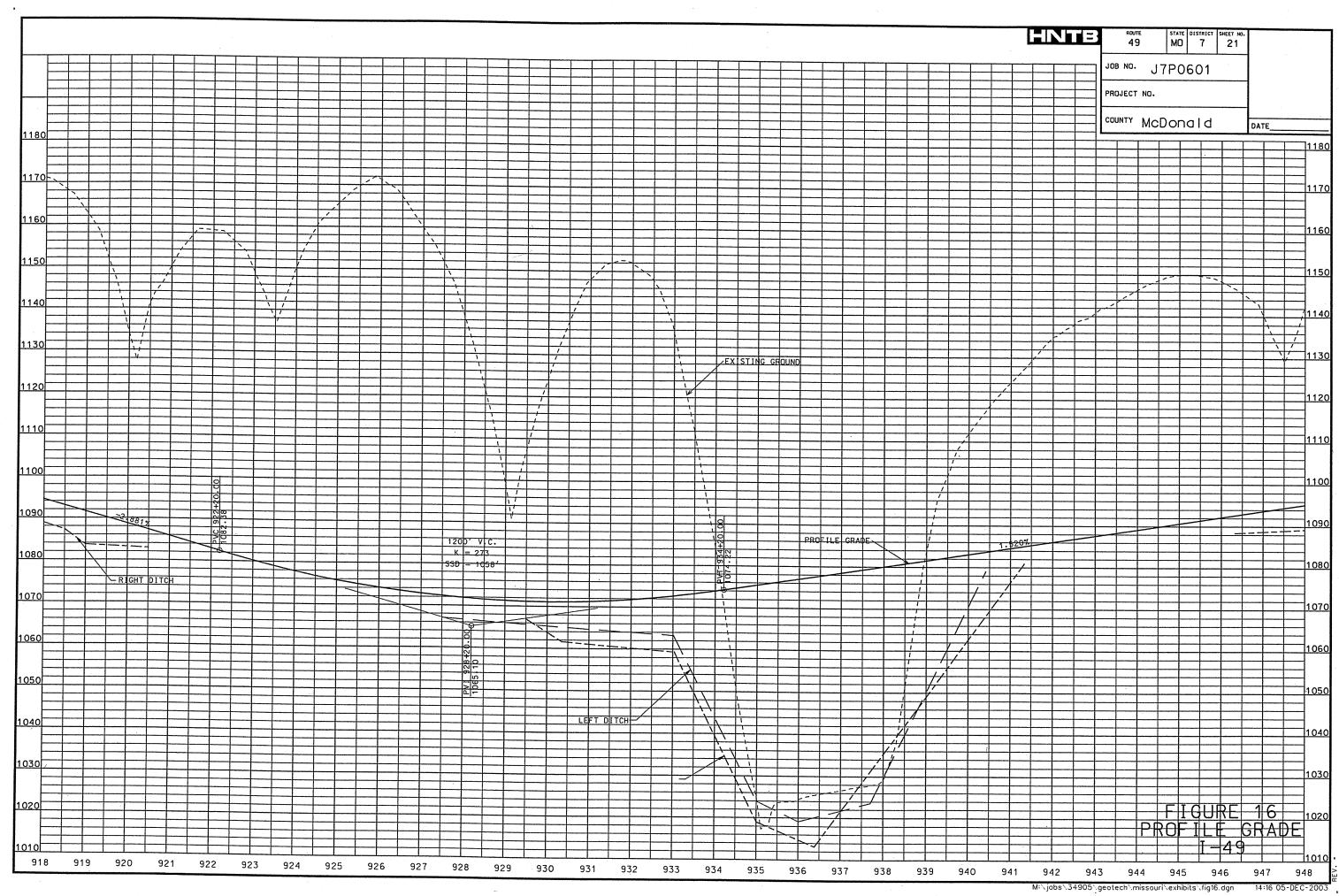


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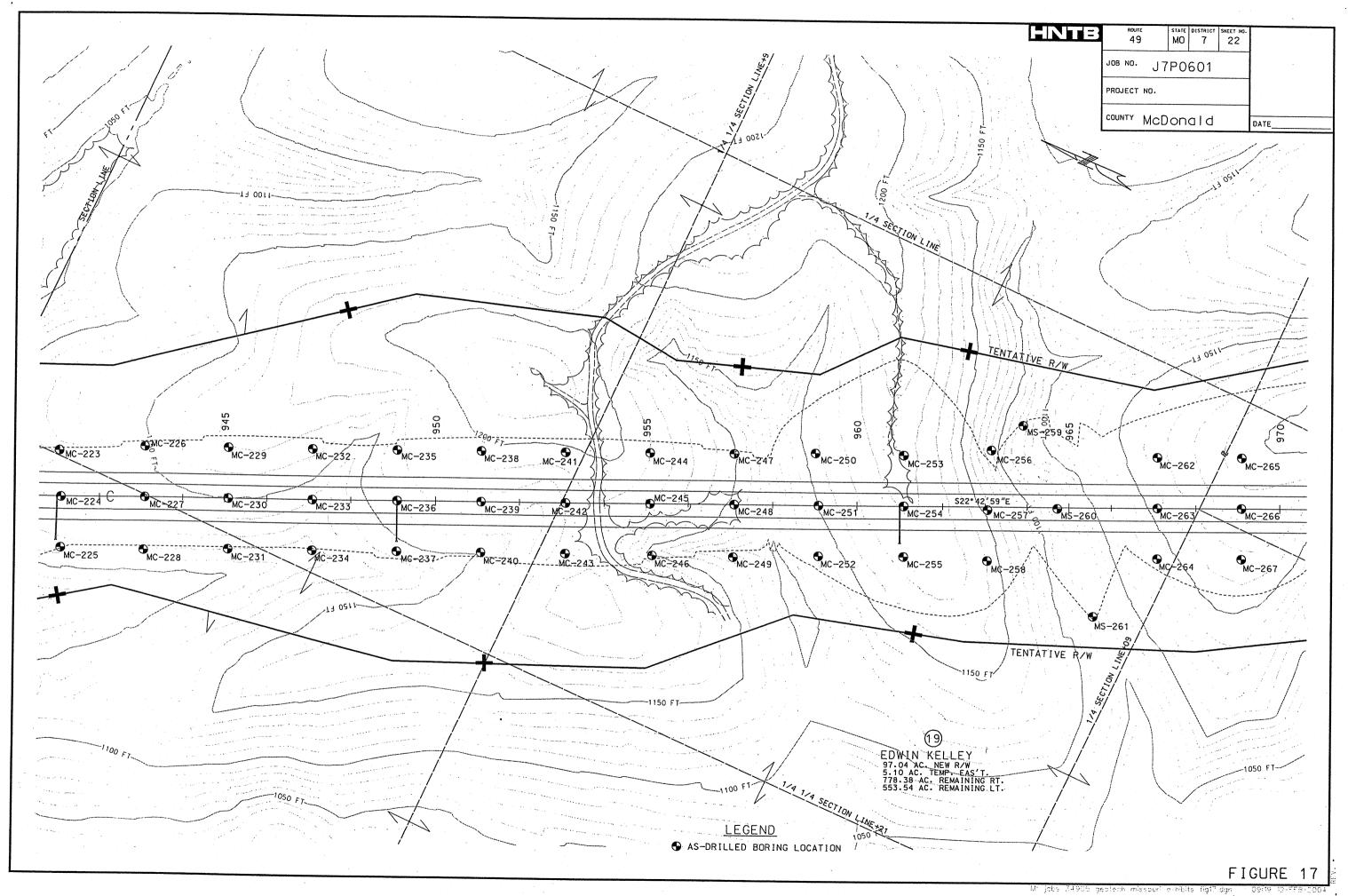
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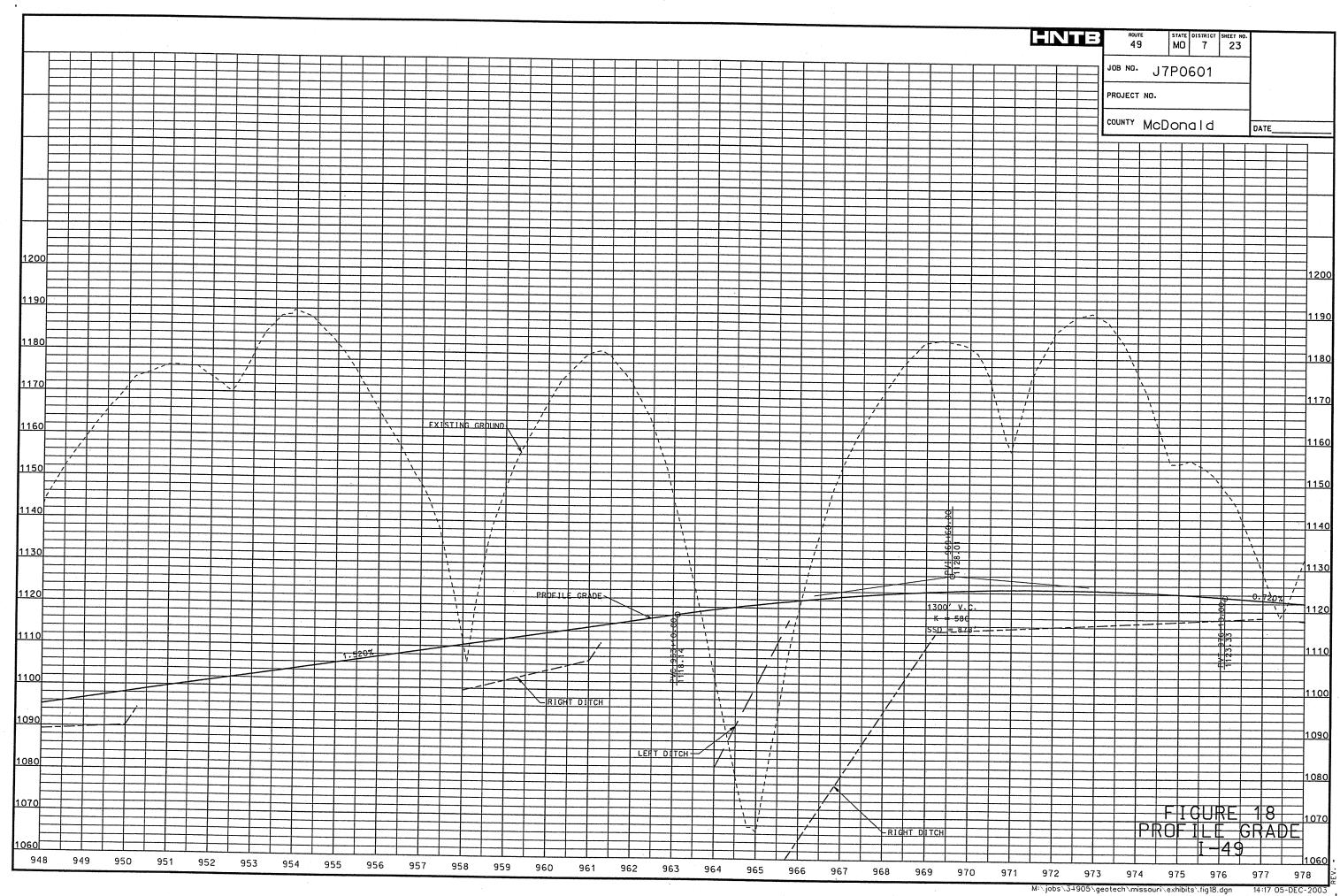
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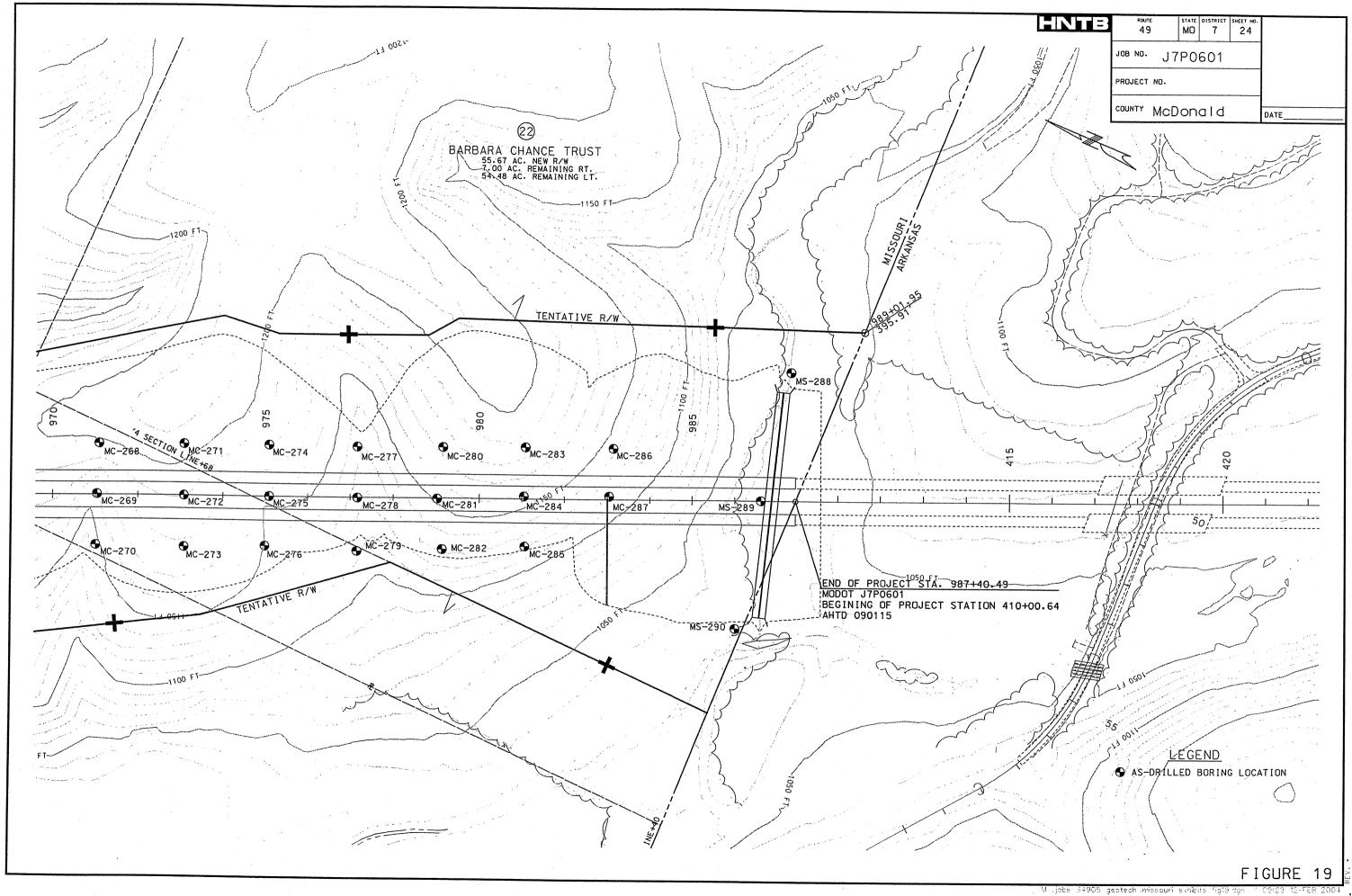
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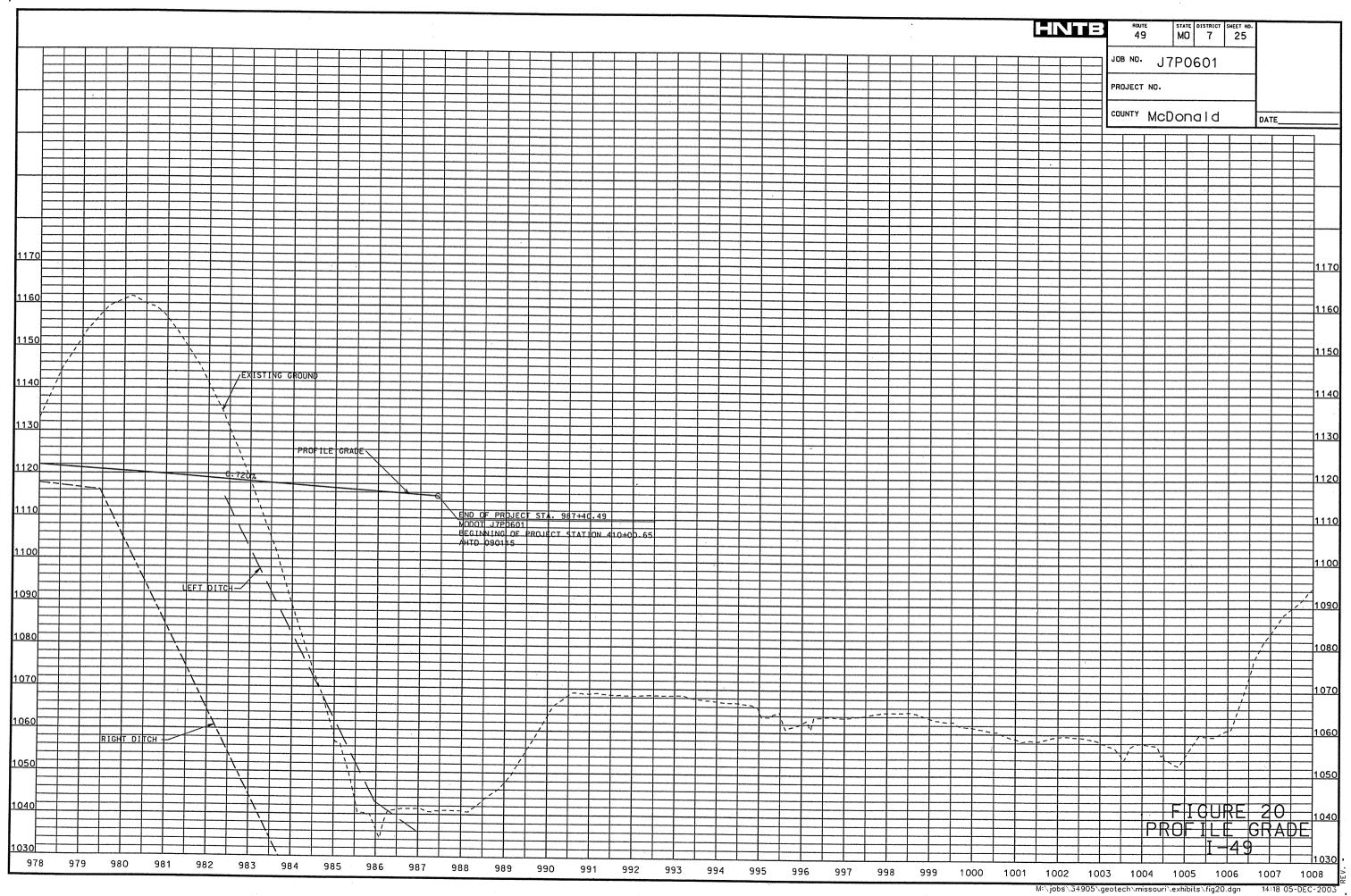
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USER NAME claw , DATE 05-DEC-2003 14:18 PEN TABLE mivjobs/34905/Missourivilbraryypentobie/highalf.pen DESIGN FILE Mivjobs/34905/geotech\missourivexhibits/fig20.dgn

9.0 BORING LOGS

9.1 As-Drilled Boring Coordinates

AS-DRILLED BORING COORDINATES I 49 - MISSOURI McDONALD COUNTY, MISSOURI

Boring No.	Northing	Easting	Boring No.	Northing	Easting	Boring No.	Northing	Easting
	9 NBL OVER US-	71 SBL	ROAD	WAY BORINGS	CONTINUED	ROAD	WAY BORINGS C	
MBS-1	145647.8928	2823511.4875	MC-30	143962.0480	2823602.1748	MS-72	139648.3218	2823455.8195
MBS-2	145467.1907	2823581.4382	MC-31	143937.5127	2823505.2315	MS-73	139322.3647	2823699.3208
MBS-3	145284.0427	2823635.6887	MC-32	143569.8489	2823679.8517	MS-74	139057.3878	2823887.6677
MB1-1	145572.9041	2823516.2888	MC-33	143555.5813	2823580.8747	MC-75	138857.2942	2823786.6502
MB1-2	145483.4773	2823596.0160	MC-35	142763.5295	2823775.4619	MC-76	138872.7323	2823667.6475
MB1-3	145385.7638	2823602.7771	MC-36	142768.2610	2823639.5295	MC-77	138882.2775	2823548.8840
MB1-4	145294.0607	2823674.6218	MC-37	142565.1786	2823890.5007	MC-78	138653.5133	2823754.7696
	SOURI RTE. 90 C	VER I-49	MC-38	142570.7090	2823764.5863	MC-79	138675.1583	2823636.7378
MB3-1	132121.2337	2821227.4738	MC-39	142573.1196	2823644.6106	MC-80	138696.8033	2823518.7061
MB3-2	132157.3745	2821225.7835	MC-40	142376.6478	2823765.6883	MC-81	138451.2280	2823727.5779
MB3-3	132123.5270	2821200.4192	MS-41	142058.7756	2824154.3813	MC-82	138479.4728	2823595.5304
MB3-4	132155.3995	2821203.2722	MS-42	142080.8079	2823754.7432	MC-83	138507.2655	2823478.7932
MB3-5	132138.8169	2821065.4988	MS-43	142082.6480	2823314.6914	MC-84	138244.4346	2823656.9238
MB3-6	132170.5197	2821069.8505	MC-44	141468.5204	2823862.4655	MC-85	138273.5132	2823587.3090
MB3-7	132160.4487	2820931.4426	MC-45	141470.9310	2823742.4897	MC-86	138320.0762	2823429.0154
MB3-8	132191.9111	2820937.2834	MC-46	141473.3416	2823622.5139	MC-87	138057.7234	2823591.1778
MB3-9	132166.5062	2820899.7996	MC-47	141268.5608	2823858.4479	MC-88	138095.9060	2823482.7016
MB3-10	132197.9014	2820905.9918	MC-48	141270.9713	2823738.4721	MC-89	138135.7488	2823369.5091
	ROADWAY BOR	INGS	MC-49	141273.3819	2823618.4963	MC-90	137861.4592	2823526.9647
MC-1	145965.8950	2823426.1438	MC-50	141068.6012	2823854.4303	MC-91	137909.0760	2823411.3895
MC-2	145898.0872	2823327.1382	MC-51	141071.0117	2823734.4545	MC-92	137954.7882	2823300.4373
MC-3	145798.3235	2823537.5422	MC-52	141072.4225	2823614.4587	MC-93	137674.7779	2823438.8050
MC-4	145729.2687	2823434.3019	MC-53	140861.6429	2823850.2721	MC-94	137717.6582	2823348.4652
MC-5	145678.3784	2823334.2956	MC-54	140871.0521	2823730.4369	MC-98	137604.9413	2823134.3806
MC-10	143924.5029	2823781.7847	MC-55	140873.4626	2823610.4612	MS-103	137287.0148	2822796.3632
MC-11	143809.4859	2823781.4742	MC-56	140668.6819	2823846.3952	MC-104	136892.4407	2822936.8163
MC-13	143609.5062	2823778.4563	MC-57	140671.0924	2823726.4193	MC-105	136963.9105	2822855.3481
MC-16	145660.8487	2822994.3017	MC-58	140673.5030	2823606.4436	MC-106	137035.2823	2822758.8801
MC-17	145481.3052	2823077.9264	MS-59	140532.1067	2823873.6572	MC-107	136737.3534	2822832.0264
MC-18	145427.9097	2822970.4605	MS-60	140451.1196	2823473.9497	MC-108	136803.1306	2822736.3950
MC-19	145302.1953	2823166.9188	MC-61	140268.7626	2823838.3600	MC-109	136874.5024	2822639.9271
MC-20	145248.7998	2823059.4529	MC-62	140271.1732	2823718.3842	MC-110	136583.5995	2822717.0277
MC-21	145123.0854	2823255.9113	MC-63	140277.5829	2823598.4887	MC-111	136642.3507	2822617.4420
MC-22	145069.6899	2823148.4454	MC-64	140068.8029	2823834.3424	MC-112	136713.7225	2822520.9741
MS-23	144846.7426	2823063.8082	MC-65	140071.2135	2823714.3667	MC-113	136410.1990	2822594.9569
MS-24	144781.6274	2823348.5203	MC-66	140073.6240	2823594.3908	MC-114	136481.5707	2822498.4890
MC-25	144343.9793	2823483.9276	MC-67	139868.8433	2823830.3248	MC-115	136552.9426	2822402.0211
MC-26	144309.4449	2823390.0799	MC-68	139879.2522	2823710.5097	MC-116	136249.4191	2822476.0039
MC-27	144143.0985	2823537.9834	MC-69	139873.6644	2823590.3732	MC-117	136320.7908	2822379.5360
MC-28	144124.9865	2823452.5254	MC-70	139669.0443	2823818.3089	MC-118	136392.1627	2822283.0680
MC-29	143986.5833	2823699.1182	MC-71	139671.2942	2823706.3315	MS-119	136067.4887	2822425.9904

AS-DRILLED BORING COORDINATES I 49 - MISSOURI McDONALD COUNTY, MISSOURI

Boring No.	Northing	Easting	Boring No.	Northing	Easting	Boring No.	Northing	Easting
ROAD	WAY BORINGS	CONTINUED	ROAD	WAY BORINGS (CONTINUED	ROAD	WAY BORINGS (CONTINUED
MS-120	136139.8808	2822240.7139	MC-164	132010.6143	2820920.5358	MC-192	127737.9055	2820805.3753
MS-121	136224.4826	2821964.9558	MC-165	131792.8703	2821004.1288	MC-193	127708.3697	2820689.0282
MC-122	135849.4415	2822182.4128	MC-166	131831.1992	2820907.2985	MC-193A	127639.5693	2821162.9742
MC-123	135917.7062	2822083.7218	MC-167	131595.8899	2820969.3627	MC-193B	127619.1027	2821042.6662
MC-124	135604.2227	2822026.6619	MS-168	130997.2290	2821372.0335	MC-194	127592.4889	2820969.4151
MC-125	135664.5339	2821922.9192	MS-169	130709.4553	2820813.8343	MC-195	127552.9825	2820857.9511
MC-126	135733.6522	2821842.8600	MS-170	130462.3502	2820353.7482	MC-196	127527.0524	2820742.7945
MC-127	135446.6051	2821960.3711	MC-170A	130002.8087	2820833.7677	MC-196A	127445.6831	2821202.6447
MS-129	135459.3857	2821396.8704	MC-170B	130004.2797	2820743.7797	MC-196B	127417.4607	2821084.9442
MS-130	135031.5443	2821628.7029	MC-171	129904.7125	2820798.7309	MC-197	127391.5653	2821031.1812
MS-131	134611.7497	2821842.7816	MC-172	129920.8074	2820679.8152	MC-198	127353.6175	2820917.6317
MC-132	134452.1104	2821471.5000	MS-173	129552.9678	2820884.2582	MC-199	127316.4114	2820803.9359
MC-133	134474.3322	2821353.5755	MS-174	129466.4499	2820637.4774	MC-199A	127252.5187	2821245.6928
MC-134	134255.1777	2821436.6127	MS-175	129364.5877	2820243.6730	MC-200	127206.5101	2821096.2294
MC-135	134275.9370	2821318.4220	MC-175A	129103.3198	2820966.6095	MC-201	127165.6840	2820983.5639
MC-136	134037.4338	2821520.2047	MC-175B	129103.2764	2820854.3931	MC-202	127123.5822	2820871.2165
MC-137	134058.1932	2821402.0140	MC-176	129123.9468	2820747.9346	MC-202A	127060.1350	2821292.1057
MC-138	134078.9524	2821283.8232	MC-177	129122.8775	2820627.7851	MC-203	127024.6620	2821166.9757
MC-139	133840.4492	2821485.6059	MC-178	129123.0207	2820508.5692	MC-204	126979.0335	2821055.7482
MC-140	133861.2086	2821367.4152	MC-178A	128910.6097	2820991.4119	MC-205	126933.3152	2820945.6011
MC-141	133881.9678	2821249.2244	MC-178B	128903.7817	2820868.5653	MC-205A	126873.6280	2821341.5499
MC-142	133643.4647	2821451.0071	MC-179	128927.9378	2820752.3228	MC-206	126841.1177	2821243.6333
MC-143	133664.2240	2821332.8163	MC-180	128922.8044	2820632.3639	MC-207	126796.0069	2821114.9404
MC-144	133684.9832	2821214.6256	MC-181	128918.7825	2820512.3217	MC-208	126779.8202	2821019.8754
MC-145	133446.4801	2821416.4083	MS-181A	128616.6836	2821144.5184	MC-208A	126694.5460	2821452.6249
MC-146	133467.2394	2821298.2176	MS-182	128622.8146	2820940.7284	MC-209	126656.6612	2821328.2518
MC-147	133249.4956	2821381.8095	MS-183	128555.2166	2820659.2452	MC-210	126609.9042	2821216.8511
MC-148	133052.5110	2821347.2107	MS-184	128470.2212	2820332.6687	MC-211	126563.1497	2821106.5087
MC-149	132640.3774	2821381.4300	MC-184A	128224.9678	2821064.3449	MC-211A	126505.8587	2821508.7442
MC-150	132679.3011	2821159.8223	MC-184B	128208.1353	2820945.5313	MC-212	126472.1142	2821398.8065
MC-151	132700.0604	2821041.6316	MC-185	128150.3095	2820846.7474	MC-213	126425.3774	2821287.6330
MC-152	132416.5788	2821499.4942	MC-186	128128.8502	2820720.5223	MC-214	126378.6997	2821177.5009
MC-153	132433.8782	2821401.0019	MC-187	128107.4605	2820602.3728	MC-214A	126318.1797	2821568.1480
MC-154	132482.3165	2821125.2236	MC-187A	128029.2711	2821093.8138	MC-215	126287.2166	2821463.5961
MC-155	132503.0758	2821007.0328	MC-187B	128010.5679	2820970.2170	MC-216	126241.4452	2821352.3045
MC-157	132104.6103	2821830.5164	MC-188	127953.9102	2820858.8116	MC-217	126194.5028	2821244.5608
MC-158	132178.9977	2821406.9996	MC-189	127932.4849	2820758.9581	MS-218	126069.2269	2821690.7392
MC-159	132285.3319	2821090.6247	MC-190	127907.2087	2820642.5109	MS-219	125964.2187	2821480.7662
MC-160	132337.2302	2820795.1479	MC-190A	127834.1184	2821126.6936	MS-220	125837.0922	2821285.2135
MC-161	132146.3003	2820726.0767	MC-190B	127813.1497	2821008.5398	MC-221	125672.9346	2821596.5091
MC-163	131989.8551	2821038.7266	MC-191	127766.9503	2820921.3102	MC-222	125628.0667	2821486.2733

AS-DRILLED BORING COORDINATES I 49 - MISSOURI McDONALD COUNTY, MISSOURI

Boring No.	Northing	Easting	Boring No.	Northing	Easting	Boring No.	Northing	Easting
	WAY BORINGS C	ONTINUED		WAY BORINGS (· ·		
MC-223	125549.2596	2821773.5472	MC-264	123058.7514	2822567.1619			
MC-224	125503.2797	2821673.4941	MC-265	122966.9462	2822865.7784			
MC-225	125456.2536	2821563.0741	MC-266	122920.6060	2822755.0870		1	
MC-226	125365.2597	2821861.7402	MC-267	122874.2658	2822644.3957			
MC-227	125318.9195	2821751.0488	MC-268	122782.4606	2822943.0121			
MC-228	125271.5708	2821635.3592	MC-269	122740.5824	2822832.6209			
MC-229	125180.7740	2821938.9740	MC-270	122697.3957	2822721.6934			(c)
MC-230	125134.4338	2821828.2826	MC-271	122597.9749	2823020.2458			
MC-231	125088.0936	2821717.5912	MC-272	122551.6347	2822909.5544			
MC-232	124996.2884	2822016.2077	MC-273	122505.2945	2822798.8631	- 3		
MC-233	124949.9482	2821905.5162	MC-274	122413.4893	2823097.4795			
MC-234	124903.6079	2821794.8249	MC-275	122367.1491	2822986.7882			
MC-235	124811.8027	2822093.4413	MC-276	122330.6554	2822876.3109			
MC-236	124765.4625	2821982.7500	MC-277	122220.8519	2823175.9577	8 4		
MC-237	124719.1223	2821872.0586	MC-278	122174.8978	2823066.1887			
MC-238	124627.3171	2822170.6751	MC-279	122127.5492	2822950.4991			
MC-239	124580.9768	2822059.9837	MC-280	122037.6748	2823253.7277			
MC-240	124534.6367	2821949.2923	MC-281	122003.3262	2823138.0161			
MC-241	124442.8314	2822247.9087	MC-282	121947.2254	2823032.4950			
MC-242	124396.4912	2822137.2174	MC-283	121860.0323	2823329.1807			
MC-243	124350.1510	2822026.5260	MC-284	121819.0226	2823222.6732		4	*
MC-244	124258.3458	2822325.1425	MC-285	121771.7498	2823115.7136			
MC-245	124212.0056	2822214.4511	MC-286	121669.6260	2823407.8089			
MC-246	124159.3584	2822104.2318	MC-287	121635.5993	2823300.6352	100		
MC-247	124073.8602	2822402.3762	MS-288	121356.7147	2823735.0284			14.1
MC-248	124027.5199	2822291.6848	MS-289	121304.5117	2823431.6542			
MC-249	123980.1712	2822175.9951	MS-290	121244.0068	2823131.7557			
MC-250	123896.9900	2822479.6740					B 25	
MC-251	123843.0342	2822368.9185						
MC-252	123796.6941	2822258.2271						
MC-253	123704.8888	2822556.8436						74
MC-254	123658.5486	2822446.1522					* #	
MC-255	123612.2084	2822335.4608						
MC-256	123520.2750	2822649.3083						
MC-257	123474.1271	2822515.7704						
MC-258	123427.4007	2822404.1566						- T
MS-259	123473.8768	2822732.6942						
MS-260	123321.6262	2822583.9502						
MS-261	123144.7468	2822381.5554				<u> </u>		- 1
MC-262	123151.4319	2822788.5447		4.0				
MC-263	123105.0917	2822677.8533						

9.2 Roadway Boring Logs

Boring				Dept					Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-1	731+00	120 ft. Left	1045.6			See Roadway Core Boring Logs						
(I ocati	ion Reference	ed to Northboun	d Ramn)				30 10					
(Local	lon mererence	ed to Northbodin	d Hamp)		*					-		
											-	
MC-2	731+00	Centerline	1016.7						CSK	10/15/2002		3
(Locati	ion Reference	ed to Northboun	d Ramp)	0.0	5.0	Light grayish brown, cherty silt, dry	AS-1	ML-GM		K		
				5.0	10.0	Reddish brown, weathered chert, with clay seams	AS-2	GC				
					-						1 10	
				10.0	12.0	Reddish brown, lean clay, moist	AS-3	CL			1	
				12.0	15.0	Reddish brown, weathered chert, with clay seams, moist	AS-4	GC				
						Bottom of Boring / Auger refusal at 15.0 feet						
		-:				Boring backfilled with cuttings at completion						
MC-3	732+93	124 ft. Left	1042.7						CSK	10/14/2002		
(Locat	ion Referenc	ed to Northboun	d Ramp)	0.0	5.0	Light grayish brown, silty chert gravel, dry Light brown, sandy (weathered) chert gravel, with silt, dry	AS-1	GM			Dry AB	
				5.0	10.0	to moist	AS-2	GM				
				10.0	16.3	Light brown, sandy (weathered) chert gravel, with silt, trace clay seams, dry to moist	AS-3	GM				
				10.0	10.5							
						Bottom of Boring / Auger refusal at 16.3 feet	BULK-4	(5 to 16.	3 feet)			
						Boring backfilled with cuttings at completion						
MC-4	733+00	Centerline	1019.9						CSK	10/14/2002		
/l ===t	ion Deference	ed to Northboun	d Pomp)	0.0	5.0	Light brown, silt, scattered chert gravel, dry	AS-1	ML			Dry AB	
(Local	ion Referenc	ed to Northbour	u namp)	0.0	5.0	Reddish brown, sandy lean clay, abundant chert gravel,					DIY AD	
				5.0	10.0	moist	AS-2	CL				
- 85-						Bottom of Boring at 10.0 feet						
						Boring backfilled with cuttings at completion						
									- 1			

Boring					h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-5	732+93	112 ft. Right	1028.9						CSK	10/14/2002		
(Locati	on Referenc	ed to Northbound	d Ramp)	0.0	5.0	Light reddish brown, chert gravel, with silt and sand, dry	AS-1	GP-GM			Dry AB	
				5.0	10.0	Reddish brown, clayey chert gravel, with sand, moist	AS-2	GC				
				10.0	17.0	Reddish brown, clayey chert gravel, abundant sand, moist	AS-3	GC				
				17.0	17.8	Light brown, weathered chert, with clay seams, moist	AS-4	GC				
						Bottom of Boring / Auger refusal at 17.8 feet						
						Boring backfilled with cuttings at completion		v				2
MC-6						Deleted - Access Denied						
MC-7		-				Deleted - Access Denied						
MC-8						Deleted - Access Denied						
MC-9						Deleted - Access Denied						
MC-10	751+76	40 ft. Right	1084.4	2 10					SPB	4/15/2003		
(Locati	on Referenc	ed to Northbound	d Ramp)	0.0	5.0	Light brown, lean clay, trace sand and gravel, moist	AS-1	CL			Dry AB	
/ 7				5.0	10.0	Reddish brown, lean clay, with sand, moist	AS-2	CL				
						with thin chert seams below 6 feet						
					10.0	White chert	AS-3					
						Bottom of Boring / Auger Refusal at 10.0 feet						
						Boring backfilled with cuttings at completion						
MC-11	752+91	38 ft. Right	1089.7			See Roadway Core Boring Logs						
(Locati	on Referenc	ed to Northbound	d Ramp)									

Boring				Dept	h (Ft)				Logged	1	GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
AC 10						Deleted - Access Denied						
MC-12						Deleted - Access Denied	-			-		
MC-13	754+91	37 ft. Right	1091.6	- 1					SPB	11/13/2002		
1010-13	734731	37 It. Hight	1031.0						SPB	11/13/2002		
(Locati	on Referenc	ed to Northboun	d Ramp)	0.0	5.0	White and light reddish brown, chert gravel, with clay, dry	S-1	GC			Dry AB	
				5.0	10.0	White and brown, clayey chert gravel, abundant chert seams, moist	S-2	GC				
				0.0	10.0	White and brown to reddish brown, clayey chert gravel,	0-2	40				
				10.0	15.0	abundant chert seams, moist	S-3	GC				
				15.0	19.0	White and brown, broken chert with clayey gravel seams, moist	S-4	GP				
				10.0	10.0	THOISE .	3-4	Gr				
				19.0	19.5	White and light brown, chert	BULK-5					
						Bottom of Boring / Auger Refusal at 19.5 feet						
7		- Thomas										
						Boring backfilled with cuttings at completion						
MS-14	,					Deleted - Access Denied						
						710000						
							-			8 3		
MS-15						Deleted - Access Denied	8 T					
												-
MC-16	731+02	125 ft. Left	995.4						CSK	10/15/2002		
(Location	on Reference	ed to Southboun	d Ramp)	0.0	3.0	Light brown, silty chert gravel, dry	AS-1	GM			Dry AB	
				2.0	4.0	Chart hard						a la
				3.0	4.0	Chert, hard						
						Bottom of Boring / Auger refusal at 4.0 feet on limestone						
						Boring backfilled with cuttings at completion						
						Donnig Buokinica with cuttings at completion						
MC-17	733+00	120 ft. Left	1018.7						CSK	10/15/2002		
(1 + i	n Deference	ad ta Cauthhaun	d Domn)	0.0	0.0	Light groups by an about group trace all de-	40.4	0.0			D AD	
(Location	n reference	ed to Southboun	u mamp)	0.0	3.0	Light grayish brown, chert gravel, trace silt, dry	AS-1	GP			Dry AB	
		-		3.0	8.0	Light brown, weathered chert, with clay seams and silt, dry	AS-2	GC				
						Bottom of Boring / Auger refusal at 8.0 feet	BULK-3	(3 to 8 fe	eet)			
	2.5											
				1000		Boring backfilled with cuttings at completion						

Boring				Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From		Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-18	733+00	Centerline	1001.7			See Roadway Core Boring Logs for Outcrop Log						
The same						Coo Housing Core Donning Logo for Catalog Log						
(Location	on Reference	ed to Southboun	d Ramp)									
						*						
MC-19	735+00	120 ft. Left	1024.3						CSK	10/15/2002		
(Locatio	on Reference	ed to Southboun	d Ramp)	0.0	5.0	Light grayish brown, chert gravel, with silt, dry	AS-1	GM			Dry AB	
						Light reddish brown and gray, weathered chert, trace clay						
				5.0	10.0	and silt seams, dry Light reddish brown and gray, weathered chert, with clay	AS-2	GC				
				10.0	15.5	seams, dry	AS-3	GC				
					2 100	Bottom of Boring / Auger refusal at 15.5 feet	BULK-4	(5 to 15	.5 feet)			
					-	Boring backfilled with cuttings at completion						

MC-20	735+00	Centerline				Rock Outcrop - See MC-18						
140.04	707.00	100 # 1 -#	1052.5			Coo Doodway Core Boring Lore						
MC-21	737+00	120 ft. Left	1052.5			See Roadway Core Boring Logs						
MC-22	737+00	Centerline	1028.1						CSK	10/15/2002		
(Location	on Reference	ed to Southboun	d Ramp)	0.0	3.5	Light grayish brown, silty chert gravel, dry	AS-1	GM			Dry AB	
						Bottom of Boring / Auger refusal at 3.5 feet on chert						
20		4				Boring backfilled with cuttings at completion						
							. ***					
MS-23	738+62	175 ft. Right	943.6			See Roadway Structure Boring Logs						
1413-23	730+02	175 it. Tilgiit	340.0			See Hoadway Structure Borning Logs						
		E16 1 5	000.0									
MS-24	740+47	51 ft. Left	963.2			See Roadway Structure Boring Logs						
				1								
7												

Boring				Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-25	745+00	Centerline	1061.7		`				CSK	10/17/2002		-
(Locatio	on Reference	ed to Southbound	d Ramp)	0.0	5.0	Light reddish brown, silt, with chert gravel and sand, dry	AS-1	ML			Dry AB	Dry 24 hr AB
ersin had a state of the state of the				4.0	10.0	Reddish brown and white, chert, with clay seams, moist	AS-2	sc				(hard chert layer from to 4 feet)
				10.0	15.0	Reddish brown and white, chert, with clay seams, moist	AS-3	sc				* *
800133	10 10			15.0	19.5	Reddish brown and white, chert, scattered clay seams, moist	AS-4	sc				
		2				Bottom of Boring / Auger refusal at 19.5 feet						
7			7- 7-			Boring backfilled with cuttings at completion	,				-	
MC-26	745+00	100 ft. Right	1066.4						CSK	10/17/2002		
(Locatio		ed to Southboun	d Ramp)	0.0	5.0	Light brown, silt, abundant chert gravel, dry	AS-1	ML			Dry AB	Dry 24hr AB
location.				5.0	7.5	Light reddish brown and white, weathered chert with clay seams, moist	AS-2	GC		les Les		
	. Assault		1000			Bottom of Boring / Auger refusal at 7.5 feet						
						Boring backfilled with cuttings at completion						
MC-27	747+08	13 ft. Right	1076.0						SPB	11/13/2002		
		ed to Southboun		0.0	5.0	White and light brown, chert gravel, with clay and sand, dry	S-1	GP			Dry AB	
100000				5.0	7.5	Light brown and white, chert gravel, with clay and sand, trace chert seams, dry	S-2	GP				
						Bottom of Boring / Auger Refusal at 7.5 feet				=		
						Boring backfilled with cuttings at completion						
MC-28	747+00	100 ft. Right	1080.5			See Roadway Core Boring Logs						
												* * * * * * * * * * * * * * * * * * * *
								,				
					-				,			

53

Boring	Station	Offset	Elevation	Depth	To	Log of Materials	Samples	USCS	Logged By:	Date	GW Depth	Comments
No.	Station	Oliset	Lievation	110111					CDD	11/13/2002		
AC-29	749+00	100 ft. Left	1075.4			White and light brown, chert gravel and cobbles, with sand			SPB	11/13/2002		
					- 0	and clay, trace chert seams, dry	S-1	GP			Dry AB	
(Locatio	n Reference	d to Southbound	Ramp)	0.0	5.0	and day, trace chert seams, dry						
				5.0	6.4	White and reddish brown, chert gravel, with lean clay, dry	S-2	GP				
No.						Bottom of Boring / Auger Refusal at 6.4 feet						
						Boring backfilled with cuttings at completion						
MC-30	749+00	Centerliné	1078.4			Reddish brown and white, clayey chert gravel, with chert			SPB	11/13/2002		
(Locatio	n Reference	ed to Southboun	d Ramp)	0.0	5.0	seams, dry	S-1	GC			Dry AB	
(Bottom of Boring / Auger Refusal at 5.0 feet	BULK-2	(0 to 5.	0 feet)			
						Boring backfilled with cuttings at completion						
	× 4							1 35				
MC-31	749+00	100 ft. Right	1066.7						SPB	11/13/2002		
		- 6 - 4	1 No. 102.1	1		Brown and white, chert gravel and cobbles, with sand and	S-1	GP				
(Locatio	on Referenc	ed to Southboun	d Ramp)	0.0	5.0	clay, trace chert seams below 1 ft, dry White and brown, chert gravel, with clay, abundant chert	3-1	- GI				Chert layer from 5 to 5
				5.0	10.0	coame dry to moist	S-2	GP				feet
				5.0	10.0	White to light gray, broken chert/chert layers (6-12" thick)	1.10					
				10.0	13.5	with clay seams, moist	S-3					Difficult drilling
						Bottom of Boring / Auger Refusal at 13.5 feet						
						Boring backfilled with cuttings at completion						
MC-32	753+00	Centerline	1087.5						SPB	11/13/2002		
		ced to Southbour	nd Ramp)	0.0	5.0	Brown and white, clayey chert gravel, with cobbles in top 2 feet, dry	S-1	GP			Dry AB	
Locali				5.0	7.3	White and brown, chert gravel, with clay, with chert seams dry	S-2	GP				
						Bottom of Boring / Auger Refusal at 7.3 feet						
						Boring backfilled with cuttings at completion						
	1				1			- Tan		9 1		

Boring No.	Station	Offset	Elevation	From	h (Ft)	Log of Materials	Samples	USCS	Logged By:	Date	GW Depth	Comments
140.	Otation								SPB	11/13/2002		
MC-33	753+00	100 ft. Right	1077.4			Brown and white chert gravel and cobbles with sand and			SFD	11/13/2002		
	- 1		d Dame)	0.0	5.0	clay	S-1	GP			Dry AB	
(Locatio	n Reference	ed to Southbound	u namp)	0.0	5.0	lotay						
				5.0	5.5	White chert	BULK-2	(0 to 5.5	feet)			Difficult drilling
		1										
						Bottom of Boring / Auger Refusal at 5.5 feet						
						Boring backfilled with cuttings at completion						
						Bonng backinica with callings at completion					The second	
												-
MS-34						Deleted - Access Denied						
		2										
				-								
MC-35	761+07	7 ft. Left	1096.9						SPB	11/11/2002		
				0.0	10	Dark brown, silty lean clay, with chert gravel, dry	S-1	CL/ML			Dry AB	
				0.0	1.0	White and light reddish brown, clayey chert gravel, with	01	ODME				
				1.0	5.0	chart seams dry	S-2	GC				
				1.0	0.0	White and reddish brown, chert gravel, few clay, abundant						Chert layer from 10-
				5.0	10.0	chert seams, dry	S-3	SP				10.5ft
						White and reddish brown, chert seams/broken chert,						Hard drilling to 12.5 ft
				10.0	15.0	scattered fat clay seams, moist	S-4	-			-	Hard drilling from 13.5
						White and reddish brown, chert seams/broken chert,	0.5	1				16 feet
				15.0	16.0	scattered fat clay seams, moist	S-5		c			10 1661
						Bottom of Boring / Auger Refusal at 16.0 feet						
						Boring backfilled with cuttings at completion						i i
						Dorning backlined with eathings at compression					4	
				-								`·
MC-36	761+05	129 ft. Right	1107.7						SPB	11/11/2002	Dry AB	
						Reddish brown and white, clayey chert gravel, with chert	0.4	GC				
				0.0	5.0	seams, dry Reddish brown and white, clayey chert gravel, abundant	S-1	GC			-	
				5.0	9.0	chert seams, dry	S-2	GC				
				3.0	0.0							
7				9.0	9.0	Sample from auger head	S-3	GC	-			
						Bottom of Boring / Auger Refusal at 9.0 feet						
							1.					
				-	-	Boring backfilled with cuttings at completion						25
											-	
							3-					
				133								
								1				

Boring					h (Ft)				Logged		GW	T
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-37	763+03	126 ft. Left	1097.8						SPB	11/11/2002		
				0.0	5.0	Light reddish brown, lean clay, with chert gravel, dry	S-1	CL			D AD	
							5-1	CL			Dry AB	Hard drilling at 5.5 ft
				5.0	5.5	Light reddish brown, lean clay, with chert gravel, dry	S-2	CL				
	. ,					Bottom of Boring / Auger Refusal at 5.5 feet						
						Boring backfilled with cuttings at completion						
MC-38	763+00	Centerline	1112.8						SPB	11/11/2002		
		*		0.0	5.0	Reddish brown and white, clayey chert gravel, dry White and reddish brown, clayey chert gravel, with chert	S-1	GC			Dry AB	
				5.0	10.0	seams, dry	S-2	GC				
		_		10.0	15.0	White and light reddish brown, clayey chert gravel, with chert seams, dry	S-3	GC			-	
				15.0	20.0	White to light reddish brown, chert gravel, scattered clay, dry	S-4	GP				
					100	White and reddish brown, broken chert, with clay seams,						
	<u> </u>			20.0	25.0	dry	S-5	GP				
				25.0	30.0	White and reddish brown, chert, with clay seams, dry White and reddish brown, broken chert, with clay seams,	S-6	GP				
				30.0	35.8	moist	S-7	GP				Clay from 31 to 31.5 fee
						Bottom of Boring / Auger Refusal at 35.8 feet						Soft clay layer from 35 t 35.8 feet
						Boring backfilled with cuttings at completion						
		-										
						3-3						
										4.		
		- 17 - 17 H										

Boring					h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-39	763+00	120 ft. Right	1114.9						SPB	11/14/2002		
1010-00	700100	120 tt. Tugitt	1114.0						01.0	11/14/2002		
				0.0	2.0	Dark brown, gravel and cobbles, with sand and silt, dry	S-1	GP				
				2.0	5.0	Light reddish brown and white, chert gravel, with sand, dry	S-2	GP				
				2.0	5.0	Light reddish blown and white, chert graver, with sand, dry	3-2	GF			-	
				5.0	10.0	White and reddish brown, chert gravel, with clay, dry	S-3	GP				
				10.0	15.0	White and reddish brown, chert gravel, with clay, trace chert seams, dry	S-4	GP				
				10.0	15.0	White and light reddish brown, chert gravel, with clay,	3-4	GF				
				15.0	20.0	scattered chert seams, dry	S-5	GP				
		2				White and light reddish brown, chert gravel, with clay,						Softer clay layer from 2
				20.0	25.0	scattered chert seams, dry	S-6	GP				to 26 ft
- 24				05.0	00.0	White and light reddish brown, chert gravel, with clay,	0.7	OB				
				25.0	30.0	trace chert seams, dry White and light reddish brown, chert gravel, with clay,	S-7	GP				Chert layer from 32.5 to
				30.0	35.0	trace chert seams, dry	S-8	GP				33 ft
				05.0	00.5	NAME: A			,			
				35.0	39.5	White and brown, clayey gravel, moist	S-9	GC			-	
						Bottom of Boring at 39.5 feet	BULK-10	(2 to 35	feet)			
						Boring backfilled with cuttings at completion						
						Doming Succession with Guttings at Completion		777				
MC-40	764+94	5 ft. Left	1076.7						SPB	11/11/2002		
						Light brown and white, chert gravel, with clay and						
				0.0	5.0	scattered chert seams, dry Light brown and white, chert gravel, with clay and	S-1	GP			Dry AB	Hard drilling below 4 fee
				5.0	9.0	scattered chert seams, dry	S-2	GP				
				0.0	0.0	Southered orient seams, ary	02	- GI				
		7				Bottom of Boring / Auger Refusal at 9.0 feet						
						Boring backfilled with cuttings after completion						
						3						
MS-41	768+04	400 ft. Left	995.1			See Roadway Structure Boring Logs						
MS-42	767+90	Centerline	977.6			See Roadway Structure Boring Logs						
MS-43	767+97	440 ft. Right	966.0			See Roadway Structure Boring Logs			100			
IVIO-40	707737	770 it. riigiit	300.0			555 Housing Chaolard Borning Logo						

Boring				Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-44	774+00	120 ft. Left	1081.2						CSK	10/21/2002		
				0.0	5.0	Light reddish brown, silt, few chert gravel, dry Reddish brown, silt with sand, scattered chert gravel, dry	AS-1	ML			Dry AB	
V.,				5.0	10.5	to moist	AS-2	ML				White chert at 10.0 fee
						Bottom of Boring / Auger refusal at 10.5 feet	BULK-3	(0 to 10	.5 feet)			
			,			Boring backfilled with cuttings at completion						
MC-45	774+00	Centerline	1096.0						CSK	10/21/2002		
				0.0	5.0	Light brown, silt, trace chert gravel, dry	AS-1	ML			Dry AB	Dry 72 hrs AB Hard seams at 7.0 and
				5.0	10.0	Light brown, silt, scattered chert gravel, dry	AS-2	ML				9.0 feet
		-		10.0	15.0	Light brown, silt, scattered chert gravel, dry	AS-3	ML				
				15.0	20.0	Light brown, silt, scattered chert gravel, dry	AS-4	ML				Hard drilling at 20.0 fe
1						Bottom of Boring / Auger refusal at 20.0 feet on possible limestone						
						Boring backfilled with cuttings at completion		1				
MC-46	774+00	120 ft. Right	1097.1						CSK	10/17/2002		
				0.0	4.5	Light brown, silt, abundant chert gravel, dry	AS-1	ML			Dry AB	Dry 24hr AB
				4.5	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
				10.0	15.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				Hard chert layer from 10.0 to 13.0 feet
				15.0	20.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-4	CL				Hard chert layer from 16.0 to 17.0 feet
						Bottom of Boring / Auger refusal at 20.0 feet						
						Boring backfilled with cuttings at completion						
MC-47	776+00	120 ft. Left	1102.1						CSK	10/21/2002		
WIO-47	77000	120 II. Leit	1102.1	0.0	4.5	Light brown, silt, with chert gravel, dry	AS-1	ML	JOK	10/21/2002	Dry AR	Dry 72 hr AB
				0.0	4.0	Bottom of Boring / Auger refusal at 4.5 on possible limestone	A3-1	IVIL			DIY AD	Hard drilling at 4.5 feet
						Boring backfilled with cuttings at completion						

Boring				Dept					Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-48	776+00	Centerline	1112.1						CSK	10/22/2002		
VIC-40	770+00	Centennie	1112.1			Light reddish brown, silt, abundant chert gravel and sand,	AS-1	ML			Dn/ AB	Dry 24 hr AB
				0.0		dry					DIY AD	DIY 24 III AD
				5.5	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
				10.0	16.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				
				16.0	20.0	Light brown, sandy chert gravel, moist	AS-4	GW				
				20.0	25.0	Brown, cherty lean clay, with sand, moist	AS-5	CL				
				25.0	30.0	Brown, cherty lean clay, with sand, moist	AS-6	CL				
				30.0	35.0	Brown lean clay, with sand, abundant chert gravel, moist	AS-7	CL				
		·	4.11	35.0	40.0	Brown, cherty lean clay, with sand, moist	AS-8	CL				Hard chert seam at 38 feet
				40.0		Brown, cherty lean clay, with sand, moist	AS-9	CL				
				40.0	45.0	Bottom of Boring at 45.0 feet	700	02				
						Boring backfilled with cuttings at completion						
		400 ft Disk4	4407.0						CSK	10/17/2002		
MC-49	776+00	120 ft. Right	1107.2				40.4	01	00.1		Day AB	Dry 24 hr AB
				0.0	4.0	Light reddish brown, silty lean clay, with chert gravel, dry	AS-1	CL	. 4.		Dry AB	Dry 24 fir AB
				4.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist Light reddish brown, sandy lean clay, with chert gravel,	AS-2	CL				
				10.0	15.0	moist	AS-3	CL				
				15.0	20.0	Light reddish brown, sandy lean clay, with chert gravel, wet	AS-4	CL			3	
						Bottom of Boring / Auger refusal at 20.0 feet						
						Boring backfilled with cuttings at completion		2				
7					- 5							
							-					H.

			Dept					Logged		GW	
Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
778 , 00	120 ft Left	1110 1						CSK	10/18/2002		
770+00	120 II. Leit	1110.1			2.1						
			0.0	5.0	Light brown silt, with chert gravel, dry	AS-1	ML			Dry AB	Dry 72 hr AB
			5.0	6.0	moist	AS-2	CL				Hard drilling at 6.0 fee
				X	Bottom of Boring / Auger refusal at 6.0 feet on possible limestone						
					Boring backfilled with cuttings at completion						
778+00	Centerline	1100.0						CSK	10/18/2002		
			0.0	5.0	Light brown silt, trace chert gravel, dry	AS-1	ML			Dry AB	Dry 72 hr AB
3			5.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
			10.0	12.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				Hard chert at 12.0 fee
					Bottom of Boring / Auger refusal at 12.0 feet			- 10 m			
					Boring backfilled with cuttings at completion						
778+01	120 ft Right	1087.5						CSK	10/17/2002		
770401	120 it. riigit	1007.0	0.0	1.0	Light brown, silty chert gravel, dry		GM			Dry AB	
			1.0	6.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-1	CL				Hard chert layer from to 6.0 feet
			6.0	8.0	Light brown, clayey chert gravel, with sand, moist	AS-2	GC				
			8.0	11.0	Weathered chert						
			2		Bottom of Boring / Auger refusal at 11.0 feet						
					Boring backfilled with cuttings at completion						
										,	
								74.4			
	778+00	778+00 120 ft. Left 778+00 Centerline	778+00 120 ft. Left 1110.1	Station Offset Elevation From 778+00 120 ft. Left 1110.1 0.0 5.0 5.0 5.0 778+00 Centerline 1100.0 0.0 5.0 10.0 10.0 778+01 120 ft. Right 1087.5 0.0 1.0 6.0 6.0	778+00 120 ft. Left 1110.1 0.0 5.0 5.0 5.0 6.0 778+00 Centerline 1100.0 0.0 5.0 10.0 12.0 778+01 120 ft. Right 1087.5 778+01 120 ft. Right 1087.5 0.0 1.0 6.0 6.0 8.0	Station Offset Elevation From To Log of Materials 778+00 120 ft. Left 1110.1 0.0 5.0 Light brown silt, with chert gravel, dry Reddish brown, lean clay with chert, with chert gravel, moist Bottom of Boring / Auger refusal at 6.0 feet on possible limestone 8	Station Offset Elevation From To Log of Materials Samples 778+00 120 ft. Left 1110.1 0.0 5.0 Light brown silt, with chert gravel, dry AS-1 8-60 Reddish brown, lean clay with chert, with chert gravel, moist Bottom of Boring / Auger refusal at 6.0 feet on possible limestone 8-778+00 Centerline 1100.0 778+00 Centerline 1100.0 10.0 5.0 Light brown silt, with chert gravel, dry AS-1 8-778+00 Reddish brown, sandy lean clay, with chert gravel, moist AS-2 10.0 12.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-3 8-80 Bottom of Boring / Auger refusal at 12.0 feet 8-778+01 120 ft. Right 1087.5 10.0 1.0 Light brown, silty chert gravel, dry 10.0 1.0 Light brown, sandy lean clay, with chert gravel, moist AS-3 8-80 Bottom of Boring / Auger refusal at 12.0 feet 8-80 Boring backfilled with cuttings at completion 778+01 120 ft. Right 1087.5 10.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-3 8-80 Bottom of Boring / Auger refusal at 12.0 feet 8-80 Boring backfilled with cuttings at completion 778+01 Meathered chert gravel, with sand, moist AS-2 8-80 Bottom of Boring / Auger refusal at 11.0 feet 8-80 Bottom of Boring / Auger refusal at 11.0 feet	Station Offset Elevation From To Log of Materials Samples USCS 778+00 120 ft. Left 1110.1 0.0 5.0 Light brown silt, with chert gravel, dry Reddish brown, lean clay with chert, with chert gravel, moist Boring backfilled with cuttings at completion 0.0 5.0 Light brown silt, trace chert gravel, dry Reddish brown, sandy lean clay, with chert gravel, moist AS-2 CL Boring of Boring / Auger refusal at 12.0 feet Boring backfilled with cuttings at completion 0.0 12.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-3 CL Boring backfilled with cuttings at completion 0.0 12.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-3 CL Boring backfilled with cuttings at completion 0.0 Light brown of Boring / Auger refusal at 12.0 feet Boring backfilled with cuttings at completion 0.0 Light brown, silty chert gravel, dry GM GM 1.0 6.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-1 CL Boring backfilled with cuttings at completion 0.0 Light brown, silty chert gravel, dry GM GM 1.0 6.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-1 CL Boring backfilled with cuttings at completion 0.0 Light brown, clayey chert gravel, with sand, moist AS-2 GC GC Borton of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bottom of Boring / Auger refusal at 11.0 feet 0.0 Bo	Station Offset Elevation From To Log of Materials Samples USCS By:	Station Offset Elevation From To Log of Materials Samples USCS By: Date	Station Offset Elevation From To Log of Materials Samples USCS By: Date Depth

Boring					h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-53	780+07	120 ft. Left	1098.0						CSK	10/21/2002		
				0.0	5.0	Light brown silt, with chert gravel, dry	AS-1	ML			Dry AB	
				5.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				Hard chert seam at 5. feet
				10.0	15.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				Hard chert seam at 12 feet
				15.0	19.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-4	CL				Hard chert seam at 19
				4.		Bottom of Boring / Auger refusal at 19.0 feet on possible limestone	70-4	OL				leet
						Boring backfilled with cuttings at completion						
MC-54	780+00	Centerline	1089.3						CSK	10/21/2002		
	200			0.0	5.0	Light brown silt, trace chert gravel, dry	AS-1	ML	4		Dry AB	Hard chert seams at 7
				5.0	10.0	Light reddish brown, silt, trace chert gravel, dry to moist Light reddish brown, sandy silt, with chert gravel, trace	AS-2	ML				and 9.0 feet
				10.0	15.0	clay seams, moist	AS-3	SM				
				15.0	19.0	Light brown, sandy silt, with chert gravel, trace clay seams, moist	AS-4	SM				
						Bottom of Boring / Auger refusal at 19.0 feet	BULK-5	(5 to 19	feet)			
						Boring backfilled with cuttings at completion						
MC-55	780+00	120 ft. Right	1082.1						CSK	10/17/2002		
				0.0	1.0	Light brown, cherty silt, dry		ML			Dry AB	
				1.0	5.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-1	CL				
			W	5.0	7.0	Reddish brown, cherty lean clay, with sand, moist	AS-2	CL				
				7.0	10.0	Light reddish brown, clayey chert gravel, with sand, wet	AS-3	GC				
				10.0	15.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-4	CL			-	
7.5				15.0	20.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-5	CL				Hard chert at 20.0 feet
- T						Bottom of Boring / Auger refusal at 20.0 feet						
						Boring backfilled with cuttings at completion						

Boring				Dept			0	11000	Logged	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	0505	Ву:	Date	Depth	Comments
AC-56	782+00	120 ft. Left	1087.9						CSK	10/22/02	Dry AB	Dry 24 Hr AB
710-30	702100	120111 2011				I I I I I I I I I I I I I I I I I I I	AS-1	ML				
				0.0	6.0	Light brown silt, scattered chert gravel, dry	AG-1	IVIL				Hard chert seam at 9.
				6.0	11.0	Light reddish brown, clayey sand, with chert gravel, moist	AS-2	SC				feet
						Bottom of Boring / Auger refusal at 11.0 feet						
						Boring backfilled with cuttings at completion						
						. 53.						
MC-57	782+00	Centerline	1084.6						CSK	10/22/02		Dry 24 Hr AB, hard ch
				0.0	5.5	Light brown to light reddish brown silt with chert gravel and sand, dry	AS-1	ML			Dry AB	seam at 4.5 feet
				5.5	6.6	Shelby Tube - 13" recovery	ST-2					
		-		6.6	6.8	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				Hard drilling at 6.6 fee
						Bottom of Boring / Auger refusal at 6.8 feet	BULK-4	(0 to 6.	B feet)			
						Boring backfilled with cuttings at completion						
		The second									7.0	
MC-58	782+00	120 ft. Righ	1085.3						CSK	10/17/2002	-	•
	, t			0.0	1.5	Light brownish gray, cherty silt, dry		ML		-	Dry AB	
				1.5	4.0	Reddish brown and white, chert gravel, with clay seams, moist	AS-1	GC				
						Bottom of Boring / Auger refusal at 4.0 feet						
						Boring backfilled with cuttings at completion						
MS-59	783+36	150 ft. Left	1034.3			See Roadway Structure Boring Logs				18 18 18 18 18		
					-	See Roadway Structure Boring Logs						
MS-60	784+25	248 ft. Righ	1010.4			See noadway Structure borning Logs						
							13					

Boring				Dept					Logged	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	0505	Ву:	Date	Deptil	Comments
MC-61	786+00	120 ft. Left	1101.4						CSK	10/22/2002		
				0.0	5.0	Light brown, silt, with chert gravel, dry	AS-1	ML			Dry AB	Dry 24 Hr AB
				5.0	10.0	Reddish brown, clayey chert gravel, with sand, moist	AS-2	GC				U-u-l-h-d-sagm et 10
				10.0	15.0	Reddish brown, clayey chert gravel, abundant sand	AS-3	GC			3 1	Hard chert seam at 10 feet
				15.0		Reddish brown clayey chert gravel with sand	AS-4	GC				Hard chert seam at 15 feet
						Bottom of Boring / Auger refusal at 19.5 feet						Hard drilling at 19.0 fe
						Boring backfilled with cuttings at completion						
		0 1 1	1000.0						CSK	10/22/2002		
MC-62	786+00	Centerline	1086.6	0.0	5.0	Light brown, silt, with chert gravel, dry	AS-1	ML			Dry AB	Dry 24 Hr AB
				5.0	7.0	Light brown, silty chert gravel, dry	AS-2	GM				Hard drilling at 6.5 feet
						Bottom of Boring / Auger refusal at 7.0 feet						
						Boring backfilled with cuttings at completion						
MC-63	785+96	120 ft. Right	1064.0						CSK	10/17/2002		
			- 1 × - 1	0.0	5.0	Light reddish brown, silty chert gravel, dry	AS-1	GM			Dry AB	Dry cave-in to 3.0 feet
				5.0	10.0	Gray, chert gravel, trace silt seams, dry	AS-2	GP				
				10.0	15.5	Gray, chert gravel, trace silt seams, dry	AS-3	GP				Hard drilling
						Bottom of Boring / Auger refusal at 15.5 feet						
						Boring backfilled with cuttings at completion						
MC-64	788+00	120 ft. Left	1117.4			See Roadway Core Boring Logs						
1410-04	700100	120111 2011										

Boring				Depth					Logged	Б.	GW	0
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
110.05	700.00	Contodino	1106.4						CSK	10/22/2002		
MC-65	788+00	Centerline	1100.4									
			~	0.0	5.0	Light brown, silty chert gravel, dry	AS-1	GM			Dry AB	Dry 24 Hr AB
					1							Hard chert seam at 5.0
				5.0	10.0	Light brown, silty chert gravel, dry	AS-2	GM				feet
						Light reddish brown, silty chert gravel, with hard chert						
				10.0	15.0	seams, dry	AS-3	GM				
						Light reddish brown, silty chert gravel, with sand and hard	40.4	GM				
				15.0	20.0	chert seams Reddish brown, silty chert gravel, with hard chert seams	AS-4	GM			-	
				00.0	05.0		AS-5	GM		· ·		
				20.0	25.0	and sand Reddish brown, silty chert gravel, with hard chert seams	A3-3	CIVI			-	
				25.0	30.0	and sand	AS-6	GM				
				25.0	30.0	Reddish brown, silty chert gravel, with hard chert seams	7100	- CI.VI				
				30.0	35.0	and sand	AS-7	GM				
				00.0	00.0	Reddish brown, silty chert gravel, with hard chert seams						
				35.0	37.0	and sand		GM				Hard chert at 37.0 fee
		7 1										
		6				Bottom of Boring / Auger refusal at 37.0 feet	BULK-8	(0 to 25	feet)			
	-					Boring backfilled with cuttings at completion						
				-			-					
MC 66	700,00	120 ft. Right	1099.7						CSK	10/17/2002		
MC-66	788+00	120 It. Tilgit	1033.7									
				0.0	2.5	Light brown, silt, with chert gravel, dry	AS-1	ML			Dry AB	Dry 24 hr AB
						Light brown, silty chert gravel, with clay and hard chert						
				2.5	10.0	seam, moist	AS-2	GM				
						Light brown, silty chert gravel, with clay and hard chert						
				10.0	15.0	seam, moist	AS-3	GM				
						Light brown, silty chert gravel, with clay and hard chert	40.4	GM				More silt
				15.0	20.0	seam, moist	AS-4	GM		-	-	MOLE SIII
				00.0	05.0	Reddish brown, clayey chert gravel, with sand, moist	AS-5	GC				
				20.0	25.0	Reddish brown, dayey cheft graver, with sand, moist	70-0	40		-	-	
				25.0	30.0	Reddish brown, sandy lean clay, trace chert gravel, moist	AS-6	CL				
				23.0	30.0	Treduisit brown, sarray loan olay, trace oner grave, more	1			19		
				30.0	33.0	Reddish brown, sandy lean clay, trace chert gravel, moist						Hard drilling at 33 feet
			-	100.0								
						Bottom of Boring / Auger refusal at 33.0 feet						
										-		
						Boring backfilled with cuttings at completion		-	1 1		-	
								-	-	-	+	
			- 34									
			1	-	-							
					35 0							1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	-			-								
		1	-	1 25.2	1							

Boring		<u>.</u>		Dept				T	Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-67	790+00	120 ft. Left	1098.1				, ,		CSK	10/22/2002		
				0.0	4.0	Light brown, silt, with chert gravel, dry	AS-1	ML			Dry AB	
											1	Hard chert seam at 4.0
				4.0	10.0	Reddish brown, cherty lean clay with sand, moist	AS-2	CL				feet
				10.0	10.5	Hard chert at 10.0'						
						Bottom of Boring / Auger refusal at 10.5 feet						
						Boring backfilled with cuttings at completion						,
MC-68	789+92	Centerline	1073.2						CSK	10/22/2002		
				0.0	3.5	Light brown, silty chert gravel, dry	AS-1	GM			Dry AB	Fill for drilling pad
				3.5	10.0	Light reddish brown, silt, abundant chert gravel, dry	AS-2	ML				
				10.0	12.5	Light reddish brown, silt, abundant chert gravel, dry	AS-3	ML				Hard drilling at 12.0 feet
						Bottom of Boring / Auger refusal at 12.5 feet						
						Boring backfilled with cuttings at completion						
	-											
MC-69	790+00	120 ft. Right	1082.3		<u> </u>				CSK	10/17/2002		
				0.0	5.0	Light reddish brown, silt, with sand, trace chert gravel and clay seams, dry to moist	AS-1	ML			Dry AB	Dry 24 hr AB
				5.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
				10.0	12.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				
				12.0	13.5	White, chert, hard						
						Bottom of Boring / Auger refusal at 13.5 feet						
						Boring backfilled with cuttings at completion						
											7	
MC-70	792+00	112 ft. Left	1057.4						CSK	10/22/2002		
				0.0	3.5	Light brown and gray, chert gravel/broken chert, with silt, dry	AS-1	GM			Dry AB	
						Bottom of Boring / Auger refusal at 3.5 feet	BULK-2	(0 to 3.	5 feet)			
				1	[Boring backfilled with cuttings at completion						

Boring	_				h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-71	792+00	Centerline	1058.3						CSK	10/22/2002		
				0.0	5.0	Light brown and gray, chert gravel, trace silt, dry Light brown and gray, chert gravel/broken chert, trace silt,	AS-1	GP			Dry AB	
_				5.0	7.5	dry	AS-2	GP				
	_					Bottom of Boring / Auger refusal at 7.5 feet						
						Boring backfilled with cuttings at completion						
MS-72	792+28	250 ft. Right	979.8			See Roadway Structure Boring Logs						
MS-73	795+49	Centerline	990.4			See Roadway Structure Boring Logs						
	-	-		:								
MS-74	797+99	200 ft. Left	994.0			See Roadway Structure Boring Logs						
MC-75	800+00	120 ft. Left	1050.5						DCP	10/15/2002	Dry AB	
				0.0	7.0	Light brown, chert gravel, with silt and clay	AS-1	GC				
				7.0	10,0	Reddish brown, cherty fat clay, with sand	AS-2	СН				
				10.0	14.3	Reddish brown, cherty fat clay, with sand	AS-3	СН				Hard drilling at 13.7 fee
			-			Bottom of Boring / Auger Refusal at 14.3 feet						
						Boring backfilled with cuttings at completion					<u> </u>	
MC-76	800+00	Centerline	1061.6						DCP	10/15/2002	Dry AB	
				0.0	5.0	Light brown, silt, with chert gravel, trace sand and clay	AS-1	ML				
				5.0	10.0	Light brown, gravel, trace sand	AS-2	GP				
				10.0	15.0	Light brown, gravel, trace sand	AS-3	ĞР				
				15.0	32.0	Light brown, gravel, trace sand		GP				No cuttings returned from below 20 feet
				<u>.</u>		Bottom of Boring / Auger Refusal at 32.0 feet	· <u>-</u>					
						Boring backfilled with cuttings at completion						

Boring				Dept					Logged		GW	_
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
AC-77	800+06	119 ft. Right	1068.5						DCP	10/15/2002	Dry AB	
	200100	, 10 th the										
		~ 		0.0	4.5	Light brown, chert gravel/weathered chert, with sand, dry Reddish brown to light brown, weathered chert with chert	AS-1	GP				
		•		4.5	10.0	gravel, trace clay	AS-2	GP				
						Reddish brown to light brown, weathered chert with chert						
				10.0	15.0	gravel, trace clay Reddish brown to light brown, weathered chert with chert	AS-3	GP				No cuttings returned
}				15.0	42.5	gravel, trace clay						from below 15 feet
						Bottom of Boring / Auger Refusal at 42.5 feet						3 augers lost in hole
						Boring backfilled with cuttings at completion			,			
		<u>.</u>	<u> </u>									
MC-78	802+00	120 ft. Left_	1082.2						DCP	10/15/2002	Dry AB	
				0.0	5.0	Light brown, gravel, with silt, dry	AS-1	GM		<u> </u>		
				5.0	10.0	Reddish brown, gravelly sand, dry	AS-2	SP			:	.,
				10.0	14.5	Reddish brown, chert gravel	AS-3	GP				
						Bottom of Boring / Auger Refusal at 14.5 feet						
						Boring backfilled with cuttings at completion						
MC-79	802+00	Centerline	1092.9		-				DCP	10/15/2002	Dry AB	
				0.0	5.0	Light brown to reddish brown, silt, with chert gravel	AS-1	ML				
			Ę	5.0	12.5	Reddish brown, gravelly fat clay, with sand, dry	AS-2	СН	1			
· -				12.5		Reddish brown, gravelly fat clay, with sand, moist	AS-3	СН				
				15.0	20.0	Reddish brown, fat clay, with chert gravel, moist to wet	AS-4	СН				Wet at 18.0 feet
							AS-5	СН				
	-	 		20.0	23.5	Reddish brown, fat clay, with chert gravel, wet			L			- twis-
						Bottom of Boring / Auger Refusal at 23.5 feet	BULK-6	(0 to 23	.5)			
				<u> </u>		Boring backfilled with cuttings at completion						
				ļ							<u> </u>	
			<u> </u>	<u> </u>								

Boring				Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-80	802+00	120 ft. Right	1096.3						DCP	10/15/2002	22 ft AB	
			-	0.0	5.0	Light brown, chert gravel, with silt, dry	AS-1	GM				
				5.0	10.0	Reddish brown, gravelly fat clay, with sand, dry	AS-2	СН				
			_	10.0	15.0	Reddish brown, gravelly fat clay, with sand, dry to moist	AS-3	СН				Moist at 11.0 feet
				15.0	20.0	Reddish brown to light brown, gravelly fat clay, with sand, moist	A\$-4	СН				
				20.0	25,0	Reddish brown to light brown, gravelly fat clay, with sand, moist to wet	AS-5	СН				Wet at 22.0 feet
				25.0	26.5	Reddish brown to light brown, gravelly fat clay, with sand, wet	AS-5			···		1761 at 22.0 leet
				23.0	20.5	Bottom of Boring / Auger Refusal at 26.5 feet	A9-9	СН				
	****		- · · ·			Boring backfilled with cuttings at completion						
	3 11.					soming becomined with readings at completion						
MC-81	803+97	135 ft. Left	1098.0						DCP	10/16/2002		No AB reading
				0.0	5.0	Light brown to reddish brown, gravel, with silt, trace clay	AS-1	GM		10,10,2002		
			.,	5.0	9.0	Reddish brown, gravelly fat clay, trace sand, moist	AS-2	СН				
						Bottom of Boring / Auger refusal at 9.0 feet						
						Boring backfilled with cuttings at completion						-
MC-82	804+00	Centerline	1107.6		-	See Roadway Core Boring Logs						
		,		····		ess risuarity solve solling Logo						
MC-83	804+00	120 ft. Right	1098,8						DCP	10/16/2002	Dry AB	
				0.0	7.0	Light brown to reddish brown, chert gravel with sand, trace clay, dry	AS-1	GP	50.	10,70,2002	5.,7	
				7.0		Reddish brown, fat clay, with chert gravel and sand, dry	AS-2	СН				
				10.0		Reddish brown, gravelly fat clay, moist	AS-3	СН				
				13.0		Reddish brown, gravelly fat clay, moist	AS-4	СН				
						Bottom of Boring / Auger refusal at 13.5 feet						
						Boring backfilled with cuttings at completion						

Boring	Otation	04-44	Elevation	Dept From	h (Ft) To	Log of Materials	Samples	LISCS	Logged By:	Date	GW Depth	Comments
No.	Station	Offset		FIUII		LOG OF MALERIAIS	Gamples	0000			1	
MC-84	806+08	120 ft. Left	1106.1						DCP	10/16/2002	24 ft AB	
				0.0	6.0	Light brown to reddish brown, sandy gravel, trace clay	AS-1	GP				
				6.0	. 9.0	Reddish brown, fat clay, with chert gravel, moist	AS-2	СН				
				9.0	15.0	Reddish brown fat clay, with chert gravel, moist	AS-3	СН				more moisture below 11 ft
				15.0	20.0	Light brown, gravelly fat clay, trace sand, moist	AS-4	СН	·			
				20.0	25.0	Light brown, gravelly fat clay, trace sand, wet	AS-5	СН		· · · · · · · · · · · · · · · · · · ·		
				25.0	27.0	Light gray, weathered limestone	AS-6					
						Bottom of Boring / Auger refusal at 27.0 feet			<u> </u>	ATTORNEY.		
_						Boring backfilled with cuttings at completion				· · · · · · · · · · · · · · · · · · ·		
		~.										
MC-85	806+00	45 ft. Left	1113.6						DCP	10/16/2002	18 ft AB	
				0.0	3.0	Light brown to reddish brown, sandy gravel, trace clay, dry	AS-1	GP				
				3.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-2	СН				
				10.0	15.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				15.0	20.0	Reddish brown, fat clay, with sand, trace chert gravel, wet	AS-4	СН				
				20.0	25.0	Reddish brown, fat clay, with chert gravel, wet	AS-5	СН				
				25.0	30.0	Light brown, fat clay, with chert gravel, wet	AS-6	СН				
						Bottom of Boring / Auger refusal at 30.0 feet						
						Boring backfilled with cuttings at completion						
			ļ	ļ								
MC-86	806+00	120 ft. Right	1090.4						CSK	10/18/2002		
				0.0	5.0	Light brown and gray, chert gravel, trace silt, dry	AS-1	GP			Dry AB	Dry 72 hr AB
				5.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
			1	10.0	15.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				More moisture Hard drilling from 17.0 to
			<u> </u>	15.0	18.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-4	CL	L			18.0 feet
					Ì	Bottom of Boring / Auger refusal at 18.0 feet	Boring	g backfill	led with cu	ttings at compl	etion	

Boring				Dept	h (Ft)		1	1	Logged		GW	<u> </u>
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-87	808+00	115 ft. Left	1119.7						DCP	10/16/2002	Dry AB	
				0.0	6.0	Light brown to reddish brown, sandy chert gravel, dry	AS-1	GP				
				6.0	13.0	Reddish brown, fat clay, with chert gravel, moist	AS-2	СН				
				13.0		Light brown, chert gravel/weathered chert, trace sand and clay, dry	AS-3	GP				
	· ,,,			16.5	17.5	Gray, chert gravel/weathered chert, trace sand and clay	AS-4	GP				,
						Bottom of Boring / Auger refusal at 17.5 feet						
						Boring backfilled with cuttings at completion						
MC-88	808+00	Centerline	1123.9						DCP	10/16/2002		No AB Reading
				0.0	4.0	Light brown to reddish brown, sandy chert gravel, dry	AS-1	GP				
· -···				4.0	11.5	Reddish brown, sandy fat clay, with chert gravel	AS-2	СН				
		7 - 1 1 1 1 1 1 1 1 1 1		11.5	13.0	Red, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				13.0	19.0	Red, gravelly fat clay, trace sand, moist	AS-4	СН				
				19.0	20.0	Light brown, fat clay, with chert gravel, trace sand, moist	NO 4	СН				
	- <u>-</u>					Bottom of Boring / Auger refusal at 20.0 feet	BULK-5	(0 to 20	feet)			
						Boring backfilled with cuttings at completion						
MC-89	808+00	120 ft. Right	1117.7						DCP	10/16/2002	Dry AB	
				0.0	6.0	Light brown to reddish brown, sandy chert gravel, dry Reddish brown to light brown, sandy chert gravel, with	AS-1	GP				
				6.0	9.0	Heddish brown to light brown, sandy chert gravel, with clay, moist	AS-2	GP-GC				
						Bottom of Boring / Auger refusal at 9.0 feet						
						Boring backfilled with cuttings at completion						
											<u> </u>	
	·											

Boring		- 4			h (Ft)			LICOC	Logged	Dete	GW	Comments
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-90	810+00	125 ft. Left	1133.0						DCP	10/16/2002	Dry AB	
	-			0.0	3.0	Light brown to reddish brown, sand, with chert gravel, dry	AS-1	SP				
		***		0.0	3.0	Reddish brown, fat clay, with chert gravel, trace sand,	70.					
				3.0	15.0	moist	AS-2	СН				
				15.0	22.0	Red, fat clay, with chert gravel	AS-3	СН				
				22.0	25.5	Red, fat clay, with chert gravel, wet						
						Bottom of Boring / Auger refusal at 25.5 feet						
						Boring backfilled with cuttings at completion					1	
MC-91	810+00	Centerline	1126.1						DCP	10/16/2002	Dry AB	
.110-91	010100	- Contonino	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			Light brown to reddish brown, sitty sand, with chert gravel,	100				<u> </u>	
		·		0.0	3.5	dry Reddish brown, fat clay, with chert gravel and sand, dry to	AS-1	SM	-	<u>,</u>		
		ļ		3.5	10.0	moist	AS-2	СН				
	,					Light brown to reddish brown, gravelly fat clay, with sand,	46.0					
				10.0	15.0	moist Light brown to reddish brown, gravelly fat clay, with sand,	AS-3	CH	· · · · · · · · · · · · · · · · · · ·		-	
				15.0	19.0	moist	AS-4	СН				
	<u>.</u>			ļ		Bottom of Boring / Auger refusal at 19.0 feet			ļ			
						Boring backfilled with cuttings at completion						
MC-92	810+00	120 ft. Right	1097.7						CSK	10/18/2002		
				0.0	1.0	Silty chert gravel (fill for drilling pad)	į				Drv AB	Dry 72 hr AB
		 		10.0	1	Light reddish brown, silty lean clay, scattered chert gravel,						
				1.0	6.0	dry to moist Light reddish brown, silty lean clay, scattered chert gravel,	AS-1	CL			<u> </u>	Hard drilling on chert of
]		6.0	7.0	dry to moist	AS-2	CL				limestone at 7.0 feet
						Bottom of Boring / Auger refusal at 7.0 feet						
						Boring backfilled with cuttings at completion						
	-											
		<u> </u>										

7

Boring	Otation	0#4	F		h (Ft)		1	T	Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-93	812+00	120 ft. Left	1145.5						DCP	10/17/2002	Dry AB	
				0.0	1.0	Light brown, sandy chert gravel, dry	AS-1	GP				
				1.0	5.0	Red, fat clay, trace sand and chert gravel		СН				
				5.0	10.0	Red, fat clay, with chert gravel, moist	AS-2	СН				
				10.0	18.0	Red, fat clay, with chert gravel, moist	AS-3	СН				
				18.0	18.5	Gray, weathered limestone/chert						
						Bottom of Boring / Auger Refusal at 18.5 feet						
						Boring backfilled with cuttings at completion						
MC-94	812+00	20 ft. Left	1134.4						DCP	10/16/2002	Dry AB	
				0.0	1.0	Light brown, sand with chert gravel, dry	- AS-1	SP				
				1.0	5.0	Reddish brown, fat clay, with chert gravel, moist		СН				
				5.0	9.5	Reddish brown, fat clay, with chert gravel, moist	AS-2	СН				
						Bottom of Boring / Auger refusal at 9.5 feet	BULK-3	BULK-3 (0 to 9.5 fee		/		
						Boring backfilled with cuttings at completion						
MC-95						Deleted - Access Denied						
MC-96						Deleted - Access Denied						
MC-97						Deleted - Access Denied						
MC-98	814+00	120 ft. Right	1123.4						CSK	10/18/2002		
			····	0.0	4.5	Light brown, cherty silt, dry	AS-1	ML			Dry AB	Dry 72 hr AB
				4.5	10.0	Light reddish brown, silty chert gravel, dry Light reddish brown, silty chert gravel, trace clay seams,	AS-2	GM				
				10.0	15.0	dry	AS-3	GM				
				15.0	18.5	Light reddish brown, silty chert gravel, trace clay seams, dry	AS-4	GM				Hard chert at 18.0 feet
						Bottom of Boring / Auger refusal at 18.5 feet	Boring bac	kfilled w	ith cuttings	s at completion		-

Boring				Depth			T		Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-99						Deleted - Access Denied						
MC-100						Deleted - Access Denied						
MC-101					1	Deleted - Access Denied						
MS-102						Deleted - Access Denied						
MS-103	818+71	239 ft Right	1039.7			See Roadway Structure Boring Logs						
MC-104	821+09	108 ft Left	1129.3						SPB	4/16/2003	Dry AB	
		:		0.0	5.0	Brown, gravel and cobbles, moist	AS-1	GP				
				5.0	10.0	Reddish brown and white, clayey gravel, with thin chert seams, moist to dry, hard seam at 7 ft, 8 ft & 10 ft.	AS-2	GC				
_				10.0	15.0	Light reddish brown and white, clayey gravel, with chert seams, dry Light reddish brown and white, clayey gravel, with chert	AS-3	GC				
				15.0	17.0	seams, dry		GC				
			-			Bottom of Boring / Auger refusal at 17.0 feet		,				
						Boring backfilled with cuttings at completion						
MC-105	821+00	Centerline	1123.7						SPB	4/16/2003	Dry AB	
				0.0	2.0	Brown, gravel and cobbles with sand, dry Reddish brown and white, clayey gravel, scattered chert	AS-1	GP				
				2.0	7.0	seams, moist	AS-2	GC				
				:		Bottom of Boring / Auger refusal at 7.0 feet	BULK-3	(2.0 - 7.	0 feet)			
						Boring backfilled with cuttings at completion						
	-											
MC-106	821+00	120 ft Right	1111.3			Brown to light brown, gravel and cobbles, trace clay and	100		SPB	4/16/2003	Dry AB	
-				3.0	10.0	sand, dry Reddish brown and white, clayey gravel with sand, moist, with chert seams below 5 feet	AS-1	GP GC				
				10.0		White and light reddish brown, clayey gravel, wet	AS-3	GC		,		
				10.0	2.3	Bottom of Boring / Auger refusal at 12.5 feet	Boring ba		ith cutting			

Boring	a				h (Ft)		1		Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-107	822+96	116 ft Left	1152.5				-	i	SPB	4/16/2003	Dry AB	
ĺ				0.0	4.0	Brown to reddish brown, clayey gravel, trace cobbles, moist	40.4		-			
				0.0			AS-1	GP			 	
		,			4.0	White chert	AS-2					
		,	- 			Bottom of Boring / Auger refusal at 4.0 feet						
						Boring backfilled with cuttings at completion						
MC-108	823+00	Centerline	1147,3						SPB	4/10/0000	De. AB	
			.,,,,,	0.0	5.0	Brown to reddish brown, clayey gravel, trace cobbles, moist	AS-1	GC	SPB	4/16/2003	Dry AB	
						Bottom of Boring / Auger refusal at 5.0 feet	BULK-2	(0 to 5 f	eet)			
						Boring backfilled with cuttings at completion	_					
MC-109	823+00	120 ft., Right	1128,8						SPB	4/40/0000	545	
			7120.0	0.0	5.0	Light brown, gravelly lean clay, moist	40.4	~	SFB	4/16/2003	Dry AB	
				5.0			AS-1	CL				
				5.0	7.0	Light brown and white, clayey gravel, moist	AS-2	GC				
	-					Bottom of Boring / Auger refusal at 7.0 feet						
						Boring backfilled with cuttings at completion			1			
MC-110	824+88	115 ft Left	1163.7			See Roadway Core Boring Logs						
	:		<u></u>									
MC-111	825+00	Centerline	1153.8						SPB	4/16/2003	Dry AB	
				0.0	3.0	Dark brown, gravel and cobbles, dry	AS-1	GP	-			
				3.0		Light brown, sandy lean clay, trace gravel, with chert seams, moist	46.0	<u></u>				
						Light brown, sandy lean clay, with chert seams, dry,	AS-2	CL				
				5.0	8.5	difficult drilling	AS-3	CL				
						Bottom of Boring / Auger refusal at 8.5 feet						
						Boring backfilled with cuttings at completion						
						-						

Boring				Depti	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-112	825+00	120 ft Right	1127.7				-		SPB	4/16/2003	Dry AB	
MC-112	020+00	120 II Figrii	1127.7			Brownish gray to light brown, sandy lean clay, trace gravel,			OF D	4/10/2003	DIY AD	
				0.0	5.0	moist	AS-1	CL				
						Brownish gray to light brown, sandy lean clay, trace gravel,						
				5.0	6.0	moist	AS-2	CL				
1						Bottom of Boring / Auger refusal at 6.0 feet						
					·· · · · · · · · · · · · · · · · · · ·	Bottom of Boiling / Auger refusal at 0.0 reet	 	-			1	
						Boring backfilled with cuttings at completion						
							<u> </u>				<u> </u>	
MC-113	827+00	120 ft Left	1165.1				1	<u> </u>	SPB	4/16/2003	Dry AB	
				0.0	5.0	Brown, gravel and cobbies, dry to moist	AS-1	GP				
				5.0	7.0	Reddish brown, fat clay, moist	AS-2	СН				
				3.0	7.0	White and light reddish brown, chert seams, trace clay	MO-2	- 0n -		1	+ +	
		~-		7.0	10.0	seams, dry	AS-3					
						White and light reddish brown, chert seams, trace clay						
				10.0	24.0	seams, dry, difficult drilling	AS-4	GC				
						Bottom of Boring / Auger refusal at 24.0 feet						
						Boring backfilled with cuttings at completion						
NO 444	907.00	Centerline	1153.2						SPB	4/17/2003	Dry AB	
MC-114	827+00	Centerine	1155.2	1					OI D	4/1//2000	0.9.70	
				0.0	5.0	Light brown, sandy lean clay, with gravel, moist	AS-1	CL				
						Light reddish brown and white, clayey gravel, with chert						
				5.0	10.0	seams, dry, difficult driffing	AS-2	GC				
				10.0	40.0	Chert with clay seams, white and light reddish brown, very slow drilling	AS-3					
		-		10.0	13.0	SIOW CHAINING	A3-3	 				
						Bottom of Boring / Auger refusal at 13.0 feet					ļ.	
						Boring backfilled with cuttings at completion						
MC-115	827+00	120 ft Right	1136.8						вкм	5/5/2003	Dry AB	
WIO-1 13	UE I TUU	(EVIL. INGIL	1130.0	1		Light brown and brown, lean clay, scattered chert			uv			
				0.0	3.0	fragments, moist	AS-1	CL			$oxedsymbol{oxed}$	
		<u> </u>				Reddish brown, lean clay, scattered gravel, trace chert		[
		ļ		3.0	9.0	seams, moist	AS-2	CL	ļ,		 	
				9.0	26.5	Light reddish brown, lean clay, scattered gravel, cobbles and chert seams, dry	AS-3	CL				
				1								
				<u></u>		Bottom of Boring / Auger refusal at 26.5 feet	Boring bac	ckfilled w	ith cutting	s at completior	$oldsymbol{ol}oldsymbol{ol}oldsymbol{oldsymbol{oldsymbol{ol}oldsymbol{ol}oldsymbol{ol}oldsymbol{ol{ol}}}}}}}}}}}}}}}}$	

Boring				Dept	h (Ft)		T	<u> </u>	Logged	ı	GW	<u> </u>
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	uscs		Date	Depth	Comments
MC-116	829+00	120 ft. Left	1144.8				Ì		SPB	10/24/2002		
	020.00	TEO IC, COIL	1177.0			White and light gray, chert gravel, abundant chert layers,		<u> </u>	orb	10/24/2002		
		·		0.0	5.0	dry	AS-1	GP	L		Dry AB	No 24 hr AB
					40.5	White and light reddish brown, broken chert/chert layers,						
				5.0	10.5	few clay seams, dry White and reddish brown, chert gravel, with fat clay, few	AS-2				ļ	Hard drilling below 5 fee
		1		10.5	15.0	chert seams, dry	AS-3	GC				
						Light brown, lean clay, abundant chert gravel, trace chert						
				15.0	20.0	seams, moist Light brown lean clay, abundant chert gravel, trace chert	AS-4	CL				
				20.0	21.0	seams, moist	AS-5	CL				
					2110	DOZENIO INGIO	70-0	<u> </u>				
						Bottom of Boring / Auger refusal at 21.0 feet						
						Boring backfilled with cuttings at completion						
						Donning Sacktimed with Cuttings at Completion					<u> </u>	
MC-117	829+00	Centerline	1146.7						ВКМ	5/5/2003	Dry AB	
									DICIVI	3/3/2003	DIY AD	
				0.0	1.0	Light brown and brown, lean clay, trace gravel, moist		CL				
				1.0	8.0	Reddish brown, lean clay, little gravel, moist	AS-1	CL				
				1.0	0.0	Light reddish brown, lean clay, scattered gravel and	A9-1	OL.				
				8.0	14.0	cobbles, dry	AS-2	CL				
						Bottom of Boring / Auger refusal at 14.0 feet	BULK-3	/1 to 12	E foot\			
						Dottom of botting / Auger relusar at 14.0 leet	DOLK-3	(11013	.5 leet)			
						Boring backfilled with cuttings at completion						
MC-118	829+00	120 ft. Right	1139.0						ВКМ	5/5/2003	Dry AB	
				0.0	4.0	light have to have less along trace are all de-	40.4					
				0.0	1.0	Light brown to brown, lean clay, trace gravel, dry	AS-1	CL				
				1.0	6.0	Reddish brown, lean clay, scattered gravel, moist	AS-2	CL			Į	
						Light reddish brown, lean clay, scattered gravel and						
				6.0	16.0	cobbles, dry	AS-3	CL				
						Bottom of Boring / Auger refusal at 16.0 feet					ļ	
1												
. —						Boring backfilled with cuttings at completion						
							1					
							<u> </u>	<u> </u>				<u> </u>
MS-119	830+76	188 ft. Left	1086.3			See Roadway Structure Boring Logs	ļ	ļ				
į							1					
							-				-	
MS-120	831+28	4 ft. Right	1077.7			See Roadway Structure Boring Logs	<u> </u>					

Boring				Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MS-121	832+24	276 ft. Right	1062.7			See Roadway Structure Boring Logs			٠		1	
											 	
MC-122	834+00	120 ft. Left	1150.2	-					SPB	10/24/2002		
						Brown and reddish brown, lean clay, with chert sand and					l	
				0.0	5.0	fine gravel, dry	AS-1	_CL_			Dry AB	No 24 hr AB
				5.0	10.0	Reddish brown, fat clay, abundant fine chert gravel, dry to moist	AS-2	СH				
				5.0	10.0	most	A3-2	ŲΠ				
				10.0	15.0	Reddish brown, fat clay, abundant fine chert gravel, moist	AS-3	СН				
							112					
	•			15.0	20.0	Reddish brown, fat clay, abundant fine chert gravel, moist	AS-4	CH				
						Reddish brown, fat clay, scattered fine chert gravel, trace						
				20.0	25.0	very thin chert seams, moist Reddish brown, fat clay, scattered fine chert gravel, trace	AS-5	СН				Hard chert layer from
				05.0	200	very thin chert seams, moist	AS-6	СН				27.0 to 28.0 feet
				25.0	28.0	very tillif cheat seams, moist	A0-0	On.			 	27.0 10 20.0 1001
		~-				Bottom of Boring 28.0 feet						
								 	·			
						Boring backfilled with cuttings at completion						
						- Lunaner um - um					<u> </u>	
110 100	834+00	Centerline	1129.7]	}				SPB	10/24/2002		
MC-123	034+00	Centerarie	1129.7	-		Reddish brown and brown, lean clay, abundant chert			- 5	10/2-4/2002		
				0.0	5.0	gravel, dry	AS-1	CL				No 24 hr AB
						Light reddish brown lean clay with chert sand and gravel,						Chert layer from 7.0 to
				5.0	7.5	moist	AS-2	CL				7.5 feet, hard drilling
												Chert layer from 11.0 to
				7.5	11.0	Light brown, lean clay, with chert sand and gravel, wet	AS-3	CL				11.5 feet Chert layer from 14.0 to
				11.0	15.0	Light brown, lean clay, with chert sand and gravel, wet	AS-4	CL				14.5 feet
		-		11.0	15.0	Light brown, lean day, with their said and graver, wer	70-4	- OL			-	14.0 1001
						Bottom of Boring 15.0 feet						
		 										· ·
	· I					Boring backfilled with cuttings at completion					<u> </u>	
				-			-				 	
MC 404	837+00	120 ft. Left	1169.5	1		See Roadway Core Boring Logs						
MC-124	03/+00	120 IL Left	1108.5	 	 	Gee Hoadway Cole boiling Logs	 	 		<u> </u>	<u> </u>	
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Boring	Otation.	0"	- 1		h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-125	837+00	Centerline	1155.1						SPB	10/24/2002		
			· · · · · · · · · · · · · · · · · · ·	0.0	1.0	Dark brown, silt, with chert gravel (4" Topsoil), dry	AS-1A	ML				No 24 hr AB
				1.0	6.0	Reddish brown, fat clay, scattered chert gravel, dry	AS-1	СН				
				6.0	6.8	Reddish brown, fat clay, dry	ST-2A	СН				
				6.0	10.0	Reddish brown, fat clay, dry	AS-2	СН		·		
				10.0	15.0	Reddish brown fat clay, moist	AS-3	СН				
				15.0	20.0	Reddish brown fat clay, moist	AS-4	СН				
				20.0	25.0	Reddish brown fat clay, moist	AS-5	СН				
						Bottom of Boring 25.0 feet	BULK-6	(1 to 25	feet)			
		~	 		-	Boring backfilled with cuttings at completion						
MC-126	836+81	104 ft. Right	1144.5						SPB	10/24/2002		
				0.0	1.0	Dark brown, silt, with chert gravel, dry (4" Topsoil)		ML	31 8	10/24/2002	Dry	No 24 hr AB
				1.0	5.0	Reddish brown, fat clay, scattered chert gravel, dry	AS-1	СН		<u>.</u>		140 24 111 710
				5.0	7.5	Reddish brown, fat clay, scattered chert gravel, dry	AS-2	СН				
				7.5	8.3	Light gray and white, chert, dry						
						Bottom of Boring / Auger refusal at 8.3 feet				•••		
						Boring backfilled with cuttings at completion						
		-										
VC-127	838+76	138 ft. Left	1166.0			Light brown and white, chert gravel, with clay, few chert			SPB	10/24/2002		
				0.0	5.0	seams, dry	AS-1	GC			Dry AB	No 24 hr AB
				5.0	10.0	Reddish brown and white, fat clay, abundant chert gravel, few chert seams, moist	AS-2	СН				
				10.0		Reddish brown and white, fat clay, abundant chert gravel, few chert seams, moist	AS-3	CH		 		
				15.0	17.0	Reddish brown and white, fat clay, abundant chert gravel, few chert seams, moist	AS-4	CH				
			-	17.0		White chert	7.0 7	0.,				
					_	Bottom of Boring / Auger Refusal at 18.0 feet	Boring bac	kfilled wi	th cuttings	s at completion		

Right 1052.7		h (Ft) To	Log of Materials Deleted - Access Denied	Samples	USCS	Logged By:	Date	Depth	Comments
Right 1052.7			Deleted - Access Denied						
Right 1052.7			Deleted - Access Defined						
Right 1052.7						!			
Right 1052.7									
Hight 1052.7		1	See Roadway Structure Boring Logs						
			See Roadway Structure Borning Logs						
rline 1064.3		1	See Roadway Structure Boring Logs						
Left 1074.4	 		See Hoadway Structure Boring Logs						
						DOD	40/40/0000	D=, 45	
ntine 1168.2	+					DCP	10/18/2002	DIV AB	
	0.0	3.0	Light brown, sand, with chert gravel, dry	AS-1	SP				
	3.0	10.0	Reddish brown, fat clay, with chert grayet, trace sand.	AS-2	СН				-
	10.0	15.0	moist	AS-3	СН				
1									
-	15.0	22.0	Reddish brown to brown fat clay with chert grayet trace		CH		·		-
	22.0	25.0	sand, moist	AS-4	СН				
	1				011				
	25.0	30.0	Reddish brown to brown, fat clay, with chert grayel, trace	 	CH				
1	30.0	35.0	sand, moist	.AS-5	СН				
	35.0	40.0	sand, moist		СН				
		1	Bottom of Boring 40.0 feet	BULK-6	(0 to 40	O feet)			
		ļ	Boring backfilled with cuttings at completion					 	
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	1	<u> </u>						<u> </u>	
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	Left 1074.4 ertine 1168.2	Left 1074.4 ertine 1168.2 0.0 3.0 10.0 15.0 22.0 25.0 30.0 35.0	Left 1074.4 ertine 1168.2 0.0 3.0 10.0 15.0 15.0 22.0 22.0 25.0 25.0 30.0 30.0 35.0 35.0 40.0	Left 1074.4 See Roadway Structure Boring Logs 1168.2 0.0 3.0 Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat 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Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with 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O.0 3.0 Light brown, sand, with chert gravel, dry AS-1 SP Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert 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1074.4 See Roadway Structure Boring Logs DCP 1168.2 DCP 0.0 3.0 Light brown, sand, with chert gravel, dry AS-1 SP Reddish brown, fat clay, with chert gravel, trace sand, moist AS-2 CH Reddish brown, fat clay, with chert gravel, trace sand, moist AS-3 CH Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist AS-4 CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown to brown, fat clay, with chert gravel, trace sand, moist CH Reddish brown 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trace sand, moist CH Reddish brown t	Left 1074.4 See Roadway Structure Boring Logs DCP 10/18/2002 0.0 3.0 Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay, with chert gravel, trace Sand, moist Reddish brown to brown, fat clay,	Left 1074.4 See Roadway Structure Boring Logs brline 1168.2 DCP 10/18/2002 Dry AB 0.0 3.0 Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist Reddish brown to brown, fat clay, with chert gravel, trace sand, moist

Boring	-	l l			h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-133	850+00	120 ft. Right	1175.7						DCP	10/18/2002	Dry AB	
				0.0	2.0	Light brown, chert gravel, with sand, dry	AS-1	GP				
				2.0	8.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-2	СН				
				8.0	9.5	Reddish brown, fat clay, with chert gravel, trace sand, moist	ST-3	СН	_			pushed 12 inches,
				9.5								recovered 12 inches
					15.0	Reddish brown, gravelly fat clay, trace sand, moist	AS-4	СН				
				15.0	20.0	Reddish brown, gravelly fat clay, trace sand, moist	AS-5	СН		<u>.</u>	_	
				20.0	23.0	Reddish brown, gravelly fat clay, trace sand, moist		СН				
						Bottom of Boring 23.0 feet						
						Boring backfilled with cuttings at completion						
1C-134	852+00	Centerline	1165.5						DCP	10/18/2002	Dry AB	
				0.0	3.5	Light brown to reddish brown, sand, with chert gravel, dry	AS-1	SP		-		
				3.5		Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-2	СН				
				10.0	15.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				15.0		Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-4	СН				
				70.0	20.0	Bottom of Boring 20.0 feet			0 (
							BULK-5	(0 10 20.	o reet)			
						Boring backfilled with cuttings at completion						
										······································		·
AC-135	852+00	120 ft. Right	1177.9						DCP	10/18/2002	Dry AB	
				0.0	2.0	Light brown to reddish brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand,	AS-1	SP				
				2.0		moist	AS-2	СН				
				11.0	15.0	Red, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				15.0	20.0	Red, fat clay with chert gravel, trace sand, moist	AS-4	СН				
						Bottom of Boring / Auger refusal at 20.0 feet						
						Boring backfilled with cuttings at completion						

Boring					h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-136	854+00	120 ft. Left	1167.2					<u> </u>	CSK	10/23/2002		
						Light reddish brown, silty lean clay, abundant chert gravel,						
				0.0	5.0	dry	AS-1	CL			Dry AB	
				5.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
					-						 	···-
				10.0	15.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL			ļ	
ļ						Bottom of Boring 15.0 feet						
						Boring backfilled with cuttings at completion		ļ <u></u>				_
												-
MC-137	854+00	Centerline	1179.8			Light brown to reddish brown, sand, with chert gravel,		<u> </u>	DCP	10/19/2002	Dry AB	
1				0.0	3.0	trace clay, dry	AS-1	SP				
			<u> </u>	0.0	0.0	Reddish brown, fat clay, with chert gravel, trace sand,	710 1	<u> </u>				pushed 12 inches,
				3.0	4.0	moist	ST-2	СН				recovered 12 inches
				4.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				4.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand,	A3-3	Un				
				10.0	15.0	moist	AS-4	СН				
						Reddish brown, fat clay, with chert gravel, trace sand,						
				15.0	22.0	moist Reddish brown, fat clay, with chert gravel, trace sand,	AS-5	CH				
				22.0	24.0	moist		CH				
								_				
						Bottom of Boring 24.0 feet						
						Boring backfilled with cuttings at completion					į	
												·
MC-138	854+00	120 ft. Right	1179.4						DCP	10/18/2002	Dry AB	
				0.0	3.5	tight brown, sand with chart gravel dry	AS-1	SP			1	
				0.0	5.5	Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand,	70-1	<u> </u>				
				3.5	12.0	moist	AS-2	СН				
				12.0	15.0	Red, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				12.0	13.0	ned, lat day, with chert graver, trace saild, moist	70-0	011			 	-
				15.0	20.0	Red, fat clay, with chert gravel, trace sand, moist	AS-4	СН				
			1	20.0	22.0	Red, fat clay with chert gravel, trace sand, moist		СН			}	
								-				
					ļ	Bottom of Boring 22.0 feet					 	
	i e	i .	ı		1		ı	1	ı I		1	
					1	Boring backfilled with cuttings at completion					!	

Boring				Dept	h (Ft)		Ι	I	Logged	<u> </u>	GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-139	856+00	120 ft. Left	1172.3						DCP	10/18/2002	Dry AB	
				0.0	4.0	Light brown silty sand with chert gravel, dry	AS-1	SM			'-	
				4.0	10.0	Reddish brown fat clay with chert gravel, trace sand, moist	AS-2	СН				
				10.0	13.0	Reddish brown fat clay with chert gravel, trace sand, moist	AS-3	СН			ļ	
						Bottom of Boring 13.0 feet			· · · · · · · · · · · · · · · · · · ·			
						Boring backfilled with cuttings at completion						
MC-140	856+00	Centerline	1178.5						DCP	10/18/2002	Dry AB	
				0.0	4.0	Light brown, sand, with chert gravel, dry	AS-1	SP	:			
	························			4.0	8.0	Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand, moist						
						Reddish brown, fat clay, with chert gravel, trace sand, very	AS-2	CH				pushed 6 inches,
				8.0	8.5	stiff	ST-3	CH				recovered 6 inches
				8.5	15.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-4	СН				
				15.0	19.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-5	СН				**************************************
						Bottom of Boring 19.0 feet	BULK-6	(0 to 19	.0 feet)			
						Boring backfilled with cuttings at completion						
					···				··-··			
MC-141	856+00	120 ft. Right	1174.4						DCP	10/18/2002	Dry AB	
				0.0	4.0	Light brown, sandy silt, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand,	AS-1	ML			<u></u>	
				4.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-2	СН				
				10.0		Reddish brown, fat clay, with chert gravel, trace sand, moist						
				10.0	15.0		AS-3	СН			-	
						Bottom of Boring 15.0 feet						
						Boring backfilled with cuttings at completion					1	
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Boring]		Dept	h (Ft)		1		Logged		GW	
No.	Station	Offset	Elevation	From		Log of Materials	Samples	uscs	By:	Date	Depth	Comments
MC-142	858+00	120 ft. Left	1172.9						DCP	10/18/2002	Dry AB	
				0.0	4.0	Light brown, silty sand, with chert gravel, dry	AS-1	SM			, , <u></u>	
				4.0	8.0			СН				
				8.0	9.5	Reddish brown, fat clay, with chert gravel, trace sand Reddish brown, fat clay, with chert gravel, trace sand, very stiff, moist	ST-3	СН				pushed 18 inches, recovered 15 inches
				9.5		Reddish brown, fat clay, with chert gravel, trace sand	AS-4	СН				recovered 15 inches
				0.0	12.0	Bottom of Boring 12.0 feet			fa.es)		· · · · · · · · · · · · · · · · · · ·	
							BULK-7	(0 10 12	reet)			
						Boring backfilled with cuttings at completion						
MC-143	858+00	Centerline	1175.2									
MC-143	000+00	Cemerane	11/5.2		-	Light brown to reddish brown, sand, with chert gravel,			DCP	10/19/2002	Dry AB	
				0.0	4.5	trace clay	AS-1	SP				
				4.5	10.0	Red, fat clay, with chert gravel, trace sand, moist	AS-2	СН				
				10.0	15.0	Red, fat clay, with chert gravel, trace sand, moist	AS-3	сн				
						Bottom of Boring 15.0 feet						
						Boring backfilled with cuttings at completion						
MC-144	858+00	120 ft. Right	1164.5						DCP	10/19/2002	Dry AB	
				0.0	4.5	Light brown to reddish brown, sand, with chert gravel, trace clay, dry	AS-1	SP				
				4.5	10.0	Reddish brown, fat clay, with chert gravel	AS-2	СН				
						Bottom of Boring 10.0 feet						
		-				Boring backfilled with cuttings at completion						
											-	
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						, u						

Boring			1	Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
									DCP	10/19/2002	Dry AB	
IC-145	860+00	120 ft. Left	1176.4						DOP	10/18/2002	DIY AG	
				0.0	4.0	Light brown, sand, with chert gravel, dry	AS-1	SP				
						Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand,						
				4.0	8.0	moist	AS-2	СН				attempted tube, no
						Reddish brown, fat clay, with chert gravel, trace sand,	ST-3	СН				recovery
				8.0	9.0	moist Reddish brown fat clay, with chert gravel, trace sand,	31-3	Un	-			lecovery
				9.0	13.5	moist	AS-4	СН				
						Bottom of Boring 13.5 feet	BULK-5	(0 to 13	.5 feet)			
ļ						Boring backfilled with cuttings at completion						
						Bonng backing with cuttings at completion						
_ [
_									200	10/10/0000	D A.D	
AC-146	860+00	Centerline	1169.9						DCP	10/19/2002	Ury AB	-
,		The state of		0.0	4.0	Light brown, sandy chert gravel, dry	AS-1	GP				i
				0.0								
				4.0	10.0	Reddish brown, fat clay, with chert gravel	AS-2	СН				
						Bottom of Boring 10.0 feet						
						Botton of Boning 10.0 feet						
						Boring backfilled with cuttings at completion						
												ļ
											1	
MC-147	862+00	120 ft. Left	1178.1						DCP	10/18/2002	Dry AB	
70 147	002100	TEO III. CON	1170.1									
				0.0	3.0	Light brown to reddish brown, sand, with chert gravel	AS-1	SP				
					40.0	Reddish brown, fat clay, with chert gravel, trace sand,	AS-2	СН				}
				3.0	12.0	moist	A3-2	Ch				
				12.0	15.0	Red, fat clay, with chert gravel, trace sand, moist	AS-3	СН			1	
				1-1-								
						Bottom of Boring 15.0 feet		ļ				
						Boring backfilled with cuttings at completion						
				ļ		boning backnilled with cuttings at completion						
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Station	Officer	Elevation						Logged	_	GW	
~~~			LIOIII	10	Log or materials	Samples	USCS	By:	Date	Depth	Comments
864+00	120 ft. Left	1179.0				ļ		DCP	10/18/2002	Dry AB	
			0.0	3.5	Light brown, sand, with chert gravel, dry	AS-1	SP				
			3.5	8.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-2	CH				
			8.0	9.5	Reddish brown, fat clay, with chert gravel, trace sand, very stiff		СН				pushed 18 inches, recovered 16 inches
			9.5	125	Reddish brown fat clay with chart gravel trace send			-			recovered to menes
	-	-									
			12.5	15.0							
					Bottom of Boring 15.0 feet	BULK-6	(0 to 15	ft)			
					Boring backfilled with cuttings at completion						
,											
868+00	225 ft. Left	1193.2						DCP	10/19/2002	Dry AB	
			0.0	4.0	Light brown, sand, with chert gravel, dry	AS-1	SP				· · · · · · · · · · · · · · · · · · ·
·			4.0				СН				
			- (								
									· · · · · ·		
		·	15.0			AS-4	CH				
				-	Bottom of Boring 16.0 feet						
					Boring backfilled with cuttings at completion						
									-		
868+00	Centerline	1186.5				:		DCP	10/19/2002	Drv AB	
			0.0	2.5	Light brown sand with chert gravel	AS-1	QD				
									,. <del>.</del>		·
		<u>, , , , , , , , , , , , , , , , , , , </u>									<del></del> .
			10.0			AS-3	CH	-			
			15.0	20.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-4	СН	1			
					Bottom of Boring 20.0 feet		[				
					Boring backfilled with cuttings at completion						
		864+00 120 ft. Left  868+00 225 ft. Left	864+00 120 ft. Left 1179.0  868+00 225 ft. Left 1193.2	Station         Offset         Elevation         From           864+00         120 ft. Left         1179.0         0.0           3.5         8.0         9.5           12.5         12.5         12.5           868+00         225 ft. Left         1193.2         0.0           4.0         10.0         15.0           868+00         Centerline         1186.5         0.0           2.5         10.0         10.0	864+00 120 ft. Left 1179.0 0.0 3.5	Station Offiset Elevation From To Log of Materials  864+00 120 ft. Left 1179.0  0.0 3.5 Light brown, sand, with chert gravel, trace sand Reddish brown, fat clay, with chert gravel, trace sand Reddish brown, fat clay, with chert gravel, trace sand, very stiff  9.5 12.5 Reddish brown, fat clay, with chert gravel, trace sand  12.5 15.0 Red fat clay, with chert gravel, trace sand, very stiff  Borting backfilled with cuttings at completion  868+00 225 ft. Left 1193.2  0.0 4.0 Light brown, sand, with chert gravel, trace sand  15.0 Reddish brown, fat clay, with chert gravel, trace sand  15.0 Reddish brown, fat clay, with chert gravel, trace sand  Bottom of Boring 18.0 feet  Boring backfilled with cuttings at completion  15.0 Reddish brown, fat clay, with chert gravel, trace sand  Bottom of Boring 18.0 feet  Boring backfilled with cuttings at completion	Station   Offset   Elevation   From   To   Log of Materials   Samples	Station	Station   Offset   Elevation   From   To   Log of Materials   Samples   USCS   By:   DCP	Station   Offset   Elevation   From   To   Log of Materials   Samples   USCS   By:   Date	Station   Offset   Elevation   From   To   Log of Materials   Samples   USCS   By:   Date   Depth

Boring		]		Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-151	868+00	120 ft. Right	1177.6						DCP	10/19/2002	Dry AB	
				0.0	5.0	Light brown, sand, with chert gravel	AS-1	SP				
				5.0	10.0	Reddish brown, fat clay, with chert gravel	AS-2	СН				
				10.0	12.0	Reddish brown, fat clay, with chert gravel	AS-3	СН				
						Bottom of Boring 12.0 feet						
						Boring backfilled with cuttings at completion						
MC-152	870+00	380 ft. Left	1211.2						DCP	10/19/2002	Dry AB	
				0.0	4.0	Light brown, sand, with chert gravel, dry Reddish brown, fat clay, with chert gravel, trace sand,	AS-1	SP				
				4.0	10.0	moist	AS-2	СН				
· ·				10.0		Reddish brown, fat clay, with chert gravel, trace sand, moist	AS-3	СН				
				16.0		Red, fat clay, with chert gravel, trace sand, moist	AS-4	СН				
				20.0		Red, fat clay, with chert gravel, trace sand, moist	AS-5	СН				
				25.0	28.0	Red, fat clay, with chert gravel, trace sand, moist						
						Bottom of Boring 28.0 feet	BULK-6	(0 to 28	feet)			
						Boring backfilled with cuttings at completion	<u> </u>				·	
MC-153	870+00	280 ft. Left	1208.8			Light brown to reddish brown, silty lean clay, trace chert			CSK	10/23/2002	Dry AB	
				0.0	4.0	gravel, dry to moist	AS-1	CL	<u> </u>			
			-	4.0	8.5	Reddish brown, lean clay, trace chert gravel, moist	AS-2	CL				
		<del> </del>		8.5	9.4	Reddish brown, lean clay, trace chert gravel, moist	ST-3	ļ				Shelby tube 10" recover
				9.4	15.0	Red, sandy lean to fat clay, abundant chert gravel	AS-4	CL/CH	ļ <u>.</u>			
				15.0	25.0	Red, sandy lean to fat clay, abundant chert gravel	AS-5	СГСН				
	· · · · · ·			25.0	30.0	Red, sandy lean to fat clay, few chert gravel	AS-6	СГСН			-	
				-		Bottom of Boring 30.0 feet	BULK-7	(4.0 to	30.0 feet)	-	ļ	
						Boring backfilled with cuttings at completion			<u> </u>		<u> </u>	

Boring			<b>-</b>		h (Ft)	l on of Adotoviole	Comples	USCS	Logged	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	0505	Ву:	Dale	Deptil	Comments
MC-154	870+00	Centerline	1190.4					,	DCP	10/19/2002	Dry AB	
						Light brown to reddish brown, sand, with chert gravel and						
				0.0	2.0	clay, dry Reddish brown, fat clay, with chert gravel, trace sand,	AS-1	SP				
					40.0	meddish brown, fat clay, with chert graver, trace sand,	AS-2	СН				•
				2.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand,	A3-2	CIT				
				10.0	16.0	moist	AS-3	СН				
				10.0	10.0							
				16.0	20.0	Red, fat clay, with chert gravel, trace sand, moist	AS-4	CH				
									·			
				20.0	25.0	Red, fat clay, with chert gravel, trace sand, moist	AS-5	CH_			<u> </u>	
						Bottom of Boring 25.0 feet						
						Bottom of Borning 25.0 feet						
						Boring backfilled with cuttings at completion					] ]	
										,,		
									CC1/	10/00/0000	Dn. AD	
MC-155	870+00	120 ft. Right	1168.8						CSK	10/23/2002	Dry AB	
1				0.0	5.0	Light brown eithy chart gravel day	AS-1	GM				
				0.0	3.0	Light brown, silty chert gravel, dry Reddish brown, sandy lean clay, abundant chert gravel,	7.0	G.111				
				5.0	10.0	moist	AS-2	CL				
	_		<u> </u>			Reddish brown, sandy lean clay, abundant chert gravel,						
				10.0	15.0	moist	AS-3	CL				
						and the second						
				1	<u></u>	Bottom of Boring 15.0 feet			-			
					ŀ	Boring backfilled with cuttings at completion						
			<b></b>			Dorning Backanica may callings at completion	-					
	-											
MC-156				<u> </u>		Deleted - Access Denied						
						·						
			<u> </u>	<del>                                     </del>	<del> </del>	Lanut PA Lanut		<del>                                     </del>				
MC-157	872+50	760 ft. Left	1199.3					]	DCP	10/19/2002	Dry AB	
IVICTION	0/2100	70011. 2011		<del>                                     </del>	<u> </u>	Light brown to reddish brown, sand with chert gravel, trace						
				0.0	4.0	clay, dry	AS-1	SP				
											1	
				4.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-2	СН			<del> </del>	
				100	140	Boddish brown fat clay with chart gravel trace cand		СН	}			
		<b></b>	<del> </del>	10.0	14.0	Reddish brown, fat clay, with chert gravel, trace sand	<del>                                     </del>	Un	-		<del> </del>	<del></del>
						Bottom of Boring 14.0 feet						
			<del> </del>	1	†** <u> </u>		<u> </u>					
					<u> </u>	Boring backfilled with cuttings at completion		<u> </u>			ļ <u> </u>	
		-						1				
			1	<u> </u>				ļ	<u> </u>		<b> </b>	
			Υ					1				

Boring				Dept	h (Ft)			<u> </u>	Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-158	872+50	330 ft. Left	1197.3		ĺ				000	40/40/0000	2 45	
		JOO III LOII	1107.0	<del></del>		Light brown to reddish brown, sand, with chert gravel,			DCP	10/19/2002	Dry AB	
				0.0	3.0	trace clay	AS-1	SP				
				3.0	- ^	Daddick business days after with the state of the						pushed 24 inches,
			ļ	3.0	5.0	Reddish brown, fat clay, with chert gravel, trace clay	ST-2	СН			<b>!</b>	recovered 16 inches
				5.0	10.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-3	СН				
				10.0	15.0	Claddish brown fot along with along to the second to the s						- · · · · ·
				10.0	15.0	Reddish brown, fat clay, with chert gravel, trace sand	AS-4	СН		·		
				15.0	18.0	Reddish brown, fat clay, with chert gravel, trace sand		СН				
							54.114.5	40	4			
						Bottom of Boring 18.0 feet	BULK-5	(0 to 18	ft)			
			-1			Boring backfilled with cuttings at completion						
					1							
	-	~	<u> </u>			7-14						
MC-159	872+00	Centerline	1193.0						DCP	10/19/2002	Dry AB	
				0.0	2.0	Light brown to reddish brown, sand, with chert gravel, trace clay, dry	40.4	20				
				0.0	2.0	Reddish brown, fat clay, with chert gravel, trace sand,	AS-1	ŞP				
				2.0	10.0	moist	AS-2	СН	-			
				10.0	17.0	Reddish brown, fat clay, with chert gravel, trace sand, moist	400	011				
				10.0	17.0	IIIOSt	AS-3	CH	<u> </u>			
				17.0	20.0	Red, fat clay, with chert gravel, trace sand, moist	AS-4	ÇН				
				20.0	25.0	Red, fat clay, with chert gravel, trace sand, moist	40.5	CI.				
				20.0	25.0	ried, fat clay, with cheft glaver, trace sand, moist	AS-5	СН				
				25.0	28.0	Red, fat clay, with chert gravel, trace sand, moist		СН				
	ļ					Bottom of Boring 28.0 feet						
						Dottom of Borning 28.0 feet	<del> </del>					·
						Boring backfilled with cuttings at completion	.]					
												***
				-			<del> </del>			· .		···
VIC-160	872+00	300 ft. Right	1198.1						CSK	10/23/2002	Dry AB	
				0.0	4 E	Light heaves allter about annual de-	10.4	21.1				
				0.0	4.5	Light brown, silty chert gravel, dry Reddish brown, sandy lean clay, abundant chert gravel,	AS-1	GM				
				4.5	10.0	moist	AS-2	CL				
				10.0	15.0	Reddish brown, sandy lean clay, abundant chert gravel,	100	01				
		· ·		10.0	15.0	moist	AS-3	CL				
						Bottom of Boring 15.0 feet						
			ļ			Rating haskfilled with auttings at completion			-			
						Boring backfilled with cuttings at completion					<u> </u>	
										1		

Boring					h (Ft)		0		Logged	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	Ву:	Date	Depui	Comments
VC-161	874+00	335ft. Right	1199.3						BMK	12/22/2002	Dry AB	
			_			D					•	
				0.0	1.0	Brown, lean clay, trace chert gravel with rootlets, moist	+					
				1.0	15.0	Reddish brown, fat clay, trace chert gravel, moist	AS-1	СН				0.1.1.01
-							ST-2	СН				Pushed 12 inches, recovered 13 inches
				3.5	4.5		31-2	Un Un				Chert layer broken
ļ						Bottom of Boring 15.0 feet						fractured 9-10.5 feet
			1,1-1			S to be different with continue at assumption						
						Boring backfilled with cuttings at completion				<u></u>		****
						Deleted - Access Denied						
MC-162						Delated Added Schilled						
MC-163	875+00	Centerline	1186.6						вмк	12/22/2002	Dry AB	
						Daniel Inc. to a short with restlete moint		CL				
	<del></del>			0.0	0.7	Brown, lean clay, trace chert with rootlets, moist Reddish brown, fat clay, scattered chert gravel, moist,		- OL		,		6" chert layer at 17 fee
				0.7	23.0	becoming wet below 17.5 feet	AS-1	СН				highly fractured
						Bottom of Boring at 23.0 feet						
				ļ. <u>.</u>		Boring backfilled with cuttings at completion						
		100 ft   Dills	1405.0						вмк	12/22/2002	Dry AB	
MC-164	875+00	120 ft. Right	1195.9	<del>                                     </del>				ļ	<u> </u>			
				0.0	1.0	Brown lean clay with rootlets, moist	<u></u>	CL	<u> </u>		ļ	Fractured chert layer
				1.0	32.0	Reddish brown fat clay, scattered chert gravel, moist to wet	AS-1	СН				from 4.5 - 5 feet
. <del></del>				1.0	32.0	Bottom of Boring at 32.0 feet	BULK-2 (		)			Moist to about 22 feet wet below 22 feet
				1		Boring backfilled with cuttings at completion						
										-		
							<u> </u>	<u> </u>			<u> </u>	
				_	<u> </u>			_			+	
				-	<u> </u>			-	<u></u>			
				1	Ì				<u></u>	1	<u> </u>	

Boring	Ctation	0"			th (Ft)		T		Logged		GW	T
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-165	877+00	Centerline	1181.2						вмк	12/22/2002	Dry AB	
						Brown, lean clay, trace chert gravel and rootlets, dry to			DIVIN	12/22/2002	Dry AB	<u></u>
		<del> </del>	<del> </del>	0.0	0.6	moist Reddish brown, fat clay, with to abundant chert gravel,		CL				
		<u>L</u>		0.6	6.0	moist	AS-1	СН				
						Reddish brown, fat clay, with chert gravel, moist to wet	1 701	- 511			-	Pushed 12 inches.
	ļ		<del> </del>	6.0	15.5	with two highly weathered chert seams Light gray to tan, slightly to moderately weathered		CH				recovered 7 inches
-				15.5	16.5	limestone						
<del></del>						Bottom of Boring / Auger refusal at 16.5 feet	BULK-2	(0.6 - 14	I.O ft)			
						Bottom of Boring at 16.5 feet						
			İ			Boring backfilled with cuttings at completion						
						g out of the completion	1					
MC-166	876+79	102 ft. Right	1187.3			-			вмк	12/22/2002	Dry AB	
				0.0	0.6	Brown, lean clay, trace chert gravel, with rootlets, dry	<b>†</b>		DIVIT	12/22/2002	DIY AB	
		-	-			· · · · · · · · · · · · · · · · · · ·		CL				
				0.6	12.5	Reddish brown, fat clay, with abundant chert gravel, dry	AS-1	CH				
				12.5	24.0	Reddish brown, fat clay, with trace chert gravel, moist	AS-2	СН				
						Bottorn of Boring at 24.0 feet						
					<del></del>	Boring backfilled with cuttings at completion						
MC-167	879+00	2 ft. Right	1175.2						ВКМ	12/22/2002	Dry AB	
				0.0	0.5	Brown, lean clay, trace chert gravel, with rootlets, moist		CL	DICIVI	12222002	DIY AB	
				0.5		Reddish brown, fat clay, scattered chert gravel, moist	AS-1	СН				Moisture content increasing with deptl
						Bottom of Boring 15.0 feet						
						Boring backfilled with cuttings at completion						
MS-168	884+52	476 ft. Left	1074.6			0 0 1						
	304732	470 II. Leit	10/4.6			See Roadway Structure Boring Logs						
/IS-169	887+97	53 ft. Right	1056.7			See Roadway Structure Boring Logs						

Boring				Depti	n (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MS-170	890+67	496 ft. Right	1145.8			See Roadway Structure Boring Logs					-	<del> </del>
AC-170A	895+00	Centerline	1154.3		1				BRO	10/9/2003	Dry AB	
	0001,90			0.0	5.0	Light brown and gray, sandy gravel, dry	AS-1	GP				
				5.0	6.0	Light brown and gray, sandy gravel, dry	AS-2	GP				
						Bottom of Boring 6.0 feet	BULK-3	(0 to 6 f	eet)			
			i			Boring backfilled with cuttings at completion						
AC-170B	895+00	90 ft. Right	1156.3						BRO	10/9/2003	Dry AB	
				0.0	5.0	Light brown and gray, sandy gravel, dry	AS-1	GP				
				5.0	8.0	Light brown and gray, sandy gravel, dry	AS-2	GP				
					<u>.</u>	Bottom of Boring 8.0 feet					-	
						Boring backfilled with cuttings at completion						
MC-171	895+83	34 ft. Right	1148.8						BRO	10/9/2003	Dry AB	
WO-171	000100	0 + 1 1g		0.0	5.0	Light brown and gray, sandy gravel, dry	AS-1	GP				
				5.0	9.0	Light brown and gray, sandy gravel, dry	AS-2	GP				
<del></del>		ļ	<u> </u>	-		Bottom of Boring 9.0 feet						
<u></u>					<u></u>	Boring backfilled with cuttings at completion						<u></u>
MC-172	895+83	153 ft. Right	1155.4						BRO	10/9/2003	Dry AB	
				0.0	5.0	Light brown, sandy gravel, dry	AS-1	GP				1
			ļ <u>-</u>	5.0	10.0	Light brown, sandy gravel, dry	AS-2	GP			ļ	
				10.0	15.0	Light brown, sandy gravel, dry	AS-3	GP		-		finer gravel below 10 ft
			-	-	-	Bottom of Boring 15.0 feet						
i				<u> </u>		Boring backfilled with cuttings at completion		<u> </u>		<u></u>	<u> </u>	

Boring	Ct-ti	0"	<b>5</b> 1 .:		h (Ft)		1	Τ	Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	uscs	By:	Date	Depth	Comments
MS-173	899+51	49 ft. Left	1089.1			See Structural Boring Log						<u> </u>
							1					
MS-174	900+30	200 ft, Right	1068.1			See Structural Boring Log						
MS-175	901+16	597 ft. Right	1030.0			See Structural Boring Log						
MC-175A	904+07	112 ft. Left	1170.5						BRO	6/5/2003	Dry AB	
· .				0.0	5.5	Light brown and red, lean clay, abundant gravel, dry	AS-1					
				5.5	6.0	Gray limestone, hard						
		714.				Bottom of Boring / Auger Refusal at 6.0 feet						
						Boring backfilled with cuttings at completion						
MC-175B	904+00	Centerline	1161.8						BRO	6/5/2003	Dry AB	
				0.0	3.0	Red, lean clay, abundant gravel, moist	AS-1	CL				
				3.0	4.0	Light gray chert, hard						
			-			Bottom of Boring / Auger Refusal at 4.0 feet						
						Boring backfilled with cuttings at completion						
MC-176	903+73	105 ft. Right	1146.8						ВКМ	12/19/2002	Dry AB	Dry 24 hr AB
				0.0	0.5	Brown, sitty lean clay, with shale gravel Light reddish brown, sandy fat clay, with to abundant chert	AS-1	CL				
				0.5	10.5	Light reddish brown, sandy fat clay, with to abundant chert gravel, dry	AS-2	СН				Chert layer from 8.5 to 9.5 feet
						Bottom of Boring / Auger Refusal at 10.5 feet						
						Boring backfilled with cuttings at completion						
												:

Boring				Dept					Logged	D-4-	GW	Comments
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-177	903+67	225 ft. Right	1148.4						вкм	12/19/2002	Dry AB	Dry 24 hr AB
	000.0.					Light brown to light reddish brown, sandy fat clay,	101	011				
				0.0	13.0	abundant chert gravel, dry	AS-1	СН				Frequent chert seams (
1	•					Bottom of Boring / Auger Refusal at 13.0 feet	BULK-2 (0	- 13 ft)				4" thick every 4-6
												inches) from 5 to 13 ft
						Boring backfilled with cuttings at completion						
		Odd # Dish	11140						ВКМ	12/19/2002	Dry AB	Dry 24 hr AB
MC-178	903+60	344 ft. Right	1144.2			Light brown to light reddish brown, sandy fat clay,	<del>                                     </del>		Ditar	12710/2002	0.,, 7.12	-,
				0.0	14.0	abundant chert gravel, dry - becoming wetter below 10 ft	AS-1	CH				
						Bottom of Boring / Auger Refusal at 14.0 feet						Frequent chert seams (
						Boring backfilled with cuttings at completion						inches) from 4 to 14 ft
										- n-19		
MC-178A	906+03	123 ft. Left	1161.5				ļ		BRO	6/5/2003	Dry AB	
	-			0.0	8.0	Light brown and red, lean clay, with gravel, moist	AS-1	CL			<u> </u>	
				8.0	13.0	Red, lean clay, abundant gravel, moist	AS-2	CL		<u>,,</u>	-	
				13.0	18.0	Red and gray, chert gravel, abundant clay, moist	AS-3	GC				
	<u>.</u>			18.0	21.0	Light gray and gray chert, hard	<del>                                     </del>					
				-		Bottom of Boring / Auger Refusal at 21.0 feet						
				<u> </u>		Boring backfilled with cuttings at completion					-	
				-								
MC-178B	906+00	Centerline	1164.9	<u> </u>			1		BRO	6/5/2003	Dry AB	
			<u> </u>	0.0	8.0	Red and gray, chert gravel, with sand and clay, moist	AS-1	GP-GC				
	<u> </u>			8.0	18.0	Red and gray, sandy gravel, abundant clay, moist	AS-2	GP-GC			-	
				18.0	20.0	Red and gray, sandy gravel, abundant clay, moist	AS-3	GP-GC				
			-	20.0	21.0	Light gray and gray chert, hard					<del>                                     </del>	
		-	ļ	<del> </del>	<u> </u>	Bottom of Boring / Auger Refusal at 21.0 feet						-
			<u> </u>	<u> </u>		Boring backfilled with cuttings at completion	-	<del> </del>			-	
		<b>\</b>										

Boring No.	Station	Offset	Elevation	Dept From	th (Ft)			T	Logged	_	GW	
				1 10111	10	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-179	905+67	114 ft. Right	1163.7			See Roadway Core Boring Logs						
MC-180	905+63	234 ft. Right	1158.4						ВКМ	12/19/2002	Dry AB	Dry 24 hr AB
				0.0	16.5	Light brown to light reddish brown, sandy fat clay, abundant chert gravel, abundant chert seams, dry	AS-1	СН			<u> </u>	.,,
	··					Bottom of Boring / Auger Refusal at 16.5 feet						Chert layer from 5 to 6. feet
						Boring backfilled with cuttings at completion						
MC-181	905+58	354 ft. Right	1153.6						ВКМ	12/19/2002	D 4D	D-v04b-4D
					4	Light brown to light reddish brown, sandy fat clay,			DIVIN	12/19/2002	DIY AB	Dry 24 hr AB
				0.0	13.5	abundant chert gravel, abundant chert seams, dry	AS-1	СН				
	<del>-</del>	*				Bottom of Boring at 13.5 feet			-			Chert layer from 10 to 10.5 feet
						Boring backfilled with cuttings at completion						
MS-181A	909+15	248 ft. Left	1057.0		J	See Roadway Structure Boring Logs						
MS-182	908+87	46 ft. Left	1048.1			See Roadway Structure Boring Logs						
MS-183	909+24	241 ft. Right	1044.8			See Roadway Structure Boring Logs						
MS-184	909+71	575 ft. Right	1033.5			See Roadway Structure Boring Logs						
MC-184A	913+00	120 ft Left	1153.0						BRO	6/6/2003	Dry AB	
				0.0	4.0	Gray and light brown, gravel, trace clay, dry	AS-1	GP			,,	
				4.0	9.0	Red and light brown, gravel, with clay, moist	AS-2	GP-GC				
	<u></u>			9.0	14.0	Dark brown and dark gray, gravel, abundant clay, moist	AS-3	GC				
				14.0	19.0	Dark brown to red, lean clay, abundant gravel, moist	AS-4	CL				
				19.0	20.0	Gray limestone, hard						
						Bottom of Boring at 20.0 feet						
						Boring backfilled with cuttings at completion	-					

Boring	04-4:-	O#c -1	Elevation	Depti From	h (Ft) To	Log of Materials	Samples	USCS	Logged By:	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	10	Log of Inaterials	Damples	0000				
IC-184B	913+00	Centerline	1134.1						BRO	6/6/2003	Dry AB	
				0.0	5.0	Light brown and gray, gravel, trace clay, moist	AS-1	GP				
	-			5.0		Light reddish brown, gravel, with clay, moist		GC				
				8.0		Gray limestone, hard						
					_	Bottom of Boring at 9.0 feet						
		<u> </u>				Boring backfilled with cuttings at completion						
					!				-			
MC-185	913+43	106 ft. Right	1104.3						сѕк	1/14/2003	Dry AB	
MC-100	310740	100 it. Tilgit	1104.0			Brown and reddish brown, clayey chert gravel, with sand,						
		<u> </u>		0.0	5.0	moist Brown and reddish brown, clayey chert gravel, with sand,	AS-1	GC			-	
		-		5.0		moist	AS-2	GC				
						Bottom of Boring / Auger Refusal at 10.0 feet						
	-					Boring backfilled with cuttings at completion						
	<u>'</u>				-							
140 406	913+46	234 ft. Right	1132.7						ВКМ	12/19/2002	Dry AB	Dry 24 hr AB
MC-186	913740	254 IL Tugit	1102.7	<u> </u>			BULK-1	GC				
				0.0	4.0	Brown, chert gravel, with clay, dry Light brown, sandy fat clay, abundant chert gravel, with	DULK-1	GC				
				4.0	9.8	chert seams	BULK-2	CH				
						Bottom of Boring at 9.8 feet						
	i					Boring backfilled with cuttings at completion						
			1	1								
		-		-	<del> </del>		1		DIZM	40/40/0000	Dn/ AD	Dry 24 hr AB
MC-187	913+50	354 ft. Right	1144.0	+-					ВКМ	12/19/2002	DIY AD	Diy 24 III AD
				0.0	0.5	Light brown, lean clay, abundant chert gravel, dry Reddish brown, sandy fat clay, scattered chert gravel, dry	<u> </u>				ļ	· · · · · · · · · · · · · · · · · · ·
				0.5	8.5	to moist	AS-1	СН		'		
		<u> </u>		8.5	14.8	Light brown to light reddish brown, sandy fat clay, abundant chert seams	AS-2	СН				
				1	17.5	Bottom of Boring / Auger Refusal at 14.8 feet						
				<del> </del>	<del>  -</del>		<del> </del>					
			1	]		Boring backfilled with cuttings at completion	<u> </u>	<u> </u>	ļ	ļ <u>'</u>	ļ.—	

Boring			<u> </u>		h (Ft)		T	Υ	Logged		GW	]
_No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
1C-187A	915+00	120 ft. Left	1153.4						BRO	6/6/2003	Dry AB	
				0.0	3.0	Brown and gray, gravel, moist	AS-1	GP				
				3.0	7.5	Brown and gray, gravel, moist	AS-2	GP				
	·			7.5	8.0	Gray limestone, hard	AS-3					
						Bottom of Boring / Auger Refusal at 8.0 feet				_		
		_		ļ	<u>-</u>	Boring backfilled with cuttings at completion						
IC-187B	914+99	5 ft. Right	1139.7						BRO	6/6/2003	Dry AB	
		-		0.0	1.0	Dark brown, silty lean clay / topsoil	AS-1	CL-ML				
				1.0	5.0	Light reddish brown, gravel, trace clay, moist	AS-2	GP				
				5.0	10.0	Light brown, gravel, trace clay, moist	AS-3	GP				
	,		<u></u>	10.0	14.0	Light brown, gravel, trace clay, moist	AS-4	GP				
				14.0	14.5	Gray limestone, hard						
						Bottom of Boring / Auger Refusal at 14.5 feet			,			
						Boring backfilled with cuttings at completion	<u> </u>		_			
MC-188	915+37	124 ft. Right	1151.0						вкм	12/19/2002	Drv AB	Dry 24 hr AB
				0.0	1.0	Light brown, chert gravel, with fat clay, dry		GC	•			
				1.0	3.0	Light brown to light reddish brown, sandy fat clay, with chert gravel, dry	AS-1	СН				
				3.0	7.0	Light brown to light reddish brown, sandy fat clay, with chert gravel and chert layers, dry	AS-2	СН				
				7.0	19.5	Brown, sandy fat clay, with chert gravel and chert layers, moist becoming wet below 17 feet						
						Bottom of Boring / Auger Refusal at 19.5 feet						
						Boring backfilled with cuttings at completion						
							<u> </u>					

Boring	, , ,			Depti					Logged		GW	0 1
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	uscs	Ву:	Date	Depth	Comments
MC-189	915+42	226 ft. Right	1156.2						ВКМ	12/19/2002	Dry AB	Dry 24 hr AB
	,	,		0.0	2.0	Light brown, chert gravel, with fat clay, dry	AS-1	GC		ł		
						Light brown to reddish brown, sandy fat clay, with chert	AS-2	СН		·		
				2.0	7.0	gravel, dry Light brown, sandy fat clay, with chert layers, (no chert	A3-2	Сп				
				7.0	22.8	layers from 12 to 15 feet)	AS-3	СН				
						Bottom of Boring / Auger Refusal at 22.8 feet	BULK-4	(0 to 22	.8 feet)			
				<u>.</u>	ļ	Boring backfilled with cuttings at completion						
										,, - ,		
MC- <u>190</u>	915+48	345 ft. Right	1152.1						вкм	12/19/2002	Dry AB	Dry 24 hr AB
				0.0	0.5	Light brown, lean clay, with rootlets, moist						
				0.5	4.0	Light brown to light reddish brown, sandy fat clay, with chert gravel, dry	AS-1	СН				
_				4.0	5.0		AS-2	CL				
				7.0	5.0	Light brown, sandy lean clay, abundant chert gravel, dry Brown to reddish brown, sandy fat clay, with chert gravel				-		With chert seams eve
		,		5.0	10.2	and chert seams *	AS-3	СН		:		4 to 6"
						Bottom of Boring / Auger Refusal at 10.2 feet						
		-		<u> </u>		Boring backfilled with cuttings at completion						
									550	0/0/0000	Dr. AR	
MC-190A	917+00	120 ft. Left	1173.9						BRO	6/6/2003	Dry AB	
				0.0	4.0	Light reddish brown, gravel, scattered sand and clay, moist	AS-1	GP			ļ	
				4.0	9.0	Light brown, gravel, abundant sand, trace clay, moist	AS-2	GP			<u> </u>	
				9.0	14.0	Red and light brown, lean clay, abundant sand, with gravel, moist	AS-3	CL				
				14.0	19.0	Light brown to brown, gravel, with sand, scattered clay, moist	AS-4	GP				
						Red to light brown, lean clay, abundant gravel, moist	AS-5	CL				
			-	19.0				OL			1	
				24.0	25.0	Gray limestone, hard	AS-6				<del>                                     </del>	
				+	-	Bottom of Boring / Auger Refusal at 25.0 feet	-		<del> </del>			
	*	<del> </del>	<del> </del>	<del> </del> -		Boring backfilled with cuttings at completion	-				<del>                                     </del>	
	-				-		<del> </del>				1	
				<u> </u>			<u>L</u>		<u>L</u>		<u> </u>	

Station 917+00	Offset  Centerline	Elevation	0.0 4.0 9.0	4.0 9.0	Log of Materials  Light brown, sandy gravel, trace clay, moist  Light brown, sandy gravel, trace clay, moist	Samples	USCS	Logged By: BRO	Date 6/6/2003	Depth Dry AB	Comments
917+00	Centerline	1170.5	4.0	9.0				BRO	6/6/2003	Dry AB	
			4.0	9.0					<u> </u>	0.,,	<del></del>
			4.0	9.0						1	1
					II IONI Drown, Sandy dravel, trace clay, moiet	•					
			9.0	140	-g.n. orani, outlay glavor, made day, molet	<u> </u>				ļ	
-				14.0	Light brown and gray, sandy gravel, trace clay, moist						
			14.0	23.0	Gravel, trace sand and clay, light brown and gray, moist						
				at 23.0	Gray limestone, hard						
					Bottom of Boring / Auger Refusal at 23.0 feet						
					Boring backfilled with cuttings at completion						
	<b></b> .										
17+30	94 ft. Right	1168.7			See Roadway Core Boring Logs						
17.20	010 ft   Di-Li	4450.0		<u></u>		<u> </u>					
717+30	ZIOIL RIGHT	1158.2			74.			ВКМ	12/20/2002	Dry AB	Dry 24 hr AB
			0.0	0.5	Brown, lean clay, with rootlets, moist		CL				<u></u>
			0.5	5.0	chert gravel, dry	AS-1	СН				
			5.0	12.5	Light brown to light reddish brown, sandy fat clay, with	1					Chert layer from 5 to 5.
			3.0	13.3			CH				feet
	<u></u>		•		Bottom of Boring / Auger Refusal at 13.5 feet	-					
					Boring backfilled with cuttings at completion						
-											
17+46	333 ft. Right	1139.7				1		вкм	12/20/2002	Dry AB	Dry 24 hr AB
	·-·		0.0	1.5	Brown chert gravel with clay, dry		GC				
		İ	1.5	10.5	Light brown to light reddish brown sandy fat clay, with to	AC 1	CH				
					Tan to light brown sandy fat clay, abundant chert gravel	A3-1	ОП	-			Chert seams every 6 to
			10.5	15.0	and chert seams, dry	AS-2	CH				8"
					Bottom of Boring / Auger Refusal at 15.0 feet	BULK-3 (0	to 15 ft)				
					Boring backfilled with cuttings at completion						
						<del>                                     </del>	+				
91	7+46	17+38 213 ft. Right	17+38 213 ft. Right 1158.2	7+46 333 ft. Right 1139.7	7+48 213 ft. Flight 1158.2 0.0 0.5 0.5 5.0 5.0 13.5 7+46 333 ft. Flight 1139.7 0.0 1.5 10.5	See Roadway Core Boring Logs   See Roadway Core Boring Logs     17+38   213 ft. Right   1158.2	17+30   94 ft. Riight   1168.7   See Roadway Core Boring Logs     17+38   213 ft. Riight   1158.2	17+30   94 ft.   Right   1168.7   See Roadway Core Boring Logs	17+30   94 ft.   Right   1168.7   See Roadway Core Boring Logs   BKM	17+30   94 ft.   Right   1168.7   See Roadway Core Boring Logs   BKM   12/20/2002     17+38   213 ft.   Right   1158.2   BKM   12/20/2002     0.0   0.5   Brown, lean clay, with rootlets, moist   CL   Light brown to light reddish brown, sandy fat clay, with   AS-1   CH   CH   CH     5.0   13.5   Bottom of Boring / Auger Refusal at 13.5 feet   BKM   12/20/2002     15   15.5   10.5   Brown chert gravel with clay, dry   Light brown to light reddish brown sandy fat clay, with   CH   CH   CH     15   15.5   15.5   Brown chert gravel with clay, dry   Light brown to light reddish brown sandy fat clay, with to abundant chert gravel, dry   AS-1   CH     15   15.5   Tan to light brown sandy fat clay, abundant chert gravel   AS-2   CH     15   Bottom of Boring / Auger Refusal at 15.0 feet   BULK-3 (0 to 15 ft)	17+30   94 ft.   Flight   1168.7   See Roadway Core Boring Logs   BKM   12/20/2002   Dry AB     17+38   213 ft.   Flight   1158.2   BKM   12/20/2002   Dry AB     0.0   0.5   Brown, lean clay, with rootlets, moist   CL   Light brown to light reddish brown, sandy fat clay, with chert gravel, dry   CH   Light brown to light reddish brown, sandy fat clay, with chert gravel and chert seams, dry   CH   Bottom of Boring / Auger Refusal at 13.5 feet   Boring backfilled with cuttings at completion   BKM   12/20/2002   Dry AB     1.5   Brown chert gravel with clay, dry   GC   Light brown to light reddish brown sandy fat clay, with   CH   CH   CH   CH   CH   CH   CH   C

Boring		Γ	<u> </u>	Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
	040.00	100# 10#	1170.1						BRO	6/6/2003	Dry AB	
MC-193A	919+00	120 ft. Left	1170.1					<u> </u>	Brio	<u> </u>	5.7.12	
				0.0	3.0	Brown gravel, scattered clay, moist	AS-1	GP				
	•			3.0	8.0	Red, lean clay, scattered sand and gravel, moist	AS-2	CL				
				8.0	11.0	Gray limestone, hard	AS-3					
						Bottom of Boring / Auger Refusal at 11.0 feet						
						Boring backfilled with cuttings at completion						
					,							
MC-193B	918+97	2 ft. Right	1162.0						BRO	6/6/2003	Dry AB	
WC-193D	310+37	Zit. Tigit	1102.0				40.4	<u> </u>				
			ļ	0.0	3.0	Light brown and gray, gravel, trace clay, moist	AS-1					
	4.00			3.0	8.0	Light brown and red, sandy gravel, with clay, moist	AS-2	ļ				
				8.0	13.0	Light brown and red, sandy gravel, scattered clay, moist	AS-3					
				13.0	18.0	Reddish brown, gravel, with sand and clay, moist	AS-4					
						Bottom of Boring / Auger Refusal at 18.0 feet						
		<u> </u>				Boring backfilled with cuttings at completion	<u> </u>					
				<u> </u>							<u> </u>	
MC-194	919+09	79 ft. Right	1150.0						ВКМ	12/20/2002	Dry AB	Dry 24 hr AB
				0.0	1.0	Brown, chert gravel with clay, dry, angular, poorly graded	į	GP				
				1.0	4.0		AS-1	СН				
				<del> </del>		Tan to light brown, gravelly fat clay, dry Light brown to light reddish brown, sandy fat clay, with		СН				Chert layer from 4 to 6
				4.0	15.5	chert gravel and chert seams, dry to moist below 10 ft	AS-2	Un Un			<del>                                     </del>	feet
				<del> </del>		Bottom of Boring / Auger Refusal at 15.5 feet	<del>                                     </del>	-			<del> </del>	
		<u>.</u>		<u> </u>		Boring backfilled with cuttings at completion		1			ļ	
					1		<u> </u>	<u> </u>				
	<del>                                     </del>		1	1								·
		<del> </del>	<del>                                     </del>	<del>                                     </del>			1	1				-
		-	-		<del> </del>		-				1	
			1	1						<u></u>	<u> </u>	<u> </u>

Boring	C-4-4!	0"			th (Ft)		I	]	Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-195	919+26	196 ft. Right	1151.2						ВКМ	12/21/2002	Drv AB	Dry 24 hr AB
				0.0	0.5	Description of the August III	-	<u> </u>		122112002	5.7.0	DI 24 III AD
		· · · · · · · · · · · · · · · · · · ·	<del></del>	0.0	0.5	Brown clayey chert gravel, dry Light brown to light reddish brown sandy fat clay, with chert	1	GC				
				0.5	8.2	seams	AS-1	СН				Chert seams to 7 feet
	**		··-			Bottom of Boring / Auger Refusal at 8.2 feet						
						Boring backfilled with cuttings at completion						
MC-196	919+29	314 ft. Right	1144.8	ļ					вкм	12/21/2002	Dry AB	Dry 24 hr AB
				0.0	0.5	Brown, lean clay, abundant chert gravel, with rootlets, dry Light brown to light reddish brown, sandy fat clay, with		GC	·			
				0.5	11.0	Light brown to light reddish brown, sandy fat clay, with chert seams	AS-1	СН				With chert seams even
	· <u></u>	<u></u>				Bottom of Boring / Auger Refusal at 11.0 feet						
						Boring backfilled with cuttings at completion						
IC-196A	921+00	120 ft. Left	1163.2							- /- /		
			1100.2	0.0	4.0	Light brown to red, lean clay, abundant sand, with gravel, moist	AS-1	CL	BRO	6/6/2003	Dry AB	
				4.0	9.0	Light brown and red, sandy gravel, with clay, moist		GP-GC				
				9.0	12.0	Reddish brown, gravel, trace clay, moist	AS-3	GP-GC				
				12.0	12.5	Gray limestone, hard						
						Bottom of Boring / Auger Refusal at 12.5 feet						
						Boring backfilled with cuttings at completion						
AC 106B	001.00	4.4 Dicks	- 1151.0									
MC-196B	921+03	1 ft. Right	1151.2	0.0	2.0	Dark brown, gravel, scattered clay and silt, trace roots, moist	AC 1	00	BRO	6/6/2003	Dry AB	
				2.0	5.0	Reddish brown, gravel, scattered clay, moist	AS-1 AS-2	GP GP				
				5.0	10.0	Reddish brown, gravel, trace clay, dry	AS-3	GP	-			
<del></del>				10.0	12.0	Brown, gravel, trace clay, dry	_AS-4	GP				
						Bottom of Boring / Auger Refusal at 12.0 feet	Boring bac	kfilled wi	th cuttings	at completion		

Boring				Dept	<del></del>	A	Cl	LICCE	Logged	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USUS	By:	Date	Depui	Comments
MC-197	921+17	59 ft. Right	1146.4						вкм	12/21/2002	Dry AB	
10-137	JE !!!	0010 109										
				0.0	0.5	Brown, lean clay, trace chert gravel, dry Light brown to reddish brown, sandy fat clay, abundant	<del></del>	CL			<b></b>	Chert seams spaced 1
				0.5	17.0	chert gravel, with chert seams, dry	AS-1	СН				2 feet apart
				0.0	17.0	Cheft Graver, with choir sound, ory		<del></del> -				
i						Bottom of Boring / Auger Refusal at 17.0 feet	BULK-2	(0.5-17.	0 ft)			
				1		Design to a liftle durith authors at approlation						
				-		Boring backfilled with cuttings at completion						
ŀ		,										
									ВКМ	12/21/2002	Dry AB	
MC-198	921+30	178 ft. Right	1134.7	-					DIVIN	12/21/2002	DIY AD	
ŀ				0.0	0.3	Brown, lean clay, trace chert gravel, with rootlets, dry		CL			<u> </u>	
					-							
				0.3	3.5	Chert gravel, abundant sandy fat clay Light brown to light reddish brown, sandy fat clay, with		GC			<del> </del>	Seams 2-4" thick
				3.5	13.5	chert gravel, with chert seams below 5 feet	AS-1	СН				spaced 1-2' apart
	,		,	1	,,,,,,							
			ļ	ļ		Bottom of Boring / Auger Refusal 13.5 feet	<u> </u>	ļ.——			-	-
,		ļ				Boring backfilled with cuttings at completion						
	· · · · · ·	<u> </u>	<del></del>	1								
							ļ				<del> </del>	
140 100	921+42	297 ft. Right	1132.9						вкм	12/21/2002	Dry AB	
MC-199	921742	297 tt. 1 light	1102.5	<u> </u>								
				0.0	0.3	Brown lean clay, trace chert gravel, with rootlets, dry Light brown to light reddish brown, sandy gravelly fat clay,	<u> </u>	CL			<del> </del>	
			ļ	0.3	3.5	dry	`	GP-CH				
			<u> </u>	0.3	3.3	Light brown to light reddish brown, sandy fat clay, with						Seams 2-4" thick
				3.5	16.0	chert gravel, dry, with chert seams	AS-1	СН			<del> </del>	spaced 1-2' apart
						Bottom of Boring / Auger Refusal at 16.0 feet						
		<u> </u>		<del> </del>		Bottom of Borning / Auger Merusal at 10.0 feet	_ · -	<del> </del>				
			1			Boring backfilled with cuttings at completion		<u> </u>				
	·	<u> </u>		+	-			+		<del></del>	1	
MC-199A	923+00	120 ft. Left	1169.4					<u> </u>	BRO	6/6/2003	Dry AB	<u> </u>
						and the second second second second	40.4	GP				
		1	<del> </del>	0.0	4.0	Light brown and red, sandy gravel, scattered clay, moist	AS-1	ur ur	-	<del>                                     </del>	+	
				4.0	6.0	Light brown and red, lean clay, with sand and gravel, moist Red, light brown and brown, lean clay, abundant sand,	AS-2	CL				
<del></del>				T				<u> </u>			•	
				6.0	7.5	moist	AS-3	CL		<del>                                     </del>	+-	
						Bottom of Boring / Auger Refusal at 7.5 feet		_				
		<del> </del>	<del>                                     </del>	1	1						[	
	1	1			<u> </u>	Boring backfilled with cuttings at completion	<u> </u>		1	1		<u> </u>

Boring					h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-200	923+11	36 ft. Right	1139.4					l	CSK	1/14/2003	Dry AB	
				0.0	2.5	Reddish brown and gray, chert gravel, with silt, dry	AS-1	GP-GM	T			
	···.					Bottom of Boring / Auger Refusal at 2.5 feet						
			<u> </u>			Boring backfilled with cuttings at completion						-
MC-201	923+25	155 ft. Right	1113.7						сѕк	1/14/2003	Dry AB	
				0.0	10.0	Reddish brown and gray, chert gravel, trace silt, dry	AS-1	GP	John	1/14/2003	DIY AU	· .
				10.0		Reddish brown and gray, chert gravel, trace silt, dry		GP				······································
		-				Bottom of Boring / Auger Refusal at 16.0 feet						
			<del></del>			Boring Backfilled with cuttings at completion						
MC-202	000.40	074# 5711					}			<del></del>		
	923+40	274 ft. Right	1101.7						CSK	1/14/2003	Dry AB	
				0.0		Light reddish brown, silt, with chert gravel, dry	AS-1	ML		- Harris		
	<u></u>			10.0		Light reddish brown, silty chert gravel, dry	AS-2	GM		<del></del>	 	
		-				Bottom of Boring / Auger Refusal at 15.5 feet						<del></del> ,
-	· · · · · · · · · · · · · · · · · · ·					Boring backfilled with cuttings at completion						
IC-202A	925+00	120 ft. Left	1173.8						BRO	6/6/2003	Dry AB	
				0.0	3.0	Light brown, sandy gravel, with clay, moist	AS-1	GP				
				3.0	6.5	Light brown, sandy gravel, with clay, moist	AS-2	GP				
						Bottom of Boring / Auger Refusal at 6.5 feet						
						Boring backfilled with cuttings at completion					·	· · · · · · · · · · · · · · · · · · ·
							_					

Boring			1			h (Ft)		1		Logged	5.	GW	0
No.	Station	Offset		Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
10 000	925+04	10 H	ight	1165.6						вкм	12/21/2002	Dry AB	
MC-203	920104	10 ft. F	ngill	0.6011		<del></del>	Light brown to light reddish brown, sandy fat clay, with	<del>                                     </del>	t				
					0.0	9.0	chert gravel and chert seams, dry	AS-1	СН				
				-			Brown with reddish brown fat clay, scattered limestone					1	Chert seams spaced 2
					9.0	25.0	gravel, with chert seams, dry	AS-2	СН				apart
			ļ				Pottom of Poring / Augor Polycol at 25 0 foot						
							Bottom of Boring / Auger Refusal at 25.0 feet	<del></del>	1			<del>                                     </del>	
			1				Boring backfilled with cuttings at completion						
		-											
											40/04/0000	D=+ 4B	
MC-204	925+21	129 ft. F	₹ight	1158.9	ļ		Light brown to light reddish brown, sandy fat clay, with			BMK	12/21/2002	Dry AB	
					0.0	3.0	chert gravel, dry		Сн			-	
					0.0	3.0	Chert graves, dry	-	<del>                                     </del>			†	
i			٠ ا		3.0	5.0	Dark reddish brown, fat clay, trace chert gravel, moist		CH				
							Brown to reddish brown, fat clay, with trace limestone						Chert seams 2 to 3 fee
					5.0	21.5	gravel, with chert layers, dry to moist	AS-1	СН				apart
			]				Bottom of Boring / Auger Refusal at 21.5 feet	BULK-2	(0.5-21	5 ft\			'
				-400	-		Bollotti di Bolling / Augel Trelusai at 21.5 leet	- BOLK-Z	(0.5 21.	J 11)		<del>                                     </del>	
							Boring backfilled with cuttings at completion	İ	:				
													•
				4450.0	<del> </del>					ВКМ	12/21/2002	Dry AB	
MC-205	925+38	247 ft. F	ugnt	1150.0	<del> </del>		Light brown, sandy fat clay, abundant chert gravel,			DIVIN	12/21/2002	0.,, 7.2	· · · ·
					0.0	15.5	scattered chert seams, dry	AS-1	CH			1	Chert seams 2-3' apart
				<del> </del>	1							Ī	
					<u> </u>	<u></u>	Bottom of Boring / Auger Refusal at 15.5 feet					ļ	
							Desire the LED at with authors at asymptotics						
					<del> </del>	ļ	Boring backfilled with cuttings at completion	<del>-</del>				<del>                                     </del>	
												ļ	
MC-205A	926+95	121 ft.	_eft	1155.9						BRO	6/6/2003	Dry AB	
					0.0	1.0	Dark brown to brown, gravel, trace sand and clay, dry	AS-1	GP				
								T				1	
					1.0	5.0	Light brown, sandy gravel, abundant clay, moist	AS-2_	GP-GC			+	<u> </u>
					5.0	9.5	Light brown, sandy gravel, with clay, moist	AS-3	GP-GC			<u> </u>	
					9.5	11.0	Light brown, sandy gravel, with clay, moist	AS-4	GP-GC				<u> </u>
							Bottom of Boring / Auger Refusal at 11.0 feet					<u> </u>	
		1										1	
	•			1			Boring backfilled with cuttings at completion			l		<u> </u>	

Boring	01-4				h (Ft)				Logged		GW	1
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-206	927+01	18 ft. Left	1159.7		ļ				вкм	12/21/2002	Do. AB	Dry 24 hr AB
						Light brown to light reddish brown, sandy fat clay,	<del>                                     </del>		DKM	12/2 1/2002	UIY AB	DIY 24 NF AB
				0.0	2.0	abundant chert gravel, dry	AS-1	СН			}	
				2.0	7.0	Brown and reddish brown, fat clay, trace chert gravel, scattered chert seams						
				2.0	7.0	scallered Cheft Scallis	AS-2	СН			<u> </u>	·
				7.0	8.0	Reddish brown, fat clay, trace chert gravel, moist	AS-3	Сн				]
						Brown fat, clay, trace chert gravel, scattered chert seams,						Chert seams every 1 to
				8.0	11.0	dry to moist	AS-4	CH		···		2 feet
						Bottom of Boring / Auger Refusal at 11.0 feet						
						Boring backfilled with cuttings at completion						
						Bowing backined with collengs at completion						
MC-207	927+11	118 ft. Right	1154.0				L		вкм	12/21/2002	Dry AB	Dry 24 hr AB
		<b>-</b> ,		0.0	2.0	Light brown to light reddish brown, sandy fat clay, with						
				0.0	2.0	chert gravel, dry	AS-1	CH				Chart seems aven. 1
				2.0	8.5	Brown, fat clay, trace chert gravel, with chert seams, dry	AS-2	СН				Chert seams every 1 foot
						Bottom of Boring / Auger Refusal at 8.5 feet						
						Boring backfilled with cuttings at completion			_			
MC-208	927+02	214 ft. Right	1149.2			Light brown to reddish brown, sandy fat clay, with chert			ВКМ	12/22/2002	Dry AB	
	j			0.0	1.0	gravel, dry		СН				
								Un				Chert seams from 4.5 to
				1.0	14.5	Brown to light brown, fat clay, with chert gravel, dry	AS-1	СН				14.5 feet
						Bottom of Boring / Auger Refusal at 14.5 feet	BULK-2	/1.1 <i>4</i>	,			Chert seams 1 to 3 feet apart
		-					DOLK-2	(1-14.51)	9			арап
			-			Boring backfilled with cuttings at completion						
MC-208A	929+00	180 ft. Left	1119.9						BRO	7/8/2003	Dry AB	
				0.0	3.5	Light brown and dark brown, gravel, dry	AS-1	GP				
				3.5		Light brown and dark brown, gravel, dry	AS-2	GP GP				
		-		8.5		Light brown and dark brown, gravel, dry			<del></del> -			
				5.5	-		AS-3	GP				
						Bottom of Boring / Auger Refusal at 11.5 feet						
1			_			Boring backfilled with cuttings at completion		İ			i	

Boring	1			Dept	h (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
			4004.0						сѕк	1/14/2003	Dry AB	
MC-209	929+02	50 ft. Left	1094.2						0310	1/17/2000	Diy AD	
				0.0	2.5	Light reddish brown, silty chert gravel, with sand, dry	AS-1	GM			<u> </u>	
						Bottom of Boring / Auger Refusal at 2.5 feet						
						Boring backfilled with cuttings at completion						
		<u>-</u>										
MC-210	929+16	70 ft. Right	1092.4						CSK	1/14/2003	Dry AB	
				0.0	2.0	Dark brown, gravelly silt, with clay, moist	AS-1	ML			<u> </u>	
						Bottom of Boring / Auger Refusal at 2.0 feet					-	
						Boring backfilled with cuttings at completion						
		ì										
MC-211	929+30	189 ft. Right	1082.2						CSK	1/14/2003	Dry AB	
		·		0.0	7.0	Light reddish brown, silty chert gravel, dry	AS-1	GM				
						Bottom of Boring / Auger Refusal at 7.0 feet					<u> </u>	
_						Boring backfilled with cuttings at completion						
	·											
MC-211A	931+00	180 ft. Left	1158.1						BRO	7/8/2003	Dry AB	
				0.0	3.5	Light brown and dark brown, gravel, dry	AS-1	GP		<u>.</u>		
				3.5	6.0	Light brown and dark brown, gravel, dry	AS-2	GP		-	<u> </u>	
						Bottom of Boring / Auger Refusal at 6.0 feet				···	<u>.</u>	
				ļ		Boring backfilled with cuttings at completion						
				ļ			_					
MC-212	931+00	65 ft. Left	1151.7	ļ		See Roadway Core Boring Logs		ļ 				
			ļ	<u> </u>			-	ļ				.,,
			<u> </u>	ļ	ļ <u>.</u>		_					<u>.</u>
	<del> </del>			<u> </u>								
								<u> </u>				4.

Boring	<del></del>			Dept	th (Ft)		1	1	Logged		ĞW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-213	931+12	55 ft. Right	1148.1						DIVA	40/00/0000	D	
								<del></del>	BKM	12/22/2002	Dry AB	
		<del> </del>		0.0	0.8	Brown, lean clay, trace chert gravel, dry Light brown to light reddish brown, sandy fat clay, with		CL				
i				0.8	5.0	scattered chert gravel, with chert seams, dry	AS-1	СН				
						Reddish brown, fat clay, with chert gravel and chert	73.1	Un				
		i		5.0	18.2	seams, moist		СН	<u> </u>			
		,				Bottom of Boring / Auger Refusal at 18.2 feet	BULK-2	(0.8-18.	2')			
						Boring backfilled with cuttings at completion		<b>1</b>				
						Soming Sections with outlings at completion						
MC-214	931+24	174 ft. Right	1110.1				_					
VIO-214	331724	174 II. Fight	1148.4						BKM	12/22/2002	Dry AB	
				0.0	0.6	Brown, lean clay, trace chert gravel, dry		CL			Ì	
ĺ				0.0	40.4	Light brown to light reddish brown, sandy fat clay.						Chert seams 0.5-1.5'
				0.6	18.4	abundant chert gravel, with chert seams, dry to moist	AS-1	СН				apart
		.,				Bottom of Boring / Auger Refusal at 18.4 feet						1-ft thick chert layer a
						Boring backfill with cuttings at completion						
/IC-214A	933+00	180 ft. Left	1134.7		·				BRO	7/8/2003	Dry AB	
				0.0	3.5	Light brown, gravel, dry	AS-1	GP			2.97.0	
				3.5	5.0	Light brown, gravel, dry	AS-2	GP		- · . <u> · </u>		
						Bottom of Boring / Auger Refusal at 5.0 feet	1.02					
					T	Boring backfill with cuttings at completion						
						S SESTIMATION SOLVEN GO SEL COMPLETION	-					
AC-215	932+97	71 ft. Left	1138.7				<u> </u>		CSK	1/14/2002	Day AD	
				0.0	9.5	Light reddish brown, silty chert gravel, dry	1 46 :		VON	1/14/2003	Dry AB	
				0.0	0.0		AS-1	GM				
						Bottom of Boring / Auger Refusal at 8.5 feet		-				
					•	Boring backfilled with cuttings at completion						
									1			

Boring				Depti			Comples	LIECE	Logged	Data	GW Depth	Comments
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	0303	Ву:	Date		Comments
MC-216	933+06	49 ft. Right	1136.8						CSK	1/14/2003	Dry AB	
				0.0	9.0	Light brown and gray, silty chert gravel, dry	AS-1	GM				
				0.0	9.0							
						Bottom of Boring/ Auger Refusal at 9.0 feet	<u> </u>					
						Boring backfilled with cuttings at completion						
			,									
											5	
MC-217	933+17	166 ft. Right	1122.5				<del></del>		CSK	1/14/2003	Dry AB	
				0.0	8.5	Brown to light reddish brown, silty chert gravel, moist	AS-1	GM				
						Bottom of Boring / Auger Refusal at 8.5 feet						
			·									
		<del></del>	<u>;</u>			Boring backfilled with cuttings at completion						
										<u> </u>		
MS-218	935+80	216 ft. Left	1020.8			See Structural Boring Log						
MG-210	300100	Zioic zon	102010									
			<u>.</u>				-					
MS-219	936+09	17 ft. Right	1024.0			See Structural Boring Log						
			4000.0			See Structural Boring Log			вкм	12/20/2002	Dry AB	
MS-220	936+62	244 ft. Right	1020.3			See Structural Bolling Log					7	
MC-221	939+24	129 ft. Right	1094.0						CSK	1/18/2003	Dry AB	<u> </u>
,					11.0	Light brown, silty chert gravel, dry	AS-1	GP-SM				
	<del></del>		<del>                                     </del>	"	1			[				
				-	<u> </u>	Bottom of Boring / Auger Refusal at 11.0 feet						<u></u>
						Boring backfilled with cuttings at completion		ļ <u></u>		·		
	,											
	<u> </u>		<del> </del>	<del> </del>					CSK	1/18/2003	Dry AB	
MC-222	939+22	10 ft. Right	1084.8	-			<del></del>	-	Can	1/16/2003	וייי וייי	
				0.0	8.0	Gray and brown, chert gravel, scattered silt, dry	AS-1	GP		! 	<b>├</b> ──-├-	***
		-				Bottom of Boring/ Auger Refusal at 8.0 feet						
		<u> </u>			<del> </del>							
	l	<u> </u>	<u> </u>	<u> </u>	<u> </u>	Boring backfilled with cuttings at completion		+			+	4/,

Boring			ļ	Dept	th (Ft)			1	Logged		GW	
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	uscs	By:	Date	Depth	Comments
/IC-223	941+03	109 ft. Left	1112.1						CSK	1/17/2003	Dry AB	
				0.0	6.0	Reddish brown sandy lean clay, few chert gravel, moist	AS-1	CL			-	
	·					Bottom of Boring / Auger Refusal at 6.0 feet						
						Boring backfilled with cuttings at completion						
MC-224	941+08	1 ft. Right	1124.7						CSK	1/17/2003	Dry AB	<del></del>
_	<del></del>			0.0	10.0	Reddish brown, silty chert gravel, with sand, dry to moist	AS-1	GM				
	·				_	Bottom of Boring / Auger Refusal at 10.0 feet	BULK-2	(0-10 ft)				
		****				Boring backfilled with cuttings at completion						
MC-225	941+10	121 ft. Right	1114.3		-				CSK	4/40/2000	2 10	
				0.0	8.0	Brown and gray, chert gravel, with silt, moist	AS-1	GP-GM	CSK	1/18/2003	Dry AB	
				8.0		Reddish brown, silty sand, with chert gravel, dry	AS-2	SM		·		·
						Bottom of Boring / Auger Refusal at 11.0 feet						
						Boring backfilled with cuttings completion						
WC-226	943+08	120 ft. Left	1148.5						CSK	1/17/2003	Dry AB	
				0.0	10.0	Light reddish brown, silty sand, with chert gravel, dry	AS-1	SM			, r <u>.</u>	
				10.0	14.5	Reddish brown, gravelly lean clay with sand, moist	AS-2	CL				
						Bottom of Boring / Auger Refusal at 14.5 feet						
						Boring backfilled with cuttings at completion						
		<u> </u>							-			
									-			<del></del>

Boring				Deptl					Logged	<b>D</b>	GW	0
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-227	943+08	Centerline	114 <u>1.6</u>						CSK	1/17/2003	Dry AB	
				0.0	10.0	Light reddish brown, silty sand, with chert gravel, dry	AS-1	SM				
-				10.0		Light brown, silty sand, with chert gravel, dry	AS-2	SM				
				_		Light brown, silty sand, with chert gravel, dry		SM				
				20.0	25.5		511114		<u></u>			
						Bottom of Boring / Auger Refusal at 25.5 feet	BULK-3	(0-25.5	π)			
						Boring backfilled with cuttings at completion	-					
						:					<u> </u>	
MC-228	943+07	125 ft. Right	1117.2				· ·		CSK	1/18/2003	Dry AB	
				0	3.0	Light reddish brown, sandy silt, with chert gravel, moist	AS-1	ML				
						Bottom of Boring / Auger Refusal at 3.0 feet						<u> </u>
						Boring backfilled with cuttings at completion						
_										,		
140,000	045.00	120 ft., Left	1169.5			See Roadway Core Boring Logs						••
MC-229	945+08	120 It Leit	1103.5		-	occ riodaway coro Boning 20g0						
					<u>.                                    </u>	A CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR OF THE CONTRACTOR	1		СЅК	1/17/2003	Dry AB	
MC-230	945+08_	Centerline	1150.2	ļ		14			COK	1/17/2003	DIY AU	· · · ·
				0.0	10.0	Light reddish brown, sandy silt, with chert gravel, dry	AS-1	ML_				
				10.0	16.5	Light brown, clayey sand, scattered chert gravel, moist	AS-2	sc			-	
. ———	· · · · · · · · · · · · · · · · · · ·			ļ		Bottom of Boring / Auger Refusal at 16.5 feet			-		ļ <u> </u>	_+-
						Boring backfilled with cuttings at completion		ļ			ļi	, <u>.</u>
						·						
MC-231	945+08	120 ft. Right	1129.2						CSK	1/18/2003	Dry AB	
WICZOL	<del>243₹00</del>	120 to 1 agen		0.0	10.0	Light reddish brown, silty sand with chert gravel, dry	AS-1	SM				
					1		1	1			<b> </b>	
				10.0	11.5	Light reddish brown, slity sand with chert gravel, dry	1	<del>                                     </del>			<del>                                     </del>	,
·				<del> </del>	-	Bottom of Boring / Auger Refusal at 11.5 feet		<del> </del>		,,,	+	
				<u> </u>	<u> </u>	Boring backfilled with cuttings at completion		-				

Boring	01-11-11		l		th (Ft)				Logged		GW	[
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-232	947+08	120 ft. Left	1162.7						ВКМ	5/8/2003	Dry AB	Dry 24 hr AB
		-		0.0	3.0	Brown and light reddish brown, lean clay, with gravel, dry Reddish brown, lean clay, scattered gravel and chert	AS-1	CL				
				3.0	11.0	seams, drv	AS-2	CL				
				11.0	18.5	Brown and light reddish brown, lean clay, with gravel, moist	AS-3	CL				
				18.5	26.0	Light brown, lean clay, scattered to with gravel and chert seams, moist	AS-4	CL				
				26.0	26.5	Gray limestone, hard						•
						Bottom of Boring / Auger Refusal at 26.5 feet						
						Boring backfilled with cuttings at completion						
MC-233	947+08	Centerline	1138.4						0014	1/40/0000	5 45	
				0.0	9.5	Light brown to light reddish brown, silty sand, with chert gravel (highly weathered chert), dry	AS-1	SM	CSK	1/18/2003	Dry AB	·
						Bottom of Boring / Auger Refusal at 9.5 feet						
						Boring backfilled with cuttings at completion						
MC-234	947+08	120 ft. Right	11170		<del></del>				-			<del></del>
VIC-234	547708	120 II. High	1117.9		40.0				CSK	1/17/2003	Dry AB	
				0.0		Light reddish brown, gravelly silt, with sand, dry	AS-1	ML				
<del>-</del>				10.0		Light reddish brown and white, silty gravel, dry	AS-2	GM				<del>-</del>
		<u> </u>		·		Bottom of Boring / Auger Refusal at 17.5 feet						
						Boring backfilled with cuttings at completion				·····		
MC-235	949+08	120 ft. Left	1168.0						CSK	1/17/2003	Dry AB	
				0.0	5.0	Light reddish brown, silt, with sand, trace gravel, dry to moist	AS-1	ML.				
				5.0	9.5	Reddish brown, sandy silt, with chert gravel, dry	AS-2	SM				
						Bottom of Boring / Auger Refusal at 9.5 feet						
						Boring backfilled with cuttings at completion						

Station 149+08	Offset Centerline	Elevation 1160.3			Log of Materials	Samples					
49100	Ochtelinio							CSK	1/17/2003	Dry AB	
			~ ~	0.5	Light reddish brown, silty sand, with chert gravel, dry	AS-1	SM				
		•	0.0	6.5		A3-1	CIVI		,		
					Bottom of Boring / Auger Refusal at 6.5 feet						
					Boring backfilled with cuttings at completion	_	-	-	_ ^*		
M9+08	120 ft. Bioht	1144.3						CSK	1/17/2003	Dry AB	
,45100	120		0.0	8.0		AS-1	CL/ML				
1		****	8.0	14.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
					Bottom of Boring / Auger Refusal at 14.0 feet						
					Boring backfilled with cuttings at completion						
254.00	100 tt 1 oft	1105.0						CSK	1/17/2003	Dry AB	
351+06	120 II. Leit	1190.5	0	8.0	Light reddish brown and white, silty chert gravel, dry	AS-1	GM				
						AS-2	CL				
					Bottom of Boring / Auger Refusal at 10.5 feet						
					Boring backfilled with cuttings at completion						
								001	4/47/0009	Dni AB	
951+08	Centerline	1176.3						USK	1/1//2003	DIY AB	
			0.0	10.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-1	CL_				1,
			10.0	19.5	Light brown, clayey sand, with chert gravel, moist	AS-2	SC			-	
- <del></del>					Bottom of Boring / Auger Refusal at 19.5 feet						
					Boring backfilled with cuttings at completion					ļ <u>!</u>	
						<u> </u>					
			<u> </u>								
95		51+08 120 ft. Left  51+08 Centerline	51+08 120 ft. Left 1195.9  51+08 Centerline 1176.3	51+08 120 ft. Left 1195.9  51+08 Centerline 1176.3  0.0  10.0	51+08   120 ft. Left   1195.9   0 8.0   10.5	1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00   1.00	14.0   8.0   14.0   Reddish brown, sandy lean clay, with chert gravel, moist   AS-1	CL/ML   AS-1   CL/ML	Light reddish brown, sitly lean clay, with chert gravel, moist AS-1 CL/ML  8.0 14.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-2 CL  Bottom of Boring / Auger Refusal at 14.0 feet  Boring backfilled with cuttings at completion  CSK  8.0 10.5 Reddish brown and white, sitly chert gravel, dry AS-1 GM  8.0 10.5 Reddish brown, sandy lean clay, with chert seams AS-2 CL  Bottom of Boring / Auger Refusal at 10.5 feet  Boring backfilled with cuttings at completion  CSK  Contentine  1176.3 Canterline  1176.4 Canterline  1176.4 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canterline  1176.5 Canter	Light reddish brown, silty lean clay, with sand and chert gravel, moist AS-1 CL/ML  8.0 14.0 Reddish brown, sandy lean clay, with chert gravel, moist AS-2 CL  Bottom of Boring / Auger Refusal at 14.0 feet  Boring backfilled with cuttings at completion  CSK 1/17/2003  120 ft. Left 1195.9 0 8.0 Light reddish brown and white, silty chert gravel, dry AS-1 GM  8.0 10.5 Reddish brown, sandy lean clay, with chert gravel, dry AS-1 GM  Bottom of Boring / Auger Refusal at 10.5 feet  Boring backfilled with cuttings at completion  CSK 1/17/2003  CSK 1/17/2003  CSK 1/17/2003  CSK 1/17/2003  CSK 1/17/2003  AS-2 CL  Bottom of Boring / Auger Refusal at 10.5 feet  Boring backfilled with cuttings at completion  CSK 1/17/2003  CSK 1/17/2003  CSK 1/17/2003  AS-2 CL  Bottom of Boring / Auger Refusal at 19.5 feet  Bottom of Boring / Auger Refusal at 19.5 feet  Boring backfilled with cuttings at completion  Bottom of Boring / Auger Refusal at 19.5 feet  Boring backfilled with cuttings at completion	Light reddish brown, silty lean clay, with sand and chert AS-1 CLML seven moist AS-2 CL Bottom of Boring / Auger Refusal at 14.0 feet Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at loss at completion Boring / Auger Refusal at 10.5 feet Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion Boring / Auger Refusal at 10.5 feet Boring backfilled with cuttings at completion CSK 1/17/2003 Dry AB Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring backfilled with cuttings at completion Boring / Auger Refusal at 19.5 feet Boring Boring backfilled with cuttings at completion Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Boring Bo

Boring				Dep	th (Ft)		Т		Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	uscs	By:	Date	Depth	Comments
MC-240	951+08	120 ft. Right	1151.4					ŀ	сѕк	1/18/2003	Dry AB	
						Brown to reddish brown, silty lean clay, with sand, few		ļ	JOIN	1710/2000	DIY AD	
				0.0	5.0	chert gravel, moist	AS-1	CL/ML			ļ <u>.</u>	
				5.0	15.0	Reddish brown, clayey sand, with chert gravel, moist	AS-2	sc				
	<del></del>			15.0	21.5	Reddish brown, clayey gravel, with sand, moist	AS-3	GC				
						Bottom of Boring / Auger Refusal at 21.5 feet	BULK-4	(5.0 to 2	21.5 feet)			
	<del></del> -					Boring backfilled with cuttings at completion						
	···											
MC-241	953+08	120 ft. Left	1197.7				-		CSK	1/17/2003	Dry AB	
			-	0.0	10.0	Light reddish brown sandy silt with chert gravel, dry	AS-1	SM				
				10.0	11.5	Light reddish brown sandy silt with chert gravel, dry, with chert seams	AS-2	SM				
	***					Bottom of Boring / Auger Refusal at 11.5 feet						
						Boring backfilled with cuttings at completion						
MC-242	953+08	Centerline	1180.7						CSK	1/15/2003	Dry AB	
				0.0	5.0	Reddish brown, clayey sand, with chert gravel, moist	AS-1	sc				
				5.0	15.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-2	CL				
				15.0	20.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				Possible void from 20 to 22.5 feet
				20.0	26.0	Reddish brown, sandy lean clay, with chert gravel, moist		CL				
						Bottom of Boring / Auger Refusal at 26.0 feet	Boring bac	kfilled wi	th cuttings	at completion		
MC-243	953+08	120 ft. Right	1183.5						CSK	1/15/2003	Dry AB	
				0.0	5.0	Reddish brown, clayey chert gravel, moist	AS-1					
				5.0	15.0	Light reddish brown and white, highly weathered chert, with clay seams, dry	AS-2				-	
				15.0	25.0	Light reddish brown and white, highly weathered chert, with clay seams, dry	AS-3					
				25.0		Light reddish brown and white, highly weathered chert, with clay seams, dry	7.5 0					Possible void from 28 to 30 feet
						Bottom of Boring / Auger Refusal at 30.0 feet	Boring bac	kfilled wi	th cuttings	at completion		

Boring				Depti	1 (Ft)		_		Logged		GW	0
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-244	955+08	120 ft. Left	1188.7						CSK	1/17/2002	Dry AB	
<u> </u>						Links and dish because and white giller conduction of ground day	AS-1	GM				
				0.0	9.0	Light reddish brown and white, silty sandy chert gravel, dry	70-1	Civi			·	
						Bottom of Boring / Auger Refusal at 9.0 feet						
						Boring backfilled with cuttings at completion						
MC-245	955+08	Centerline	1179.6						CSK	1/17/2003	Dry AB	
ļ				0.0	10.0	Light reddish brown, sandy silt, with chert gravel, dry	AS-1	SM				
						Light reddish brown and white, silty chert gravel, with sand,	AS-2	GM				With clay seams below 15 feet
				10.0	20.0	dry Light reddish brown and white, silty chert gravel, with sand,	A5-2	GM				13 1660
	_			20.0	23.0	dry						
				1		Bottom of Boring / Auger Refusal at 23.0 feet	BULK	(0-20.0	ft)			
		ļ	<u> </u>			Boring backfilled with cuttings at completion		-	<u> </u>			
				ļ							<del> </del>	
MC-246	955+14	122 ft. Right	1147.6						CSK	1/17/2003	Dry AB	
WIO-240	230114	ILL II. I IIgiii					40.4					
			<u> </u>	0.0	2.5	Brown and white, chert, with silt	AS-1				<u> </u>	
		L.,				Bottom of Boring / Auger Refusal at 2.5 feet						
-		}				Boring backfilled with cuttings at completion						
	· -	<del> </del>			-							
					ļ			<del> </del>	-		1	
MC-247	957+08	120 ft. Left	1152.0				ļ	ļ	CSK	1/17/2003	Dry AB	
	_		1	0.0	8.5	Light reddish brown, sandy silt, with chert gravel, dry	AS-1	SM	1			
				0.0	0.0							
		<u> </u>	ļ	<del> </del>		Bottom of Boring / Auger Refusal at 8.5 feet		<del> </del>	<del>                                     </del>		+	
						Boring backfilled with cuttings at completion		<u> </u>	ļ <u>.</u>		<del>                                     </del>	
										-		
		<del> </del>		1	<del>                                     </del>		<u> </u>	1	001/	4/47/0000	De: AD	
MC-248	957+08	Centerline	1146.3	<del> </del>	<del> </del> -	Light reddish brown, sandy silt, with chert gravel, dry to			CSK	1/17/2003	Dry AB	-
				0.0	10.0	moist	AS-1	SM				
		1		10.0	11.5	Light reddish brown, sandy silt, with chert gravel and chert seams, dry to moist, with clay seams		SM	1			
<del> </del>	-	<del> </del>		10.0	11.3		<u> </u>					
			<u> </u>	<u> </u>		Bottom of Boring / Auger Refusal at 11.5 feet	Boring ba	ckfilled v	with cutting	s at completion	<u>n</u>	

Boring No.	Station	Offset	Clavetice		h (Ft)				Logged		GW	
		· · · · · · · · · · · · · · · · · · ·	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-249	957+07	125 ft. Right	1117.9		ļ				CSK	1/17/2003	Dry AB	
		-		0.0	7.5	Brown and white, weathered chert, with silt seams, dry	AS-1					
						Bottom of Boring / Auger Refusal at 7.5 feet						
						Boring backfilled with cuttings at completion				<del></del>		
MC-250	959+01	123 ft. Left	1157.0						CSK	1/19/2003	Dry AB	
				0.0	5.0	Light reddish brown, silty sand, scattered chert gravel, dry	AS-1	SM		··	7	
				5.0	15.0	Light reddish brown, silty sand, scattered chert gravel, dry, with chert seams	AS-2	SM				
				15.0		Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL		<del> </del>		
					21.0	-	A3-3	UL.				Hard rock at 20.0 feet
						Bottom of Boring / Auger Refusal at 21.5 feet Boring backfilled with cuttings at completion						
MC-251	959+08	Centerline	1150.1						CSK	1/19/2003	Dry AB	
				0.0	10.0	Light reddish brown, silty sand, with chert gravel, dry	AS-1	SM				Hard chert seam 6.5-8.0 feet
				10.0	14.0	Reddish brown, sandy gravel, with silt, dry	AS-2	GP				
				14.0	20.0	Reddish brown, sandy lean clay, with chert gravel, moist	AS-3	CL				
						Bottom of Boring / Auger Refusal at 20.0 feet						
					_	Boring backfilled with cuttings at completion						
MC-252	959+08	120 ft. Right	1133.3									<del></del>
	555155	12 II. Tilgin	1100.0	0.0	10.0	Light brown and light reddish brown, silty chert gravel, dry	40.4		CSK	1/19/2003		Hard chert seam
				10.0			AS-1	GM			-	5-6.0 feet
				20.0		Gray and light reddish brown, chert gravel, with silt, dry	AS-2	GP				
				20.0		Gray and light reddish brown, chert gravel, with silt, dry	AS-3	GP				·
						Bottom of Boring / Auger Refusal at 28.0 feet						
						Boring backfilled with cuttings at completion			-			

Boring				Dent	h (Ft)				Logged		GW	<del></del>
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
								-				
IC-253	961+08	120 ft. Left	1183.4			See Roadway Core Boring Logs						
						·						
<del></del> +			<del></del>									
MC-254	961+08	Centerline	1180.4						CSK	1/16/2003	Dry AB	
						State and distributions all the second areas and all the second and areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are all the second areas are	AS-1	GM				
				0.0	9.0	Light reddish brown, silty chert gravel, dry	A3-1	GIVI				
						Bottom of Boring / Auger Refusal at 9.0 feet	;					
				ļ		Boring backfilled with cuttings at completion						
$\longrightarrow$				<del> </del>								· · ·
MC-255	961+08	120 ft. Right	1173.5		<u> </u>				CSK	1/16/2003	Dry AB	
7		1		0.0	10.0	Light reddish brown and white, sandy silt, with chert gravel/highly weathered chert, dry	AS-1	SM				
				0.0	10.0	Reddish brown, sandy silt, with chert gravel/highly	70-1	CIVI			<del>                                     </del>	
		- '		10.0	20.0	weathered chert, dry	AS-2	SM				
				<b>_</b>	<u> </u>	Bottom of Boring / Auger Refusal at 20.0 feet		<u> </u>				
				l		Boring backfilled with cuttings at completion		ļ .				
				†								
					<u> </u>		ļ				<u> </u>	
	000.44	134 ft. Left	1108.2				İ		CSK	1/19/2003	Dry AB	
MC-256	963+14	134 II. Len	1108.2		-		<del> </del>		- 0011			
				0.0	1.0	Gray, chert and limestone	AS-1					
						Data at Baring / Avenue Defined at 1 O feet					1	
				<del> </del>	-	Bottom of Boring / Auger Refusal at 1.0 foot		<u> </u>		<u> </u>		
						Boring backfilled with cuttings at completion					<u> </u>	
		<del>                                     </del>		<u> </u>								
				1			1	<u> </u>			<del>                                     </del>	
NO SEZ	963+05	7 ft. Right	1144.8						CSK	1/19/2003	Dry AB	
MC-257	303+03	/ II. Figni	1144.0	+	<del> </del>			<del>                                     </del>				
				0.0	7.0	Gray and light brown, chert gravel, with silt and sand, dry	AS-1	GP				
						Date of Date / Avenue Defined at 7.0 feet	BULK-2	(0.70 f	not)			
				<del> </del> -	+	Bottom of Boring / Auger Refusal at 7.0 feet	BULK-2	(0-7.01	Beij		<del>                                     </del>	
						Boring backfilled with cuttings at completion						
		1		1								
			<u> </u>	<del> </del>			<del> </del>	ļ			<del> </del>	
		-	<del> </del>	-	<del> </del>		1	<del>                                     </del>				*
						· ·	<u> </u>	<b></b> _	<u> </u>		++	
			1				I	1			1	

Boring					h (Ft)		T	Τ	Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-258	963+05	128 ft. Righ	nt 1158.7				1		CSK	1/19/2003	Dry AB	
						White and light reddish brown, weathered chert, with silt	<u> </u>	1	001	1713/2000	DIY AU	<del> </del>
			<del></del>	0.0	6.0	seams, dry Light reddish brown and gray, chert gravel, scattered silt,	AS-1	GP-GM				
				6.0	14.0	dry	AS-2	GP				
				14.0	21.5	Reddish brown, sandy gravel, with silt, moist	AS-3	GP-GM				
						Bottom of Boring / Auger Refusal at 21.5 feet						
			ļ			Boring backfilled with cuttings at completion						
					-							
MS-259	963+89	193 ft. Left	1075.1		<u> </u>	See Roadway Structure Boring Logs						
											-	
MS-260	964+72	3 ft. Righ	t 1070.1			See Roadway Structure Boring Logs		-				
MS-261	965+57	258 ft. Righ	1 1058.5			See Roadway Structure Boring Logs						
						, seems seeming and				-		
MC-262	967+08	120ft. Left	1166.1						CSK	1/21/2003	Dry AB	
				0.0	10.0	Reddish-brown and white, sandy chert gravel, with fat clay seams, dry to moist	AS-1	GP				
	. <u>-</u>			10.0	20.0	Light reddish-brown and white, sandy chert gravel with silt, dry	AS-2	GP				
				20.0	29.5	Light reddish-brown and white, sandy chert gravel, with sit, dry						No cuttings returned
		-,				Bottom of Boring / Auger Refusal at 29.5 feet						
						Backfilled with cuttings at completion						
AC-263	967+08	Centerline	1155.6									
,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	301700	Centerinie	1133.0	0.0	10.0	Light reddish-brown, silty sand, with chert gravel, dry	AC 4	C.L.	CSK	1/21/2003	Dry AB	
				10.0		Reddish-brown, silty sand, with chert gravel, dry	AS-1 AS-2	SM SM				
				15.0		Reddish-brown, sandy lean clay, with chert gravel, moist	AS-3	CL				
						Bottom of Boring at 19.0 feet	BULK-4					
						Backfilled with cuttings at completion						

Boring					h (Ft)	Law of Materials	Samples	USCS	Logged By:	Date	GW Depth	Comments
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	0303	Бy.	Date	Deptit	Conments
1C-264	967+08	120ft. Right	1138.9						CSK	1/21/2003	Dry AB	
				0.0	3.5	Light brown, silty chert gravel, dry		GM	ļ <del>  </del>		-	
				3.5	10.0	Light reddish-brown, silty sand, with chert gravel, dry	AS-1	GM				
				10.0	20.0	White and light reddish-brown, chert gravel, with silt, dry	AS-2	GP-GM				
			<del></del>	20.0		White and light reddish-brown, chert gravel, with silt, dry	AS-3	GP-GM				
						Bottom of Boring at 30.0 feet					Ī	
						Bollom of Burning at 30.0 feet						
						Backfilled with cuttings 1/21/03						
								<u> </u>				
MC-265	969+08	120 ft. Left	1194.6						CSK	1/21/2003	Dry AB	Dry 8 days AB
no-203						Light reddish-brown and white, silty sand/highly weathered					5	D- : 0.4 has 4.5
				0.0	10.0	chert, with chert gravel, dry	AS-1	SM	SPB	1/29/2003	Dry AB	Dry 24 hrs AB
				100		Light reddish-brown and white, silty sand/highly weathered	AS-2	SM			ļ	
				10.0	20.0	chert, with chert gravel, dry Light reddish-brown and white, silty sand, with chert	A0-2	OIVI				<u> </u>
				20.0	30.0	gravel, less weathered, dry	AS-3	SM				
											İ	
				30.0	40.0	White and brown, chert gravel, scattered silt, dry	AS-4	GP			ļ	no cuttings returned -
						14this and become about ground posttored city day						forced into walls
			ļ	40.0	55.0	White and brown, chert gravel, scattered silt, dry No cuttings returned to surface, forced into side walls,						10,000 11110 111110
				55.0	66.0	chert laver from 56 to 57 feet	AS-12					
			<del></del>	33.0	30.0	onor layor from oo to or too		<b>†</b>				
						chert seam from 62.5 to 63.5 feet		<u> </u>				
	_	<u> </u>				Broken chert with clay seams, difficult drilling, augers						
				66.0	71.5	skipping						
						Bottom of Boring / Auger Refusal at 71.5 feet	ļ					
	·					Boring backfilled with cuttings at completion						
	<del></del>		<del></del>			Bornig backing with cuttings at completion	1					
											<u> </u>	
MC-266	969+08	Centerline	1183.4	1		113-based disk because all to another short special blocks.		<u> </u>	CSK	1/21/2003	Dry AB	
					100	Light reddish-brown, silty sand, with chert gravel/highly weathered chert, with clay seams, dry to moist	AS-1	SM				
		<u> </u>	ļ <u> </u>	0.0	10.0	Light reddish-brown, silty sand, with chert gravel/highly	70-1	- OIN			<del>                                     </del>	
			1	10.0	20.0	weathered chert, with clay seams, dry to moist	AS-2	SM			ļ	
	,, <u>,</u> ,,			20.0	24.0	Reddish-brown, clayey gravel, with sand, moist	AS-3	GC				
					1	Bottom of Boring / Auger Refusal at 24.0 feet	BULK-4	(0 to 24	feet)			
		<del>                                     </del>		<del>                                     </del>	<u> </u>			1				
		I	<u></u>	1	<u> </u>	Backfilled with cuttings at completion	<u> </u>	Ь		l	1	<u> </u>

Boring	<b>-</b>				th (Ft)		T	Γ	Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
AC-267	969+08	120ft. Right	1167.7						CSK	1/21/2003	Dry AB	
,				0.0	40.0		İ			172 172003	DIY AD	· · · · · · · · · · · · · · · · · · ·
	-			0.0	10.0	Light reddish-brown, silty sand, with chert gravel, dry	AS-1	SM				
				10.0	20.0	Reddish-brown, silty gravelly sand, dry	AS-2	SM	ĺĺ			
				20.0	20.0	Heddish-brown, sandy lean clay, scattered chert gravel,						
				20.0	30.0	moist Reddish-brown, sandy lean clay, scattered chert gravel,	AS-3	CL				
	<del></del>			30.0	40.0	moist	AS-4	CL	1			
				40.0	50.0	Reddish-brown, sandy lean to fat clay, scattered sand, moist						<del></del>
				40.0	50.0	Reddish-brown, sandy lean to fat clay, scattered sand,	AS-5	CL/CH				
				50.0	55.0	moist	AS-6	сг/сн				
		-				Bottom of Boring at 55.0 feet						····
							<del>  </del>		-		-	
						Backfilled with cuttings at completion						
		10000							,			
MC-268	971+08	120 ft. Left	1198.5						CSK	1/00/0000		
						Light reddish brown, silty sand, scattered chert			CSK	1/20/2003	<del> </del>	<del></del> -
				0.0	10.0	gravel/highly weathered chert, dry Light reddish brown, silty sand, scattered chert	AS-1	SM			Dry AB	
		1		10.0	20.0	gravel/highly weathered chert, dry	AS-2	SM				
						Light reddish brown, silty sand, scattered chert	7.0-2	SIVI	-		<del> </del> -	
				20.0	27.0	gravel/highly weathered chert, dry	AS-3	SM				
						Bottom of Boring / Auger Refusal at 27.0 feet						
						Boring backfilled with cuttings at completion						
IC-269	074.04	0.6										4
NC-209	971+04	2 ft. Left	1156.3						CSK	1/20/2003		
				0.0	10.0	Light brown and white, chert gravel, scattered silt, dry	AS-1	GP			Dry AB	
				10.0	14.5	Light brown and white, chert gravel, scattered silt, dry	AS-2	GP				
							A3-2	GF				······································
						Bottom of Boring / Auger Refusal at 14.5 feet						
						Boring backfilled with cuttings at completion						
}	f					,						
<u> </u>							<del>                                     </del>	-	_			
-+												
					ĺ							
					,			_	- +		<del>                                     </del>	

Boring				Dept	ı (Ft)				Logged		GW	
No.	Station	Offset	Elevation	From	Τo	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
40.070	074 - 04	117 ft. Right	1143.6						CSK	1/20/2003		
MC-270	971+01	117 it. Algrit	1143.0							1720.200		····
				0.0	10.0	Light reddish brown, silty chert gravel, dry	AS-1	GM			Dry AB	
				100	42.0	Hard chert layer			İ			
				10.0	13.0	naro chen layer						
				13.0	20.0	Reddish brown, silty sand, with chert gravel, dry to moist	AS-2	SM		·		
				00.0	00.0	Desidiah henre alayay and with about gravel majet	AS-3	sc				
				20.0	30.0	Reddish brown, clayey sand, with chert gravel, moist Reddish brown, chert gravel, with clay and clay seams,	A0-0	30				
				30.0	35.0	moist	AS-4	GP-GC				
						Detter of Desire / Assess Defined at CE O feet						
						Bottom of Boring / Auger Refusal at 35.0 feet						
- 1						Boring backfilled with cuttings at completion						
		***										
						100				,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		
MC-271	973+08	120 ft. Left	1205.0			See Roadway Core Boring Logs			BRO	8/20/2003	Dry AB	Dry 24 hr AB
				-		1-11		<u> </u>			-	
MC-272	973+08	Centerline	1188.8						CSK	1/20/2003		
						Light reddish brown, silty sand, with chert gravel/highly	404	SM			Dry AB	
				0.0	10.0	weathered chert, dry White, silty sand, with chert gravel/highly weathered chert,	AS-1	SM			DIY AD	
				10.0	13.5	dry	AS-2	SM				
							DITIES	/0.10 E	£==\$\			
						Bottom of Boring / Auger Refusal at 13.5 feet	BULK-3	(0-13.5	ieet)		1	
		1				Boring backfilled with cuttings at completion						
		<u> </u>							[			·
				ļ				<del>  -</del> -	5		+	
MC-273	973+06	120 ft. Right	1177.6						CSK	1/20/2003	<u> </u>	
2.0	3, 5.50	1				Reddish brown, sandy lean to fat clay, with chert gravel.	40.	Q1 (Q1)			Dn: AD	
		<u> </u>		0.0	4.0	moist White, silty sand, with chert gravel/highly weathered chert,	AS-1	CL/CH	<del> </del>		Dry AB	
i				4.0	10.0	ldrv	AS-2		_			
- , :-	-					Light reddish brown, silty sand, with chert gravel/highly	1.5.5					
				10.0	13.5	weathered chert, dry	AS-3	_			<del> </del>	
					ļ	Bottom of Boring / Auger Refusal at 13.5 feet					1	
			<del>                                     </del>	1								
		ļ		1		Boring backfilled with cuttings at completion	<del>  -</del> -	<u> </u>	ļ.——		-	
									1			
		<del>                                     </del>	<del>                                     </del>		T							
		<u> </u>					1	<del> </del>	<del>                                     </del>		+	
			]		1							

Boring No.	Station	Offset	Elouation		h (Ft)			1	Logged		GW	
110.	Otation	Oliset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-274	975+08	120 ft. Left	1180.1				ļ		CSK	1/20/2003		
				0.0	10.0	Light reddish brown, silty sand, with chert gravel/highly weathered chert, dry		1				
		<del> </del>		0.0	10.0	weathered chert, dry	AS-1	SM	ļ		ļ	
	<del></del>					Bottom of Boring / Auger Refusal at 10.0 feet						
	•					Boring backfilled with cuttings at completion				<del></del>	ļ	
MC-275	975+08	Centerline	1154.5		_				0014			
	_			-			<del></del> -		CSK	1/20/2003		
	·			0.0	10.0	Reddish brown and white, silty chert gravel, dry	AS-1	GM			Dry AB	
				10.0	17.5	Light reddish brown, sandy silt, with chert gravel, dry	AS-2	SM				
						Bottom of Boring / Auger Refusal at 17.5 feet						
	· · · · · · · · · · · · · · · · · · ·					Boring backfilled with cuttings at completion						
MC-276	<del></del>						,					
	974+99	116 ft. Right	1146.2						CSK	1/20/2003		
		<u> </u>		0.0	10.0	Light reddish brown, silty sand, scattered chert gravel, dry Light reddish brown, silty sand, scattered chert gravel, with	AS-1	SM			Dry AB	
				10.0	12.0	Light reddish brown, silty sand, scattered chert gravel, with clay seams, dry	AS-2	SM		·		
						Bottom of Boring / Auger Refusal at 12.0 feet						
						Boring backfilled with cuttings at completion						
MC-277	977+16	118 ft. Left	1131.7	_					SPB	1/28/2003		
				0.0	10.0	Light reddish-brown, brown and white, clayey chert gravel, dry	AS-1	GC			Dr. AD	Dry 24 hrs AB
				40.0		Light reddish-brown, brown and white, clayey chert gravel,					DIY AD	DIY 24 IIIS AD
<del></del>				10.0	12.5	dry	AS-2	GC				
						Bottom of Boring / Auger Refusal at 12.5 feet	BULK-3	(0-12.5 f	eet)			
						Boring backfilled with cuttings at completion						

Boring		1		Depti	n (Ft)				Logged	· _	GW	_
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
	077.40	4 & Dialet	1100.0						SPB	1/28/2003		Dry AB
MC-278	977+16	1 ft. Right	1122.9					-	<u> </u>			
	·			0.0	5.0	Brown and light brown, chert gravel and cobbles, dry	AS-1	GP_				Dry 24 hours AB
						Brown and dark gray, chert gravel, trace sand, with chert					ļ	
				5.0	10.0	seams, dry	AS-2	GP			<u> </u>	Hard chert seam from
					15.0	Brown and dark gray, chert gravel, trace sand, dry	AS-3	GP				13.5 to 14 feet
				10.0	15.0	Reddish-brown and dark gray, fat clayey chert gravel,	70.0	<u> </u>			<del>                                     </del>	Hard chert seam from 16
}				15.0	18.0	moist	AS-4	GC			1	to 16.5 feet
				1010								
						Bottom of Boring at 18.0 feet					<b></b>	
						Boring backfilled with cuttings at completion						
								<u> </u>				
MC-279	977+15	126 ft. Right	1110.6						SPB	1/28/2003		Dry AB
						Dark gray and brown, chert gravel, with chert seams, trace			]			D 04 h 4D
				0.0	5.0	clay, dry, chert layer from 5 to 6 feet Dark gray and brown, chert gravel, with chert seams and	AS-1	GP			<u> </u>	Dry 24 hrs AB
				5.0	10.0	clay, moist	AS-2	GP-GC				
	· · · · · · · · · · · · · · · · · · ·			5.0	10.0	Dark gray and brown, chert gravel, with chert seams and	7.02	<del>0. 00</del>				
				10.0	12.0	clay, moist						
	*					Bottom of Boring / Auger Refusal at 12.0 feet						
						Boring backfilled with cuttings at completion						
								ļ				
MC-280	979+15	119 ft. Left	1173.9						SPB	1/28/2003		Dry AB
ING EGG	0,0	1,70				Light reddish-brown and white, clayey chert gravel,						5 641 45
				0.0	5.0	abundant chert seams, dry	AS-1	GC			1	Dry 24 hrs AB
<del></del> :					400	Light reddish-brown and white, clayey chert gravel, abundant chert seams, dry	AS-2	GC				!
	<del></del>			5.0	10.0	Light reddish-brown and white, clayey chert gravel,	70-2	<del>  40</del> -	-	-		
		1	İ	10.0	15.0	abundant chert seams, dry	AS-3	GC	1			
	l	+				Beige and white chert gravel, with sand and clay, with					1	
	1			15.0	20.0	chert seams, dry	AS-4	GP	ļ		<b>_</b>	Ob 1 6 05 4-07
						lattick about according	AS-5	GP		ì		Chert layer from 25 to 27 feet, few cuttings
		<del> </del>	<u> </u>	20.0	25.0	White, chert gravel, dry Light brown and white, chert gravel, abundant chert layers	NO-2	l Gr	<del>                                     </del>	-	1	returning to surface
				25.0	30.0		AS-6	GP .				retaining to sandoe
				30.0	T	Light brown and white, chert gravel, dry		GP				
<u> </u>			<u> </u>	1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		Bottom of Boring / Auger Refusal at 31.5 feet						
		1				Boring backfilled with cuttings at completion						
<u> </u>	1	+	<u> </u>	<del>                                     </del>	†							
			<u> </u>	<u></u>	<u> </u>		<u> </u>		<u> </u>	1		

Boring No.	Station	04	<b>-</b> 1		th (Ft)				Logged		GW	<u> </u>
140.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
MC-281	979+02	1 ft. Right	1151.4					ļ	SPB	1/28/2003		Dry AB
								<u> </u>	0, 0	1720/2000		DIY AD
				0.0	5.0	Reddish-brown, cherty lean clay, trace chert seams, dry Light reddish-brown and white, clayey chert gravel,	AS-1	CL				Dry 24 hrs AB
į				5.0	10.0	abundant chert seams, dry	AS-2	GC				(Abundant chert seam
_						Light reddish-brown and white, chert gravel, with sand and	A3-2	GC		<del></del>		(4-8" thick)
				10.0	15.0	clay, dry	AS-3	GP-GC				ļ
				15.0	20.0	Light reddish-brown and white chert gravel, with sand and clay, dry					1	
				13.0	20.0	Reddish-brown and white, fat clayey chert gravel, with	AS-4	GP-GC				
				20.0	25.0	chert seams, dry to moist	AS-5	GC				
				_		Reddish-brown and white and gray fat clayey chert gravel.	710 0	40		· · · · · · · · · · · · · · · · · · ·	<del>                                     </del>	
				25.0	30.0	with chert seams, moist	AS-6	GÇ			1	}
				30.0	35.0	Reddish-brown and white, chert gravel, with sand and clay, moist	40.7	00.00				
				33.0	55.0	Reddish-brown and white, chert gravel, with sand and clay,	AS-7	GP-GC			ļ	
				35.0	40.0	moist	AS-8	GP-GC				
		·		40.0	40.5	Brown and gray, chert gravel with sand and clay, with chert					<u> </u>	
				40.0	46.5	seams, moist	AS-9	GP-GC				·
						Bottom of boring / Auger refusal at 46.5 feet						
						Boring backfilled with cuttings at completion	,					
MC-282	979+13	120 ft. Right	1131.6						SPB	1/28/2003		Dry AB
						Reddish-brown and brown, lean clay, with chert gravel and			<u> </u>	1/20/2000		Oly AD
				0.0	5.0	sand, dry Light reddish-brown and white, clayey chert gravel, with	AS-1	CL				Dry 24 hours AB
		1		5.0	10.0	sand, dry	AS-2	GC				Chert layers from 6 to
						Light reddish-brown and white, clayey chert gravel, with	A0-2	GC		·		feet and 8 to 9 feet
				10.0	15.0	sand, dry	AS-3	GC				1-ft thick chert layer
				45.0	00.0	Reddish-brown, white and gray, chert gravel, with sand						
				15.0	20.0	and clay, trace chert seams Reddish-brown, white and gray, chert gravet, with sand	AS-4	GP-GC				
				20.0		and clay, trace chert seams	AS-5	GP-GC				
						Bottom of Boring / Auger Refusal at 25.5 feet						
						Boring backfilled with cuttings at completion						
						2						
AC-283	981+08	120 ft. Left	1182.0			0 0 0 0 0						
10 200	301700	IZVII. LEIL	1183.0			See Roadway Core Boring Logs		_ +	-			
												·
								ļ	Ì			

Boring		· · · · · · · · · · · · · · · · · · ·		Depti	n (Ft)			[	Logged		GW	
No.	Station	Offset	Elevation	From	То	Log of Materials	Samples	USCS	Ву:	Date	Depth	Comments
							i		SPB	1/28/2003		Dry AB
MC-284	981+05	6 ft. Left	1155.7	-	<del></del>				SEB	1/20/2003	<del>                                     </del>	DIY AD
Ì				0.0	2.0	Brown, lean clay, with chert gravel and cobbles, dry		CL				Dry 24 hrs AB
						Reddish-brown and white, lean clay, with sand, trace chert						
				2.0	5.0	gravel, with chert seams, dry Light reddish-brown and white, cherty lean clay, with chert	AS-1	CL			<b>_</b>	
				ایرا	40.0	seams, dry	AS-2	CL				
				5.0	10.0	seams, dry	70-2	- OL			<del>                                     </del>	,
	·			10.0	13.0	Light reddish-brown and white, cherty lean clay, dry	AS-3	CL				
		***		13.0	20.0	Brown and white, clayey chert gravel, dry	AS-4	GC			<del> </del>	
				20.0	25.0	Reddish-brown and white, cherty fat clay, moist	AS-5	СН				
				20.0	25.0	riedusit brown and write, onorty rat only, moot	1.00					pushed tube 20",
ļ				25.0	27.0	Reddish-brown and white, cherty fat clay, moist Reddish-brown and white, fat clay, with sand and chert	ST-6	СН			<u> </u>	recovered 22"
		-		1			40.7					ngs recovered, possibly around augers
				25.0	40.0	gravel, trace chert seams, moist Reddish-brown and white, fat clay, with sand and chert	AS-7	CH		.,	packing	cuttings returned below
				40.0	51.0	gravel, trace chert seams, moist	AS-8	СН				40 feet
				40.0	31.0	graver, trade direct dearns, mouse	1	<u> </u>		•		
						Bottom of Boring at 51.0 feet	BULK-9	(20 to 5	1 feet)		ऻ	
				<del> </del>	<u></u>	Boring backfilled with cuttings at completion		<del> </del>			<del>                                     </del>	
						•						
				1.						1 100 1000	0	Dry 24 hrs AB
MC-285	981+07	111 ft. Right	1118.7	—					SPB	1/28/2003	Dry Ab	DIY 24 IIIS AD
		]		0.0	5.0	Brown and gray, lean clay, with sand and chert gravel, dry	AS-1	CL				
			<del> </del>	1-0.0	0.0	Reddish-brown and white, lean clay, with sand and chert						
		1		5.0	10.0	gravel, trace chert seams, dry	AS-2	CŁ				
						Reddish-brown, white and gray, lean clay, with sand and						Chert layer from 10 to 1
				10.0	14.0	chert gravel, dry	AS-3	CL	ļ		<del> </del>	feet
				1.		Bottom of Boring at 14.0 feet						
				<del> </del>	<del> </del>	Bottom of Borning at 14.0 (60)	-					
				L	1	Boring backfilled with cuttings at completion						
		<del>                                     </del>	<u> </u>	<del> </del>	<b></b>		<del>                                     </del>	<del>                                     </del>	<del>                                     </del>		+	
					1		1					
		<del>                                     </del>	<del> </del>	1	<del> </del>				1	-		·
	1				<u> </u>		<u> </u>	<u> </u>	1			
									1			
<u> </u>		<del>                                     </del>	<del></del>	+-	<del> </del>		<del> </del>	<del> </del>			<del>                                     </del>	
											<u> </u>	
· · · · · · · · · · · · · · · · · · ·	1	<del>                                     </del>	<u> </u>		1						1	
				<del> </del>	<u> </u>		+		-		<del> </del>	
	1	1										
	L	J	<u> </u>	_1		<u> </u>	<del></del>	<u> — — </u>	<del></del> -	l		<u> </u>

Boring				Dept	th (Ft)		<u> </u>	1	Logged		GW	T
No.	Station	Offset	Elevation	From	To	Log of Materials	Samples	USCS	By:	Date	Depth	Comments
MC-286	983+14	119 ft. Left	1141.8									
		7.10 11. 2011	1141.0					ļi	SPB	1/29/2003	Dry AB	Dry 24 hrs AB
				0.0	2.0	Light brown and white, clayey chert gravel, moist	AS-1	GC	İ			
			}						1	<del></del>	† <del></del>	
		<del>                                       </del>	-	2.0	5.0	Reddish-brown and white, fat clay, with chert gravel, moist Reddish-brown and white, chert fat clay, trace chert layers,	AS-2	CH		· · · · · · · · · · · · · · · · · · ·		
				5.0	10.0	ldrv	AS-3	СН			ŀ	
						Reddish-brown and white, chert fat clay, trace chert layers,	- 7.0 0				·	
				10.0	15.0	dry Reddish-brown and white, chert fat clay, trace chert layers,	AS-4	СН				
		}		15.0	20.0	dry	AS-5	СН	,			-
						Reddish-brown and white, fat clay, with sand and chert	A3-3	Cf			<del> </del>	Chert layer from 20.0 to
				20.0	25.0	gravel, with chert seams, moist	AS-6	СН				21.5 feet
				25.0	30.0	Reddish-brown and white, fat clay, with chert gravel and sand, abundant chert layers, moist						
			``	20.0	30.0	Reddish-brown, white and gray, clayey chert gravel, with	AS-7	СН			<u> </u>	
		<u> </u>		30.0	37.0	chert seams, moist	AS-8	GC	ļ		-	
		~				D-H	:				<del>  -</del>	
						Bottom of Boring at 37.0 feet						
						Boring backfilled with cuttings at completion		l				
ľ							,		<del></del> -			<u></u>
							·					
MC-287	983+04	7 ft. Left	1118.4	ł					SPB	1/27/2003	Do. AB	Dry 24 hrs AB
1				. "		Brown, light reddish-brown and white, chert cobbles and			3, 5	1/2//2003	DIY AB	DIY 24 HIS AD
				0.0	5.0	gravel, with clay and sand, dry	AS-1	GP-GC				
ļ				5.0	10.0	Reddish-brown, white and gray, clayey chert gravel, dry	AS-2	GC				Gray chert layer from 5
							A0-2	GC				to 6.5 feet
				10.0	14.0	Reddish-brown, white and gray, clayey chert gravel, dry	AS-3	GC				
		<u> </u>				Bottom of Boring at 14.0 feet		Î				
		-			_	Bottom of Bolling at 14.0 leet						
						Boring backfilled with cuttings at completion						
			<del></del>									
MS-288	987+29	300 ft. Left	1040.3	1		See Roadway Structure Boring Logs						
						, y g-						<del></del>
			·									
MS-289	986+60	Centerline	1041.9			See Roadway Structure Boring Logs	İ					
MS-290	986+00	300 ft. Right	1038.0			See Roadway Structure Boring Logs						
		rugiit	. 000.0	<del></del> -		dee noddway Structure Boring Logs						

9.3 Roadway Core Boring Logs Boring Log Geologic Log Core Photograph

# **Geologic Log Legend**

CT-Chert LS-Limestone SH-Shale Solid lines represent joints and fractures Dashed lines represent intact contacts between rock types

	LOG OF BORI	NG I	10.	M	C-1					P.	age 1 of 2
CLI	ENT HNTB					ï	- h. <b>i.</b>				
SIT		PRO	JEC	Т							
	McDONALD COUNTY, MISSOURI				CAL	/PLES	I-49, N	MISSO	URI	TESTS	
	Boring Location: 731+00, 120 Feet left of centerline				SAN	IPLES	<b></b>			IESIS	
ST GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1045.6 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
Ŕ	SILTY GRAVEL		GМ		AS						
	light grayish brown, dry  GRAVEL, trace clay seams light gray and reddish brown, dry	5-	GP						į		
			GP	2	AS						
	- with clay seams below 10 feet  14.5	10—	GP	3	AS					·	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	15—		RUN 1	DB	93%	RQD 63%				
		25—		RUI 2	I DB	100%	RQD 75%				
A A A A A A A A A A A A A A A A A A A	Continued Next Page	30	-								
bet	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
W	ATER LEVEL OBSERVATIONS, ft						RING S				10-15-02
WL	□ DRY WD       □ DRY AB     □     □     □     □ DRY AB     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □     □	7	_,	7	<b>-</b>		RING C				10-16-02
WL	Y DRY WD Y DRY AB	CI	_[		-	RIG				FOREM.	<del></del>
WL					`	APP	ROVE	D C	SK	JOB#	J7P0601

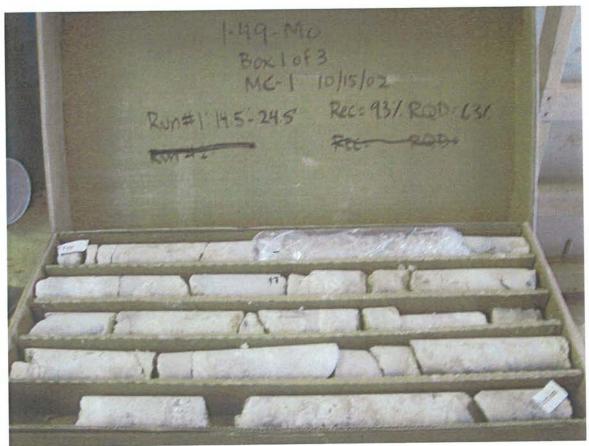
CLIENT			110	. M	<u> </u>					Р	age 2 of 2
	HNTB										
SITE	McDONALD COUNTY, MISSOURI	PRO	JEC	T			1-49, N	MSSC	URI		
	,		T	Π	SAI	<b>IPLES</b>			- CI (1	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pd	UNCONFINED STRENGTH, psf	Blow Counts for 18*
Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	35-		RUN 3	DB	100%	RQD 90%				
	BOTTOM OF BORING AT 38.5 FEET BACKFILLED WITH CUTTINGS 10/15/02 ++ Classification estimated from rock cores. Petrographic analysis may reveal other rock types.										
	ı										
water Water	fication lines represent the approximate boundary lines soil and rock types: in-situ, the transition may be gradual.  LEVEL OBSERVATIONS, ft  DRY WD DRY AB  TETT			<b>-</b>			NG ST	OMPL	ETED	OREMA	10-15-02 10-16-02

100

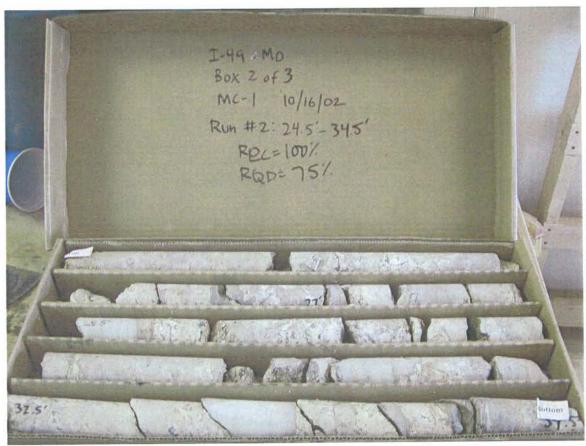
	LOG OF BOR	ING	NO	. M	C-	1				F	'age 2	of 4
CLi	IENT <b>HNTB</b>						GEOL	OGIC	LOG			şı.
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	T			i-49, N					:
	MODELLE COCKTT, MICCOCKT				SAI	MPLE		111330	OKI	TESTS		
GRAPHIC LOG	DESCRIPTION	ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ff.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
											-	,
		 										1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	OVERBURDEN  14.5 1031.1    CHERT++	- -		RUN	DB	93%	RQD					
	stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	15— —		1			63%					
	REED SPRINGS FORMATION  LS  CT	-										• • • • • • • • • • • • • • • • • • • •
	CLAY SEAM.				-							
	CT, TRLS	_										
The s	Continued Next Page	20—										
betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.											
WA.	TER LEVEL OBSERVATIONS, ft				. ⊩	<u>.</u>	NG ST					5-02
WL	Tory wo tory as Terr	30		)[	1	BORI RIG	NG CO			OREMA	N	16-02 J/N
WL	·- ·- · · · · · · · · · · · · · · · · ·					APPF	ROVED	) CS	SK JO	OB#	J7P	06Ö1

<u></u>	LOG OF BO	VIIVO	INU	. 17	10-	1				<u>F</u>	age 3	of 4
	HNTB						GEOL	OGIC	LOG			
SI	McDONALD COUNTY, MISSOURI	PRO	JEC	T								
_	IMOSOURI		1		SAI	MPLE	<b>I-49, N</b> S	VISSC	UKI	TESTS	<del></del>	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
<b>}</b>	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	-					7,11					7
	CT	-										T.
	24.5							,				
	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	25—		RUN 2	DB 1	00%	RQD 75%					
	- 1 cT		-									4
-		_										
<u> </u>	Continued Next Page	30—										
he st etwe	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.						-	-				
/AT	ER LEVEL OBSERVATIONS, ft					ORIN	IG STA	RTEC	)		10-15	-02
	Y DRY WD YDRY AB	<b></b> _	_		В		IG COI	MPLE	TED		10-16	
ΓZ	▗▗▗▗▗▗▗▗▗▗ <u>▗</u> ▗▗	- II	- 1		RI		ATV,	44.000	- 1 = -			JW

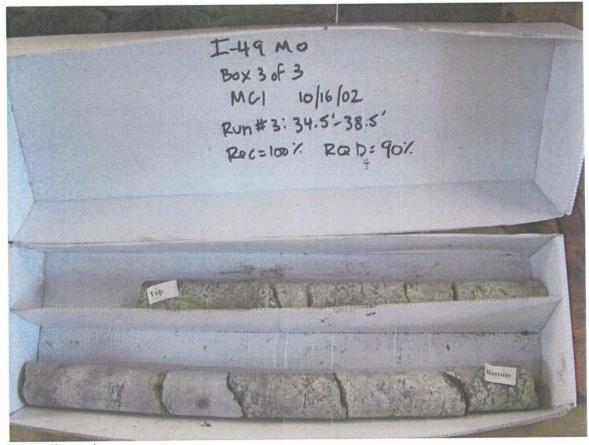
	LOG OF BOR	NG I	NO	. M	<b>C-</b> 1					<u>. P</u>	age 4	of 4
CLII	HNTB					1	GEOL	OGIC	LOG			- "
SIT	McDONALD COUNTY, MISSOURI	PRO	JEC	Т			I-49, N	MISSO	URI	-		
					SAN	<b>VPLE</b> S			1	TESTS		
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	\								-		1 1 1
	. ↓ . ↓											
7/.1	34.5 1011.1 CHERT++	_ 		RUN	DB	100%	RQD					
	stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	35		3			90%			٠		· Chry
3	1007.1. i	_				-						
The	tratification lines represent the approximate boundary lines											· .
betwe	en soil and rock types: In-situ, the transition may be gradual.							·				- ^-
	TER LEVEL OBSERVATIONS, ft  Variable DRY  ✓ DRY  ✓ DRY  ✓ DRY  ✓ DRY  ✓ AB				-		NG ST					5-02 6-02
	Y DRY WD Y DRY AB	٦r	6	1	1	RIG				OREMA		5-0 <u>2</u> JW
WL					<b>-</b> [		ROVED		SK JO		J7P(	



I 49 Missouri Missouri J7P0601 Boring MC-1 Run No. 1 14.5 Feet to 24.5 Feet



I 49 Missouri Missouri J7P0601 Boring MC-1 Run No. 2 24.5 Feet to 34.5 Feet

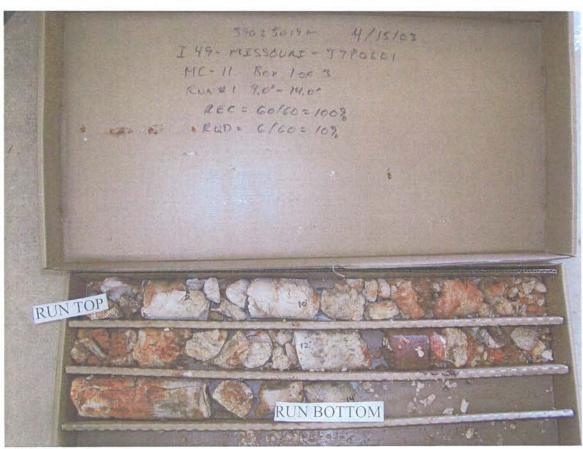


I 49 Missouri Missouri J7P0601 Boring MC-1 Run No. 3 34.5 Feet to 38.5 Feet

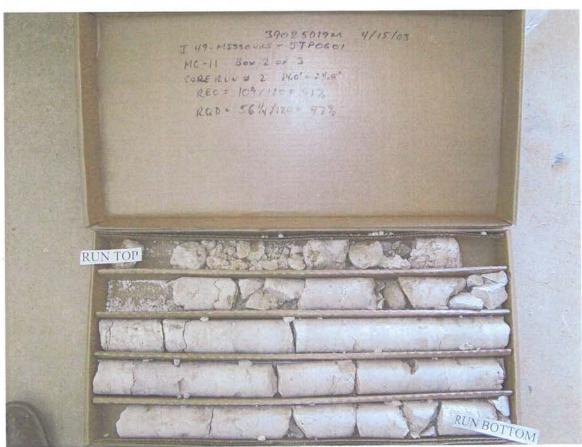


	LOG OF BORII	NG N	0.	MC	C-1	1				Pa	ige 1 of 1
CL	ENT										
SIT	HNTB	PRO	JEC	T							
40	McDONALD COUNTY, MISSOURI						I-49, N	IISSO	URI		
	Boring Location: 752+91, 38 Feet right of centerline				SAN	/PLES	3			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1089.7 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	GRAVELLY LEAN CLAY	_	CL	1	AS						
	light brown, dry to moist  3.5  LEAN CLAY, trace sand and gravel reddish brown, moist	5—	CL	2	AS		3				
	9 1080.7	=									
	CHERT++ stratified, abundant clay seams, white and reddish brown, thin bedded, very fine grained, highly weathered, medium hard to moderately hard, with vugs and cavities	10-		1			RQD 10%				
	17.5	15-		2	IDB	91%	RQD 47%				
	stratified, trace limestone seams, white and light gray, thin bedded, very fine grained, weathered, moderately hard, with vugs (decreasing with depth)	20-									
	BOTTOM OF BORING AT 29 FEET BACKFILLED WITH CUTTINGS 04/15/03 ++ Classification estimated from rock cores. Petrographic analysis may reveal	25-		RUN 3	N DB	96%	RQD 79%				
Δ Z											
be	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
W	ATER LEVEL OBSERVATIONS, ft						RING S				4-15-03
WI WI							RING C				4-15-03
WI		U		RIG ATV, #103E FOREMA							AN JW J7P0601

$\bigcap$	LOG OF BORI	NG N	10.	M	C-1	1				P	age 1 of 3	1
CL	IENT HNTB						GEOL	OGIC	LOG			1
SIT	E	PRO	JEC ⁻	Т								
_	McDONALD COUNTY, MISSOURI  Boring Location: 752+91, 38 Feet right of centerline	-			SAN	/PLES	1-49, N	IISSO	URI	TESTS		
	Boring Location. 752+91, 36 Feet right of centerline											
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
9	Approx. Surface Elev.: 1089.7 ft		Sn	ž	7	RE	SF	38	P S	N S		_
		-										- M
	NO LOG DRAWN No original	s les de	. 6									
		-	-					173				
	9 1080.7	7		RIIN	I DB	100%	RQD					
	Continued Next Page	10-		1	00	100 /	10%					
The	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.	1										*
THE RESIDENCE OF REAL PROPERTY.	TER LEVEL OBSERVATIONS, ft						ING S				4-15-0	-
WL					2		ING C				4-15-0	-
WL	ā ā IIGII	al				RIG	AT\ ROVE	/, #10		OREMA	J7P060	_
\/\/I					- 1	APP	$() \lor \vdash [$	1 5	PK 1.J(	UB #	JIPUDU	. 1

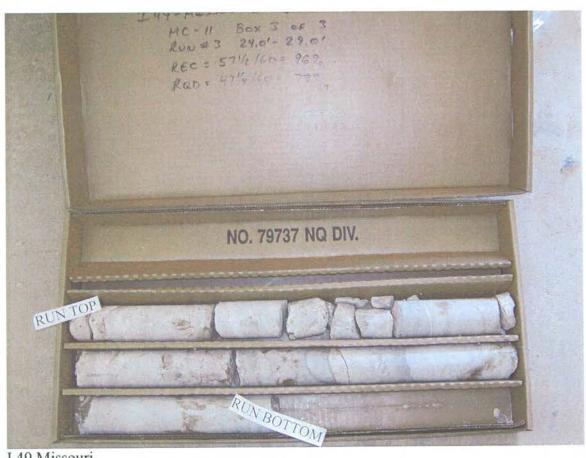


I 49 Missouri Missouri J7P0601 Boring MC-11 Run No. 1 9.0 Feet to 14.0 Feet



I 49 Missouri Missouri J7P0601 Boring MC-11 Run No. 2 14.0 Feet to 24.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-11 Run No. 3 24.0 Feet to 29.0 Feet



	LOG OF BORII	NG N	Ο.	MC	C-18	<b>B</b>				Pa	ge 1 of 3
CLI	ENT HNTB					М	easur	ad Sa	ction		
SIT		PRO.	JEC	Ŧ		141	casui	eu se	CLIOII		
011	McDONALD COUNTY, MISSOURI	1110		•							
	Boring Location: 733+00, Centerline				SAN	APLES				TESTS	
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3	DESCRIPTION	ٰ ہے ا	Æ			R.	نے	% 'E	<b>≤</b>		
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GRAPHIC LOG	Anaron Curton Flour 1004.7.5	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in	SPT - N BLOWS / ft.	WATER CONTENT,	DRY UNIT WT pd	UNCONFINED STRENGTH, psf	
U	Approx. Surface Elev.: 1001.7 ft CHERT OUTCROPS	<del></del>		-		-	-, ш	<del> </del>			
	thin beds exposed in vegetated gravel	=						!		1	
	cover	_						ŀ			
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		_	-								
	18 983.	,	1								
	18 983.1 EXPOSED BEDROCK	<u> </u>	1								
	interbedded limestone and chert with talus		1	-							
	light gray and gray, medium bedded	20-	1					1			
		=	1	1							
	Photo 10	_	1							1	
		=	1								
		:	\$	1							
		25	1								
		-	1								
	28 973.	,	‡				-	1			
	28 973. ROCK FACE	4 :	╡				1				
	interbedded limestone and chert		7				1		1		
	light gray and gray, medium to thick bedded	30-	1		1						
		:	7								
	i · · · · · · · · · · · · · · · · · · ·	-	=								
てレ	Continued Next Page		<u> </u>				<u> </u>		<u> </u>	1	<u> </u>
_	e stratification lines represent the approximate boundary lines tween soil and rock types: in-situ, the transition may be gradual.					T	2010	T 4		-	
W	ATER LEVEL OBSERVATIONS, ft						RING				·
W	¥ Total						RING	COMP			
Wi	A A INCL	ال				RIG				FOREM	AN
										JOB#	J7P06

	<del></del>		LOG	OF BORII	NG N	Ю.	M	C-1	8				P	age 2 of 3
		ENT	HNTB			_	<del></del> -		N	leasur	ed Se	ction		
S	IT	Έ	McDONALD COUNTY, MISSOURI		PRO	JEC	T			<u></u>	<del>*</del>	<u> </u>		·
						<u> </u>		SAI	MPLES	3			TESTS	
GRAPHIC LOG	0101111010		DESCRIPTION		ОЕРТН, П.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
		36	ROCK FACE interbedded limestone and chert light gray and gray, medium to thick bedded MC-18 at bottom of rock face EXPOSED BEDROCK interbedded limestone and chert with t light gray and gray, medium bedded	965.7 talus	35—									
			Photos 6, 7, 8, 9		40									
7/22/03		51.5	ROCK FACE interbedded limestone and chert light gray and gray, medium to thick bedded Photos 3, 4, 5	950.2	55									
BOREHOLE 99 5019MC16.GPJ TERRACON.GDT 772203	ne s	62.5	CHERT OUTCROPS medium to thick beds exposed in vege gravel cover  Continued Next Page eation lines represent the approximate boundar	v lines	65									
be be	two	een so	il and rock types: in-situ, the transition may be	gradual.										
8 W		ΓER I	LEVEL OBSERVATIONS, ft							NG ST				
M G		<u>Ā</u>	<u>*</u>	<b>Jerra</b>	76	6	1	۱ ا	BORI RIG	NG CC	MPLE		NDE111	
W			<u> </u>						Logge	ed	SP	B JC	OREMA OB#	N J7P0601

LOG OF BORING NO. MC-18 Page 3 of 3													
CLIENT HNTB			Measured Section										
SITE			PROJECT PROJECT										
McDONALD COUNTY, MISSOURI			SAMPLES TESTS										
GRAPHIC LOG		DESCRIPTION		ОЕРТН, А.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
		CHERT OUTCROPS medium to thick beds exposed in gravel cover	vegetated	70									
	78.5	GRAVEL STREAM BED	923.		1							<u> </u> 	
OREHOLE 99 5019MC16.GPJ TERRACON.GDT 7722/03		Photos 1 and 2 show cliff exposur MC-18 and MC-20.	ION AT										
d Th	e strati	fication lines represent the approximate b	oundary lines	<u></u> l	1	_!					1	<u> </u>	
between soil and rock types: in-situ, the transition may be gradual.							BO	BORING STARTED					
ន្ត W	WATER LEVEL OBSERVATIONS, ft WL ♀ ▼												
w d	ALY STACON RIG FOR						FOREM						
g w			<b></b>					Log	ged		SPB .	JOB#	J7P060



Photo 1: MC-18 & MC-20 Cliff Exposure MC-18 is located on the leftmost rock exposure (gray). MC-20 is located in the trees on the right side of the photo. Both locations are approximately midway up the cliff. Photo was taken facing southeast.



Photo 2: MC-18 & MC-20 Cliff Exposure 2 Similar to Photo 1 – photo taken facing generally east. MC-18 is located on leftmost exposure and MC-20 is located in treed valley on right side of photo. A stream is present at the base of the exposure.

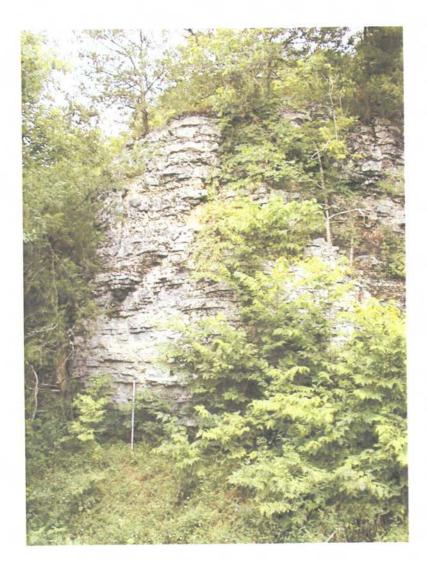


Photo 3: Basal rock outcrop Exposure of interbedded limestone and chert. Jacob staff on bottom is 5 feet long for scale. Streambed is located at lower leftmost corner of photo.

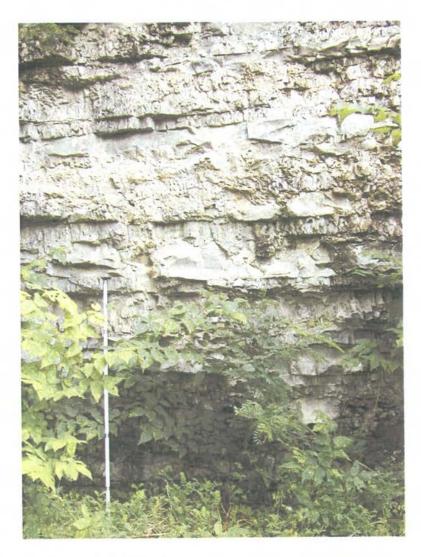


Photo 4: Lower half of basal outcrop.

Detail of lower section of basal outcropping of interbedded chert and limestone. Blocky fracture layers are limestone beds. Angular fracture layers are chert beds. Jacob staff is 5 feet long with 1-foot divisions (gray) for scale.

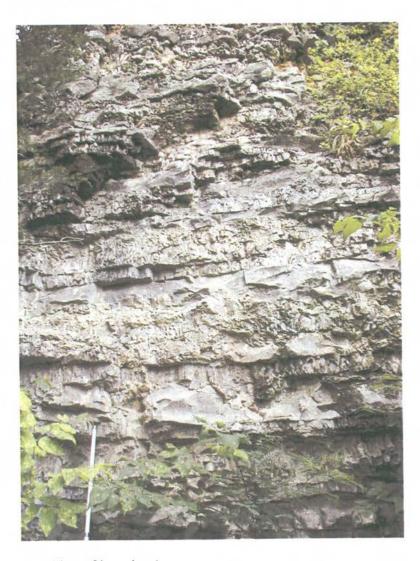


Photo 5: Upper section of basal outcrop.

Detail of upper section of basal outcropping of interbedded chert and limestone. Top of exposure not shown. Blocky fracture layers are limestone beds. Angular fracture layers are chert beds. Jacob staff is 5 feet long with 1-foot divisions (gray) for scale.

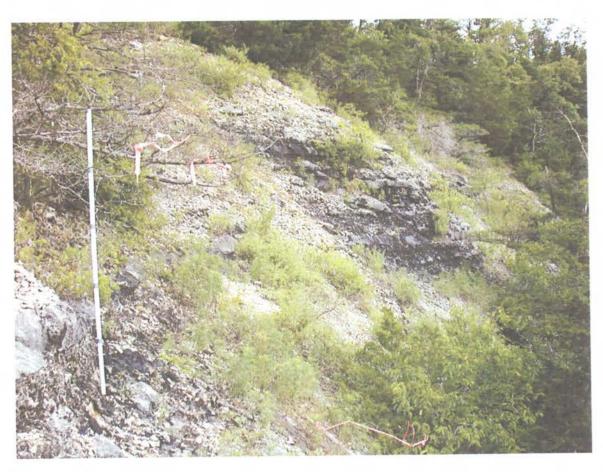


Photo 6: Outcrops near MC-18. Rock slope with outcropping limestone and chert beds looking south from MC-18. MC-18 is located in the lower center of the photo. MC-20 is located in the valley near trees shown in the upper right corner. Jacob staff is 5 feet long for scale.

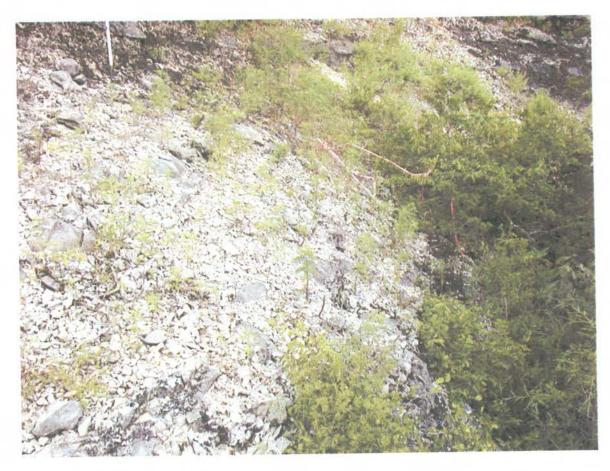


Photo 7: Rock scree and outcrops near MC-18.

MC-18 is located near the fallen stake in center of photo. Surface consists of broken limestone and chert gravel and fractured rock shelves.

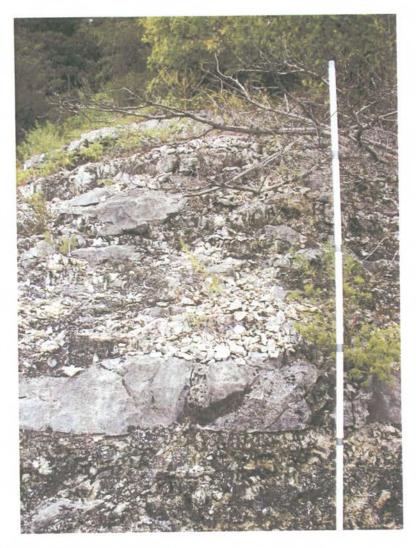


Photo 8: Detail of outcrop above MC-18. Interbedded chert and limestone outcrop. Blocky fracture layers (gray) are limestone beds. Angular fracture layers (white and also black exposure in bottom of photo) are chert beds. Jacob staff is 5 feet long with 1-foot divisions (gray) for scale.

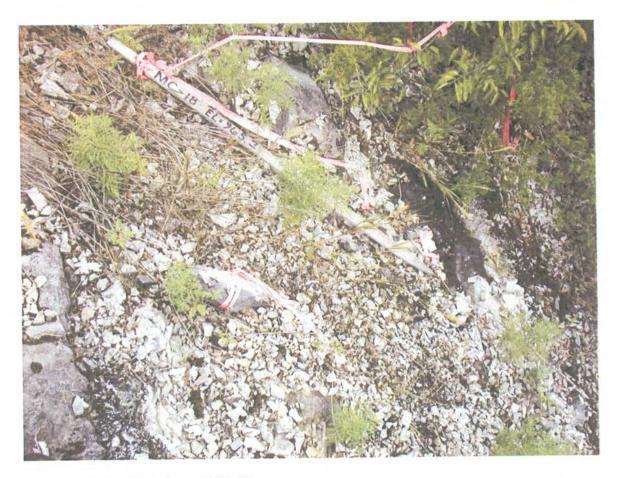


Photo 9: Staked location of MC-18. MC-18 was marked with pink paint near the end of the wood lathe. Limestone and chert layers are exposed at the surface near left and right sides of the photo.

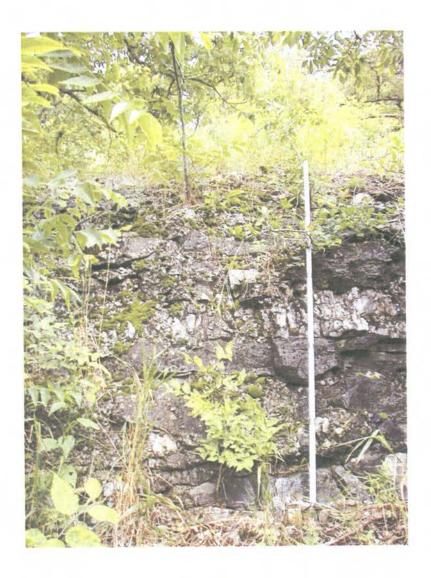


Photo 10: Rock outcrop near middle of exposure, below MC-18. Shown are interbedded chert and limestone beds. This exposure is located approximately 30 feet south of the basal outcrop shown in Photos 1 through 3. The top of this outcrop is at a similar elevation as the top of the basal outcrop. Jacob staff is 5 feet long with 1-foot divisions (gray) for scale.

$\bigcap$	LOG OF BORII	Ο.	MC	C-2	1				Pa	ige 1 of 2	
CLI	ENT <b>HNTB</b>										
SIT	E	PRO.	JEC	Τ							
	McDONALD COUNTY, MISSOURI				SAN	/PLES	1-49, N	IISSO	URI	TESTS	
	Boring Location: 737+00, 120 Feet left of centerline				34,	III LLC					
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
र्भ	Approx. Surface Elev.: 1052.5 ft SILTY GRAVEL		GM	1	AS	ш	ОУШ	>0	0 6		
	light grayish brown, dry	=		·							
	GRAVEL, with sand, with clay seams light reddish brown and light gray, dry		GP GC	2	AS						
	GRAVEL, with sand, with clay seams reddish brown and light gray, dry to moist	5 =	GP GC	3	AS						
	redustriblown and light gray, dry to moist	_								-	
000		] =	1								
		10-	GP	4	AS				ļ. <u> </u>		
			GC		73						
		-	1					i			
		=				. "					
		15—	GP		AS			_	<del> </del>	<b> </b>	-
		=	GC		İ				1		
		-	1								
		=	╡								
	21.5 ∇ 1031.	20-	=								
Δ	CHERT++	- ا			N DE	100	RQD				
Δ	and gray, thin bedded, very fine grained,		7	1			64%				
	slightly weathered to fresh, hard, solid	25-	3								
$\Delta$ $\Delta$	2		<u> </u>								
Δ Δ	7	-	4			ŀ					
$\Delta$	<u> </u>		$\exists$								
Δ Σ Δ	2	30-	$\exists$								
Θ Δ	<u>4</u>									ļ. —	1
GPJ TERRACON GDT 11/17/03	4	-	7	RU	NDE	3100	% RQE	7			
TERR	Continued Next Page				_!						
G pe	e stratification lines represent the approximate boundary lines tween soil and rock types: in-situ, the transition may be gradual.					T	-11:0			<u>.</u>	10.46.00
¥C-2	ATER LEVEL OBSERVATIONS, ft						RING S				10-16-02 10-17-02
8 W		<u>'</u>				BO RIC	RING (			FOREM	
SOREHOLE 99 MC-21							PROVE			JOB#	J7P0601
M W						AF	. INOVE		5511	700 n	J J.J.

	LOG OF BORI	NG N	10.	. M	C-2	21					Page 2 of 2
CLI	ENT HNTB			_							Page 2 of 2
SIT	E	PRC	JEC	T					·	<del></del>	
	McDONALD COUNTY, MISSOURI	-	1	]	SΔ	MPLE	-49,	VISSO	URI	TESTS	<del></del>
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	40	Blow Counts for 18*
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid  BOTTOM OF BORING AT 55.5 FEET BACKFILLED WITH CUTTINGS 10/17/02 ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.	35		RUN 3	DB	100%	46%		Δ α	200	æ
The st	ratification lines represent the approximate boundary lines en soff and rock types: in-situ, the transition may be gradual.						<u>.                                     </u>				<u> </u>
WATI	ER LEVEL OBSERVATIONS, ft				Ţ	30RII	NG ST.	ARTE	D		10-16-02
Nr Z							VG CO			·	10-16-02
NL Z	P 21.5 WD ¥ DRY AB P P P P P P P P P P P P P P P P P P	30				RIG		#103		REMAI	

CSK JOB#

J7P0601

APPROVED

Mr 🛣

WL

	LOG OF BORI	NG N	10.	M	C-2	1				P	age 3	of 6
	ENT HNTB					(	GEOL	OGIC	LOG			.;
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49, N	risso	URI			
					SAI	MPLES			ı	TESTS	1	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
	OVERBURDEN	- -		:								<b>.</b>
	21.5   CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, solid  TRLS  1031.0  1031.0  TRLS			RUN 1	DB	100%	RQD 64%					##:
	LS REED SPRINGS FORMATIONS  CT, TRLS						;	•				
<u></u>	<u>.</u>	25— —										7.
	· · · · · · · · · · · · · · · · · · ·							-				
	-	-										٠
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The s	stratification lines represent the approximate boundary lines					· · · · · · · · · · · · · · · · · · ·						
	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft				<del>-</del> -T	BORI	NG S1	ARTE	D		10-1	6-02
					ŀ		NG CC					7-02
۸L	¥ 21.5 WD ¥ DRY AB TEIT					RIG		, #10:	_	OREMA		JW
ΝL						APPF	ROVED	) CS	SK   JO	JB #	J/P	0601

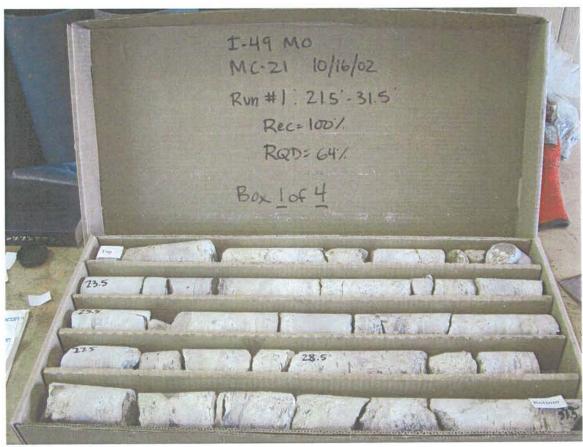
	LOG OF BORI	NG N	10.	M	C-2	1				F	age 4	of 6
	IENT HNTB						GEOL	OGIC	LOG		, <u></u>	
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	Т		•	I-49, N	VIISSC	URI			
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid  31.5  CHERT++  STATISTICS  CHERT++  CHERT++							SO	Δά			**************************************
	stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid	-		2 2	חפ	100%	46%					
		35—			,							
	CT, TRLS											
The s	Continued Next Page tratification lines represent the approximate boundary lines	40						:				- 1
betwe	en soil and rock types: in-situ, the transition may be gradual.  ER LEVEL OBSERVATIONS, ft				ĪF	ORIN	NG ST	ΔRTE:	<u> </u>		10-16	:
۷Ľ	<u> </u>	<b>-</b>			L		1G CO				10-10	
۸۲   ۲	Y 21.5 WD Y DRY AB PEFF	JC	Ų,		F	RIG	ATV, OVED	#103 CS	E FC K JO	REMAI	J7P0	JW 601

		L OBSE	RVATIONS	, π
WL	<del>▽</del> 21.5	WD	▼ DRY	AB
WL	Ā		<u>V</u>	
WL				

BORII	NG STA	RTED		10-	16-02
BORII	NG CON	/PLETE	ED	10-	17-02
RIG	ATV, 7	#103E	FOREM	AN	JW
APPR	OVED	CSK	JOB#	J7F	20601

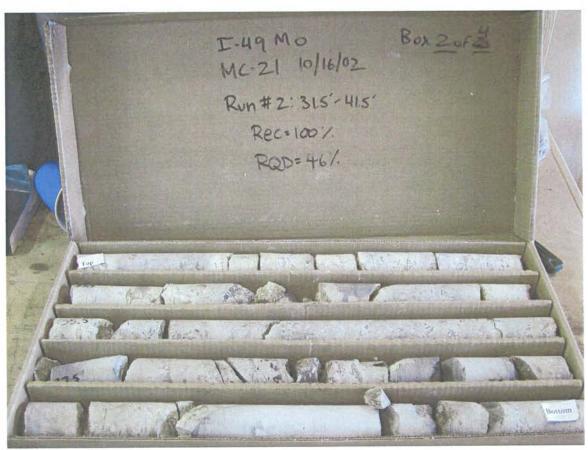
	LOG OF BORI	10.	М	C-2	1				P	age 5 of 6	
CLI	ENT HNTB					٠	GEOL	OGIC	LOG	<u> </u>	
SIT	E	PRO	JEC	Т		<del></del>					·
,	McDONALD COUNTY, MISSOURI		Π		SAM	/PLES	1-49, N	/11550	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION	оертн, п.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
7	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid  41.5  CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, and gray, thin bedded, very fine grained, solid  CT, TALLS						RQD 95%	, so	08	⊃®	· · · · · · · · · · · · · · · · · · ·
	CT, TRLS	45—									5
	Continued Next Page	JU —					· · · · ·				
betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.					<b></b>					10 10 55
	TER LEVEL OBSERVATIONS, ft  ▼ 21.5 WD ¥ DRY AB		٠		⊩		ING ST				10-16-02 10-17-02
WL Y 21.5 WD YDRY AB COCO						RIG		, #10		OREMA	
						APP	ROVE		SK J	OB#	J7P0601

	LOG OF BORI	NG I	١٥.	M	C-2	1				F	age 6 of 6
	IENT HNTB						GEOL	ogiç	LOG		
SI	McDONALD COUNTY, MISSOURI	PRO	DJEC	T			1-49, N	MISSO	URI		
					SAI	MPLE:				TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid  51.5  1001.0	-									
	cHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid			RUN 4	DВ	100%	RQD 92%				
	CT, TR LS	 -				-					
	55.5 997.0	55—-									
											· ·
	·										
he s	tratification lines represent the approximate boundary lines			<u>!</u>							··
	een soil and rock types: in-situ, the transition may be gradual.  ER LEVEL OBSERVATIONS, ft					OPIN	IC CT	4 D.T.C.			40.40.00
			,		-		NG STA				10-16-02 10-17-02
	¥ 21.5 WD ¥ DRY AB TEFF	30			R	IG		#103		REMAI	
/[		_				PPR	OVED		< 10		J7P0601



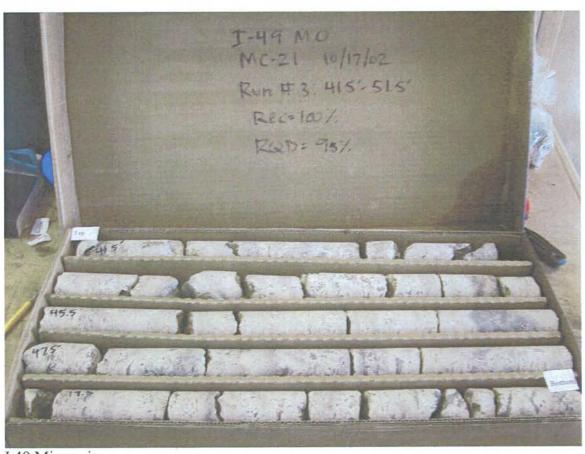
I 49 Missouri Missouri J7P0601 Boring MC-21 Run No. 1 21.5 Feet to 31.5 Feet





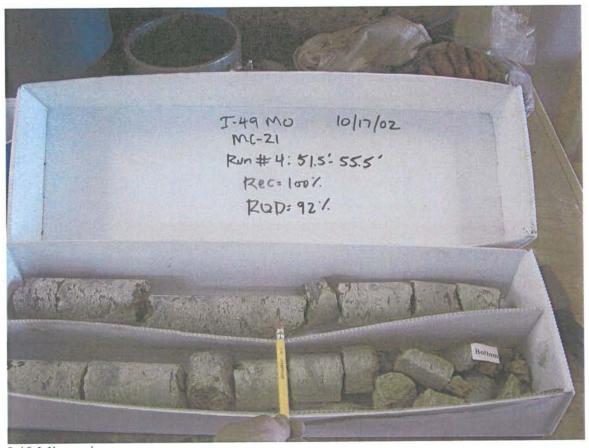
I 49 Missouri Missouri J7P0601 Boring MC-21 Run No. 2 31.5 Feet to 41.5 Feet





I 49 Missouri Missouri J7P0601 Boring MC-21 Run No. 3 41.5 Feet to 51.5 Feet





I 49 Missouri Missouri J7P0601 Boring MC-21 Run No. 4 51.5 Feet to 55.5 Feet



	LOG OF BORII	NG N	0.	MC	-28	3				Pa	age 1 of 2
CLI	ENT <b>HNTB</b>										
SIT	E	PRO	JEC	Γ							
	McDONALD COUNTY, MISSOURI				CAL	<u> </u>  PLES	-49, N	<u>IISSO</u>	URI	TESTS	
	Boring Location: 747+00, 100 Feet right of centerline				SAIV	IFLES				15013	<b>6</b> 0
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1080.5 ft	ЭЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pd	UNCONFINED STRENGTH, psf	Blow Counts for 18"
نڭرة	GRAVEL AND COBBLES, with sand and		GP	1	AS		<u> </u>				
	clay  dark brown and white, dry  GRAVEL, with clay, with chert seams		GP	2	AS						
600	white and light reddish brown, dry	_									
	5 1075.5 CLAYEY GRAVEL, scattered chert	5—	GC	3	AS				<u> </u>		
	seams white and reddish brown, moist				:						
		10-	GC	4	AS						
	13 1067.5	_	1						i		
	SANDY GRAVEL, with clay, with chert seams light brown, moist to wet	15—	GP	5	AS				-		
	20 1060.5	20	GP	6	AS						
	BROKEN CHERT, with clay seams, abundant chert seams and beds light brown and white, moist	-			٨٥						
000		=	-								
	Δ	25—	GP	7	AS						
4	CHERT++ stratified, trace limestone seams, light gray			RUN 1	DB	77%	RQD 58%				
	Singrity weathered to fresh, hard, solid	30-		RUN 2	DB	100%	RQD 59%				
X V	Continued Next Page					<u> </u>					
The	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
W.	ATER LEVEL OBSERVATIONS, ft					BOR	ING S	TART	ED		11-13-02
s WL					_	BOR	ING C	OMPI	LETE	)	11-13-02
ğ Wı		<b>a</b>			7	RIG	AT	V, #10	)3E	FOREM	AN JW
g WI					_	APP	ROVE	D S	SPB .	JOB#	J7P0601

LOG OF BORING NO. M										
CL								<del></del>		Page 2 of 2
SIT	HNTB									
511	McDONALD COUNTY, MISSOURI	PRO	JEC	T			i-49. N	/IISSOU	RI	
					SAI	MPLES			TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	pod pod UNCONFINED STRENGTH, psf	Blow Counts for 18"
4 A	34.5 - weathered and vuggy below 33.5 feet			RUN 3	DB	97%	RQD 39%			
	BOTTOM OF BORING AT 34.5 FEET BACKFILLED WITH CUTTINGS 11/13/02  ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.									
The s	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.									-
	TER LEVEL OBSERVATIONS, ft		_	·····	1	30RII	NG ST	ARTED		11-13-02
	V 07.5				-			MPLET		11-13-02
WL		30				RIG		#103E	<del></del>	
WL			-				OVED		<del></del>	J7P0601

BOREHOLE 99 MC-28.GPJ TERRACON.GDT 11/12/03

	LOG OF BORI	NG N	10.	MC	C <b>-</b> 2	8				Р	age 3	of 4
CLIE	ENT <b>HNTB</b>	:				. (	GEOL	OGIC	LOG			·
SITE	McDONALD COUNTY, MISSOURI	PRO	JEC	Τ			I-49, N	/ISSO	ı iri			
	MCDONALD COURTY, MISSOURI				SAN	<b>VPLES</b>			1014	TESTS	· · · · ·	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, In.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
											387	1966.
20000	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained,	25		RUN 1	DB	77%	RQD 58%				y.	
The s betwee WAT	slightly weathered to fresh, hard, solid  CT + LS - INTERREDDED  REED SPRINGS FORMATION  COntinued Next Page  tratification lines represent the approximate boundary lines sen soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft  Y 27.5 WD PDRY AB  Y	30			1	BOR RIG	ING STING CO	OMPL /, #10	ETED 3E F	OREMA	11-1 11-1 AN J7P0	3-02 JW

	LOG OF BOR	ING I	NO.	M	C-2	8						
С	LIENT HNTB						<b></b>				Page 4 o	<u> </u>
Si	TE	PRO	JEC	т			GEUL	OGIC L	.OG		<del></del>	
F	McDONALD COUNTY, MISSOURI	ļ	Т	<del>                                     </del>	SAI	MPLE		MISSO!	JRI	TESTS		
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, In.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		ĸ
	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid	-		RUN 2	DB	100%	RQD 59%					10
	CHERT++ stratified, trace limestone seams, light gray and gray, thin bedded, very fine grained, slightly weathered to fresh, hard, solid  - weathered and vuggy below 33.5 feet			RUN 3	DB	97%	RQD 39%					İ
	34.5 1046.0										es.	
The s	stratification lines represent the approximate boundary lines										. • • • • • • • • • • • • • • • • • • •	
DEIM	een soil and rock types: in-situ, the transition may be gradual.  FER LEVEL OBSERVATIONS, ft		_		1-					<u> </u>		
NL					_		IG STA	RTED MPLET	ED		11-13-0	
٧L	¥ 27.5 WD ¥ DRY AB P	36	0		_	IG				REMAN	)-13-13 ال	)2 W
٧L					-		OVED	SPB	<del>                                     </del>		J7P060	

BOREHOLE 99 MC-28.GPJ TERRACON.GDT 12/6/03



I 49 Missouri Missouri J7P0601 Boring MC-28 Run No. 1 27.5 Feet to 30.0 Feet Run No. 2 30.0 Feet to 32.0 Feet Run No. 3 32.0 Feet to 34.5 Feet



	LOG OF BORII	NG N	О.	M	C-64	1				Pa	ige 1 of 3
CLIE	ENT HNTB										
SITE		PRO	JEC	Τ							
	McDONALD COUNTY, MISSOURI				CAL	IPLES	I-49, N	IISSO	URI	TESTS	·
	Boring Location: 788+00, 120 Feet left of centerline				SAN	IPLES	)	"		IESIS	- <del>-</del> 60
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1117.4 ft	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pof	UNCONFINED STRENGTH, psf	Blow Counts for 18"
H	SILT, trace gravel and sand, with clay		ML	1	AS		- <del> </del>			307	
	seams light reddish brown, dry										
	5 1112.4 SANDY LEAN CLAY, with gravel	5—	CL	2	AS			<u> </u>	<del> </del>		
	reddish brown, moist  10 1107.4	10		_		•					
	SILTY GRAVEL AND SAND light reddish brown, dry	10-	GP GM	3	AS						
	ight reads in brown, any	15—	GP GM	4	AS	•					
		20-	GP GM		AS						
:41			=			ļ					
	25 1092.4  CLAYEY GRAVEL, with chert seams and beds white and reddish brown, moist	25	GC	6	AS						
		30-	GC	7	AS		<del> </del>		1		1
	i	=									
Z Z A A	Continued Next Page						ļ				
The	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
ΨA	ATER LEVEL OBSERVATIONS, ft					BOF	RING S	TART	ED		10-23-02
g WL						BOF	RING C	OMPL	ETE	)	10-25-02
betw WA WL WL				J		RIG		V, #10		FOREMA	
š WL						APP	ROVE	D S	PB	JOB#	J7P0601

	LOG OF BORI	NG N	10.	M	C-6	4			-	P	age 2 of 3
CLI	ENT <b>HNTB</b>							·			age I of o
SIT	E	PRO	JEC	Т				,			
	McDONALD COUNTY, MISSOURI			г	-	45) 5	I-49, N	/IISSO	URI		
					SA	MPLES	3	!		TESTS	- to
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	CLAYEY GRAVEL, with chert seams and		-		-	Œ.	ν _α	50		⊃∽	8
	beds white and reddish brown, moist										
	•	35	GC	8	AS						
	·	_									
		40—									
			GC	9	AS						
	43 1074.4				ļ ,						
	CHERT++ stratified, abundant limestone seams, light			RUN	DB	100%	RQD	-			
	gray and gray, thin to medium bedded.	45-		ı			43%				
	very fine to fine grained, slightly weathered to fresh, hard, solid										
		-									
Δ <b>4</b>				RUN 2	DB	85%	RQD 21%				
		50		_				!			
		-							Ì		
		_									
Δ Δ Δ Δ				RUN 3	DB	100%	RQD 25%				
		55					20 /6				
ΔΔ		=									
				·				1	ļ		
		60									
		~=									
		Ξ									
Δ 4	·	$\exists$		RUN 4	DB	99%	RQD 15%		j		
^ ^	Continued Next Page	65—									
The s	tratification lines represent the approximate boundary lines										
betwe	een soil and rock types: in-situ, the transition may be gradual.  ER LEVEL OBSERVATIONS, ft				<u> </u>	2001	NO OT	'A D.T.C			10.00.00
	V DDV WD V DDV				<u> </u>	SUKI	NG ST	AKIE	U		10-23-02

WL PDry 24 hr AB WL Dry 24 hr AB

BOREHOLE 99 MC-64.GPJ TERRACON.GDT 11/12/03

**lerracon** 

BORIN	IG STA	RTED		10-	23-02
BORIN	IG COM	IPLETE	ĒD	10-	25-02
RIG	ATV, #	#103E	FOREM	AN	JW
APPRO	OVED	SPB	JOB#	J7F	20601

	LOG OF BORII	NG N	О.	MC	C-64	4			-	Pa	age 3 of 3
CLI	ENT HNTB										
SIT		PRO	JEC	Т							
	McDONALD COUNTY, MISSOURI				SAN	/PLES	I-49, N	11550	URI	TESTS	··· /
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
40404040404040 404040404040	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid	70-		RUN 5	DB	100%	RQD 22%				
	BOTTOM OF BORING AT 75 FEET BACKFILLED WITH CUTTINGS ON 10/25/02 ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.	75									
The	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
	TER LEVEL OBSERVATIONS, ft						ING S				10-23-02
WL	Y DRY WD Y DRY AB   Y Dry 24 hr AB Y	7	-6	71	ا ر	BOR RIG	ING C				10-25-02
WL	▼ Dry 24 hr AB ▼	U	_•	ار			ROVE		PB J	OREMA	J7P0601

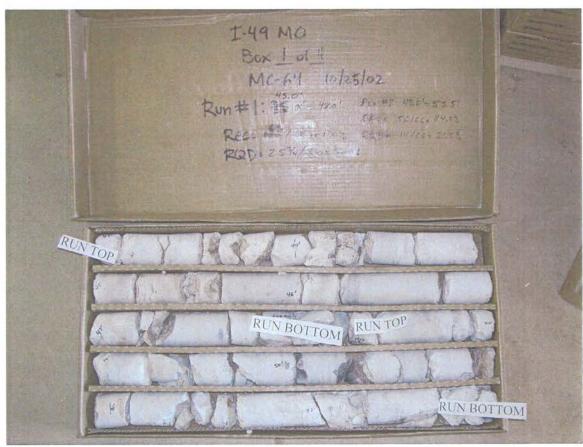
CLII	LOG OF BORI	NG N	IU.	IVI	U-0	4				F	age 5 of
	HNTB						GEOL	OGIC	LOG		
SITI	McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49, N	/ISSC	URI		
					SAI	MPLE			, O1XI	TESTS	<del></del>
GRAPHIC LOG	DESCRIPTION	ОЕРТН, ћ.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	OVERBURDEN										
#	TOT4.4  CHERT++ stratified, abundant limestone seams, light cr gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid  ST  CT  REED SPAINGS FORMATION	45		RUN 1	DB	100%	RQD 43%				
	CT  LS  CT  CT	-		-							
	STEF 1069.4  CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid  Continued Next Page	50—		RUN 2	D8	85%	RQD 21%				
The st	ratification lines represent the approximate boundary lines	<u></u>									
	en soil and rock types: in-situ, the transition may be gradual.  ER LEVEL OBSERVATIONS, ft				٦,	OP'	NG ST	ΔΡΤΓ	ח		10-23-0
							NG CC				10-23-0
	PDRY WD FDRY AB PDRY 24 hr AB F					RIG				REMA	
NL							OVED	<del> </del>		B#	J7P060

01.11	LOG OF BORI	NG N	10.	M	C-6	4				F	age 6	of 8
	ENT <b>HNTB</b>				=		GEOL	OGIC	LOG			
SITE	McDONALD COUNTY, MISSOURI	PRC	JEC	T :			1-49, N	MISSO	URI	·		-
					SA	MPLE				TESTS		
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		w.
9	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid											; ;
	27 CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid	55—		RUN 3	DB	100%	RQD 25%				1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	en og
	CT LS CT CS											
	Continued Next Page	60—										Mr. Ny
etwee	atification lines represent the approximate boundary lines n soil and rock types: in-situ, the transition may be gradual.											
	R LEVEL OBSERVATIONS, ft		•			ORI	VG ST	ARTEL	)		10-23	3-02
	DRY WD FDRY AB Dry 24 hr AB	7			B		1G CO	MPLE	TED		10-25	-02
/L 🛂	Dry 24 hr AB ¥	IJĻ	U		R	liG		#103E	FO	REMAN	1	JW
<u>-   </u>					Α	PPR	OVED	SPE	3   JOI	3#	J7P06	601

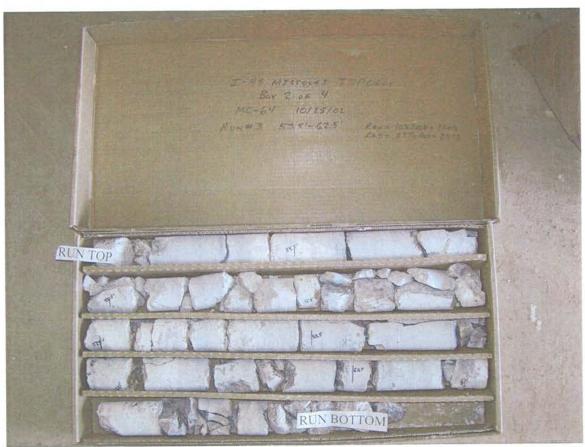
	LOG OF BORI	NG N	10.	MC	<b>C-6</b>	4				Р	age 7 of 8
CLI	ENT HNTB					1	GEOL	OGIC	LOG		
SIT		PRO	JEC	Τ			1.40.3	Heec.	ומוו		
	McDONALD COUNTY, MISSOURI	<del>                                     </del>	П		SAM	/PLES	1-49, <u>N</u>	/IISSC	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	LS CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, chert very fine to fine grained, slightly weathered to fresh, hard, solid  CT  CT W/LS - braken and recemented w/ca/c/le, same crysi-/s	-									
	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid			RUN 4	DB	99%	RQD 15%				· · ·
Σ 	CT- highly fractural	65— —									<b>रुत</b> ए
	CT  68.5  CHERT++  stratified, abundant limestone seams, light  cT gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid  CT  Continued Next Page			RUN 5	DB	100%	RQD 22%				G ₇ .
The	stratification lines represent the approximate boundary lines										
	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft				Ť	BOR	ING S	TARTI	ED		10-23-02
WL					ı		ING C				10-25-02
WL.	Y Dry 24 hr AB Y	30			1	RIG		/, #10		OREM/	
WL	I					4221	VOAE	ري ر ا	ירום∟	<b>∵</b> ⊢	OLE OOO I

•

		LOG OF BOR	ING N	10.	M	<b>C-</b> 6	4				P	age 8 of 8
	L	LIENT HNTB						GEOL	OGIC	LOG		
	L	McDONALD COUNTY, MISSOURI	PRC	JEC	Τ			1-49, N	AISSC	URI	_	
	GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
LS		CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Ls  Cr  Cr  Ls  Cr  Cr  Cr  Cr  Cr  Cr  Cr  Cr  Cr  C	-									# · · · · · · · · · · · · · · · · · · ·
GPJ TERRACON,GDT 12/5/03		1042.4 1042.4	75									
	The :	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
	WA ²	TER LEVEL OBSERVATIONS, ft				Тв	ORIN	IG STA	RTE	)		10-23-02
E 99		YDRY WD YDRY AB   YDry 24 hr AB Y    Page 16				В		IG COI		·		10-25-02
E	WL	¥ Dry 24 hr AB ¥	JL.	U			IG PPRO	ATV, OVED		F0 3 J01	REMAN 3 #	J7P0601



I 49 Missouri Missouri J7P0601 Boring MC-64 Run No. 1 43.0 Feet to 48.0 Feet Run No. 2 48.0 Feet to 53.5 Feet



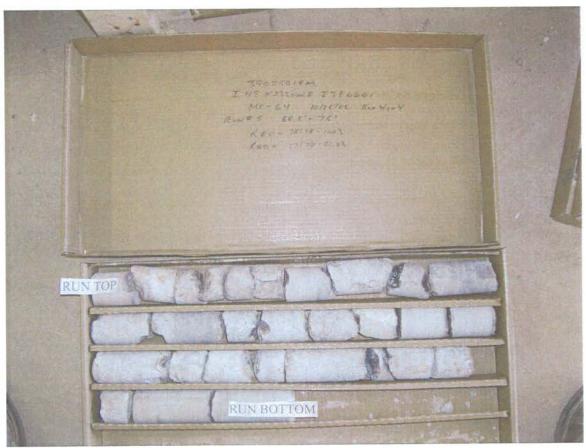
I 49 Missouri Missouri J7P0601 Boring MC-64 Run No. 3 53.5 Feet to 62.5 Feet





I 49 Missouri Missouri J7P0601 Boring MC-64 Run No. 4 62.5 Feet to 68.5 Feet





I 49 Missouri Missouri J7P0601 Boring MC-64 Run No. 5 68.5 Feet to 75.0 Feet

$\bigcap$	LOG OF BORII	NG N	Ο.	MC	<b>2-8</b> 2	2				Pa	ige 1 of 3
CLI	ENT				_						
SIT	HNTB E	PRO	JEC ⁻	Τ							
	McDONALD COUNTY, MISSOURI				041		I-49, N	iisso	URI	TESTS	
	Boring Location: 804+00, Centerline				SAN	/PLES	•		T	15313	*o
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1107.6 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pof	UNCONFINED STRENGTH, psf	Blow Counts for 18"
,0°	SANDY GRAVEL, trace clay	_	GP	1	AS						
	light brown to reddish brown, dry  3 1104.6  GRAVELLY FAT CLAY, with sand light brown to reddish brown, moist	5—	СН	2	AS						
	7 1100.6	_									
	FAT CLAY, with gravel, trace sand reddish brown, moist	10—									
			СН	3	AS	:					
		15-	СН	4	AS						
		-									
		20-	СН	5	AS						
		-	1								
		25-	СН	6	AS						- - -
			=								
		30-	- CH	1 7	AS	<u> </u>	<del> </del>	-	-	<del> </del>	-
				'				:			
7. F. F. F. F. F. F. F. F. F. F. F. F. F.	Continued Next Page	<u> </u>	1	<u> </u>			1		1		
ල් bet	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.					T	2010 0	\T A ==	-		10-17-02
∯ W	ATER LEVEL OBSERVATIONS, ft						RING S			<u> </u>	10-17-02
S WI	P DRY WD Y DRY AB	7			П		RING C			FOREM	
S WI	"						PROVE			JOB#	J7P0601

C: :-	LOG OF B	ORI	NG N	10.	M	C-8	2				F	age 2 of 3
CLIE	HNTB										-	
SITE	McDONALD COUNTY, MISSOURI	·	PRO	JEC	Т	•						
	MODORALD COUNTY, MICSOCKI		<del> </del>	Γ_		SA	MPLE		MISSO	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION		ОЕРТН, А.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	GRAVELLY FAT CLAY, with sand	1074.6	=									
	light brown, moist		35	СН	8	AS						
1/2 3		1070.2										
	LIMESTONE++ stratified, with chert seams and inclusions, gray, thin to medium bedded, fine grained, slightly weathered, hard, solid		40		1		95%	13%				
	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		7		RUN 2	DB	97%	RQD 80%				
			45—		DIIN	DR	100%	RQD				
					3		100 /	77%				
			50			DB	92%	RQD				
					4			63%				
		٠	55		RUN 5	DB	100%	RQD 82%				
			60—		DUN	DD.	1000/	Don				
62	21	045.6			6	שט	100%	RQD 75%				
<u></u>	,		$\exists$		i	,	Ì					
	Continued Next Page		65									
The st	ratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.								•		<u>-</u>	
	ER LEVEL OBSERVATIONS, ft						BORI	NG ST	ARTE	n		10-17-02
								NG CC			<u></u>	10-17-02
WL 7		r	30					CME-7			DREMA	
WL		_ `				<b>-</b>		OVED			)B #	J7P0601

	LOG OF BOR	NG N	Ю.	MC	<b>C-8</b>	2				Pa	age 3 of 3
CLI	ENT <b>HNTB</b>										<u> </u>
SIT	É	PRO	JEC	τ							
	McDONALD COUNTY, MISSOURI	<u> </u>	l		SAN	/PLES	I-49, N	IISSO	URI	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	76	Blow Counts for 18"
	LIMESTONE++ stratified, abundant chert seams and inclusions, gray and dark gray, medium bedded, fine grained, slightly weathered, hard to very hard, solid	=		RUN 7		100%	RQD 87%				
		70		RUN 8	DB	95%	RQD 73%				
	78.6 1029.0	75—		RUN 9	DB	100%	RQD 81%				
	BOTTOM OF BORING AT 78.6 FEET BACKFILLED WITH CUTTINGS 10/17/02  ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.										
The	stratification lines represent the approximate boundary lines										
betv	ween soil and rock types: in-situ, the transition may be gradual.					BOR	ING S	TARTE	ED.		10-17-02
WL					_		ING C			<u> </u>	10-17-02
WL	Y DRY WD Y DRY AB	<b>a</b>		Jľ	1	RIG	CME-	75, #2	19 F	OREMA	N DB
WL						APP	ROVE	์ כ	DP J	JOB#	J7P0601

SO MC 82 GB TERBACON

$\bigcap$	LOG OF BORI	NG N	10.	M	C-8	2			•		age 4 of 8
CL	IENT HNTB						GEOL	OGIC	LOG	<u>r</u>	age + UI o
SIT	E	PRO	JEC	T		<del></del>					
	McDONALD COUNTY, MISSOURI	<u> </u>		_	SA	MPLE		VISSO	DURI	TESTS	<del></del>
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	÷
	No Log No original sket										
	37.4 1070.2 LIMESTONE++ stratified, with chert seams and inclusions, gray, thin to medium bedded, fine grained,	35—		RUN 1	DB	95%	RQD 13%	,	•		
The s	slightly weathered, hard, solid  40 1067.6  Continued Next Page  stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft	40				BORI	NG ST	ARTE	ED.		10-17-02
WL			-			BORI	NG C	MPLI	ETED		10-17-02
	V DRY WD V DRY AB									OREMA	N DB
WL	<u> </u>					APPF	ROVED		)P JC	)B#	J7P0601



I 49 Missouri Missouri J7P0601 Boring MC-82 Run No. 1 37.4 Feet to 40.0 Feet Run No. 2 40.0 Feet to 45.0 Feet Run No. 3 (partial) 45.0 Feet to 50.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-82 Run No. 3(partial) 45.0 Feet to 50.0 Feet Run No. 4 50.0 Feet to 55.0 Feet Run No. 5 (partial) 55.0 Feet to 60.0 Feet



I 49 Missouri Missouri J7P0601 Boring MC-82 Run No. 5 (partial) 55.0 Feet to 60.0 Feet Run No. 6 60.0 Feet to 65.0 Feet



I 49 Missouri Missouri J7P0601 Boring MC-82 Run No. 7 65.0 Feet to 70.0 Feet Run No. 8 (partial) 70.0 Feet to 75.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-82 Run No. 8 (partial) 70.0 Feet to 75.0 Feet Run No. 9 75.0 Feet to 78.6 Feet



<u> </u>	LOG OF BORIN	IG N	Ο.	MC	;-1 ⁻	10			<u></u>	Р	age 1 of 2
CLI	ENT HNTB										
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	T							<u> </u>
	Boring Location: 824+88, 115 Feet left of centerline		l		SAI	MPLE:	1-49, N	VIISSO	URI	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER		RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
88	Approx. Surface Elev.: 1163.7 ft	ЭEР	SC	Ş	TYPE	Ğ	FP.	¥ o	걸	INC	slow
	1 LEAN CLAY 1162.7		CL	1	AS	<u> </u>	SB	>0	۵۵	⊃∽	8
	light brown and brown, dry  LEAN CLAY, trace gravel reddish brown, dry  4 1159.7		CL	2	AS						
	LEAN CLAY, scattered to with gravel light reddish brown, dry	5—	CL	3	AS						
		10-									
		15								:	·
	19 1144.7 CHERT++	=			HS						
Δ Δ Δ Δ Δ Δ Δ Δ	stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid	20 —									
$\Delta$ $\Delta$ $\Delta$		=		RUN 1	DB	100%	RQD 92%				
Δ Δ Δ Δ Δ Δ Δ Δ	•	25—		RUN 2	DB	97%	RQD 88%				
Δ Δ Δ Δ		=								_	
Δ Δ Δ Δ Δ Δ				RUN 3	DB	100%	RQD 85%				
ΔΔ	Continued Next Page										<u> </u>
The	stratification lines represent the approximate boundary lines										
Detw VA/A	reen soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft					B∪¤	NG S	ΓΔΩΤΙ	-D		5-5-03
WL					ŀ		NG C				5-6-03
	Y DRY 24 hr AB Y	36		3	1	RIG		/, #10		OREMA	
WL WL							ROVE		(M J		J7P0601

	LOG OF BORI	NG N	Ю.	MC	:-11	10				Pa	ige 2 of 2
CLIE	ENT HNTB										
SITE		PRC	JEC	Т							
L,	McDONALD COUNTY, MISSOURI		1					NISSOL	JRI		
}					SAN	MPLES	3			TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
ΔΔ	CHERT++										
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid			RUN 4	DB	100%	RQD 56%		:		
				RUN 5	DB	100%	RQD 88%				
							•				
				RUN 6	DB	100%	RQD 86%				
Δ Δ Δ Δ Δ Δ											
				RUN 7	DB	100%	RQD 95%				
Δ Δ Δ Δ Δ Δ Δ Δ				RUN	DB	100%	RQD				
Δ Δ Δ Δ Δ Δ				8			85%				
	BOTTOM OF BORING AT 64.3 FEET BACKFILLED WITH CUTTINGS 05/06/03		<del></del>	RUN 9	DB	100%	RQD 100%				
Δ Δ Δ Δ Δ Δ	++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.										
	64.3 1099.4	1							-		
The :	stratification lines represent the approximate boundary lines reen soil and rock types: in-situ, the transition may be gradual.			1		1					
WA.	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TARTE	D	<u> </u>	5-5-03
	! <del>&lt;'</del>				_	BOR	ING C	OMPLE	ETED		5-6-03
	¥ DRY WD ¥ DRY AB ▼ DRY 24 hr AB ▼	ar		)r	7	RIG	ΑTV	/, #103	E F	OREMAI	N JW
WL						APPI	ROVE	) BK	M J	OB #	J7P0601

CI	LOG OF BOR	ING	NC	). I	MC	-1	10					age 3 of
	HNTB							GEOL	OĞIC	LOG		
SIT	McDONALD COUNTY, MISSOURI	PF	(OJ	ECT	-	•		1.40				
	, moodin					SA	MPLE		VIISSC	JURI	TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.		USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	OVERBURDEN							37 11				
	22.3  cr CHERT++ stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, cr solid	_4		R	UN 1	DB	100%	RQD 92%				
	243  CHERT++ stratified, with limestone seams, light gray  27 and gray medium hodded, year, fine	.4		R	UN I	DB S	97%	RQD 88%				
	and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid	25-										
) e)	LS Inclusions	-										
	LS cT - Interballed	-										
	29.3 1134.  CT  L3 Inclusions  Continued Next Page	30-			JN [	DB 10		RQD 85%				
The s betwe	stratification lines represent the approximate boundary lines sen soil and rock types: in-situ, the transition may be gradual.											
	ER LEVEL OBSERVATIONS, ft				-	В	ORII	NG ST.	ARTE	Ď		5-5-0
	▼ DRY WD ▼ DRY AB					В	ORII	4G CO	MPLE	TED		5-6-0
-	Y DRY 24 hr AB Y	حال			П	R	iĠ	ATV,	#103	E FO	REMAI	VL V
VL					=		PPR	OVED		OL N	· · · · · · ·	J7P06

	Ĺ	OG OF BORI	NG N	О.	MC	)-1°	10				Р	age 4 of 7
CLI	ENT HNTB	-						GEOL	OGIC	LOG		
SIT		OUD	PRO	JEC	Т			1.40.1	AICCO	upi		
<u> </u>	McDONALD COUNTY, MISS	UURI	ļ	-	<u> </u>	SA	MPLE:	1-49, M	111550	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	cr stratified, with limestone seams and gray, medium bedded, ven grained, slightly weathered to fi solid	y fine	-									,
	ct cs - highly foreboard		_ 									
	34.3  cr CHERT++ stratified, with limestone seams	1129.4 s, light gray			RUN 4	DB	100%	RQD 56%				
	and gray, medium bedded, very grained, slightly weathered to fr solid	y fine	35—									
	· c7										7.0	
ļ												
	39.3	1124.4				DB	100%	RQD				
	LS er		40-		5			88%				
	Continued Next Pa	ge	40									
The : betwe	stratification lines represent the approximate een soil and rock types: in-situ, the transition	boundary lines n may be gradual.										
	TER LEVEL OBSERVATIONS, ft	T		•			BORI	NG ST	ARTE	D		5-5-03
WL	Ÿ DRY WD ¥ DRY AB	75					3 <b>0</b> RI	NG CC	MPLE	TED		5-6-03
	Ÿ DRY 24 hr AB Ÿ	][err	JL	.C			RIG	ATV	, #103	E FO	REMA	Mr N
WL							\PPF	OVED	вк	M JC	)B #	J7P0601

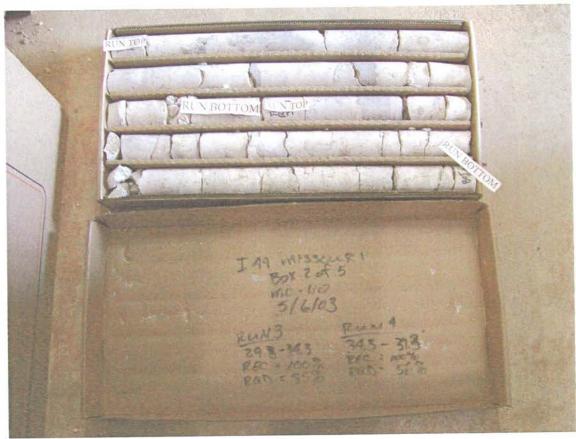
<u> </u>	LOG OF BORII	NG N	0.	MC	C-1	10	<u> </u>			F	age 5 of
	IENT HNTB						GEOL	OGIC	LOG	_	
SIT		PRO	JEC	T							
	McDONALD COUNTY, MISSOURI	1	Τ	1	SA	MPLE	<u> -49,  </u>	MISSO	URI	TESTS	
			Ì		T		Ĭ		[		T
GRAPHIC LOG	DESCRIPTION	DEPTH, fl.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	CHERT++ stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid			-						20,	
	LS - CT										
	Ls - C <del>F</del> 44.3 1119.4	-					,				
. •	c+ stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid	45—		RUN 6	DB	100%	RQD 86%	,	-		
	LS-Inclusions										:
	LS - Inclusions	.					·				
	CT CT										
4	49.3	50—	ī	RUN 7	DB 1	00%	RQD 95%				
The s	Continued Next Page stratification lines represent the approximate boundary lines										
betwe	een soil and rock types: in-situ, the transition may be gradual.										•
	FER LEVEL OBSERVATIONS, ft				<b>I</b> -		NG ST			_	5-5-0
	V DRY WD V DRY AB V DRY 24 hr AB V P	7					NG CC	<u>·</u>			5-6-0
	¥ DRY 24 hr AB ¥		Ŀ	J		RIG		, #103		DREMA	
<b>VL</b>			•			\PPF	OVED	BK	M JC	)B#	J7P060

	LOG OF BO	ORIN	NG N	0.	MC	)-1	10				Р	age 6 of	7
CL	IENT HNTB							GEOL	OGIC	LOG			
SIT	E		PRO	JEC	Т								_
	McDONALD COUNTY, MISSOURI					SA	MPLE	1-49, N S	MISSC	URI	TESTS	<del></del>	_
								Ī			]		_
GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf		±
	cr Schert Stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid							Ample - vymania and a			•		**
	Ls		_										
	CT												
		109.4			<b>-</b>		1000						···
0	CHERT++ stratified, with limestone seams, light gray and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid LS-Inclusions  CT-Light, fractured		55—	:	8 8	DB	100%	RQD 85%			-		
	er - 4s				-								
	cr												
	. <i>L</i> S		7							,			
		104.4	$\dashv$						-				,,
	CT		-	F	RUN 9	DB	100%	RQD 100%					
	Continued Next Page		60		ĺ			}	ļ			٠	
The	stratification lines represent the approximate boundary lines			L				- , . , . , . ,	1				_
	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft					1.		NO OT	ADTE	D			_
	· · · · · · · · · · · · · · · · · · ·							NG ST				5-5-0 5-6-0	
۷L	V DRY WD V DRY AB V DRY 24 hr AB V TEN	<b>'</b>	7	6			RIG		, #103		DREMA		-
۷L		- 4				╸╟		ROVED		M JC		J7P060	_
_							\	CAED	אם	אנן של	/U #	JIPUOL	٠

	LOG OF BORIN	IG N	Ο.	МС	-11	10				P	age 7 of 7
	IENT HNTB						GEOL	OGIC	LOG	_	
SIT	McDONALD COUNTY, MISSOURI	PRO	JEC	Т			1-49, N	/ISSO	URI		
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
5	cr and gray, medium bedded, very fine grained, slightly weathered to fresh, hard, solid	- -	Ö	Z	Ţ	R	35 BII	))	od .	III ST	
۵	LS - Inclusions 64.3 1099.4	_									
is/03				· · · · · · · · · · · · · · · · · · ·	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s						₩· 
MOREHOLE 99 MC-110.6PJ TERRACON.GDT 12/6/03	stratification lines represent the approximate boundary lines reen soil and rock types: in-situ, the transition may be gradual.					=					,
WA	TER LEVEL OBSERVATIONS, ft	·			-  -		NG ST				5-5-03
g WL	V DRY WD V DRY AB V DRY 24 hr AB V C	ar	-	1		BORI RIG	NG CC	OMPLE , #103		OREMA	5-6-03 N JW
WL WL	TURT 24 NEAD			<b>/</b>	<b>■</b>   '		ROVED		M J		J <b>7</b> P0601



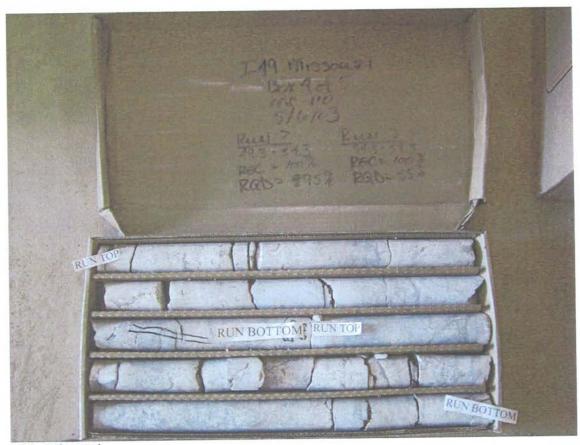
I 49 Missouri Missouri J7P0601 Boring MC-110 Run No. 1 22.3 Feet to 24.3 Feet Run No. 2 24.3 Feet to 29.3 Feet



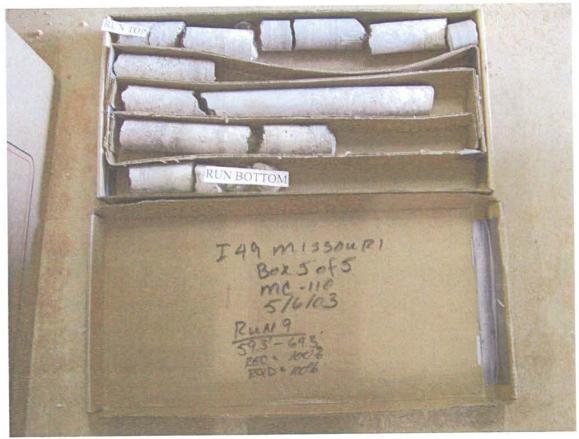
I 49 Missouri Missouri J7P0601 Boring MC-110 Run No. 3 29.3 Feet to 34.3 Feet Run No. 4 34.3 Feet to 39.3 Feet



I 49 Missouri Missouri J7P0601 Boring MC-110 Run No. 5 39.5 Feet to 44.5 Feet Run No. 6 44.5 Feet to 49.5 Feet



I 49 Missouri Missouri J7P0601 Boring MC-110 Run No. 7 49.3 Feet to 54.3 Feet Run No. 8 54.3 Feet to 59.3 Feet



I 49 Missouri Missouri J7P0601 Boring MC-110 Run No. 9 59.3 Feet to 64.3 Feet

	LOG OF BORIN	IG N	Ο.	MC	-12	24				Pa	age 1 of 2
CLI	ENT HNTB										
SIT	E	PRO.	JEC	T							
	McDONALD COUNTY, MISSOURI				041		I-49, N	IISSO	URI	TEOTO	
	Boring Location: 837+00, 120 Feet left of centerline				SAN	APLES	•			TESTS	
GRAPHIC LOG	DESCRIPTION	<b>ДЕРТН, ft.</b>	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
×××	Approx. Surface Elev.: 1169.5 ft		0	2	⊢ AS	œ	S	<u> ₹0</u>		⊃ S	
	GRAVEL, abundant clay brown and reddish brown, dense  5 1164.5			1	AS						
	FAT CLAY, abundant gravel, trace chert	5—		2	AS						
	seams reddish brown, very stiff, moist	10									
	15 1154.5			3	AS						
	FAT CLAY, with gravel	15—		4	AS		· · · ·				
	reddish brown, stiff, moist  18.5  1151.0										
	LIMESTONE++ stratified, scattered chert seams and inclusions, light gray and white, medium bedded, very fine grained, fresh, hard, solid	20		RUN 1	DB	99%	RQD 88%				
		25									
The A WC STORY WE WILL WITH THE WATER WITH THE WATER WITH THE WATER WITH THE WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER WATER W		30		RUN 2	DB	98%	RQD 71%				
¥ '	Continued Next Page	<u>L</u> _						<u>_</u>	<u> </u>	<u> </u>	
The bet	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
W.	ATER LEVEL OBSERVATIONS, ft					BOR	ING S	TART	ED		10-24-02
S WL					ŀ		ING C			)	10-24-02
WL	Y DRY WD Y DRY AB Y Y T	30		7	7	RIG		/, #10		OREMA	
g WL						APP	ROVE	D S	РВ Ј	OB#	J7P0601

	LOG OF BORIN	IG N	Ο.	MC	-12	24				Р	age 2 of 2
	ENT HNTB										
SITE	McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49, N	AISSO	URI		
					SAI	MPLE:				TESTS	
GRAPHIC LOG	DESCRIPTION	ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pof	UNCONFINED STRENGTH, psf	
	LIMESTONE++ stratified, scattered chert seams and inclusions, light gray and white, medium bedded, very fine grained, fresh, hard, solid	35		RUN 3	DB	100%	RQD 80%				
H	40.5 1129.0	40-		-			/0				
	BOTTOM OF BORING AT 40.5 FEET BACKFILLED WITH CUTTINGS 10/24/02  ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.								**************************************		
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SIT	TE McDONALD COUNTY, MISSOURI	PRO	JEC.	Τ			I-49, N	NISSC	DURI			
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GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf		
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_					SAI	MPLE	s			TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPĘ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	; ;
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7	LS 28.2  LIMESTONE++ stratified, scattered chert seams and inclusions, light gray and white, medium bedded, very fine grained, fresh, hard, solid		F	RUN I	DB S		RQD 71%				
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	LOG OF BORI	NG N	0.	MC	)-12	24				Р	age 4 of 5
CLI	ENT HNTB						GEOL	OGIC	LOG		
SIT		PRO	JEC	Τ					·		
	McDONALD COUNTY, MISSOURI				SAI	MPLE	1-49, N	11330	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	ان ان ان ان ان ان ان ان ان ان ان ان ان ا
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	38.2 1131.3  LIMESTONE++  stratified, scattered chert seams and  LS inclusions, light gray and white, medium			RUN 3	DB	100%	RQD 80%				
	bedded, very fine grained, fresh, hard, solid	40—									
The : betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.										,
WA [.]	TER LEVEL OBSERVATIONS, ft		- 40	<b>.</b> P	ŀ	BOR	NG ST		ETED		10-24-02 10-24-02
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GRAPHIC LOG		DESCRIPTION		ОЕРТН, Я.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	<b>L S</b> 40.5		1129.0										
petw	een soil a	ion lines represent the approximate boundary lines and rock types: in-situ, the transition may be grad	s ual.										
	TER LE	VEL OBSERVATIONS, ft  WD ▼ DRY AB							IG STA				10-24-02
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APPROVED

J7P0601

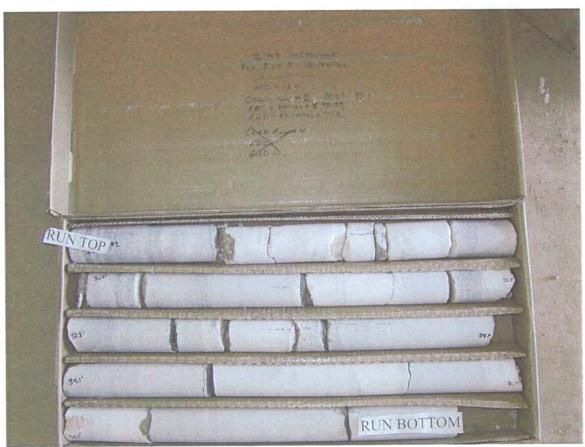
SPB JOB#

OREHOLE 99 MC-124



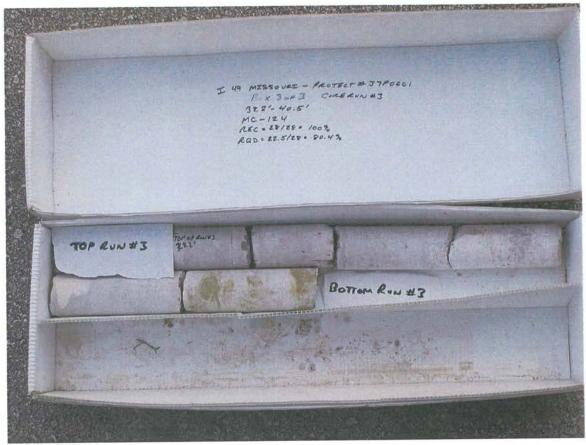
I 49 Missouri Missouri J7P0601 Boring MC-124 Run No. 1 18.5 Feet to 28.2 Feet





I 49 Missouri Missouri J7P0601 Boring MC-124 Run No. 2 28.2 Feet to 38.2 Feet





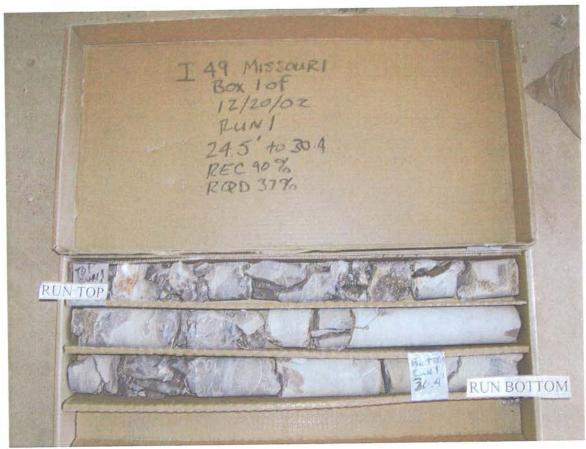
I 49 Missouri Missouri J7P0601 Boring No. MC 124 Run No. 3 38.2 Feet to 40.5 Feet

LOG OF BORING NO. MC-179 Page 1 of 2													
CLI	ENT HNTB												
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	McDONALD COUNTY, MISSOURI						1-49, N	IISSO	URI		· · · · · · · · · · · · · · · · · · ·		
	Boring Location: 905+67, 114 Feet right of centerline				ŞAN	/PLES	<u> </u>		l	TESTS			
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1163.7 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf			
	1 CLAYEY GRAVEL 1162.7	_	GC	1	AS								
	SANDY FAT CLAY, scattered gravel light brown to light reddish brown, dry	5—	СН	2	AS								
		=											
	9.5 1154.2 SANDY FAT CLAY, with chert seams	10—	СН	3	AS	ļ		<del> </del>					
	light brown to light reddish brown, moist												
		15											
	23.5 1140.2	=	1										
	CHERT++ stratified, abundant limestone seams, light gray and gray, thin bedded, very fine grained, fresh, hard, solid	25		RUN 1	DB	90%	RQD 37%						
Δ Δ Δ Δ			1	1					1				
		30-		RUN 2	1 DB	1009	RQD 45%		<del>                                     </del>		1		
The bet	Continued Next Page	-		-									
The	stratification lines represent the approximate boundary lines	<u> </u>				·	•	<u> </u>					
bet	ween soil and rock types: in-situ, the transition may be gradual.										40.00.00		
WA	ATER LEVEL OBSERVATIONS, ft						RING S				12-20-02		
g WL	□ DRY WD → DRY AB	_	_,				RING C		,		12-20-02		
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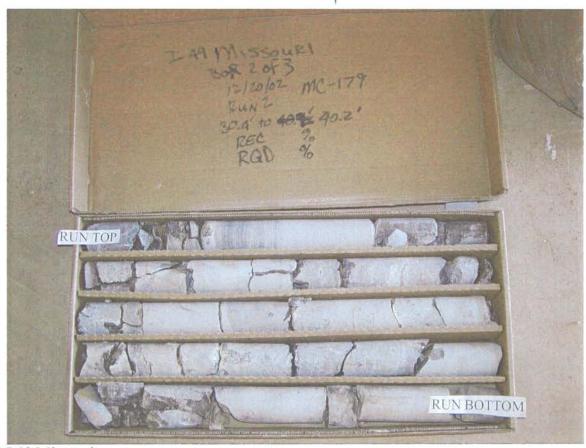
CLIEN		F BORIN	IG N	<b>O</b> .	MC	:-17	79	· <u>-</u> -			P	age 2 of 2		
	HNTB													
SITE	McDONALD COUNTY, MISSOURI		PRO	JEC	Т			1-49, N	MISSO	URI	IRI			
						SAI	MPLE:				TESTS	<u> </u>		
GRAPHIC LOG	DESCRIPTION		DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf			
Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ	CHERT++ stratified, abundant limestone seams, li gray and gray, thin bedded, very fine grained, fresh, hard, solid	ight 1123.5	35											
	BOTTOM OF BORING AT 40.2 FEET BACKFILLED WITH CUTTINGS 12/20 ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.	/02												
water	ffication lines represent the approximate boundary soil and rock types: in-situ, the transition may be to the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the contract of the	gradual.					BORI	NG ST	ARTE	D		12-20-02		
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		IENT HNTB						GEOL	OGIC	LOG			
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	GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, In.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED SSTRENGTH, psf		OFFICE STATES
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		REED SPAING: FORMATION  LS  CT+LS - Interballed  LS  CT	_ _ _ _										
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		40.2	70									
79.GPJ	Detw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.										
		TER LEVEL OBSERVATIONS, ft				В	DRIN	G STA	RTED			12-20-02
	WL WL	Y DRY WD Y DRY AB	<b>_</b>					G CON				12-20-02
표.	WL.	P DRY WD P DRY AB P P P P P P P P P P P P P P P P P P	JL	U		RI		ATV, #		+	REMAN	
8	, , ,					AF	PRC	VED	BKM	JOB	# ,	J7P0601



I 49 Missouri Missouri J7P0601 Boring MC-179 Run No. 1 24.5 Feet to 30.4 Feet



I 49 Missouri Missouri J7P0601 Boring MC-179 Run No. 2 30.4 Feet to 40.2 Feet



	LOG OF BORIN	IG N	Ο.	MC	2-19	91		10 "		P	age 1 of 3
	IENT <b>HNTB</b>			Aı	uton	natic	Hamm	er Effi	cienc	y = 80.1	7%
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	Т			I-49, N	NSSO	IIRI		•
	Boring Location: 917+30, 94 Feet right of centerline				SA	MPLE			OTT	TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1168.7 ft	DЕРТН, ft.	USCS SYMBÓL	NUMBER	TYPE	RECOVERY, in	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
500	CHERT GRAVEL AND COBBLES	_	GP	1	AS						
	light brown and white, dry - trace clay below 3 feet  1163.7	5-		,	1 m			3 3 3 3			3
	CHERT GRAVEL, with clay and chert seams reddish brown and white, dense, dry to moist		GP GC		AS		2				
	CLAYEY CHERT GRAVEL, abundant chert seams reddish brown and white, dense, moist  15	10	GC	3	AS						
	CLAYEY CHERT GRAVEL, with chert seams	15	GC	4	AS						7
	reddish brown, white and gray, dense, moist - very soft clay seam at about 19 feet		9							·	×
	22.8 1145.9	20—	GC	5	AS						
	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very	25—		1			RQD 56%		* " p		
	hard, solid			RUN -2 RUN 3		97% 100%	520/				
BOREHOLE 99 MC-191.6PJ TERRACON.GDT 12/4/03  M		30-		RUN 4	DB	100%	RQD 76%				
TERF	Continued Next Page							50 40			
The bety	stratification lines represent the approximate boundary lines yeen soil and rock types: in-situ, the transition may be gradual.										
WA WA	TER LEVEL OBSERVATIONS, ft				T	BORI	NG ST	ARTE	D		1-31-03
g WL					- 1		NG CC				2-8-03
WL	Y DRY 24 hr Y	30			1	RIG		, #103		DREMA	
Mr	37.084-5.					APPF	ROVED	SP	В ЈС	)B#	J7P0601

	LOG OF BORIN	IG N	Ο.	MC	:-1	91				Р	age 2 of 3
CLIE	HNTB			Αι	uton	natic	Hamm	er Eff	icienc	y = 80.1	
SITE	E McDONALD COUNTY, MISSOURI	PRO	JEC	Т	-		I-49, N			·/	
					SA	MPLE		11330	OKI	TESTS	
GRAPHIC LOG	DESCRIPTION	ОЕРТН, А.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
$\Delta \Delta$	CHERT++ stratified, abundant limestone seams, light					-				_	
	gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid	35		5			RQD 59% RQD 53%				
Δ Δ Δ Δ Δ Δ		40-		7			RQD 75%				
				RUN 8	DB	98%	RQD 81%				
4		45 —	F	RUN 9	DB	100%	RQD 65%				
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	- trace shale seams below 49.5 feet	50	F	RUN 10	DB	100%	RQD 29%				,
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		55	F	RUN 11	DB	100%	RQD 98%				
		60-	F	12	DB 1	00%	RQD 84%				
	Continued Next Page	65				7		-+			
The str	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.				1_						
	ER LEVEL OBSERVATIONS, ft				TE	BORIN	NG STA	ARTE	D.	······································	1-31-03
	Z DRY WD Z DRY AB		_				NG CO				2-8-03
MF Z	PDRY WD FDRY AB PDRY 24 hr F	JC			F	≀iG	ATV,			REMAN	

APPROVED

SPB JOB#

J7P0601

BOREHOLE 99 MC-191.GPJ TERRAGON.GDT 12/4/03

WL

	LOG OF BOR	NG N	Ο.	MC	-19	)1				Pa	ige 3 of 3
CLIE	HNTB				ıtom	atic	Hamm	er Eff	icienc	y = 80.7	%
SITE	McDONALD COUNTY, MISSOURI	PRO	JEC	Т			I-49, N	IISSO	URI		
					SAN	<b>MPLES</b>				TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very	-		RUN 13	DB	100%	RQD 90%				
	hard, solid	70-		RUN 14	DB	100%	RQD 74%				
△	3 1099  LIMESTONE++ stratified, trace shale seams, light gray, medium bedded, fine grained, fresh, hard, solid	75—		RUN 15	DB	100%	RQD 100%		-		
	BOTTOM OF BORING AT 84.5 FEET BACKFILLED WITH CUTTINGS 02/08/03 ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.	80-	-	RUN 16	DB	100%	RQD 96%				
	NOTE: Information from two borings was combined to produce this log. Boring MC-191 was drilled to 21.9 feet and cored to 37.1 feet, where the boring caved in and was abandoned.  Boring MC-191A was moved 2 feet east of MC-191 and drilled to a depth of 22.8 feet and cored to 84.5 feet.	1.2			The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s						
betwe	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.					BOP	ING S	TARTI	=D		1-31-0
					_		ING C			<u> </u>	2-8-0
	¥ DRY WD ¥ DRY AB ¥ DRY 24 hr ¥	<b>'a</b> '		31	1	RIG				OREMA	
WĹ			_		<b>-</b>		ROVE		PB J		J7P060

	LOG OF BO	ORIN	IG N	0.	MC	:-19	91				P	age 3	of 9
CLI	ENT <b>HNTB</b>							GEOL	OGIÇ	LOG			
SIT	E McDONALD COUNTY, MISSOURI		PRO	JEC	Т			I-49, N	AISSC	N IRI			
	Medical Court, Micooda			l		ŞAI	MPLE				TESTS		
GRAPHIC LOG	DESCRIPTION		ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		\$ . m
			_ _			· · · · · · · · · · · · · · · · · · ·			70-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1				
	OVERBURDEN		_										,
	22.8 _cr CHERT++	1145.9			D1 11		1000/	RQD				}	
/ 8/	stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid  CT  REED SPRINGS FORMATION  LS				1		100 %	56%					-¥k. va €
	- LS		25									-	1
	cherr++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very	1143.4 1142.2	1		RUN 2	DB	97%	RQD 53%					î î
	cr CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid LS W/ CT SEAMS				RUN 3	DB	100%	RQD 75%					·
	CT - 48		_	,									
PI	CT	1139.2			RUN 4	DB	100%	RQD 76%			: 		# 4 {
	Continued Next Page		30		•			7 0 /0					
The	stratification lines represent the approximate boundary lines			<u>'</u>				•					
	reen soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft					1	BORI	NG S1	ARTE	D		1-3	1-03
						ŀ		NG C					8-03
_	Y DRY WD Y DRY AB  Y DRY 24 hr Y	rra	30		)[	1	RIG			,	OREMA		JW
WL								ROVED	·	PB JO		J7P0	

		LOG OF BORIN	NG N	0.	MC	:-19	91				F	Page 4 of 9
	L	LIENT HNTB						GEOL	OGIC	LOG		
	SI	TE McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49, N	/ISSO	URI		
					<u> </u>	SAN	/PLE				TESTS	
	GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	/ // 0	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid LS  CONTENT:										,
cr cr	<u> </u>	cr Ls cr Ls cr - Ls 7-C7 34.5						, and the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second				er 
	土	cr CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid  36.2  1132.5	35—		RUN 5	DB 9	94%	RQD 59%				
cr		cr CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid cr		F	6	DB 1	00%	RQD 53%				
TERRACON.GDT 12/5/03		CT CT CT CT S39.5 CT CT CT CT CT CT CT CT CT CT CT CT CT	40—	F	RUN [	DB 10		RQD 75%				
1.GPJ	betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.										J
AC-19.		TER LEVEL OBSERVATIONS, ft				В	ORIN	IG STA	RTE	)	<del>-</del>	1-31-03
86		¥ DRY WD ¥ DRY AB				_		IG CO				2-8-03
30REHOLE		¥ DRY WD ¥ DRY AB  ¥ DRY 24 hr ¥  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Control  Cont	JC		П	R	iG	ATV,		- 1	REMAN	
BOR	WL					Al	PPR	OVED	SPE	3 JOI	В#	J7P0601

	LOG OF BORIN	IG N	Ο.	MC	-19	)1				Р	age 5 of 9
CLI	ENT <b>HNTB</b>						GEOL	OGIC	LOG		
SIT		PRO	JEC	Τ			I-49, N				· ·
	MICDONALD COOK 11, MICSOOK		Γ		SAN	/PLES			OIXI	TESTS	
GRAPHIC LOG	DESCRIPTION	OEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	cr CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid CHERT++	<u> </u>			DB	98%	RQD				
	stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid			8			81%				<u></u>
		<u> </u>									
	- CT 44.5 <b>LS</b> 1124.2	_									
Z	cs CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid	45— -		RUN 9	DВ	100%	RQD 65%				
	CT LS CT	_									
	LS 7	_									
A	LI	_									
+	49.5 1119.2  cr  Ls  Continued Next Page	50		RUN 10	DB	100%	RQD 29%				
The	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.								•		
	TER LEVEL OBSERVATIONS, ft				Т	BOR	ING S	TARTI	ΞD		1-31-
WL					⊦		ING C			···	2-8-0
WL	V DRY WD V DRY AB V DRY 24 hr V P	30		Jľ	<b>1</b>	RIG	ΑT\	/, #10	3E F	OREMA	AN J
WL					<b>-</b>		ROVE	<u> </u>	PB J	OB#	J7P060

					<u>.</u> .		L	OG O	F BOR	ING N	10.	M	C-1	91				ı	Page 6 of 9
		JENT	·		HNT	В									GEOL	OGIC	LOG		
	SI [*]	TE	McDO	NALI	D COU	NTY, MI	SSC	OURI		PRO	OJEC	T			1-49, 1	MISSC	DURI		- 4
	•							-					SA	MPLE				TESTS	
	GRAPHIC LOG				DESC	CRIPTIC	ON			ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, In.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
		CT CT CT LS CT	CHERT+ stratified gray and very fine hard, sol	, abu I gray to fi	v, thin to	o mediur	m be	edded.		-		777			1				E T T T E
Ls cr cr		27 27 54.5 CT 64.5 CT 64.5 4.5	CHERT+ stratified, gray and very fine hard, soli	abu gray to fir	, thin to	mediun	n be	dded.		2 _ 55		RUN 11	DB	100%	RQD 98%				
12/5/03	O	CT SH LS CT CT	Inclusio	<b>,</b>															
TERRACON.GDT 1		59.5 CT		Co	ntinue	d Next F	Page	•	1109.	60-		RUN 12	DB	100%	RQD 84%				T:
	The s	stratifica	ation lines re and rock ty	epres	ent the a	pproxima	te bo	undary lin	nes adual										
MC-191.GPJ			EVEL OB				201111	ay ue gli	ouudi.		·			BORI	NG ST	ARTE	ח		1-31-03
8		[▼] DR			Z DRY		В	7	<u> </u>		<b>.</b>				NG CC			· · · · · · · · ·	2-8-03
BOREHOLE		₫ DR		hr 3	<u> </u>		┪		<b>5</b> LL	30	C	)[		RIG				REMA	
ag Tage	WL												_   /	APPF	ROVED		В ЈО		J7P0601

9 81

	LOG OF B	ORIN	IG N	Ο.	MC	:-19	91				P	age 7 of 9
CL	IENT HNTB							GEOL	OGIC	LOG		
SIT			PRO	JEC	Т		-					
	McDONALD COUNTY, MISSOURI				·····	SAI	MPLES	1-49, N	/IISSO	URI	TESTS	
GRAPHIC LOG	DESCRIPTION		DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	TWO
	CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid  CT  LS  SH  CT  L3  CT  SH  - LS		-									
	cr 64.5  cr CHERT++ stratified, abundant limestone seams, light cr gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid cr sH cr	1104.2	65-		RUN 13	DB	100%	RQD 90%				
<u>.</u>	LS Inclusion  CT  69.5 LS  CT  CT  CT  69.5 LS  CT  CT  CT  CT  CT  CT  CT  CT  CT  C	1099.2	70—		RUN 14	DB	100%	RQD 74%				- - - - - - - - - - - - - - - - - - -
The	stratification lines represent the approximate boundary lines yeen soil and rock types: in-situ, the transition may be gradua	ıl.										
_	ATER LEVEL OBSERVATIONS, ft					T	BOR	ING S	TARTE	ED.		1-31-03
WL						Į.		ING C				2-8-03
WL	Y DRY WD Y DRY AB   Y DRY 24 hr Y	ff?	30		)[	<b>1</b>	RIG		/, #10		OREMA	
WL		`				<b>-</b>	APPI	ROVE			OB #	J7P0601

	LOG OF E	BORIN	IG N	Ο.	MC	:-19	91				P	age 8 of 9
CLIENT	HNTB							GEOL	OGIC	LOG		
SITE	McDONALD COUNTY, MISSOURI		PRO	JEC	Т			I-49, N	/ISSO	IIRI		
····	MEDGRALD GOGRITI, MIGGORIA					SAI	MPLE:				TESTS	· · · · · · · · · · · · · · · · · · ·
GRAPHIC LOG	DESCRIPTION		ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
CT CT CT	chert++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard to very hard, solid		_		7.7					and the second		
LS	REED SPRINGS FORMATION	J	· —									
22 CT,	LS Inclusion	1095.7										
2 SH	<u>LIMESTONE++</u> stratified, trace shale seams, light gray,	1093.7	- -									
74.5	LIMESTONE++	1094.2	- -		ואו זם	DB.	100%	RQD				
45 2H	stratified, trace shale seams, light gray, medium bedded, fine grained, fresh, hard, solid	,	75		15	מט	100 %	100%				
	45		-									
H2 H2												• • • • • • • • • • • • • • • • • • •
2H			-									
79.5 24 24	Continued Next Page	1089.2	80-	ļ	RUN 16	DB	00%	RQD 96%				
The stratific	ation lines represent the approximate boundary lines if and rock types: in-situ, the transition may be graduated	al.										
	EVEL OBSERVATIONS, ft					1	BORI	NG ST	ARTE	D		1-31-03
Mr 🚡 DŁ	RY WD ¥ DRY AB			-			BORI	NG CC	MPLE	TED		2-8-03
Mr 🛣 Db	RY WD FDRY AB RY 24 hr 🛂	TTG	JC	C			RIG	ATV	#103	BE FC	DREMA	N JW
WL							\PPF	OVED	SF	B JC	)B #	J7P0601

Cl	LOG OF BO										P	age 9 of
	НИТВ							GEOL	OGIC	LOG		
SIT	McDONALD COUNTY, MISSOURI		PRO	JEC.	T			1 40 B	Heen	i ibi		
	MCDONALD COUNTY, MISSOURI					SAN	/PLES	1-49, N	11330	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION		DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	LIMESTONE++ stratified, trace shale seams, light gray, medium bedded, fine grained, fresh, hard, solid SH SH SH SH 84.5	1084.2										
	NOTE: Information from two borings was combined to produce this log. Boring MC-191 was drilled to 21.9 feet and cored to 37.1 feet, where the boring caved in and was abandoned.  Boring MC-191A was moved 2 feet east of MC-191 and drilled to a depth of 22.8 feet and cored to 84.5 feet.											
betv	e stratification lines represent the approximate boundary lines tween soil and rock types: in-situ, the transition may be gradual ATER LEVEL OBSERVATIONS, ft					⊢		ING ST				1-31-(
		rr=	76	7	1	1	RIG				OREMA	
WL												



I 49 Missouri Missouri J7P0601 Boring MC-191 Run No. 1 21.9 Feet to 25.2 Feet Run No. 2 25.2 Feet to 30.2 Feet





I 49 Missouri Missouri J7P0601 Boring MC-191 Run No. 3 30.2 Feet to 35.2 Feet Run No. 4 35.2 Feet to 37.1 Feet





I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 1 22.8 Feet to 25.3 Feet Run No. 2 25.3 Feet to 26.5 Feet Run No. 3 26.5 Feet to 29.5 Feet



I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 4 29.5 Feet to 34.5 Feet Run No. 5 34.5 Feet to 36.2 Feet Run No. 6 36.2 Feet to 39.5 Feet



I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 7 39.5 Feet to 41.0 Feet Run No. 8 41.0 Feet to 44.5 Feet Run No. 9 44.5 Feet to 49.5 Feet

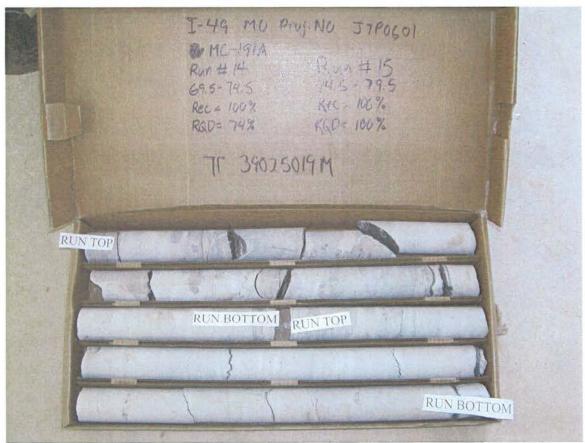


I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 10 49.5 Feet to 54.5 Feet Run No. 11 54.5 Feet to 59.5 Feet



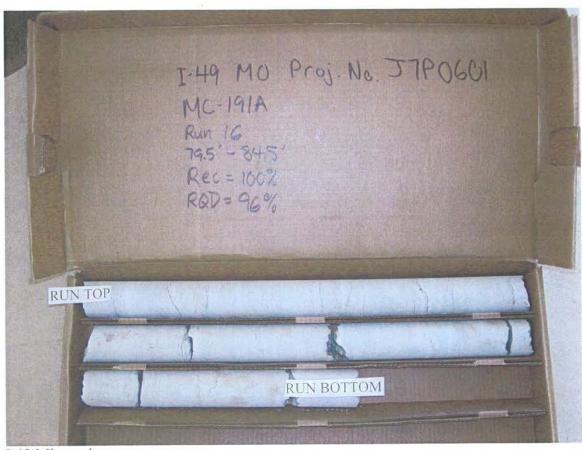


I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 12 59.5 Feet to 64.5 Feet Run No. 13 64.5 Feet to 69.5 Feet



I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 14 69.5 Feet to 74.5 Feet Run No. 15 74.5 Feet to 79.5 Feet





I 49 Missouri Missouri J7P0601 Boring MC-191A Run No. 16 79.5 Feet to 84.5 Feet



	LOG OF BOR	NG N	0.	MC	-2 ⁻	12				P	age 1 of 3
CL	IENT <b>HNTB</b>										
SIT	E	PRO	JEC	T							
<u> </u>	McDONALD COUNTY, MISSOURI						I-49, N	IISSO	URI		
	Boring Location: 931+00, 65 Feet left of centerline				SAI	MPLES	<u> </u>			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1151.7 ft	ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	LEAN CLAY, with gravel		CL	1	AS						
	brown, stiff to very stiff, moist			30.00							
	5 1146	.7 5	-	1	100						
	SANDY LEAN CLAY, with gravel, scattered chert seams brown to light reddish brown, very stiff, moist	-	CL	2	AS						
	10 1141	.7 10	1								,
	SANDY LEAN CLAY, with gravel, with chert seams light brown to brown, very stiff, moist		CL	3	AS	II 9					
		15-	CL	4	AS						
	1134 - soft clay layer from 16 to 17 feet	7 -									
	LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	20-		1			RQD 93% RQD				
	very fine to fine grained, fresh, flard, solid			2		100 %	93%				
		25—		RUN 3	DB	100%	RQD 98%		V		
+		30-	+	DIIN	I DP	1000/	RQD			-	
				4	סט	100%	79%				
1	Continued Next Born		=							* (*	
The	continued Next Page estratification lines represent the approximate boundary lines										
-	ween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft				$\neg$	BOR	ING ST	TARTE	D		2-9-03
WL			15.13				ING C	The second		)	2-20-03
WL						RIG		/, #103		OREMA	
WL	LAN ESE GEVORSAL				-1	APP	ROVE		_	IOB#	J7P0601

OLIENS.	LOG OF BORI	NG N	<u>O.</u>	MC	<b>)-2</b>	12				F	Page 2 of 3
CLIENT	HNTB										
SITE	McDONALD COUNTY, MISSOURI	PRC	JEC	T			1-49, 1	Misso	NI IDI		
				1	SA	MPLE		111000	/OKI	TESTS	· · · · · · · · · · · · · · · · · · ·
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	LIMESTONE++	ā	ž	ž	F	~	요표	38	28	SIG	
	stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	35—		RUN 5	DB	100%	83%				
		40-		RUN 6	DB	100%	RQD 63%				
		45		RUN 7	DB	100%	RQD 72%				
		50		RUN 8	DB	100%	RQD 61%			·· <del>·</del>	
		55 —		RUN 9	DB	100%	RQD 84%				
		60-		RUN 10	DB	100%	RQD 94%				
	Continued Next Page	65		RUN	DΒ	100%	RQD		į		
i ne stratif between s	ication lines represent the approximate boundary lines soil and rock types: in-situ, the transition may be gradual.										
WATER	LEVEL OBSERVATIONS, ft					BORI	NG ST	ARTF	D		2-9-03
ΛΓ <u>Δ</u> D							NG CC				2-20-03
VL 🛣	PRY WD Y DRY AB	30				RIG	ATV	, #103	E FC	REMA	N KS
					]/	APPF	ROVED	SP	B   JC	B#	J7P0601

CLIE	HNTB								<u>., </u>		
SITE	McDONALD COUNTY, MISSOURI	PRO.	JEC	Т			I-49, N	IISSO	URI		
					SAM	IPLES				TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid			11	:		88%				
		70-		RUN 12	DB	100%	RQD 95%				
		75-		RUN 13	DB	100%	RQD 98%				
	81	80-		RUN 14	DB	100%	RQD 100%				
	medium to thick bedded, medium to coarse grained, fresh, hard, solid	85		RUN 15		100%	RQD 93%				
	91 1060.	90-		RUN 16		100%	RQD 100%				
	BOTTOM OF BORING AT 91 FEET BACKFILLED WITH CUTTINGS 02/20/03 ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.										
The	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
W	ATER LEVEL OBSERVATIONS, ft						RING S				2-9-
WI	V DRY WD V DRY AB V I CI				_	BOF	RING C	OMP	LETE	ט	2 <b>-</b> 20-

	LOG OF BO	ORIN	G N	Ο.	MC	-21	2				Pa	ge 2 of	10
CLI	ENT - HNTB						(	GEOL	OGIC	LOG			
SIT	E McDONALD COUNTY, MISSOURI		PRO	JEC.	Ť	·		1-49, N	AISSO	IIDI			
	MICDONALD COUNTY, MISSOURI					SAN	/PLES			OIN	TESTS		
GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf		organ p
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		ŀ	_										
			-										
	OVERBURDEN	1	-										
				ľ				İ					
	19	1133.7											
	CT LIMESTONE++	50.1	_			DB	100%	RQD					
	stratified, abundant chert seams and inclusions, trace shale laminations, white,		_	1	1			93%					
	light gray and gray, thin to medium bedded,												ŵ
	very fine to fine grained, fresh, hard, solid			-									- 25 1
	LS REED SPRINGS FORMATION		_	1									
		1131.7	20-		<u> </u>	<u> </u>		<del> </del>	-	-	<del> </del>	1	
Tho	stratification lines represent the approximate boundary lines					1	<u> </u>	<u> </u>		<u> </u>	<u></u>	<u>-</u> -	
bety	ween soil and rock types: in-situ, the transition may be gradual.												
WA	ATER LEVEL OBSERVATIONS, ft							ING S				2-9	
WL		ee.	7		77	<b>-</b>		ING C				2-20	
WL	ā IIG			_L	JĮ		RIG		V, #10		OREM		K
WL.							APP	ROVE	D S	PB	IOB#	J7P0	ιbÜ

		LOG OF BORI	NG N	10.	MO	C-2	12				Pa	age 3 of 10
	L	LIENT HNTB						GEOL	OGIC	LOG		
	SI	TE McDONALD COUNTY, MISSOURI	PRO	DJEC	T			I-49, N			•	
			1 -	7		SA	MPLE			70131	TESTS	
	GRAPHIC LOG	DESCRIPTION	ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
		LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	_	-	RUN 2	1	1	RQD 93%				
		LS CF CF CF						7000			j	**** *** ******
cr	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	CT  CT  CT  SH  25 LS  CT  LIMESTONE++  CT  Stratified abundant chart scame and	25—		RUN	DB 1	00%	RQD				
		stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	-		3			98%				
12/5/03		CT CT CT	-									d dr
TERRACON,GDT		Continued Next Page	30									
MC-212.GPJ	betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.										j
MC-21	WA	TER LEVEL OBSERVATIONS, ft				В	ORIN	IG STA	RTE	)	···	2-9-03
න	WL	Ÿ DRY WD ¥ DRY AB						IG CO				2-20-03
BOREHOLE	ŴĹ	Y DRY WD Y DRY AB	30			R	IG	ATV,		,	REMAN	
SE SE	WL					A		OVED		JOE		J7P0601

	LOG OF BORIN	G N	0.	MC	-21	2				Pa	ge 4	of 10
CLI	ENT HNTB					(	GEOLO	OGIC	LOG			
SIT		PRO	JEC	T			1.40. N	aleev	IIDI			
<del></del> 1	McDONALD COUNTY, MISSOURI		Γ	Γ.	SAN	/PLES	1-49, N		OKI	TESTS		
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		
	LIMESTONE++ stratified, abundant chert seams and			RUN 4	DB	100%						
	inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	35-		5			RQD 83%					では、
				RU1 6	V DB	1009	RQD 63%					
		_	1				30 /8	,				
	45	40-	}									
	Continued Next Page			1		<u></u>	1		1		1	
The bet	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.											
	ATER LEVEL OBSERVATIONS, ft						RING S					2-9-0
							RING C	OMP	<del></del>			-20-0
WL WL		عال				RIG	ΑТ	V, #10	)3E	OREM		K
WL					-	APF	ROVE	D S	рв .	JOB#	J7	P060

		LOG OF BORI	NG N	Ю.	MC	<b>C-2</b>	12				Pa	ige 5	 of 10
	<u> </u>	JENT HNTB		-				GEOL	OGIC	LOG		<u> </u>	<del></del>
	SI	TE McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49 M	MISSO	IIRI	_		
				T		SA	MPLE		11000	<u> </u>	TESTS		
	GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	**	Daget
		LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid											**.
		LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	45		RUN 7	DB	100%	RQD 72%					A STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STATE OF THE STA
TERRACON GDT 12/6/03		LS  SH  LS + CT  LS  49  LS  CT  LS + CT  LS - Le - Le - Le - Le - Le - Le - Le -	50	F	RUN I	DB 1	00%	RQD 61%					H T
G _G	The s	stratification lines represent the approximate boundary lines			,								コ
		een soil and rock types: in-situ, the transition may be gradual.  FER LEVEL OBSERVATIONS, ft				T.	0001	10.07	DTC-				
g V		<del></del>						NG STA				2-9 2 <b>-</b> 20	-03
111		Y DRY WD Y DRY AB	36				RIG	<del></del>			REMAN		-03 KS
BORE	۷L		<b></b>			A		OVED	_	JOE		J7P06	

	LOG OF BORI	IG N	0.	MC	;-21	12				Pa	ge 6 of 10
CLI	ENT HNTB						GEOL	OGIC	LOG		·
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	Т			1-49, N	MISSO	URI		
					SAI	MPLES				TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
$\Gamma$	LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid  LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS CT LS	55—		RUN 9	DB	100%	RQD 84%				
	LS+CT  LS  SH  LS  59  CS  1092.7  LS  Cr harlad vertical join d  CT	-		RUN 10	DB	100%	RQD 94%				
The	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.	60		1				]			
WA	TER LEVEL OBSERVATIONS, ft						ING S	-			2-9-03
WL	¥ DRY WD ¥ DRY AB						ING C	OMPL			2-20-03
WL WL	Y DRY WD Y DRY AB Y Y	عال		Jľ		RIG	AΤ\	/, #10	3E F	OREMA	N KS
WL.					_	APP	ROVE	o s	РВ Ј	OB#	J7P0601

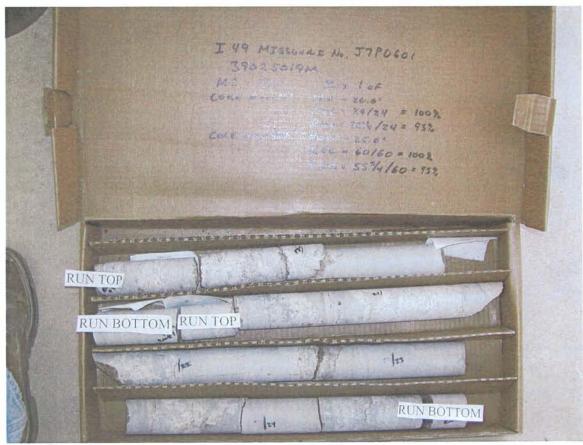
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 	LOG OF BORI	NG N	О.	MC	2-2	12				Pa	age 7 of 10
	JENT HNTB						GEOL	OGIC	LOG		
SI	TE McDONALD COUNTY, MISSOURI	PRC	JEC	T			I-49, N	-			
					SA	MPLE	<u>s</u>			TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	_								- ::	
	Ls + c <del>r</del>				-						
	64 1087.7 CT+7LIMESTONE++				DB	00%	RQD				
	stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid  LS  LS  LS  LS  LS  LS  LS  LS  LS  L	65—		11			88%		, , ,		
<u> </u>	SH CTOLS LS LS										
	1082.7  CT  LS  CT  LS  CT  CS  COntinued Next Page	70—	F	RUN E 12	DB 10		RQD 95%				
he si etwe	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.										
VAT	ER LEVEL OBSERVATIONS, ft				В	ORIN	IG STA	RTEL	)		2-9-03
	¥ DRY WD ¥ DRY AB	<b>-</b>	_				IG CON				2-20-03
/L   \\ \	Y DRY WD Y DRY AB TEST	JC	U	П	R		ATV,	<del></del>		REMAN	KS
_					Αſ	PPRO	OVED	SPE	JOB	3# .	J7P0601

	LOG OF BOR	NG N	Ο.	MC	-21	12				Pag	e 8 of 10			
CL	IENT HNTB						GEOL	OGIC	LOG					
SIT	E	PRC	JEC	T										
	McDONALD COUNTY, MISSOURI		I-49, MISSOURI SAMPLES TESTS											
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf				
<	cr LIMESTONE++ stratified, abundant chert seams and inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid		-								1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1			
	LS+CT SH CT SH LS	-	-											
	C7  LIMESTONE++  cr+ stratified, abundant chert seams and	- '.7	<u> </u>	RUN 13	DB	100%	RQD 98%							
	inclusions, trace shale laminations, white, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid to healed vertical joint	75-									· 数。			
	- ct Lewled vertical joint	-												
	- LS + CT - LS 79 107	2.7							ţ					
	<b>L</b> S	80-		RUN 14	DB	100%	RQD 10 <b>0</b> %				inter-			
The	Continued Next Page e stratification lines represent the approximate boundary lines				1	<u> </u>	<u> </u>	<u> </u>	<u></u>					
bet	ween soil and rock types: in-situ, the transition may be gradual.			_		BOB	ING S	TART	FD		2-9-03			
	ATER LEVEL OBSERVATIONS, ft - ♀ DRY WD ♀ DRY AB						ING C			D	2-20-03			
WL		<b>'a</b> '		31	ור	RIG		√, #10		FOREMA				
* 4 L					-		ROVE			JOB#	J7P0601			

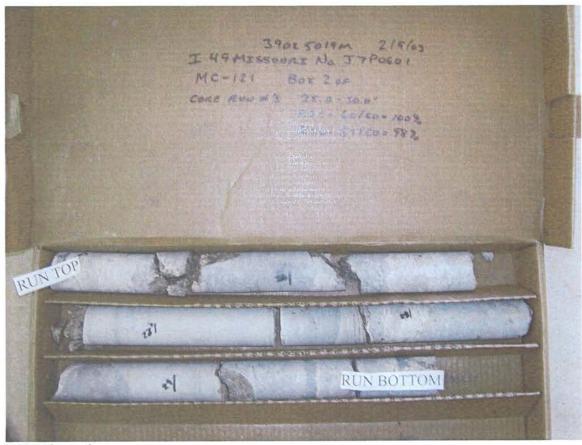
_	LOG OF BORI	NG N	О.	MC	<b>C-2</b>	12				Pa	age 9 of 10
	LIENT HNTB						GEOL	OGIC	LOG		
SI	McDONALD COUNTY, MISSOURI	PRC	JEC	T			I-49, I	·			
					SA	MPLE				TESTS	
GRAPHIC LOG	DESCRIPTION  REED SPRINGS FORMATION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	ψ.
The s	continued Next Page stratification lines represent the approximate boundary lines	85		RUN 15	DB	100%	RQD 93%				
etwe	een soil and rock types: in-situ, the transition may be gradual.										j
۷A٦	TER LEVEL OBSERVATIONS, ft			-	В	ORIN	IG STA	RTEL	)		2-9-03
	▼ DRY WD ▼ DRY AB		_				ig coi				2-20-03
	P DRY WD P DRY AB	JC			R	IG				REMAN	
۷L		. —			A	PPRO	OVED	SPE	JOE	3 #	J7P0601

	LOG OF BORIN	G N	0.	MC	-21	12				Pag	e 10 of 10		
CLI	ENT HNTB	-					GEOL	OGIC	LOG				
SIT	Е	PROJECT I-49, MISSOURI											
	McDONALD COUNTY, MISSOURI				SAN	MPLES		11330	UKI	TESTS			
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf			
	LIMESTONE++  LS stratified, trace shale laminations, gray, medium to thick bedded, medium to coarse grained, fresh, hard, solid  1060.7	-											
The	stratification lines represent the approximate boundary lines												
	ween soil and rock types: in-situ, the transition may be gradual.	-				BOR	ING S	TART	ED		2-9-0		
W.	ATER LEVEL OBSERVATIONS, ft  V DRY WD V DRY AB						INGC				2-20-0		
WL		7		71	7	RIG		/, #10		OREMA			
VVL			_•			APP			PB J		J7P060		



I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 1 18.0 Feet to 20.0 Feet Run No. 2 20.0 Feet to 25.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 3 25.0 Feet to 30.0 Feet



I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 4 30.0 Feet to 34.0 Feet Run No. 5 34.0 Feet to 39.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 6 39.0 Feet to 44.0 Feet Run No. 7 44.0 Feet to 49.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 8 49.0 Feet to 54.0 Feet Run No. 9 54.0 Feet to 59.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 10 59.0 Feet to 64.0 Feet Run No. 11 64.0 Feet to 69.0 Feet



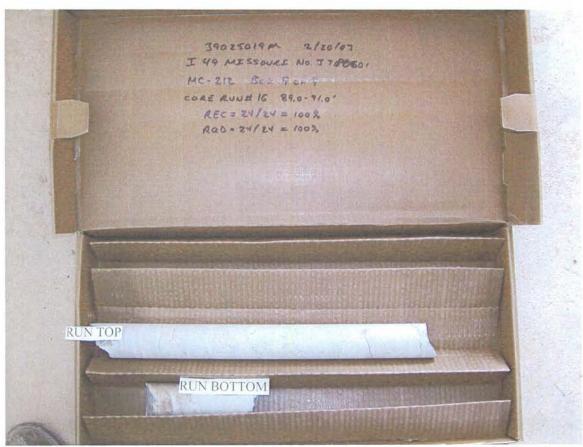


I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 12 69.0 Feet to 74.0 Feet Run No. 13 74.0 Feet to 79.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 14 79.0 Feet to 84.0 Feet Run No. 15 84.0 Feet to 89.0 Feet



I 49 Missouri Missouri J7P0601 Boring MC-212 Run No. 16 89.0 Feet to 91.0 Feet



	LOG OF BORIN	IG N	0.	MC	-22	29				D	omo 1 of 2
CLI	ENT				-					Г	age 1 of 3
SIT	HNTB	PRO	IFC								T
011	McDONALD COUNTY, MISSOUR	PRO	JEC	1			I-49, N	/IISSO	URI		
	Boring Location: 945+08, 120 feet left of centerline				SAN	MPLES				TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
/////	Approx. Surface Elev.: 1169.5 ft  LEAN CLAY, with gravel	ä			AS	8	SF	30	<u>P</u> 8	N. S.	
	brown, stiff, moist	=	CL	1	AS						
	5 1164.5	5—	0.								
	LEAN CLAY, scattered gravel reddish brown, stiff to very stiff, moist	-	CL	2	AS			- F			
		10									
	Sociedadas a T	15—				¥	-				
	20 1149.5				100						
	LEAN CLAY, with gravel brown, stiff, moist	20 —	CL	3	AS	<i>a</i>					
		25									
	- abundant chert seams below 31 feet	30-	10 10 10 10 10			×					
/////	Continued Next Page	$\exists$						Ama i	# manual	n in a said	
The s	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.				1 1						
	TER LEVEL OBSERVATIONS, ft					ROBI	NG ST	APTE	D		F 0 00
WL					-		NG ST		-		5-8-03
WL	¥ DRY WD ¥ DRY AB  ¥				1	RIG		TV, #9		OREMA	5-20-03 N SS
WL	APPROVED BRO CE						ROVED				J7PO601

	LOG OF BORIN	IG N	<u>O.</u>	MC	-22	29				F	Page 2 of 3
	ENT HNTB										
SIT	E McDONALD COUNTY, MISSOUR	PRO	JEC	Т			I-49, N	/ISSO	IJRI		
					SA	MPLE			<u> </u>	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	LEAN CLAY, with gravel brown, stiff, moist	=							i		
	36  LIMESTONE++  stratified, abundant chert seams and inclusions, with clay seams, light gray and	35—		RUN 1	DB	73%	RQD 59%				
	gray, thin bedded, fine grained, weathered, hard, possible cavities  CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded,	40-		RUN 2	DB	100%	RQD 95%				
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	very fine to fine grained, slightly weathered to fresh, hard, solid, trace vugs	45		RUN 3	DB	100%	RQD 81%			·	
$\Delta$	49 1120.5 CHERT++			4			RQD 100% RQD				
	stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs	50		5	00	90 /6	88%	:			
		55		RUN 6	DB	97%	RQD 79%		į		
		$\exists$			RB	222					
				RUN 7			RQD 83%				!
		60-		RUN 8	DB	100%	RQD 55%				
Δ	i	3		RUN	DB I	100%	ROD				
	Continued Next Page	65—									
The s betwe	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.		·		•						
WAT	ER LEVEL OBSERVATIONS, ft				E	BORI	NG ST	ARTE	)		5-8-0 <b>3</b>
_	¥ DRY WD ¥ DRY AB		_	_	Ē	BORI	NG CO	MPLE	TED	<del></del> -	5-20-03
WL	y DRY WD Y DRY AB TEST	JC			F	RIG	A٦	V, #9	8 FC	REMA	N SS
VVL					1	\PPR	OVED	BRO	OL IO	B#	J7PO601

	LOG OF BORIN	IG N	0.	MC	-22	29				P	age 3 of 3
CL	ENT <b>HNTB</b>										<u> </u>
SIT		PRO	JEC	Т			I-49, N	lieeo	I IDI		
	MCDONALD COCKTT, MICCOCK		1		SAI	MPLES		11330	OKI	TESTS	<del></del>
GRAPHIC LOG	DESCRIPTION	ОЕРТН, А.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	-м -
Δ Δ Δ Δ Δ Δ Δ Δ	CHERT++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs			9			60%				
		70-		RUN 10	DB	95%	RQD 75%				
		75		RUN 11	DB	95%	RQD 94%				
Δ Δ Δ Δ Δ Δ		80-		12		97%	97%				
	BOTTOM OF BORING AT 88.5 FEET BACKFILLED WITH CUTTINGS ON 05/20/03	85-		13			RQD 98% RQD 80%	- - - -			;
	++ Classification estimated from core	=======================================									
	NOTE: Boring MC-229 was drilled to 36 feet and cored to 49 feet. At this depth, the core bit would not cut the chert. The boring was abandoned until a different bit could be used.										
	Boring MC-229B was cored in the same boring as MC-229. The hole was cased to 42 feet and cored to 88.5 feet.				:						-
The bety	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.			,							
W	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TARTI	ΞD		5-8-0 <b>3</b>
: WL	\[   \begin{align*}   \Pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \Pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \Pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \Pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \Pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \Pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   \pi \\ DRY \\   \end{align*}   \]   \[   \begin{align*}   {align*}   \]   \[   a		-,		<u>,</u>		ING C	OMPL	ETEC	)	5-20-03
WL	TORY WO TORY AB COMMENTS	حال	_[	JI		RIG			-+	OREMA	
<b>WL</b>						APP.	ROVE	D BE	SOJJ	OB#	J7PO601

		LOG OF BORIN	IG N	0.	MC	:-2:	29				Pa	ge 4 of 10
1		HNTB						GEOL	OGIC	LOG		
	SIT	McDONALD COUNTY, MISSOURI	PRO	JEC	T			1-49, N	/IISSC	URI		
	I		-	-		SA	MPLE:			1	TESTS	T
	GRAPHIC LOG	DESCRIPTION	ОЕРТН, ſĹ	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	٠.
			35—									
TERRACON.GDT 12/6/03		LIMESTONE++ stratified, abundant chert seams and inclusions, with clay seams, light gray and gray, thin bedded, fine grained, weathered, hard, possible cavities  CT REED SARINGS FORMATION  LS  CT Continued Next Page	40—		1			RQD 59% RQD 95%			,	•
GP.	The :	stratification lines represent the approximate boundary lines een soil and rock types: In-situ, the transition may be gradual.				_						
MC-229.	_	TER LEVEL OBSERVATIONS, ft	·		******	T	BOR	NG ST	ARTE	D		5-8-03
	WL		<b>—</b>					NG C	OMPL	ETED		5-20-03
프		Y DRY WD Y DRY AB Y Y  Z  Z  Z  Z  Z	JL	.C			RIG		TV, #		OREMA	
ğ	WL						APPF	ROVED	) BF	SO 10	OB#	J7PO601

LOG OF BORING NO. MC-229 Page 5 of 10 CLIENT **HNTB GEOLOGIC LOG** SITE **PROJECT** McDONALD COUNTY, MISSOURI I-49, MISSOURI SAMPLES TESTS GRAPHIC LOG UNCONFINED STRENGTH, psf RECOVERY, in. USCS SYMBOL DRY UNIT WT DESCRIPTION SPT - N BLOWS / ft. WATER CONTENT, DEPTH, ft. NUMBER TYPE CHERT++ stratified, abundant limestone seams, light gray and gray, thin to medium bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace vugs fractures LS CT CT L 5 43 67 1125.0 CHERT++ RUN DB 100% RQD 67 stratified, abundant limestone seams, light 3 81% gray and gray, thin to medium bedded, 45. 27 very fine to fine grained, slightly weathered to fresh, hard, solid, trace vugs LS 45  $c\tau$ CT 1122.0 CHERT++ RUN DB 100% RQD CT stratified, abundant limestone seams, light 4 100% gray and gray, thin to medium bedded, LS very fine to fine grained, slightly weathered to fresh, hard, solid, trace vugs 49 1120.5 LS RUN DB 98% RQD 88% 50 **Continued Next Page** The stratification lines represent the approximate boundary lines between soil and rock types: In-situ, the transition may be gradual.

		L OBSE	RVATIONS,	, ft
WL	[∑] DRY	WD	¥ DRY	AB
WL	Ā		Ţ	
WL				

**Tierracon** 

_					
BORING	STA	RTED		_	5-8-03
BORING	CON	/PLETE	ED_	5	20-03
RIG	ΑT	v, #98	FOREM	AN	SS
APPROV	ΈD	BRO	JOB#	J7F	O601

LS

	LOG OF BORIN	IG N	Ο.	MC	<b>C-2</b>	29			·	Pa	ge 6 d	of 10
	IENT HNTB						GEOL	OGIC	LOG			
SIT	McDONALD COUNTY, MISSOURI	PRO	JEC	Т			I-49, I	VISSO	URI			·
					SA	MPLE	S			TESTS	T	
GRAPHIC LOG	DESCRIPTION	ОЕРТН, А.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf		st ^a n.
	cr CHERT++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs											And f
	<i>CT</i>	_ 										
	CT									•		
- 4 -	_ LSCF	_										
	LS	_										
 	54 55 CHERT++  Stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs	55—		RUN 6	DВ	97%	RQD 79%		·		**	*
		_										•
	Stratified, abundant limestone seams, light gray and gray, medium to thick bedded,	-			RB					<u> </u>		
	to fresh, hard, solid, trace pits and vugs  CHERT++  stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs			RUN 7	DB	98%	RQD 83%					
	67 1110.5											,
	LS			RUN 8	DB	100%	RQD 55%				Ş.	e e
	Continued Next Page	60					:					±. ;`
	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.								<u> </u>			
	TER LEVEL OBSERVATIONS, ft				Ī	BORI	NG ST	ARTE	D		5-	8-03
	V DRY WD V DRY AB V	76	-	<b>,</b>			NG CC					0-03
	ă ă IIGLI	IJL	·L	J		RIG			<del></del>	PREMA		SS
WL :						APPF	ROVED	BR	OLIC	B#	J7PC	0601

CI	LOG OF BORI	NG N	U.	MIC	<i>,</i> -2	29				Pa	age 7 of 1
	HNTB						GEOL	OGIÇ	LOG		
SIT	McDONALD COUNTY, MISSOURI	PRC	JEC	T	•		1.40	MISSO	NI IDI		
	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s	<del>                                     </del>			SA	MPLE		111330	OIXI	TESTS	
5070	DESCRIPTION	نبر	MBOL			RY, in.	j.	7, %	TW.T	INED TH, psf	
GRAPHIC LOG	<del></del>	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	creatified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs										
	48	_	İ			1					
	er						İ				
	cr	_									
	- Ls	_									
		-								•	
	- LS	-									
	64 1105.5							i			<u>.</u>
	chert++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered	_		RUN 9	DB	100%	RQD 60%				
-	to fresh, hard, solid, trace pits and vugs	65—									
	cr										
	LS	-									
	CT   43	_									
	- cT										
	45										
	<del>-</del>	-									V*
			Ì					- 1	Ì		
	69 1100.5		[	i						į	3 2
	43	7		RUN 10	DB	95%	RQD 75%				
	LS LS	-		10			13%				
-	Continued Next Page	70—									
The s	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.			1					<u> </u>		V
	TER LEVEL OBSERVATIONS, ft			<del></del>	Ţ	30RI	NG ST	ARTF	D		5-8-03
					-		NG CC				5-20-03
	Y DRY WD Y DRY AB TEST					RIG		ΓV, #9		REMA	
VL					<b>-</b> F		OVED			B#	J7PO601

CL	LOG OF BORIN	10 14	<u>J.</u>	141	J=Z:	LJ		<del></del>		Pa	ge 8 of 1
	HNTB						GEOL	OGIC I	LOG		
SIT	TE McDONALD COUNTY, MISSOURI	PRO	JEC	Т			I_40 N	/IISSO	ופוו		
		<del> </del>			SA	MPLE			<u> </u>	TESTS	<del>"' ,</del>
GRAPHIC LOG	DESCRIPTION	ОЕРТН, А.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	chert++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs	_									
	LS	_									
	cr _4\$			•						:	
	CT LS CT	_									
	74 LS  CHERT++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs	75—		RUN 11	DB	95%	RQD 94%		-		
	_ Ls	_									
	_ LS	_									
	- L9 CT										
	79 Ls 1090.5	_		RUN	DB	97%	RQD				
	Ls CT	-		12			97%				
The s	stratification lines represent the approximate boundary lines	80—					į				···
	een soil and rock types: in-situ, the transition may be gradual.					BOD!	NG ST	ADTE	D		5-8-6
	TER LEVEL OBSERVATIONS, ft  ▼ DRY WD ▼ DRY AB				L		NG SI				5-20-(
	Y DRY WD Y DRY AB Y Y  T  T  T  T  T  T  T  T  T  T  T  T	76	•	1	<b>)</b>	RIG		TV, #9		REMA	
VL			•	ge.	<b>-</b> [-		OVED			B#	J7PO60

	LOG OF BORIN	IG N	0.	MC	-22	29				Pa	ge 9 of 10
	LIENT HNTB				·		GEOL	OGIC	LOG		
SI	TE McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49, N				
					SA	MPLE:				TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	cr CHERT++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs  81.5  1088.0	-					,				
	cr CHERT++ stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs			RUN 13	DB	100%	RQD 98%				,
	65 67 84 1085.5 CHERT++			OL IN	DB	100%	RQD				
	stratified, abundant limestone seams, light gray and gray, medium to thick bedded, very fine to fine grained, slightly weathered to fresh, hard, solid, trace pits and vugs	85—		14		100 %	80%				
<	- rz	_									т С С
	- LS						:				
	<b>4 S</b> - 88.5 1081.0										
											į
The s	Continued Next Page stratification lines represent the approximate boundary lines								İ		
petwe	een soil and rock types: in-situ, the transition may be gradual.										
	TER LEVEL OBSERVATIONS, ft  ☐ DRY WD ☐ DRY AB ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐					<del></del>	NG ST			<del></del>	5-8-03
٧L	V DRY WD V DRY AB V V	<b>3C</b>			R	lG	Α٦	ΓV, #9	8 FC	REMAI	
۷L					Α	PPR	OVED	BR	0 10	B#	J7PQ601

L		OG OF BORIN	IG N	Ο.	MC	<b>)-2</b> 2	29				Pag	e 10 of 10
	JENT HNTB					_		GEOL	OGIC	LOG		
SIT	E McDONALD COUNTY, MISSO	NI IPI	PRO	JEC	Т							·
	Mesolates Goold II, Misse	JORI		Ι –	Γ.	SAI	MPLE:	1-49, N	11220	UKI	TESTS	<del></del>
GRAPHIC LOG	DESCRIPTION		<b>ДЕРТН, ft.</b>	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	our Sec. 1
	NOTE: Boring MC-229 was drilled to 36 cored to 49 feet. At this depth, the would not cut the chert. The boring abandoned until a different bit coused.  Boring MC-229B was cored in the boring as MC-229. The hole was 42 feet and cored to 88.5 feet.	he core bit ring was puld be									S	
		1										4
The s	stratification lines represent the approximate bo	oundary lines		-		1	1					<del></del>
betwe	een soil and rock types: in-situ, the transition r	nay be gradual.					_					
	TER LEVEL OBSERVATIONS, ft					-		NG ST				5-8-03
1	[▼] DRY WD <mark>▼ DRY AB</mark> ▼ <u>▼</u>	<b>Tlerra</b>	76					NG CO			DE	5-20-03
WL	· · · · · · · · · · · · · · · · · · ·		JL			<b>-</b>	RIG	·	TV, #9		REMAI	
VVL						1 /	イトトム	OVED	BK(	ol lo	<b>ピ</b> #	J7PO601



I 49 Missouri Missouri J7P0601 Boring MC-229 Run No. 1 36.0 Feet to 39.5 Feet Run No. 2 39.5 Feet to 44.5 Feet



I 49 Missouri Missouri J7P0601 Boring MC-229 Run No. 3 44.5 Feet to 49.0 Feet Run No. 4 49.0 Feet to 51.5 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 1 42.0 Feet to 44.0 Feet Run No. 2 44.0 Feet to 47.5 Feet



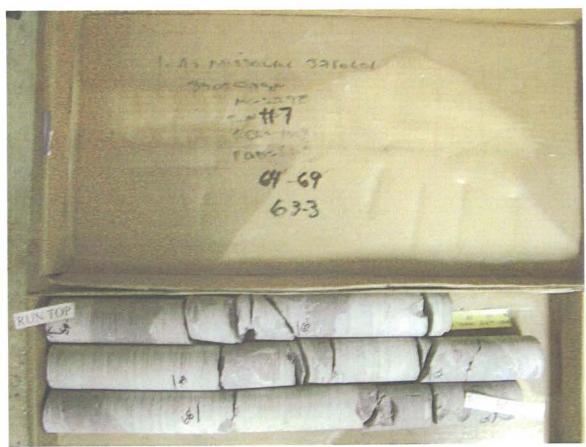
I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 3 47.5 Feet to 49.0 Feet Run No. 4 49.0 Feet to 54.0 Feet Run No. 5 54.0 Feet to 56.0 Feet





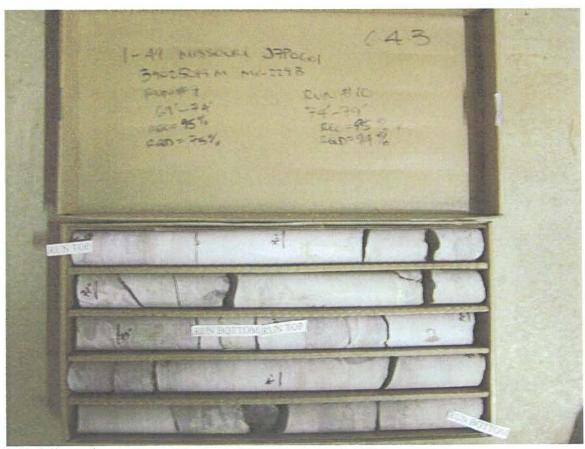
I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 6 57.0 Feet to 59.0 Feet Run No. 7 59.0 Feet to 64.0 Feet





I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 8 64.0 Feet to 69.0 Feet





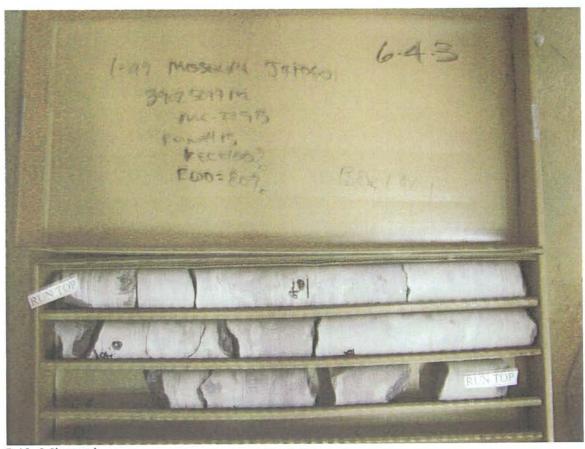
I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 9 69.0 Feet to 74.0 Feet Run No. 10 74.0 Feet to 79.0 Feet





I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 11 79.0 Feet to 81.5 Feet Run No. 12 81.5 Feet to 84.0 Feet





I 49 Missouri Missouri J7P0601 Boring No. MC 229B Run No. 13 84.0 Feet to 88.5 Feet



	LOG OF BOI	RIN	IG N	0.	MC	:-2:	53		,,,,,	•		
CLI	ENT HNTB					·				·		age 1 of 3
SIT	E		PRO	JEC	Т		-	<del></del>				·
	McDONALD COUNTY, MISSOURI  Boring Location: 961+08, 120 feet left of centerline			ı —	Γ	SAI	MPLE		/ISSO	URI	TESTS	
	Soming Education: 901700, 120 feet left of Centerline			<b> </b> 			VII L.L.		<del>                                     </del>		12313	
GRAPHIC LOG	DESCRIPTION		نیر	USCS SYMBOL			RECOVERY, in.	يد	% '_	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
АРНІ			DEРТН, ft.	S S)	NUMBER	ш	OVE.	SPT - N BLOWS / ft.	WATER CONTENT,	ž	ENG	
GR	Approx. Surface Elev.: 1183.4 ft		<u> </u>		NON	TYPE	REC	SPT BLO	A δ	Pg Pg	STR	
	CLAYEY GRAVEL, with chert seams light brown and brown, dense, moist		_	GC		HS	:					
	and stown and stown, across, moist		=									
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	17 CLAYEY GRAVEL / HIGHLY	66.4	=	GC		RB						
	WEATHERED CHERT, abundant chert seams					``						
	light brown, very dense, moist		20—									
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. X. A	30 118	53.4	30-								<u> </u>	
ΔΔ			=		RUN 1	DB	100%	RQD 32%				
Δ 4 ^ ^	1		$\exists$									
76-	Continued Next Page											
A A A A A A A A A A A A A A A A A A A	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.											<u> </u>
WA	TER LEVEL OBSERVATIONS, ft					1	BOR	ING ST	ARTE	D		2-20-03
WL	V DRY WD V DRY AB V V	<b>-</b> -	7-	-	<b>)</b> F	•		ING C				5-31-03
WL	ā IIGL		JL		J		RIG		TV, #9	_	OREMA	
WL							APP	ROVED	) BR	O   J0	OB#	J7P0601

	LOG OF BORIN	IG I	VC	).	MC	-25	53				P	age 2 of 3
CLII	ENT HNTB											
SITI	E	PR	OJ	EC1	-							<del></del> -
	McDONALD COUNTY, MISSOURI		1	T		SAN	MPLES	1-49, N	MISSO	URI	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.		USCS SYMBOL	NUMBER	турЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	. 9
$\Delta$ $\Delta$ $\Delta$ $\Delta$	CHERT++ stratified, abundant limestone seams and		$\exists$									
	beds, light gray and gray, thin bedded, very fine grained, weathered, hard, abundant fractures, with vugs	35- -		F	RUN 2	DB	100%	RQD 42%				
		40-		F	RUN 3	DB	100%	RQD 57%				
		45-		ļ	RUN 4	DB	100%	RQD 82%				
	50 1133.4	50-			5			RQD 46%				,
	CHERT++ stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh,	_			6			RQD 85% RQD				
	hard, solid	55-	=		7 RUN	DB	100%	100% RQD 85% RQD				
		60-			9			60%				
		-		F	RUN 10	DB	100%	RQD 75%				
Δ Δ Δ Δ	Continued Need Deep	65-	7									
	Continued Next Page stratification lines represent the approximate boundary lines			. !								<del></del>
betw	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft						BOD!	ING ST	TADTE	-D	<del></del>	2-20-03
WL	V					┢		ING CO			)	5-31-03
WL WL	y y Terr						RIG	A		98 F	OREMA	

"-	LOG OF BORIN	IG N	0.	MC	-25	3				Pa	age 3 of 3
CLIE	HNTB										
SITE	McDONALD COUNTY, MISSOURI	PRO	JEC	Т			1-49, N	NISSO	URI		
			,		SAN	/PLES	3			TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	:
	CHERT++ stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	70-		RUN 11		100%	RQD 74%				
	BOTTOM OF BORING AT 80 FEET BACKFILLED WITH CUTTINGS 05/31/03	75—		12 RUN			74% RQD				
Δ Δ Δ Δ Δ Δ Δ Δ Δ Δ	++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.  1103.4	80		13			78%				e
	NOTE: Information from three borings was combined to produce this log. Boring MC-253 was drilled to 7 feet and cored to 45 feet. At this depth, the boring caved in and was abandoned.  Boring MC-253A was moved 9 feet northwest of boring MC-253. MC-253A was drilled to 28 feet and cored to 49.5 feet, where the core barrel became stuck in the rock. The boring was abandoned.										
	the rock. The boring was abandoned.  Boring MC-253B was moved 9 feet northeast of boring MC-253. MC-253B was drilled to 30 feet and cored to 80 feet.										,
				<u> </u>							
The s	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.										
	TER LEVEL OBSERVATIONS, ft						ING S				2-20-03
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WL	ā ā IIGU	CI	_(	J	▮▮	RIG	ROVE		#98   F RO   J	OREMA	J7P0601

9 MC-253.GPJ TERRACON

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L		ENT				HNT	В								•				, (	GEOL	.OGIC	LOG	_		· · · · ·
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F				<u> </u>		0001	• • • • •	VII O	<del>500</del>	111			_		Γ.		. \$	АМІ	PLES		MISSO	JURI	TESTS	;	بر بر
	GKAPHIC LOG	LS	CUI	ERT++		DESC	RIPT	101	١					DEPTH, ft.	USCS SYMBOL	NUMBER	٠.	1.	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf		\$
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-		LS																							A Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part of the Part
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	CLIENT		HNTB								GEOL	ogic	LOG	<u> </u>		
Ĺ	SITE	McDON	ALD COUNTY	, MISSOURI		PRO	JEC	T				MISSO			<del></del>	_
ļ									SA	MPLE				TESTS		_
	GRAPHIC LOG		DESCRIF	PTION		DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	15	
-	er cr	fine graine	abundant limes gray and gray d, weathered.	stone seams and , thin bedded, v hard, abundant	erv	_		RUN 3		100%	RQD 57%					-
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	Ls														<u>.</u> ه ۰۰	
<u> </u>	45 67				1138.4	4 45								-	  38	
		Deas, light (	gray and gray, I. weathered, h	one seams and thin bedded, ve ard, abundant	ry	45	F	RUN 4	DB 1	00%	RQD 82%					
	∠ς 47.3															
	cT	CHERT++ stratified, at	oundant limesto	one seams and	1136,1		R	UNI	DB 10	00%	RQD 46%					
		veas, light g	ray and gray, t weathered. h	hin bedded ver	У						10 /6				-	
2/5/03	cr		·												# £	
TERRACON GDT 12/5/03	۲۶					4										
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	e stratificat ween soil	tion lines repre	ontinued Nex	t Page nate boundary line sition may be grad	s											
W	ATER LF	VEL ORSE	RVATIONS, ft	sidon may be grad	ual.				_			<del>-:</del>				
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The better WA			<u>V</u>		2113	76			BC		G COM		<del> </del>		5-31-03	
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L	CLIENT HNTB						GEOL	OGIC I	LOG		
S	McDONALD COUNTY, MISSOURI	PRO	JEC	T			1.40 8	Neev	LIDI		_
		<del>                                     </del>	Γ		SA	MPLE	1 <b>-49, N</b> S	11330	UKI	TESTS	<u> </u>
GRAPHIC LOG		DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	chert++ stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid			RUN 6	DB	100%	RQD 85%				
	CT	-									
<b> </b>	2.2			RUN	DB	100%	RQD				
	53 CT 1130.4	-		_7			100% RQD				
	stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	- -		8 8			85%				. df
	CT	4									•
<b> </b>	55 1128.4 LS CHERT++	55—		DI INI	DB	10004	RQD	_:			
	stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid			9	DB		60%				
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The betw	stratification lines represent the approximate boundary lines yeen soil and rock types: in-situ, the transition may be gradual.	<u> </u>	<del></del>					¹			- W
	TER LEVEL OBSERVATIONS, ft				R	ORIN	IG STA	RTED			2-20-03
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WL					Α	PPRO	OVED	BRO	<del></del>		J7P0601

LOG OF BORIN	IG N	0.	MC	C-2	53				<u> </u>	age 7 of 9
HNTB						GEOL	OGIC	LOG		
SITE McDONALD COUNTY, MISSOURI	PRO.	JEC	T			I-49, N	MISSO	URI		
		•		SA	MPLE				TESTS	
DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
CF CHERT++ Ls stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid  Ls CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS CF LS LS LS LS LS LS LS LS LS LS LS LS LS	65		RUN 10	DB	100%	RQD 75%	\$0	O O	n s	
Continued Next Page  The stratification lines represent the approximate boundary lines at tween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft  AP DRY WD PDRY AB  L PDRY WD PDRY AB  L PDRY WD PDRY AB  L PDRY WD PDRY AB  L PDRY WD PDRY AB			n	B(	ORIN			ED FOF	REMAN	2-20-03 5-31-03 SS

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L	HNTB						GEOL	محاد	LOG		
3	SITE  McDONALD COUNTY, MISSOURI	PRO	JEC	T	.,					·	<del></del>
-	INCOCKALD COOKI 1, MISSOURI	_ <u> </u>	Τ-	Τ.	SAN	MPLES	1-49, N	MISSO	<u>URI</u>	TESTS	
1.									T	15313	<u></u>
OC Oldayao		ОЕРТН, А.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	: Affre
	cr stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	_		RUN 12	DB	100%	RQD 74%				3
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	25 25 25										e de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de la companya de l
	25 CHERT++ stratified, abundant limestone seams and beds, light gray and gray, thin to medium bedded, very fine to fine grained, fresh, hard, solid	75	F	RUN I 13	DB 10	00% F	RQD 78%				
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	LOG OF BOR	ING N	0.	MC	:-25	53				P	age 9 of
CLIEN	T HNTB						GEOL	OGIC	LOG		
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	McDONALD COUNTY, MISSOURI	_	1		SAI	MPLE	1-49, N s	11550	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pd	UNCONFINED STRENGTH, psf	
Ō	Information from three borings was combined to produce this log. Boring MC-253 was drilled to 7 feet and cored to 45 feet. At this depth, the boring caved in and was abandoned.  Boring MC-253A was moved 9 feet northwest of boring MC-253. MC-253A was drilled to 28 feet and cored to 49.5 feet, where the core barrel became stuck in the rock. The boring was abandoned.  Boring MC-253B was moved 9 feet northeast of boring MC-253. MC-253B was drilled to 30 feet and cored to 80 feet.	JO.	n	N	4	RI	18 H	M	od IO	in S	
etween s	fication lines represent the approximate boundary lines soil and rock types: in-situ, the transition may be gradual.  LEVEL OBSERVATIONS, ft						NG STA				2-20-0
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BORING	STA	RTED		2-2	0-03
BORING	COV	/PLETE	ED	5-3	1-03
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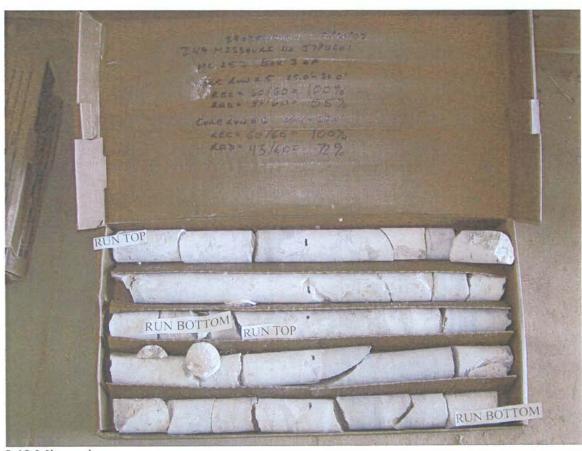
I 49 Missouri Missouri J7P0601 Boring MC-253 Run No. 1 7.0 Feet to 10.0 Feet Run No. 2 10.0 Feet to 15.0 Feet





I 49 Missouri Missouri J7P0601 Boring MC-253 Run No. 3 15.0 Feet to 20.0 Feet (no recovery) Run No. 4 20.0 Feet to 25.0 Feet



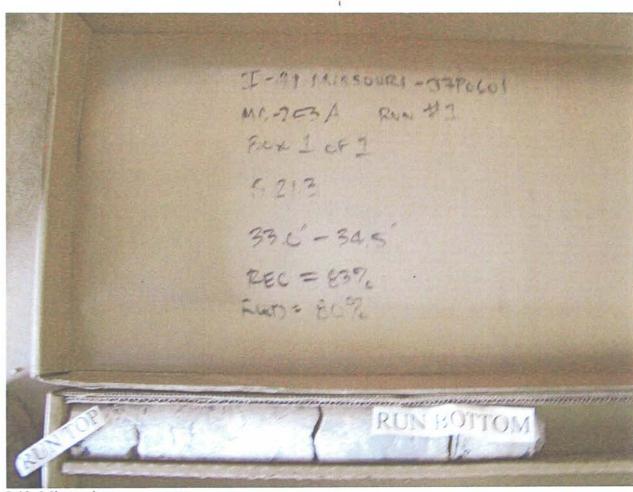


I 49 Missouri Missouri J7P0601 Boring MC-253 Run No. 5 25.0 Feet to 30.0 Feet Run No. 6 30.0 Feet to 35.0 Feet

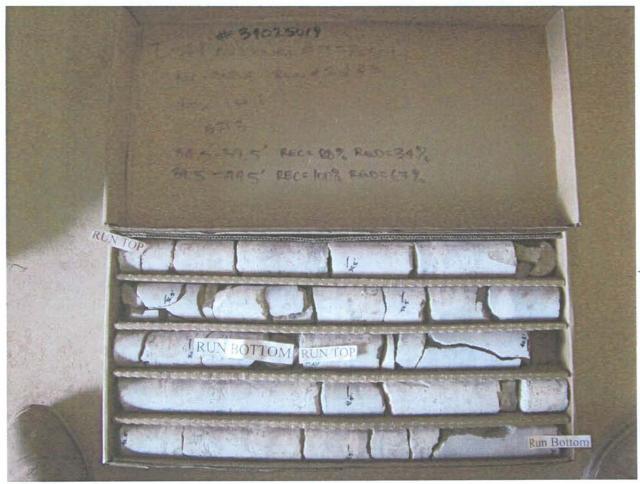




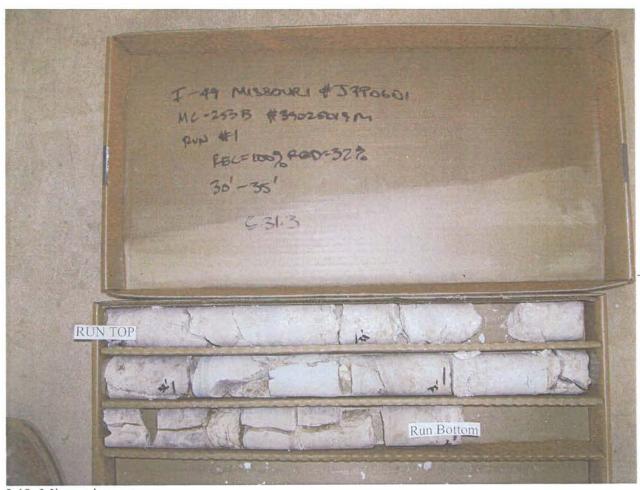
I 49 Missouri Missouri J7P0601 Boring MC-253 Run No. 7 35.0 Feet to 40.0 Feet Run No. 8 40.0 Feet to 45.0 Feet



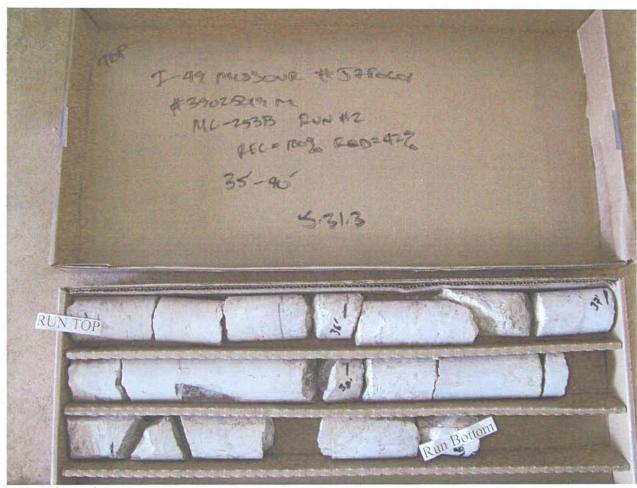
I 49 Missouri Missouri J7P0601 Boring No. MC 253A Run No. 1 33.0 Feet to 34.5 Feet



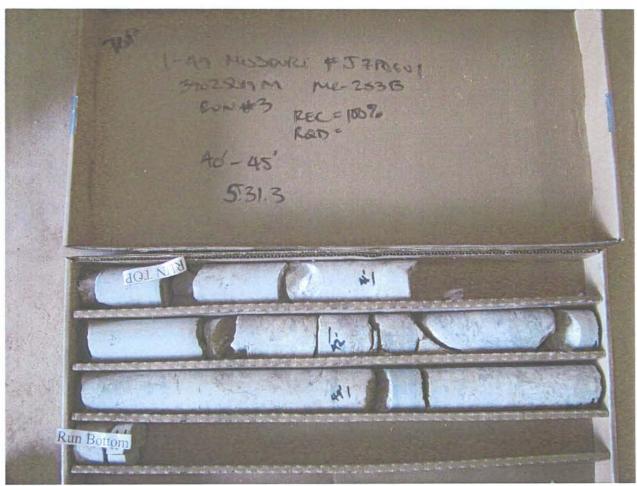
I 49 Missouri Missouri J7P0601 Boring No. MC 253A Run No. 2 34.5 Feet to 39.5 Feet Run No. 3 39.5 Feet to 44.5 Feet



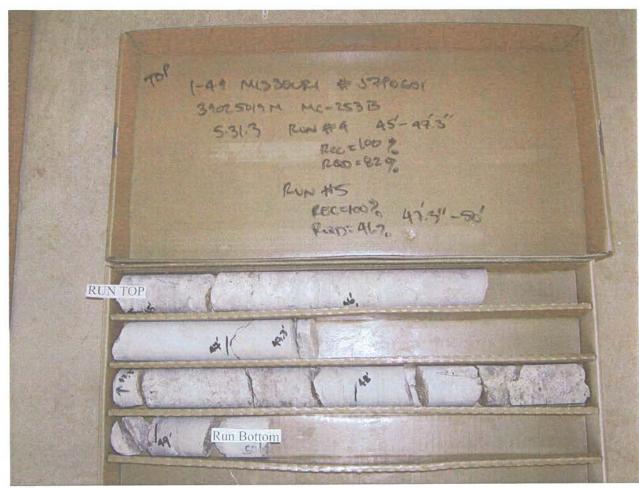
I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 1 30.0 Feet to 35.0 Feet



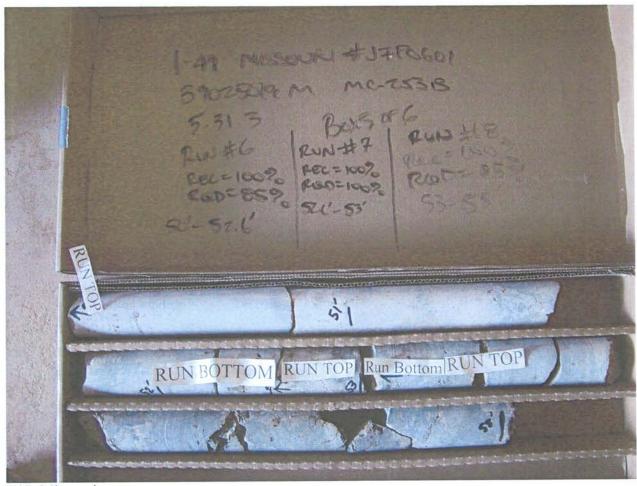
I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 2 35.0 Feet to 40.0 Feet



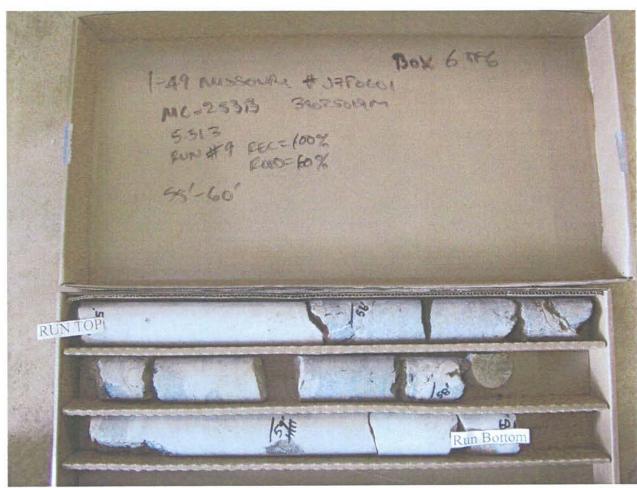
I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 3 40.0 Feet to 45.0 Feet



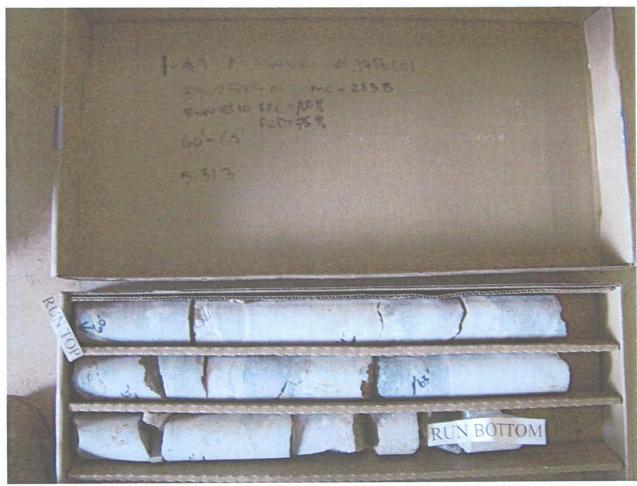
I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 4 45.0 Feet to 47.3 Feet Run No. 5 47.5 Feet to 50.0 Feet



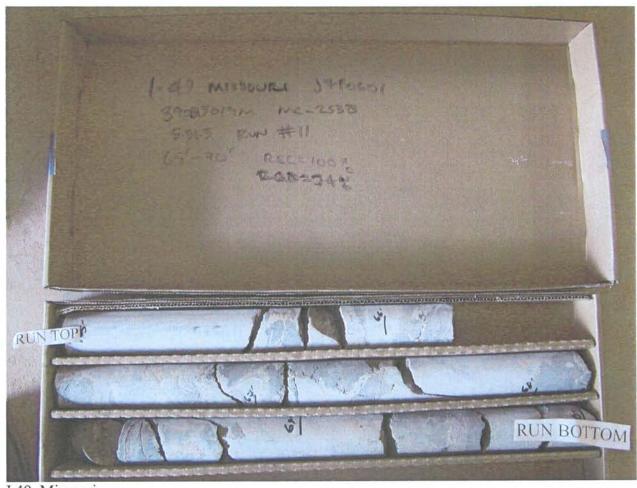
I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 6 50.0 Feet to 52.6 Feet Run No. 7 52.6 Feet to 53.0 Feet Run No. 8 53.0 Feet to 55.0 Feet



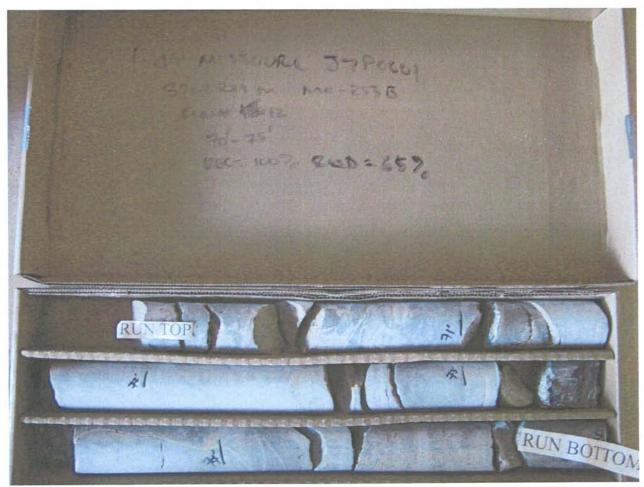
I 49 Missouri 5/31/03 Missouri J7P0601 Boring No. MC 253B Run No. 9 55.0 Feet to 60.0 Feet



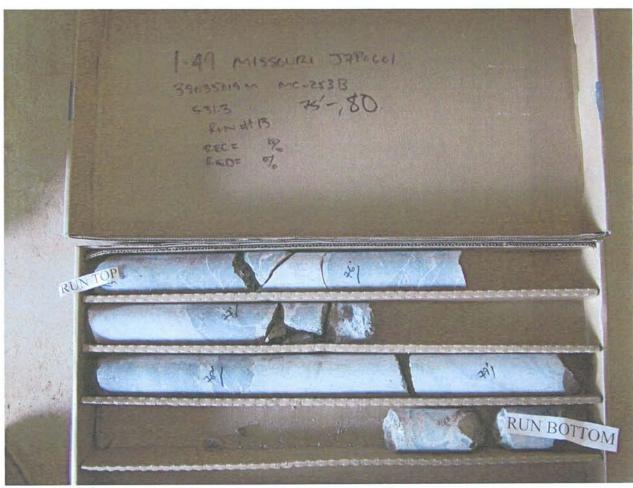
I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 10 60.0 Feet to 65.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 11 65.0 Feet to 70.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 12 70.0 Feet to 75.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 253B Run No. 13 75.0 Feet to 80.0 Feet

	LOG OF BORII	NG N	0.	MC	-27	<b>'</b> 1			,	P	age 1 of 3
CLI	ENT <b>HNTB</b>										<u>-90 : 0: 0</u>
SIT	E	PRO	JEC	Т							
	McDONALD COUNTY, MISSOURI Boring Location: 973+08, 120 feet left of centerline	<del>                                     </del>	Γ.	ļ	SAI	<b>VPLES</b>	1-49, N	<u> IISSO</u>	URI	TESTS	
	25 mg 25 additi. 375 700, 120 feet left of Centerline			ļ	<u> </u>						
507	DESCRIPTION		ABOL			Y, in.	ند	8.	₹	VED H, ps	
GRAPHIC LOG		DEPTH, ft.	USCS SYMBOL	BER		RECOVERY, in	N. VS/f	R ENT	LNS.	NGT	
	Approx. Surface Elev.: 1205.0 ft	DEP	USC	NUMBER	TYPE	REC	SPT - N BLOWS / ft.	WATER CONTENT,	DRY UNIT WT	UNCONFINED STRENGTH, psf	
300		_	GP	1	AS						
	rod, writte and gray, dense, moist	<u>=</u>									
	•	=									
.0°.		5—									
So O		=									
50°											
.0°3		10—									
		10-									
		=									
Od		=									
		15—									
		=									
.0°3		-									
00		=									
	GRAVEL, with silt and clay	20	GP	2	AS						-
	light brown and white, dense, moist	=									
		=									
	25 1180.0	25 _									
$\Lambda \Lambda$	26 CHERT++ Stratified, abundant clay seams, white and 1179.0	의 <u>-</u>		1 1	ne	17% 100%	RQD				
^ ^	highly weathered, hard, with cavities	1 -	1	RUN 2	-		RQD 57%				
	CHERT++ stratified, trace limestone seams, white and	=	1								
	light gray, medium bedded, very fine grained, weathered, hard, solid, trace vugs	30-	]								
	i i			RUN 3	DB	100%	RQD 83%				
	Continued Next Page	_					30 /0				
The betw	stratification lines represent the approximate boundary lines reen soil and rock types: in-situ, the transition may be gradual.										
WA	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TARTI	ED		8-20-03
WL	V DRY WD V DRY AB V DRY 24 hr AB V C	7	-,		ا و		ING C				8-22-03
· · · · · · · · · · · · · · · · · · ·	♥ DRY 24 hr AB ♥	<b>U</b>	_[	JI		RIG		ATV, #	-	OREMA	
WL						APP	ROVE	וט כ	₹U [ j	IOB#	J7P0601

	LOG OF BORI	NG N	Ο.	MC	-27	<b>'</b> 1				P	age 2 of 3
CLI	ENT HNTB										
SIT	McDONALD COUNTY, MISSOURI	PRO	JEC	Т		· ·	I-49, N	MSSO	IJRI	· · · · · ·	
	The state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the state of the s				SAI	MPLES			· · · · ·	TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
		35-									
	CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid	40		RUN 4	DB	100%	RQD 90%				
		45-		RUN 5	DB	90%	RQD 78%				
		45		6			RQD 94%				
4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4		50-		7			RQD 100% RQD				
		55—		8			95%				
		60		RUN 9	DВ	100%	RQD 95%				
The betw WA WL WL				RUN 10	DB	95%	RQD 90%				
ΔΔ	Continued Next Page	65—									
The	stratification lines represent the approximate boundary lines										
WA	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft				丁	BOR	ING S	TART	ED .		8-20-03
WL	Ÿ DRY WD ₹ DRY AB	7		<b>7</b> -	•		ING C				8-22-03
WL WL	¥ DRY WD ¥ DRY AB  ▼ DRY 24 hr AB ▼	۵l	J	JI		RIG APPI	A ROVE	TV,#	$\rightarrow$	OREMA	N SS J7P0601

	TER LEVEL OBSE	RVATIONS, ft	
	· ·	<b>▼</b> DRY	ΑB
WL	TDRY 24 hr AB	<u> Y</u>	
WL			

BORING STARTED         8-20-03           BORING COMPLETED         8-22-03           RIG         ATV, #98 FOREMAN SS           APPROVED BRO JOB # J7P0601				
RIG ATV, #98 FOREMAN SS	BORING STA	RTED		8-20-03
· · · · · · · · · · · · · · · · · · ·	BORING CO	MPLETE	ED .	8-22-03
APPROVED BRO JOB# J7P0601	RIG AT	V, #98	FOREMA	AN SS
	APPROVED	BRO	JOB#	J7P0601

	LOG OF BORIN	IG N	0.	MC	-27	'1				P	age 3 of 3
CLI	ENT HNTB										
SIT		PRO	JEC	Т			I-49, N	HISSO	URI	<u> </u>	<u> </u>
				[	SAN	/PLES			<u> </u>	TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
<u>Δ</u> Δ Δ Δ	CHERT++	_					•				
Δ Δ Δ Δ Δ Δ	stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid			RUN 11	DB	100%	RQD 88%				
$\Delta$ $\Delta$		70-						1			
Δ Δ Δ Δ Δ Δ		=======================================		RUN 12	DB	100%	RQD 97%				
Δ Δ Δ Δ			1							•	
Δ4	76 1129.0	75—				:					
	CHERT++ stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine grained, fresh, hard, solid			RUN 13	DB	100%	RQD 97%				
Δ Δ Δ Δ Δ Δ		80-		RUN	DB	97%	RQD				
		=		14		<b>5.</b> 70	69%				
Δ Δ Δ Δ		85—									•
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	BOTTOM OF BORING AT 96 FEET BORING BACKFILLED WITH CUTTINGS 08/22/03			RUN 15	DB	95%	RQD 87%				
1 2 2 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.	90-									
1 2 2 3 4 4 4 4 4 4 4 4 7 7 7 7 7 7 7 7 7 7 7	Note: Catcher broke - lost last foot of core from barrel.	95—		RUN 16	DB	75%	RQD 69%				
ΔΔ	96 1109.0		<del> </del>	-							
The bety	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TARTI	ΞD		8-20-03
WL	\$\Pi\$ DRY   \$\Pi\$ DRY   \$\AB\$				<u>,</u>		ING C				8-22-03
WL	Y DRY 24 hr AB Y	حال	_(			RIG				OREMA	
WL						APP	ROVE	D BF	₹O   J	IOB#	J7P0601

	ENT HNTB						GEOL	OGIC	LOG			
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	T			I-49, N	Neco	ilDi			
	MEDONALD COUNTY, MIGGOOK		[		SA	MPLE		11330	OKI	TESTS		_
GRAPHIC LOG	DESCRIPTION	оертн, п.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pof	UNCONFINED STRENGTH, psf		
	25  CF CHERT++ stratified, abundant clay seams, white and CLAY pink, very thin bedded, very fine grained, highly weathered, hard, with cavities  1179.0	25—		RUN 1	DB	17%	RQD 0%	,		:		
000000	CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid  REED SPRINGS FORMATION  - highly freedored	-		RUN 2	DB	100%	RQD 57%					
-	ст Continued Next Page	30-										
The s betwe	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.	<del>, , , , , , , , , , , , , , , , , , , </del>						- · · ·		· · · · · · · · · · · · · · · · · · ·		_
	ER LEVEL OBSERVATIONS, ft			-	ļ	30RII	NG ST.	ARTF	D		8-20	)-
	Y DRY WD Y DRY AB Y DRY 24 hr AB Y				-		NG CC				8-22	
	PDRY 24 hr AB ¥		-			RIG						_

	LOG OF BORII	NG N	Ο.	MC	-27	71				Pa	ige 4 of 10
CLIE	HNTB						GEOL	OGIC	LOG		
SITE	McDONALD COUNTY, MISSOURI	PRC	JEC	T			I-49, N	/ISSC	URI		
					SAI	MPLE	s			TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, In.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	c <del>r</del>	_									
	cr CHERT++ stratified, trace limestone seams, white and light gray, medium bedded, very fine grained, weathered, hard, solid, trace vugs		,	RUN 3	DB	100%	RQD 83%				
	er										
	<b></b>	35									
LS	CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid	-		RUN 4	DB	00%	RQD 90%				
_ c;											
c	i	40-									
he strati etween	Continued Next Page  ification lines represent the approximate boundary lines soil and rock types: in-situ, the transition may be gradual.										
VATER	LEVEL OBSERVATIONS, ft				В		IG STA				8-20-03
	DRY WD YDRY AB DRY 24 hr AB Y		0	Π	B( RI		IG COM	MPLE V, #98		REMAN	8-22-03 SS
_					A	PRO	OVED	BRC	JOE	3 #	J7P0601

	LOG OF BORIN	NG N	Ο.	MC	-27	71				Pa	ige 5 of 10
ÇL	JENT HNTB						GEOL	OGIC	LOG		
SI		PRO	JEC	Т							<del></del> ·
	McDONALD COUNTY, MISSOURI	1			SAI	MPLE:	<b>I-49, N</b> S	/IISSC	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ff.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	'CT	_									
	27 CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid	-		RUN 5	DB	90%	RQD 78%				
	CT	_									
	46 1159.0  CHERT++  stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh,	45— —		RUN 6	DB	100%	RQD 94%				:
	hard, solid	_									· .
	48.8  CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid	50—		RUN 7	DB 1		RQD 100%				·
he:	Continued Next Page stratification lines represent the approximate boundary lines		į								
etw	een soil and rock types: in-situ, the transition may be gradual.			<del> </del>							* <u>*</u>
	TER LEVEL OBSERVATIONS, ft  VERY DRY WD VERY ABOUT THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO THE TRANSPORTED TO				⊢		NG ST				8-20-03
٧L	¥ DRY WD ¥ DRY AB ¥ DRY 24 hr AB ₹	30	C		F	RIG		ΓV, #9		REMA	
٧L					F	<b>APPR</b>	OVED	BR	O JC	)B#	J7P0601

	LOG OF BORIN	IG N	<u>O.</u>	MC	-27	71				Pa	ge 6 of 10
	IENT HNTB						GEOL	OGIC	LOG		
Si	TE McDONALD COUNTY, MISSOURI	PRO	JEC	T					•	:	
	MICCOLALD COURT 1, MICCOURT				SA	MPLE	1-49, <u>N</u> S	11330	/UKI	TESTS	
GRAPHIC LOG	DESCRIPTION	ОЕРТН, А.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	
	CT LS 51 1154,0										; (
	CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid			RUN 8	DB	100%	RQD 95%				
ka uni	CLAY  CT	55									4
	27 56 Ls  27 CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid	-		RUN 9	DB	100%	RQD 95%				
	LS CF					e.					
	CT+LS  Continued Next Page	60—									
The s	stratification lines represent the approximate boundary lines sen soil and rock types: in-situ, the transition may be gradual.		l.		<u></u>		<u>'</u>			·	G S
	FER LEVEL OBSERVATIONS, ft	· <del></del>			П		NG ST	ADTE	<u> </u>	<del>"-</del> "-	9 20 02
	V DDV WD V DDV				-		VG CO				8-20-03 8-22-03
ΝĽ	V DRY 24 hr AB V					IG				REMAI	
٨L		_		-	Ā		OVED		O JO		J7P0601

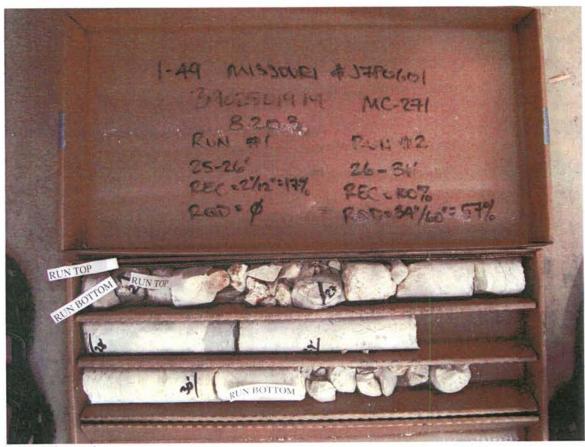
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	LOG OF BORIN	IG N	Ο.	MC	-27	71				Pa	ge 7 c	of 10
CLI	ENT HNTB						GEOL	OGIC I	.OG			
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	T			1-49, N	IISSO	URI			
	Modern 25 Cooking Microsoft				SAI	MPLE				TESTS		
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf		. <del></del>
	611144.0	_										,
	CHERT++ stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard, solid			RUN 10	DВ	95%	RQD 90%					. •
	LS CT _ LS	_					:					
	Ls											
	_	_										* <b>3</b> * 3
	- cT	65	:					٠				Mary A.
()	66 1139.0 CHERT++	_		RI IN	DB	100%	RQD					*
	stratified, with limestone seams, white and light gray, medium to thick bedded, very fine grained, slightly weathered to fresh, hard solid	_		11		100 %	88%					
	cr highly fractured, wholey seems	_										
	<del>-</del>	_										
	c <del>r</del>											**************************************
	Continued Next Page	70—		:							,	***
The s	stratification lines represent the approximate boundary lines			ļ		i	ļ	1				<del></del>
betwe	een soil and rock types: in-situ, the transition may be gradual.					DOD!	NG ST	ADTE	<u> </u>		0.0	0.02
	TER LEVEL OBSERVATIONS, ft  ☐ DRY WD ☑ DRY AB ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐				₽		NG ST					0-03 2-03
	¥ DRY WD ¥ DRY AB ▼ DRY 24 hr AB ▼			)[		RIG		TV, #9		OREMA		SS
WL			_		<b>-</b>	APPF	ROVED			OB #	J7P0	0601

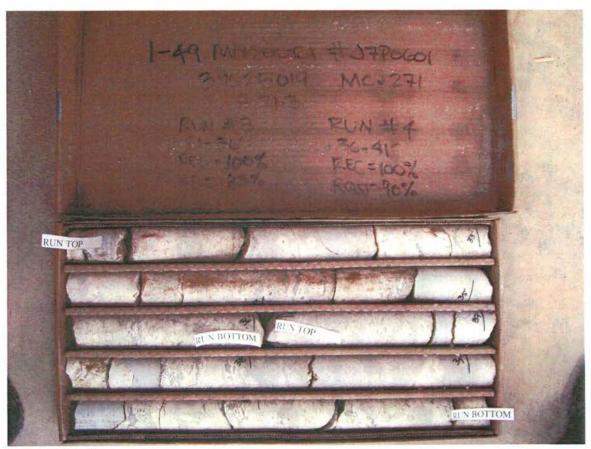
CI	LOG OF BORIN	NG N	0.	MC	;-2	71				Pa	ige 8 of 1
	HNTB						GEOL	OGIC	LOG		
SI	McDONALD COUNTY, MISSOURI	PRC	JEC	т			I-49, I	MISSO	URI		
					SA	MPLE	S			TESTS	1
GRAPHIC LOG	DESCRIPTION	ОЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	CT LS										
	1134.0  CHERT++ stratified, with limestone seams, white and  light gray, medium to thick bedded, very fine grained, slightly weathered to fresh,  CLAY hard, solid			RUN 12	DB	100%	RQD 97%				
	LS - CF										
	CT - CLAY LS	75— —									
	CHERT++ stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine grained, fresh, hard, solid			RUN 13	DB 1	00%	RQD 97%				
-	LS	_									
	CT CT										
-	Continued Next Page	80—									
he si etwe	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.										
VAT	ER LEVEL OBSERVATIONS, ft				Тв	ORIN	IG STA	RTF	)	····	8-20-03
/L Z		_	_	_	-		IG CO				8-22-03
	PDRY WD PDRY AB PDRY 24 hr AB PDRY 24 hr AB	JC	O		\ <u> </u>	IG į		V, #98	· T	REMAN	
<u> </u>					A	PPR	OVED	BRC	<del></del>		J7P0601

	LOG OF BORIN	IG N	0.	MC	-27	'1				Pa	ge 9 of 10
	ENT HNTB					(	GEOL	OGIC	LOG		
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	τ 			I-49, N	IISSO	URI	TESTS	
					SAN	/PLES		<u>                                      </u>	Γ_	TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	
	CHERT++ stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine grained, fresh, hard, solid  CHERT++  CT CHERT++	_		RUN	DB	97%	RQD				
	stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine grained, fresh, hard, solid	. <u>-</u>		14			69%				
											•
	<i>cr</i> -	_									,
	LS	_									
	CT L3 SH CT SH	85— —								į	
	<b>CT</b> 87 1118.0	_									,
	CHERT++ stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine grained, fresh, hard, solid	_		RUN 15	DB	95%	RQD 87%				** A
	LS	<b>-</b>									
	<b>4</b> \$ '	_									
	LS Continued Next Page	90—									
The betw	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.										
	TER LEVEL OBSERVATIONS, ft						ING S				8-20-03
WL	V DRY WD V DRY AB V DRY 24 hr AB V DRY 24 hr AB V DRY 24 hr AB		-,	77	ا <b>د</b>		ING C				8-22-03
WL WL	▼ DRY 24 hr AB ▼	Cال	_[	JI		RIG				OREMA	
WL		•	_			APP	ROVE	и в	KO	JOB#	J7P0601

-	LOG OF BORI	NG N	10.	MC	<b>C-2</b>	71				Pag	e 10 of 10
	IENT HNTB				-		GEOL	OGIC	LOG	,	
SIT	McDONALD COUNTY, MISSOURI	PRO	JJEC	T		URI					
			T		SA	MPLE		11330	, OKI	TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pof	UNCONFINED STRENGTH, psf	
	CHERT++ stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine grained, fresh, hard, solid	-							1	3	
	92 CF  CHERT++ stratified, with limestone seams, light gray and gray, thick bedded, very fine to fine  CF grained, fresh, hard, solid  SH  CT+LS	_		RUN 16	DB	75%	RQD 69%				
	Ls - c <del>r</del>	95									
	96 1109.0										
he st	tratification lines represent the approximate boundary lines										
ewee	en soil and rock types: in-situ, the transition may be gradual.	-			_		16.4				<u></u>
	ER LEVEL OBSERVATIONS, ft  Z DRY WD Z DRY AB				B		IG STA				8-20-03
	DRY WD DRY AB PORY AB	1				ORIN IG	IG COI		<del></del>	<b></b>	8-22-03
L			_		<u>۲</u>		OVED		JOE	REMAN	SS J7P0601



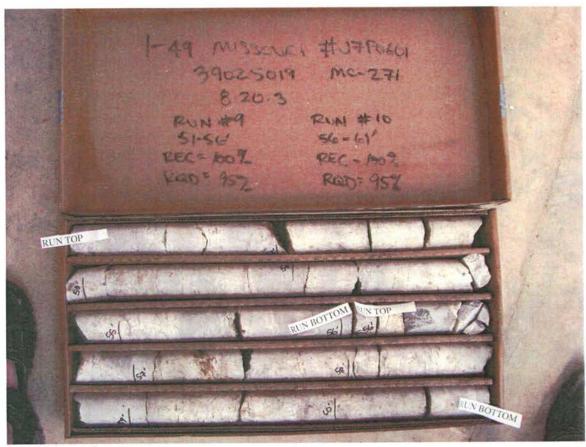
I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 1 25.0 Feet to 26.0 Feet Run No. 2 26.0 Feet to 31.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 3 31.0 Feet to 36.0 Feet Run No. 4 36.0 Feet to 41.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 5 41.0 Feet to 46.0 Feet Run No. 6 46.0 Feet to 48.75 Feet Run No. 7 48.75 Feet to 51.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 8 51.0 Feet to 56.0 Feet Run No. 9 56.0 Feet to 61.0 Feet



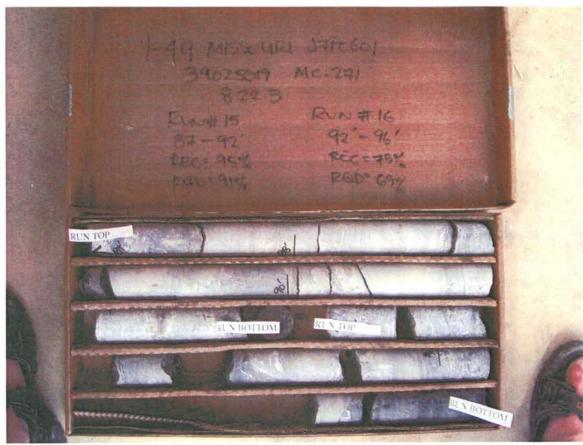
I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 10 61.0 Feet to 66.0 Feet Run No. 11 66.0 Feet to 71.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 12 71.0 Feet to 76.0 Feet Run No. 13 76.0 Feet to 81.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 14 81.0 Feet to 87.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 271 Run No. 15 87.0 Feet to 92.0 Feet Run No. 16 92.0 Feet to 96.0 Feet

$\bigcap$	LOG OF BORIN	IG N	0.	MC	-28	3				Pa	ige 1 of 3
CLI	ENT										9
SIT	HNTB	PRO	JEC	T				<u> </u>			
	McDONALD COUNTY, MISSOURI							MISSO	JRI		
	Boring Location: 981+08, 120 feet left of centerline				SAN	/PLES	3			TESTS	
ဗ္ဗ			ğ			, in.		<u> </u>	Ę	D bsf	
GRAPHIC LOG	DESCRIPTION	نے	USCS SYMBOL	<u>~</u>		RECOVERY, in.	/ft.	WATER CONTENT, %	DRY UNIT WT pd	UNCONFINED STRENGTH, psf	
AP I		БЕРТН, А	SSS	NUMBER	핃	co	SPT - N BLOWS / ft.	E E	5	SON	
8	Approx. Surface Elev.: 1183.0 ft	H			TYPE	RE	S H	§8		ŠĖ	
	GRAVEL, with silt and clay light brown and white, medium dense to	=	GC	1	AS						:
	dense, dry	=									
		_	]								
			}								
		5-	-								
		=									
		-	}							. 1	
		=									
		10-	1								
			]								
		1 =	}								
		_	1								!
			1								
		15—	]								
		=	1				1				
		-	1								
			]								
***	20 1163.0 GRAVEL, with clay	20-	-	2	AS						
	reddish brown, dense, dry to moist	-	1								
	•	-	}								
		=	1								
		25—	1								
		=	]								
		_				ŀ					
		-	+	1	RB					1	
		20 -	]								
		30-	}								
		=	1								
رمويرمو	Continued Next Page	_									
The	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.										
3	TER LEVEL OBSERVATIONS, ft					BOF	RING S	TARTE	D		8-12-03
WL					_	BOF	RING C	OMPL	ETE	)	8-20-03
WL	V DRY WD V DRY AB V I C C C C C C C C C C C C C C C C C C	리		JI	7	RIG	/	4TV, #	98 F	OREMA	N SS
WL				_	•	APP	ROVE	D E	зо Г.	JOB#	J7P0601

	LOG OF BORING NO. MC-283 Page 2 of 3												
CLI	ENT <b>HNTB</b>										.go 2 01 0		
SIT		PRO	JEC	T			·		· ·				
	McDONALD COUNTY, MISSOURI	I-49, MISSOURI											
		SAMPLES TESTS											
GRAPHIC LOG	DESCRIPTION	ОЕРТН, А.	USCS SYMBOL	NUMBER	турЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf			
	GRAVEL, with clay reddish brown, dense, dry to moist	_											
		35											
betw	een soil and rock types: In-situ, the transition may be gradual.												

	TER LEVE	EL OBSEI	RVATION	S, ft
WL	[▽] DRY	WD	¥ DRY	AB
WL	Ā		<u>¥</u>	
WL	-			

BOREHOLE 99 MC-283.GPJ TERRACON.GDT 11/17/03

Terracon

BORING	STAR	TED		8-12	2-03
BORING	COMF	PLETE	ED	8-20	0-03
RIG	ATV,	#98	FOREMA	N	SS
APPROV	ED	во	JOB#	J7P0	601

	LOG OF BORIN	IG N	Ο.	MC	-28	33				Р	age 3 of 3			
CLI	ENT HNTB		· · · · · ·		•					•	<u></u>			
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	T	, ,	<del></del>	1.40 B	liee A			·			
	and the second second		I-49, MISSOURI SAMPLES T								TESTS			
P GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf				
ΔΔ	CHERT++ stratified, abundant limestone seams and			RUN	DB	100%	RQD 44%							
Δ Δ Δ Δ	beds, gray to dark gray, medium bedded, very fine grained, fresh, hard, solid	Ξ		'			44 %							
$\Delta$ $\Delta$	voly line granied, nesti, hard, solid	_	-	RUN	DB	90%								
$\Delta$ $\Delta$ $\Delta$		70 <del></del>		2			58%							
Δ Δ Δ Δ														
	73 1110.0													
Δ Δ Δ Δ	CHERT++ stratified, with limestone seams, trace			RUN 3	DB	90%	RQD 85%			i				
Δ Δ Δ Δ	shale laminations, white, light gray and dark gray, medium bedded, very fine	75—												
ΔΔ	grained, fresh, very hard, solid													
ΔΔ	78 1105.0													
	BOTTOM OF BORING AT 78 FEET BACKFILLED WITH CUTTINGS 08/20/03  ++ Classification estimated from core samples. Petrographic analysis may reveal other rock types.													
									;					
		:												
		·									;			
	f													
The s	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.					1					·			
	TER LEVEL OBSERVATIONS, ft				<b>—</b>	BOR	NG ST	ARTF	D		8-12-03			
			_		- 1		NG CC				8-20-03			
WL	¥ DRY WD ¥ DRY AB TEIT			Jľ		RIG	Α	TV, #9	98 F	OREMA	N SS			
WL						APPF	ROVED	В	0 10	OB#	J7P0601			

CI	LIENT									<u> </u>	Page 7 c		
SI	HNTB TE	PRO	IFC	· T			GEOL	OGIC	LOG		-		
_	McDONALD COUNTY, MISSOURI	110	,J_C	, 1	I-49, MISSOURI								
		,			SA	MPLE				TESTS			
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf			
	65  CHERT++ cr stratified, abundant limestone seams and beds, gray to dark gray, medium bedded, very fine grained, fresh, hard, solid  cr REED SPAENGS FORMATION	65		RUN 1	DB	100%	RQD 44%						
	68  CHERT++ stratified, abundant limestone seams and beds, gray to dark gray, medium bedded, very fine grained, fresh, hard, solid	-		RUN 2	DB	90%	RQD 58%						
	Continued Next Page	70-									·		
The betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.												
	TER LEVEL OBSERVATIONS, ft				E	BORI	NG ST	ARTE	D		8-12-		
					-		NG CC				8-20-		
۷L	Y DRY WD Y DRY AB	36			F	RIG				REMA			
٧L			_		- [	\DDE	OVED		0 10		J7P06		

	LOG OF BORIN	IG N	Ο.	MC	:-28	33				P	age 8 of			
	IENT HNTB						GEOL	OGIC	LOG					
SIT		PRO	JEC	T										
	McDONALD COUNTY, MISSOURI	_		1	I-49, MISSOURI SAMPLES TESTS									
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf				
	CHERT++ stratified, abundant limestone seams and cr beds, gray to dark gray, medium bedded, very fine grained, fresh, hard, solid													
	Table 1110.0  CHERT++  stratified, with limestone seams, trace shale laminations, white, light gray and dark gray, medium bedded, very fine grained, fresh, very hard, solid			RUN 3	DB	90%	RQD 85%							
	CT CT CT SH	75—												
	CT SH CT+LS 78 1105.0	-								,				
Thos	troti 5 cotton line						·							
betwe	tratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.													
	TER LEVEL OBSERVATIONS, ft						NG ST				8-12-0			
	V DRY WD V DRY AB V I Effe	36			ŀ		NG CC		- , -		8-20-0			
<b>▼</b>		IJL	.L		F	RIG	A ⁻	ľV, #9	98   FC	REMAI	N S			



I 49 Missouri Missouri J7P0601 Boring No. MC 283 Run No. 1 65.0 Feet to 68.0 Feet Run No. 2 68.0 Feet to 73.0 Feet



I 49 Missouri Missouri J7P0601 Boring No. MC 283 Run No. 3 73.0 Feet to 78.0 Feet

9.4 Roadway Structure Boring Logs

	LOG OF BORII	NG N	10.	M	S-2	3				D	age 1 of 1
CLI	ENT <b>HNTB</b>			Α.	.4	-4!- !					
SIT	E	PRC	JEC		itom	atic	Hamm	er Em	cienc	y = 80.	7%
	McDONALD COUNTY, MISSOURI		_		CAN	ADI E	IISSO	URI	TEOTO		
	Boring Location: 738+62, 175 Feet right from baseline southbound ramp				SAN	/IPLES	5			TESTS	-m
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 943.6 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	GRAVEL, trace clay		GP		HS	ш.	ОЛШ	>0		78	ш
	light brown and white, loose to dense, moist		GP	1	SS	14	10	X.			5, 5, 5
		5—	- GP		. ac						0, 0, 0
		=	GP		HS						
		_	GP	2	SS	10	10				4, 4, 6
		10-	GP		HS				e .		
	14 929.6	=	0.0		00	4.4					10 10 17
	LIMESTONE GRAVEL, with sand	15—	GP GP	3	SS	11	30				13, 13, 17
200	17 926.6	=	-		-						
	AUGER REFUSAL ON LIMESTONE										
	BOTTOM OF BORING AT 17 FEET BACKFILLED WITH CUTTINGS 10/15/02										
The bety WA WL WL											
The bety	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.							*(	Calibrate	ed Hand	Penetrometer
WA	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TART	ED		10-15-02
WL	¥ DRY WD ¥ DRY AB					BOR	ING C	OMPL	ETED		10-15-02
WL	Y DRY 24 hr AB Y AB					RIG	AT\	/, #10	3E F	OREMA	WL NA
WL						APP	ROVE	D C	SK J	OB#	J7P0601

5019MS23-24 GP.I

	LOG OF BORI	NG N	10.	M	S-4	1					
CLI	ENT									Р	age 1 of 1
SIT	HNTB	PRC	JEC		Autor	natio	Hamr	ner Ef	ficier	ncy = 83	%
	McDONALD COUNTY, MISSOURI	1110	,o				I-49, N	/IISSO	URI		
	Boring Location: 768+04, 400 Feet left of centerline				SAN	/PLE	S			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 995.1 ft	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	CLAYEY GRAVEL dark brown and white, loose, dry to moist		GC		PA						
		=	GC	1	SS	12	9				3, 4, 5
		5—	GC		PA						
		=									
		10-	GC	2	SS	10	10				5, 5, 5
		=	GC		PA			v			
	13.5 981.6  GRAVELLY LEAN CLAY, scattered sand	=	CL	3	SS	14	11				5, 5, 6
	brown and white, medium stiff, moist	15—	CL		PA						
	18.3 976.8	=									
	AUGER REFUSAL ON APPARENT CHERT BOTTOM OF BORING AT 18.3 FEET BACKFILLED WITH CUTTINGS 11/14/03										
The	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.							*C	alibrat	ed Hand F	Penetrometer
N ROSE WILLIAM	TER LEVEL OBSERVATIONS, ft				T	BOR	ING ST	TARTE	D		11-13-02
WL	☑ DRY WD ☑ DRY AB	70					ING C	OMPLE	ETED	)	11-13-02
WL	V DRY WD V DRY AB V DRY 24 hr AB V C					RIG		TV, #9	_	OREMA	
WL					1	APP	ROVED	SF	BJ	OB#	J7P0601

	LOG OF BORI	NG I	10.	M	S-4	2				Р	age 1 of 1
CLI	ENT HNTB				Autor	natio	Hamr	ner Ff	ficion	ncy = 83	
SIT		PRC	JEC		idioi	110000	riaiii	IIII LI	iloioi	icy – 03	70
	McDONALD COUNTY, MISSOURI Boring Location: 767+90, Centerline				CAL	4DLE	I-49, N	IISSO	URI	TEOTO	
	Borning Location. 767+90, Centenine				SAN	/PLE				TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 977.6 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
000	GRAVEL WITH COBBLES	-	GP		PA		7,2			307	ш
200	brown, dry	=									
0.	3.5 974.1	_					- 1				
	GRAVELLY SAND, trace clay brown and white, loose to medium dense,	=	SP	1	SS	6	14				2, 5, 9
	dry	5—	SP		PA				,		
		=									
		_									
		=	SP	2	SS	4	4				2, 1, 3
	11 966.6	10-	SP		PA						
	11.4 LIMESTONE++ gray, hard	_									
	BOTTOM OF BORING AT 11.4 FEET BACKFILLED WITH CUTTINGS 11/13/02 ++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
The	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.							*0	alibrat	ted Hand I	Penetrome
3 1000	TER LEVEL OBSERVATIONS, ft				T	BOR	ING S	TARTE	D		11-13-
WL					- 1		ING C			)	11-13-
WL	¥ DRY WD ¥ DRY AB ▼ DRY 24 hr AB ▼				7	RIG		TV, #		OREMA	
WL						2	ROVE			OB#	J7P06

SPB JOB#

APPROVED

	LOG OF BORII	NG I	10.	M	S-4	3					1.11
CL	JENT HNTB				Auto	tic	Llame		el-l		age 1 of 1
SIT	ΓE	PRO	JEC	T	Autoi	matic	Hami	ner En	ricien	cy = 83°	%
$\vdash$	McDONALD COUNTY, MISSOURI	<u> </u>					I-49, N	/IISSO	URI		
	Boring Location: 767+97, 440 Feet right of centerline				TSAI	MPLES	3	-		TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 966.0 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	GRAVEL, with clay brown and white, medium dense, dry to	=	GC		PA						
	moist	5—	GC	1	SS	10	12				5, 6, 6
		=			IA					,	
			GC	2	SS	6	12				5, 7, 5
		10—	GC		PA						
	14.5 951.5	=	GC	3	SS	10	9				5, 4, 5
	SANDY LEAN CLAY brown, very soft, moist	15—	CL		PA	10					5, 4, 5
		=									
	19 947.0  19.5 LIMESTONE++ 946.5 light brown, hard, highly weathered	Ξ	CL	5	ST SS	6	50/0"				50/0"
	AUGER REFUSAL ON LIMESTONE										
	BOTTOM OF BORING AT 19.5 FEET BACKFILLED WITH CUTTINGS 11/13/03									Marie 1	
The	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.							*Ca	alibrate	d Hand F	Penetrometer
SUS ASSESSED.	TER LEVEL OBSERVATIONS, ft				7	BORI	NG ST	ARTE	D		11-13-02
	7				-		NG CC				11-13-02
	TORY WD FORY AB TORY					RIG		TV, #9		OREMA	
WL						APPF	ROVED	SP	В ЈС	DB #	J7P0601

				LOG O	F BORIN	IG N	10.	MS	S-5	9				Pa	age 1 of 1
CLI	IENT		HNTB					۸.	ıtom	atic I	Jamm	or Eff	iolono	y = 80.7	
SIT	Ē					PRO	JEC		itom	alic i	Панни	eren	icienc	y – 60.7	70
	Porin	McDONALD g Location: 783			orlina			-	SAN	/IPLES	I-49, N	IISSO	URI	TESTS	
GRAPHIC LOG	Borni		DESCRIPTIC		eriine	#i	USCS SYMBOL	8	O/All	RECOVERY, in.		WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
SRAPH	Appro	x. Surface Elev	, · 103/ 3 ft			DЕРТН, ft.	ISCS 8	NUMBER	TYPE	RECOV	SPT - N BLOWS / ft.	VATER	DRY UN	JNCON	Slow Co
30	1.5	GRAVEL					GP		HS	ш.	ош	>0		20	ш
300	1.5	gray, loose, dr	У		1032.8	_	-							,	
		AUGER REFL CHERT BOTTOM OF BACKFILLED	JSAL ON APP BORING AT 1	I.5 FEET											
The bet W// WL WL WL															
The	e stratific	cation lines repres	sent the approxin	nate boundary	lines							*	Calibrat	ed Hand	Penetromete
bet	ween so	oil and rock types:	in-situ, the trans	sition may be o	gradual.				-	BOE	RING S	TART	FD		10-22-02
WL		LEVEL OBSER	▼ DRY	AB							RING C			)	10-22-02
WL		RY 24 hr AB		AB	ell					RIG		V, #10		OREMA	
WL		NI Z4III AB									ROVE			OB#	J7P0601

	LOG OF BORII	NG N	0.	MS	S-60	0				Pa	age 1 of 1	
CLI	ENT			Α		-4! - I	lamm		alana			
SIT		PRO	JEC.		tom					y = 80.7	%	
	McDONALD COUNTY, MISSOURI				CAR	/PLES	I-49, N	IISSO	URI	TESTS		
	Boring Location: 784+25, 248 Feet right of centerline				SAIV	IPLES	)			15313		
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1010.4 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"	
SHIC	GRAVEL, with silt		GM		HS		- V			2 0,		
	light brown and gray, very dense, dry			1	SS	10	18/6"				25, 18,	
AIS.	CHEKITT	5—			HS		50/2"				50/2"	
	gray, hard											
	AUGER REFUSAL ON CHERT											
	BOTTOM OF BORING AT 5 FEET BACKFILLED WITH CUTTINGS 10/18/02											
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.											
The	e stratification lines represent the approximate boundary lines							*	Calibra	ted Hand	Penetrometer	
-	ween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft					BOF	RING S	TART	ED		10-18-02	
WL							RING C			)	10-18-02	
WL	P DRY 24 hr AB ▼					RIG					AN JW	
10//		RIG ATV, #103E FOREMAN										

10MS 60 60 72 74 CP | TERPACON GDT

	LOG OF BORIN	IG N	Ο.	MS	5-72	2				Pa	age 1 of 1
CLI	ENT HNTB			Au	ıtom	atic I	lamm	er Effi	icienc	y = 80.7	7%
SIT	E	PRO	JEC.				I-49, N			,	
-	McDONALD COUNTY, MISSOURI  Boring Location: 792+28, 250 Feet right of centerline				SAN	1PLES		11330	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 979.8 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	CLAYEY GRAVEL, with silt brown, light brown and reddish brown, medium dense, moist	5—	GC GC		HS SS HS	10	14				6, 6, 8
	8 971.8 CHERT++		_	2	SS	0	55/2"		1		5/2", 50/0"
	gray, naru	10—		-	HS	-0	0012				3/2 , 30/0
	11.2 968.6	=	_						-		
	BOTTOM OF BORING AT 11.2 FEET BACKFILLED WITH CUTTINGS 10/17/02 ++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
Dog H	e stratification lines represent the approximate boundary lines								*Calibra	ated Hand	d Penetrometer
be \v	tween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft					ВО	RING S	STAR	ΓED		10-17-02
B W						во	RING (	COMP	LETE	D	10-17-02
W						RIG				FOREM	
W A						API	PROVE	ED (	CSK	JOB#	J7P0601

SO FOLDMERO EN 72 74 CB | TEPPACON GI

	LOG OF BORII	VG N	10.	M	S-74	4				P	age 1 of 1
CL	ENT HNTB			Α.	.4			F.EE			
SIT		PRO	JEC ⁻		itom	atic i	Hamm	er Em	cienc	y = 80.7	/%
-	McDONALD COUNTY, MISSOURI				241	1PLES	I-49, N	IISSO	URI	TESTS	
90	Boring Location: 797+99, 200 Feet left of centerline		30F		JAN			%	7		for 18"
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
<u>6</u>	Approx. Surface Elev.: 994.0 ft SILTY GRAVEL	DE	S) GM	ž	⊢ HS	R	요필	\$3	Pod	NN	Bic
	brown, medium dense, moist	=	GIVI		ПО						
	3.5 990.5 SILTY SANDY GRAVEL	=	GM	1	SS	12	14				8, 7, 7
	brown, light reddish brown and gray, medium dense, moist	5—	GM		HS						
		=									
900		=	GM	2	SS	12	12				4, 6, 6
300		10-	GM		HS						
3000		=									
		15—	GM	3	SS	14	24				7, 13, 11
900	17.3 976.7	=			ПО			-			
	AUGER REFUSAL ON APPARENT CHERT										
	BOTTOM OF BORING AT 17.3 FEET BACKFILLED WITH CUTTINGS 10/22/02		·								
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.									-	
The bet W/											
The	e stratification lines represent the approximate boundary lines							*(	Calibrat	ed Hand	Penetrometer
bet	ween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft					BOF	RING S	TART	ED		10-21-02
WL	7						RING C			)	10-21-02
WL		ال				RIG				OREM	
10/1					- 1	ADD	DOVE	D 0	OIL	00 #	1700601

	LOG OF BORIN	IG N	Ο.	MS	-10	3				Pa	age 1 of 1
CLI	IENT HNTB			Α	utor	natic	Hamn	ner Eff	icien	cy = 83°	
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC					IISSOL			
	Boring Location: 818+71, 239 Feet right of centerline				SAN	/PLES				TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1039.7 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	LEAN CLAY, trace gravel light brown and gray, medium stiff, dry	=	CL		HS		2.				
	- scattered cobbles below 4.7 feet  1033.7  LIMESTONE++ brown to gray, hard, weathered to fresh	5—	CL	1	SS	12	13/6" -50/2"				7, 13, 50/2"
	AUGER REFUSAL ON LIMESTONE  BOTTOM OF BORING AT 7 FEET BACKFILLED WITH CUTTINGS 05/05/03  ++ Classification estimated from disturbed samples. Core samples or petrographic analysis may reveal other rock types.										
The bety	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.							*Ca	alibrat	ed Hand F	Penetrometer
	ATER LEVEL OBSERVATIONS, ft							TARTE			5-5-03
WL	V DRY WD V DRY AB V V V V V V V V V V V V V V V V V V	70	-	7	2			OMPLE			5-5-03
WL	$\bar{x}$ $\bar{x}$										
WL					- 1	APP	ROVE	) BK	M L	()R#	J7P0601

BOREHOLE 99 5019MS103.GPJ TERRACON.GDT 1/5/04

SPB

JOB#

J7P0601

WL

	LOG OF BORIN	IG N	O.	MS	-12	0				P	age 1 of 1
CLI	ENT										
SIT	HNTB E	PRO	JEC		itom	atic	amm	er Eff	cienc	y = 80.	1%
	McDONALD COUNTY, MISSOURI		020				I-49, N	IISSO	URI		
	Boring Location: 831+28, 4 Feet right of centerline				SAN	/IPLES	3			TESTS	
C C GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1077.7 ft	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
2000 0000 0000	GRAVEL, scattered clay and cobbles brown and white, dense, dry	=	GP		PA						
	brown, reddish brown and white, dense, dry	5—	GC GC	1	SS	18	47				22, 26, 21
	7.5 1070.2 8 CHERT++ 1069.7 white, hard, weathered	_									
	AUGER REFUSAL ON CHERT										
	BOTTOM OF BORING AT 8 FEET BACKFILLED WITH CUTTINGS 10/24/02										
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
betv	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.					DO-	111000			ted Hand	Penetromete
	ATER LEVEL OBSERVATIONS, ft						RING S				10-24-02
WL	¥ DRY WD ¥ DRY AB  ¥  ▼  ▼  ▼  ▼  ▼  ▼  ▼  ▼  ▼  ▼  ▼  ▼	7			n	RIG	RING C			OREM	10-24-02 AN JW
WL	÷ ÷						ROVE				J7P0601

	LOG OF BORIN	IG N	0.	MS	-12	21				Pa	age 1 of 1
CLI	ENT HNTB			۸.	ıtom	otio	Llamm	~	iolono		
SIT		PRO	JEC		itom	alic	Панни	er Ell	icienc	y = 80.7	70
	McDONALD COUNTY, MISSOURI			-		4D1 E4	I-49, N	IISSO	URI		
	Boring Location: 832+24, 276 Feet right of centerline				SAN	/IPLES	5			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1062.7 ft	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	GRAVEL, abundant clay, scattered cobbles and sand gray, grayish brown and white, dense to very dense, dry	=	GC		HS						
6/8/ A Z	4 1058.7 4.8 CHERT++ 1057.9	7	GC	1	SS	8	17/6"				17/6",
	light gray, hard			-	HS		50/6"				50/6"
	AUGER REFUSAL ON CHERT  BOTTOM OF BORING AT 4.8 FEET BACKFILLED WITH CUTTINGS 10/24/02  ++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
The	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.							*	Calibrat	ed Hand	Penetrometer
-	ATER LEVEL OBSERVATIONS, ft					BOF	RING S	TART	ED		10-24-02
WL			_				RING C				10-24-02
WL		3				RIG	AT\	V, #10	)3E F	OREMA	WL NA
WL					-	APP	ROVE	D S	PR J	OB#	J7P0601

19MS119-120 129-131 GP.I TERRACON GDT 7

SITE   McDONALD COUNTY, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISSOURI   149, MISS		LOG OF BORIN	IG N	0.	MS	5-12	29				Pa	age 1 of 1
Boring Location: 841+03, 375 Feet right of centerline   DESCRIPTION   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMPLES   SAMP		HNTB			Αι	utom	atic	Hamm	er Effi	iciend		
Boring Location: 841+03, 375 Feet right of centerline  DESCRIPTION  DESCRIPTION  Approx. Surface Elev:: 1052.7 ft  GRAVEL AND COBBLES, with clay dark brown, medium dense, moist  SAMPLES  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist  GRAVEL AND COBBLES, with clay brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, light reddish brown, ligh	SIT		PRO	JEC							,	70
SRAVEL AND COBBLES, with clay dark brown, medium dense, moist    1049.2   GC						SAN	MPLES		11000	OKI	TESTS	
GRAVEL AND COBBLES with clay dark brown, medium dense, moist  3.5  GRAVEL AND COBBLES with clay brown, light reddish brown and white, medium dense, moist  3.5  GRAVEL AND COBBLES with clay brown, light reddish brown and white, medium dense, moist  3.6  GP 1 SS 4 13  7, 7, 6  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS  GC HS	GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1052.7 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
GRAVEL AND COBBLES, with clay brown, light reddish brown and white, medium dense, moist    10		GRAVEL AND COBBLES, with clay dark brown, medium dense, moist				HS						
The stratification lines represent the approximate boundary lines service analysis may reveal other rock types.  The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.  WATER LEVEL OBSERVATIONS, ft  WL V DRY WD DRY AB  TO 1042.7  1042.7  1042.7  1042.7  1042.7  1043.7  1042.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7  1043.7		GRAVEL AND COBBLES, with clay brown, light reddish brown and white.	5—	GC GP	1		4	13				7, 7, 6
BOTTOM OF BORING AT 12 FEET BACKFILLED WITH CUTTINGS 10/25/02  ++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.  The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.  WATER LEVEL OBSERVATIONS, ft WL V DRY WD DRY AB WL V DRY WD DRY AB WL V DRY WD FOREMAN J	Δ	LEAN CLAY, with sand, trace gravel brown, very stiff, moist CHERT++, with clay seams	10-	CL	2		12	13				7, 6, 7
The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.  WATER LEVEL OBSERVATIONS, ft  WL V DRY WD PRY AB  WL V DRY AB  WL V DRY AB  Terraction lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.  BORING STARTED 10-25-08  BORING COMPLETED 10-25-08  RIG ATV, #103E FOREMAN J												
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WL Y Y PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERTY OF THE PROPERT							BOR	ING S	TARTE	ED		10-25-02
VVL   ¥   Y   Y   Y   Y   Y   Y   Y   Y   Y		¥ DRY WD ¥ DRY AB	7	-	77	7						10-25-02
WL APPROVED SPB JOB# J7P060	WL											J7P0601

	LOG OF BORIN	IG N	0.	MS	3-13	0				D	age 1 of 1
CL	ENT HNTB										
SIT		PRO	JEC		non	atic	Hamm	erEm	icienc	y = 80.7	7%
	McDONALD COUNTY, MISSOURI						I-49, N	IISSO	URI		
	Boring Location: 843+99, Centerline				SAN	/IPLES	3			TESTS	-
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1064.3 ft	<b>DEPTH, ft.</b>	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
المار المار	GRAVEL AND COBBLES, trace clay		GP		HS	ш.	ОШ	>0		200	ш_
	dark brown, loose, wet  3.5  1060.8	=									
,0°	SILTY SANDY GRAVEL brown, light reddish brown and gray,	=	GP	1	SS	4	8				9, 6, 2
	medium dense, moist	5—	GP		HS						
0		=	GP	2	SS	3	11				10, 5, 6
000		10-	GP								.0,0,0
		=	GP		HS						
	13.5 1050.8 14 FAT CLAY, with gravel 1050.3	Ξ	СН	3	SS	12	12				12, 50/6"
A A	dark brown and white, stiff, moist  CHERT++, trace clay seams  white, hard, highly weathered  AUGER REFUSAL ON CHERT	15—			HS		50/6"				12, 00/0
	BOTTOM OF BORING AT 15 FEET BACKFILLED WITH CUTTINGS 10/24/02										
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
					3						
The	stratification lines represent the approximate boundary lines							*(	Calibrate	ed Hand	L Penetrometer
betv	veen soil and rock types: in-situ, the transition may be gradual.		was a state of			DOD	INIO O	T A D.T.			40.04.00
WA	TER LEVEL OBSERVATIONS, ft  ☐ DRY WD ☐ DRY AB						ING S				10-24-02
WL	Y DRY WD Y DRY AB				7	RIG		/, #10		OREMA	
WL			<b></b>				ROVE		PB J		J7P0601

9 5019MS119-120,129-131,GPJ TERRACON.(

LOG OF BORING NO. MS-168 Page 1 of 1													
CLI	ENT <b>HNTB</b>			Αι	ıtom	atic l	-lamm	er Effi	iciend	y = 80.7	<b>'%</b>		
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC	Т			I-49, N	IISSO	URI				
	Boring Location: 884+52, 476 Feet left of centerline				SAN	<b>IPLES</b>				TESTS			
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1074.6 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"		
	SANDY GRAVEL, few clay	_	GP		PA								
	brown, medium dense, dry	5—	GP GP	1	SS	18	13				8, 7, 6		
, <b>9</b>	9.2 1065.4	_	CL	2	SS	13	3			5000*	5, 3, 50/2"		
	reddish brown, very stiff, moist CHERT AND LIMESTONE++, trace clay seams light gray, moderately hard to hard, highly weathered  18.2  CHERT++, with limestone seams, trace	15-		3	PA SS PA	0	50/0.5				50/0.5"		
be WI						ВОР	RING S	TART	ED	D	Penetrometer  10-8-03  10-8-03  AN JW		
WI		CI				RIG		V, #10		FOREM.			
K WI						APF	ROVE	D S	SPB	JOB#	J7P0601		

01.1	LOG OF BO	DRIN	IG N	Ο.	MS	S-16	<b>39</b>				Р	age 1 of 1
	ENT HNTB				A	uton	natic	Hamm	er Effi	icien	cy = 80.	
SIT	McDONALD COUNTY, MISSOURI		PRC	JEC	Т		Vie -					
	Boring Location: 887+97, 53 Feet right of centerline			Т		SAI	MPLE	1-49, N	/IISSO	URI	TESTS	•
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1056.7 ft		<b>DEPTH, ft.</b>	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
00	SANDY GRAVEL AND COBBLES, with			SP		PA	<u> </u>	S M	50	۵ ۵	⊃ ⊗	<u>m</u>
0,0	clay	1054.7	5	SP	1	SS	18	31				10, 16, 1
	7.5	1049.2	=									
	SANDY GRAVEL, with clay gray and reddish brown, very dense, dry	0.10.2	10—	GP GC GP GC	2	SS PA	10	50/5.5'				41, 50/5.5
	12.5  CLAYEY GRAVEL  gray and reddish brown, medium dense, moist	044.2		GC	3	SS	18	17				10, 9, 8
	17.5	039.2	15—									
	SANDY GRAVEL, with clay brown, loose to very loose, dry  20  FAT CLAY, trace chert seams reddish brown, stiff, moist	036.7	20-	GP GC GP GC	4	SS PA	4	1/8" - <del>50/1"</del>				6, 1/8", 50/1"
	24	032.7	_	СН	5	SS	18	20			3000*	6, 6, 14
		032.7	_			PA						
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.											
	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.								*C	alibrat	ed Hand I	Penetromet
	TER LEVEL OBSERVATIONS, ft						BOR	ING ST	ARTE	D		10-8-0
	V DRY WD V DRY AB V V E	-	70			9		ING CO				10-8-0
	ž ž			-L			RIG		, #103		OREMA	
WL							APPI	ROVED	SF	BJ	OB#	J7P060

CI	LOG OF BORIN	IG N	<u>U.</u>	IVIS	0-17	U				Р	age 1 of 1
	HNTB			Αι	utom	atic	Hamm	er Eff	icienc	y = 84.	1%
SI	McDONALD COUNTY, MISSOURI	PRO	JEC	T			1.40				
	Boring Location: 890+67, 496 Feet right of centerline				SAN	/PLES	I-49, N	11550	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1145.8 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	FAT CLAY, with to abundant gravel	_	СН		HS						
	brown, very stiff, moist	5—	СН	1	SS	18	21				7, 11, 1
	9.1 1136.7	=	CU		00	10	40/01				10 50/5
	9.7 <b>LIMESTONE++</b> 1136.1	_	СН	2	SS	10	10/6" 50/5"				10, 50/5
	\gray to light gray, hard, fresh										
	AUGER REFUSAL ON LIMESTONE						,				
	BOTTOM OF BORING AT 9.7 FEET BACKFILLED WITH CUTTINGS 12/22/02								χ.		
	++ Classification estimated from disturbed samples. Core samples or petrographic analysis may reveal other rock types.							,			
The	e stratification lines represent the approximate boundary lines							*(	Calibrat	ed Hand	Penetrome
	ween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft				_	BOR	ING S	TARTI	=D		12-22-
WL	<del>Π</del> · · · · · · · · · · · · · · · · ·						ING C				12-22-0
WL					7		CME-			OREMA	
WL							ROVE			OB#	J7P060

CI	IENT	LC	OG OF BORIN	IG N	0.	MS	3-17	73				Р	age 1 of 1
	HN	ITB				Αι	utom	atic	Hamm	er Eff	icienc	y = 80.	7%
SIT	McDONALD CO	JNTY MISSO	IIRI	PRC	JEC	Т							
	Boring Location: 899+51						SAI	MPLES	<b>I-49, N</b>	/11550	UKI	TESTS	
GRAPHIC LOG	DES Approx. Surface Elev.: 1	SCRIPTION		DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
000	SILTY GRAVEL brown, loose, mois  3.5  FAT CLAY, scatter olive brown, stiff, m	ed gravel	1085.6	5—	GM CH	1	SS PA	14	10				3, 4, 6
	LIMESTONE++ gray, hard  AUGER REFUSAL		1082.1	=									
The	BOTTOM OF BOR BACKFILLED WIT  ++ Classification es samples. Core sar analysis may revea	H CUTTINGS stimated from nples or petro al other rock ty	01/13/03 disturbed graphic pes.							***	alibrata	d Hond 6	Ponetrometry
betw	een soil and rock types: in-site	u, the transition r	nay be gradual.					2001	NO 07			d Hand F	Penetrometer
WA WL	TER LEVEL OBSERVATI		7 -						NG ST				1-13-03
WL	TORY WD F DR  TORY 24 hr  TORY	Y AB	Jerra					BORI RIG	NG CC	) #103		DREMA	1-13-03 N KS
WL									ROVED			)B#	J7P0601

	LOG OF BORIN	IG N	О.	MS	<b>S-1</b> 7	74				P	age 1 of 2
CLI	ENT <b>HNTB</b>			Δ.	uton	natic	Hamm	or Eff	iciona	y = 80.	
SIT		PRC	JEC		<u> </u>	IGUO	T COLLEGE	ici Lii	iciei i	<u>y – 00.</u>	76
	McDONALD COUNTY, MISSOURI						I-49, N	/ISSO	URI		
	Boring Location: 900+30, 200 Feet right of centerline				_SAI	MPLE	S			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1068.1 ft	DEРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	CLAYEY GRAVEL dark brown and gray, medium dense, moist		GC		PA						
	daik brown and gray, medium dense, moist	5—	GC	1	SS PA	18	11				7, 5, 6
2/4	8 1060.1 SHALE++	_							İ		
	gray to brownish gray, hard, weathered	10		2	SS PA	3	50/3"	<u> </u>			50/3"
				3	ss	2	50/2"				50/2 <b>"</b>
		15—		İ	PA						<b>V</b> 012
		20-		4	SS PA	<del>- 1</del>	50/2"				50/2"
	·	11111		5	SS	0	50/2"		:		50/2"
		25—			PA						
		30-			SS PA	1	50/2"				50/2"
	Continued Next Page	$\dashv$						1			
The si	tratification lines represent the approximate boundary lines en soil and rock types: in-situ, the transition may be gradual.							*Ca	llibrate	d Hand P	enetrometer
betwe											
petwe	ER LEVEL OBSERVATIONS, ft					3ORI	NC ST	∆RT⊑ı	ח		1 12 02
WAT	<del></del>						NG ST			· · · · · · · · · · · · · · · · · · ·	1-13-03
VL Z		<b>)</b> [					NG CO	MPLE	TED	REMA	1-13-03

	LOG OF E	BORII	NG N	О.	MS	5-17	4					Page 2 of
CLIE	int <b>Hntb</b>				Aı	utom	natic	Hamm	er Eff	icienc	v = 80.	7%
SITE		·-	PRO	JEC							,	
— T.	MICDONALD COURT I, MISSOURI	_	<del> </del>		Г	SAI	MPLE	I-49, N	7133U	UKI	TESTS	<u> </u>
					H	T	<u> </u>	Ĭ			12010	
GRAPHIC LOG	DESCRIPTION		DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	SHALE++ gray to brownish gray, hard, weathered	-	_									
	gray to brownish gray, hard, weathered		35-		7	SS PA	0	50/2"				50/2"
								1	I			
			_		8	SS PA	1	50/2"				50/2"
			40-									
			=		9	SS	0	50/3"				50/3"
			45			PA						00,0
						.						
					10	SS	-0	5077W				
50	)	1018.1	50		-10	PA	0	50/2"				50/2"
	AUGER REFUSAL ON SHALE											
	BOTTOM OF BORING AT 50 FEET BACKFILLED WITH CUTTINGS 01/13/03							į				
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.											
	i											÷.
he stra etween	itification lines represent the approximate boundary lines soil and rock types: in-situ, the transition may be gradual								*Cal	ibrated	Hand P	enetromet
VATE	R LEVEL OBSERVATIONS, ft	•				B	ORIN	IG STA			·	
	DRY WD Y DRY AB					•		IG COI				1-13-0
	DRY WD Y DRY AB DRY 24 hr Y	Γſā	3C			R	IG				REMAN	1-13-0 N K
'L		~	_	_		·				. , . 🗸	*PI41	• 1

CL	IENT										age 1 of 1
SIT	HNTB		150		utom	atic	Hamm	er Eff	icienc	y = 80.7	'%
511	McDONALD COUNTY, MISSOURI	PRO	JEC	1			I-49, N	MISSO	IIDI		
	Boring Location: 901+16, 597 Feet right of centerline				SAN	/PLES		11330	UKI	TESTS	
	Defining Education of the following the strength of definition					100					
GRAPHIC LOG	DESCRIPTION	<b>DEPTH, ft.</b>	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
<u> </u>	Approx. Surface Elev.: 1030.0 ft  GRAVELLY LEAN CLAY, with sand		CL	Z	PA	~	Sa	50	۵۵	⊃ o	Δ.
	dark brown, very stiff, moist to wet										
	₹	_	CL	1	SS	18	14				4, 5, 9
		5—	CL		PA						
		=	CL		PA						
ZX	7 1023.0 SHALE++	_									
=	dark gray to brownish gray, moderately hard to hard, weathered	=	-	-2-	00	2	F0/F1				F0/F"
	hard to hard, weathered	10-			SS PA		50/5"				50/5"
=		10—									
		_									
		_									
		=		3	SS	1	50/2"				50/2"
		15—			PA						
==		_		1							
		_									
		_		4	SS	2	50/2"	-			50/2"
		20-			PA	-	0012				3012
		=									
	22 ▼ 1008.0	_	-		-			-			
	AUGER REFUSAL ON SHALE										
	BOTTOM OF BORING AT 22.0 FEET BACKFILLED WITH CUTTINGS 01/13/03										
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
The	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.							*(	Calibrate	ed Hand F	Penetrome
	ATER LEVEL OBSERVATIONS, ft	-			$\neg$	BOR	ING S	TARTI	=D		1-13-0
WL					-		ING C				1-13-0
WL		ar		71	7	RIG		/, #10		OREMA	
WL	2 24111 -						ROVE		SK J		J7P060

CLI	ENT HNTB			Λ	uton	natic	Hamn	or Ef	ficien	cy = 83%	4
SIT		PRO	JEC		utor	latic	Панн	iei Ei	licient	cy – 63 /	0
	McDONALD COUNTY, MISSOURI						I-49, N	IISSO	URI		
	Boring Location: 909+15, 248 Feet left of centerline		2		SAN	1PLES	3			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1057.0 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	SHALE++ grayish brown, soft to moderately hard,	=			PA						
=	highly weathered	_									
		=								7	
=		_ =		1	SS	16	45/6" 50/2"				30, 45, 50/2"
==		5-			PA						
		_				0					
		_									
	- sample wet at 9 feet	=		2	SS	-6-	50/6"				50/6"
	Sample were at a reet	10-			PA						
		_						l Win			
=	4040.4	_									
	- becoming gray, hard, fresh below 13.5 feet	_		3	SS	1-	50/1"				50/1"
	AUGER REFUSAL ON SHALE										
	BOTTOM OF BORING AT 13.6 FEET BACKFILLED WITH CUTTINGS 06/05/03										
	++ Classification estimated from disturbed samples. Core samples or petrographic analysis may reveal other rock types.			***							
									19		
									100		
The	e stratification lines represent the approximate boundary lines							*	Calibrat	ted Hand I	Penetrome
bet	ween soil and rock types: in-situ, the transition may be gradual.		-		_	BOL	INIC	TADT	ED		6-5-0
	ATER LEVEL OBSERVATIONS, ft						RING S			`	6-5-0
WL		21		7		RIG		ATV, i		OREMA	
WL	DRY 24 hr AB 🛂	UL					ROVE		RO J		J7P060

	LOG OF BORIN	IG N	0.	MS	-18	2				Pa	ige 1 of 1
CLI	ENT <b>HNTB</b>			AL	itom	atic	Hamm	er Effi	icienc	y = 80.7	'%
SIT	E	PRO	JEC							,	1-10
	McDONALD COUNTY, MISSOURI Boring Location: 908+87, 46 Feet left of centerline				SAN	/PLES	I-49, N	NISSO	URI	TESTS	
S GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	S SYMBOL	NUMBER		RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
GRA	Approx. Surface Elev.: 1048.1 ft	DEP	nscs	NCS	TYPE	REC	SPT	WAT	DRY	UNC	Blow
	1 GRAVEL, with silt dark brown, loose, dry SHALE++	=	GM		PA						
	brownish gray, moderately hard to hard, weathered	5		1	SS PA	0	50/2"				50/2"
	$ar{ar{ar{ abla}}}$	10-		2	SS PA	2	50/2"				50/2"
				3	SS	1	50/3"				50/3"
		15			PA	3					
	AUGER REFUSAL ON SHALE	20-		4	SS PA	3	50/5"				50/5"
	BOTTOM OF BORING AT 26.0 FEET BACKFILLED WITH CUTTINGS 01/14/03	-									50/01
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.  1022.1	25 —		5	SS PA	2	50/2"				50/2"
The bett WL WL WL											
The	stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.							*(	Calibrat	ted Hand	Penetrometer
WA	ATER LEVEL OBSERVATIONS, ft	2.			1	BOF	RING S	TART	ED		1-14-03
WL	¥ 8.5 WD ¥ 20 AB	7	-	7	-		RING C				1-14-03
WL						RIG		V, #10		OREMA	
WL						APP	ROVE	D C	SK J	IOB#	J7P0601

LOG OF BOR	RING N	Ю.	MS	5-18	33				Р	age 1 of 1
CLIENT HNTB			Δ	utom	natic	Hamm	er Fff	icienc	y = 80.	7%
SITE	PRO	JEC					J. L.II	.510110	, 00.	. , 0
McDONALD COUNTY, MISSOURI						I-49, N	NISSO	URI		
Boring Location: 909+24, 241 Feet right of centerline			-	SAI	MPLE:	S			TESTS	
DESCRIPTION  Approx. Surface Elev.: 1044.8 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
GRAVELLY LEAN CLAY	-	CL		PA						
dark brown and reddish brown, very stiff, moist										
		CL	1	SS	3	16				8, 8, 8
5 103 SHALE++	9.8	-	-	PA			-			
brownish gray to gray, moderately hard to hard, weathered										
			2	SS		30				30, 50/3"
	10-			PA		50/3"				
										1
		3								
		-	3	SS	2	50/3"		-		50/3"
	15-			PA						
	_									
		-	4	SS	0	50/3"				50/3"
	20-			PA						
22.5 102	2.3									
그 그리 하는 것 하지 않는 아버지의 생활하였다.										
AUGER REFUSAL ON SHALE										
BOTTOM OF BORING AT 22.5 FEET BACKFILLED WITH CUTTINGS 01/14/03										
++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
The stratification lines represent the approximate boundary lines between soil and rock types: in-situ, the transition may be gradual.							*C	alibrate	ed Hand F	Penetrometer
WATER LEVEL OBSERVATIONS, ft				Т	BOR	NG ST	ARTE	D		1-14-03
				-		NG CC				1-14-03
WL Y DRY WD Y DRY AB TEM				1	RIG				OREMA	
WL						ROVED				J7P0601

019MS173-175.182-184.GPJ TERRACON.GDT 12

	LOG OF BORIN	G N	0.	MS	-18	4				Р	age 1 of 1
CLI	ENT HNTB			Αι	ıtom	atic l	Hamm	er Eff	icienc	y = 80.	7%
SIT	E McDONALD COUNTY, MISSOURI	PRO	JEC				I-49, N			-	
	Boring Location: 909+71, 575 Feet right of centerline				SAN	/PLES		11330	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1033.5 ft	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	GRAVELLY SILT, with clay dark brown, dense, moist to wet		ML		PA						
	SHALEY LEAN CLAY / HIGHLY WEATHERED SHALE dark gray and brown, hard, moist to wet  8.5	5—	CL	1	SS	12	35				10, 15, 20
	AUGER REFUSAL ON APPARENT SHALE BOTTOM OF BORING AT 8.5 FEET BACKFILLED WITH CUTTINGS 01/14/03										
The	e stratification lines represent the approximate boundary lines							*	Calibrat	ed Hand	Penetrometer
	ween soil and rock types: in-situ, the transition may be gradual.  ATER LEVEL OBSERVATIONS, ft					BOR	ING S	TART	ED		1-14-03
WL							ING C			)	1-14-03
WL		3				RIG	AT	V, #10	3E F	OREM	AN KS
WL						APP	ROVE	D C	SK J	OB#	J7P0601

LOG OF BORING NO. MS-218 Page 1 of 1													
CLI	ENT HNTB			Αι	ıtom	atic	Hamm	er Effi	icienc	y = 80.7	′%		
SIT		PRO	JEC							-			
	McDONALD COUNTY, MISSOURI				044		I-49, N	IISSO	URI	TESTS			
	Boring Location: 935+80, 216 Feet left of centerline				SAN	1PLES	)			IES15			
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1020.8 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"		
	CLAYEY GRAVEL, with sand	_	GC		PA								
	dark brown, loose, moist		GC	1	SS	6	13				4, 6, 7		
		5-					10				٦, ٥, ١		
			GC		PA								
		=	GC	2	SS	14	11				8, 6, 5		
		10-	GC		PA				-				
		=	300		Γ.Λ								
		_											
		=	GC	3	SS	6	20	<b>-</b>			9, 9, 11		
		15-					20				0, 0, 1.		
		=	GC		PA								
92	17 1003.8 SHALE++												
	dark gray and gray, moderately hard to	=				-		-			50/2"		
	hard, weathered	20		4	SS	2	50/2"				50/2		
		20-											
===	AUGER REFUSAL ON SHALE	_											
, ===		=											
	BOTTOM OF BORING AT 28.0 FEET BACKFILLED WITH CUTTINGS 01/14/03	25—		5	SS PA	2	50/2"				50/2"		
KRACON OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE CONTRACT OF THE	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.  992.8												
259-261, 288-290, GPJ, TE													
7-887													
9-261													
67.07		-									D		
ONEHOLE 99 5019MSZ18-220  M	The stratification lines represent the approximate boundary lines  *Calibrated Hand Penetrometer between soil and rock types: in-situ, the transition may be gradual.												
W W	ATER LEVEL OBSERVATIONS, ft					BOF	RING S	TART	ED		1-14-03		
g WL						BOF	RING C	OMPL	ETE	)	1-14-03		
M MI		d				RIG	AT	V, #10	)3E	FOREMA	AN KS		
WI WI		0				APP	ROVE	D C	SK	JOB#	J7P0601		

$\bigcap$	LOG OF BORIN	IG N	0.	MS	-21	9				Pa	ige 1 of 2
CLI	ENT HNTB			Λ.	ıtom	atic I	-lamme	ar Effi	cienc	y = 80.7	
SIT		PRO	JEC		10111	auc i	10111111	31 <b>L</b> 111	CIEIRC	y – 00.1	
L	McDONALD COUNTY, MISSOURI				CAL	/PLES	I-49, N	IISSO	URI	TESTS	
	Boring Location: 936+09, 17 Feet right of centerline				JAN	III LL				12010	8
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	туре	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pd	UNCONFINED STRENGTH, psf	Blow Counts for 18"
77775	Approx. Surface Elev.: 1024.0 ft  CLAYEY GRAVEL, with sand		GC		PA	<u> </u>	8 8	>0			
	dark brown, loose, moist	_									
		5	GC	1	SS	5	4				3, 2, 2
		-	GC		PA						
	- with clay seams below 8.5 feet	=	GC	2	SS	5	9				4, 4, 5
		10-	GC		PA				-		
	·	_	1	ļ							
		_	GC	3	SS	18	16				8, 8, 8
		15	GC		PA	 					
		-					<u>.</u>				
	<ul> <li>changing to brown and reddish brown, moist to wet below 18.5 feet</li> </ul>	20-	GC	4	SS	18	10				4, 4, 6
		-	GC		PA		1				
	23.5 1000.5 SHALE++		-	5	58	0	50/3"		-		50/3"
TERRACON GDT 772	dark gray and gray, moderately hard to hard, weathered	25	 	3	PA		 				
ERRAC		-	-								
				-6-	SS PA	6	50/6"				50/6"
98-7-		30 -			` ^						
3612		-	-								
0.259	Continued Next Page		1				1				
М М М М М М М М М М М М М М М М М М М	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.							*(	Calibrat	ed Hand	Penetrometer
W W	ATER LEVEL OBSERVATIONS, ft						RING S				1-14-03
s Wl			-,	7	<b>-</b>		RING C				1-14-03
MI WI		U	_L	JI		RIG		V, #10		OREMA	J7P0601
g Wi						ALL	ROVE	ט ע	SK J	OB#	J/ FUOU I

		LOG OF BORIN	NG N	Ю.	MS	-21	19				Р	age 2 of 2
	CL	ENT HNTB			Αι	ıtom	atic	Hamm	er Eff	icienc	y = 80.	7%
	SIT	E McDONALD COUNTY, MISSOURI	PRC	JEC				1-49, N			,	
	_					SAM	MPLE:				TESTS	
	GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
ı		33 991.0	_	<u> </u>								
		AUGER REFUSAL ON SHALE BOTTOM OF BORING AT 33.0 FEET	-									
ı		BACKFILLED WITH CUTTINGS 01/14/03										
j		++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
1/03												
5019MS218-220 259-261 288-290 GPJ TERRACON GDT 7/24/03												
GPJ TERRA												
-261.288-290								·				
20.259												
\$218-2	The betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.							*C	alibrate	d Hand F	enetrometer
5019M		TER LEVEL OBSERVATIONS, ft	·			T	BORI	NG ST	ARTE	D		1-14-03
	WL	☑ DRY WD ¥ DRY AB			_		BORI	NG CC	OMPLE	TED		1-14-03
퓺	WL	PDRY WD FDRY AB PEFF	عال	.[			RIG	ATV	, #103	BE FO	DREMA	N KS
å(	WL					/	APPF	ROVED	CS	K JC	OB #	J7P0601

	LOG OF BOR	ING N	10.	MS	3-22	20				D	age 1 of 1
CLI	ENT HNTB										
SITE		PRO	JEC	T	utom	atic	Hamm	er Eff	icienc	y = 84.	1%
	McDONALD COUNTY, MISSOURI		,,,,				I-49, N	/IISSO	URI		
	Boring Location: 936+62, 244 Feet right of centerline				SAN	/PLES	S			TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1020.3 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	CLAYEY GRAVEL brown, stiff to very stiff, moist to wet		GC		PA						
			GC	1	SS	12	7				4, 4, 3
		5-	GC		PA						
		1 - 20									
			GC	2	SS	12	18		-		5, 8, 10
	11 1009	3 10-	СН		PA						
	FAT CLAY, abundant gravel brown to dark brown, moist to wet	-									
			СН	3	SS	3	13				5, 6, 7
		15-	СН		PA						
		-	СН	4	SS	8	29	Page 1			4, 16, 13
		20-	СН		PA						
		-									
	23.8 996 SHALE++	7		-5 -6	SS PA	0	50/6"				50/6"
	dark gray, hard, weathered	25-		0	FA			des			
	BOTTOM OF BORING AT 27.8 FEET BACKFILLED WITH CUTTINGS 12/22/02				00		45/5"				45/011
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.	.5 —		7	SS	8	45/6"				45/6", 50/2"
The betw	stratification lines represent the approximate boundary lines een soil and rock types: in-situ, the transition may be gradual.							*(	Calibrate	ed Hand	Penetromete
	TER LEVEL OBSERVATIONS, ft					BOR	ING S	TART	ED ,		12-22-0
WL						BOR	ING C	OMPL	ETED		12-22-0
WL	Y DRY WD Y DRY AB	d				RIG	CME-	75, #3	886 F	OREMA	N JV
WL						APP	ROVE	D BI	KM J	OB#	J7P060

CI	LOG OF BORIN	IG N	<b>O</b> .	IVIS		9				P	age 1 of	
	HNTB			Αι	utom	atic	Hamm	er Eff	icienc	y = 80.7	7%	
SIT		PRO	PROJECT I-49, MISSOURI									
	McDONALD COUNTY, MISSOURI  Boring Location: 963+89, 193 Feet left of centerline				SAN	/PLE		IISSC	URI	TESTS		
g	borning Ecocation. 500 F00, 100 Feet left of Centernine		70								or 18"	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"	
5	Approx. Surface Elev.: 1075.1 ft	DE				RE	SP	\$0	DR	ST	Blo	
30	SILTY GRAVEL gray and dark brown, dense, dry to moist  1073.1  LIMESTONE++, with chert seams	=	GM		PA							
	LIMESTONE++, with chert seams 1072.6.			1	SS	0	50/0"				50/0	
	AUGER REFUSAL ON LIMESTONE											
	BOTTOM OF BORING AT 2.5 FEET BACKFILLED WITH CUTTINGS 01/19/03											
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.											
	analysis may reveal earth rock types.				· ·							
								^				
etv	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.									ed Hand F		
	ATER LEVEL OBSERVATIONS, ft				- 1-		ING ST				1-19	
٧L	V DRY WD V DRY AB V V V					BOR	ING C	OMPL	ETED		1-19	
NL	Ä Ä ISL					RIG				OREMA	N	

	LOG OF BORII	NG N	10.	MS	5-26	60				F	Page 1 of 1
CL	ENT HNTB			Aı	utom	natic	Hamm	or Eff	icienc	y = 80.	
SIT		PRO	DJEC	Т		1410	Tiuliiii	ici Lii	TOTOTIC	y - 00.	. 7 70
	McDONALD COUNTY, MISSOURI  Boring Location: 964+72, 3 Feet right of centerline	-	T	199	CAI	MPLE	I-49, N	MISSC	URI	TEOTO	
	Bonng Location. 904+72, 3 Feet right of centerline			-	SAI	MPLE	5		T	TESTS	T
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1070.1 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
000	SILTY GRAVEL gray and dark brown, dense, dry to moist	-	GM		PA			-			
000	4 ▼ 1066.1 4.5 <u>LIMESTONE++</u> , with chert seams 1065.6	=	GM	1	SS	6	12/6" 50/0"				4, 12, 50/0"
	AUGER REFUSAL ON LIMESTONE										3070
	BOTTOM OF BORING AT 4.5 FEET BACKFILLED WITH CUTTINGS 01/19/03										
	++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
,	analysis may reveal other rock types.										
2 "					. ,			*			
									c		
The	stratification lines represent the approximate boundary lines							*0	alihrate	d Hand I	Penetromete
betw	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft		-		_	ROP	ING ST			G Hallu I	1-19-03
WL					- 1-		ING CO				1-19-03
WL	y y AB	36		1	1	RIG		, #103		DREMA	
WL							ROVED			B#	J7P0601

	LOG OF BORIN	G N	0.	MS	-26	1				Pa	age 1 of 1
CL	IENT HNTB			Αι	ıtom	atic	Hamm	er Effi	icienc	y = 80.7	
SI	ΓE	PRO	JEC.							,	-70
-	McDONALD COUNTY, MISSOURI  Boring Location: 965+57, 258 Feet right of centerline				SAN	MPLES	1-49, N	IISSO	URI	TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1058.5 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
.0.	SILTY GRAVEL	_	GM		PA						
	gray and dark brown, dense, dry to moist		GM	1	SS	0	50/0"				50/0"
								. 6		* 2011	
	ALLANGE AND BEAUTY AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS AND ADDRESS							*/	Calibrati	ad Hand	Penetrometer
bet	e stratification lines represent the approximate boundary lines ween soil and rock types: in-situ, the transition may be gradual.									eu mand	
S VV	ATER LEVEL OBSERVATIONS, ft				- 1		ING S				1-19-03
WL			-	71	7		ING C				1-19-03
WL				JI		RIG	ROVE	/, #10		OREMA OB#	J7P0601

Mr Mr

CLI	LOG OF BORIN									P	age 1 of 1
	HNTB			Αι	ıtom	atic	Hamm	er Effi	cienc	y = 80.	7%
SIT	E McDONALD COUNTY, MISSOURI	PRC	JEC	Т			I-49, N	11880	IIDI		
T	Boring Location: 987+29, 300 Feet left of centerline				SAN	/PLES		11330	UKI	TESTS	
GRAPHIC LOG	DESCRIPTION  Approx. Surface Elev.: 1040.3 ft	DЕРТН, ft.	USCS SYMBOL	NUMBER	TYPE	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	<u>CLAYEY GRAVEL</u> , with cobbles reddish brown, brown and white, loose to	=	GC GC	1	PA SS	8	6				2, 3, 3
	medium dense, moist	_	GC		PA						
	<b>T</b>	=	GC	2	SS	6	15				7, 8, 7
	•	5-	GC		PA						
		=							-		
	8.5	_									
	GRAVEL, with sand and clay brown and white, medium dense, wet  ▼	=	GP	3	SS	4	12				4, 6, 6
	Town and write, median dense, wet	10-	GC GP GC		PA		- 1				
8		_	GC	8							
		=	GP	4	SS	1	6/6"				4, 6, 54
<b>100</b>	14.9 1025.4	-	GC GP	-	PA	-	54/5"				4, 0, 34/
			GC								
8	AUGER REFUSAL ON APPARENT LIMESTONE										
	BOTTOM OF BORING AT 14.9 FEET BACKFILLED WITH CUTTINGS 01/30/03				1						
							-				
The	stratification lines represent the approximate boundary lines veen soil and rock types: in-situ, the transition may be gradual.							*(	Calibrate	ed Hand	Penetrome
	ATER LEVEL OBSERVATIONS, ft					BOR	ING S	TARTE	ΞD		1-30-
WL	₹ 9.5 WD ₹ 10 AB			7	-		ING C	OMPL			1-30-
WL	¥ 9.5 WD ¥ 10 AB ¥ 4.3 24 hr ¥	حال	_[			RIG		/, #10		OREM	
WL						APP	ROVE	) SI	PB J	OB#	J7P06

ORING STARTED	1-30-03
ORING COMPLETE	ED 1-30-03
RIG ATV, #103E	FOREMAN JW
APPROVED SPB	JOB # J7P0601

CLI	ENT							<b>15</b> 67			ige 1 of 2
SIT	HNTB	PRO	DJEC		itom	atic I	damm	er Effi	cienc	y = 80.7	%
311	McDONALD COUNTY, MISSOURI	' ' '	JUL. U	•			I-49, N	IISSO	URI		
	Boring Location: 986+60, Centerline		1		SAN	PLES				TESTS	
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТУРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
<u>0</u>	Approx. Surface Elev.: 1041.9 ft		CL	Z	PA	<u>«</u>	ശമ	<b>≤</b> 0	0 &	O.S.	<u>@</u>
	SILTY LEAN CLAY, with gravel dark brown, stiff, moist		ML	1	SS	12	12			2000*	3, 5, 7
		5-	<u> ML</u>	ļ <u>.</u>							-, -, -
	8 Total NEW CAND with ground	.9	CL ML		PA						
	CLAYEY SAND, with gravel reddish brown, medium dense to loose,		- sc	2	SS	16	13	,			4, 6, 7
	moist to wet ♀	10-	sc		PA						
	¥			<u> </u>	00			<u> </u>	ļ		
	•	4.5	SC	3	SS	5	12				5, 5, 7
		15-	SC		PA						0.2.2
			SC	4	SS	6	6				9, 3, 3
	22 1019 SHALE++ dark gray and gray, moderately hard to	20-	sc		PA						
	hard, weathered	25 -		5	SS PA	4	50/4"				50/4"
		30-		6	SS PA	2	50/2"				50/2"
	Continued Next Page estratification lines represent the approximate boundary lines		٠.		<u> </u>	<u> </u>		*(	 Calibrat	led Hand	Penetrome
bet	ween soil and rock types: in-situ, the transition may be gradual.						,-				
	ATER LEVEL OBSERVATIONS, ft						ING S				1-20-
WL	- ♥ 11 WD ♥ 13 AB - ♥ 7.5 24 hr ♥	<b>-</b>			اح		RING C				1-29-
WL	. ₹ 7.5 24 hr ₹					RIG	ΔΤ	/ #10	13E   E	OREMA	۸N ،

W	WATER LEVEL OBSERVATIONS, ft									
8 WL	. <u>V</u>	• •	WD	<b>¥</b> 13	AB					
WL	<u>Ā</u>	7.5	24 hr	¥						
WL										

lerracon
----------

BORI	NG STA	RTED		1-20-0
BORI	NG CON	/PLETE	ED .	1-29-0
RIG	ATV, #	#103E	FOREM	AN JV
APPR	OVED	CSK	JOB#	J7P060

	LOG OF BORIN	G N	0.	MS	-29	0				P	age 1 of 2
CL	IENT HNTB			Αι	ıtom	atic I	łamm	er Eff	icienc	y = 80.1	7%
ŞIT		PRO	JEC	T			. 40 5				
	McDONALD COUNTY, MISSOURI  Boring Location: 986+00, 300 Feet right of centerline				SAN	/PLES	I-49, N	11330	UKI	TESTS	
	Borning Escations 555 555, 555 Feet right of Serialining										18.
GRAPHIC LOG	DESCRIPTION	DEPTH, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT	UNCONFINED STRENGTH, psf	Blow Counts for 18"
<u> </u>	Approx. Surface Elev.: 1038.0 ft  GRAVEL, with sand and clay		GP	Z	PA	œ	<u> </u>	≶ن	۵۵	⊃ 'S	<u> </u>
	reddish brown, brown and white, loose to medium dense, moist	-				ı					
			GP	1	SS	12	17				9, 8, 9
	<b>⊼</b>	5 —	GP		PA						
		-	GP	2	SS	10	9				6, 4, 5
	₹	10	GP	_	PA			-			-, ., -
			GF								
	₽	=	GP	3	SS	2	30				11, 13, 1
		15 —	GP		PA						1
	18.5 1019.5										
<del>کار</del> ۱۹۰۰	SANDY GRAVEL with clay	_	GP	4	SS	6	6				3, 3, 3
	reddish brown and white, loose to medium dense, moist to wet	20-	GP		PA						
		<u>-</u>									
	25.5 1012.5 SHALE++	25 —	GP GP	5	SS PA	10	16				9, 8, 8
	dark gray and gray, moderately hard to hard, weathered	-	-								
		30		6	SS	1	50/1"				50/1"
		-									
	Continued Next Page										
Th	e stratification lines represent the approximate boundary lines tween soil and rock types: in-situ, the transition may be gradual.							•	Calibra	ted Hand	Penetromet
	ATER LEVEL OBSERVATIONS, ft		•••			BOF	ING S	TART	ED		1-30-0
W						BOF	ING C	OMP	LETEI	)	1-30-0
W	L ¥ 14 WD ¥ 9.5 AB L ¥ 6 24 hr ¥	حال				RIG		V, #10		FOREM	
w						APF	ROVE	D S	SPB .	JOB#	J7P060

	LOG OF BORI	NG N	Ю.	MS	3-29	90				P	age 2 of 2
	ENT HNTB			Αι	utom	atic	 Hamm	er Eff	icienc	y = 80.	7%
SIT	E McDONALD COUNTY, MISSOURI	PRC	JEC				I-49, N			· · · · · · · · · · · · · · · · · · ·	
		1			SAI	MPLE				TESTS	
GRAPHIC LOG	DESCRIPTION	DЕРТН, ft.	USCS SYMBOL	NUMBER	ТҮРЕ	RECOVERY, in.	SPT - N BLOWS / ft.	WATER CONTENT, %	DRY UNIT WT pcf	UNCONFINED STRENGTH, psf	Blow Counts for 18"
	SHALE++  dark gray and gray, moderately hard to hard, weathered	_	-	7	SS	1	50/1"				50/1"
	nard, weathered	35-			HS						
		40-		8	SS HS	1	50/1"				50/1"
		45 —		9	SS HS	2	50/3"				50/3"
	51.8 986.	50		10	SS HS	1	50/1"			,	50/1"
The betw WA WL WL	AUGER REFUSAL ON SHALE  BOTTOM OF BORING AT 51.8 FEET BACKFILLED WITH CUTTINGS 01/30/03 ++ Classification estimated from disturbed samples. Core samples and petrographic analysis may reveal other rock types.										
The	stratification lines represent the approximate boundary lines					a.		*C	alibrate	ed Hand F	Penetrometer
betw WA	een soil and rock types: in-situ, the transition may be gradual.  TER LEVEL OBSERVATIONS, ft				1	BORI	NG ST			, a , idila r	1-30-03
WL							NG CO				1-30-03
WL	¥ 14       WD       ¥ 9.5       AB         ¥ 6       24 hr       ¥	<b>a</b> r		)[	<b>)</b>	RIG		, #103		DREMA	
WL			_		•		ROVED		<del></del>	OB #	J7P0601

`	WATER LEVEL OBSERVATIONS, ft									
	<del>¥</del> 14	WD	<b>¥</b> 9.5	AB						
WL	<u>⊼</u> 6	24 hr	<u>V</u>							
WL										



BORI	NG STA	RTED		1-30-03
BORI	NG COM	1PLETE	ED	1-30-03
RIG	ATV, #	#103E	FOREMAN	1 JW
APPR	OVED	SPB	JOB#	J7P0601

10.0 TEST DATA

10.1 Summary of Laboratory Test Data

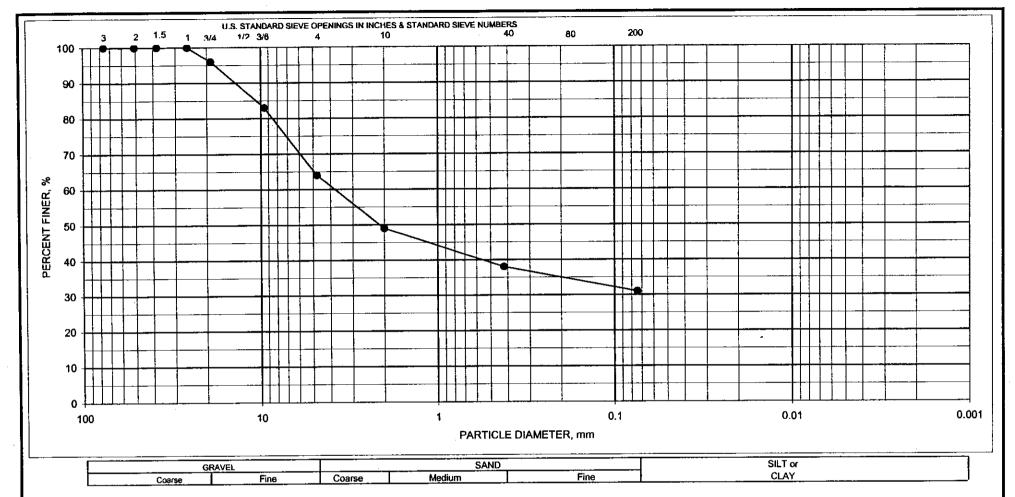
# I-49 MISSOURI LAB TEST DATA PINEVILLE, MISSOURI TO ARKANSAS STATE LINE McDONALD COUNTY, MISSOURI MODOT PROJECT NO. J7P0601

		D #	11-1-1	A44	rberg L	imita			0	ovo Ar	alveie	(parcar	t passin	0)			Resistivity	Unit We	ight, pcf	Std Compaction	Unconfined	Lab CBR	AASHTO	Group
Boring	Sample	Depth	Moisture	LL	PL PL	PI	1.5"	1"	2/4"	2/9"	No. 4	No 10	No 40	No. 100	No. 200	На	(ohm/cm)	In-situ	Dry	(pcf) @ %	(psf)	(@0.1 in.)		Index
Number	Number	(feet)	Content (%)	LL	PL	PI	1.5		3/4	3/6	140. 4	140. 10	140. 40	140. 100	140. 200	pri	(Offit verif)	III-Situ	Diy	(poi) 6 70	(50.)	(00:1:)		
								-				40	- 00		31	-	-			108.0 @ 17.3	-	1.7	A-2-4	0
MC-3	Bulk	5-16.3'	11.6	29	20	9			96	83	64	49	38				4470			100.0 @ 17.3	-	1.7	A-2-6	0
MC-19	Bulk	5-15.5'	8.6	29	17	12			100	93	82	64	42		33	8.3	4470					-	A-2-0	
MC-28	S-1	0-2'	20.1	38	34	4															-	-		
MC-28	S-2	2-5'	17.9	40	20	20																		
MC-28	S-3	5-10'	28.9																					
MC-28	S-4	10-13'	22.2																					
MC-28	S-5	13-20'	22.6	27	25	2																		
MC-28	S-6	20-25'	19.8	26	23	3																		
MC-28	S-7	25-27.5'	20.6	24	22	2					-													
			13.7	38	21	17		-	96	75	34	32	27		24					102.3 @ 19.0			A-2-6	1
MC-33	Bulk	0-5.5'			20	10	-	-	98	90	75	56	44		38					100.8 @ 17.8			A-4	1
MC-39	Bulk	2-35'	0.8	30	20	10	-		90	90	75	36	44	-	30			Note 1	Note 1	100.0 6 17.0	Note 1			
MS-43	Tube	18.5'-19'	16.5			_		_										Note 1	Note 1		14016 1		A-6	2
MC-44	Bulk	0-10.5	13.7	30	19	11			100	97	89	73	53	-	41							-	7-0	-
MC-49	AS-1	0-4'	13.4				-			-		100							-			-		
MC-49	AS-2	4-10'	24.5																		-	-	-	
MC-49	AS-3	10-15'	22.9	27	24	3															-		-	
MC-49	AS-4	15-20'	27.4						3/4															
MC-57	Bulk	0-6.8'	17.8	28	20	8			98	91	77	63	49		41	4.9	2881						A-4	1
MC-57	Tube	5.5-6.6	17.6	31	21	10		-										113.2	96.1		1200			
MC-65	Bulk	0-25.0'	9.8	31	24	7			100	95	80	59	37		29								A-2-4	0
MC-79	Bulk	3-23.5'	0.7	32	23	9			99	84	65	50	38	1-	31								A-2-4	0
	AS-1	0-3'	15.3	- OE	20	-			- 00															
MC-85		3-10'	25.1	-	-	-		-		-			<del>                                     </del>	-							1			
MC-85	AS-2			-	-	-	_		-	_				-		-		-			1	1		
MC-85	AS-3	10-15'	22.3	-	-	_	-	-	-	_	-										1	-	-	
MC-85	AS-4	15-20'	33.7		-								-	-	-				<del>                                     </del>		-	-	-	
MC-85	AS-5	20-25'	25.3										-	-				-				-	-	
MC-85	AS-6	25-30'	22.2																		-	-		
MC-88	Bulk	3-20.0'	0.5	27	22	5			99	90	73	59	48		41					97.2 @ 22.6		-	A-4	1
MC-94	Bulk	0-9.5'	3.9	47	19	28			100	92	83	75	67		54						1 1		A-7-6	11
MC-125	Bulk	1-25'	32.8	48	25	23			100	97	92	83	70		53	4.9	9470			101.7 @ 18.9		5.1	A-7-6	9
MC-125	Tube	6-6.8'	25.1	43	21	22												117.6	94.0		1550			
MC-133	Tube	8-9'	18.3	38	21	17												Note 1	Note 1		Note 1			
MC-137	Tube	3-4'	14.0	37	19	18												125.6	110.2		Note 1			
		8'-9.5'	25.0	0,	10	10												118.0	94.4		760			
MC-142	Tube		18.8	48	24	24	-		-		_		1					121.5	102.3		1550			
MC-148	Tube	8-9.5'			22	27	-	-	96	94	88	82	74	-	69	4.4	9120	125	102.0	103.5 @ 15.9	1	6.0	A-7-6	15
MC-153	Bulk	4-30'	22.9	49			-	-	90	34	00	02	14	-	03	7.7	3120	123.6	101.3	.00.0 0 10.0	1850	1	1	
MC-153	Tube	8.5-9.4	21.9	53	26	27	-	-	_	-	-	-	-		-	-			Note 1		Note 1	<del>                                     </del>	1	
MC-158	Tube	3-5'	7.6	46	23	23	_	-			-		-		-	-		Note 1	NOIS 1		I NOTE I	-	1	-
MC-159	AS-1	0-2'	17.8				_						-								+		-	
MC-159	AS-2	2-10'	26.3	54	21	33															-	-	-	-
MC-159	AS-3	10-17'	28.3																			-	-	
MC-159	AS-4	17-20'	34.8	53	23	30																		
MC-159	AS-5	20-25'	32.7										1										1	
MC-164	Bulk	1'-32'	25.5	56	19	37	100	100	100	98	96	92	83	77	74	5.6	5602			106.3 @ 18.2		3.1	A-7-6	19
MC-177	Bulk	0 - 13.0'	6.6	20	17	3	100	95	92	79	56	35	22	17	16					124.2 @ 9.5			A-2-4	0
		0-13.0	2.6	30	23	7	100	86	70	25	12	10	8	7	7								A-2-4	0
MC-178A	1		2.0	27	20	7	83	74	53	25	10	7	6	5	5						1		A-2-4	0
MC-178A	2	8 - 13											28	22	20	-	-	-			1	1	A-2-4	0
MC-178A	3	13 - 18	11.4	22	16	6	100	100	98	85	65	44				-	-	-			+	1	A-2-4	0
MC-186	Bulk	0-4'	3.8	24	21	3	100	93	84	40	11	7	6	5	5			-			+	+	A-2-4	0
MC-186	Bulk	4'-9.8'	10.7	28	19	9	100	100	97	81	63	50	40	36	34			-	-		-			
MC-189	Bulk	2' - 22.8'	3.6	20	17	3	98	96	96	88	68	47	29	23	21						-		A-2-4	0
MC-189	S-1	0'-2'	4.0										1								-	-	-	-
MC-189	S-3	7'-22.8'	3.2																					
	1	-				-																		

# I-49 MISSOURI LAB TEST DATA PINEVILLE, MISSOURI TO ARKANSAS STATE LINE McDONALD COUNTY, MISSOURI MODOT PROJECT NO. J7P0601

Boring	Sample	Depth	Moisture	Atte	rberg L	imits						(percen					Resistivity	Unit We		Std Compaction	Unconfined		AASHTO	Group
Number	Number	(feet)	Content (%)	LL	PL	PI	1.5"	1"	3/4"	3/8"	No. 4	No. 10	No. 40	No. 100	No. 200	pН	(ohm/cm)	In-situ	Dry	(pcf) @ %	(psf)	(@0.1 in.)		Index
MC-190A	1	0-4	6.1	25	19	6	100	100	89	74	50	36	27	25	24								A-2-4	0
MC-190A	2	4-9	6.3	25	20	5	100	100	94	77	52	36	27	25	23			-					A-2-4	0
/C-190A	3	9 - 14	4.3	26	20	6	100	96	91	76	52	36	27	25	24								A-2-4	0
MC-190A	4	14 - 19	2.0	26	19	7	100	87	71	39	20	13	8	7	6								A-2-4	0
MC-190A	5	19 - 24	1.9	29	19	10	83	83	67	38	14	6	5	5	4								A-2-4	0
MC-202	AS-1	0'-10'	6.0			1																		
MC-202	AS-2	10'-15.5'	5.4																					
MC-204	Bulk	0.5'-21.5'	5.9	24	19	5	100	100	100	95	80	62	42	35	32	5.0	28			109.6 @ 16.6			A-2-4	0
AC-205A	Bulk	0 - 11	4.9	26	19	7	100	100	100	86	63	47	35	31	30								A-2-4	0
MC-213	Bulk	0.8'-18.2'	11.0	24	18	6	100	100	100	95	83	66	49	43	40								A-4	1
MS-218	SS	8.5'-10'	18.1	40	18	22																		
MS-219	SS	3'-5'	16.5	-																				
MS-219	SS	8.5'-10'	21.3																					
MS-219	SS	13.5'-15'	15.0																					
MS-220	SS	3.5'-5.0'	6.5	36	22	14				1 11													1900	
MC-224	Bulk	0'-10'	7.1	29	16	13	100	100	98	94	81	61	40	33	30					124.1 @ 9.4			A-2-6	0
MC-226	AS-1	0'-10'	12.0							1.435														
MC-226	AS-2	10'-14.5'	18.6																					
MC-227	Bulk	0'-20'	9.3	28	20	8	100	100	100	94	82	66	49	43	41	4.5	2			112.7 @ 16.2		7.8	A-4	1
MC-242	AS-1	0'-5'	17.3																					
MC-242	AS-2	5'-15'	21.0																			199		
MC-242	AS-3	15'-20'	18.9																		1			
MC-245	Bulk	0'-20'	12.6	33	22	11	100	100	98	94	82	69	54	48	46								A-6	3
MC-257	Bulk	0'-7'	1.3																					
MC-263	Bulk	0'-19'	11.5	29	20	9	100	100	100	91	77	63	49	47	45								A-4	2
MC-264	AS-1	3.5'-10'	10.8																					
MC-264	AS-2	10'-20'	9.4																					-
MC-264	AS-3	20'-30'	12.2	4																				-
MC-266	Bulk	0'-24'	8.8	31	21	10	100	100	100	95	78	60	42	36	33								A-2-4	0
MC-272	Bulk	6'-13.5'	10.6	34	26	8	100	100	99	96	85	69	51	45	42	4.4	2			94.2 @ 23.7			A-4	1
MC-277	Bulk	0'-12.5'	10.6	22	18	4	100	91	87	75	60	46	35	31	30								A-2-4	0
MC-281	AS-1	0'-5'	15.1																					-
MC-281	AS-2	5'-10'	7.4		1																			-
MC-281	AS-3	10'-15'	7.0						1															-
MC-281	AS-4	15'-20'	9.1	117																				-
MC-281	AS-5	20'-25'	13.2	9 10															- 1					-
MC-281	AS-6	25'-30'	10.3																					-
MC-284	Bulk	20'-51'	14.3	37	20	17	100	100	100	97	90	77	57	49	46	5.7	2	1201		106.0 @ 13.0		7.5	A-6	4
MC-284	ST-6	25'-27'	17.7															Note 1	Note 1		Note 1			
MS-289	SS	8.5'-10'	25.2	42	21	21																		
MS-290	SS	8.5'-10'	23.8	48	20	28										7 7 7 7	- 79	2716						-
																								-

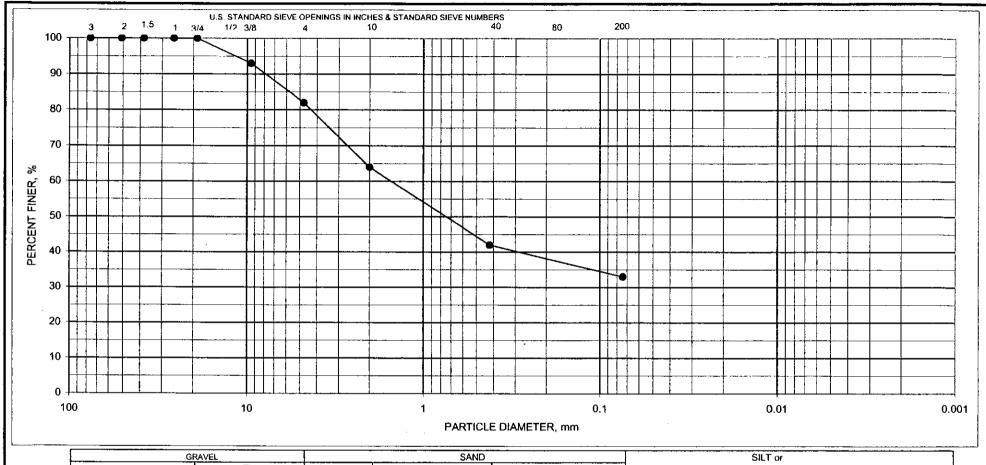
10.2 Grain Size Curves



BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATTI	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	Pi
MC-3	Bulk	5 to 16.3 feet	Clayey Gravel with Sand	GC	11.6	29	20	

PROJECT I 49 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line





	GF	AVEL		SAND		SILT or	
1	Coarse	Fine	Coarse	Medium	Fine	CLAY	

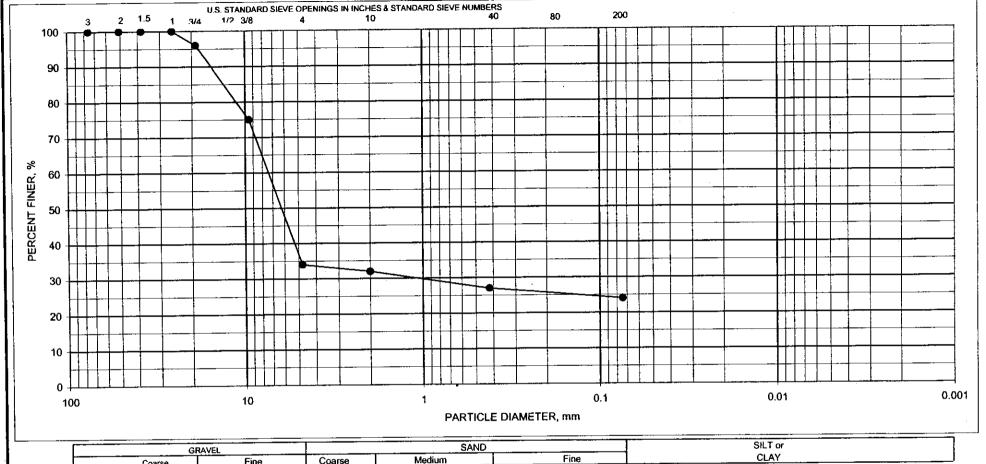
В	BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATT!	ERBERG LI PL	MITS PI
	MC-19	Bulk	5 to 15.5 feet	Clayey Sand with Gravel	sc	8.6	29	17	12

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri DATE

April 2003





GRAVEL		SAND		SILT or
Coarse Fine	Coarse	Medium	Fine	CLAY

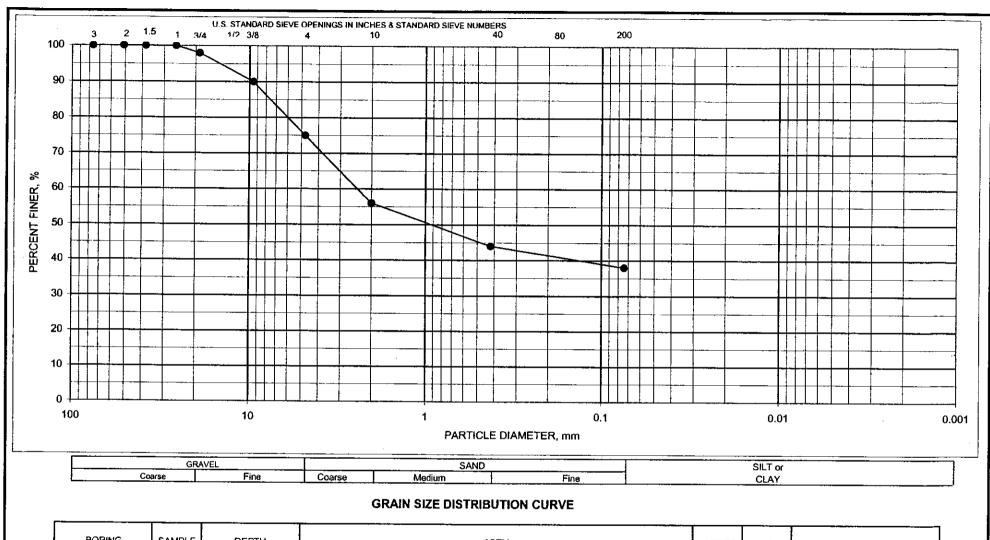
BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	Pi
MC-33	Bulk	0 to 5.5 feet	Clayey Gravel with Sand	GC	13.7	38	21	17

MC-33	Bulk	0 to 5.5 feet	Clayey Gravel with Sand	GC	13.7	38	21	17

PROJECT 1 49 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line	
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April 2003 39025019M DATE JOB NO. McDonald County, Missouri

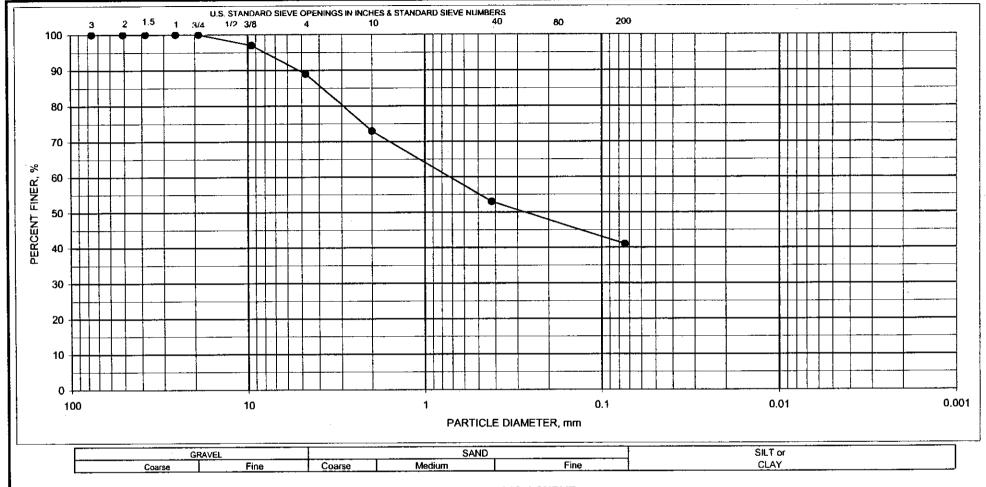




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-39	Bulk	2 to 35 feet	Clayey Sand with Gravel	SC	0.8	30	20	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Lin	PROJECT 149 - Missor	uri Project Number J7P0	601 - Pineville	Missouri to Arkansas	s State Line
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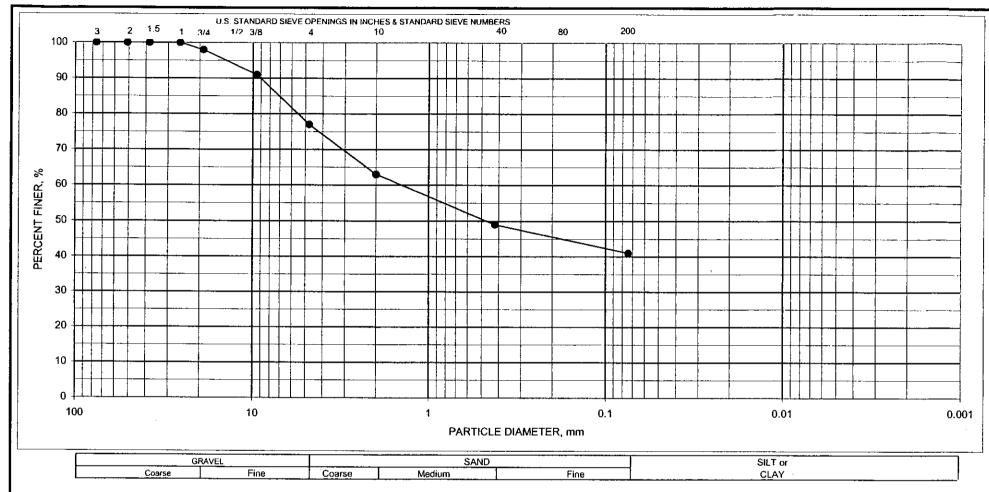




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATTI	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	I.L	PL	PI
MC-44	Bulk	0 to 10.5 feet	Clayey Sand	sc	13.7	30	19	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line	
PROJECT 149 - MISSOUT Project Number 17 Pool 1 - Pinevine, Missoum to Arkansas State Line	

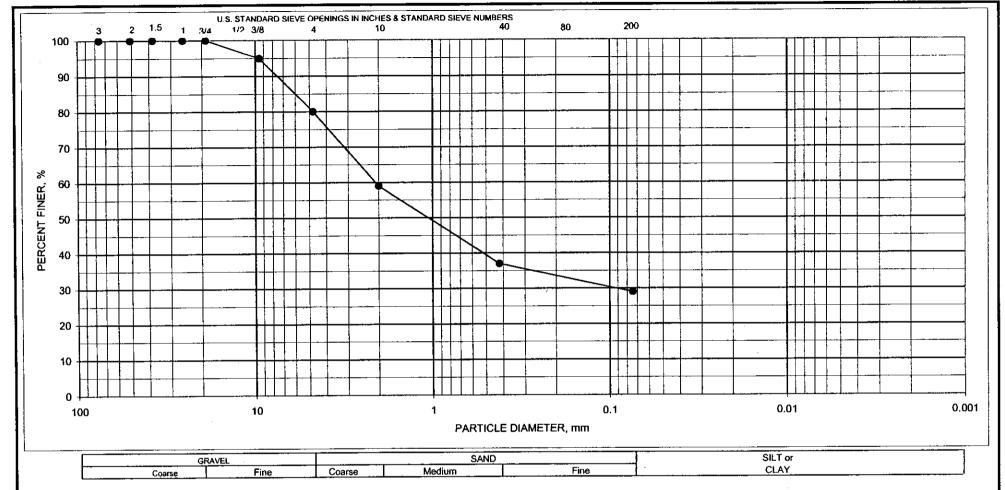




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-57	Bulk	0 to 6.8 feet	Clayey Sand with Gravel	sc	17.8	28	20	

PROJECT I 49 - Missouri Project Number J7P0601 - Pines	ville. Missouri to Arkansas State Line
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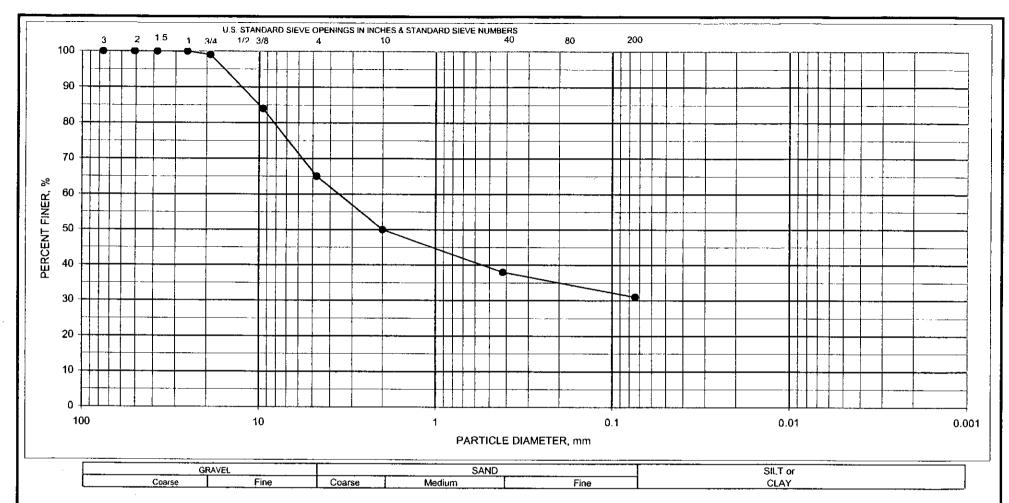




BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTI LL	ERBERG LI	MITS Pi
MC-65	Bulk	0 to 25 feet	Silty Sand with Gravel	SM	9.8	31	24	7

the second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second second secon	
PROJECT   49 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line	
PROJECT 149 - MISSUM PROJECT MUNDER DA FUOUT - ENDANGE, MIGGOUR TO FARGUADO CARRE ENTO	

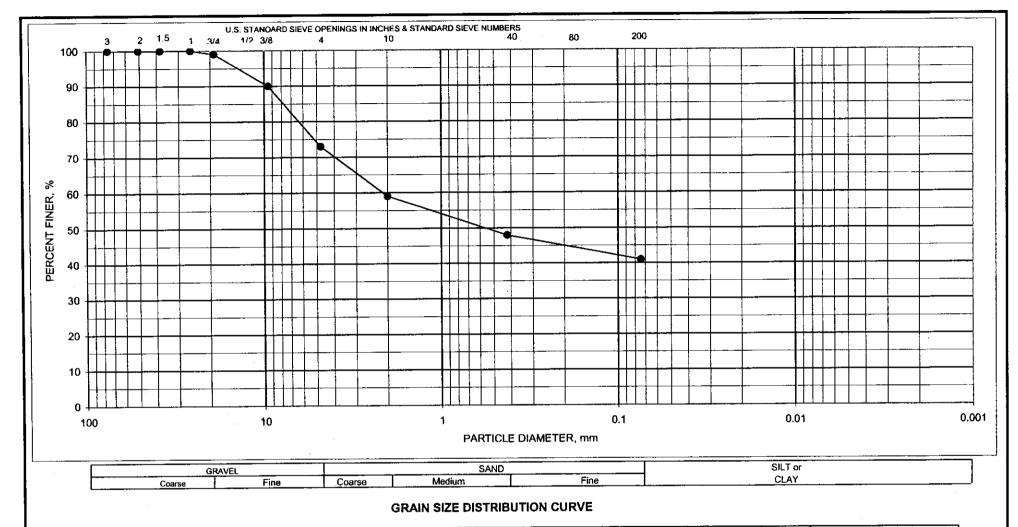




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED		ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL		LL	PL	PI
MC-79	Bulk	3 to 23.5 feet	Clayey Gravel with Sand	GC	0.7	32	23	9

PROJECT 149.	Miccouri Project Number 1700601	- Pineville, Missouri to Arkansas State Line	
111000001140	. MRSSOUR LIDIECT MULLIDEL TYPODOL:	* Pitteville, Missouri to Arkarisas State Line	

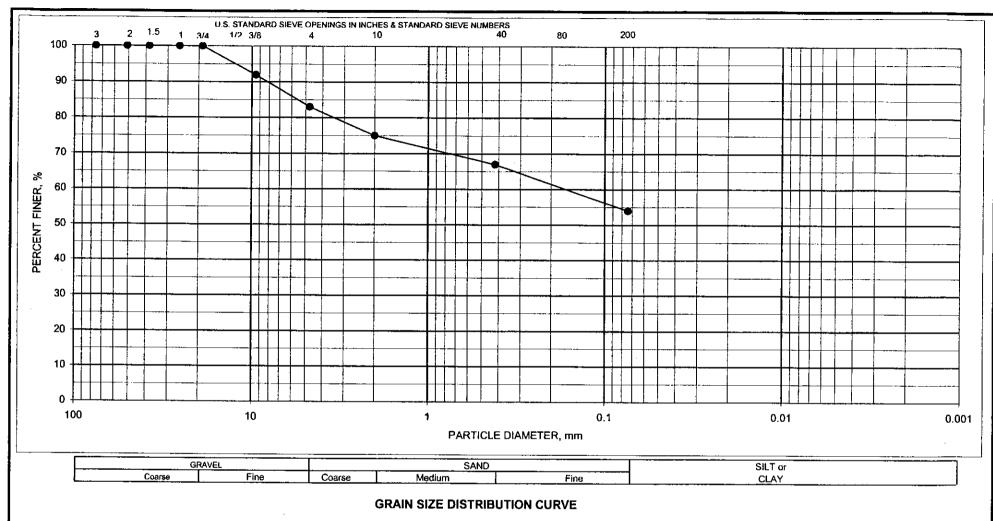




BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATT LL	ERBERG LI	MITS PI
MC-88	Bulk	3 to 20 feet	Silty Sand with Gravel	SM	0.5	27	22	5

PRO JECT	149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line	



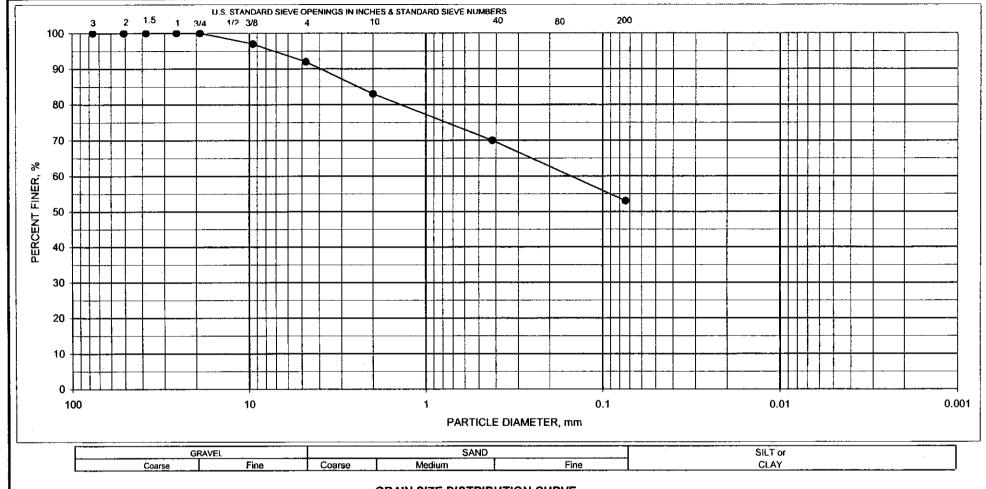


BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-94	Bulk	0 to 9.5 feet	Sandy Lean Clay with Gravel	CL	3.9	47	19	

PROJECT	149.	- Missouri Project Number	1700601	Dinovitto	Adinopurate A	donnan	Ctata	. :
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 McDonald County, Missouri
 JOB NO.
 39025019M
 DATE
 April 2003

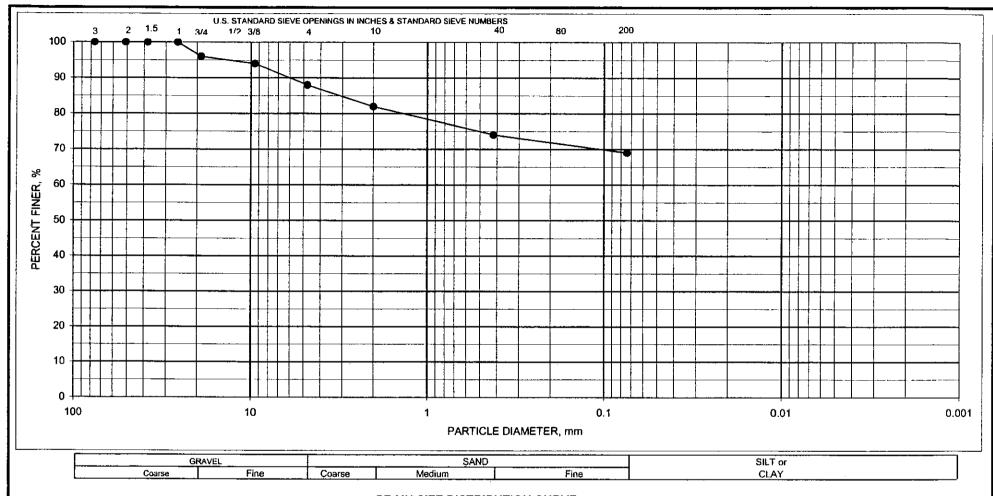




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL		PI
MC-125	Bulk	1 to 25 feet	Sandy Lean Clay	CL	32.8	48	25	23

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkar	nsas State Line	a
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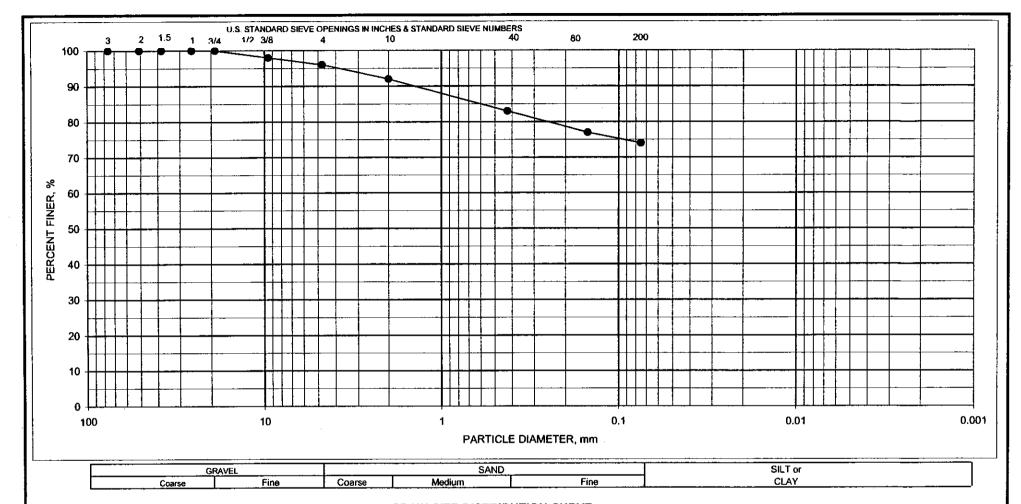




BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATT LL	ERBERG LI	MITS PI
MC-153	Bulk	4 to 30 feet	Sandy Lean Clay	CL	22.9	49	22	27

PROJECT 149 - Missouri Project Number J7P0601 - Pinevitle, I	Missouri ta Adunassa Ctata Lina

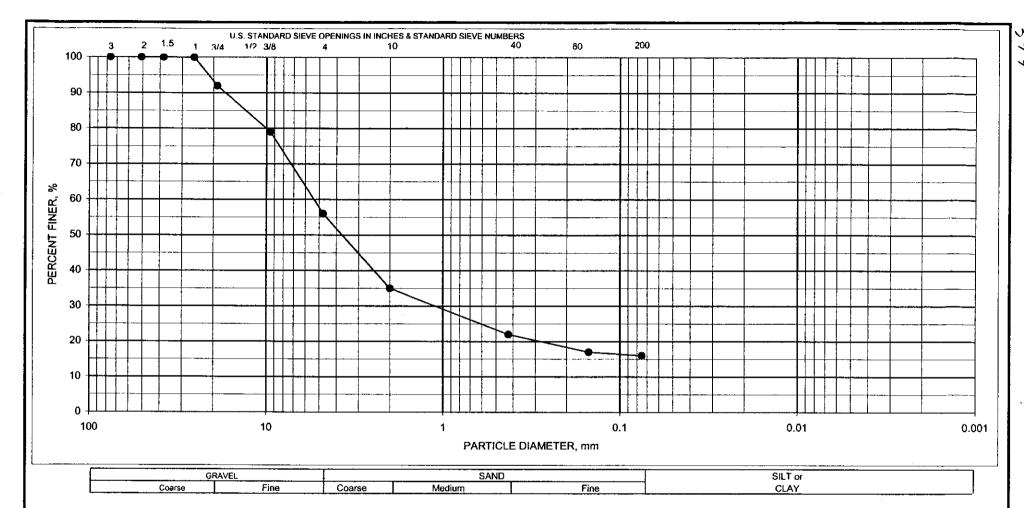




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LII	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-164	Bułk	1 to 32 feet	Fat Clay with Sand	CL	25.5	56	19	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

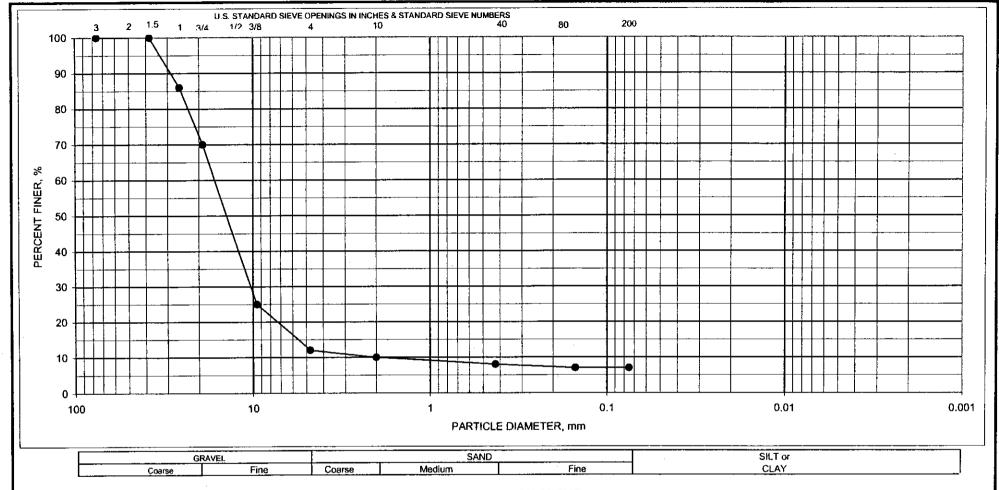




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC. %	L <b>L</b>	PL	PI
MC-177	Bulk	0 to 13 feet	Silty Gravel with Sand	SM	6.6	20	17	3

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

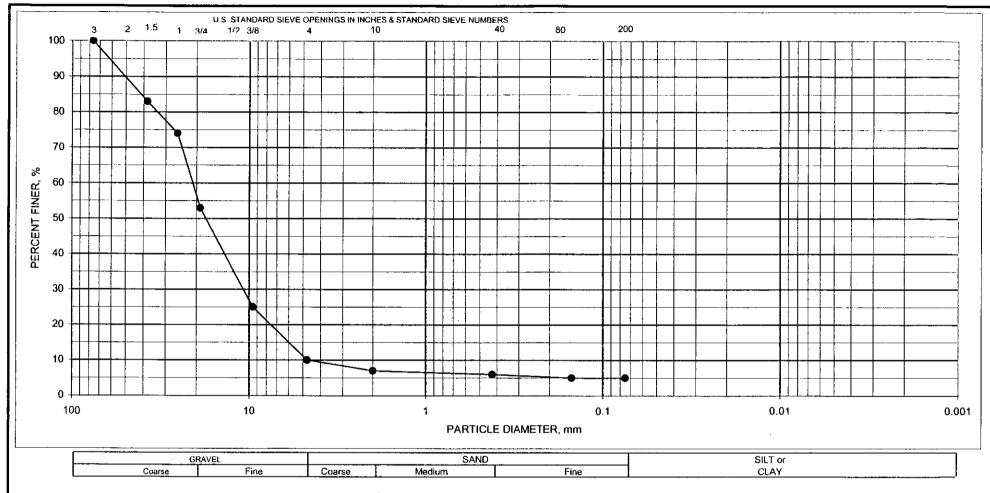




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATTI	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-178A	1	0 - 8	Poorly Graded Gravel with Silt	GP-GM	2.6	30	23	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

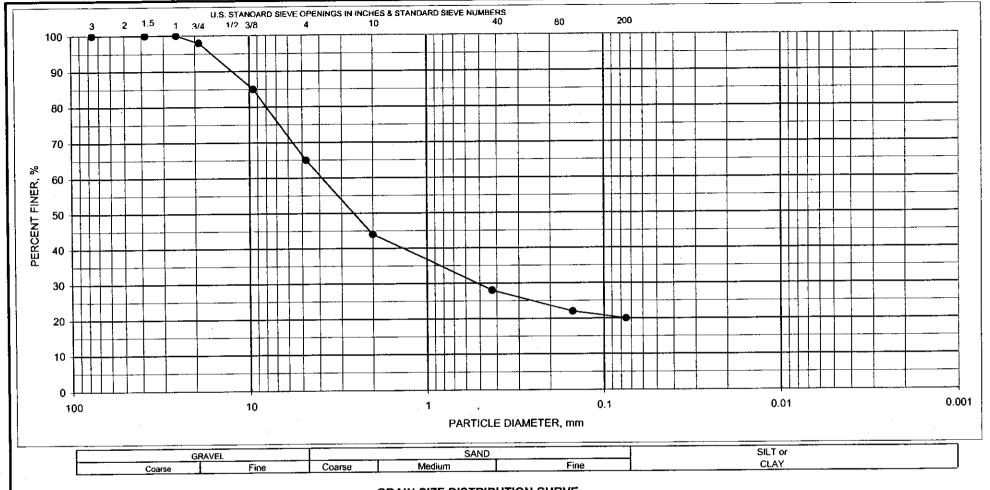




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-178A	2	8 - 13	Well Graded Gravel with Sitty Clay	GW-GC	2.2	27	20	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

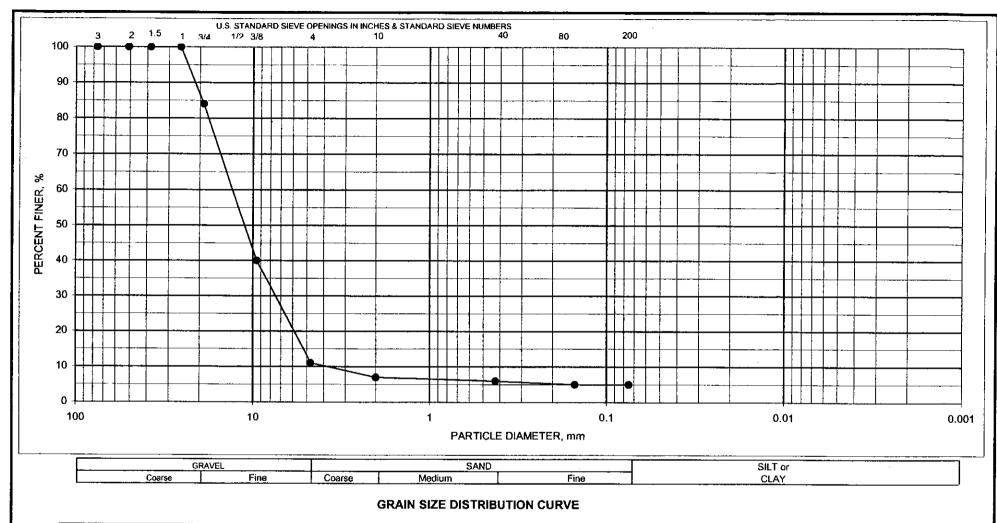




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT1	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-178A	3	13 - 18	Silty, Clayey Sand with Gravel	SC-SM	11.4	22	16	

PROJECT 149 - Missouri Proje	ct Number J7P0601 - Pineville,	Missouri to Arkansas State Line

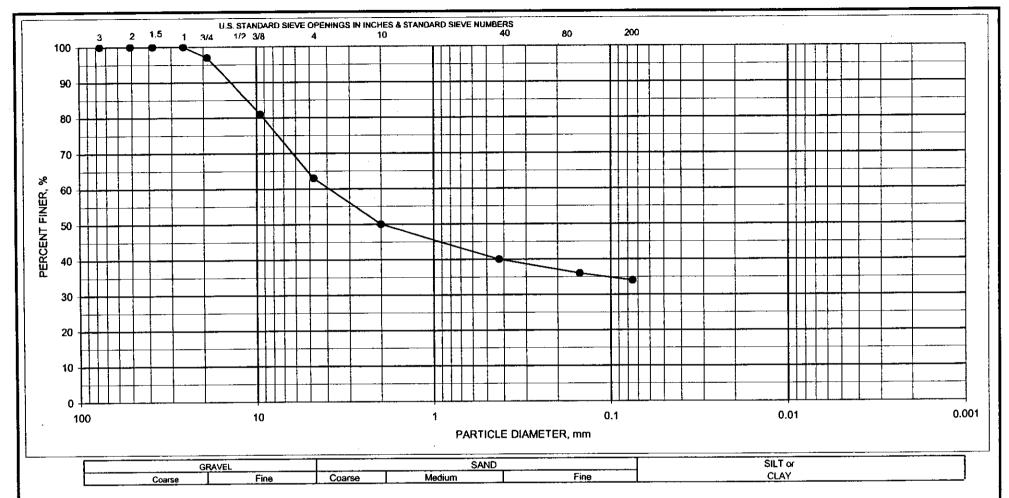




В	ORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTI LL	ERBERG LI	MITS PI
	MC-186	Bulk	0 to 4 feet	Well Graded Gravel	GW	3.8	24	21	3

PROJECT 149 - Missouri Project Number J7P0601	- Pinavilla, Missauri to Arkonsos Stata Lina
- FROJECT 149 - WISSOUT PROJECT NUMBER J/PONOT	~ Pineville Missolid to Adkansas State Line





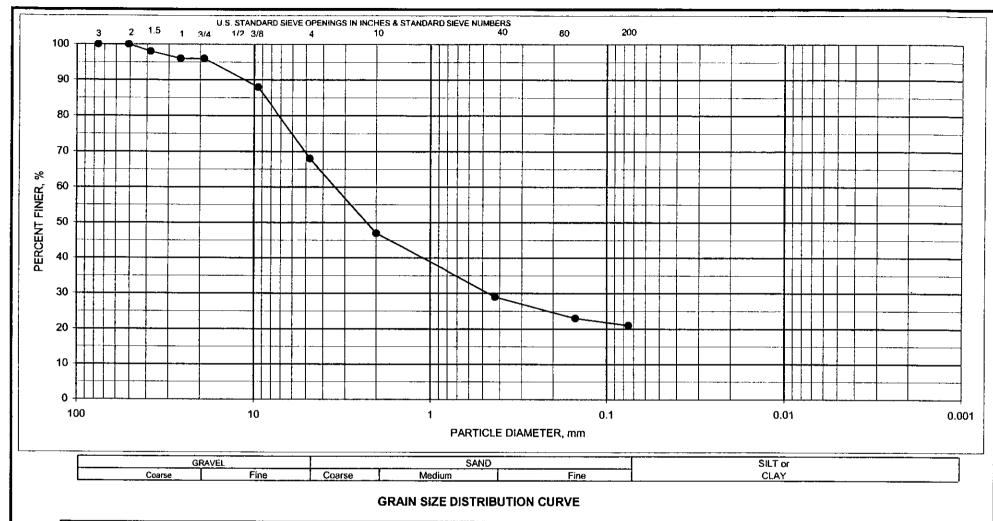
BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-186	Bulk	4 to 9.8 feet	Clayey Gravel with Sand	GC	10.7	28	19	

MC-186	Bulk	4 to 9.8 feet	Clayey Gravel with Sand	GC	10.7	28	19	9
		· · · · · · · · · · · · · · · · · · ·		<del></del>				

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri	souri to Arkansas State Line	
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April 2003 39025019M DATE JOB NO. McDonald County, Missouri





В	ORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATTI	ERBERG LI	MITS
	NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	Pi
N	/C-189	Bulk	2 to 22.8 feet	Silty Sand with Gravel	SM	3.6	20	17	3

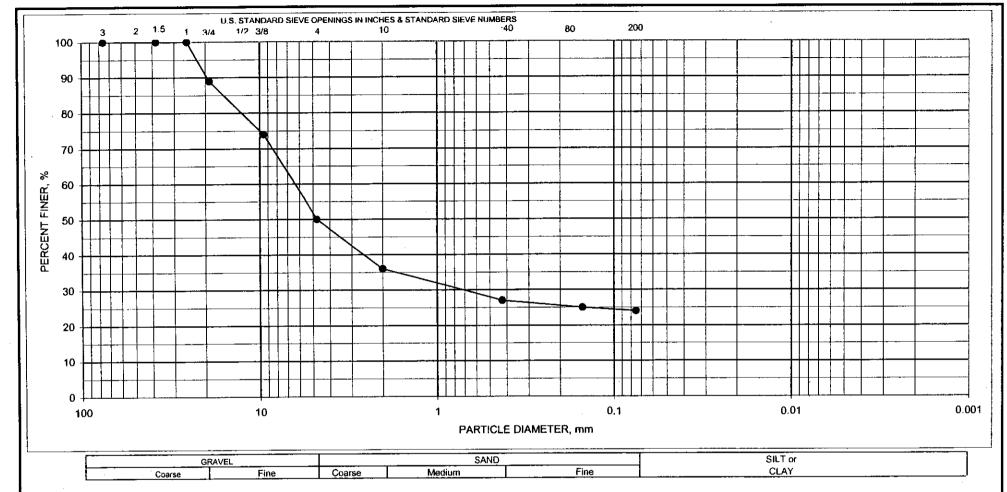
PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri JOB NO. 39025019M

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April 2003

DATE



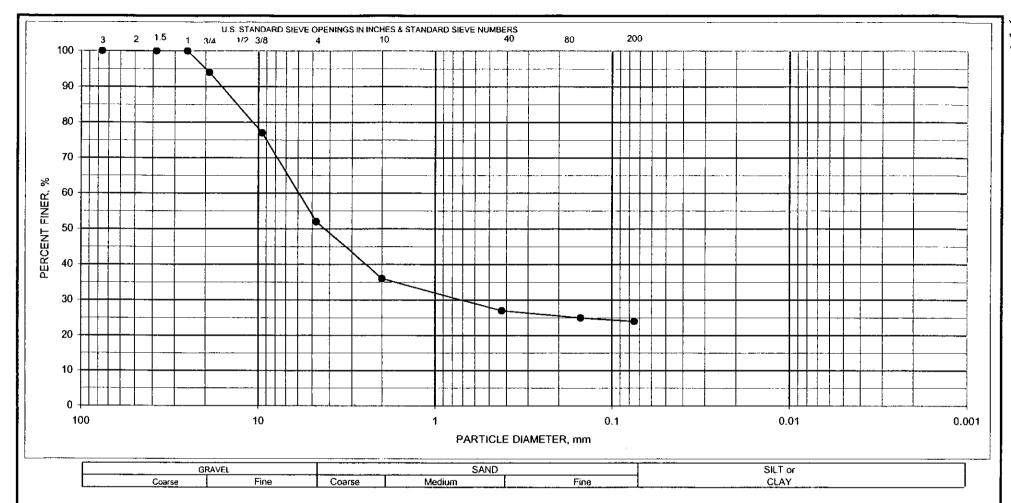
BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC.%	LL	PL	PI
MC-190A	1	0 - 4	Silty, Clayey Gravel with Sand	GC-GM	6.1	25	19	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri JOB NO. 39025019M

DATE November 2003

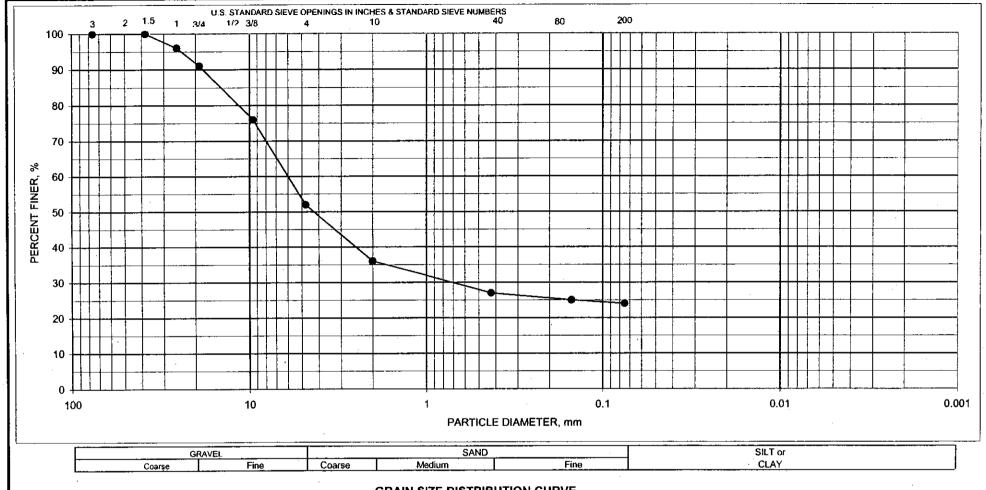




BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATT LL	ERBERG LI PL	Pl
MC-190A	2	4 - 9	Silty, Clayey Gravel with Sand	GC-GM	6.3	25	20	5

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line



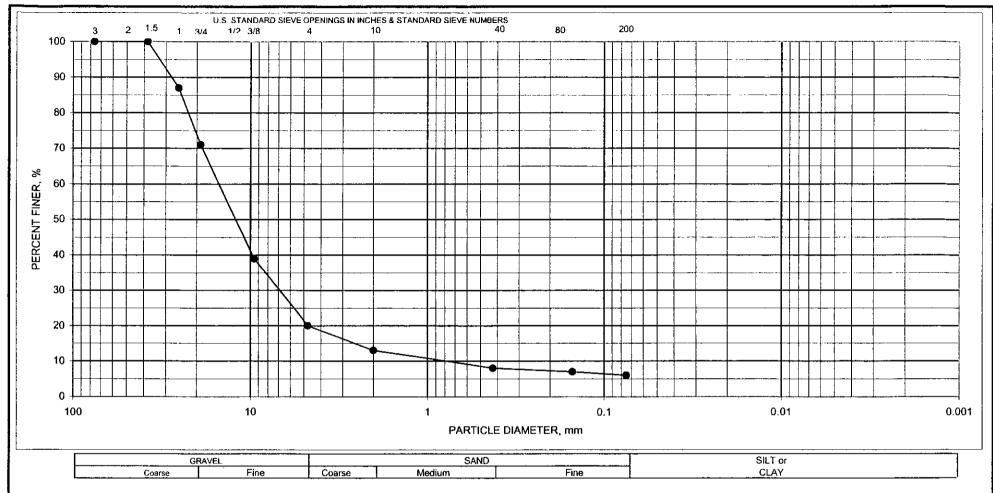


BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-190A	3	9 - 14	Silty, Clayey Gravel with Sand	GC-GM	4.3	26	· 20	

DDO IECT LAG	- Missouri Project Number	1700001	Discuilla I	discouri to	Advancae State I	ina
PROJECT 149 -	- Missouri Project Number	J/FU6U1 -	Mineville. N	MISSOURI 10 A	Arkansas Stale L	_ine

JOB NO. 39025019M DATE November 2003 McDonald County, Missouri





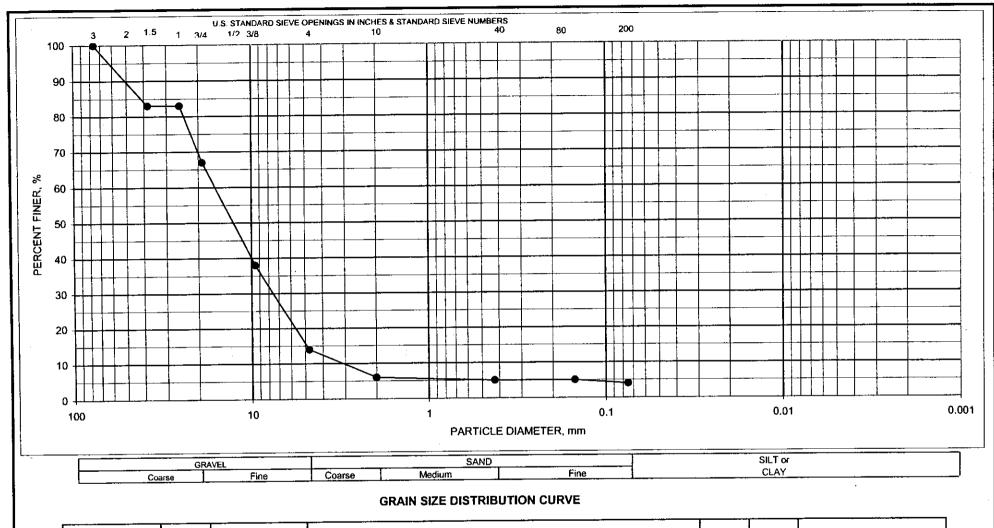
BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %		ERBERG LI PL	MITS PI
MC-190A	4	14 - 19	Poorly Graded Gravel with Silty Clay	GP-GC	2	26	19	7

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri JOB NO. 39025019M DATE November 2003



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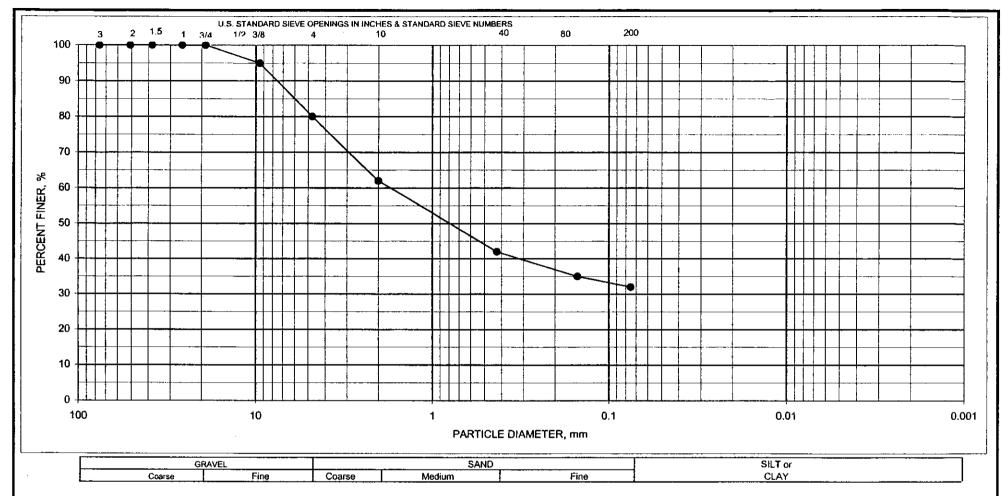
BORING NO.	SAMPLE NO.	DEPTH, feet	7.01	UNIFIED SYMBOL	NAT. WC, %	ATT. LL	ERBERG LI PL	MITS PI
MC-190A	5	19 - 24	Well Graded Gravel	GW	1.9	29	19	10

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri JOB NO. 39025019M

DATE November 2003

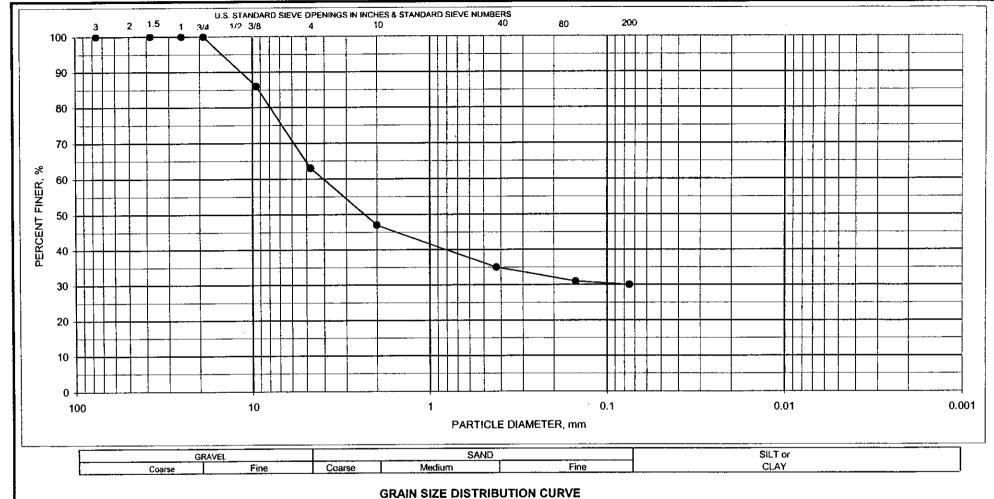




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATTI	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-204	Bulk	0.5 to 21.5 feet	Silty Clayey Sand with Gravel	SC-SM	5.9	24	19	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line



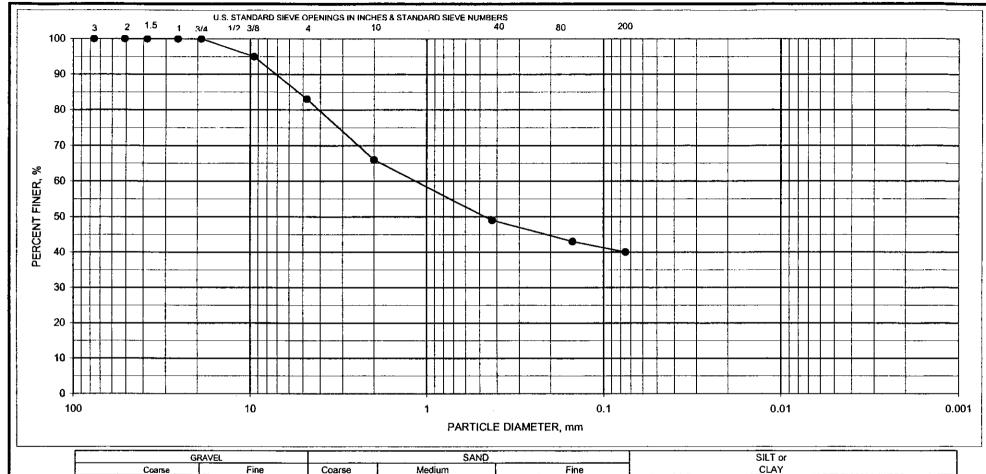


BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTI LL	ERBERG LI	MITS PI
MC-205A	1, 2, 3	0 - 11	Sitty, Clayey Gravel with Sand	GC-GM	4.9	26	19	7

PROJECT 149 - Missouri Project Number J7P06	D1 - Pineville, Missouri to Arkansas State Line
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JOB NO. 39025019M DATE November 2003 McDonald County, Missouri





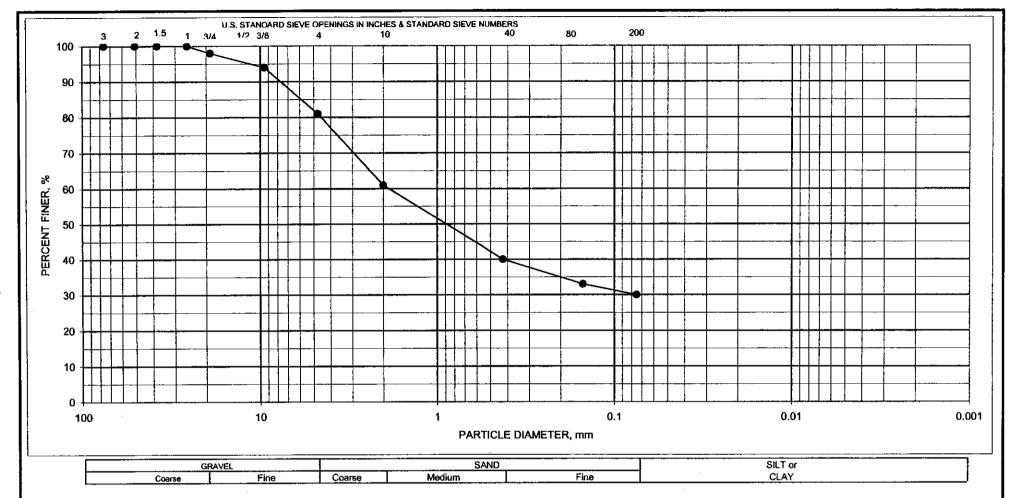
	AVEL		SAND		SILT or						
Coarse	Fine	Coarse	Medium	Fine	CLAY						

BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LII	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	Pi
MC-213	Bulk	0.8 to 18.2 feet	Silty Clayey Sand with Gravel	SC-SM	11	24	18	

PROJECT I 49 - Missouri Project Number J7P0801 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri JOB NO. DATE





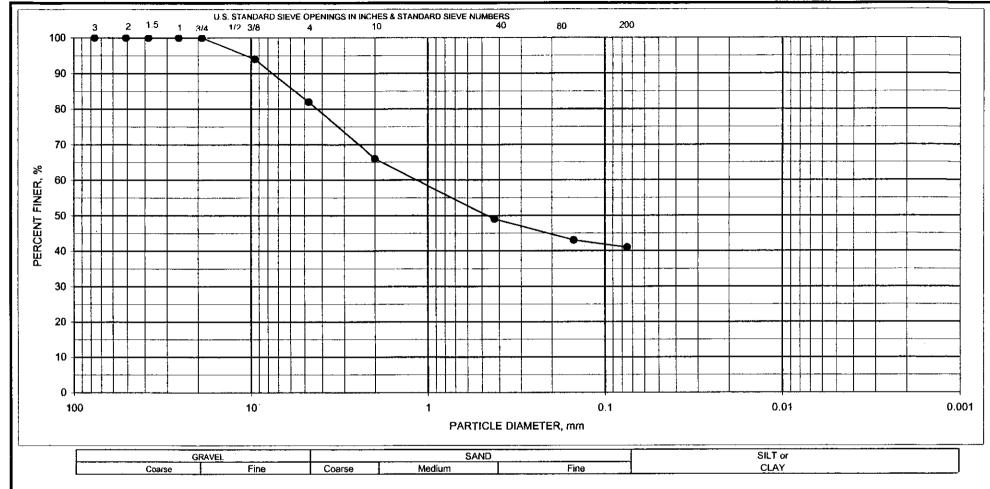
BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MIT\$
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-224	Bulk	0 to 10 feet	Clayey Sand with Gravel	sc -	7.1	29	16	

PROJECT I	49 - Missouri Pro	ject Number J7P0601	- Pineville, Missou	ri to Arkansas State Line

McDonald County, Missouri JOB NO. 39025019M DATE April 2003



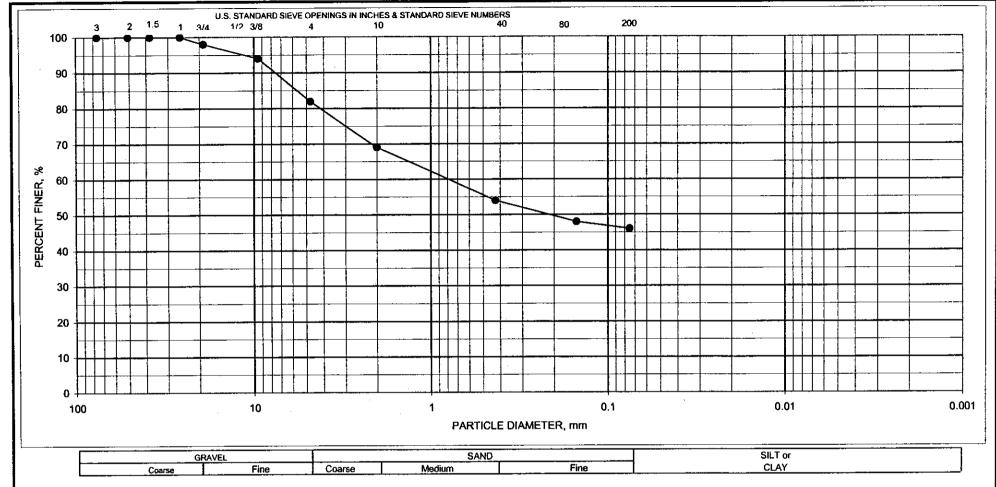
787



BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATT LL	ERBERG LI	MITS PI
MC-227	Bulk	0 to 20 feet	Clayey Sand with Gravel	SC	9.3	28	20	8

PROJECT 1 49 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

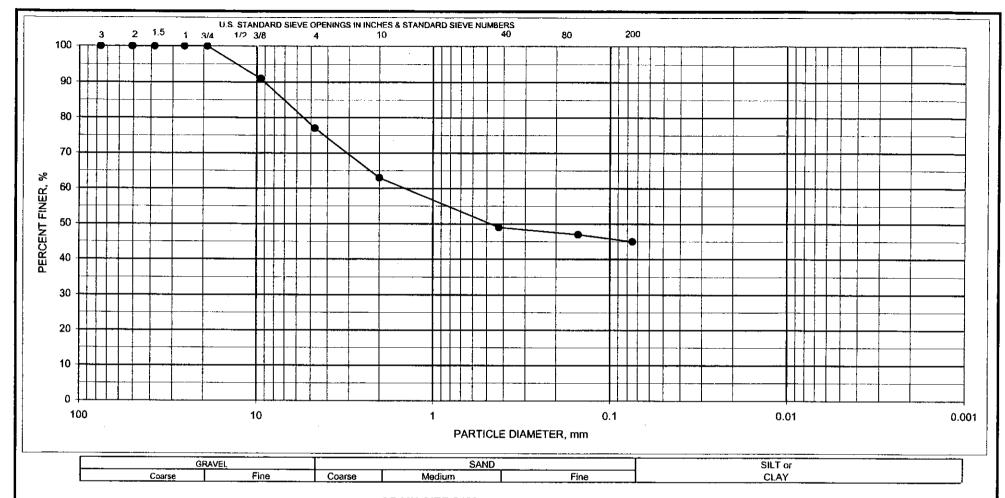




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL		PI
MC-245	Bulk	0 to 20 feet	Clayey Sand with Gravel	sc	12.6	33	22	11

PROJECT 149 - Missouri Project Number	r J7P0601 - Pineville.	Missouri to Arkansas State Line	
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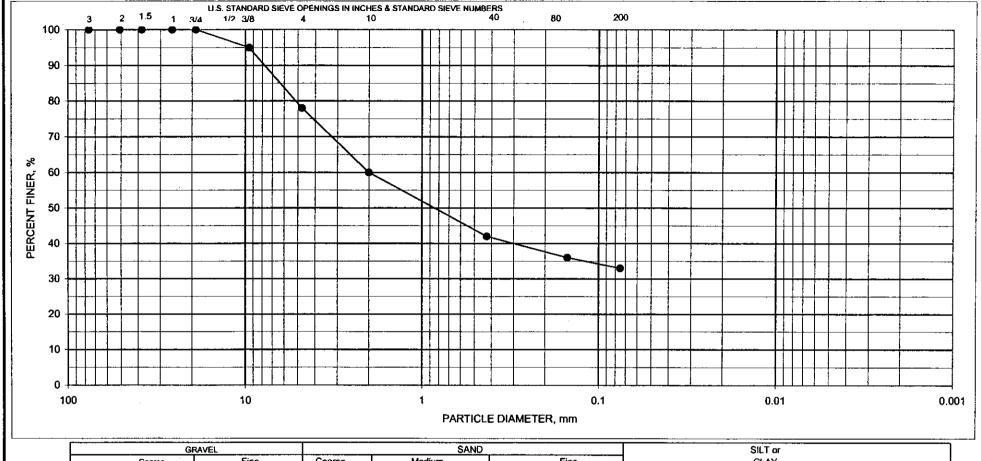
BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATTI	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-263	Bulk	0 to 19 feet	Clayey Sand with Gravel	sc	11.5	29	20	

PROJECT I 49 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

McDonald County, Missouri JOB NO. 39025019M

DATE April 2003





#### Coarse Coarse Fine Medium CLAY

#### **GRAIN SIZE DISTRIBUTION CURVE**

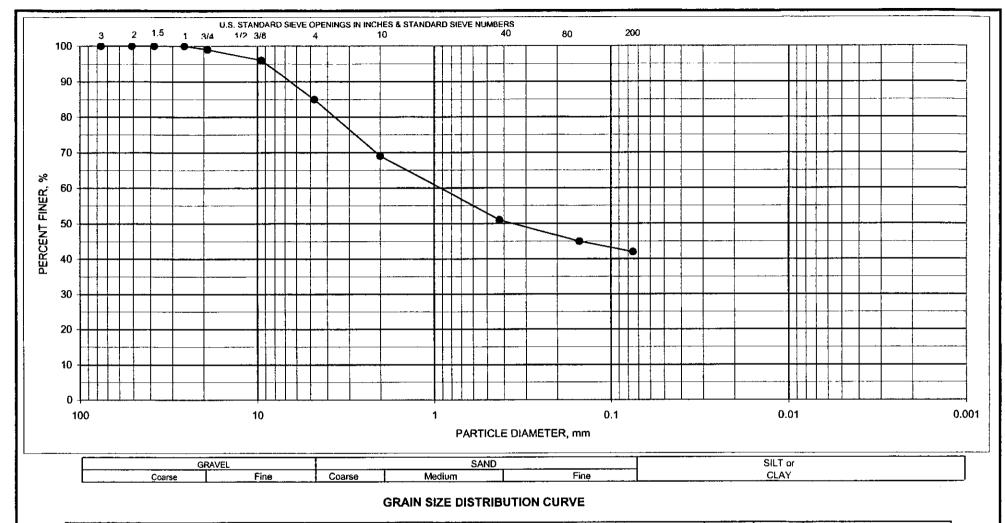
BORING NO.	SAMPLE NO.	OEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATT [*]	ERBERG LI PL	MITS PI
MC-266	Bulk	0 to 24 feet	Clayey Sand with Gravel	sc	8.8	31	21	10

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas Stete Line						
	DOO IECT	1.40	Miccourt Design Number 178	DORON Dir	navilla Missouri to Arkaneas Stata Lina	
	FROJECT	144.	MIISSOUIT ETOJECH MULTIDEL 371	-0001-11	ilavilla, iviissoutti to Arkatisas State Efile	

McDonald County, Missouri JOB NO. 39025019M DATE April 2003



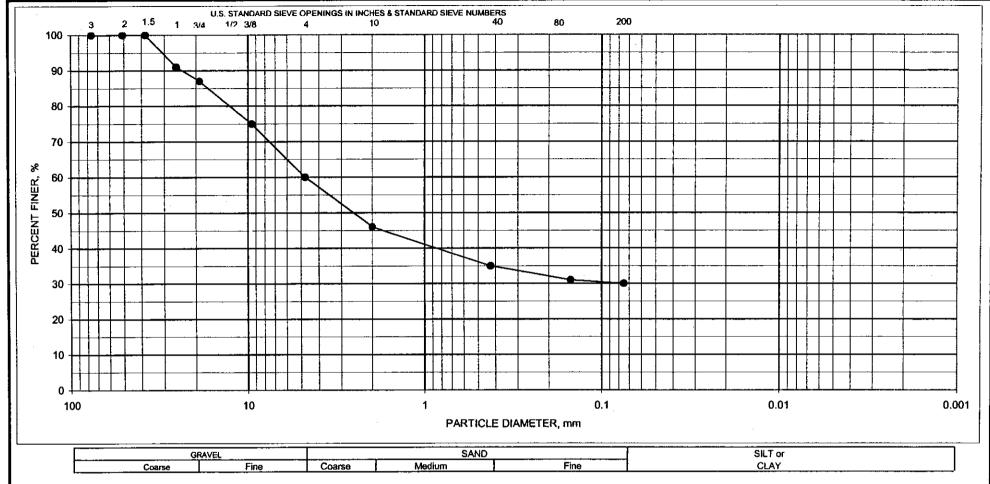
393



BORING NO.	SAMPLE NO.	DEPTH, feet	ASTM DESCRIPTION	UNIFIED SYMBOL	NAT. WC, %	ATTI LL	ERBERG LI	MITS PI
MC-272	Bulk	6 to 13.5 feet	Silty Sand with Gravel	SM	10.6	34	26	8

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line

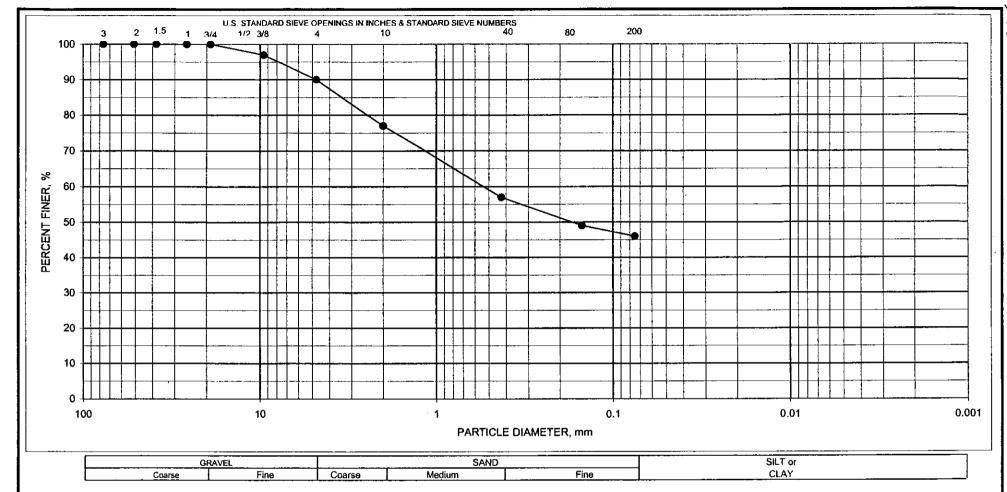




BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT.	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	Pl
MC-277	Bulk	0 to 12.5 feet	Silty Clayey Gravel with Sand	GC-GM	10.6	22	18	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line





BORING	SAMPLE	DEPTH,	ASTM	UNIFIED	NAT,	ATT	ERBERG LI	MITS
NO.	NO.	feet	DESCRIPTION	SYMBOL	WC, %	LL	PL	PI
MC-284	Bulk	20 to 51 feet	Clayey Sand	sc	14.3	37	20	

PROJECT 149 - Missouri Project Number J7P0601 - Pineville, Missouri to Arkansas State Line



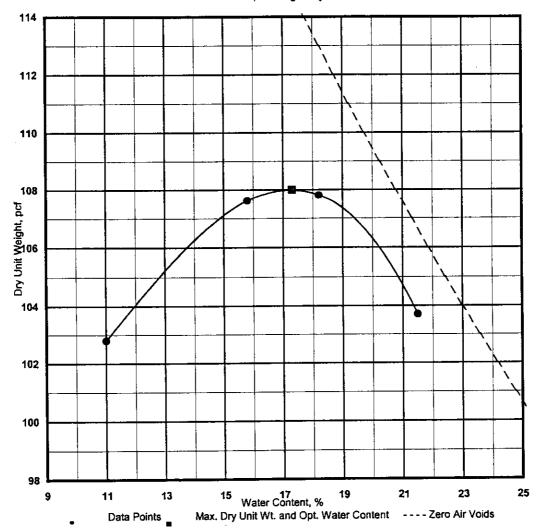
10.3 Standard Compaction Results

### llerracon-

### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 108.0 pcf
Source Material:	MC-3 5 to 16.3 feet	Optimum Water Content: 17.3 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 29 Plastic Limit: 20
Test Method:	AASHTO T99	Plasticity Index: 9
Test Procedure:	Method C	% passing # 200 sieve: <u>31</u>
Sample Preparation:	Wet Preparation	
Rammer:	Mechanical X Manual	Reviewed by: SPB

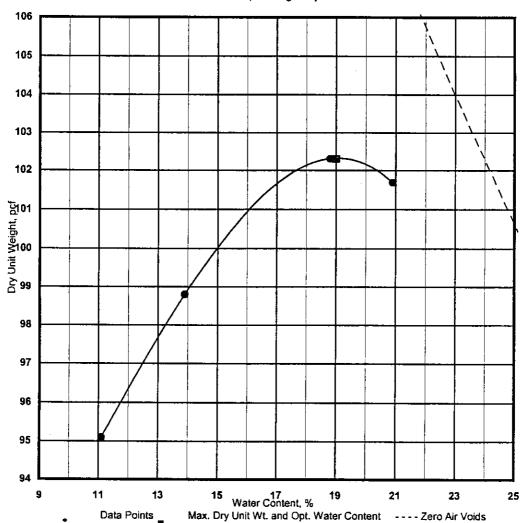


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	149 - Missouri Project Number J7P0601	
Location:	Pineville, Missour to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 102.3 pcf
Source Material:	MC-33 0 to 5.5 feet	Optimum Water Content: 19.0 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 38 Plastic Limit: 21
Test Method:	AASHTO T99	Plasticity Index:17_
Test Procedure:	Method C	% passing # 200 sieve: <u>24</u>
Sample Preparation:	Wet Preparation	<del></del>
Rammer:	Mechanical X Manual	Reviewed by: SPB

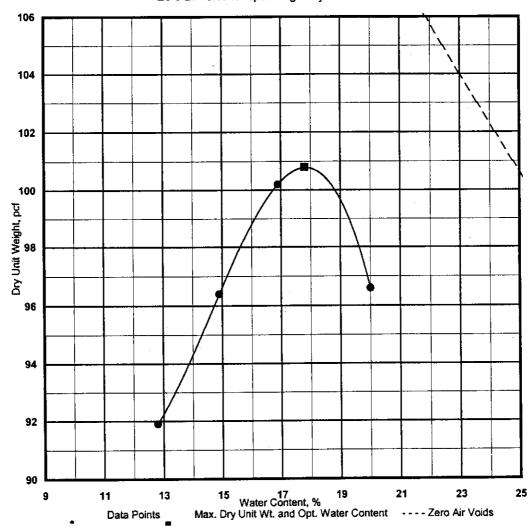


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 100.8 pcf
Source Material:	MC-39 2 to 35 feet	Optimum Water Content: 17.8 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 30 Plastic Limit: 20
Test Method:	AASHTO T99	Plasticity Index: 10
Test Procedure:	Method C	% passing # 200 sieve: <u>38</u>
Sample Preparation:	Wet Preparation	
Rammer:	Mechanical X Manual	Reviewed by: SPB

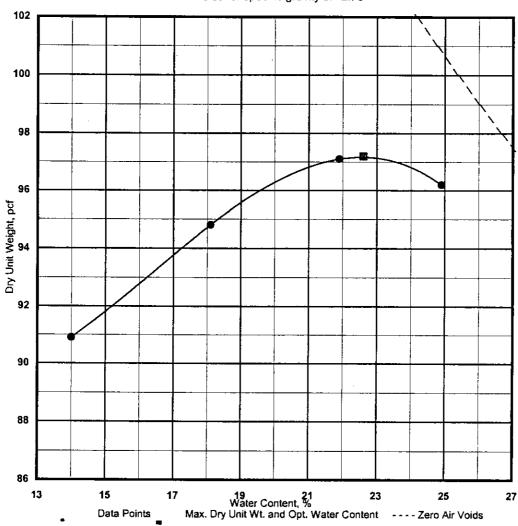


### **Terracon**

### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 97.2 pcf
Source Material:	MC-88 3.0 to 20.0 feet	Optimum Water Content: 22.6 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 27 Plastic Limit: 22
Test Method:	AASHTO T99	Plasticity Index: 5
Test Procedure:	Method C	% passing # 200 sieve: 41
Sample Preparation:	Wet Preparation	<del></del>
Rammer:	Mechanical X Manual	Reviewed by: SPB

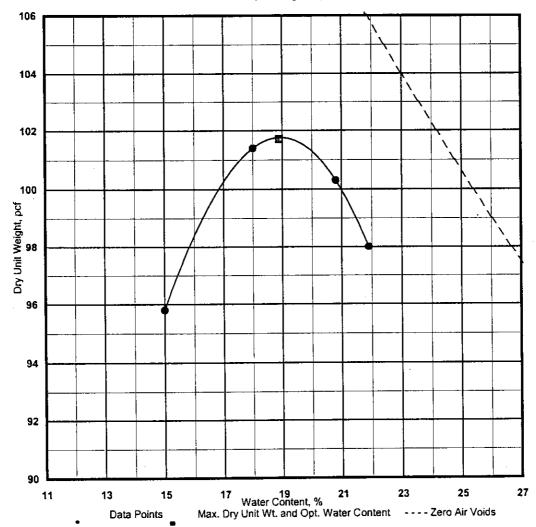


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	1
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 101.7 pcf
Source Material:	MC-125 1 to 25 feet	Optimum Water Content: 18.9 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 48 Plastic Limit: 25
Test Method:	AASHTO T99	Plasticity Index: 23
Test Procedure:	Method C	% passing # 200 sieve:53
Sample Preparation:	Wet Preparation	S
Rammer:	MechanicalX_Manual	Reviewed by: SPB

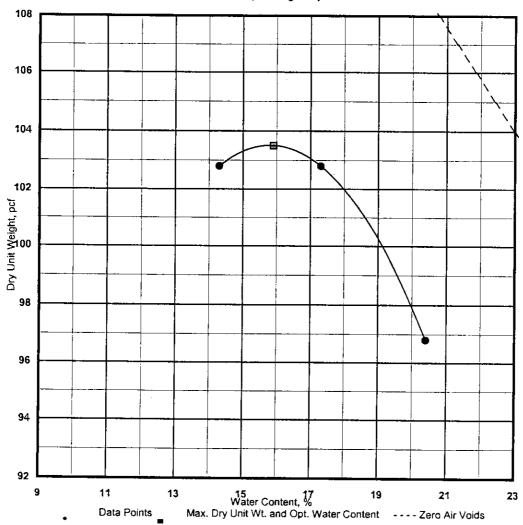


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	- W - W - W - W - W - W - W - W - W - W
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 103.5 pcf
Source Material:	MC-153 4 to 30 feet	Optimum Water Content: 15.9 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 49 Plastic Limit: 22
Test Method:	AASHTO T99	Plasticity Index: 27
Test Procedure:	Method C	% passing # 200 sieve: 69
Sample Preparation:	Wet Preparation	·
Rammer:	MechanicalX Manual	Reviewed by: SPB

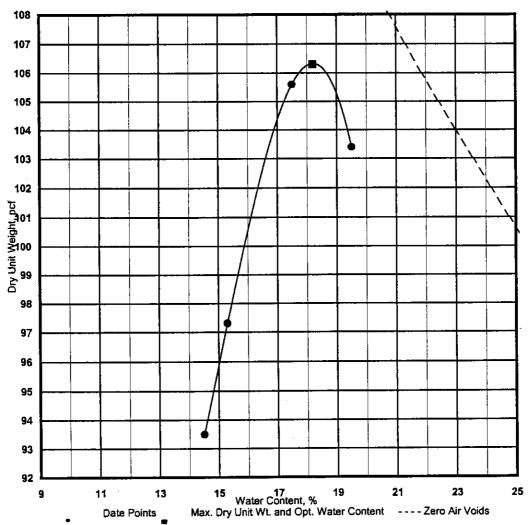


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 106.3 pcf
Source Material:	MC-164 1.0 to 32.0 feet	Optimum Water Content: 18.2 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 56 Plastic Limit: 19
Test Method:	AASHTO T99	Plasticity Index: 37
Test Procedure:	Method C	% passing # 200 sieve:
Sample Preparation:	Wet Preparation	
Rammer:	Mechanical X Manual	Reviewed by: SPB

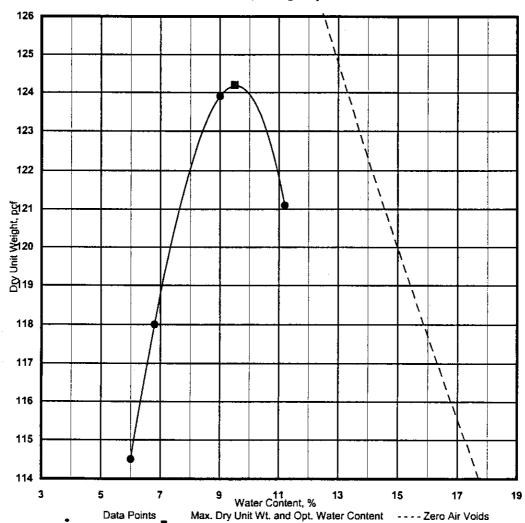


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	149 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.; 124.2 pcf
Source Material:	MC-177 0 to 13.0 feet	Optimum Water Content: 9.5 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 20 Plastic Limit: 17
Test Method:	AASHTO T99	Plasticity Index: 3
Test Procedure:	Method C	% passing # 200 sieve: 16
Sample Preparation:	AASHTO T99	-
Rammer:	Mechanical X Manual	Reviewed by: SPB

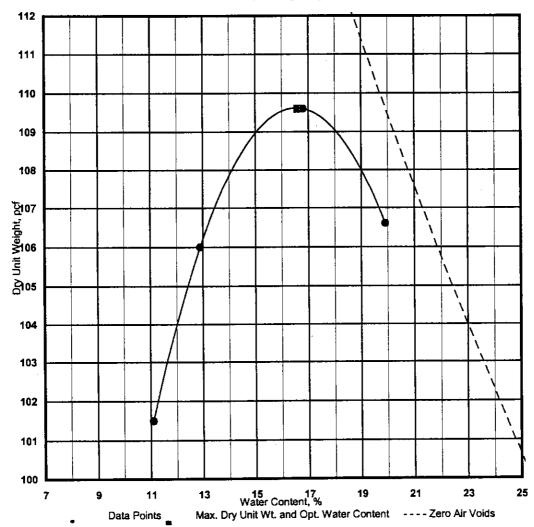


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.; 109.6 pcf
Source Material:	MC-204 0.5 to 21.5 feet	Optimum Water Content: 16.6 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 24 Plastic Limit: 19
Test Method:	AASHTO T99	Plasticity Index: 5
Test Procedure:	Method A	% passing # 200 sieve: 32
Sample Preparation:	Wet Preparation	
Rammer:	Mechanical X Manual	Reviewed by: SPB

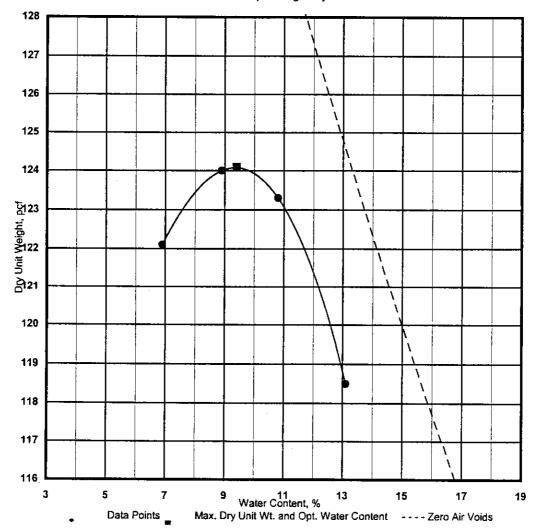




### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 124.1 pcf
Source Material:	MC-224 0 to 10.0 feet	Optimum Water Content: 9.4 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 29 Plastic Limit: 16
Test Method:	AASHTO T99	Plasticity Index: 13
Test Procedure:	Method C	% passing # 200 sieve: 30
Sample Preparation:	Wet Preparation	-
Rammer:	Mechanical X Manual	Reviewed by: SPB

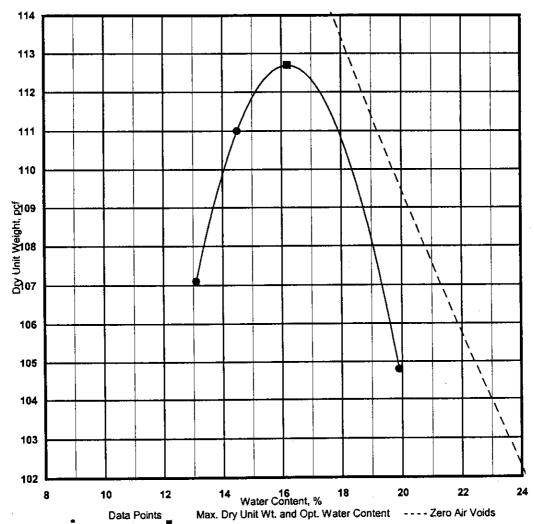


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### **Laboratory Compaction Characteristics of Soil**

2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 112.7 pcf
Source Material:	MC-227 0 to 20.0 feet	Optimum Water Content: 16.2 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 28 Plastic Limit: 20
Test Method:	AASHTO T99	Plasticity Index: 8
Test Procedure:	Method A	% passing # 200 sieve: 41
Sample Preparation:	Wet Preparation	<del></del>
Rammer:	Mechanical X Manual	Reviewed by: SPB

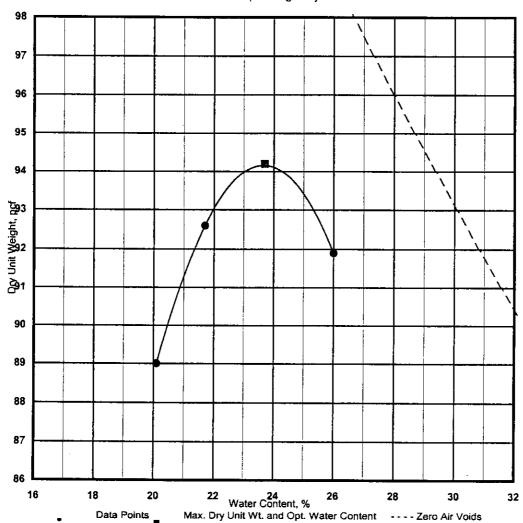


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### **Laboratory Compaction Characteristics of Soil**

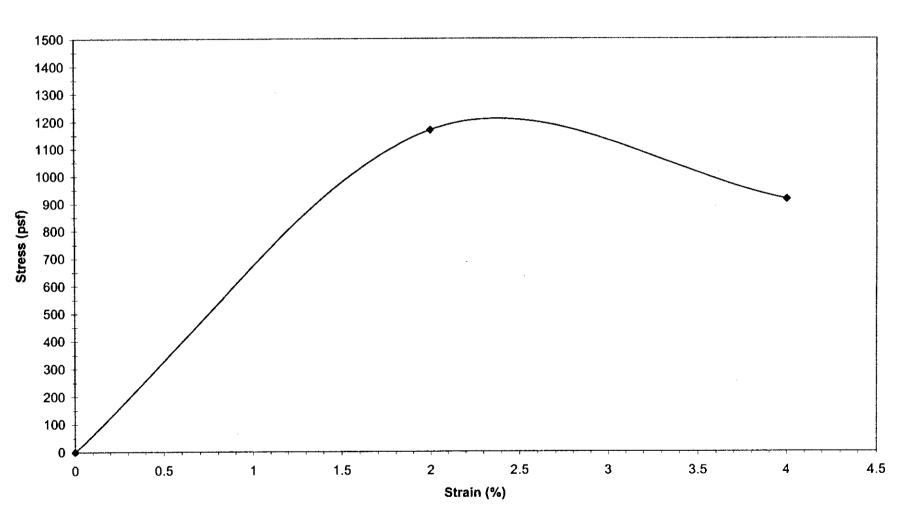
2201-C S Thompson, #3 Springdale, AR 72764 (479)750-9775

Client Name:	HNTB Corporation	Project No.: 39025019M Date: April 2003
Project Name:	I 49 - Missouri Project Number J7P0601	
Location:	Pineville, Missouri to Arkansas State Line	
City & State:	McDonald County, Missouri	TEST RESULTS
		Maximum Dry Unit Wt.: 94.2 pcf
Source Material:	MC-272 6.0 to 13.5 feet	Optimum Water Content: 23.7 %
Sample Description:		
Material Designation:	Sample date:	Liquid Limit: 34 Plastic Limit: 26
Test Method:	AASHTO T99	Plasticity Index: 8
Test Procedure:	Method C	% passing # 200 sieve: _ 42_
Sample Preparation:	Wet Preparation	<del></del>
Rammer:	MechanicalX_Manual	Reviewed by: SPB



10.4 Unconfined Compression Strength Results

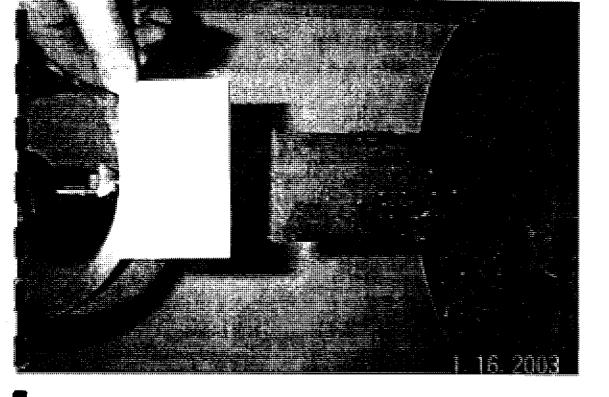
Unconfined Compressive Strength of Cohesive Soil Boring MC-57, Sample ST-2, 5.5 to 6.6 feet I 49 Missouri - Project J7P0601 McDonald County, Missouri

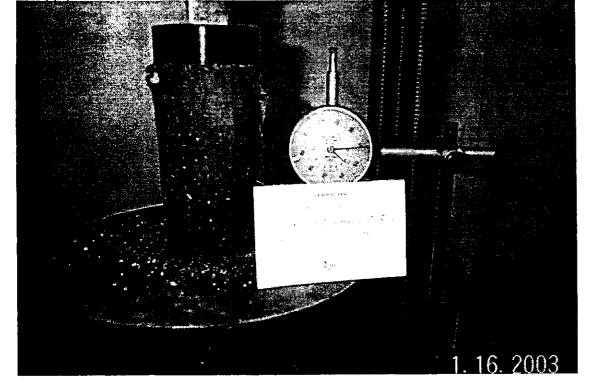


**Dry Unit Weight of Soil** Field Sampled by Shelby Tube

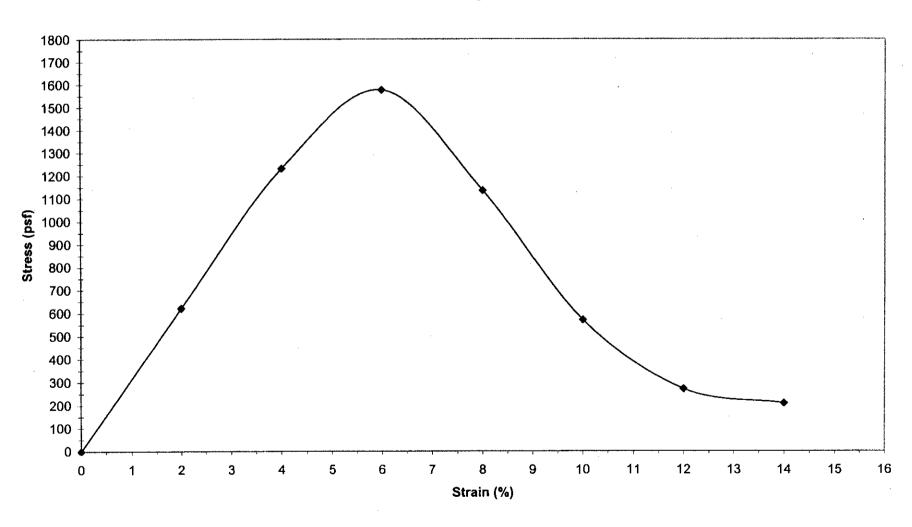
**ASTM D-1587 ASTM D-2166**  10930 East 56th Street Tulsa, Oklahoma 74146 (918)250-0461

Pineville, Missouri to Arkansas State Line	Job Name:	149 Missour	i Project J	7P0601		Pro	oject No.:	3902501	19M Da	ate: January	2003
Boring   MC-57   Sample   ST-2   Depth   5.5 to 6.6 feet		Pineville, Mi	ssouri to A	rkansas S	tate Line	_	_				
Tube Sample Geometry	Boring					5.5 to 6.6	feet				
Mold Wt.   1072.4   Do=	Recovery	13"	Qp	1.5 tsf	Sample De:	scription Sa	ndy Lean C	lay, Red B	rown		
Mold + Soil   2104.1   Ao=   6.215   sq. in.   Initial Area   Ao=   0.0432   sq. ft.   Lo=   5.594   in.   Initial Length   Vo=   34.74   cu. In.   Initial Volume   Vo=   0.0201   cu. Ft.   Lo/Do:   2.0   Lo/Do:   2.0   End   Vo=   0.0201   cu. Ft.   Initial Volume   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.0201   Cu. Ft.   End   Vo=   0.	Unit Weig	jht Data				Tube Sa	ample Ge	ometry			
Mold + Soil   2104.1   Ao= 0.0432   sq. ft.     Lo= 5.594   in.   Initial Length     Vo= 0.0201   cu. Ft.     Lo/Do= 2.0     Moisture Content     Tare No#   L6		Mold Wt.		1072.4		Do=	2.813		in.	Initial Diame	eter
Mass   1031.7   2.275   2.275   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.0   2.						Ao=	6.215		sq. in.	Initial Are	a
Mass   1031.7   2.275		Mold + Soil		2104.1		Ao=	0.0432		sq. ft.		ĺ
Moisture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture Content   Nosture C						Lo=	5.594			Initial Leng	ıth
Noisture Content   Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0		Mass	1031.7	2.275		Vo=	34.74		cu. In.	Initial Volur	ne
Noisture Content   Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0     Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0   Lo/Do=   2.0		•	ams	= lbs.		Vo=	0.0201		cu. Ft.		
Tare No# t-6			Ŭ			Lo/Do=					
Wet Wt + Tare         120.6         g         Wet Wt + Tare         g           Dry Wt + Tare         105.9         g         Dry Wt + Tare         g           Tare Wt.         23.3         g         Tare Wt.         g           Wt of Water         14.7 g Wt of Dry Soil         Wt of Dry Soil         g         Moisture Content Wt of Dry Soil         g           3* Shelby Tube Sample         Proving Ring         Failure Sketch           Load Dial Axial Load (lbs.)         Strain (V%) (sq. ft.)         (PSF)         O 0 0 0 0 0 0 0 0         O 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Moisture	Content									
Dry Wt + Tare         105.9         g         Dry Wt + Tare         g           Tare Wt.         23.3         g         Tare Wt.         g           Wt of Water Wt of Dry Soil         14.7 g 82.6 g         Moisture Content 17.8 %         Wt of Water Wt of Dry Soil         g         Moisture Content Wt of Dry Soil         g           3* Shelby Tube Sample         Proving Ring         Failure Sketch           Load Dial Axial Load (lbs.)         Strain (%) (sq. ft.)         (PSF)         (PSF)           0         0         0         0         0           51.5 0.112 2 22.7 1169         22.7 1169         1169           41.2 0.224 4 22.2 916         2.8 0         0           0.448 8 21.3 0         0         0           0.559 10 20.9 0         0         0           0.671 12 20.4 0         0         0           0.783 14 19.9 0         0         0           0.395 16 19.5 0         0         0           0.007 18 19.5 0         0         0           0.1007 18 19.5 0         0         0           Wet Density         qu= 1200 psf	Tare No#	t-6				Та	re No#				
Mode of Water with of Dry Soil         14.7 g with of Dry Soil         Moisture Content 17.8 %         With of Water with of Dry Soil         g with of Dry Soil         Moisture Content %           3" Shelby Tube Sample         Proving Ring         Failure Sketch           Load Dial Reading (lbs.)         Strain Unit Strain Corrected Area (PSF)         Stress (PSF)         O           0         0         0         0         0           41.2 0.224         4         22.2         916           0.336         6         21.8         0           0.448         8         21.3         0           0.559         10         20.9         0           0.783         14         19.9         0           0.783         14         19.9         0           0.895         16         19.5         0           0.1007         18         19.0         0           1.119         20         18.5         0    Wet Density qu= 1200 psf	Wet Wt + Tare	120.6		g		We	t Wt + Tare		.9		
Wt of Water Wt of Dry Soil         14.7 g 82.6 g         Moisture Content 17.8 %         Wt of Dry Soil         g Wt of Dry Soil         Moisture Content %           3" Shelby Tube Sample         Proving Ring           Load Dial Reading (lbs.)         Axial Load (lbs.)         Strain (%) (sq. ft.)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)         (PSF)	Dry Wt + Tare	105.9	······································	g		Dry	y Wt + Tare_		9		
Wt of Dry Soil         82.6 g         17.8 %         Wt of Dry Soil         g         %           3" Shelby Tube Sample         Proving Ring           Load Dial Reading (lbs.)         Axial Load (lbs.)         Strain Unit Strain Corrected Area (sq. ft.)         Stress (PSF)         Proving Ring         Failure Sketch           0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	Tare Wt.	23.3	<u> </u>	g		•	Tare Wt.		.9		
Wt of Dry Soil         82.6 g         17.8 %         Wt of Dry Soil         g         %           3" Shelby Tube Sample         Proving Ring           Load Dial Reading (lbs.)         Axial Load (lbs.)         Strain Unit Strain Corrected Area (sq. ft.)         Stress (PSF)         Proving Ring         Failure Sketch           0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0         0	Wt of Water	14.7	a !	Moist	ure Content	☐ wt	t of Water	g	Moistu	re Content	
Load Dial   Axial Load   Strain   Unit Strain Corrected Area   Stress   (%)   (sq. ft.)   (PSF)	Wt of Dry Soi					Wt	t of Dry Soil			%	
Load Dial   Axial Load   Strain   Unit Strain Corrected Area   Reading   (lbs.)   (%)   (sq. ft.)   (PSF)	3" Shelby Tu	ıbe Sample	Pro	oving Ring	•	<del>-</del>					
Reading         (lbs.)         (%)         (sq. ft.)         (PSF)           0         0         0         0         0           51.5         0.112         2         22.7         1169           41.2         0.224         4         22.2         916           0.336         6         21.8         0           0.448         8         21.3         0           0.559         10         20.9         0           0.671         12         20.4         0           0.783         14         19.9         0           0.895         16         19.5         0           1.007         18         19.0         0           1.119         20         18.5         0    Wet Density  Qu= 1200 psf		•							Fa	ailure Sketch	
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			Strain								
51.5			0			<del> </del>					
0.336   6   21.8   0		<del></del>			22.7			$\neg$			
0.448   8   21.3   0		41.2		4							
0.559   10   20.9   0				6							
0.671   12   20.4   0								_			İ
0.783   14   19.9   0						<del> </del>					
0.895   16   19.5   0					<del></del>	+		<del></del> -			
1.007   18   19.0   0	· · · · · · · · · · · · · · · · · · ·				<del></del>			-			
1.119 20 18.5 0  Wet Density qu= 1200 psf						1		$\neg$			
			1.119	20	18.5		0				
						Γ	<u>.</u>			•	
113.2 (pcf)						We		(pcf)	qu= <u>12</u>	200 psf	
Dry Density         96.1 (pcf)         su= 600 psf						Dr		(pcf)	<b>su=</b> 60	00 psf	





Unconfined Compressive Strength of Cohesive Soil Boring MC-125, Sample ST-2a, 6.0 to 6.8 feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



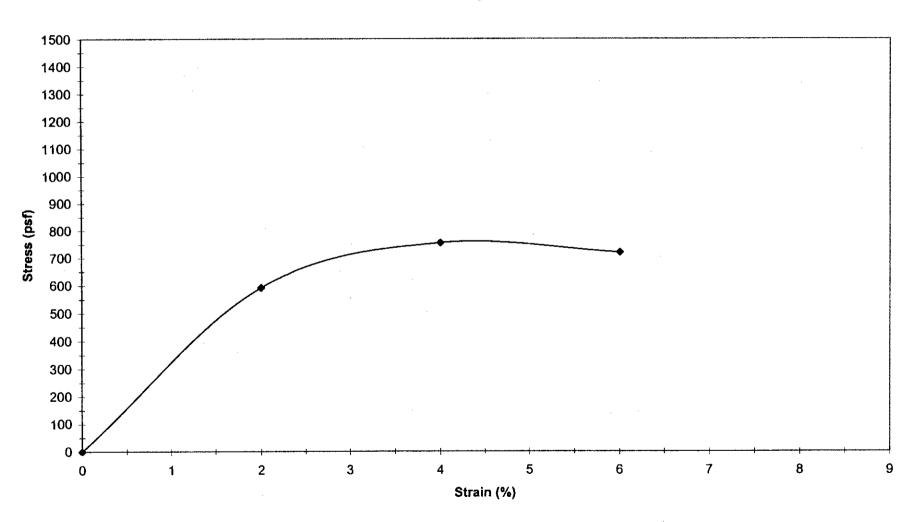
# lerracon

# **Dry Unit Weight of Soil** Field Sampled by Shelby Tube

**ASTM D-1587 ASTM D-2166**  10930 East 56th Street Tulsa, Okiahoma 74146 (918)250-0461

Job Name:	l 49 Missour	i Project J	7P0601		Р	roject No.:	390250	25019M Date: January 2003				
	Pineville, Mis	ssouri to A	rkansas S	tate Line	-	_			_			
Boring	MC-125	Sample	ST-2a	Depth	6 to 6.8 t	feet						
Recovery	8"	Qp	1.75 tsf	Sample Des	cription <u>L</u>	ean Clay, trac	e gravel	- Red	Brown			
Unit Weig	tht Data				Tube S	Sample Ge	ometry					
	Mold Wt.		1072.5		Do=	2.813		in.	Init	ial Diameter		
					Ao=	6.215		sq. in	i, I	nitial Area		
	Mold + Soil		2145.1		Ao=	0.0432		sq. ft		ŀ		
					Lo=	5.594		in.	ln	itial Length		
	Mass	1072.6	2.365		Vo=	34.74		cu. Ir	ı. İn	itial Volume		
	•	gms	= lbs.		Vo=	0.0201		cu. F	t.			
		_			Lo/Do=	2.0		_				
Moisture	Content											
Tare No#	+ 70				т	are No#						
Tale NO#	1-12				1		<del></del> -					
Wet Wt + Tare	133.9		, g		W	et Wt + Tare_		_9				
Dry Wt + Tare	111.2		, <b>9</b>		D	ry Wt + Tare_		g				
Tare Wt.	20.7		g			Tare Wt.		g				
			. •			-		• -				
Wt of Water	22.7		Moiet	ure Content	1 w	Vt of Water _	0	Mois	sture Co	ontent		
Wt of Dry Soi			i .	25.1 %		Vt of Dry Soil		""	, a. c. c.	%		
-						_		L				
2° Chalby Tu	iba Campla	D.	ovina Pina									
3" Shelby Tu	ibe Sample	Ρπ	oving King		-				Failure	Sketch		
Load Dial	Axial Load	Strain	Unit Strain	Corrected Area		Stress						
Reading	(lbs.)		(%)	(sq. ft.)		(PSF)						
00	0	0	0	0		0						
	27.4	0.112	2	22.7	ļ	622		ŀ				
	55.4	0.224	6	22.2		1232						
	72.4 53.3	0.336 0.448	8	21.8 21.3		1577 1136						
	27.4	0.559	10	20.9		571						
	13.3	0.671	12	20.4	<u> </u>	271						
	10.5	0.783	14	19.9		209						
ļ	10.0	0.895	16	19.5	ļ	0						
	<del> </del>	1.007	18	19.0	† · · · · · ·	0						
	1	1.119	20	18.5		0						
						Vet Density		au=	1550 p	osf		
					_		pcf)	•				
						ny Donoite	1					
						<b>Pry Density</b> 94.1 (	pcf)	su=	775 ps	sf		
					İ							

# Unconfined Compressive Strength of Cohesive Soil Boring MC-142, Sample ST-3, 8.0 to 9.5 feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



# Terracon

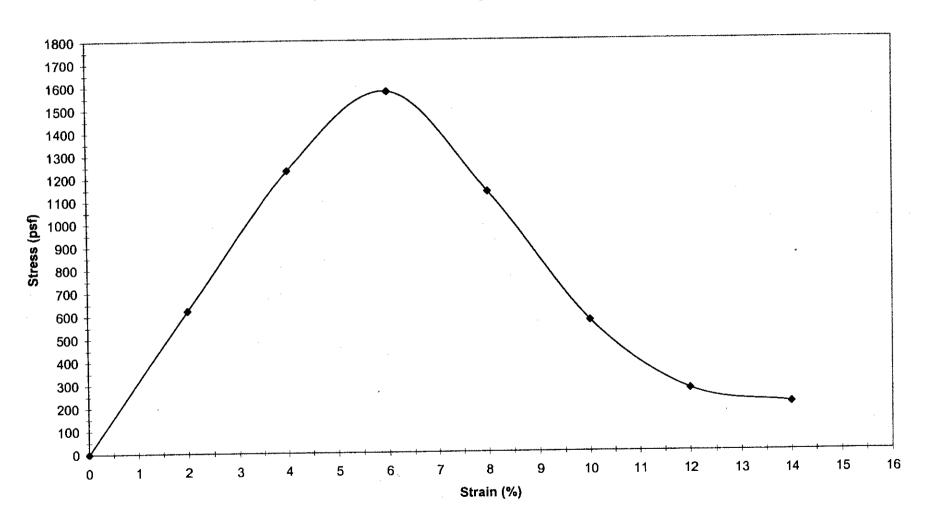
Dry Unit Weight of Soil
Field Sampled by Shelby Tube

**ASTM D-1587 ASTM D-2166** 

10930 East 56th Street Tulsa, Oklahoma 74146 (918)250-0461

Job Name:	l 49 Missour	i Project J	7P0601		_ Pr	oject No.:	3902501	19M D	ate: April 2003	
	Pineville, Mi	ssouri to A	rkansas S	_				-		
Boring	MC-142	Sample	<b>S</b> T-3	Depth	8 to 9.5 fe	eet				
Recovery	10"	Qp	4.0 tsf	Sample Des	cription <u>Le</u>	an Clay, with	gravel -	Red Bro	wn	
Unit Weig	ht Data				Tube S	ample Geo	metry			
	Mold Wt.		1073.5		Do=	2.813		in.	Initial Diameter	
					Ao=	6.215		sq. in.	Initial Area	
	Mold + Soil		2149.2		Ao=	0.0432		sq. ft.		
					Lo=	5.594		in.	Initial Length	
	Mass	1075.7	2.372		Vo=	34.74		cu. In.	Initial Volume	
		gms	= lbs.		0.0201 2.0	<del> </del>	cu. Ft.			
Moisture	Content				Lo/Do=					
Tare No#	31				Та	re No#				
Wet Wt + Tare	487.5		g		We	et Wt + Tare_	<del></del>	g		
Dry Wt + Tare	413.7		g		Dry	y Wt + Tare_	· · · · · · · · · · · · · · · · · · ·	,g		
Tare Wt.	118.5		g			Tare Wt.		g		
Wt of Water Wt of Dry Soil		g	<u>.</u>	ure Content 25.0 %	Wt of Water g Wt of Dry Soil g			Moistu	re Content %	
3" Shelby Tu	be Sample	Pro	oving Ring		-			F:	ailure Sketch	
Load Dial	Axial Load	Strain	Unit Strain	Corrected Area	T	Stress			and to okotor	
Reading	(lbs.)	<u>_</u>	(%)	(sq. ft.)	ļ	(PSF)			]	
	0 26.1	0 0.112	2	0 22.7	-	0 593	$\rightarrow$			
	34	0.112	4	22.2		756				
	33.1	0.336	6	21.8		721				
				<del> </del>						
								ļ		
i	I									
					w	et Density _118.0(p	ocf)	qu= <u>76</u>	60 psf	
					Dr	y Density	ocf)	su= <u>38</u>	30 psf	

Unconfined Compressive Strength of Cohesive Soil
Boring MC-148, Sample ST-3, 8.0 to 9.5 feet
I 49 Missouri - Project J7P0601
McDonald County, Missouri



# Jerracon-

## **Dry Unit Weight of Soil** Field Sampled by Shelby Tube

13.3

10.5

0.671

0.783

0.895

1.007

1.119

12

14

16

18

**ASTM D-1587 ASTM D-2166**  10930 East 56th Street Tulsa, Oklahoma 74146 (918)250-0461

Job Name:	I 49 Missour	i Project J	7P0601			Project No.:	39025019M	Date:	January 2003
	Pineville, Mi	ssouri to A	rkansas Si	tate Line					
Boring	MC-148	Sample	ST-3	•	Depth <u>8.0 t</u>	o 9.5 feet			
Recovery	12.5"	Qp _.	3.25 tsf	Samp	le Descriptio	n <u>Lean Clay, wi</u>	th gravel, trace	sand, R	ed Brown
Unit Weig	ıht Data				Tub	e Sample Ge	eometry		
	Mold Wt.		1072.5		Do=	2.813	in.	Ini	tial Diameter
	·		*		Ao=	6.215	 sq.	ip.	Initial Area
	Mold + Soil		2180.5		Ao=		<del></del>	ft.	
	•				Lo=	5.594	•		nitial Length
	Mass	1108	2.443		Vo=				itial Volume
	•		= lbs.		Vo=	·	cu.		nadi volomo
		3			Lo/D	·			
Moisture	Content								
Tare No#	t46					Tare No#	<del></del>		
Wet Wt + Tare	123.5		9			Wet Wt + Tare	<u>:</u> g		
Dry Wt + Tare	107.3		g			Dry Wt + Tare	g		
Tare Wt.	21.2		g			Tare Wt.	g		
	40.0	r					ستس	····	J. 231.
Wt of Water Wt of Dry Soil				re Conten	١	Wt of Water Wt of Dry Soil		oisture Co	ontent %
VVCOI DIY OON		9 [		10.0 /0		With Dry Con	a [		
3" Shelby Tu	be Sample	Pro	ving Ring						
								Failure	e Sketch
Load Dial	Axial Load	Strain		Corrected A		Stress			
Reading 0	(lbs.) 0	0	(%) 0	(sq. ft	.)	(PSF) 0			
	27.4	0.112	2		2.7	622	<del></del>		
	55.4	0.224	4		2.2	1232	<del> </del>	$N^{I_1}$	U // _
	72.4	0.336	6	2	1.8	1577		XI	11/2/
	53.3	0.448	8		1.3	1136		12/12	
	27.4	0.559	10	20	0.9	571		17/	.101 / I

20.4

19.9

19.5

19.0

18.5

Wet Density 121.5	(pcf)
Dry Density	/nof\

271

209

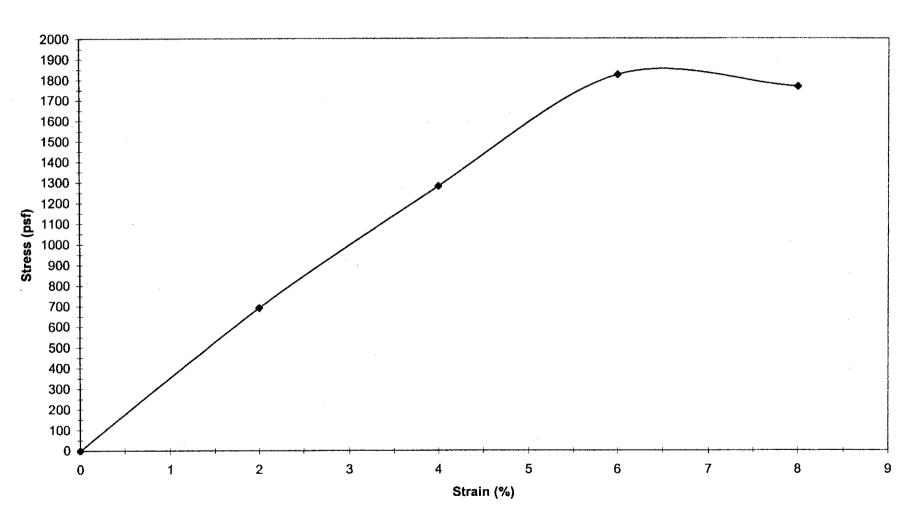
0

0

qu= 1550 psf

**su=** 775 psf 102.3 (pcf)

# Unconfined Compressive Strength of Cohesive Soil Boring MC-153, Sample ST-3, 8.5 to 9.4 feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



# lerracon

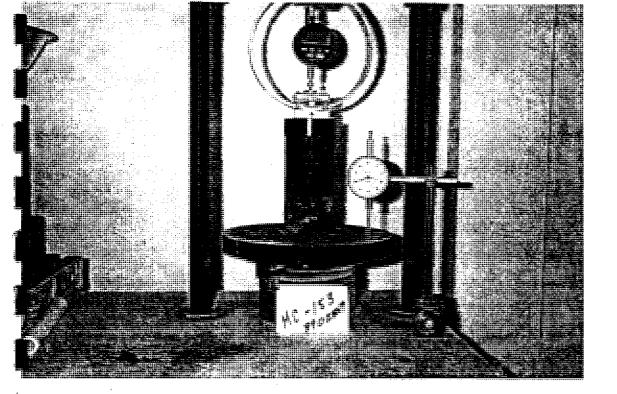
**Dry Unit Weight of Soil** Field Sampled by Shelby Tube

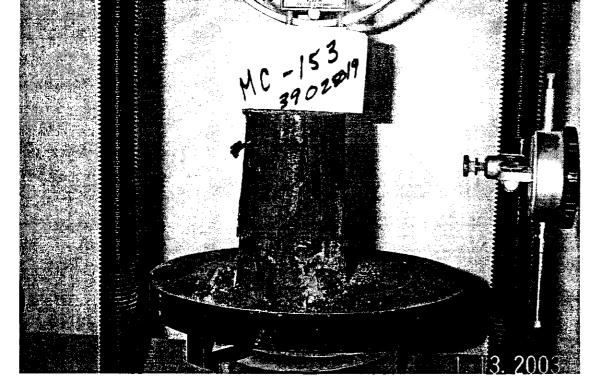
**ASTM D-1587** 

**ASTM D-2166** 

10930 East 56th Street Tulsa, Oklahoma 74146 (918)250-0461

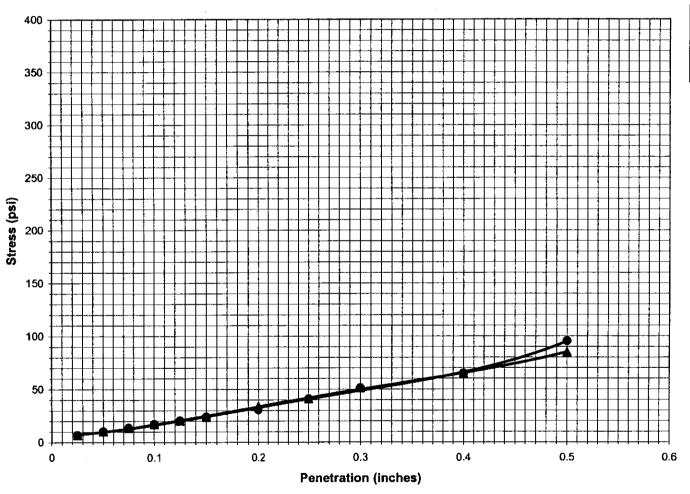
Job Name:	I 49 Missour	Project J	7P0601		Pi	roject No.:	390250	19M	Date: Ja	anuary 20	003
	Pineville, Mis			tate Line	•	•	TT				
Boring	MC-153				8.5 to 9.4	feet					
Recovery	14"	Qp	2.0 tsf	. Sample Des	cription Fa	at Clay, with	sand, trad	e grav	el - Red	Brown	
Unit Weig	ht Data				Tube S	ample Ge	ometry				$\neg$
_			1072.5		Do=	2.813	-	in.	Initia	l Diameter	
	-				Ao=	6.215		sq. in.		tial Area	
	Mold + Soil _		2199 1		Ao=			•		udi / w Ou	
			2100.1		Lo=	5.594		in.		al Length	
	Macc	1126.6	2.484		Vo=	34.74		•		al Volume	
•	Wass_							cu. In.		ai volume	
		gms	= lbs.		Vo= Lo/Do=	0.0201 2.0		cu. Ft.			
Moisture	Content				20,00	2.0		•			
Tare No#	t14			<b>. </b> .	Ta	are No#					
Wet Wt + Tare			•		We	et Wt + Tare	<u> </u>	.9			
Dry Wt + Tare	111.5	<del></del>	g		Dr	y Wt + Tare		.9			
Tare Wt.	23.5		g			Tare Wt.	<del></del>	<b>.</b> g			
Wt of Water Wt of Dry Soil 3" Shelby Tu	88	g		ure Content 21.9 %		t of Water t of Dry Soil		Moist	ture Con	tent %	
					<u>-</u>				Failure S	Sketch	
Load Dial	Axial Load	Strain		Corrected Area		Stress					
Reading 0	(lbs.) 0	0	(%) 0	(sq. ft.)		(PSF)					
	30.5	0.112	2	22.7		693					
	57.6	0.224	4	22.2		1281					
	83.8	0.336	6	21.8		1825					İ
	82.9	0.448	8	21.3		1767					
		0.559 0.671	10 12	20.9 20.4		0					
		0.783	14	19.9		0					
		0.895	16	19.5		0					
		1.007	18	19.0		0					
		1.119	20	18.5		0					
					_	ry Density	(pcf)	-	1850 psf 925 psf	f	<del>_</del> = <del>u</del>





10.5 California Bearing Ratio Results

# California Bearing Ratio MC-3: Bulk Sample from 5 to 16.3 Feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



O Top As Soaked

△ Bottom As soaked

- Corrected Top, As Soaked
- ▲ Corrected Bottom, As Soaked

Corrected CBR Top As Soaked = 1.7

Corrected CBR Bottom As Soaked = 1.7

Before Soaking 2046.5

3efore

### CALIFORNIA BEARING RATIO TEST INFORMATION

Input:

Diameter of Penetration Piston (in.):

Calcs: Area of Penetration Piston (in.²): MOISTURE CONTENT DETERMINATION

2 3.14

Top 1"

774.9

After Soaking

After Soaking

Average

2582.6

39025019M

MC-3: 5 to 16.3 Feet

Input:

Results:

Wt. Wet Soil & Tare (g):

Wt. Dry Soil & Tare (g): Wt. Tare (g):

Wt. of Water (g):

Wt. of Dry Soil (g):

Maisture Content (%):

1886.6 684.8 2223.5 373 250.1 371.7 159.90 90.10 359.10 1513.60 434.70 1851.80 10.56421776 20.726938 19.39194297

DENSITY DETERMINATION

Input:

Results:

Wt. Moist Soil & Mold (g): Wt. Empty Mold (g):

Wt. Moist Soil (g): Wet Density (lb./ft.4):

Dry Density (lb./ft.*):

Soaking	Top 1"	Average
8532.7	8567.1	8567.1
4319.5	4319.5	4319.5
4213.2	4247.6	4247.6
123.9	124.9	124.9
112.9327015	103,43958	104.5962038

Tup As Scaked

Penetration (in.)	Load Dial (div.)	Load (lbs.)	Stress (lb./in.²)	Uncorrected CBR Value	
0.025	2		6.8		0.025
0.050	3		10.2		0.050
0.075	4		13.6		0.075
0.100	5		17.0	1.70	0.100
0.125	6		20.4		0.125
0.150	7		23.8		0.150
0.200	9		30.6	2.04	0.200
0.250	12		40.9		0.250
0.300	15		51.1		0.300
0.400	19		64.7	·	0.400
0.500	28		95.3	1	0.500

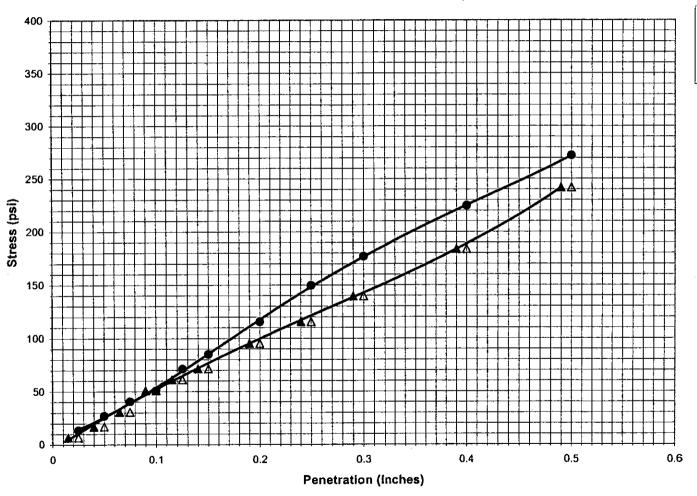
1.7

Bottom As soaked

DULUIU AS SU	aken				
Penetration (in.)	Load Diai (dlv.)	Load (lbs.)	Stress (lb./ln.²)	Uncorrected CBR Value	
0.025	2		6.8		0.025
0.050	3		10.2		0.050
0.075	4		13.6		0.075
0.100	5		17.0	1.70	0.100
0.125	6		20.4		0.125
0.150	7		23.8		0.150
0.200	10		34.0	2.27	0.200
0.250	12		40.9		0.250
0.300	15		51.1		0.300
0.400	19		64.7.		0.400
0.500	25	_	85.1		0.500

Density Correction	
Final Moisture Content Final Moist Wt of Soil	19.39194 4247.6
Dry Weight of Soil	3557.694
Initial Moisture Content	
Initial Moisture Wt of Soil Weight of Water initial	<b>42</b> 13.2 655.5
Initial Moisture Content	18.4
Initial Density of Soil	
Initial Wet Density	123.9
Initial Dry Density	104.6

### California Bearing Ratio MC-125: Bulk Sample from 1 to 25 Feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



O Top As Soaked

△ Bottom As soaked

- Corrected Top, As Soaked
- ▲ Corrected Bottom, As Soaked

Corrected CBR Top As Soaked = 5.1

Corrected CBR Bottom As Soaked = 5.1 Before

Soaking

### CALIFORNIA BEARING RATIO TEST INFORMATION

input: Calcs: Diameter of Penetration Piston (in.):

Area of Penetration Piston (in.2):

2 3.14

After Soaking

39025019M

MC-125: 1 to 25 feet

MOISTURE CONTENT DETERMINATION

Input:

Results:

Input:

Results:

Wt. Wet Soil & Tare (g):

Wt. Dry Soil & Tare (g):

Wt. Tare (g):

Wt. of Water (g): Wt. of Dry Soil (g):

Moisture Content (%):

Top 1" Average 1085.8 2251.1 1832.6 1597.4 959.2 1951 237.6 241 249.7 235.20 126.60 300.10 1359.80 718.20 1701.30 17.29666127 17.627402 17.63945218

DENSITY DETERMINATION

Wt. Moist Soil & Mold (g): Wt. Empty Mold (g):

Wt. Moist Soil (g): Wet Density (lb./ft.3):

Dry Density (lb/fL³):

Before	After Soaking			
Soaking	Top 1"	Average		
8072.4	8027.5	8027.5		
4129.6	4129.6	4129.6		
3942.8	3897.9	3897.9		
115.9	114.6	114.6		
98.82491005	97.424799	97.4148195		

Top As Soaked

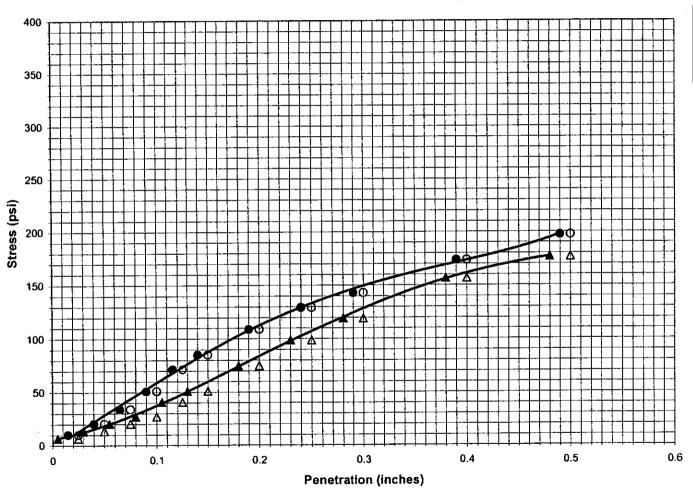
Penetration (in.)	Load Dial (dlv.)	Load (lbs.)	Stress (lb./in.²)	Uncorrected CBR Value	
0.025	4		13.6		0.025
0.050	8		27.2		0.050
0.075	12		40.9		0.075
0.100	15		51.1	5.11	0.100
0.125	21		71.5		0.125
0.150	25		85.1		0.150
0.200	34		115.8	7.72	0.200
0.250	44		149.8		0.250
0.300	52		177.0		0.300
0.400	66		224.7		0.400
0.500	80		272.4		0.500

### Bottom As soaked

DOLLOW VY 20	akeu		_	,	•
Penetration (in.)	Load Dial (div.)	Load (lbs.)	Stress (lb.lin.²)	Uncorrected CBR Value	
0.025	2		6.8		0.015
0.050	5		17.0		0.040
0.075	9		30.6		0.065
0.100	15		51.1	5.11	0.090
0.125	18		61.3		0.115
0.150	21		71.5		0.140
0.200	28		95.3	6.36	0.190
0.250	34		115.8	1	0.240
0.300	41		139.6		0.290
0.400	54		183.9		0.390
0.500	71		241.7	· ·-	0.490

Density Correction	
Final Moisture Content Final Moist Wt of Soil	17.63945 3897.9
Dry Weight of Soil	3313.429
Initial Moisture Content	
Initial Moisture Wt of Soil Weight of Water initial Initial Moisture Content	3942.8 629.4 18.0
Initial Density of Soil	
Initial Wet Density	115,9
Initial Dry Density	97.4
1	

# California Bearing Ratio MC-153: Bulk Sample from 4 to 30 Feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



- O Top As Soaked
- △ Bottom As soaked
- ◆ Corrected Top, As Soaked
- ▲ Corrected Bottom, As Soaked

Corrected CBR Top As Soaked = 6.0

Corrected CBR Bottom As Soaked = 3.8 Before

Soaking

2728.6

2431.9

249 4

Before

### CALIFORNIA BEARING RATIO TEST INFORMATION

Input:

Diameter of Penetration Piston (in.):

Calcs: Area of Penetration Piston (in.2);

2 3.14

After Soaking Top 1" Average 1043.2 2369.8

2085.2

245.9

39025019M

MC-153: 4 to 30 feet

MOISTURE CONTENT DETERMINATION

Input:

Results:

Wt. Wet Soil & Tare (g):

Wt. Dry Soil & Tare (g):

Wt. Tare (g): Wt. of Water (g): Wt. of Dry Soil (g):

296.70 113.60 284.60 2182.50 692.30 1839.30 13.59450172 16.409071 15.47327788

929.6

237.3

Moisture Content (%):

DENSITY DETERMINATION

Wt. Moist Soil & Mold (g):

Results:

Input:

Wt. Empty Mold (g): Wt. Moist Soil (g): Wat Density (lb./ft.3):

Dry Density (lb/ft³):

After Soaking
Top 1" Average Soaking 8178.3 8179.2 8178.3 4287.9 4287.9 4287.9 3891.3 3890.4 3890.4 114.4 114.4 114.4 100.7128147 98.255023 99.05128018

Top As Soaked

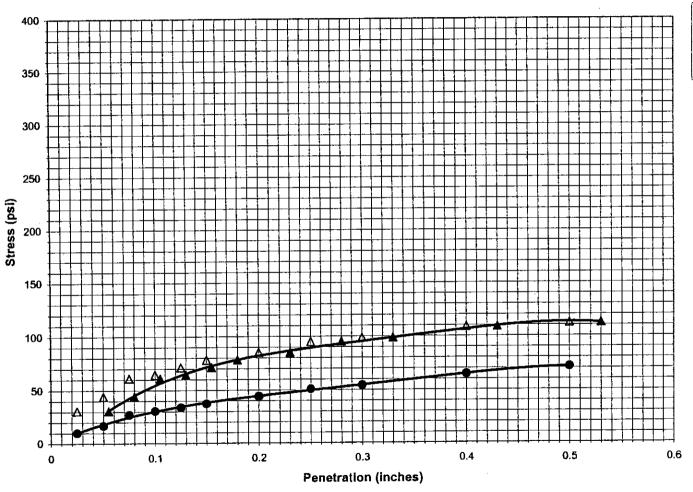
100 110 00011			1		7
Penetration (in.)	Load Diał (div.)	Load (!bs.)	Stress (IbJin.²)	Uncorrected CBR Value	
0.025	3		10.2		0.015
0.050	6		20.4		0.040
0.075	10		34.0		0.065
0.100	15	-	51.1	5.11	0.090
0.125	21		71.5		0.115
0.150	25		85.1		0.140
0.200	32		109.0	7.26	0.190
0.250	38		129.4		0.240
0.300	42		143.0		0.290
0.400	51		173.6	l	0.390
0.500	58		197.5		0.490

### Bottom As soaked

Penetration (in.)	Load Dial (div.)	Load (lbs.)	Stress (lb./in.²)	Uncorrected CBR Value	į
0.025	2		6.8		0.005
0.050	4		13.6		0.030
0.075	6		20,4		0.055
0.100	8		27.2	2.72	0.080
0.125	12		40.9		0.105
0.150	15		51.1		0.130
0.200	22		74.9	4.99	0.180
0.250	29		98.7		0.230
0.300	35		119.2		0.280
0.400	46		156.6		0.380
0.500	52		177.0		0.480

Density Correction	
Final Moisture Content	15.47328
Final Moist Wt of Soil	3890.4
Dry Weight of Soil	3369,091
Initial Moisture Content	
Initial Moisture Wt of Soil	3891.3
Weight of Water initial	522.2
Initial Moisture Content	15.5
Initial Density of Soil	
Initial Wel Density	114.4
Initial Dry Density	99.1
1	

# California Bearing Ratio MC-164: Bulk Sample from 1 to 32 Feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



- O Top As Soaked
- △ Bottom As soaked
- Corrected Top, As Soaked
- ▲ Corrected Bottom, As Soaked

Corrected CBR Top As Soaked = 3.1

Corrected CBR Bottom As Soaked = 5.5

### CALIFORNIA BEARING RATIO TEST INFORMATION

Input: Calcs: Diameter of Penetration Piston (in.):

2 3.14

1035,4

864.9

244.9

After Soaking Top 1" Average

2416.7

1996.6

247.2

4100.0

3.1

39025019M MC-164: 1 to 32 feet

Area of Penetration Piston (in.2): MOISTURE CONTENT DETERMINATION

Input:

Results:

Input:

Wt. Wet Soil & Tare (g): Wt. Dry Soil & Tare (g):

Wt. Tare (g): Wt. of Water (g):

Wt. of Dry Soil (g): Moisture Content (%):

63.70 170.50 420.10 405.60 620.00 1749,40 15.70512821 27.5 24.01394764

Before

Soaking

710-1

646.4

240 8

3904.6

DENSITY DETERMINATION

After Soaking
Top 1" Average Before Soaking 8021.4 8716.8 8216.8 41168 4116.8 4116.8

Results: Wt, Moist Soil (g): Wet Density (lb./ft.3):

Dry Density (lb./ft.¹):

Wt. Moist Soil & Mold (g):

Wt. Empty Mold (g):

4100.0 1148 120.5 120.5 99.21361463 94.541176 97.19874441

Top As Soaked

Penetration (in.)	Load Dial (div.)	Load (ibs.)	Stress (lbJin.²)	Uncorrected CBR Value	
0.025	3		10.2		0.025
0.050	5		17.0		0.050
0.075	8		27.2		0.075
0.100	9		30.6	3.06	0.100
0.125	10		34.0		0.125
0.150	11		37.5		0.150
0.200	13		44.3	2.95	0.200
0.250	15		51.1		0.250
0.300	16		54.5		0.300
0.400	19		64.7		0.400
0.500	21		71.5		0.500

Penetration (in.)	Load Dial (div.)	Load (lbs.)	Stress (tbJin.²)	Uncorrected CSR Value	
0.025	9	•	30.6		0.055
0.050	13		44.3		0.080
0.075	18		61.3		0.105
0.100	19		64.7	6.47	0.130
0.125	21		71.5		0.155
0.150	23		78.3	1	0.180
0.200	25		85.1	5.67	0.230
0.250	28		95.3	1	0.280
0.300	29		98.7		0.330
0.400	32		109.0		0.430
0.500	33		112.4		0.530

Density Correction

Final Moisture Content Final Moist Wt of Soil

24.01395 4100.0

Dry Weight of Sail

3306.08

Initial Moisture Content Initial Moisture Wt of Soil

3904.6 598.5 18.1

Initial Density of Soil

Weight of Water initial

Initial Moisture Content

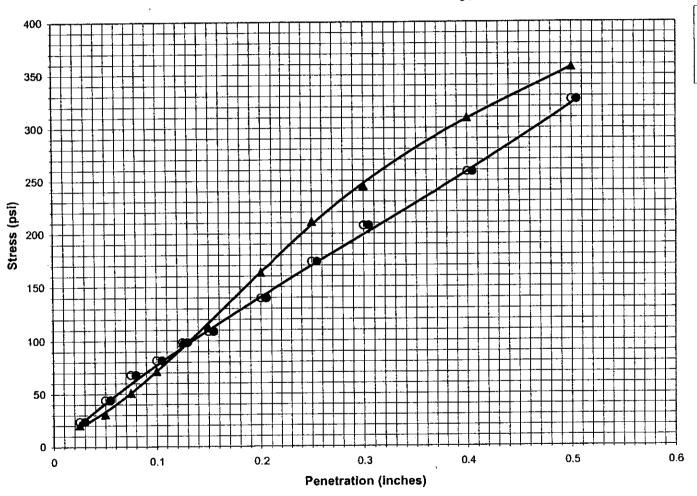
Initial Wet Density

114.8

Initial Dry Density

97.2

# California Bearing Ratio MC-227: Bulk Sample from 0 to 20 Feet I 49 Missouri - Project J7P0601 McDonald County, Missouri



O Top As Soaked

△ Bottom As soaked

- Corrected Top, As Soaked
- ▲ Corrected Bottom, As Soaked

Corrected CBR Top As Soaked = 7.8

Corrected CBR Bottom As Soaked = 7.2 Before

Before

### CALIFORNIA BEARING RATIO TEST INFORMATION

Input: Caics: Diameter of Penetration Piston (in.):

Area of Penetration Piston (in.2):

3.14

39025019M MC-227: 0 to 20 feet

MOISTURE CONTENT DETERMINATION

Input:

Results:

Input:

Wt. Wet Soil & Tare (g):

Wt. Dry Sail & Tare (g):

Wt. Tare (g): Wt. of Water (g):

Wt. of Dry Soil (g):

Moisture Content (%):

After Soaking
Top 1" Average
777.\$ 2843.4 Soaking 1091.2 777.8 692.7 966 2437.2 247.6 236.8 248.4 125.20 85.10 406.20 718.40 455.90 2188.80

17.42761693 18.666374 18.55811404

After Soaking

DENSITY DETERMINATION

Wt. Moist Soil & Mold (g):

Wt. Empty Mold (g): Results: Wt. Moist Soil (g): Wet Density (lb./ft.3):

Dry Density (IbJfL3):

Soaking	Top 1"	Average
8338.I	8379 6	8379.6
4127.1	4127.1	4127.1
4211.0	4252.5	4252.5
123.8	125.0	125.0
105.4295431	105.35714	105.4533475

Top As Soaked

Penetration (in.)	Load Dial (div.)	t.oad (lbs.)	Stress (IbJin.²)	Uncorrected CBR Value	
0.025	7		23.8		0.030
0.050	13		44.3		0.055
0.075	20		68.1		0.080
0.100	24		81.7	8,17	0.105
0.125	29		98.7		0.130
0.150	32		109.0		0.155
0.200	41		139.6	9.31	0.205
0.250	51		173.6		0.255
0.300	61		207.7		0.305
0.400	76		258.8		0.405
0.500	96		326.9		0.505

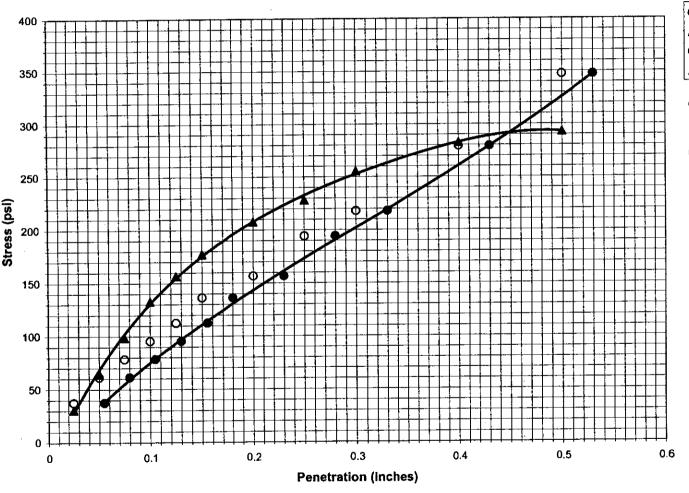
7.8

Bottom As soaked

Bottom As scaked						
Penetration (in.)	Load Dial (div.)	Load (ibs.)	Stress (IbJin.²)	Uncorrected CBR Value		
0.025	6		20.4		0.025	
0.050	9		30.6	· .	0.050	
0.075	15		51.1		0.075	
0.100	21		71.5	7.15	0.100	
0.125	29		98.7		0.125	
0.150	33		112.4	1	0.150	
0.200	48		163.4	10,90	0.200	
0.250	62		211.1	T	0.250	
0.300	72		245.1		0.300	
0.400	91		309.8		0.400	
0.500	105		357.5		0.500	

Density Correction	
Final Moisture Content Final Moist Wt of Soil	18.55811 4252.5
Dry Weight of Soil	3586.849
Initial Moisture Content	
Inilial Moisture WI of Soil Weight of Water initial Initial Moisture Content	4211.0 624.2 17.4
Initial Density of Soil	
Initial Wet Density	123.8
Initial Dry Density	1083

# California Bearing Ratio MC-284: Bulk Sample from 20 to 51 Feet 1 49 Missouri - Project J7P0601 McDonald County, Missouri



- O Top As Soaked
- △ Bottom As soaked
- ◆ Corrected Top, As Soaked
- ▲ Corrected Bottom, As Soaked

Corrected CBR Top As Soaked = 7.5

Corrected CBR Bottom As Soaked = 13.3

### CALIFORNIA SEARING RATIO TEST INFORMATION

Input: Calcs: Diameter of Penetration Piston (in.):

Area of Penetration Piston (in.2):

2 3.14 39025019M

MC-284: 20 to 51 feet

MOISTURE CONTENT DETERMINATION

Input:

Results:

Wt. Wet Soil & Tare (g): Wt. Dry Soil & Tare (g): Wt. Tare (g): Wt. of Water (g): Wt. of Dry Soil (g):

Moisture Content (%):

Before	After Scaking			
Scaking	Top 1"	Average		
1115.4	995.8	3564.7		
1002.7	861.8	3039.6		
244	240.8	245.8		
112.70	134.00	525.10		
758.70	621.00	2793.80		
14.85435614	21.5781	18.79518935		

DENSITY DETERMINATION

Input:

Results:

Wt. Moist Soil & Mold (g): Wt. Empty Mold (g): Wt. Moist Soil (g): Wet Density (lb./ft.3): Dry Density (lb./ft.3);

Before	After Soaking				
Soaking	Top 1"	Average			
8088.5	8244	8244			
4117.5	4117.5	4117.5			
3971.0	4126.5	4126.5			
116.7	121.3	121.3			
101.6482125	99.786968	102.1245899			

Tup As Spaked

Penetration (in.)	Load Diai (div.)	Load (lbs.)	Stress (lb./ln.²)	Uncorrected CBR Vatue	
0.025	11		37.5		0.055
0.050	18		61.3		0.080
0.075	23		78.3		0.105
0.100	28		95.3	9.53	0.130
0.125	33		112.4		0.155
0.150	40		136.2		0.180
0.200	46		156.6	10.44	0.230
0.250	57		194.1		0.280
0.300	64		217.9		0.330
0.400	82		279.2		0.430
0.500	102		347.3		0.530

Bottom As soaked						
Penetration (in.)	Load Dial (div.)	Load (lbs.)	Stress (lb./in.²)	Uncorrected CBR Value		
0.025	9		30.6	-	0.025	
0.050	19		64.7		0.050	
0.075	29		98.7		0.075	
0.100	39		132.8	13.28	0.100	
0.125	46		156.6		0.125	
0.150	52		177.0	ĺ	0.150	
0.200	61		207.7	13.85	0.200	
0.250	67		228.1		0.250	
0,300	75		255.4		0.300	
0.400	83		282.6	L	0.400	
0.500	86		292.8		0.500	

13.3

Density Correction	
Final Moisture Content Final Moist Wt of Soil	18.7 <b>95</b> 19 41 <b>2</b> 6.5
Dry Weight of Soil	3473.626
Initial Moisture Content	
Initial Moisture Wt of Soil Weight of Water Initial Initial Moisture Content	3971.0 497.4 14.3
Initial Density of Soil	
Initial Wet Density	116.7
Initial Dry Density	102,1:
ŀ	

11.0 MoDOT TRAFFIC INFORMATION

### **MEMORANDUM**



### Missouri Department of Transportation Transportation Planning 2217 St. Marys Blvd.

TO:

Sean L. Matlock-7de

CC:

Diane Heckemeyer-de

Ken Fryer-po Shyam Gupta-br

FROM:

Barb Dudenhoeffer

Transportation Planner

DATE:

January 31, 2002

SUBJECT:

Design Traffic

Route 71, McDonald County Rte. H to Arkansas State Line

Job No. J7P0601

Post-it* Fax Note 7671 Date 2/1/2002 # of 3

To JOHN MARTEL From SEAN MATLOCK

Co./Depl. HNTB

Phone # (816) 527-2231 Phone # (417) 629-3378

Fax # (816) 472-4086 Fax # (417) 629 - 3314

We are providing updated estimates of average daily traffic and 18-kip ESAL units for the above project as requested.

<u>US 71</u>	<u>ADT</u>		SAL Units to Way) Rigid
Construction Year (2007) Design Year (2027) Peak Hour – 8% Directional Distribution – 60% ADT Trucks – 22%	17,200 28,700	3,630 6,060	6,060 10,120
Accumulated 20-year ESAL units (thou Accumulated 35-year ESAL units (thou		34,820 75,040	58,110 125,240
			AL Units o Way)

January 31, 2002 Page Two

Attached are estimated construction and design year turning movements for the intersection of US 71 and Route 90. The traffic estimates are based on manual and machine counts.

cw

Attachment

J:\analysis\j7p0601.doc

### Missouri Highway and Transportation Department

Transportation Management Systems
Turning Movement Diagram and Summary

### McDonald County

Station Location: Intersection of US 71 & Rte. 90 Date: January, 2002

Base Year: _____ Const. Year: ______ Design Year: ______ 2027

20 Year Design Factor 1.68

	Base		const. 2007		Design 2027		
North to West			165		275	20 48 M	
North to South		<i>7</i> / 1 .	8180	(%)	13670		
North to East			195		325	77. N	
North March	20.089		49,623.5	140000	7.50 E.S.		W-48388
East to North			195		325		
East to West			110	201296	185		
East to South			85		140		
	10000	(39.22)		Messec.	9054/89A	500 SS	10.90
South to East			85		140		
South to North			8180		13670		
South to West			335		560		
	0.00		- K.				
West to South			335		560		
West to East			110		185		
West to North			165		275		

