

# LOG OF BORING B - 09

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 424.5 Feet (Approximate)

Date Drilled: 3/26/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0				TOPSOIL					
		13/18	CL	Dark Brown Sandy CLAY		1.2 Qp	20		
420 -5		7/24	SM	Gray-Brown Silty SAND			5		
		18/18				1.0 Qp	24		
415 -10		20/24	CH	Dark Gray-Brown CLAY	84	0.8 Qp	37		
			SP	Gray-Brown Fine SAND					
410 -15		13/18					3		
405 -20		18/18					15		
400 -25					TD - 20.0 Feet				
395 -30									

**Notes:**

**GROUNDWATER**

- First Observed During Drilling - Dry
- At Completion - Not Recorded

Piezometer Installed: No



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# LOG OF BORING B - 10

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 423.5 Feet (Approximate)

Date Drilled: 3/28/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: HSA and Mud Rotary  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0				TOPSOIL Dark Brown Silty CLAY					
420		16/18	CL			0.75	26		
-5		15/18			-Gray-Brown below 5.5 Feet	Qp			
415		18		SM	Gray Fine SAND, with Silt				
-10									Began Mud Rotary at 15.0 Feet
410		18/18		SM	Dark Gray-Brown Silty SAND				
-15									
405	24		SM	Dark Gray Fine SAND, with Silt	92		30		
-20									
400	13/18		SP	Dark Gray Fine SAND					
-25									
395									
-30									

(continued)

**Notes:**

**GROUNDWATER**

- First Observed During Drilling - N/A
- At Completion - N/A

Piezometer Installed: No



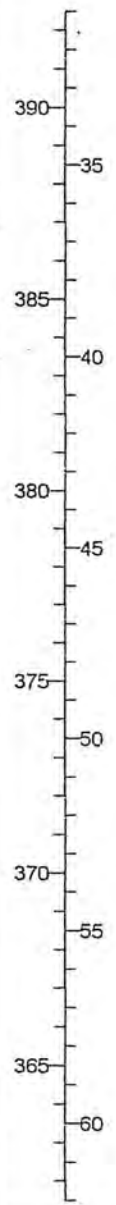

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BORING LOG 2554GINTFILE.GPJ SHIVELY.GDT 4/24/03

# LOG OF BORING B - 10 (Cont.)

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 423.5 Feet (Approximate)

Date Drilled: 3/28/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: HSA and Mud Rotary  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
		<p>16/18</p> <p>18/18</p> <p>10/18</p>	<p>CH</p> <p>SP</p> <p>TD - 45.0 Feet</p>	<p>Dark Gray CLAY</p> <p>Dark Gray Fine SAND</p> <p>- Gray below 42.0 Feet</p>			<p>33</p> <p>40</p>	

**Notes:**

**GROUNDWATER**

- First Observed During Drilling - N/A
- At Completion - N/A

Piezometer Installed: No



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BORING LOG 2554\GINTFILE.GPJ SHIVELY.GDT 4/24/03



# LOG OF BORING B - 12

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 428.0 Feet (Approximate)

Date Drilled: 1/17/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
0		18/18		TOPSOIL			69	
425		9/18		Gray FLYASH, FILL			56	
5		15/18		-with Organics 3.0 to 8.0 Feet		0.4 Qp	35	
420		21/24			87	0.4 Qp	34	UU = 0.20 TSF
-10				TD - 10.0 Feet				
415								
-15								
410								
-20								
405								
-25								
400								
-30								

Notes:

GROUNDWATER

- First Observed During Drilling - Dry
- At Completion - Dry
- 4 days After Completion - 4.5 Feet
- Piezometer Installed: No



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# LOG OF BORING B - 13

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 449 Feet (Approximate)

Date Drilled: 1/16/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0				TOPSOIL					
		1 3 3	12/18	Gray FLYASH, FILL		1.2 Qp	26		
445		7 12 17	9/18					24	
-5			14/17		-trace Bottom Ash below 5.5 Feet			29	
440		3 4 4	12/18					34	
-10									
435	4 5 5	17/18				0.5 Qp	28		
-15									
430	2 5 6	NSD/18				1.8 Qp	37		
-20				TD - 15.0 Feet					
425									
-25									
420									
-30									

Notes:

**GROUNDWATER**

- ▽ First Observed During Drilling - Dry
- ▽ At Completion - Dry
- ▽ 1 days After Completion - Dry
- 5 days After Completion - dry
- Piezometer Installed: No



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# LOG OF BORING B - 14

Project Name: Dynege Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 448.5 Feet (Approximate)

Date Drilled: 1/17/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> <p>0</p> <p>445</p> <p>5</p> <p>440</p> <p>10</p> <p>435</p> <p>15</p> <p>430</p> <p>20</p> <p>425</p> <p>25</p> <p>420</p> <p>30</p> </div> <div style="flex: 1;"> </div> </div>	<p>13/18</p> <p>14/18</p> <p>13/24</p> <p>14/18</p> <p>13/18</p> <p>17/18</p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	<p>TOPSOIL</p> <p>Gray FLYASH, FILL</p> <p></p> <p></p> <p>Dark Gray FLYASH and BOTTOM ASH, FILL</p> <p>TD - 20.0 Feet</p>	<p></p> <p>60</p> <p></p> <p>1.6 Qp</p> <p>0.5 Qp</p> <p>0.5 Qp</p>	<p></p> <p></p> <p></p> <p>38</p> <p>43</p> <p>40</p>	<p>22</p> <p>25</p> <p>28</p> <p></p> <p></p>	<p></p> <p></p> <p></p> <p></p> <p></p> <p></p>	

Notes:

**GROUNDWATER**

- First Observed During Drilling - Dry
- At Completion - Dry
- 4 days After Completion - Dry
- Piezometer Installed: No



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# LOG OF BORING B - 16

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 440 Feet (Approximate)

Date Drilled: 1/17/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
440 - 0				TOPSOIL				
		14/18		Gray FLYASH, trace Bottom Ash, FILL		1.7 Qp	30	
435 - 5		15/18				0.7 Qp	32	
		18/18				1.4 Qp	30	
430 - 10		15/24			54		44	
				TD - 10.0 Feet				
425 - 15								
420 - 20								
415 - 25								
410 - 30								

Notes:

**GROUNDWATER**

- First Observed During Drilling - Dry
- At Completion - Dry
- 4 days After Completion - Dry
- Piezometer Installed: No



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# LOG OF BORING B - 17

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 440 Feet (Approximate)

Date Drilled: 1/17/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
440-0		18/18		TOPSOIL Gray FLYASH, trace Boiler Slag, FILL		0.9 Qp	29	
435-5		22/24		Gray BOTTOM ASH and BOILER SLAG, trace Flyash, FILL	86		11	
430-10		18/18		Gray FLYASH, FILL -with Bottom Ash 5.5 to 8.0 Feet		0.9 Qp	58	
425-15		18/18		TD - 10.0 Feet		2.4 Qp	45	
420-20								
415-25								
410-30								

Notes:

**GROUNDWATER**

- ▽ First Observed During Drilling - 6.0 Feet
  - ▽ At Completion - Dry
  - ▽ 4 days After Completion - Dry
- Piezometer Installed: No



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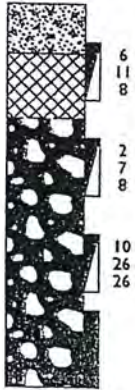
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# LOG OF BORING B - 18

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 442.5 Feet (Approximate)

Date Drilled: 1/17/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
0				Base ROCK, FILL				
440		10/18		Brown Silty CLAY, with Sand, Crushed Limestone, FILL			5	
5		8/18		Gray BOTTOM ASH, with Flyash, FILL		3.2 Qp	16	
435		17/18				4.5+ Qp	19	
10		23/24		TD - 10.0 Feet	78		20	
430								
15								
425								
20								
420								
25								
415								
30								

Notes:

GROUNDWATER

- ☑ First Observed During Drilling - Dry
- ☑ At Completion - Dry
- ☑ 4 days After Completion - Dry
- Piezometer Installed: No



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# LOG OF BORING B - 19

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 440 Feet (Approximate)

Date Drilled: 1/17/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
440-0				Base ROCK, FILL				
		17/24		Gray FLYASH, FILL -with Crushed Limestone to 4.0 Feet	68		35	
435-5		16/18				0.3 Qp	43	
		14/18					43	
430-10		17/18			0.5 Qp	46		
425-15		16/18	SP	Gray-Brown Fine SAND				
420-20				TD - 15.0 Feet				
415-25								
410-30								

Notes:

GROUNDWATER

- ▽ First Observed During Drilling - 8.5 Feet
- ▽ At Completion - Dry
- ▽ 4 days After Completion - Dry
- Piezometer Installed: No



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# LOG OF BORING B - 20

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 435 Feet (Approximate)

Date Drilled: 3/28/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
435 0 430 5 425 10 420 15 415 20 410 25 405 30		13/18  16/18  14/18  13/18	  SP    	Brown Silty CLAY, trace Sand, Gravel, FILL  Gray-Brown Fine to Medium SAND  -Fine to Coarse Grained below 8.0 Feet  TD - 10.0 Feet	          	  3.0 Qp          	  20   8   7   3	          

Notes:

GROUNDWATER

- First Observed During Drilling - NSD
- At Completion - NSD
  
- Piezometer Installed: No



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BORING LOG 2554GINTFILE.GPJ SHIVELY.GDT 4/21/03





# LOG OF BORING B - 22

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 437.5 Feet (Approximate)

Date Drilled: 3/11/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
0		10/18		TOPSOIL Very Dark Gray FLYASH, FILL -trace Bottom Ash to 5.5 Feet		2.1 Qp	42	
435		24/24			70	1.2 Qp	36	
-5		8/18		-Dark Gray, with Boiler Slag 5.5 to 8.0 Feet		0.8 Qp	18	
430		24/24		-Gray below 8.0 Feet	60		58	
-10		18/18				1.2 Qp	24	
425		18/18		CL Dark Gray-Brown Silty CLAY		1.9 Qp	28	
-15		18/18		CH Gray-Brown CLAY		1.8 Qp	46	
420		18/18						
-20		18/18						
415		18/18						
-25	18/18							
410				TD - 25.0 Feet				
-30								

**Notes:**

**GROUNDWATER**

- ▽ First Observed During Drilling - Dry
- ▽ At Completion - 18.5 Feet

Piezometer Installed: No



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BORING LOG 2554GINTFILE.GPJ SHIVELY.GDT 4/21/03

# LOG OF BORING B - 23

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 436 Feet (Approximate)

Date Drilled: 3/11/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0		14/18		TOPSOIL			45		
435		11/18		Gray FLYASH, FILL			48		
5		23/24				63		46	
430		15/18	CL	Dark Gray-Brown Silty CLAY		1.4 Qp	22		
10		18/18				0.5 Qp	27		
425	17/18						25		
15				TD - 20.0 Feet					
420									
20									
415									
25									
410									
30									
405									

Notes:

GROUNDWATER

First Observed During Drilling - Dry  
 At Completion - 13.0 Feet

Piezometer Installed: No

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BORING LOG 2554.GINT\FILE.GPJ SHIVELY.GDT 4/21/03



# LOG OF BORING B - 24

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 428 Feet (Approximate)

Date Drilled: 3/11/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0		14/18		TOPSOIL Dark Gray FLYASH, FILL			58	No Recovery in Shelby Tube, Pushed Split-Spoon Sampler	
425		7/18		-trace Bottom Ash 3.0 to 5.5 Feet			36		
5		12/18		-with Bottom Ash below 5.5 Feet			25		
420			24/24	SC	Dark Gray-Brown Fine SAND, with Clay	108	0.5 Qp	25	CU
10			16/18	CL	Dark Gray-Brown Silty CLAY			29	
415			15/18	CH	Dark Gray CLAY		0.8 Qp	47	
15			18/18		TD - 25.0 Feet			51	
410									
20									
405									
25									
400									
30									

Notes:

GROUNDWATER

- ▽ First Observed During Drilling - Dry
- ▽ At Completion - 6.7 Feet

Piezometer Installed: No



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BORING LOG 2554GINTFILE.GPJ SHIVELY.GDT 4/24/03

# LOG OF BORING B - 25

Project Name: Dynege Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 428 Feet (Approximate)

Date Drilled: 3/11/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0		9/18		Dark Gray FLYASH, trace Bottom Ash, FILL		0.2 Qp	46		
425		16/18	CL	Dark Brown Silty CLAY, with Sand			25		
5		24/24				110	0.4 Qp	22	
420		17/18	SM	Gray-Brown Silty SAND			30		
10		16/18	CL	Dark Gray Silty CLAY, with Sand			0.2 Qp	28	
415		17/18	CH	Dark Gray-Brown CLAY			51		
15					TD - 20.0 Feet				
410									
20									
405									
25									
400									
30									

**Notes:**

GROUNDWATER      ▽ First Observed During Drilling - Dry  
                               ▽ At Completion - 7.3 Feet

Piezometer Installed: No



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BORING LOG 2554GINTFILE.GPJ SHIVELY.GDT 4/21/03



# LOG OF BORING B - 26

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 424 Feet (Approximate)

Date Drilled: 3/13/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks
0		11/18	CL	TOPSOIL Dark Brown Silty CLAY -with Roots to 3.0 Feet		0.75 Qp	18	
420		14/24	SC	-with Sand below 3.0 Feet Dark Brown Clayey SAND	98	1.0 Qp	24	
415		12/18	ML	Gray-Brown SILT, with Clay, Sand	95	1.0 Qp	17	
410		9/18	SM	Gray SAND, with Silt			28	
405		16/18	CL-CH	Dark Gray Silty CLAY			35	
400		12/18	SP	Gray Fine SAND TD - 25.0 Feet			34	
395								
390								

Notes:

GROUNDWATER

- ▽ First Observed During Drilling - Dry
- ▽ At Completion - Dry

Piezometer Installed: No



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BORING LOG 2554GINTFILE.GPJ SHIVELY.GDT 4/21/03



# LOG OF BORING B - 27

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 424 Feet (Approximate)

Date Drilled: 3/13/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0				TOPSOIL					
		14/18	CL	Dark Gray Brown Silty CLAY		3.8 Qp	19		
420		13/18		-Dark Brown, trace Sand 3.0 to 5.5 Feet			25		
5			21/24		-Gray-Brown below 5.5 Feet	96	1.2 Qp	25	
415		15/18	CH	Gray-Brown CLAY		1.2 Qp	29		
10		13/18	SC	Gray-Brown Fine SAND, with Clay		0.75 Qp	25		
410		14/18	SP	Gray-Brown Fine SAND				3	
15				TD - 20.0 Feet					
405									
20									
400									
25									
395									
30									

Notes:

GROUNDWATER

- ▽ First Observed During Drilling - Dry
- ▼ At Completion - Dry

Piezometer Installed: No



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# LOG OF BORING B - 28

Project Name: Dynegy Rail Loop  
 Project Location: Wood River, Illinois  
 Project Number: SG9-2554  
 Elevation: 424 Feet (Approximate)

Date Drilled: 3/13/03  
 Drilling Contractor: Meyer Drilling, Inc.  
 Drilling Method: Hollow Stem Auger  
 Logged By: Meyer/Kinsella

Elevation/ Depth (feet)	Graphic Log Sampler Symbols and SPT Blows	Rec. (in./in.)	USCS	Description	DD (pcf)	UCS (tsf)	MC (%)	Remarks	
0				TOPSOIL					
			17/18	CL	Dark Brown Silty CLAY		0.75	26	
420			15/24		-Dark Gray-Brown below 3.0 Feet	98	0.75	24	
-5			18/18				1.2	26	
415			18/24	SC	Gray-Brown Clayey SAND	103	0.5	17	
-10			16/18	SP	Gray-Brown Fine SAND			3	
410			18/18					4	
-15		17/18		-Fine to Medium Grained below 22.0 Feet			14		
405									
-20									
400									
-25									
395									
-30									
				TD - 25.0 Feet					

Notes:

GROUNDWATER

- ▽ First Observed During Drilling - Dry
- ▽ At Completion - Dry















Piezometer Installed: No



Missouri (314) 770-1001  
 Illinois (618) 398-1414

# KEY TO SYMBOLS

## Strata Symbols

 Base Rock	 USCS Low to High Plasticity Clay
 Fill	 Flyash
 USCS Low Plasticity Silty Clay	 Bottom Ash and/or Boiler Slag
 USCS High Plasticity Clay	 USCS Low Plasticity Clayey Silt
 USCS Poorly-graded Sand	 USCS Low Plasticity Sandy Clay
 Topsoil	 USCS Clayey Sand
 USCS Silty Sand	 USCS Sandy Silt

## Soil Samplers

 Split Spoon	 Grab Sample
	

DD - Dry Density  
Qp - Pocket Penetrometer  
USCS - Unified Soil Classification System  
UCS - Unconfined Compressive Strength  
MC - Moisture Content  
LL - Liquid Limit  
PL - Plastic Limit  
PI - Plasticity Index  
HYD - Hydrometer Test Performed  
CU - Consolidated Undrained Triaxial Test Performed  
G<sub>s</sub> - Specific Gravity  
NSD - Non-supplied Data



### GENERAL NOTES

The number of borings is based on topographic and geologic factors: the magnitude of loading; the size, shape, and value of the structure; consequences of failure; and other factors. The type and sequence of sampling is selected to reduce the possibility of undiscovered anomalies and increase drilling efficiency. Attempts are made to detect and/or identify occurrences during drilling and sampling such as encounter of water, boulders, gas, zones of lost circulation, relative ease or resistance of drilling progress, unusual sample recovery, variation in driving resistance, unusual odors, etc. However, lack of mention of such variations does not preclude their presence.

Although attempts are made to obtain stabilized groundwater levels, the levels shown on the Boring Logs may not have stabilized, particularly in more permeable cohesive soils. Consequently, the indicated groundwater levels may not represent present or future levels. Groundwater levels may vary significantly over time due to the effects of precipitation, infiltration, or other factors not evident at the times indicated.

Unless otherwise noted, soil classifications indicated on the Boring logs are based on visual observations and are not the result of classification tests. Although visual classifications are performed by experienced technicians or engineers, classifications so made may not be conclusive.

Generally, variations in texture less than one foot in thickness will be described as seams while thicker strata will be logged as individual strata. However, minor anomalies and changes of questionable lateral extent may appear only in the verbal description. The lines indicating changes in strata on the Boring Logs are approximate boundaries only as the actual material change may be between samples or may be a gradual transition. Changes in materials observed by field or laboratory personnel are indicated by solid single lines whereas estimated material changes between recovered samples are indicated by double solid lines.

Samples chosen for laboratory testing are selected in such a manner so as to determine selected physical characteristics of each material encountered. However, as samples are recovered only intermittently and only representative samples are tested, the results of such tests may not conclusively represent the characteristics of all subsurface materials present.

## NOTATIONS USED ON BORING LOGS

## Approximate Proportions

Trace <15%  
 With 15-29%  
 Modifier >30%

Clay or clayey may be used as a major material or modifier, regardless of relative proportion, if the clay content is sufficient to dominate the soil properties.

## Particle Size

<b>Boulders</b>	>12 inches
<b>Cobbles</b>	12 Inches - 3 Inches
<b>Gravel</b>	
Coarse	3 Inches - 3/4 Inch
Fine	3/4 Inch - No. 4 Sieve (4.75mm)
<b>Sand</b>	

Coarse	No. 4 - No. 10 Sieve (2.00mm)
Medium	No. 10 - No. 40 Sieve (0.42mm)
Fine	No. 40 - No. 200 Sieve (0.074mm)
<b>Silt</b>	No. 200 Sieve - 0.005 mm
<b>Clay</b>	<0.005 mm

## SPT Blow Count

Number of impacts of a 140 pound hammer falling a distance of 30 inches to cause a standard split-barrel sampler, 1 3/8 inches I.D., to penetrate a distance of 6 inches. The number impacts for the first 6 inches of penetration is known as the seating drive. The sum of the impacts for the last 12 inches of penetration is the Standard Penetration Test Resistance or "N" value. For example, if Blows = 6-8-11, then "N" = 8+11 or 19.

## Other Notations

- 50/3 - impacts to cause sampler to penetrate the indicated number of inches, 50 blows for 3 inches in this case  
 WR - Sampler penetrated under the static loading of the weight of the drill rod  
 WH - Sampler Penetrated under the static loading of the weight of the hammer and drill rod  
 X - No Blow Count

## Laboratory Test Symbols

- QP - Calibrated Penetrometer  
 QU - Unconfined Compressive Strength  
 LL - Liquid Limit  
 PL - Plastic Limit  
 MC - Natural Moisture Content

**NOTATIONS USED ON BORING LOGS, (Cont.)****Drilling, Sampling, & Groundwater Level Symbols**

AR	- Auger Refusal	RB	- Rotary Rock Bit
AS	- Auger Sample	SR	- Split-Barrel Refusal
BS	- Bag or Bulk Sample	SS	- Standard 1 3/8 Inches Dia. Split-Barrel Sample
DB	- Drag Bit	TOB	- Termination of Boring
DCI	- Dry Cave-In	3T	- Thin-Walled Tube Sample, 3 Inches Diameter
FA	- Flight Auger	TR	- Thin-Walled Tube Refusal
LS	- Large 2 1/2 Inches Dia. Split-Barrel Sample	WB	- Wash Bore
NC	- NX Conventional Rock Core	WCI	- Wet Cave-In
NW	- NX Wireline Rock Core	WS	- Wash Sample

**Description Abbreviations**

App	- Apparent	Med	- Medium
Bk	- Black	Mot	- Mottled
Bld	- Boulder(s)	Org	- Organic(s)
Br	- Brown, Brownish	Oxi	- Oxidation, Oxidized
Calc	- Calcareous	Pkt	- Pocket(s)
Cbl	- Cobble(s)	Pt	- Peat, Peaty
Cl	- Clay, Clayey	Rd	- Red, Reddish
Co	- Coarse	Rt	- Root(s)
Conc	- Concretion(s)	Sa	- Sand, Sandy
Dk	- Dark	Sh	- Shale, Shaley
Fi	- Fine	Si	- Silt, Silty
Frac	- Fractured	Slk	- Slickensided, Slickensides
Frag	- Fragment(s)	Sm	- Seam(s)
Gr	- Gray, Grayish	Sp	- Spot(s)
Grv	- Gravel, Gravelly	Stn	- Stain(s)
Inb	- Interbedded	Stk	- Streak(s)
Jt	- Joint(s)	Tr	- Trace
Lig	- Lignite	v	- Very
Ls	- Limestone	w/	- With
Lt	- Light	Yel	- Yellow, Yellowish



**Unified Soil Classification System****Coarse-Grained Soils**

- GW** - Well-graded gravels, gravel-sand mixtures, little or no fines
- GP** - Poorly graded gravels, gravel-sand mixtures, little or no fines
- GM** - Silty gravels, gravel-sand-silt mixtures
- GC** - Clayey gravels, gravel-sand-clay mixtures
- SW** - Well-graded sands, gravelly sands, little or no fines
- SP** - Poorly graded sands, gravelly sands, little or no fines
- SM** - Silty sands, sand-silt mixtures
- SC** - Clayey sands, sand-clay mixtures

**Fine-Grained Soils**

- ML** - Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, or clayey silts with slight plasticity
- CL** - Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
- OL** - Organic silts and organic silty clays of low plasticity
- MH** - Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
- CH** - Inorganic clays of high plasticity, fat clays
- OH** - Organic clays of medium to high plasticity, organic silts
- PT** - Peat and other highly organic soils