

 CH2MHILL		PROJECT NUMBER 334469.SA.HS	BORING NUMBER MW-231 (IW-3)	SHEET 1 of 4		
		<h2 style="text-align: center;">SOIL BORING LOG</h2>				
PROJECT : Memphis Depot - Intermediate Aquifer Inv.		LOCATION : Memphis, Tennessee		ELEVATION:		
DRILLING CONTRACTOR : Boart Longyear		NAME OF DRILLER : T. Schmalfeldt / C. Herron				
DRILLING METHOD/EQUIPMENT: Canterra CT 250 Mud Rotary (M) / SR 120 Track-Mounted Rotasonic (R)		SIZE/TYPE OF BIT : 17.25" (M) / 4X6"; 9.25" (R)				
OVERBURDEN THICKNESS : DEPTH DRILLED INTO ROCK N/A		TOTAL DEPTH OF BORING 198 ft-bgs				
WATER LEVELS : 139.4 ft-bgs		START: 8/14/07 (M) ; 8/28/07 (R) / END: 8/16/07 (M) ; 8/31/07 (R)		LOGGER : Derek Miller/ORO		
DEPTH BELOW SURFACE (FT)	SAMPLE INTERVAL (FT)	RECOVERY (FT)	#/TYPE	STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.	COMMENTS DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. FID (ppm)
					0.0-70.0: NOT SAMPLED	0.0-70.0: MUD ROTARY RIG DID NOT BEGIN SAMPLING UNTIL 70.0 FT BGS *REFERENCE MW-37 BORING LOG
35	0-70	N/A	N/A	N/A		
70	70-72	2 / 2	SS-1	N/A	70.0-72.0: CLAY (CL), light gray to reddish brown, moist, firm common medium prominent black mottles throughout	MAX FID ON CORE: 0.9
	72-74	2 / 2	SS-2	N/A	72.0-74.0: AS ABOVE	MAX FID ON CORE: 0.0
75	74-76	2 / 2	SS-3	N/A	74.0-74.5: AS ABOVE 74.5-75.0: SANDY CLAY (CL), gray to reddish brown, moist, firm, v. fine-grained sand, ~35-40% sand	MAX FID ON CORE: 0.0
	76-78	1.8 / 2	SS-4	N/A	75.0-76.0: CLAY (CL), reddish brown to light gray, moist, firm 76.0-76.2: AS ABOVE 76.2-78.0: SILTY CLAY (CL), dark gray, moist, stiff, few fine distinct black mottles throughout, distinct contact	MAX FID ON CORE: 0.0
	78-80	1.8 / 2	SS-5	N/A	78.0-80.0: AS ABOVE	MAX FID ON CORE: 0.0
80	80-82	1.3 / 2	SS-6	N/A	80.0-81.5: CLAYEY SAND (SC), dark gray, moist, firm, v. fine grained sand, ~35-40% clay	MAX FID ON CORE: 0.0
	82-84	1.5 / 2	SS-7	N/A	81.5-82.0: SILTY CLAY (CL), dark gray, moist, stiff, few fine distinct black mottles throughout 82.0-83.7: CLAYEY SAND (SC), dark gray, moist, firm, v. fine grained sand, ~35-40% clay	MAX FID ON CORE: 0.0
85	84-86	2 / 2	SS-8	N/A	83.7-84.0: SILTY CLAY (CL), dark gray, moist, stiff, few fine distinct black mottles throughout 84.0-85.0: CLAY (CL), dark gray, sl. moist, hard	MAX FID ON CORE: 0.0
	86-88	2 / 2	SS-9	N/A	85.0-85.4: CLAYEY SAND (SC), dark gray, moist, firm, v. fine grained sand, ~35-40% clay	MAX FID ON CORE: 0.0
	88-90	2 / 2	SS-10	N/A	85.4-86.0: CLAY (CL), dark gray, sl. moist 86.0-88.0: AS ABOVE	MAX FID ON CORE: 0.0
90	90-93	3 / 3	C-1	N/A	88.0-89.0: CLAY (CL), dark gray, sl. moist, hard 89.0-90.0: CLAYEY SAND (SC), dark gray, moist, firm, v. fine grained sand, ~35-40% clay 0.0-90.0: 12" CARBON STEEL PERMANENT CASING	MAX FID ON CORE: 0.0
	93-94.5	1.5 / 1.5	ST-1	N/A	90.0-91.7: SL. SANDY CLAY (CL), dark gray, moist, hard, v. fine-grained sand, ~10% sand 91.7-93.0: CLAYEY SAND (SC), dark gray, moist, firm, v. fine to fine-grained sand, ~50% sand, sl. plasticity 93.0-94.5: SANDY CLAY (CL), dark gray, moist, firm, v. fine to fine-grained sand, ~30-35% sand *LOGGED SHAVINGS FROM TUBE*	MAX FID ON TUBE: 0.0 Sample MW231 ST 93-94.5: (Shelby tube) Vertical permeability and grain size anaylsis

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				SOIL BORING LOG					
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DRILLING CONTRACTOR : Boart Longyear				NAME OF DRILLER : T. Schmalfeldt / C. Herron					
DRILLING METHOD/EQUIPMENT: Canterra CT 250 Mud Rotary (M) / SR 120 Track-Mounted Rotasonic (R)				SIZE/TYPE OF BIT : 17.25" (M) / 4X6"; 9.25" (R)					
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WATER LEVELS : 139.4 ft-bgs				START: 8/14/07 (M) ; 8/28/07 (R) / END: 8/16/07 (M) ; 8/31/07 (R)				LOGGER : Derek Miller/ORO	
DEPTH BELOW SURFACE (FT)		SAMPLE INTERVAL (FT)		STANDARD PENETRATION TEST RESULTS		SOIL DESCRIPTION		COMMENTS	
		RECOVERY (FT)		6"-6"-6" (N)				DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. FID (ppm)	
		#/TYPE							
94.5-98		3.5 / 3.5		C-2		N/A		94.5-98.0: AS ABOVE, moderate plasticity	
								MAX FID ON CORE: 0.0	
								Sample MW231 SS 96: TOC (415.1) ONLY	
98-108		10 / 10		C-3		N/A		98.0-108.0: AS ABOVE, few coarse distinct black mottles	
								MAX FID ON CORE: 0.0	
108-118		10 / 10		C-4		N/A		108.0-109.9: AS ABOVE	
								MAX FID ON CORE: 0.0	
								109.9-110.8: SILTY SAND (SM), gray, moist, loose and crumbly, v. fine-grained sand, ~30% silt	
								110.8-116.0: SANDY CLAY (CL), gray, sl. moist, hard, v. fine grained sand, sand increasing w/ depth from ~30 to 40%	
118-128		10 / 10		C-5		N/A		116.0-117.0: ORGANIC SILT AND WOOD GRAVELS (OL), black, sl. moist, loose, gravels up to 1/4", dark brown	
								117.0-118.0: SILTY SAND (SM), gray, moist, firm and crumbly, v. fine-grained sand, ~30-35% silt	
								118.0-119.5: SANDY CLAY (CL), dark gray, moist, hard, few v. fine faint black mottles, ~20% fine-grained sand	
								119.5-121.0: CLAYEY SAND (SC), dark gray, moist, firm, sl. plasticity, ~30-35% clay	
								121.0-128.0: SANDY CLAY (CL), dark gray, sl. moist, hard, ~30% v. fine-grained sand	
128-138		10 / 10		C-6		N/A		128.0-132.8: AS ABOVE, trace v. dark brownish black organic staining	
								MAX FID ON CORE: 0.0	

 CH2MHILL				PROJECT NUMBER 334469.SA.HS		BORING NUMBER MW-231 (IW-3)		SHEET 3 of 4	
				SOIL BORING LOG					
PROJECT : Memphis Depot - Intermediate Aquifer Inv.				LOCATION : Memphis, Tennessee				ELEVATION:	
DRILLING CONTRACTOR : Boart Longyear				NAME OF DRILLER : T. Schmalfeldt / C. Herron					
DRILLING METHOD/EQUIPMENT: Canterra CT 250 Mud Rotary (M) / SR 120 Track-Mounted Rotasonic (R)				SIZE/TYPE OF BIT : 17.25" (M) / 4X6"; 9.25" (R)					
OVERBURDEN THICKNESS : DEPTH DRILLED INTO ROCK N/A				TOTAL DEPTH OF BORING 198 ft-bgs					
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DEPTH BELOW SURFACE (FT)			STANDARD PENETRATION		SOIL DESCRIPTION			COMMENTS	
SAMPLE INTERVAL (FT)			TEST RESULTS		SOIL NAME, USCS GROUP SYMBOL, COLOR, MOISTURE CONTENT, RELATIVE DENSITY, OR CONSISTENCY, SOIL STRUCTURE, MINERALOGY.			DEPTH OF CASING, DRILLING RATE, DRILLING FLUID LOSS, TESTS, AND INSTRUMENTATION. FID (ppm)	
RECOVERY (FT)			6"-6"-6" (N)						
135	128-138	10 / 10	C-6	N/A	132.8-138.0: SILTY CLAY (CL), dark gray, sl. moist, hard, common medium distinct light gray mottling			MAX FID ON CORE: 0.0	
140	138-148	10 / 10	C-7	N/A	138.0-141.4: SANDY CLAY (CL), dark gray, moist, firm to ~30% v. fine-grained sand 141.4-148.0: SILTY CLAY (CL), dark gray, sl. moist, hard, ~20% silt, few coarse distinct black mottles, trace wood gravel up to 1/4", dark brownish black			MAX FID ON CORE: 12.0	
145									
150	148-158	10 / 10	C-8	N/A	148.0-150.1: SL. SANDY CLAY (CL), dark gray, moist, firm, ~20% v. fine-grained sand 150.1-156.0: CLAYEY SAND (SC), dark gray, sl. moist, hard and crumbly, sl. plasticity, ~50-60% v. fine-grained sand			MAX FID ON CORE: 6.3	
155									
160	158-168	10 / 10	C-8	N/A	156.0-158.0: SANDY CLAY (CL), dark gray, moist to sl. moist w/ depth, hard, ~35-40% v. fine-grained sand 158.0-160.3: AS ABOVE 160.3-168.0: SL. SILTY SAND (SM), gray, wet, loose to firm and crumbly, well sorted, ~80-85% v. fine to fine-grained sand			MAX FID ON CORE: 15.0	
165									

**CH2MHILL**

PROJECT NUMBER

334469.SA.HS

BORING NUMBER

MW-231 (IW-3)

SHEET 4 of 4

SOIL BORING LOG

PROJECT : Memphis Depot - Intermediate Aquifer Inv. LOCATION : Memphis, Tennessee

ELEVATION:

DRILLING CONTRACTOR : Boart Longyear

NAME OF DRILLER : T. Schmalfeldt / C. Herron

DRILLING METHOD/EQUIPMENT: Canterra CT 250 Mud Rotary (M) / SR 120 Track-Mounted Rotasonic (R)

SIZE/TYPE OF BIT : 17.25" (M) / 4X6"; 9.25" (R)

OVERBURDEN THICKNESS : DEPTH DRILLED INTO ROCK N/A

TOTAL DEPTH OF BORING 198 ft-bgs

WATER LEVELS : 139.4 ft-bgs START: 8/14/07 (M) ; 8/28/07 (R) / END: 8/16/07 (M) ; 8/31/07 (R)

LOGGER : Derek Miller/ORO

DEPTH BELOW SURFACE (FT)				STANDARD PENETRATION TEST RESULTS 6"-6"-6" (N)	SOIL DESCRIPTION	COMMENTS	
SAMPLE INTERVAL (FT)							
RECOVERY (FT)		#/TYPE					
	158-168	10 / 10	C-8	N/A	168.0-178.0: AS ABOVE, coarsening down w/ depth from v. fine to fine-grained	MAX FID ON CORE: 15.0	
170	168-178	10 / 10	C-9	N/A		MAX FID ON CORE: 12.0	
175							
180	178-188	10 / 10	C-10	N/A		178.0-179.5: AS ABOVE 179.5-180.3: AS ABOVE, many prominent coarse dark brownish black laminated organic staining, nearly horizontal 180.3-188.0: SL. SILTY SAND (SM), gray, wet, loose, ~90% fine-grained sand, well sorted	MAX FID ON CORE: 10.8
185							
190	188-198	10 / 10	C-11	N/A	188.0-198.0: AS ABOVE	MAX FID ON CORE: 20.0	
195							

TD @ 198.0 FT-BGS