


EC 13-115

 <b>MWH Americas, Inc.</b> 335 Phoenixville Pike Malvern, Pennsylvania 19355	<b>Boring ID: D63C_MWH</b> Page 1 of 6	
	<b>Project Name:</b> 2009 Dissolved Phase Plume Continued Delineation <b>Location:</b> Delaware City, DE <b>Project Number:</b> <b>Date Started:</b> 4/24/2009 <b>Date Finished:</b> 4/28/2009 <b>Drilling Method:</b> Roto-Sonic <b>Sampling Method:</b> <b>State Permit Number:</b> NA	<b>Boring Location:</b> Delaware City Refinery <b>Drilling Company:</b> Bowser Morner <b>Ground Elevation (ft/msl):</b> <b>Total Depth (ft):</b> 220.0' <b>Boring Diameter (in):</b> 8" <b>Water Level During Drilling (ft/bgs):</b> <b>Weather Conditions:</b> <b>Logged By:</b> Joseph Remenicky

Depth (feet)	Blow Counts	Recovery (inches)	PID (ppm)	Sample ID	Sample Interval	USCS	Lithology	Lithologic Description	Well Diagram	Remarks
0							ML	0' - 0.65' Vary pale brown (10YR 7/4) TOPSOIL; silt matrix; trace fine-grained sand; plant rootlets.		Stick-up well completion.
0.65							ML	0.65' - 5.3' Yellowish brown (10YR 5/6) SILT; trace fine-grained sand; medium plasticity.		
5.3	7						SP ML	1.3' - 2.2' Little coarse-grained rounded gravel.		
5.3							SW ML	2.2' Color grades to yellowish brown (10YR 5/8).		
5.3							SW	4.9' - 5.3' Little fine-grained sand.		
5.3							SW	5.3' - 5.7' Yellowish brown (10YR 5/6) fine-grained SAND.		
5.7							SW	5.7' - 7.3' Very pale brown (10YR 7/3) SILT; little clay; dry; low plasticity.		
7.3							SW	7.3' - 8.2' Yellowish brown (10YR 5/8) fine-grained SAND; little coarse- to fine-grained subrounded to rounded gravel, medium-grained sand; trace silt.		
8.2							ML	8.2' - 13.9' Color grades to brownish yellow (10YR 6/8); trace fine-grained subrounded to rounded gravel.		
13.9							SW	13.9' - 15.2' Very pale brown (10YR 8/2) CLAYEY SILT; trace fine-grained sand; hard.		
15.2							SW	15.2' - 15.9' Very pale brown (10YR 7/4) medium-grained SAND; some fine-grained sand; little fine-grained subrounded to rounded gravel, coarse-grained sand; silt.		
15.9							ML	15.9' - 18.7' Trace fine-grained gravel, coarse-grained sand.		
18.7							SW	18.7' - 20.2' Little fine-grained gravel, coarse grained sand.		
20.2							SW	20.2' - 20.4' Brownish yellow (10YR 6/6) SILT; trace fine-grained sand; low plasticity.		
20.4							SW	20.4' - 22.7' Very pale brown (10YR 7/4) medium-grained SAND; some fine-grained sand; little silt; trace fine-grained subrounded to rounded gravel, coarse-grained sand.		
22.7							GM	22.7' - 23.5' Little fine-grained gravel; coarse-grained sand.		
23.5							SW	23.5' - 24.85' Dark yellowish brown (10YR 4/4) fine-grained SAND; some fine-grained gravel; little coarse gravel; micaceous.		
24.85							SW	24.85' - 29.2' No gravel.		
29.2							SW	25.1' Color grades to yellowish brown (10YR 5/4).		
35		10								



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35						GM SW SW		29.2' - 29.6' Dark yellowish brown (10YR 4/6) coarse-grained angular to subrounded GRAVEL; some silt; little fine-grained sand; micaceous; iron deposits.		
40		9.5				SW		29.6' - 30.9' Yellowish brown (10YR 5/4) fine-grained SAND; micaceous. 30.9' - 34.7' Dark yellowish brown (10YR 3/4) medium- to fine-grained SAND; little fine-grained subrounded to rounded gravel, coarse-grained sand; trace silt. 33.1' - 33.9' Some fine-grained subrounded to rounded gravel; little coarse-grained subrounded to rounded gravel.		
45						SW		34.7' - 34.9' Very dark brown (10YR 2/2) fine-grained subangular to rounded GRAVEL; little silt.		
50		9				SW		34.9' - 35.6' Dark yellowish brown (10YR 3/4) medium- to fine-grained SAND; little fine-grained subrounded to rounded gravel, coarse-grained sand; trace silt. 35.6' - 38.5' Dark yellowish brown (10YR 3/4) medium-grained SAND; some fine-grained sand; trace fine-grained subrounded to rounded gravel, coarse-grained sand. 37.5' Color grades to yellowish brown (10YR 5/6).		
55						SW		38.5' - 47.8' Yellowish brown (10YR 5/8) medium- to fine-grained SAND; trace coarse-grained sand. 45' - 46.9' Little fine-grained subrounded to rounded gravel.		
60		10				SW		47.8' - 66.2' Very pale brown (10YR 7/4) fine-grained SAND; little medium-grained sand; trace silt. 49' Color grades to yellowish brown (10YR 5/8). 55.1' - 55.5' Little fine-grained subrounded to rounded gravel. 58.5' Rounded coarse gravel grain. 63.9' - 65.3' Little fine-grained subrounded to rounded gravel.		
65						SW		66.2' - 67.7' Brownish yellow (10YR 6/8) medium-grained SAND; little coarse- to fine-grained sand; trace coarse- to fine-grained angular to subangular gravel.		
70						SW		67.7' - 69.8' Brownish yellow (10YR 6/8) fine-grained SAND; trace coarse- to fine-grained subrounded to rounded gravel. 69.5' Subrounded cobble.		
75		10				SW		69.8' - 75.8' Yellowish brown (10YR 5/8) medium-grained SAND; little fine-grained subrounded to rounded gravel; trace coarse-grained gravel, silt. 73.4' Color grades to yellowish red (5YR 4/6).		



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80								75.8' - 80.4' Brownish yellow (10YR 6/8) fine-grained SAND; trace coarse- to fine-grained subrounded to rounded gravel.		
85		7.5				SW		80.4' - 101.8' Yellowish red (5YR 4/6) medium- to fine-grained SAND. 80.6' - 81' Little coarse- to fine-grained gravel.  84.2' Color grades to brownish yellow (10YR 6/8).  89' Color grades to yellowish red (5YR 4/6).  91.4' Color grades to dark reddish brown (5YR 3/4). 91.5' Color grades to yellowish red (5YR 4/6). 93.5' - 93.6' Little coarse- to fine-grained subrounded to rounded gravel. 94.4' - 95.1' Color grades to dark reddish brown (5YR 3/4).  96.9' - 99.3' Angular to subangular cobbles to coarse-gravel grains; iron deposits.  99.3' - 101.4' Color grades to brownish yellow (10YR 6/8); little coarse- to fine-grained gravel.		
95		10								
100										
105		10				ML SP		101.8' - 102' Pale yellow (2.5Y 8/2) fine-grained SANDY SILT. 102' - 104.8' Pale yellow (2.5Y 8/2) fine-grained SAND. 102.1' Color grades to yellow (10YR 7/8).		Columbia-Potomac Contact (101.8).
						ML SP		104.8' - 105.8' Very pale brown (10YR 8/4) fine-grained SANDY SILT; low plasticity. 104.9' Color grades to brownish yellow (10YR 6/8). 105.1' Color grades to very pale brown (10YR 8/4).		
						ML SP		105.8' - 108.8' Very pale brown (10YR 8/4) fine-grained SAND. 108.8' - 109' Very pale brown (10YR 8/4) fine-grained SANDY SILT; low plasticity.		
		10				ML SP		109' - 117.4' Brownish yellow (10YR 6/8) fine-grained SAND; trace medium-grained sand, silt. 113' Color grades to very pale brown (10YR 8/4). 117.4' - 117.9' Very pale brown (10YR 8/4) fine-grained SANDY SILT.		



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120						ML SP		117.9' - 118.8' Yellow (10YR 8/6) fine-grained SAND. 118.7' Color grades to yellow (10YR 7/8).		
		10				CL SP CL SP		118.8' - 119' Yellow (10YR 8/6) fine-grained SANDY SILT. 119' - 121.8' Brownish yellow (10YR 6/8) fine-grained SAND; trace medium-grained sand, silt. 121.8' - 121.9' Clay lense; medium plasticity.		
125						CL		121.9' - 122.2' Yellow (10YR 8/6) fine-grained SAND.		
						SM		122.2' - 123' Yellow (10YR 8/6) SILTY CLAY; some fine-grained sand.		
130						SP		123' - 127' Very pale brown (10YR 8/2) fine-grained SAND. 124.8' Color grades to yellow (10YR 7/6). 125.3' Color grades to very pale brown (10YR 7/3). 126' Color grades to white (10YR 8/1); little medium-grained sand. 126.8' - 126.9' Clay lense; high plasticity.		
135		10						127' - 129' White (10YR 8/1) CLAY; high plasticity. 129' - 131' Yellow (10YR 7/6) silty fine-grained SAND.		
140								131' - 155.3' Light gray (10YR 7/2) fine-grained SAND. 134.5' Color grades to yellow (10YR 7/8). 136.5' Color grades to very pale brown (10YR 8/2).		
145		10						146.5' Color grades to yellow (10YR 7/8). 146.8' Color grades to very pale brown (10YR 7/3). 148' Color grades to yellow (10YR 7/8).		
150										
155		10				CL		155.3' - 159' Very pale brown (10YR 8/2) CLAY; hard; plastic.		
160						SM		159' - 163.6' Very pale brown (10YR 8/2) SILTY fine-grained SAND.		





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205										
210		13						209.5' - 215' Glauconitic.		
215										
220										
225										
230										
235										
240										
245										