




















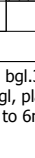













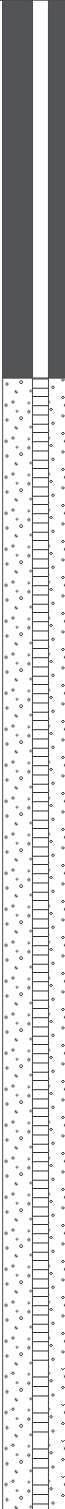


























<div></div> <div>Project: <b>Garth Works</b> Location: <b>Taffs Well</b> Client: <b>Transport For Wales</b></div>						Location Details						Status		Borehole Number					
						Easting: 312522.30    Northing: 183410.17 Level: 33.58mAOD    Depth: 25.20m Logger: NEB    Type: RC Inclination: 90°						FINAL		<b>BH101</b>					
						Sheet 1 of 3													
Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time						Scale: 1:50			
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV				
0.00	17.90	Cable Percussion Rotary Open Hole Rotary Core	Dando 2000 Berretta T44 Berretta T44	M. McAuley, N. Llewelyn R. Cowan, J. Davies R. Cowan, J. Davies	17.50	200	17.50	200	26/03	16:30	6.00	6.00	3.9	Approved By: CBP	Start Date: 26/03/2018 Finish Date: 26/03/2018				
17.90	22.70				25.20			27/03	16:30	15.45	15.00	6.5							
22.70								28/03	00:00	17.50	17.50	8.9							
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring							
												Depth (m)	Ref	Core Run	FI	TCR	SCR	RQD	Tests / Results
ASPHALT (MADE GROUND) CONCRETE (MADE GROUND) Black sandy sub-angular to angular fine to coarse, clinker, iron slag and ash GRAVEL (MADE GROUND) Soft brown silty slightly gravelly CLAY. Gravel is angular fine to medium iron slag. (MADE GROUND)								0.05	33.53			0.20 - 0.40	B1						
								0.20	33.38										
								0.60	32.98										
								0.50	0.50										
Firm brown mottled orange grey silty CLAY with brown concretions. (ALLUVIUM)  .....hydrocarbon odour from 2.00 to 6.00m bgl								1.10	32.48			1.20 - 1.60	UT6						
Soft grey silty CLAY with rare rounded sandstones cobbles. (ALLUVIUM)								2.80	30.78			3.20 - 3.65	D10						
Medium dense brown sandy sub-rounded to rounded fine to medium sandstone, mudstone and quartz GRAVEL. (RIVER TERRACE DEPOSITS) .....hydrocarbon odour from 4.00m to 7.20m bgl.								4.00	29.58			4.00 - 5.00	B14						
Medium dense brown silty sub-rounded to rounded fine to medium sandstone GRAVEL. (RIVER TERRACE DEPOSITS)								7.20	26.38			7.50 - 8.00	B16						
Soft becoming firm grey clayey SILT. (ALLUVIUM)								8.00	25.58			8.00 - 9.00	B17						
																			
																			
																			
Observations / Remarks  1. Inspection Pit hand excavated to 1.20m bgl prior to drilling.2. Groundwater strike at 4.00m bgl.3. Upon completion exploratory hole installed 50mm diameter slotted standpipe piezometer from 6.00 to 3.00m bgl, plain standpipe from 3.00m bgl to GL with flush cover and concrete surround. 4. Unusual Odours: Hydrocarbons from 2m to 6m. 5. * Denotes drillers description								Drilling Fluid						Hammer Information					
								From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %					
													AX3 AX7 AX3 AX9	68					
								Groundwater							Project Number				
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A107519													
4.00	-	4	20	2.40															

<div></div> <div>Project: <b>Garth Works</b></div> <div>Location: <b>Taffs Well</b></div> <div>Client: <b>Transport For Wales</b></div>						<div>Location Details</div> <div>Easting: 312522.30 Northing: 183410.17</div> <div>Level: 33.58mAOD Depth: 25.20m</div> <div>Logger: NEB Type: RC</div> <div>Inclination: 90°</div>						<div>Status</div> <div>FINAL</div>		<div>Borehole Number</div> <div>BH101</div>																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
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		Project: <b>Garth Works</b>		Location Details				Status		Borehole Number									
		Location: <b>Taffs Well</b>		Easting: 312522.30    Northing: 183410.17				FINAL		<b>BH101</b>									
		Client: <b>Transport For Wales</b>		Level: 33.58mAOD    Depth: 25.20m															
				Logger: NEB    Type: RC						Sheet 3 of 3									
				Inclination: 90°															
Method, Plant and Crew					Diameter		Casing		Drilling Progress by Time					Scale: 1:50					
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By:	PV				
0.00 17.90 22.70	17.90 22.70 25.20	Cable Percussion Rotary Open Hole Rotary Core	Dando 2000 Berretta T44 Berretta T44	M. McAuley, N. Llewelyn R. Cowan, J. Davies R. Cowan, J. Davies	17.50 25.20	200 150	17.50 22.70	200 150	26/03 27/03 28/03 11/04	16:30 16:30 00:00 00:00	6.00 15.45 17.50 25.20	6.00 15.00 17.50 25.20	3.9 6.5 8.9	Approved By:	CBP				
														Start Date:	26/03/2018				
														Finish Date:	26/03/2018				
Strata Description						Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples, Tests and Rotary Coring								
											Depth (m)	Ref	Core Run	FI	TCR	SCR	RQD	Tests / Results	
*SILT, CLAY, SAND* (ALLUVIUM)																SPT(C) 20.20m, 50 (5,7/50 for 250mm)	21		
*SAND GRAVEL* (RIVER TERRACE DEPOSITS)							21.70	11.88									SPT(C) 21.70m, 50 (3,12/50 for 200mm)	22	
*BROKEN LIMESTONE* (PEMBROKE LIMESTONE GROUP)							22.20	11.38											
Very strong grey/red fine grained thickly bedded dolomitised LIMESTONE with heavy mineral veining. Non-intact to closely spaced undulating, rough, open, clean, sub-vertical to vertical (60 to 90 degree) discontinuities (PEMBROKE LIMESTONE GROUP)							22.70	10.88			22.70	C28							
													22.70 23.20			92	0	0	23
													23.20 24.70			67	26	0	24
....possible mudstone bed weathered to clay from 24.60m to 24.70m bgl.													24.25	C29					
													24.70 25.20			80	0	0	25
EOH at 25.20m - Borehole drilled beyond scheduled depth of 15.0m bgl. Terminated due to time constraints.							25.20	8.38											
																			26
																			27
																			28
																			29
																			30
Observations / Remarks										Drilling Fluid				Hammer Information					
1. Inspection Pit hand excavated to 1.20m bgl prior to drilling.2. Groundwater strike at 4.00m bgl.3. Upon completion exploratory hole installed 50mm diameter slotted standpipe piezometer from 6.00 to 3.00m bgl, plain standpipe from 3.00m bgl to GL with flush cover and concrete surround. 4. Unusual Odours: Hydrocarbons from 2m to 6m. 5. * Denotes drillers description										From (m)	To (m)	Return Min %	Colour	Type	Serial No.	Energy Ratio %			
															AX3 AX7 AX3 AX9	68			
										Groundwater					Project Number				
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	A107519													

<div></div> <div><div>CENTRAL ALLIANCE</div><div>EXPLORE &gt; IDENTIFY &gt; DELIVER</div></div> <div><div>Alliance House, South Park Way Wakefield 41 Business Park Wakefield WF2 0XJ Tel +44(0)1924 229889 Web: www.central-alliance.co.uk</div></div>		<div>Log Type</div> <div><b>Cable Percussion</b></div> <div>Sheet 1 of 2</div>		<div>Exploratory Hole Number</div> <div><b>CPBH212</b></div> <div>FINAL</div>		<div></div> <div>CENTRAL ALLIANCE</div> <div>GEO</div>									
Project No: <b>4376</b>		Location Details:		Methodology & Plant			Scale: 1:50								
Name: <b>Taff's Well Depot</b>		Easting: <b>312497.33</b> Northing: <b>183310.85</b>		Depth (m) 0.00 - 1.20 1.20 - 13.75		Method Inspection Pit Cable Percussion		Plant Used Hand Tools Dando 2000		Checked By: <b>NH</b>					
Location: <b>Cardiff</b>		Elevation: <b>33.63mAOD</b> Final Depth: <b>13.75m</b>								Approved By: <b>RH</b>					
Client: <b>Amev</b>		Logged By: <b>NH</b> Grid System: <b>OSGB</b>								Start Date: <b>25/04/2019</b>					
		Orientation: <b>N/A</b> Inclination: <b>90°</b>								Finish Date: <b>30/04/2019</b>					
Strata Description		Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Chiselling (mins)	Water Added (Litres)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing				
											Depth (m)	Ref	Test Results		
MADE GROUND: TARMAC. [MADE GROUND]			(0.10)	33.53							0.20	1 B	PID 0.25m = 0.3ppm		
MADE GROUND: Brown slightly sandy angular to subangular fine to coarse roadstone GRAVEL. Sand is fine to coarse. [MADE GROUND]			0.10								0.25	1A ES			
			(0.25)	33.28							0.25	2 ES			
			0.35								0.40	2 D			
			(0.25)	33.03							0.40	3 D			
Possible MADE GROUND: Soft dark brown slightly gravelly slightly sandy CLAY. Gravel is angular fine to coarse roadstone and sandstone. Sand is fine to coarse. [MADE GROUND]			0.50								0.50	2A ES	PID 0.50m = 0.4ppm		
			0.50								0.50	3 B			
			0.50								0.50	4 ES			
			0.50								0.50	5 B			
			0.90								0.90	4 D			
1 Yellowish brown gravelly very clayey fine to coarse SAND. Gravel is subrounded to rounded fine to coarse sandstone. [ALLUVIUM]			0.90								0.90	6 D	PID 1.00m = 0.1ppm	1	
			1.00								1.00	5 B	SPT(S) 1.20m, N=28 (3,4/3,4,11,10)		
			1.00								1.00	5A ES			
			1.00								1.00	7 B			
			1.00								1.00	8 ES	PID 1.50m = 0.1ppm		
			1.20 - 1.65								1.20 - 1.65	10 B			
			1.20 - 1.65								1.20 - 1.65	6 D			
			1.20 - 1.65								1.20 - 1.65	7 B			
			1.20 - 1.65								1.20 - 1.65	9 D			
			1.50								1.50	11 ES			
			1.50								1.50	7A ES			
			2.00								2.00	12 D	SPT(C) 2.20m, N=50 (6,11/50 for 227mm)	2	
			2.00								2.00	8 D			
			2.20 - 2.65								2.20 - 2.65	10 B			
			2.20 - 2.65								2.20 - 2.65	13 B			
			3.00								3.00	11 D	SPT(C) 3.00m, 50 (5,5/50 for 185mm)	3	
3 From 3.00m to 3.45m becomes slightly clayey sandy gravel.			3.00								3.00 - 3.45	14 D			
			3.00 - 3.45								3.00 - 3.45	13 B			
			3.00 - 3.45								3.00 - 3.45	15 B			
			4.00								4.00	14 D	SPT(C) 4.00m, N=41 (3,4/5,10,10,16)	4	
			4.00								4.00	16 D			
4 From 4.00m with medium cobble content. Cobbles are subrounded sandstone.			4.00 - 4.45								4.00 - 4.45	16 B			
			4.00 - 4.45								4.00 - 4.45	17 B			
			5.00								5.00	17 D	SPT(C) 5.00m, N=50 (7,9/50 for 235mm)	5	
			5.00 - 5.45								5.00 - 5.45	19 B			
			6.00								6.00	20 D	SPT(C) 6.00m, N=25 (5,9/6,3,7,9)	6	
6 From 6.00m becomes greyish brown.			6.00 - 6.45								6.00 - 6.45	22 B			
			7.00								7.00	23 D			
			7.30 - 7.75								7.30 - 7.75	25 B	SPT(S) 7.30m, N=25 (2,3/6,6,6,7)		
			8.00								8.00	26 D			
			9.00								9.00	27 D	SPT(S) 9.00m, N=29 (2,4/5,6,8,10)	9	
			10.00								10.00	29 D			
			10.00								10.00	29 D			
			10.00								10.00	29 D			
			10.00								10.00	29 D			
			9.50	24.13	300						250				
			9.50								250				
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			9.50								250				
			9.50								250				
			9.50								250				
			9.50								250				
			9.50								250				
			9.50								250				
			9.50								250				
Medium dense to very dense greyish brown sandy subrounded to rounded fine to coarse sandstone GRAVEL with occasional sand lenses and low cobble content. Sand is fine to coarse.			9.50	24.13	300						250				
Continued on Next Page											10.00	29 D		10	
Observations / Remarks		Misc.	Shift Information				Backfill			Installations					
			Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam.
								0.00	2.50	Bentonite	Standpipe		2.50 - 12.50	12.50	50
								2.50	12.50	Gravel					
								12.50	13.75	Bentonite					
			Groundwater Strikes												
			Strike (m)		Rises To (m)		Time (min)		Remarks						
			4.00		4.00		20								



Sheet 2 of 2

FINAL



Client: Amey

Orientation: N/A      Inclination: 90°

Finish Date: 30/04/2019

### Samples & Testing

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20

EOH at 13.75m - Refusal

Installations

Groundwater Encountered  
Casing Used  
Monitoring Point/s Installed  
Hammer Ref & Energy Ratio (%)  
AR1324 (57%)

Resp. Zon	
-----------	--





Standpipe



























\_\_\_\_\_

(

Strike (m)	Rises To (m)
10	10
20	20
30	30
40	40
50	50
60	60
70	70
80	80
90	90
100	100
110	110
120	120
130	130
140	140
150	150
160	160
170	170
180	180
190	190
200	200
210	210
220	220
230	230
240	240
250	250
260	260
270	270
280	280
290	290
300	300
310	310
320	320
330	330
340	340
350	350
360	360
370	370
380	380
390	390
400	400
410	410
420	420
430	430
440	440
450	450
460	460
470	470
480	480
490	490
500	500
510	510
520	520
530	530
540	540
550	550
560	560
570	570
580	580
590	590
600	600
610	610
620	620
630	630
640	640
650	650
660	660
670	670
680	680
690	690
700	700
710	710
720	720
730	730
740	740
750	750
760	760
770	770
780	780
790	790
800	800
810	810
820	820
830	830
840	840
850	850
860	860
870	870
880	880
890	890
900	900
910	910
920	920
930	930
940	940
950	950
960	960
970	970
980	980
990	990
1000	1000

[illegible]

<div></div> <div><div>CENTRAL ALLIANCE</div><div>EXPLORE &gt; IDENTIFY &gt; DELIVER</div></div>		<div>Alliance House, South Park Way Wakefield 41 Business Park Wakefield WF2 0XJ Tel +44(0)1924 229889 Web: www.central-alliance.co.uk</div>		<div>Log Type</div> <div>Combined Borehole</div> <div>Sheet 1 of 3</div>		<div>Exploratory Hole Number</div> <div>RBBH202</div> <div>FINAL</div>		<div></div> <div>CENTRAL ALLIANCE</div> <div>GEO</div>							
Project No: 4376		Location Details				Methodology & Plant				Scale: 1:50					
Name: Taff's Well Depot		Easting: 312591.85		Northing: 183072.24		From (m)		Method		Plant Used		Checked By: NH			
Location: Cardiff		Elevation: 34.41mAOD		Final Depth: 21.00m		0.00 - 1.20 1.20 - 2.70 2.70 - 17.00 17.00 - 21.00		Inspection Pit Dynamic Sampling (Windowless) Rotary Open Holing Rotary Coring		Hand Tools Fraste PLG Fraste PLG Fraste PLG		Approved By: RH			
Client: Amey		Logged By: RJ+NE		Grid System: OSGB								Start Date: 29/05/2019			
		Orientation: N/A		Inclination: 90°								Finish Date: 03/06/2019			
Strata Description		Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Method	Coring		
MADE GROUND: Grey CONCRETE with 3cm rebar. [MADE GROUND]			(0.30)	34.11					Depth (m)	Ref	Test Results	WLS			
MADE GROUND: Black gravelly fine to coarse SAND. Gravel is angular to subangular fine to coarse brick, concrete, clinker and slag. [MADE GROUND]			0.30						1 D 2 ES 3 B 4 ES	PID 0.35m = 0.2ppm  PID 0.60m = 0.1ppm					
1			(1.60)						1.10 1.20 - 1.65	5 ES 6 D	PID 1.10m = 0.3ppm SPT(S) 1.20m, N=15 (3,3/4,4,3,4)				1
2			1.90	32.51					1.60 1.70	7 ES 8 D	PID 1.60m = 0.3ppm	WLS			
Possible MADE GROUND: Brown sandy subrounded to rounded fine to coarse GRAVEL of various lithologies. Sand is fine to coarse. [MADE GROUND]								1.90 2.00 - 2.45	9 D 10 D	SPT(S) 2.00m, N=23 (4,5/7,5,6,5)					
		(0.80)						2.40 2.50	11 D 12 ES	PID 2.50m = 0.5ppm					
3			2.70	31.71					2.70 - 3.15	13 D	SPT(S) 2.70m, N=27 (2,2/4,7,7,9)	RO			
SAND, GRAVEL and COBBLES (Driller's Description). [ALLUVIUM]															
4									4.10 - 4.60	14 D	SPT(S) 4.15m, N=29 (8,8/8,5,8,8)				4
5			(5.30)						5.15 - 5.60	15 D	SPT(S) 5.15m, N=34 (8,5/7,9,9,9)				5
6									6.50 - 6.95	16 D	SPT(S) 6.50m, N=34 (7,8/8,8,9,9)	RO			
8			8.00	26.41					8.00 - 8.45	17 D	SPT(S) 8.00m, N=48 (5,5/7,12,15,14)				8
9									9.50 - 9.95	18 D	SPT(S) 9.50m, N=44 (6,6/6,9,13,16)				9
10			(3.00)												10
Continued on Next Page															
Observations / Remarks		Misc.	Shift Information				Backfill			Installations					
		No Groundwater Encountered Casing Used Monitoring Point/s Installed	Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam
								0.00 0.30 7.50 12.00	0.30 7.50 12.00 21.00	Concrete Bentonite Gravel Bentonite	Standpipe		8.00 - 12.00	12.00	50
			Water Strikes												
			Strike (m)	Rises To (m)	Time (min)	Remarks									

<div></div> <div><div>CENTRAL ALLIANCE</div><div>EXPLORE &gt; IDENTIFY &gt; DELIVER</div></div> <div><div>Alliance House, South Park Way Wakefield WF2 0XJ Tel +44(0)1924 229889 Web: www.central-alliance.co.uk</div></div>		<div>Log Type</div> <div>Combined Borehole</div> <div>Sheet 2 of 3</div>		<div>Exploratory Hole Number</div> <div>RBBH202</div> <div>FINAL</div>		<div></div> <div>CENTRAL ALLIANCE</div> <div>GEO</div>												
Project No: 4376		Location Details				Methodology & Plant				Scale: 1:50								
Name: Taff's Well Depot		Easting: 312591.85		Northing: 183072.24		From (m)		Method		Plant Used		Checked By: NH						
Location: Cardiff		Elevation: 34.41mAOD		Final Depth: 21.00m								Approved By: RH						
Client: Amey		Logged By: RJ+NE		Grid System: OSGB								Start Date: 29/05/2019						
		Orientation: N/A		Inclination: 90°								Finish Date: 03/06/2019						
Strata Description		Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Method	Coring					
									Depth (m)	Ref	Test Results		Core Run	TCR	SCR	RQD	If	
SAND and GRAVEL (Driller's Description). [ALLUVIUM]																		
SAND, GRAVEL, COBBLES and CLAY (Driller's Description). [ALLUVIUM]			11.00	23.41		116 11.00			11.00 - 11.45	19 D	SPT(S) 11.00m, N=49 (6,7/9,10,14,16)						11	
			(1.50)														12	
SAND, GRAVEL and COBBLES (Driller's Description). [ALLUVIUM]			12.50	21.91					12.50 - 12.95	20 D	SPT(S) 12.50m, N=47 (7,7/10,11,13,13)						13	
			(1.50)														14	
SAND and GRAVEL (Driller's Description). [ALLUVIUM]			14.00	20.41					14.00 - 14.45	21 D	SPT(S) 14.00m, N=45 (6,9/9,11,11,14)						15	
			(1.50)														16	
SAND, GRAVEL and COBBLES (Driller's Description). [ALLUVIUM]			15.50	18.91					15.50	22 D	SPT(S) 15.50m, 50 (25 for 35mm/50 for 40mm)						17	
			(0.50)														18	
SAND and GRAVEL (Driller's Description). [ALLUVIUM]			16.00	18.41													19	
			(0.50)														20	
LIMESTONE (Driller's Description). [PEMBROKE LIMESTONE GROUP]			16.50	17.91													21	
			(0.50)														22	
Strong very thinly bedded to thickly laminated crystalline locally vuggy DOLOMITE. Discontinuities are closely spaced diagonal (45 degrees) planar rough with iron staining and some calcite infill. [PEMBROKE LIMESTONE GROUP] <i>From 17.00m to 17.10m recovered as subangular fine to coarse gravel.</i>			17.00	17.41													23	
																	24	
From 18.10m to 18.29m recovered as subangular fine to coarse dolomite and calcite gravel.																	25	
																	26	
From 18.60m to 18.70m with 1 no. discontinuity planar rough with iron staining.																	27	
																	28	
From 19.50m to 19.61m Assumed Zone of Core Loss.																	29	
																	30	
Continued on Next Page																	31	
Observations / Remarks		Misc.	Shift Information				Backfill			Installations								
			Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam			
								0.00 0.30 7.50 12.00	0.30 7.50 12.00 21.00	Concrete Bentonite Gravel Bentonite	Standpipe		8.00 - 12.00	12.00	50			
											Water Strikes							
											Strike (m)	Rises To (m)	Time (min)	Remarks				



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Log Type

**Combined  
Borehole**

Sheet 3 of 3

Exploratory Hole Number

# RBBH202

## FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376

Name: **Taff's Well Depot**

Location: **Cardiff**

Client: Amey

### Location Details

Easting: 312591.85

Northing: 183072.24

Elevation: 34.41mAOD

Final Depth: 21.00m

Logged By: RJ+NE

Grid System: **OSGB**

Orientation: N/A

Inclination:  $90^\circ$ 

## Methodology & Plant

From (m)

## Method

## Method

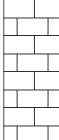
Scale: 1:50

Checked By: NH

Approved By: RH

Start Date: 29/05/2019

Finish Date: 03/06/2019

	Strata Description	Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Method	Coring					
									Depth (m)	Ref	Test Results		Core Run	TCR	SCR	RQD	If	
21	From 20.11m to 20.28m becomes black with frequent coral fossils.		21.00	13.41	116 21.00								19.50 21.00	93	93	69	>25	21
	14																	
	4																	
22	EOH at 21.00m - Rockhead																	22
23																		
24																		
25																		
26																		
27																		
28																		
29																		
30																		

Observations / Remarks	Misc.	Shift Information					Backfill		Installations					
	No Groundwater Encountered Casing Used Monitoring Point/s Installed	Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam
							0.00	0.30	Concrete	Standpipe		8.00 - 12.00	12.00	50
							0.30	7.50	Bentonite					
							7.50	12.00	Gravel					
							12.00	21.00	Bentonite					
		Water Strikes												
Strike (m)		Rises To (m)	Time (min)	Remarks										





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Log Type  
**Combined  
Borehole**

Sheet 1 of 2

Exploratory Hole Number

# RBBH203

## FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376

Name: **Taff's Well Depot**

Location: **Cardiff**

Client: Amey

### Location Details

Easting: **312584.15**

Northing: 183087.07

Logged By: TW+NH

Grid System: OSGB

Orientation: N/A

Inclination:  $90^\circ$ 

## Methodology & Plant

Inspection F

### Dynamic Sampling (Windowless)

Rotary Open Holing  
Dynamic Sampling

Rotary Open Holing

Hand Tools

Fraste PLG

Fraste PLG





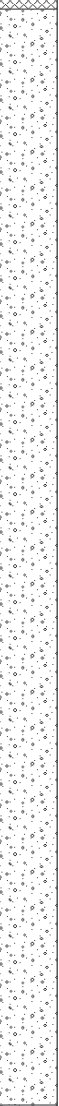
Fraste PLG

Scale: 1:50

Checked By: NH

Start Date: 04/04/2

Finish Date: 06/05/2019

Strata Description			Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Method	Coring												
										Depth (m)	Ref	Test Results		Core Run	TCR	SCR	RQD	If								
1	MADE GROUND: Light grey CONCRETE. [MADE GROUND]			(0.25)	34.02							0.30 0.40 0.50 - 1.00 0.60	1 D 2 ES 3 B 4 ES	PID 0.40m = 0.2ppm  PID 0.60m = 0.1ppm	B											
	MADE GROUND: Light red sandy angular fine to coarse brick and limestone GRAVEL. Sand is fine to coarse. [MADE GROUND]			0.25 (0.20)																	33.82					
	MADE GROUND: Light brown slightly silty gravelly fine to coarse SAND. Gravel is subrounded to rounded fine to coarse sandstone. [MADE GROUND]			0.45																						
				(0.90)	32.92 32.82																					
	MADE GROUND: Dark brown slightly gravelly slightly sandy silty CLAY. Gravel is angular to subrounded fine to medium slag and sandstone. Sand is fine to coarse. [MADE GROUND]			1.35 (0.10)		32.57																				
	Possible MADE GROUND: Soft to firm light brown slightly gravelly silty CLAY. Gravel is subangular to subrounded fine to coarse sandstone, slate and limestone. [MADE GROUND]			1.45 (0.25) 1.70																						
	Light brown slightly silty sandy subangular to rounded fine to coarse limestone, sandstone and slate GRAVEL with low cobble content Sand is fine to coarse. Cobbles are subrounded sandstone. [ALLUVIUM]													WLS												
	2																									
	3																									
4																										
5																										
6																										
7																										
8																										
9																										
10																										
Continued on Next Page																										

Observations / Remarks	Misc.	Shift Information					Backfill		Installations					
	<i>No Groundwater Encountered Casing Used Monitoring Point/s Installed</i>	Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam
							0.00	0.30	Concrete	Standpipe		10.00 - 13.00	13.00	50
							0.30	9.50	Bentonite					
							9.50	13.00	Gravel					
							13.00	19.00	Bentonite					
										Water Strikes				
										Strike (m)	Rises To (m)	Time (min)	Remarks	



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Log Type  
**Combined  
Borehole**

Sheet 2 of 2

Exploratory Hole Number

# RBBH203

## FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376

Name: **Taff's Well Depot**

Location: **Cardiff**

Client: Amey

### Location Details

Easting: 312584.15

Northings: **183087.07**

Elevation: 34.27mAO

Final Depth: 19.00m

Logged By: TW+NH

Grid System: **OSGB**

Orientation: N/A

Inclination:  $90^\circ$

Methodology &amp; Plant

From (m)

## Method

--	--

Scale: 1:50

Checked By: NH

Approved By: RH

Start Date: 04/04/2019

Finish Date: 06/05/2019

Strata Description						Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Coring									
													Depth (m)	Ref	Test Results	Method	Core Run	TCR	SCR	RQD	If				
COBBLES and GRAVEL (Driller's Description). [ALLUVIUM]							(3.60)						11.00 - 11.45	18 D	SPT(S) 11.50m, N=50 (7,9/11,15,15,9)	WLS							11		
Light brown slightly gravelly slightly silty fine to medium SAND. Gravel is subrounded fine to medium sandstone, limestone and mudstone. [ALLUVIUM]							13.00	21.27				13.00 - 13.45	19 D	SPT(S) 13.00m, N=18 (1,1/2,5,5,6)									12		
From 13.80m with dark brown coal bands and subangular fine coal gravel.												13.60	20 D										13		
From 14.14m to 14.23m becomes slightly clayey.							(2.70)						14.00 - 14.45 14.10	23 B 21 D										14	
													14.50 - 14.86	22 D	SPT(S) 14.50m, 50 (3,11/50 for 210mm)								15		
LIMESTONE (Driller's Description). [PEMBROKE LIMESTONE GROUP]							15.70 (0.30)	18.57								RO							16		
Strong light grey mottled reddish brown and orange crystalline locally vuggy DOLOMITE with frequent calcite veins. Discontinuities are medium spaced subhorizontal undulating rough with some calcite infill. [PEMBROKE LIMESTONE GROUP] From 16.11m to 16.23m recovered as subrounded to rounded fine to medium gravel.							16.00	18.27														1	NI		16
																									17
From 17.68m to 18.40 Assumed Zone of Core Loss.							(3.00)											16.00 17.50	100	89	80	4		17	
																								18	
From 18.40m becomes very strong and light grey.																		17.50 18.00	0	0	0			18	
																		18.00 18.50	20	20	20	NR		18	
																		18.50 19.00	86	86	46	8		19	
EOH at 19.00m - Rockhead							19.00	15.27	116 19.00															19	
																								20	
																								20	
Observations / Remarks						Misc.	Shift Information						Backfill			Installations									
No Groundwater Encountered Casing Used Monitoring Point/s Installed						Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam							
											0.00	0.30	Concrete	Standpipe		10.00 - 13.00	13.00	50							
											0.30	9.50	Bentonite												
											9.50	13.00	Gravel												
											13.00	19.00	Bentonite												
						Water Strikes																			
						Strike (m)	Rises To (m)	Time (min)	Remarks																



Sheet 1 of 1

FINAL



Client: Amey

Orientation: N/A      Inclination: 90°

Finish Date: 01/07/2019

--	--

*From 0.50m with brick and slag gravel*

EOH at 1.00m - Abandoned due to obstruction

10

Installations

Diam

**No Groundwater Encountered  
Hole Not Cased  
No Monitoring Point Installed  
Hammer Ref & Energy Ratio (%)**

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Colour



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Log Type  
**Combined  
Borehole**

Sheet 1 of 2

Exploratory Hole Number

# RBBH205

## FINAL



CENTRAL ALLIANCE  
**GEO**

[illegible]



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Log Type  
**Combined  
Borehole**

Sheet 2 of 2







Exploratory Hole Number

# RBBH205

# FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376		Location Details						Methodology & Plant			Scale: 1:50									
Name: Taff's Well Depot		Easting: 312574.07	Northing: 183100.27		From (m) 16.00 - 18.50		Method		Plant Used		Checked By: NH									
Location: Cardiff		Elevation: 34.21mAOD	Final Depth: 18.50m								Approved By: RH									
Client: Amey		Logged By: TW+NH	Grid System: OSGB								Start Date: 07/06/2019									
		Orientation: N/A	Inclination: 90°								Finish Date: 12/06/2019									
Strata Description		Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole ø (mm) Depth (m)	Casing ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Method	Coring							
									Depth (m)	Ref	Test Results		Core Run	TCR	SCR	RQD	If			
SAND (Driller's Description). [ALLUVIUM]			(3.50)									RO								
Sandy clayey SILT. (Driller's Description). [ALLUVIUM]			12.50 (0.95)	21.71							13.00 - 13.45	21 D	SPT(S) 13.00m, N=11 (1,0/1,2,4,4)							
No Recovery. Light brown slightly silty predominantly medium to coarse SAND. [ALLUVIUM]			13.45 (0.05)	20.76 20.71							13.60	22 D								
Dark brown mottled light brown slightly gravelly slightly silty predominantly medium to coarse SAND. Gravel is angular to subangular fine to medium coal. [ALLUVIUM]			13.92 (0.58)	20.29																
Dense brown SAND (Driller's Description). [ALLUVIUM]			14.50 (1.50)	19.71									SPT(S) 14.50m, N=50 (7,12/15,15,15,5)							
Very strong light grey and reddish brown crystalline DOLOMITE with frequent calcite veins. Discontinuities are closely spaced subhorizontal planar to undulating rough with occasional calcite infill. [PEMBROKE LIMESTONE GROUP] From 16.00m to 16.30m recovered as angular fine to coarse gravel.			16.00 (2.50)	18.21															NI	
From 17.50m to 17.89m Assumed Zone of Core Loss.																				
From 17.89m to 18.25m recovered as angular to subangular coarse gravel.																			NR	
EOH at 18.50m - Rockhead			18.50	15.71	140 18.50														NI	



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Log Type  
**Combined  
Borehole**

Sheet 1 of 3

Exploratory Hole Number

# RBBH206

## FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376

Name: **Taff's Well Depot**

Location: **Cardiff**

Client: Amey

### Location Details

Easting:

Elevation

Logged By:

## Orientat

Northings: 183262.36

Final Depth: **21.00m**

Grid System: **OSGB**

Inclination:  $90^\circ$

Methodology &amp; Plant

## Method

## Dynamic Sampling

Fräste PLG

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Plant Used

Fraste PLG

Rotary Open Ho

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Scale: 1:50

Checked By: NH

Approved By: PH

6/11/2019 10/06/2019

\_\_\_\_\_

Finish Date:	15/06/2015
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[illegible]

Observations / Remarks	Misc.	Shift Information					Backfill			Installations				
	No Groundwater Encountered Casing Used Monitoring Point/s Installed	Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam
							0.00	0.20	Grout	Standpipe	18.00 - 21.00	21.00	50	
							0.20	18.00	Bentonite					
							18.00	21.00	Gravel					
		Water Strikes												
		Strike (m)	Rises To (m)	Time (min)	Remarks									



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Log Type  
**Combined  
Borehole**

Sheet 2 of 3

Exploratory Hole Number

# RBBH206

## FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376

Name: **Taff's Well Depot**

Location: **Cardiff**

Client: Amey

### Location Details

Easting: 312553.95

Northings: 183262.36

Elevation: 33.73mAO

Final Depth: **21.00m**

Logged By: TW+MD

Grid System: **OSGB**

Orientation: N/A

Inclination: 90°

Methodology &amp; Plant

From (m)

## Method

Plant Used

Scale: 1:50

Checked By: NH

Approved By: RH

Start Date: 18/06/2019

Finish Date: 19/06/2019

[illegible]

Observations / Remarks	Misc.	Shift Information					Backfill			Installations				
	No Groundwater Encountered Casing Used Monitoring Point/s Installed	Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam
							0.00	0.20	Grout	Standpipe	18.00 - 21.00	21.00	50	
							0.20	18.00	Bentonite					
							18.00	21.00	Gravel					
		Water Strikes												
		Strike (m)	Rises To (m)	Time (min)	Remarks									



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Log Type  
**Combined  
Borehole**

Sheet 3 of 3

Exploratory Hole Number

# RBBH206

# FINAL



CENTRAL ALLIANCE  
**GEO**

Project No: 4376

Name: Taff's Well Depot

Location: **Cardiff**

Client: **Amey**

### Location Details

Easting: 312553.95

Northing: 183262.36

Elevation: **33.73mAOD**

Final Depth: **21.00m**

Logged By: TW+MD

Grid System: **OSGB**

Orientation: N/A

Inclination:  $90^\circ$ 

Methodology &amp; Plant

From (m)

## Method

Scale: 1:50

Checked By: NH

Approved By: RH

Start Date: 18/06/2019

Finish Date: 19/06/2019

Strata Description			Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Coring								
										Depth (m)	Ref	Test Results	Method	Core Run	TCR	SCR	RQD	If			
Strong white and dark red crystalline brecciated DOLOMITE with abundant calcite infill. [PEMBROKE LIMESTONE GROUP] <i>From 20.28m to 20.89m recovered as angular to subangular medium to coarse gravel.</i>				(1.12)										19.50	75	65	65	3			
														21.00						NI	1
EOH at 21.00m - Rockhead				21.00	12.73	140 21.00													21		
																			22		
																			23		
																			24		
																			25		
																			26		
																			27		
																			28		
																			29		
																			30		
Observations / Remarks			Misc.	Shift Information					Backfill			Installations									
No Groundwater Encountered Casing Used Monitoring Point/s Installed				Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam					
									0.00 0.20 18.00	0.20 18.00 21.00	Grout Bentonite Gravel	Standpipe		18.00 - 21.00	21.00	50					
			Water Strikes																		
			Strike (m)	Rises To (m)	Time (min)	Remarks															





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Log Type  
**Combined  
Borehole**

Sheet 1 of 2

Exploratory Hole Number





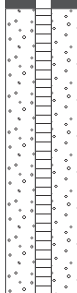
# RBBH209

# FINAL



CENTRAL ALLIANCE  
**GEO**

[illegible]

<div></div> <div><div>CENTRAL ALLIANCE</div><div>EXPLORE &gt; IDENTIFY &gt; DELIVER</div></div>		<div>Alliance House, South Park Way Wakefield 41 Business Park Wakefield WF2 0XJ Tel +44(0)1924 229889 Web: www.central-alliance.co.uk</div>		<div>Log Type</div> <div>Combined Borehole</div> <div>Sheet 2 of 2</div>		<div>Exploratory Hole Number</div> <div>RBBH209</div> <div>FINAL</div>		<div></div> <div>CENTRAL ALLIANCE</div> <div>GEO</div>										
<div>Project No: 4376</div> <div>Name: Taff's Well Depot</div> <div>Location: Cardiff</div> <div>Client: Amey</div>		<div>Location Details</div> <div><div>Easting: 312464.60</div><div>Elevation: 35.44mAOD</div><div>Logged By: MD+PD</div><div>Orientation: N/A</div><div>Northing: 183253.42</div><div>Final Depth: 15.00m</div><div>Grid System: OSGB</div><div>Inclination: 90°</div></div>				<div>Methodology &amp; Plant</div> <div><div>From (m)</div><div>Method</div><div>Plant Used</div></div>			<div>Scale: 1:50</div> <div>Checked By: NH</div> <div>Approved By: RH</div> <div>Start Date: 08/07/2019</div> <div>Finish Date: 09/07/2019</div>									
<div>Strata Description</div>		<div>Legend</div>	<div>Depth (m) (Stratum Thickness)</div>	<div>Reduced Level (mAOD)</div>	<div>Hole Ø (mm) Depth (m)</div>	<div>Casing Ø (mm) Depth (m)</div>	<div>Water Level (m)</div>	<div>Installation / Backfill</div>	<div>Samples &amp; Testing</div> <div><div>Depth (m)</div><div>Ref</div><div>Test Results</div></div>			<div>Method</div>	<div>Coring</div> <div><div>Core Run</div><div>TCR</div><div>SCR</div><div>RQD</div><div>If</div></div>					
<div>Greyish brown fine to coarse SAND/GRAVEL with COBBLES and occasional BOULDERS (Driller's Description). [ALLUVIUM]</div>		<div></div>	<div>(6.00)</div>					<div></div>	<div>SPT(S) 10.50m, N=42 (3,6/8,8,12,14)</div>									
<div>Assumed Zone of Core Loss.</div>			<div>14.00</div>	<div>21.44</div>		<div>140 14.00</div>		<div></div>	<div>SPT(S) 12.00m, 50 (25 for 125mm/50 for 190mm)</div>			<div>RC</div>	<div>14.00 15.00</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>NR</div>	
<div>EOH at 15.00m - Scheduled Depth</div>			<div>15.00</div>	<div>20.43</div>	<div>140 15.00</div>				<div>SPT(C) 13.50m, 50 (25 for 90mm/50 for 115mm)</div>									
<div>Observations / Remarks</div>		<div>Misc.</div>	<div>Shift Information</div> <div><div>Date</div><div>Time</div><div>Depth (m)</div><div>Casing (m)</div><div>Water (m)</div></div>				<div>Backfill</div> <div><div>From (m)</div><div>To (m)</div><div>Material</div></div>			<div>Installations</div> <div><div>Instrument Details</div><div>Resp. Zone</div><div>Depth (m)</div><div>Diam</div></div>								
<div>No Groundwater Encountered Casing Used Monitoring Point/s Installed</div>							<div>0.00 12.10 12.10 14.10 14.10 15.00</div>	<div>Bentonite Gravel Arisings</div>	<div>Standpipe</div>	<div>12.10 - 14.10</div>	<div>14.10</div>	<div>50</div>	<div>Water Strikes</div> <div><div>Strike (m)</div><div>Rises To (m)</div><div>Time (min)</div><div>Remarks</div></div>					

Project No: 4376		Location Details				Methodology & Plant				Scale: 1:50									
Name: Taff's Well Depot		Easting: 312433.63		Northing: 183284.53		From (m) 0.00 - 1.20 1.20 - 4.00 4.00 - 15.45		Method Inspection Pit Dynamic Sampling Rotary Open Holing		Plant Used Hand Tools Frate PLG Frate PLG		Checked By: NH							
Location: Cardiff		Elevation: 35.84mAOD		Final Depth: 15.45m								Approved By: RH							
Client: Amey		Logged By: TW+PD		Grid System: OSGB								Start Date: 02/07/2019							
		Orientation: N/A		Inclination: 90°								Finish Date: 04/07/2019							
	Strata Description		Legend	Depth (m) (Stratum Thickness)	Reduced Level (mAOD)	Hole Ø (mm) Depth (m)	Casing Ø (mm) Depth (m)	Water Level (m)	Installation / Backfill	Samples & Testing			Method	Coring					
										Depth (m)	Ref	Test Results		Core Run	TCR	SCR	RQD	IF	
	MADE GROUND: TARMAC. [MADE GROUND]			(0.20)										WLS					
	MADE GROUND: Reddish brown clayey very sandy angular to subangular fine to coarse limestone and rare brick GRAVEL. Sand is fine to coarse. [MADE GROUND]			0.20	35.64						0.20 - 0.40 0.30	1 B 2 ES	PID 0.20m = 0.5ppm						
1				(0.80)															
				1.00 (0.20)	34.84														1
	MADE GROUND: Dark brown clayey very sandy angular to subrounded fine to coarse brick, sandstone and limestone GRAVEL with low cobble content. Sand is fine to coarse. Cobbles are angular to subrounded brick, sandstone and limestone. [MADE GROUND]			1.20	34.64							1.00 - 1.20 1.10 1.20 - 1.65 1.20 - 2.00	5 B 6 ES 14 D 7 B	SPT(S) 1.20m, N=6 (1,2/1,1,2,2)					
2	MADE GROUND: Dark brown sandy very gravelly CLAY with low cobble content. Sand is fine to coarse. Gravel is angular to subrounded fine to coarse sandstone and limestone. Cobbles are subangular limestone and sandstone. [MADE GROUND]			(1.55)							1.90 2.00 - 2.45 2.00 - 2.75	8 ES 9 D 10 B	SPT(S) 2.00m, N=7 (1,1/2,1,3)					2	
				2.75	33.08														
3	Possible MADE GROUND: Firm yellowish brown slightly gravelly sandy CLAY. Sand is fine to coarse. Gravel is subrounded to rounded fine to medium sandstone. [MADE GROUND]			(1.25)								2.80 2.90 3.00 - 3.45	11 D 12 ES 15 D	SPT(S) 3.00m, N=8 (1,1/2,1,2,3)					3
											3.40	13 D							
4	Yellow/brown SAND/GRAVEL and COBBLES (Driller's Description). [ALLUVIUM]			4.00	31.84							4.00 - 4.45	16 D	SPT(S) 4.00m, N=38 (3,10/11,8,9,10)					4
				(1.30)															
5												5.00 - 5.45	17 D	SPT(S) 5.00m, N=22 (3,3/3,3,9,7)					5
	Greyish brown coarse SAND with GRAVEL and occasional COBBLES (Driller's Description). [ALLUVIUM]			5.30	30.54														
6													6.00 - 6.45	18 D	SPT(S) 6.00m, N=20 (4,3/3,5,6,6)				6
7																			7
												7.50 - 7.95	19 D	SPT(S) 7.50m, 50 (6,8/50 for 160mm)					
8																			8
9												9.00 - 9.45	20 D	SPT(S) 9.00m, N=31 (5,6/8,7,7,9)					9
10	Continued on Next Page											10.00 - 10.45	21 D						10
Observations / Remarks			Misc.	Shift Information				Backfill			Installations								
			No Groundwater Encountered Casing Used Monitoring Points Installed	Date	Time	Depth (m)	Casing (m)	Water (m)	From (m)	To (m)	Material	Instrument Details		Resp. Zone	Depth (m)	Diam			
									0.00 11.50 13.50	11.50 13.50 15.45	Bentonite Gravel Bentonite	Standpipe		11.50 - 13.50	13.50	50			
				Water Strikes															
				Strike (m)	Rises To (m)	Time (min)	Remarks												



Sheet 2 of 2

## FINAL



EOH at 15.45m - Scheduled Depth