

## Technical Note

### Requisite Surveillance

### Foundry Central West Teesworks

#### Introduction

Following pre-application advice from the Environment Agency (EA), Arcadis propose the following groundwater water monitoring strategy be conducted as requisite surveillance under a Deposit for Recovery (DfR) permit at the Foundry Central West (FCW) site.

Activities subject to the permit are set out in the following documents:

- Remediation Options Appraisal, Enabling Earthworks and Remediation Strategy [10047374-AUK-XX-XX-RP-ZZ-748-01-FCW\_ROA&S].
- Remediation Options Appraisal, Deposit for Recovery Permit at Foundry Central West [10047374-AUK-XX-XX-RP-ZZ-976-01-FCW\_DfR\_ROA]
- Earthworks Specification [10035117-AUK-XX-XX-RP-ZZ-907-03-FCW\_Earthworks]

The documents set out the proposals for the remediation and enabling earthworks required to construct a development platform at the Site.

#### Groundwater Monitoring

Groundwater monitoring will be carried out monthly by Arcadis as a requirement of the DfR permit, and will include recording of groundwater levels and the sampling of groundwater for analysis. Sampling will be undertaken in accordance with the Monitoring Plan, presented in 10047374-AUK-XX-XX-MS-YY-Y-1-Foundry Central West Monitoring and Maintenance Plan. Groundwater data has been collected to act as a baseline for the compliance monitoring points. Groundwater quality data has been collected at the Site since 2017 and a comprehensive database of groundwater quality has been developed

The groundwater monitoring programme will continue to be undertaken at the compliance monitoring points during the DfR activities, and for a period of three months following completion of the DfR activity. The groundwater quality data will be assessed following each monitoring visit over this period and the results of the measured concentrations of Groundwater Directive hazardous substances and non-hazardous pollutants will be compared against the Compliance Limits.

Following completion of the DfR activity and subsequent three months of post monthly monitoring, the results will be provided to the Environment Agency. At this point the work on site will be considered as being complete, and recommendations based on the outcome will be provided to the Environment Agency, to agree (if required), the groundwater monitoring including frequency and testing suite to be collected to inform a permit surrender application. Should the concentrations of Groundwater Directive hazardous substances and non-hazardous pollutants in the compliance monitoring boreholes be below the Compliance Limits, as a stable or falling trend, during the completion monitoring, then a Permit surrender application will be submitted.

#### Groundwater Monitoring Boreholes

The groundwater monitoring will be conducted at compliance monitoring points comprising groundwater monitoring wells, these are shown on Figure 10047374-AUK-XX-XX-DR-ZZ-1036-02-FCW\_Permit GW\_Loc included in Appendix A. Borehole logs for the monitoring wells are presented in Appendix B which screen the underlying Secondary (A) Aquifer comprising Tidal Flat Deposits (TFD).

The monitoring well network will be maintained in accordance with the Maintenance Plan, presented in

10047374-AUK-XX-XX-MS-YY-Y-1-Foundry Central West Monitoring and Maintenance Plan.

The following monitoring wells are located down hydraulic gradient of the permit boundary FOU-AUK-BH101, A-BH18D, A-BH35S, and B-BH26S, and will be subject to Compliance Limits. Three further boreholes FOU-AUK-BH102, FOU-AUK-BH103, and FOU-AUK-BH104 are located at the upgradient site boundary. These will not be subject to Compliance Limits, but will be used to assess incoming groundwater quality.

### **Compliance Limits**

Compliance Limits are set for each individual monitoring well down gradient of the permit boundary FOU-AUK-BH101, A-BH18D, A-BH25S, and B-BH26S.

Derivation of groundwater compliance limits is presented in this memo for the following two down gradient monitoring wells:

- A-BH26S
- A-BH35S

Two further downgradient monitoring wells, FOU-AUK-BH101S and A-BH18D, are pending additional groundwater monitoring. Groundwater compliance limits will be set for these two wells once sufficient data is available.

Groundwater compliance limits have been set for the six hazardous and three non-hazardous pollutants identified and assessed in the Hydrogeological Risk Assessment (10047374-AUK-XX-XX-RP-ZZ-815-02-Foundry Central West HRA) as priority substances.

Groundwater monitoring data from the baseline period, prior to commencement of permitted works, has been used to inform determination of criteria.

Graphs presenting groundwater concentrations over the period of June 2023 to July 2024 are presented as Appendix C. The data has been assessed to remove data points deemed unrepresentative, and to select the most accurate data where data from multiple test methods may be available. Comments on the dataset are provided in the table below.

Based on the graphs, compliance limits have been defined based on a mean value plus three standard deviations over the period of June 2023 to July 2024. These criteria are presented on the graphs in Appendix C.

Where a substance was reported <MDL over the baseline period, MRV have been set as compliance limits for hazardous substances. For non-hazardous substances reported <MDL over the baseline period, WQS have been set as compliance limits.

In addition, where the criteria calculated based on mean plus three standard deviations is less than the MRV or WQS, the MRV or WQS have been set as compliance limits.

The Compliance Limits are presented in Table 1. Further details on the derivation, including calculation of simple descriptive statistics, are presented as Appendix D.

**Table 1**

**Groundwater Quality Compliance Limits and Controls**

<b>Criterion Objective</b>			
To confirm that during DfR activities the input of Groundwater Directive hazardous substances to groundwater is prevented and the input of non-hazardous pollutants is limited.			
<b>Measurement</b>	<ul style="list-style-type: none"> <li>• Arsenic (hazardous)</li> <li>• Hexavalent Chromium (hazardous)</li> <li>• Lead (hazardous)</li> <li>• Mercury (hazardous)</li> <li>• Benzo(a)pyrene (hazardous)</li> <li>• Naphthalene (non-hazardous)</li> <li>• Benzene (hazardous)</li> <li>• Ammoniacal Nitrogen (non-hazardous)</li> <li>• Total Cyanide (non-hazardous)</li> </ul>		
<b>Monitoring points the subject of compliance</b>	Groundwater monitoring wells FOU-AUK-BH101, A-BH18D, A-BH25S, and B-BH26S down hydraulic gradient of the permit boundary.		
<b>Compliance limits for down hydraulic gradient groundwater monitoring boreholes</b>	<b>Substance</b>	<b>A-BH26S</b>	<b>B-BH35S</b>
	Arsenic	22.6µg/l	11.8µg/l
	Hexavalent Chromium	1µg/l*	1µg/l*
	Lead	0.34µg/l	0.401µg/l
	Mercury	0.02µg/l	0.053µg/l
	Benzo(a)pyrene	0.02µg/l	0.02µg/l
	Naphthalene	2µg/l	2µg/l
	Benzene	0.2µg/l*	0.2µg/l*
	Ammoniacal Nitrogen	2.65mg/l	6.04mg/l
Total Cyanide	50µg/l	50µg/l	
<b>Assessment test</b>	Concentrations exceed the Control Levels on three consecutive occasions.		
<b>Contingency Action</b>			<b>Response Time</b>
Repeat the sampling and testing			Weeks 1-4
Laboratory analysis			Weeks 4-6
Undertake investigation work to identify trends, statistical variations and outlier			Weeks 6-8

datasets	
Report to the Environment Agency on the appraisal of risks	Weeks 8-10
If the groundwater quality is acceptable to re-evaluate the assessment criteria	Week 12
If the groundwater quality is unacceptable implement agreed corrective measure	Week 12

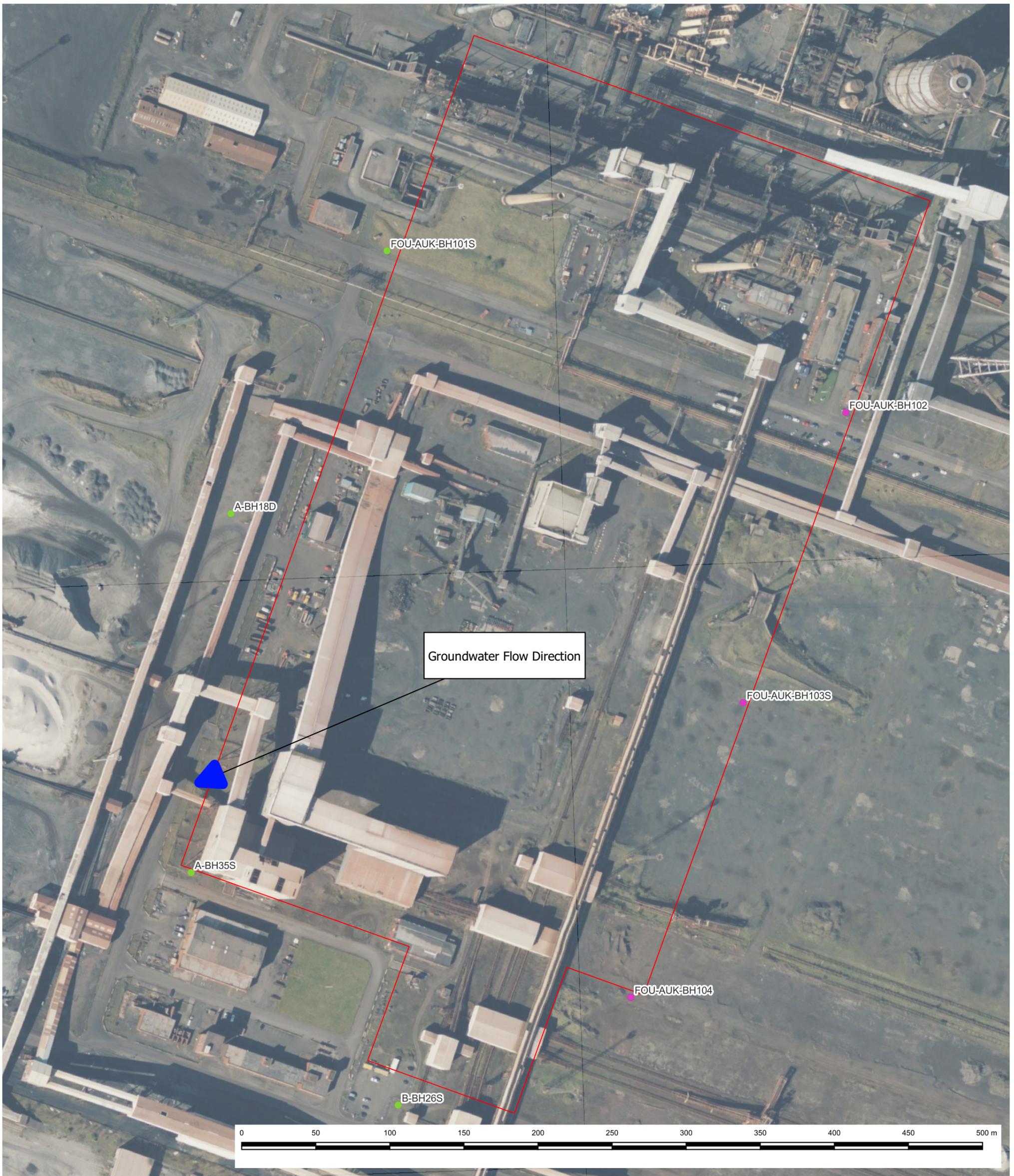
**Notes**

\*Preliminary pending confirmation from additional round of analysis.

A process flow diagram of contingency actions is presented as Appendix E.

**Appendix A**

10047374-AUK-XX-XX-DR-ZZ-1036-02-FCW\_Permit GW\_Loc



### Legend

#### Monitoring Purpos

- Permit Compliance
- Up Hydraulic Gradient Surveillance

#### Base Maps

Bing

#### Redline

— Permit

#### Notes:

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CONTACT ARCADIS IN CASE OF ANY QUERIES.

**Title: Permit Monitoring Locations**

**Site: Teesworks - Foundry Central West**

**Client:**  
South Tees Development Corporation

**Project:**  
10047374

**Date:** 23/01/2025  
**Drawn By:** JALM  
**DRG No:** 10047374-AUK-XX-XX-DR-ZZ-1036-02-FCW\_Permit GW\_Loc



**Appendix B**  
Monitoring Well Borehole Logs

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	
	<b>Co-ordinates:</b> E: 455802.102 N: 525505.716	<b>Ground Level (m):</b> 6.877 AOD
		<b>Date Started:</b> 31/07/2023 <b>Date Completed:</b> 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
0.00-0.16	1 B					MADE GROUND: Dark brown slightly sandy gravelly SILT with low cobble content. Cobbles are subangular of slag. Gravel is subangular to rounded fine to coarse of slag. Sand is fine to medium <b>(MADE GROUND)</b>				
0.35	2 ES	PID = 0.9ppm				From 0.20m to 3.00m bgl: No recovery due to suspected wash out of material.			(0.76)	
0.50	3 ES	PID = 0.9ppm								
0.60-0.70	4 D									
0.80-1.50	5 B					MADE GROUND: Light grey slightly sandy silty subangular to subrounded fine to coarse GRAVEL with medium cobble content. Cobbles are subangular of slag. Sand is fine to coarse NB: Sulphurous odour present <b>(MADE GROUND)</b>	6.12		0.76	
1.10	6 ES	PID = 0.6ppm								
1.20-1.30	7 D					From 1.10m bgl: Cobble content becomes low.				
1.50-1.90	8 B	SPT(C) N=28 3.7/ 8.8,6.6 PID = 0.8ppm				From 1.50m to 1.95m bgl: Becomes reddish brown.				
1.60										
1.70-1.80	9 D					At 1.70m bgl: Subangular cobble of slag present.			(1.97)	
1.70-1.80										
2.00-2.40	10 B					From 1.95m to 2.46m bgl: Becomes light grey with abundant white specks.				
2.10	11 ES	PID = 0.8ppm								
2.20-2.30	12 D					At 2.26m bgl: Subangular cobble of slag present.				
2.20-2.30										
2.50-2.70	13 B					From 2.46m to 2.73m bgl: Becomes greyish brown.				
2.50-2.70										
2.75-3.00	14 B						4.15		2.73	
2.75-3.00									(0.27)	
2.90	15 ES	PID = 0.8ppm				MADE GROUND: Reddish brown sandy silty subangular to rounded fine to coarse GRAVEL of slag, mudstone and sandstone with low cobble content. Cobbles are subangular of slag. Sand is fine to coarse <b>(MADE GROUND)</b>				
2.90							3.88		3.00	

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
		Insp. Pit	0.02	01-08-2023	09:30	0.00	0.00		1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.76m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.
				01-08-2023	10:00	0.20	0.00		

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G1.GPJ || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	
	<b>Co-ordinates:</b> E: 455802.102 N: 525505.716	<b>Ground Level (m):</b> 6.877 AOD
		<b>Date Started:</b> 31/07/2023 <b>Date Completed:</b> 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
3.00-3.25	16 B	SPT(C) N=49				MADE GROUND: Light brown gravelly silty fine to coarse SAND with frequent shell fragments and occasional clay lenses. Gravel is subrounded to rounded fine to coarse of mudstone and sandstone <b>(MADE GROUND)</b>	3.60	[Cross-hatch pattern]	(0.28)	[Scale]
3.05	17 ES	6, 12/ 11, 12, 14, 12 PID = 0.6ppm								
3.30	18 ES					MADE GROUND: Soft reddish brown gravelly slightly sandy silty CLAY with frequent shell fragments and with low cobble content. Cobbles are subangular of slag. Gravel is subangular to subrounded fine to coarse of slag sandstone and mudstone. Sand is fine to coarse NB: Sulphurous odour noted <b>(MADE GROUND)</b>	3.60	[Cross-hatch pattern]	3.28	[Scale]
3.40-4.00	19 B									
3.50	20 ES	PID = 0.4ppm				MADE GROUND: Dark greyish brown slightly sandy silty angular to subrounded fine to coarse GRAVEL of slag and mudstone with medium cobble content. Cobbles are subangular of slag. Sand is fine to medium NB: Sulphurous odour noted <b>(MADE GROUND)</b>	2.38	[Cross-hatch pattern]	4.50	[Scale]
3.70-3.80	21 D									
4.00-4.50	22 B					From 4.45m bgl: Subangular cobble of slag present. MADE GROUND: Dark greyish brown slightly sandy silty angular to subrounded fine to coarse GRAVEL of slag and mudstone with medium cobble content. Cobbles are subangular of slag. Sand is fine to medium NB: Sulphurous odour noted <b>(MADE GROUND)</b>	2.38	[Cross-hatch pattern]	(0.83)	[Scale]
4.20-4.30	23 D									
4.45	24 ES	PID = 0.4ppm				From 4.50m to 4.86m bgl: Becomes slightly gravelly. Gravel is rounded coarse of mudstone and possible limestone.	1.55	[Cross-hatch pattern]	5.33	[Scale]
4.50-5.30	25 B	SPT(C) N>50 7, 12 / 50 for 62mm								
5.10	26 ES	PID = 0.6ppm				From 5.22m to 5.33m bgl: Becomes sandy. Sand is fine to medium. Very dense light brown fine to coarse SAND with frequent shell fragments and black specks of possible organic matter NB: Organic odour noted <b>(TIDAL FLAT DEPOSITS)</b>	1.55	[Dotted pattern]		[Scale]
5.20-5.30	27 D									
5.40-6.00	28 B					From 5.56m to 5.67m bgl: Band of shell fragments present. From 5.67m to 6.00m bgl: Becomes light yellowish brown with occasional black specks of possible organic matter.	1.55	[Dotted pattern]		[Scale]
5.50	29 ES	PID = 0.6ppm								
5.80	30 ES	PID = 0.5ppm								
5.90-6.00	31 D									

Water Strikes		Hole Diameter		Progress				Remarks			
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)			
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.		

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation		<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire		
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
<b>Co-ordinates:</b> E: 455802.102 N: 525505.716		<b>Ground Level (m):</b> 6.877 AOD	<b>Date Started:</b> 31/07/2023  <b>Date Completed:</b> 07/08/2023

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
6.00-6.60 6.00	32 B 33 SS	SPT(S) N>50 12,13 / 38,12 for 22mm				From 6.00m bgl: Sand becomes fine to medium. Odour no longer noted.				
6.50-6.60	34 D					From 6.44m to 6.49m bgl: Band of shell fragments present.				
6.60-7.00	35 B									
6.80		PID = 0.6ppm								
7.00-7.50 7.00-7.10	36 B 37 D									
7.50-7.80 7.50	38 B 39 SS	SPT(S) N>50 6,19 for 73mm / 26,24 for 22mm				From 7.50m to 7.88m bgl: Becomes slightly gravelly. Gravel is subangular to rounded fine to medium of sandstone and mudstone.				
7.60	40 ES	PID = 0.1ppm								
7.70-7.80	41 D									
7.90-8.50	42 B					From 7.88m to 9.51m bgl: Sand becomes fine to medium.				
8.20-8.30	43 D									
8.50-9.00	44 B									
8.70-8.80	45 D									

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.



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Borehole No. A-BH18

Sheet: 4 of 14

Equipment & Methods: 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	Project Name: Foundry Central Exploratory Ground Investigation		Job No: 60701533
	Project Location: Redcar, North Yorkshire		
	Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
Co-ordinates: E: 455802.102 N: 525505.716		Ground Level (m): 6.877 AOD	Date Started: 31/07/2023 Date Completed: 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
9.00- 10.50 9.00	46 B 47 SS	SPT(S) N>50 4,12 / 20,25,5 for 13mm								
9.75- 9.85	48 D									
10.50- 12.00 10.50	49 B 50 SS	SPT(S) N>50 10,13 / 21,25,4 for 10mm								
11.25- 11.35	51 D									
At 10.79m bgl: Band of subangular to subrounded fine gravel of mudstone with frequent shell fragments present.										

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G1.GPJ || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

Water Strikes		Hole Diameter		Progress				Remarks		
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)		
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: ES Checked By: EW AGS Status: DRAFT



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Borehole No. A-BH18

Sheet: 5 of 14

Equipment & Methods: 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	Project Name: Foundry Central Exploratory Ground Investigation		Job No: 60701533
	Project Location: Redcar, North Yorkshire		
Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited			
Co-ordinates: E: 455802.102 N: 525505.716		Ground Level (m): 6.877 AOD	Date Started: 31/07/2023 Date Completed: 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
12.00- 13.50 12.00	52 B 53 SS	SPT(S) N>50 3,6 / 11,20,19 for 61mm								
12.60	54 ES	PID = 0.1ppm								
12.75- 12.85	55 D								(15.24)	
13.50- 15.00 13.50	56 B 57 SS	SPT(S) N>50 3,7 / 12,20,18 for 67mm								
14.25- 14.35	58 D					From 14.17m to 14.54m bgl: Becomes gravelly. Gravel is subangular to subrounded fine of mudstone with frequent shell fragments present.				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
				01-08-2023	17:00	15.00	15.00	3.23	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.
				02-08-2023	08:00	15.00	15.00	4.63	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: ES Checked By: EW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. A-BH18

Sheet: 6 of 14

Equipment & Methods: 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	Project Name: Foundry Central Exploratory Ground Investigation		Job No: 60701533
	Project Location: Redcar, North Yorkshire		
	Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
Co-ordinates: E: 455802.102 N: 525505.716		Ground Level (m): 6.877 AOD	Date Started: 31/07/2023 Date Completed: 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
15.00- 16.50 15.00	59 B 60 SS	SPT(S) N=49 4,8/ 9,11,14,15								
15.75- 15.85	61 D					From 15.91m to 16.24m bgl: Becomes slightly gravelly with frequent shell fragments. Gravel is angular to subrounded fine of mudstone.				
16.50- 18.00 16.50	62 B 63 SS	SPT(S) N>50 4,6 / 10,10,16,14 for 60mm				From 16.24m bgl: Occasional shells present.				
17.25- 17.35	64 D					From 17.15m to 17.39m bgl: Becomes slightly gravelly coarse sand with abundant shells and shell fragments. Gravel is subangular to subrounded fine to medium of mudstone and possible sandstone.				
17.60	65 ES	PID = 0.1ppm								

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: ES Checked By: EW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.GPU || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455802.102 N: 525505.716
		<b>Date Started:</b> 31/07/2023 <b>Date Completed:</b> 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
18.00- 19.50 18.00	66 B 67 SS	SPT(S) N=32 3,3/ 4,6,10,12				From 18.00m bgl: Becomes dense.  From 18.16m bgl: With frequent black specks of possible carbonaceous material and occasional shell fragments. Odour no longer present.				
18.75- 18.85	68 D									
19.50	69 SS	SPT(S) N=27 1,1/ 3,5,8,11				From 19.50m to 20.50m bgl: Core run reduced to 1.00m due to poor sample retention within the core barrel.				
19.80- 20.50	70 B									
20.00- 20.10	71 D									
20.80	72 ES	PID = 0.1ppm				From 20.50m to 21.00m bgl: Core run reduced to 0.50m due to poor sample retention within the core barrel.  Soft locally firm reddish brown gravelly CLAY. Gravel is subangular to subrounded fine to medium of sandstone, limestone and mudstone <b>(GLACIAL TILL)</b>	-13.69		20.57	

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455802.102 N: 525505.716
		<b>Date Started:</b> 31/07/2023 <b>Date Completed:</b> 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
21.00- 21.50 21.00	73 B 74 SS	SPT(S) N=29 0.2/ 2,3,9,15							(0.99)	
21.20- 21.30	75 D									
21.60- 22.00	76 B					Firm reddish brown slightly gravelly CLAY with occasional possible carbonaceous material and medium cobble content. Cobbles are subangular to subrounded of mudstone and possible limestone. Gravel is angular to subrounded fine to coarse of mudstone and sandstone <b>(GLACIAL TILL)</b>	-14.68		21.56	
22.00- 22.50	77 B					From 22.08m to 22.50m bgl: Bands of weak bluish grey mudstone present with white mineralisation present.			(1.00)	
22.45	78 ES	PID = 0.1ppm				From 22.41m to 22.50m bgl: Bands of extremely weak bluish grey mudstone present.	-15.68		22.56	
22.76- 22.86	79 C			CLAY	22.50-24.00	Medium strong thinly laminated reddish brown mottled grey MUDSTONE. Fracture set 1: Subvertical very closely spaced undulating rough moderately wide and infilled with white mineralization (possible gypsum). Fracture set 2: 30 to 45 degrees extremely closely spaced undulating stepped moderately wide infilled with white mineralization (possible gypsum). Fracture set 3: Very closely spaced, 10 degrees, undulating rough, open and infilled with clay <b>(MERCIA MUDSTONE GROUP)</b>				
22.95		PID = 0.3ppm		NI		From 22.86m to 22.98m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.				
				16		From 22.98m to 23.35m bgl: Becomes weak bluish grey.				
23.48- 23.60	80 C			NI		From 23.35m to 23.40m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.				
23.70- 24.00	81 C			0		From 23.48m bgl: Becomes extremely strong. Fracture set 3 no longer present.				
				NI		From 23.67m to 23.70m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.				
				0		From 23.70m bgl: Becomes weak.				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
		178	22.50	02-08-2023	14:30	22.50	22.50	4.71	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.
				03-08-2023	08:00	22.50	22.50	7.26	

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455802.102 N: 525505.716
		<b>Date Started:</b> 31/07/2023 <b>Date Completed:</b> 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
27.00		SPT(C) N>100 9,16 for 52mm / 29,37,34 for 25mm		NI	27.00- 28.50	From 27.00m to 27.15m bgl: Zone of non-intact due to SPT (C) test disturbance. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 27.15m bgl: Fracture set 4 becomes very closely to extremely closely spaced.  At 27.49m bgl: Fracture set 4 becomes locally undulating stepped.  From 27.57m to 27.71m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 27.92m to 27.95m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 28.32m to 28.36m bgl: Zone of non-intact possibly drilling induced. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 28.82m to 29.39m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 29.59m to 29.63m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 29.63m to 29.91m bgl: Fracture set 4 and 5 become clean of infill.				
				39						
27.65		PID = 0.3ppm	100 72 0	NI						
				43						
				NI						
				30						
				NI						
				25	28.50- 30.00					
				NI						
29.00		PID = 0.5ppm	94 43 0	NI						
				60						
				NI						
				57						
				NR						

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.GPU || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. A-BH18

Sheet: 11 of 14

Equipment & Methods: 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	Project Name: Foundry Central Exploratory Ground Investigation		Job No: 60701533
	Project Location: Redcar, North Yorkshire		
	Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
Co-ordinates: E: 455802.102 N: 525505.716		Ground Level (m): 6.877 AOD	Date Started: 31/07/2023 Date Completed: 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument									
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run														
30.00	PID = 0.5ppm	SPT(C) N>100 18,7 for 12mm / 22,18,30,30 for 32mm	100 39 0	NI	30.00- 31.50	From 29.91m to 30.00m bgl: No recovery due to suspected wash out of material.													
						From 30.00m to 30.22m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.													
						From 30.28m to 30.52m bgl: Zone of non-intact possibly due to weakness and fracturing. Becomes light grey. Recovered as light grey slightly clayey angular to subangular fine to medium gravel of mudstone.													
30.40						From 30.66m to 30.71m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.													
						From 30.83m to 31.04m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.													
						From 31.34m to 31.50m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.													
						From 31.50m to 31.67m bgl: No recovery due to suspected wash out of material.													
						From 31.67m to 32.17m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.													
32.00						PID = 0.2ppm					89 34 0	NI	31.50- 33.00	From 32.19m bgl: Fracture set 4 becomes extremely closely spaced.					
														From 32.25m to 32.42m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.					
														From 32.33m bgl: Becomes light grey.					
														From 32.70m to 32.75m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.					
														From 32.87m to 32.92m bgl: Zone of non-intact possibly due					

Water Strikes		Hole Diameter		Progress				Remarks
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)
				03-08-2023	17:00	33.00	33.00	3.62
				04-08-2023	08:00	33.00	33.00	7.86

1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire.  
2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling.  
3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl.  
4. Topography: Level Ground.  
5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water.  
6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl.  
7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: ES Checked By: EW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.L.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. A-BH18

Sheet: 12 of 14

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	
	<b>Co-ordinates:</b> E: 455802.102 N: 525505.716	<b>Ground Level (m):</b> 6.877 AOD
		<b>Date Started:</b> 31/07/2023 <b>Date Completed:</b> 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
33.00	87 D	SPT(C) N>100 8,12 / 21,35,44 for 52mm  PID = 0.6ppm	90 62 0	NR	33.00-34.50	to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.				
33.15						NI	From 33.00m to 33.11m bgl: No recovery due to suspected wash out of material.			
						24	From 33.11m to 33.21m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.			
						NI				
						0				
						NI	At 33.29m bgl: Fracture set 4 becomes undulating stepped clean.			
						61	From 33.38m to 33.43m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
33.82- 33.92						NI	From 33.48m to 33.51m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
						36	From 33.51m to 33.82m bgl: Fracture set 4 becomes infilled with clay and fine gravel of mudstone. Fracture set 5 becomes clean of infill.			
						NI	At 33.74m bgl: Fracture set 5 extremely close here.			
						29	From 33.82m to 33.92m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as very clayey angular to subangular fine to medium gravel of mudstone.			
						NR				
						13	From 34.20m to 34.24m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
	82 33 0	PID = 0.9ppm		NR	34.50-36.00	From 34.38m to 34.42m bgl: No recovery due to suspected wash out of material.				
						NI	From 34.50m to 34.77m bgl: No recovery due to suspected wash out of material.			
						23	From 34.77m to 34.92m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.			
						NI				
						44	From 35.05m to 35.11m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
						NI	From 35.20m to 35.26m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
						50	From 35.26m to 35.41m bgl: Becomes very weak.			
						NI	From 35.41m to 35.47m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
35.60						36	From 35.53m to 35.63m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.			
						NI				
	48	From 35.77m to 35.79m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey								

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: ES Checked By: EW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.GPU || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. A-BH18

Sheet: 13 of 14

Equipment & Methods: 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	Project Name: Foundry Central Exploratory Ground Investigation		Job No: 60701533
	Project Location: Redcar, North Yorkshire		
	Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
Co-ordinates: E: 455802.102 N: 525505.716		Ground Level (m): 6.877 AOD	Date Started: 31/07/2023 Date Completed: 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
36.00		SPT(C) N>100 25 for 35mm / 100 for 62mm		NI	36.00-37.50	angular to subangular fine to medium gravel of mudstone.  From 35.79m to 36.00m bgl: Fracture set 5 becomes very closely spaced.				
				57		From 35.93m to 36.00m bgl: Fracture set 4 becomes extremely closely spaced.				
				NR						
				75		From 36.00m to 36.21m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.				
36.50		PID = 2.9ppm		NI		From 36.21m to 36.48m bgl: Becomes very weak.				
				73		From 36.28m to 36.32m bgl: No recovery due to suspected wash out of material.				
			97 56 0	NI		From 36.32m to 36.69m bgl: Fracture sets 4 and 5 become extremely closely spaced and clean of infill.				
				45		From 36.48m to 36.54m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.				
				NI		From 36.69m to 36.93m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.				
				47		From 36.75m bgl: Fracture set 4 becomes extremely closely spaced.				
				NI		From 36.75m to 36.82m bgl: Becomes weak and interbedded with grey mudstone.				
37.55		PID = 2.8ppm		NI	37.50-39.00	From 36.93m to 36.97m bgl: Becomes very weak.				
				40		From 36.97m bgl: Becomes extremely weak.				
				NI						
37.76- 37.83	88 C			52		From 37.15m to 37.21m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.				
				52		From 37.31m bgl: Becomes very weak.				
				NI		From 37.40m to 37.57m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.				
			100 68 0	43		From 37.46m bgl: Becomes extremely weak.				
				NI		From 37.57m to 37.67m bgl: Becomes moderately strong light bluish grey interbedded with dark bluish grey mudstone. Occasional veins present. Veins are subhorizontal closely spaced undulating smooth moderately wide infilled with white mineralization (possible gypsum). Fracture set 4 becomes planar smooth partly open clean of infill.				
				66		From 37.67m to 37.71m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.				
				22		From 37.71m to 38.04m bgl: Becomes moderately strong light bluish grey interbedded with dark bluish grey mudstone. Occasional veins present. Veins are subhorizontal closely spaced undulating smooth moderately wide infilled with white mineralization (possible gypsum). Fracture set 4 becomes				
							-32.12		39.00	

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
				04-08-2023	12:00	39.00	39.00	4.22	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.
				07-08-2023	10:00	39.00	39.00	6.60	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: ES Checked By: EW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.GPU || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 22.50 Sonic Drilling Hammer ID: (GS0002) 22.50 - 40.00 Rotary Drilling Hammer ID: (GS0002)	Project Name: Foundry Central Exploratory Ground Investigation	Job No: 60701533
	Project Location: Redcar, North Yorkshire Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	Co-ordinates: E: 455802.102 N: 525505.716
		Date Started: 31/07/2023 Date Completed: 07/08/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
39.00		SPT(C) N>100 14.11 for 47mm / 55.45 for 18mm			39.00-40.00	planar smooth partly open clean of infill.  From 38.04m to 38.12m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.  From 38.09m to 38.26m bgl: Becomes moderately strong and reddish brown mottled grey interbedded with grey mudstone.  From 38.26m to 38.38m bgl: Zone of non-intact possibly drilling induced. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 38.38m bgl: Becomes very weak reddish brown. Fracture set 4 becomes extremely to very closely spaced and clean of infill.  From 38.88m to 39.00m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as angular to subangular fine to medium gravel of mudstone.				
39.20- 39.30	89 D			NI						
39.50		PID = 0.5ppm	100 62 0						(1.00)	
39.79- 39.85	90 C			70						
				NI						
				56						
				NI						
						Moderately weak thinly laminated light bluish grey mottled red MUDSTONE with rare veins infilled with white mineralization. Fracture set 6: Subvertical extremely close spaced planar smooth open clean. Fracture set 7: Subhorizontal very closely spaced planar smooth open clean <b>(MERCIA MUDSTONE GROUP)</b>  From 39.00m to 39.36m bgl: Zone of non-intact due to SPT (C) test disturbance. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  From 39.00m to 39.61m bgl: Becomes extremely weak.  From 39.38m to 39.58m bgl: Zone of non-intact possibly due to weakness and fracturing. Recovered as slightly clayey angular to subangular fine to medium gravel of mudstone.  At 39.65m bgl: Fracture set one becomes planar smooth open and infilled with white mineralization (possible gypsum).  At 39.81m bgl: Fracture set one becomes planar smooth moderately wide and infilled with white mineralization (possible gypsum).  At 39.84m bgl: Fracture set one becomes planar smooth open and infilled with white mineralization (possible gypsum).  From 39.85m to 39.90m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.  From 39.99m to 40.01m bgl: Zone of non-intact possibly drilling induced. Recovered as angular to subangular fine to medium gravel of mudstone.				
						End of Borehole 40.00 m (Thickness of basal layer not proven)				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
		146	40.00	07-08-2023	16:15	40.00	40.00		1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 22.50m bgl and completed via Rotary coring to 40.00m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 3.00m bgl and 3.28m to 5.33m bgl. Sulphurous odour noted from 0.78m to 2.73m bgl and 3.28m to 5.33m bgl. 7. 35mm diameter standpipe installed to 4.00m bgl and 50mm diameter standpipe installed to 19.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G1.GPJ || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited
	<b>Co-ordinates:</b> E: 455767.037 N: 525264.537	<b>Ground Level (m):</b> 6.807 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
0.00-0.30	1 B					MADE GROUND: Dark reddish brown gravelly silty fine to coarse SAND with occasional rootlets. Gravel is angular to subangular fine to coarse of limestone, igneous rock, brick and slag <b>(MADE GROUND)</b>			(0.35)	
0.30-0.80	2 D 3 ES 4 B	PID = 0.3ppm				MADE GROUND: Black sandy angular to subangular fine to coarse GRAVEL of limestone, brick and slag with medium cobble content. Cobbles are angular of brick and slag. Sand is fine to coarse <b>(MADE GROUND)</b>	6.46		0.35	
0.80-1.50	5 D 6 ES	PID = 0.3ppm				MADE GROUND: Dark grey gravelly silty fine to coarse SAND with medium cobble content. Cobbles are angular of slag. Gravel is angular to subangular fine to coarse of limestone and slag <b>(MADE GROUND)</b>	6.01		0.80	
1.50-1.93	7 B 8 D 9 ES	PID = 0.8ppm				MADE GROUND: Light yellowish brown slightly gravelly fine to coarse SAND with low cobble content, occasional shell fragments and occasional pockets of stiff gravelly clay. Cobbles are angular of slag. Gravel is angular to subangular fine to coarse of limestone and slag <b>(MADE GROUND)</b>			(1.13)	
1.93-3.00	10 B 11 B 12 ES	PID = 0.3ppm SPT(C) N=40 7,10/ 12,12,9,7				MADE GROUND: Light yellowish brown slightly gravelly fine to coarse SAND with low cobble content, occasional shell fragments and occasional pockets of stiff gravelly clay. Cobbles are angular of slag. Gravel is angular to subangular fine to coarse of limestone and slag <b>(MADE GROUND)</b>	4.88		1.93	
2.00-2.50	13 D	PID = 0.2ppm								
2.70	14 ES	PID = 0.2ppm								

From 2.90m to 3.10m bgl: Becomes gravelly. Gravel is

Water Strikes		Hole Diameter		Progress			Remarks		
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
		Insp.Pit	0.35	21-03-2023	08:30	0.35			1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation		<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire		
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
<b>Co-ordinates:</b> E: 455767.037 N: 525264.537		<b>Ground Level (m):</b> 6.807 AOD	<b>Date Started:</b> 21/03/2023 <b>Date Completed:</b> 24/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
3.00-3.70	15 B	PID = 0.3ppm				angular to subangular fine to coarse of limestone and slag.		(2.57)		
3.00	16 ES	SPT(S) N=34								
3.10	17 SS 18 ES	4,6/ 6,8,9,11 PID = 0.2ppm								
3.50		PID = 0.2ppm								
3.70-4.50	19 B									
4.00	20 ES	PID = 0.1ppm								
4.40	21 D									
4.50-5.63	22 B 23 SS	PID = 0.4ppm SPT(S) N=14 4,4/ 3,3,3,5				MADE GROUND: Soft black very sandy silty CLAY with occasional pockets of organic material. Sand is fine to coarse (MADE GROUND)	2.31	4.50		
4.50										
4.70	24 D									
5.00	25 ES	PID = 0.4ppm						(1.13)		
5.50		PID = 0.4ppm				From 5.42m bgl: Becomes slightly sandy. Sand is fine to coarse.				
5.90	26 D					Dense dark brown fine to coarse SAND with occasional pockets of organic material and occasional shell fragments and rare rounded fine to medium gravel of coal and mudstone (TIDAL FLAT DEPOSITS)	1.18	5.63		
						From 5.90m bgl: Becomes light yellowish brown.				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. A-BH35

Sheet: 3 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation  <b>Project Location:</b> Redcar, North Yorkshire  <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Job No:</b> 60701533
	<b>Co-ordinates:</b> E: 455767.037 N: 525264.537	<b>Ground Level (m):</b> 6.807 AOD

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
6.00-6.80 6.00	27 B 28 ES 29 SS	PID = 0.7ppm SPT(S) N=49 1.4/ 9,14,18,8				From 6.00m to 7.04m bgl: Becomes mottled dark grey.				
6.50		PID = 0.4ppm								
6.80-7.50 6.80	30 B 31 D									
7.50-8.20 7.50	32 B 33 SS	PID = 0.3ppm SPT(S) N=43 1.3/ 5,9,11,18				From 8.53m bgl: Becomes mottled dark grey.  From 8.53m to 9.00m bgl: Slight organic odour noted.				
8.20-9.00 8.20	34 B 35 D									
8.50		PID = 0.2ppm								

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: BG/NS Checked By: JW AGS Status: DRAFT



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Borehole No. A-BH35

Sheet: 4 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation  <b>Project Location:</b> Redcar, North Yorkshire  <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Job No:</b> 60701533
	<b>Co-ordinates:</b> E: 455767.037 N: 525264.537	<b>Ground Level (m):</b> 6.807 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
9.00	36 SS	SPT(S) N=38 1.1/ 3.5, 10, 20				From 9.00m to 10.50m bgl: Zone of no recovery caused by sample washout due to the addition of flush to advance casing.				
10.50-11.20 10.50	37 B 38 SS	PID = 0.5ppm SPT(S) N>50 12, 12 / 13, 15, 18, 4 for 10mm				From 10.50m bgl: Becomes locally very dense.  From 10.50m to 10.67m bgl: Band of coarse sand present.			(8.79)	
11.00	39 ES	PID = 0.2ppm								
11.20-12.00 11.20	40 B 41 D									
11.50		PID = 0.4ppm				From 11.81m to 12.00m bgl: Band of coarse sand present.				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: BG/NS Checked By: JW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation		<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire		
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
<b>Co-ordinates:</b> E: 455767.037 N: 525264.537		<b>Ground Level (m):</b> 6.807 AOD	<b>Date Started:</b> 21/03/2023  <b>Date Completed:</b> 24/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
15.50	50 C	PID = 0.0ppm	100 80 56	NI	15.00-16.50	Very weak red mottled bluish grey thinly laminated fractured MUDSTONE. Fracture set 1: Very closely to medium spaced, 15 to 25 degrees, undulating smooth, tight to partly open and clean or infilled with white crystalline material (possible quartz) and red silt. Fracture set 2: Closely spaced, 50 to 70 degrees, planar rough, closed to partly open and clean or infilled with red silt. Mottling caused by redox weathering ( <b>MERCIA MUDSTONE GROUP</b> )  From 15.00m to 15.17m bgl: Zone of non-intact probably due to weathering.  From 15.44m to 15.53m bgl: Zone of non-intact probably due to weathering.  From 15.93m to 15.97m bgl: Zone of non-intact probably due to weathering.				
				0						
				NI						
				7						
16.09- 16.22	50 C	PID = 0.0ppm	100 13 0	NI	16.50-18.00	From 16.50m to 16.58m bgl: Zone of non-intact probably due to weathering.  From 16.77m to 19.60m bgl: Zone of non-intact probably due to weathering.				
				6						
				5						
16.50	51 ES	PID = 0.0ppm	100 13 0	NI	16.50-18.00	From 16.50m to 16.58m bgl: Zone of non-intact probably due to weathering.  From 16.77m to 19.60m bgl: Zone of non-intact probably due to weathering.				
				6						
17.30	51 ES	PID = 0.0ppm	100 13 0	NI	16.50-18.00	From 16.50m to 16.58m bgl: Zone of non-intact probably due to weathering.  From 16.77m to 19.60m bgl: Zone of non-intact probably due to weathering.				
				6						
17.50	51 ES	PID = 0.0ppm	100 13 0	NI	16.50-18.00	From 16.50m to 16.58m bgl: Zone of non-intact probably due to weathering.  From 16.77m to 19.60m bgl: Zone of non-intact probably due to weathering.				
				6						

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455767.037 N: 525264.537
		<b>Date Started:</b> 21/03/2023 <b>Date Completed:</b> 24/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
18.00		SPT(C) N>100 18,7 for 5mm / 100 for 50mm		NI	18.00-19.50	From 18.00m to 19.50m bgl: 33% recovery due to washout of material.				
		PID = 0.0ppm	33 0 0							
19.00						From 19.60m to 19.75m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.				
		PID = 0.0ppm		CLAY						
19.50		SPT(C) N>100 15,10 for 25mm / 56,44 for 20mm		NI	19.50-21.00	From 19.75m to 19.99m bgl: Zone of non-intact probably due to weathering.				
				CLAY						
20.00				CLAY		From 19.99m to 20.00m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
		PID = 0.0ppm	100 16 0	CLAY						
				CLAY		From 20.06m to 20.13m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
				CLAY						
				CLAY		From 20.20m to 20.36m bgl: Zone of non-intact probably due to weathering.				
				CLAY						
				CLAY		From 20.42m to 20.44m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
				CLAY						
				CLAY		From 20.49m to 21.00m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.				
				CLAY						

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.G.P.U || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. A-BH35

Sheet: 8 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation <b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Job No:</b> 60701533	
	<b>Co-ordinates:</b> E: 455767.037 N: 525264.537	<b>Ground Level (m):</b> 6.807 AOD	<b>Date Started:</b> 21/03/2023 <b>Date Completed:</b> 24/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
21.00		PID = 0.0ppm SPT(C) N>100 3,18 / 74,26 for 20mm			21.00-22.50	From 21.00m to 21.30m bgl: Recovered as firm reddish brown slightly gravelly slightly sandy clay. Gravel is subangular fine to medium of very weak weathered mudstone. Sand is fine to coarse .				
21.30- 21.42	52 C			0		From 21.41m to 21.56m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.				
				CLAY						
				8						
			100			From 21.69m to 21.71 bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
			41							
			33			From 21.86m to 21.88m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
22.00	53 ES	PID = 0.0ppm				From 21.88m to 21.99m bgl: Zone of non-intact probably due to weathering.				
				0						
				CLAY						
				NI		From 22.13m to 22.19m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.				
22.29- 22.39	54 C			0						
				NI		From 22.19m to 22.29m bgl: Zone of non-intact probably due to weathering.				
				0						
				CLAY		From 22.24m bgl: Becomes light bluish grey and heavily oxidised with areas of high porosity, possibly due to mineral washout.				
				0						
				CLAY		From 22.39m to 22.57m bgl: Zone of non-intact probably due to weathering.				
				0						
				CLAY		From 22.64m to 22.82m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.				
23.00		PID = 0.0ppm								
				0						
				CLAY		From 22.96m to 23.04m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
				0						
				CLAY		From 23.12m to 23.19m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
23.33- 23.54	55 C		100							
			42							
			32							
				0						
				CLAY		From 23.32m to 23.33m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.				
				0						
				NI		From 23.54m to 24.00m bgl: Zone of non-intact probably due to weathering.				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
				22-03-2023	17:00	22.50	22.50	2.60	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.09m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.
				23-03-2023	08:15	22.50	22.50	4.10	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: BG/NS Checked By: JW AGS Status: DRAFT

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Borehole No. A-BH35

Sheet: 9 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation		<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire		
	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited		
<b>Co-ordinates:</b> E: 455767.037 N: 525264.537		<b>Ground Level (m):</b> 6.807 AOD	<b>Date Started:</b> 21/03/2023  <b>Date Completed:</b> 24/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument		
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run							
24.00	56 C	PID = 0.0ppm SPT(C) N>100 18,7 for 5mm / 47,53 for 55mm	100 57 36	CLAY	24.00-25.50	From 24.00m to 24.22m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.						
				7			From 24.36m to 24.42m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.					
				CLAY			From 24.42m to 24.75m bgl: Zone of non-intact probably due to weathering.					
				NI								
				5	PID = 0.0ppm							
				CLAY								
				6					From 25.32m to 25.34m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak mudstone.			
				CLAY								
				5					From 25.50m to 25.70m bgl: Recovered as firm reddish brown slightly gravelly slightly sandy clay. Gravel is subangular fine to medium of very weak weathered mudstone. Sand is fine to coarse			
				CLAY								
	NI					From 25.70m to 25.94m bgl: Recovered as firm reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.						
	CLAY											
	NI					From 25.94m to 26.20m bgl: Zone of non-intact probably due to weathering.						
	CLAY											
	NI					From 26.20m to 26.27m bgl: Band of soft reddish brown gravelly clay. Gravel is subangular fine to medium of very weak weathered mudstone.						
	CLAY											
	NI					From 26.27m to 26.68m bgl: Zone of non-intact probably due to weathering.						
	CLAY											
	6											
	CLAY											
	NI					From 26.85m to 27.21m bgl: Zone of non-intact probably due to weathering.						

Water Strikes		Hole Diameter		Progress			Remarks		
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.

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Borehole No. A-BH35

Sheet: 11 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.35 Insulated Hand Tools 0.35 - 15.00 Sonic Drilling (Hammer ID: GS00007) 15.00 - 30.00 Rotary Drilling (Hammer ID: GS00007) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00007)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation  <b>Project Location:</b> Redcar, North Yorkshire  <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Job No:</b> 60701533
	<b>Co-ordinates:</b> E: 455767.037 N: 525264.537	<b>Ground Level (m):</b> 6.807 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
30.00		PID = 0.0ppm SPT(C) N>100 25 for 70mm / 100 for 20mm				NO RECOVERY - zone of SPT (C) test	-23.28		(0.09) 30.09	
<b>End of Borehole 30.09 m</b> (Thickness of basal layer not proven)										

Water Strikes		Hole Diameter		Progress				Remarks		
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)		
		50	30.09	23-03-2023	17:00	30.09	30.00	2.60	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, refused at 0.35m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 15.00m bgl and completed via Rotary coring to 30.09m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Water strikes masked due to the addition of drilling water. 6. Slag encountered in material recovered from ground level to 4.50m bgl. No olfactory evidence of contamination encountered. 7. 35mm diameter standpipe installed to 13.00m bgl and 50mm diameter standpipe installed to 28.00m bgl upon completion.	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: BG/NS Checked By: JW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
0.00-0.25	1 B					MADE GROUND: Black mottled dark reddish brown gravelly silty fine to coarse SAND with abundant ash frequent rootlets and occasional fragments of metal and ceramic. Gravel is angular to subrounded fine to coarse of slag brick chert sandstone and limestone <b>(MADE GROUND)</b>	6.48	[Cross-hatch pattern]	(0.43)	[Vertical line]
0.20	2 ES	PID = 3.9ppm								
0.30	3 D					MADE GROUND: Dark brown mottled grey very sandy angular to subrounded fine to coarse GRAVEL of slag. Sand is fine to coarse <b>(MADE GROUND)</b>	6.04	[Cross-hatch pattern]	(0.44)	[Vertical line]
0.43-0.87	4 B	PID = 0.6ppm								
0.87-1.50	7 B					MADE GROUND: Dark reddish brown mottled grey gravelly fine to coarse SAND with medium cobble content. Cobbles are subangular to subrounded of brick and slag. Gravel is angular to subrounded fine to coarse of brick slag concrete chert and limestone <b>(MADE GROUND)</b>	5.41	[Cross-hatch pattern]	(0.63)	[Vertical line]
1.00	8 D 9 ES	PID = 0.5ppm								
1.50-3.00	10 B 11 SS	PID = 0.4ppm SPT(C) N=10 2,2/ 2,2,3,3				MADE GROUND: Dark grey angular to subangular fine to coarse GRAVEL of slag and concrete with medium cobble content and occasional fragments of metal. Cobbles are angular of slag <b>(MADE GROUND)</b>  From 1.50m to 3.00m bgl: Slight sulphurous odour. Too coarse for ES sample.	5.41	[Cross-hatch pattern]	(1.82)	[Vertical line]
1.50										
2.00	12 D	PID = 0.6ppm				From 2.86m bgl: Becomes slightly sandy. Sand is fine to coarse.	5.41	[Cross-hatch pattern]	(1.82)	[Vertical line]
2.50		PID = 0.9ppm								

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
		Insp.Pit	0.25	17-03-2023	09:00	0.20			1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.

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<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire  <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781
		<b>Date Started:</b> 17/03/2023  <b>Date Completed:</b> 23/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
3.00-3.32 3.00	13 B 14 D 15 ES	PID = 0.8ppm SPT(C) N=50 5,14/ 16,20,10,4								
3.40	16 ES	PID = 0.4ppm				MADE GROUND: Firm dark brown mottled red and light brown slightly sandy slightly gravelly CLAY with medium cobble content and rare shell fragments. Cobbles are subangular of slag. Gravel is subangular to subrounded fine to coarse of slag brick chert sandstone limestone and mudstone. Sand is fine to coarse <b>(MADE GROUND)</b>	3.59		3.32	
3.50	17 D	PID = 0.4ppm							(0.39)	
3.71-4.50	18 B					MADE GROUND: Dark yellowish brown slightly gravelly fine to coarse SAND with occasional shell fragments occasional pockets of organic material and frequent pockets of firm dark brown clay. Gravel is subangular to rounded fine to coarse of mudstone limestone chert and sandstone <b>(MADE GROUND)</b>	3.20		3.71	
4.00	19 D 20 ES	PID = 0.3ppm							(0.79)	
4.50-5.74 4.50	21 B 22 SS	PID = 0.2ppm SPT(S) N=17 2,3/ 6,3,4,4				MADE GROUND: Soft dark brown mottled grey slightly gravelly sandy CLAY with occasional relict rootlets frequent bands of black specks and frequent shell fragments. Gravel is subangular to subrounded fine to coarse of limestone chert mudstone and sandstone. Sand is fine to coarse <b>(MADE GROUND)</b>	2.41		4.50	
5.00	23 ES	PID = 0.6ppm				From 4.20m bgl: Becomes mottled grey. Pockets of clay no longer present.				
5.50	24 D	PID = 1.0ppm				From 4.80m to 6.00m bgl: Slight organic odour present.			(1.24)	
5.80	25 ES	PID = 0.6ppm				From 5.37m to 5.74m bgl: Becomes grey mottled brown and black. Becomes slightly sandy.				
5.90	26 D					Very dense locally medium dense dark yellowish brown mottled grey and black slightly gravelly fine to coarse SAND with frequent shell fragments and frequent pockets of black organic material. Gravel is subangular to rounded fine to coarse of mudstone sandstone limestone and quartz	1.17		5.74	

Water Strikes		Hole Diameter		Progress				Remarks				
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)				
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.			

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781
		<b>Date Started:</b> 17/03/2023 <b>Date Completed:</b> 23/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
6.00 - 6.70 6.00	27 B 28 SS	PID = 0.6ppm SPT(S) N>50 2,5 / 11,14,25 for 75mm				<b>(TIDAL FLAT DEPOSITS)</b>  From 6.21m bgl: No longer mottled black. Gravel becomes rare.				
6.50		PID = 0.2ppm								
6.70 - 7.50 6.70	29 B 30 D									
7.00		PID = 0.2ppm								
7.50 - 8.20	31 B	PID = 0.0ppm SPT(S) N=15 1,1/ 2,3,4,6							(3.77)	
8.00		PID = 0.1ppm								
8.20 - 9.00 8.20	32 B 33 D									
8.50		PID = 0.0ppm								

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
				17-03-2023	12:00	9.00	9.00	2.10	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.
				20-03-2023	09:15	9.00	9.00	4.80	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: NS Checked By: JW AGS Status: DRAFT

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<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	Project Name: Foundry Central Exploratory Ground Investigation Project Location: Redcar, North Yorkshire Client: bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	Job No: 60701533
	Co-ordinates: E: 455901.227 N: 525102.781	Ground Level (m): 6.907 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/Instrument		
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run							
9.00-9.51 9.00	34 B 35 SS	PID = 0.0ppm SPT(S) N>50 2,3 / 10,11,21,8 for 5mm				From 9.00m to 9.51m bgl: Becomes very gravelly.						
9.51-10.50 9.80	36 B 37 ES	PID = 0.0ppm PID = 0.0ppm				Very stiff dark brown mottled grey slightly sandy slightly gravelly SILT. Gravel is angular to subangular fine to medium of mudstone. Sand is fine to medium <b>(REDCAR MUDSTONE FORMATION)</b>	-2.60		9.51			
10.00-10.50 10.50	38 D	PID = 0.0ppm PID = 0.0ppm							(1.08)			
			CLAY		10.50-12.00	Reddish brown angular to subangular fine to coarse gravel of extremely weak mudstone with frequent bands of firm clay <b>(REDCAR MUDSTONE FORMATION)</b>	-3.68		10.59			
			NI			From 10.68m to 10.74m bgl: Band of firm reddish brown mottled grey slightly gravelly clay present. Gravel is angular to subangular fine to medium of mudstone						
			CLAY			From 10.68m to 10.74m bgl: Band of firm reddish brown mottled grey slightly gravelly clay present. Gravel is angular to subangular fine to medium of mudstone						
11.07-11.18 11.07	39 ES	PID = 0.0ppm				From 11.07m to 11.18m bgl: Band of firm reddish brown mottled grey slightly gravelly clay present. Gravel is angular to subangular fine to medium of mudstone.			(0.99)			
			NI									
			CLAY									
			NI									
			0			Extremely weak fractured thinly laminated reddish brown MUDSTONE with frequent 1-2cm bands of weak grey mudstone. Fracture set 1: Subvertical to 70 degrees closely spaced undulating rough to smooth very tight clean. Fracture set 2: 10-25 degrees very close to closely spaced undulating smooth very tight clean <b>(REDCAR MUDSTONE FORMATION)</b>	-4.67		11.58			

Water Strikes		Hole Diameter		Progress				Remarks			
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)			
		178	10.50						1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.		

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
12.00		PID = 0.0ppm		NI	12.00-13.30	From 12.00m to 12.36m bgl: Zone of non-intact due to drilling techniques.			(1.46)	
				12		From 12.36m to 13.04m bgl: Abundant drilling induced fractures.				
			100 53 0	NI		From 12.69m to 12.85m bgl: Zone of non-intact due to fragility of rock.				
13.00		PID = 0.0ppm		6		Weak grey fractured thinly laminated MUDSTONE. Fracture set 1: Subhorizontal closely spaced undulating smooth partly open infilled with grey silt <b>(REDCAR MUDSTONE FORMATION)</b>	-6.13		13.04	
				NI						
				NR	13.30-15.00	From 13.21m to 13.30m bgl: Zone of non-intact due to fragility of rock.			(1.00)	
				5		From 13.60m to 13.98m bgl: Abundant drilling induced fractures.				
13.80	40 ES	PID = 0.0ppm		NI		From 13.98m to 14.07m bgl: Zone of non-intact due to fragility of rock.	-7.13		14.04	
14.00		PID = 0.0ppm		6						
			82 74 32			Medium strong dark grey thinly to thickly laminated fractured MUDSTONE with occasional bands of fossilised shells and shell fragments. Fracture set 1: Subhorizontal to 20 degrees closely to medium spaced undulating smooth closed to partly open clean or infilled with grey gravelly clay. Gravel is angular to subrounded fine to medium of mudstone <b>(REDCAR MUDSTONE FORMATION)</b>				
14.51- 14.62	41 C									
14.76- 14.91	42 C									
				CLAY						

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
				20-03-2023	15:00	13.50	13.50	2.10	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.
				21-03-2023	07:45	13.50	13.50	3.40	

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G:G:PU || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument	
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run						
15.00		PID = 0.0ppm	100 69 0	0	15.00-16.50	From 14.91m to 16.50m bgl: Band of firm grey clay.					
				9		From 15.00m to 16.50m bgl: Abundant drilling induced fractures.					
				NI							
				14		From 15.23m to 15.32m bgl: Zone of non-intact due to fragility of rock.					
				NI		From 15.46m to 15.61m bgl: Zone of non-intact due to fragility of rock.					
				5							
				NI							
				0		From 16.02m to 16.08m bgl: Zone of non-intact due to fragility of rock.					
				CLAY							
				6		From 16.15m to 16.18m bgl: Band of firm grey clay.					
16.00		PID = 0.0ppm	100 71 20	NI	16.50-18.00	From 16.50m bgl: Becomes weak.					
				6		From 16.50m to 16.68m bgl: Zone of non-intact due to drilling techniques.					
				NI							
				10		From 17.37m to 17.46m bgl: Zone of non-intact due to fragility of rock.					
				NI		From 17.56m to 17.72m bgl: Zone of non-intact due to fragility of rock.					
				7							
17.00		PID = 0.0ppm									
17.70-17.88	43 C										

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire	<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
18.00		PID = 0.0ppm		NI	18.00-19.50	From 18.00m to 18.20m bgl: Zone of non-intact due to drilling techniques.				
				5		From 18.20m to 18.37m bgl: Abundant drilling induced fractures.				
				NI		From 18.37m to 18.60m bgl: Becomes medium strong.				
18.70- 18.86	44 C		100 74 21			From 18.60m to 18.65m bgl: Zone of non-intact due to fragility of rock.				
19.00		PID = 0.0ppm		6						
						From 19.36m to 19.50m bgl: Zone of non-intact due to fragility of rock.				
					19.50-21.00	From 19.50m to 19.85m bgl: Zone of non-intact due to fragility of rock.				
20.00		PID = 0.0ppm		5		Medium strong light grey medium interbedded with light brown MUDSTONE with frequent load structures present. Fracture set 1: Subvertical to 70 degrees widely spaced stepped smooth partly open clean. Fracture set 2: Subhorizontal medium to widely spaced undulating smooth tight to closed infilled with grey silt <b>(PENARTH GROUP)</b>	-13.12		20.03	
			97 63 54			From 20.28m to 20.44m bgl: Zone of non-intact due to fragility of rock.				
				NI						
20.70- 20.99	45 C			2		From 20.70m bgl: Becomes weak.				
				NR						

Water Strikes		Hole Diameter		Progress				Remarks			
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)			
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.		

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.G.P.U || Library: AECOM AGS 4.0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation	<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781
		<b>Date Started:</b> 17/03/2023 <b>Date Completed:</b> 23/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument	
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run						
21.00		PID = 0.0ppm			21.00-22.50	From 21.00m to 21.45m bgl: Frequent drilling induced fractures.					
21.77- 21.95	46 C		100 86 24	4							
22.00		PID = 0.0ppm				From 22.13m to 22.30m bgl: Band of firm light grey gravelly clay. Gravel is angular to subangular fine to medium of mudstone.			(4.80)		
22.13- 22.30	47 ES	PID = 0.0ppm		CLAY							
				13							
22.64- 22.76	48 C			NI	22.50-24.00	From 22.67m to 22.84m bgl: Zone of non-intact due to fragility of rock.					
				13		From 22.80m bgl: Fracture set 2 becomes medium spaced.					
				CLAY		From 22.98m bgl: Fracture set 1 becomes medium spaced.					
			100 59 39	8		From 23.00m to 23.04m bgl: Band of soft grey gravelly clay present. Gravel is angular fine of weak mudstone.					
				NI		From 23.43m to 23.49m bgl: Zone of non-intact due to fragility of rock.					
				0		From 23.58m to 23.68m bgl: Zone of non-intact due to fragility of rock.					
				7		From 23.82m to 24.00m bgl: Zone of non-intact due to fragility of rock.					
				NI							

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
				21-03-2023	17:30	24.00	24.00	2.80	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.
				22-03-2023	08:15	24.00	24.00	5.30	

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G:GPU || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. B-BH26

Sheet: 9 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation  <b>Project Location:</b> Redcar, North Yorkshire  <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Job No:</b> 60701533	
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD	<b>Date Started:</b> 17/03/2023  <b>Date Completed:</b> 23/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
24.00		SPT(C) N>100 25 for 70mm / 100 for 40mm		NR	24.00- 25.50	From 24.00m to 24.14m bgl: Zone of no recovery.				
24.35- 24.47	49 C			NI		From 24.14m to 24.35m bgl: Recovered as grey slightly clayey angular to subangular gravel of mudstone with medium cobble content. Cobbles are angular to subangular of mudstone.				
				8						
				NI		From 24.47m to 24.79m bgl: Recovered as grey slightly clayey angular to subangular gravel of mudstone with medium cobble content. Cobbles are angular to subangular of mudstone.				
			91 33 21	0						
25.28- 25.48	50 C			12		Very weak fractured dark reddish brown MUDSTONE with frequent zones weathering oxidation causing dark blueish grey colouring. Fracture set 1: Subvertical to 70 degrees medium spaced undulating rough partly open weathered infilled with soft reddish brown slightly sandy gravelly clay. Gravel is angular to subrounded fine of mudstone. Sand is fine. Fracture set 2: Horizontal medium spaced undulating rough tight clean or with occasional calcite infill <b>(MERCIA MUDSTONE GROUP)</b>	-17.92		24.83	
				NI						
				0						
				CLAY						
				5		From 25.00m to 25.06m bgl: Zone of non-intact due to fragility of rock.				
				NR	25.50- 27.00					
				0						
				NI		From 25.68m bgl: Becomes medium strong with closely spaced sub horizontal to horizontal 1-2mm wide calcite veins.				
25.98- 26.61	51 C					From 25.73m to 25.84m bgl: Zone of non-intact due to fragility of rock.				
				6						
			88 67 53							
				CLAY		From 26.46m to 26.58m bgl: Recovered as soft reddish brown slightly sandy gravelly silty clay due to weathering. Gravel is angular to subangular fine of mudstone. Sand is fine to medium.				
				0						
				CLAY						
26.80	52 ES	PID = 0.0ppm		0		From 26.74m to 26.82m bgl: Recovered as soft reddish brown slightly sandy gravelly silty clay due to weathering. Gravel is angular to subangular fine of mudstone. Sand is fine to medium.				
				NI						

Water Strikes		Hole Diameter		Progress				Remarks			
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)			
									1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.090m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.		

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: NS Checked By: JW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G:G:PJ || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. B-BH26

Sheet: 10 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation  <b>Project Location:</b> Redcar, North Yorkshire  <b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited	<b>Job No:</b> 60701533	
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD	<b>Date Started:</b> 17/03/2023  <b>Date Completed:</b> 23/03/2023

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
27.00	53 C	SPT(C) N>100 25 for 60mm / 100 for 20mm	100 99 61	5	27.00- 28.50	From 25.92m to 27.00m bgl: Zone of non-intact due to fragility of rock.			(5.17)	
27.07- 27.38						From 27.00m bgl: Fracture set 1 is no longer visible.				
						From 27.07m bgl: Becomes weak.				
						From 27.40m to 28.90m bgl: Calcite veins become very abundant up to 25mm thick.				
						From 28.23m to 28.33m bgl: Recovered as soft reddish brown gravel due to weathering. Gravel is angular to subangular fine to medium of mudstone.				
						From 28.40m to 28.50m bgl: Recovered as soft reddish brown slightly clayey slightly sandy gravel due to weathering. Gravel is angular to subangular fine to medium of mudstone. Sand is fine to coarse.				
28.91- 29.06	54 C		100 87 82	0	28.50- 30.00	From 28.80m to 28.84m bgl: Recovered as medium strong reddish brown angular to subangular fine to medium gravel of mudstone.				
						From 28.90m to 30.00m bgl: Calcite veins become frequent up to 5 mm thick.				
29.40- 29.55	55 C			3		From 29.04m to 29.10m bgl: Recovered as medium strong reddish brown angular to subangular fine to medium gravel of mudstone.				
						From 29.80m to 29.91m bgl: Recovered as medium strong reddish brown slightly clayey angular to subangular fine to coarse gravel of mudstone.				

Water Strikes		Hole Diameter		Progress				Remarks	
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)	
		146	30.00						1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.09m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: NS Checked By: JW AGS Status: DRAFT

Report ID: STANDARD COREHOLE LOG || Project: V5.4 FOUNDRY CENTRAL G.I.G.P.U || Library: AECOM AGS 4\_0\_4 LIBRARY FOUNDRY SOUTH 08122023.GLB || Date: 23 February 2024



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Borehole No. B-BH26

Sheet: 11 of 11

<b>Equipment &amp; Methods:</b> 0.00 - 0.20 Insulated Hand Tools 0.20 - 10.50 Sonic Drilling (Hammer ID: GS00008) 10.50 - 30.00 Rotary Drilling (Hammer ID: GS00008) 30.00 - 30.09 Standard Penetration Test (Hammer ID: GS00008)	<b>Project Name:</b> Foundry Central Exploratory Ground Investigation		<b>Job No:</b> 60701533
	<b>Project Location:</b> Redcar, North Yorkshire		<b>Client:</b> bp Alternative Energy Investments Limited and bp Exploration Operating Company Limited
	<b>Co-ordinates:</b> E: 455901.227 N: 525102.781	<b>Ground Level (m):</b> 6.907 AOD	

In Situ Testing			Coring Information			DESCRIPTION	Reduced Level (m)	Legend	Depth (Thick) (m)	Backfill/ Instrument
Depth (m)	Sample Ref & Type	Test Type and Result	TCR SCR RQD	FI	Core Run					
30.00		SPT(C) N>100 25 for 75mm / 100 for 15mm			30.00	NO RECOVERY - zone of SPT (C) test From 30.00m to 30.09m bgl: No recovery due to SPT (C).	-23.18		(0.09) 30.09	
<b>End of Borehole 30.09 m</b> (Thickness of basal layer not proven)										

Water Strikes		Hole Diameter		Progress				Remarks		
Strike Depth	Flow Remarks	Hole Dia (mm)	Depth of Hole (m)	Date	Time	Hole Depth (m)	Casing Depth (m)	Water Depth (m)		
		50	30.09	22-03-2023	17:30	30.09	30.00	3.60	1. Sonic/Rotary Core (SO/RC) borehole located within the Foundry Area of Teesside Works Redcar, North Yorkshire. 2. Buried Service Inspection pit attempted using Insulated Hand Tools, terminated at 0.20m bgl. Permission granted to progress borehole via Sonic drilling. 3. SO/RC borehole advanced via Sonic drilling to 10.50m bgl and completed via Rotary coring to 30.09m bgl. 4. Topography: Level Ground. 5. Groundwater not encountered during drilling. Strikes masked due to the addition of drilling water. 6. Slag material encountered in material recovered from ground level to 3.71m bgl. Ash encountered in material recovered from ground level to 0.43m bgl. Sulphurous odour noted in material recovered from 1.50m bgl to 3.00m bgl. 7. 35mm diameter standpipe installed to 10.00m bgl and 50mm diameter standpipe installed to 24.00m bgl upon completion.	

Notes: For explanation of symbols and abbreviations, see Key Sheet. Scale: 1:15 Logged By: NS Checked By: JW AGS Status: DRAFT

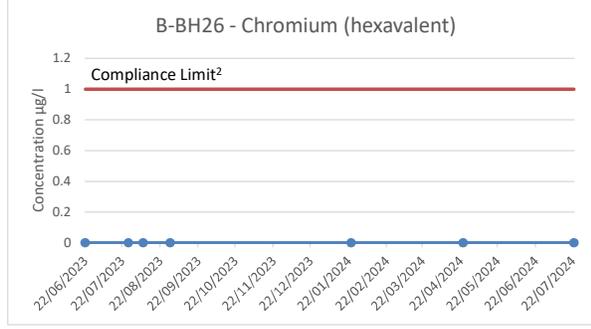
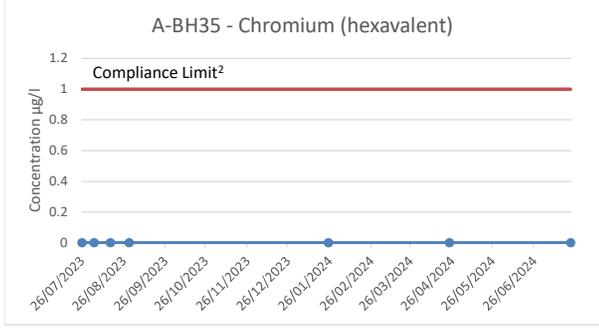
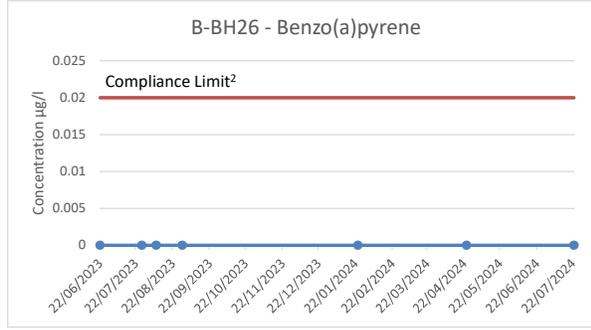
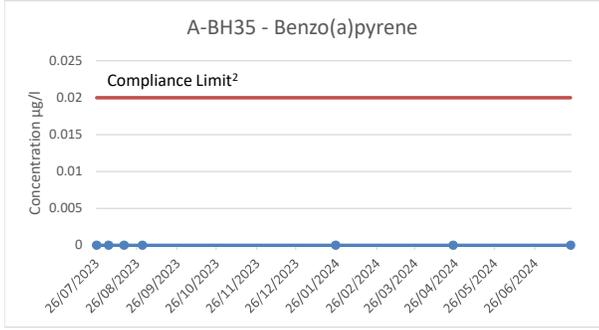
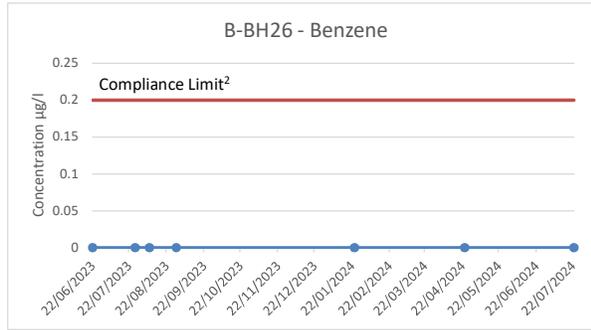
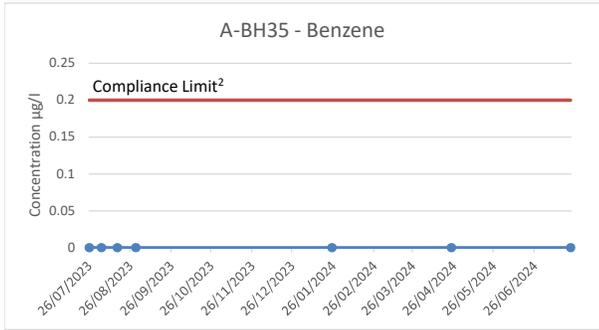
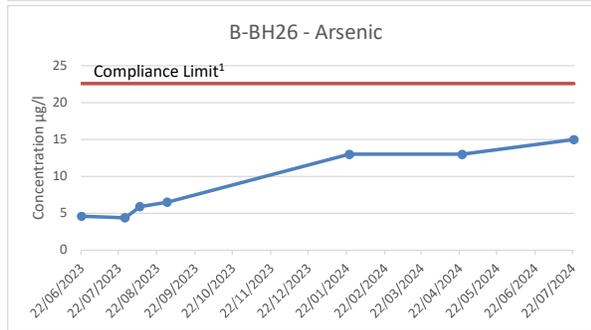
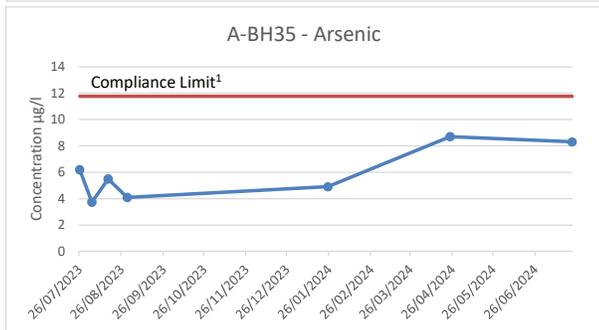
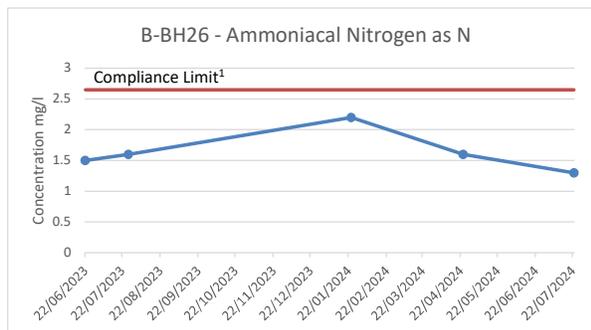
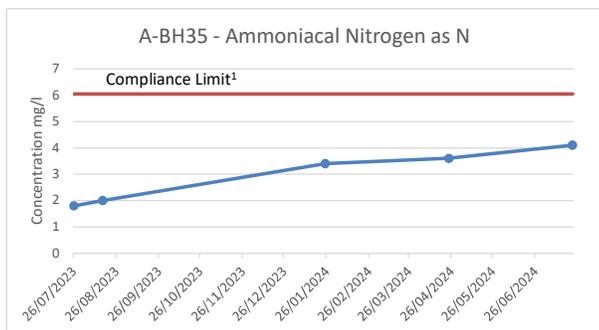
**DATA PENDING**

**Borehole logs for the following wells were not available at the time of writing and will be submitted once finalised:**

FOU-AUK-BH101, FOU-AUK-BH102, FOU-AUK-BH103, and FOU-AUK-BH104

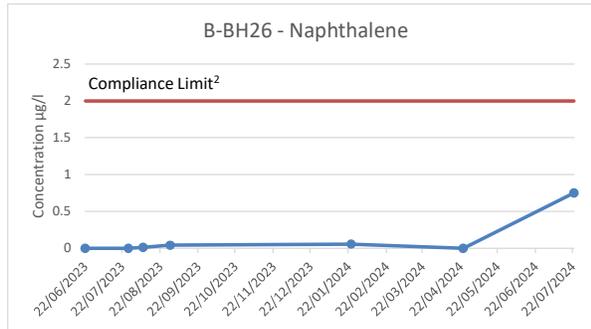
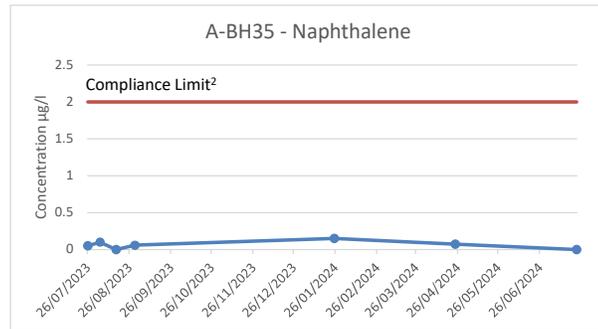
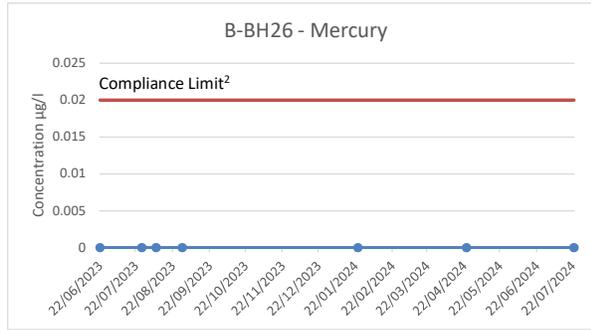
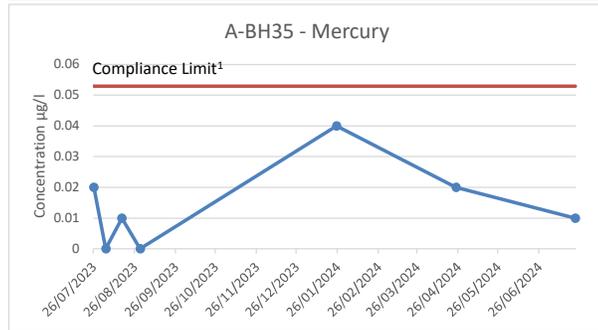
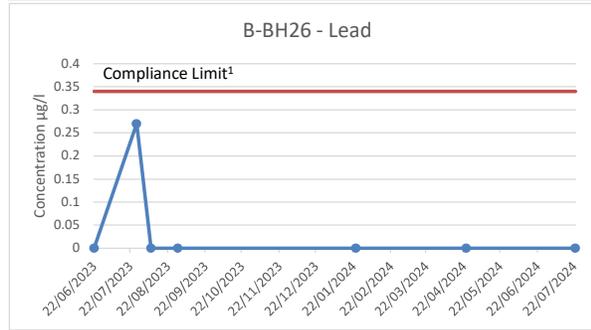
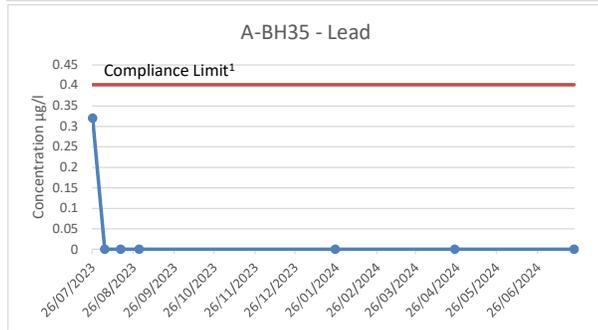
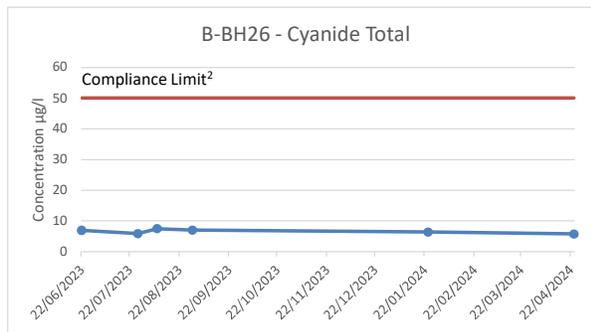
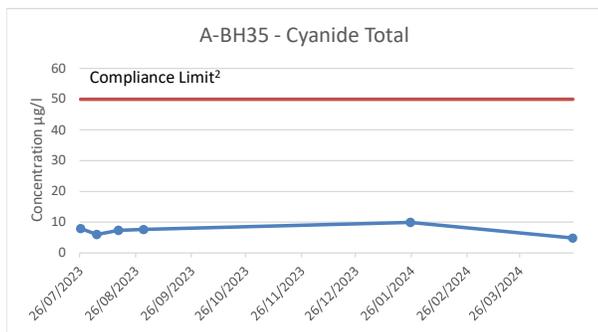
## **Appendix C**

Graphs showing substance concentrations recorded in A-BH26S and A-BH35S over the period of June 2023 to July 2024



Notes

- 1 Compliance limit based on mean plus 3 x standard deviation
- 2 Compliance limit based on MRV or WQS



Notes

- 1 Compliance limit based on mean plus 3 x standard deviation
- 2 Compliance limit based on MRV or WQS

**Appendix D**  
Compliance Limit Derivation Table

**Appendix D**

Compliance Limit Derivation Table

Substance	Units	MRV/WQS	Minimum	Maximum	Mean*	Standard Deviation	Mean + 3 x SD	Criteria	Rationale
<b>A-BH35S</b>									
Arsenic	µg/l	5 <sup>2</sup>	3.74	8.7	5.92	1.95	11.8	11.8	Mean + 3 x SD
Chromium (hexavalent)	µg/l	1 <sup>2</sup>	<MDL	<MDL	-	-	-	1	MRV
Lead	µg/l	0.2 <sup>2</sup>	<MDL	0.32	0.10	0.10	0.401	0.401	Mean + 3 x SD
Mercury	µg/l	0.02 <sup>2</sup>	<MDL	0.04	0.02	0.01	0.053	0.0529	Mean + 3 x SD
Benzo(a)pyrene <sup>4</sup>	µg/l	0.02 <sup>2</sup>	<MDL	<MDL	-	-	-	0.02	MRV
Naphthalene <sup>4</sup>	µg/l	2 <sup>3</sup>	<MDL	0.15	0.10	0.077	0.332	2	WQS
Benzene	µg/l	0.2 <sup>2</sup>	<MDL	<MDL	-	-	-	0.2	MRV
Ammoniacal Nitrogen as N	mg/l	0.5 <sup>1</sup>	1.8	4.1	2.98	1.02	6.04	6.04	Mean + 3 x SD
Cyanide Total <sup>5</sup>	µg/l	50 <sup>1</sup>	4.8	9.9	7.25	1.74	12.5	50	WQS
<b>B-BH26S</b>									
Arsenic	µg/l	5 <sup>2</sup>	4.4	15	8.92	4.55	22.6	22.6	Mean + 3 x SD
Chromium (hexavalent)	µg/l	1 <sup>2</sup>	<MDL	<MDL	-	-	-	1	MRV
Lead	µg/l	0.2 <sup>2</sup>	<MDL	0.27	0.09	0.08	0.340	0.340	Mean + 3 x SD
Mercury	µg/l	0.02 <sup>2</sup>	<MDL	<MDL	0.01	-	-	0.0200	MRV
Benzo(a)pyrene <sup>4</sup>	µg/l	0.02 <sup>2</sup>	<MDL	<MDL	-	-	-	0.02	MRV
Naphthalene <sup>4</sup>	µg/l	2 <sup>3</sup>	<MDL	0.75	0.13	0.272	0.950	2	WQS
Benzene	µg/l	0.2 <sup>2</sup>	<MDL	<MDL	-	-	-	0.2	MRV
Ammoniacal Nitrogen as N	mg/l	0.5 <sup>1</sup>	1.3	2.2	1.64	0.336	2.65	2.65	Mean + 3 x SD
Cyanide Total <sup>5</sup>	µg/l	50 <sup>1</sup>	5.8	7.54	6.61	0.69	8.69	50	WQS

Notes

\*For results <MDL, a value of 0.5 times MDL has been used

1 – Drinking water standard

2 - MRV

3 – Environmental Quality Standard adopted in absence of drinking water standard

4 - For PAH, data from PAH specific method is presented in preference to the VOC or SVOC method as a lower MDL is achieved.

5 – For total cyanide, a single sample from July 24 excluded due to high MDL (result <40ug/l)

**Appendix E**

Contingency Action: Process Flow Diagram

