

Gravel). There are no groundwater abstraction points within 500m of the site and the site is not located within a groundwater Source Protection Zone.

6.2.2.1 Leachate

2No. soil samples obtained from Made Ground soils were scheduled for leachate testing to assess the mobility of constituents from soil samples collected from the site. The results of this analysis have been compared with Tt's inhouse Freshwater TSV (the most conservative screening value from River Water Environmental Quality Standards (EQS), Drinking Water Standards (DWS) or Freshwater Lake TSVs). **No exceedances of the TSVs** were recorded, indicating limited potential for contaminants to leach from the soils.

6.2.2.2 Groundwater

The groundwater screening assessment has been undertaken to identify the chemical constituents analysed which might potentially pose unacceptable levels of risk to the groundwater underlying the site. Measured concentrations from a single round of groundwater sampling have been compared with Tt's inhouse Freshwater TSV (the most conservative screening value from River Water Environmental Quality Standards (EQS), Drinking Water Standards (DWS) or Freshwater Lake TSVs). Where measured concentrations exceed these levels, this does not necessarily indicate a requirement for remediation; it can however, be the trigger for the undertaking of a more detailed quantitative assessment in accordance with the current UK tiered risk assessment framework.

A single groundwater sample was collected from BH01 (all other installations were dry) during the first round of water monitoring and scheduled for laboratory analysis for a suite of commonly elevated potential contaminants.

The results were screened using the adopted TSV (as defined above) and only the dissolved Zinc concentration (32µg/l) showed an exceedance of the respective screening value (10.9 µg/l). With the assumption that the concentration is 100% bioavailable, the Zinc concentration is slightly above typical ambient background concentrations of UK rivers which ranges between 1.2 and 7.1 µg/l.

7.0 GROUND GAS ASSESSMENT

7.1 INTRODUCTION

Three rounds of gas monitoring have been undertaken to date on the 2nd and 8th of December 2021, and 8th February 2022.

A full factual record of the monitoring visits is presented in Section 3.9 and **Appendix 6**.

7.2 POTENTIAL SOURCES

Based on the desk-based assessment ^{ref 1} and the findings of the site investigation, limited potential ground gas sources have been identified on the site and in the surrounding areas which include:

- Made Ground of variable thickness associated with creating level development platforms for the school buildings on the sloping site. Up to 3.9m thickness of Made Ground has been proven during these works.

7.3 DATA SUMMARY

Tables 5 and 6 summarise the ground gas concentrations and flows obtained during the two monitoring visits undertaken to date. Using the CIRIA C665 ^{ref 9} guidance on Ground Gas the greatest flow rate and greatest concentrations of ground gases are combined to reflect a worst-case scenario. The ranges of concentrations at each location do not necessarily correspond to the same monitoring date but represent the maximum readings across the monitoring programme to allow an assessment of the gas concentrations on a worst-case scenario basis. It is noted, however, that a worst-case scenario cannot be wholly achieved without falling atmospheric pressure during the monitoring period.

7.4 GROUND GAS RISK ASSESSMENT

A semi-quantitative land gas assessment has been undertaken using the guidance provided in BS8485 ^{ref 10} and CIRIA C665 ^{ref 9} which provides a framework for assessment of ground gas risk to buildings/structures with a range of foundation designs.

Using peak flow rates and gas concentrations recorded over both monitoring visits, a semi-quantitative, worst-case scenario GSV (ltr/gas/hr) derived from the peak concentration (% volume) x peak flow (ltr/hr) is summarised in Table 13.

⁹ CIRIA - C665 Assessing Risks posed by hazardous ground gases to buildings (2007)

¹⁰ BS 8485 (2015) Code of Practice for the design of protective measures for methane and carbon dioxide ground gases for new buildings

Table 13 GSV Worst Case Scenario Summary

Gas	Peak Concentration (%)	Peak Flow (l/hr)	Maximum Gas Flow (l/hr)	GSV Worst Case Scenario
CO ₂	3.50	-0.026	0.00091	CS1 (Very Low Risk)
CH ₄	0.10	-0.026	0.000026	CS1 (Very Low Risk)

The resultant GSV calculations indicate the site is currently representative of Characteristic Situation 1, and therefore it is unlikely that special ground gas protection measures to new buildings will be required. If further monitoring indicates higher concentrations of ground gas or greater flows, consideration should be given to incorporating a gas membrane into new buildings.

8.0 CONCEPTUAL SITE MODEL

8.1 INTRODUCTION

A preliminary conceptual site model (CSM) and qualitative risk assessment was provided as part of the Tt desk-based assessment ^{ref 1}. Updates to the CSM and risk assessment of potential contamination linkages to receptors made based on the intrusive site investigation works and monitoring and laboratory assessment undertaken to date are discussed as follows.

8.2 SUMMARY OF POTENTIAL GROUND CONTAMINATION RISK

8.2.1 Sources

Based on a review of the available desk-based information ^{ref 1} and ground investigation data available to date, the following potential sources have been identified

- S1 – Made Ground associated with historical development / earthworks to create level development platforms. Some anthropogenic materials were noted within the Made Ground including ceramic tile, concrete and asphalt and brick fragments. These likely originate from former buildings that were historically present on site (farmstead and earlier school buildings).

8.2.2 Pathways

The primary pathways by which sensitive receptors may come into contact with ground contamination are considered to be the following:

- P1 – Direct dermal contact with and / or ingestion of contaminated soil;
- P2 – Atmospheric transport and inhalation of airborne dusts, vapours and fibres;
- P3 – Lateral and vertical migration of gases / vapours through the underlying strata;
- P4 – Leaching of potential onsite sources of contamination;
- P5 – Lateral and vertical migration of dissolved phase contamination in the Secondary Aquifers;
- P6 – Contaminant migration through preferential pathways (e.g. underground service ducts, drains, etc.);
- P7 – Surface water runoff;
- P8 – Direct contact with buildings / structures leading to chemical attack and damage;
- P9 – Accumulation of hazardous gas in buildings; and
- P10 – Leaching of potential offsite sources of contamination.

8.2.3 Receptors

The following are considered to be sensitive receptors:

- R1 - Groundworkers
- R2 - Future School Users
- R3 - Surface Water Features – on site pond, inland rivers, Thurlaston Brook and Soar River
- R4 - Secondary A Superficial Aquifers and Secondary B Bedrock Aquifer

8.3 RISK ASSESSMENT

A qualitative risk assessment has been undertaken using the matrix approach defined within CIRIA C552 ^{ref 11} as detailed in Table 14 which evaluates the pollutant linkages and the assigned risk rating and updates the preliminary CSM identified in the Tt desk based assessment ^{ref 1}. The CIRIA C552 risk categories and the assessment methodology are detailed in Appendix 9.

¹¹ Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001).

Table 14 Updated CSM

Potential Source	Potential Pollutant	Potential Receptor	Potential Pathway to Receptor	Associated Hazard (Severity)	Likelihood of Occurrence	Risk
S1: Made Ground associated historic development and earthworks	No contaminants identified at concentrations that would be considered hazardous (with the exception of an isolated and limited instance of beryllium, although this is not considered to pose a significant risk) but occasional anthropogenic fragments of ceramic, brick and concrete were recorded	R1 Groundworkers	Direct contact/ingestion, atmospheric transport and inhalation, migration, and accumulation of hazardous gases/vapours. (P1, P2, P3, P9)	Human Health (Medium)	Low Likelihood Groundworks increase the chance of construction site workers encountering sub-surface soils impacted during earthworks. Limited evidence of contamination has been encountered. No asbestos fibres were recorded but anthropogenic materials were noted including brick and ceramic fragments which may present an injury hazard if found to be angular/sharp fragments Risks can be further reduced with the introduction of a Construction & Environmental Management Plan (CEMP) and adoption of appropriate PPE.	Low / Moderate
		R2 Future School Site Users			Low Likelihood Areas of soft landscaping in future developments will act as continuous pathways between underlying Made Ground and site users, however no significant contamination has been identified during the investigation. The anthropogenic materials identified, whilst not a mobile contamination sources, may be present as sharp/angular fragments that may be injurious if encountered near the surface in playing fields	Low / Moderate
		R3 Surface Water Features	Leaching of on-site contamination, lateral and vertical migration of contamination, migration through preferential pathways, surface runoff. (P4, P5, P6, P7)	Controlled Waters (Mild)	Unlikely Given the limited evidence of mobile contamination and the distance between the source and receptor, contamination of surface waters is highly unlikely.	Very Low
		R4 Secondary Superficial Aquifers	Leaching of on-site contamination, lateral and vertical migration of contamination, migration through preferential pathways. (P4, P5, P6)	Controlled Waters (Mild)	Unlikely Limited evidence of contamination and potential for leachate to impact groundwater.	Very Low

9.0 CONCLUSIONS

9.1 CONTAMINATION RISK ASSESSMENT SUMMARY

Based on the data collated during the ground investigation and the desk based review of the site in the Tetra Tech Phase 1 Report (Aug 2021), no contamination of any significance has been recorded within the ground on site. However, fragments of anthropogenic materials such as ceramics, brick, concrete etc. were noted within the Made Ground which may present a risk of injury if in shallow soils within playing fields. The groundwater table is deep (10.40m bgl) significantly reducing the risk of any contaminant linkages to the underlying Secondary A aquifer.

Ground gas has not been recorded in concentrations that are likely to present a significant risk at this site.

9.2 GEOTECHNICAL ASSESSMENT SUMMARY

The adoption of conventional spread foundations (e.g pad or strip foundations) is likely to be viable for light loads associated with the temporary modular classrooms. However, due to potential variability in composition and consistency of the near surface soils in the area of Block D, it is likely that Piled foundations will be required.

9.3 RECOMMENDATIONS

No significant sources of contamination have been identified on site and contamination of the shallow soils was not observed. However, for any areas of proposed playing fields (e.g. grass covered sports pitches), care will be required to make sure that fragments of former demolition rubble (concrete, brick etc) are not present near the surface which may cause injury to the users of these playing fields. In this instance, a cover of imported topsoil may be required to prevent any contact with the underlying Made Ground.

However, it is also acknowledged that variable conditions may be present in between investigation locations and on this basis, groundworkers undertaking construction works (foundations, site levelling, installing services etc) should be vigilant for any signs of contamination during their works and if such should be encountered, works halted whilst the advice of a contaminated land consultant is sought. Groundworkers should also use appropriate PPE and employ standard environmental management practices.

It is not considered that ground gas protection measures are required for new buildings based on the current data, however, further monitoring is recommended, particularly during falling atmospheric pressure, to confirm the ground gas regime.

The limited data available has resulted in a cautious approach to the geotechnical characterisation and ground model. Further efficiency in design and risk elimination could be achieved through additional investigations, particularly in the area around block D, where constraints prevented a standard triangulation of the deeper conditions of the site to inform pile design. This would be

achieved via the drilling of an additional 2No cable percussive boreholes to depths of between 15 to 20m bgl in areas targeted based on the emerging design and anticipated structural loads.

APPENDICES

1 REPORT CONDITIONS

This report is produced solely for the benefit of the **Department for Education** and no liability is accepted for any reliance placed on it by any other party unless specifically agreed in writing otherwise.

This report refers, within the limitations stated, to the condition of the site at the time of the inspections. No warranty is given as to the possibility of future changes in the condition of the site.

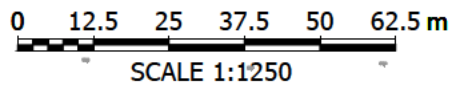
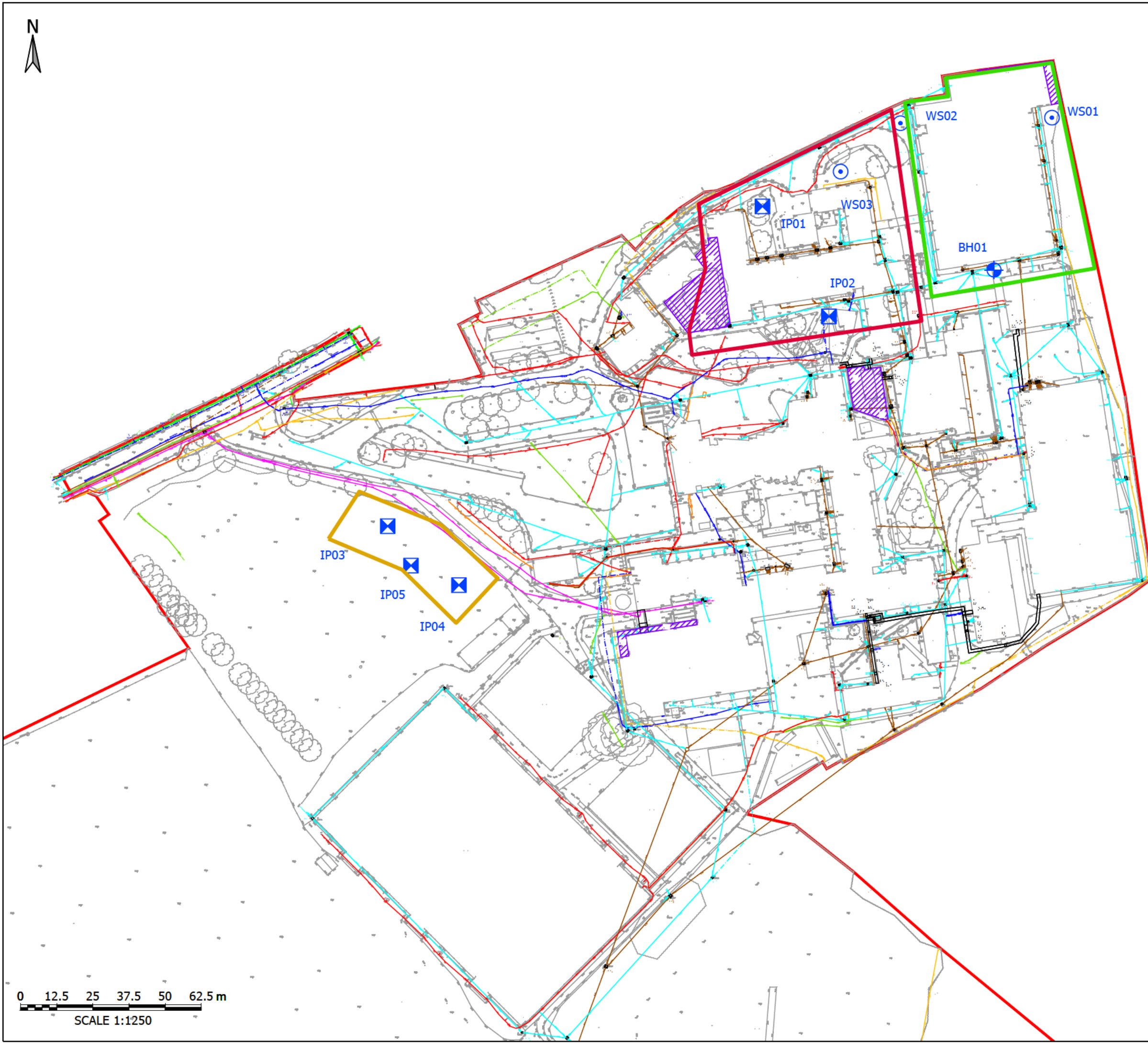
This report is based on a visual site inspection, reference to accessible referenced historical records, information supplied by those parties referenced in the text and preliminary discussions with local and Statutory Authorities. Some of the opinions are based on unconfirmed data and information and are presented as the best that can be obtained without further extensive research. Where ground contamination is suspected but no physical site test results are available to confirm this, the report must be regarded as initial advice only, and further assessment should be undertaken prior to activities related to the site. Where test results undertaken by others have been made available these can only be regarded as a limited sample. The possibility of the presence of contaminants, perhaps in higher concentrations, elsewhere on the site cannot be discounted.

Whilst confident in the findings detailed within this report because there are no exact UK definitions of these matters, being subject to risk analysis, we are unable to give categorical assurances that they will be accepted by Authorities or Funds etc. without question as such bodies often have unpublished, more stringent objectives. This report is prepared for the proposed uses stated in the report and should not be used in a different context without reference to Tetra Tech. In time improved practices or amended legislation may necessitate a re-assessment.

The assessment of ground conditions within this report is based upon the findings of the study undertaken. We have interpreted the ground conditions in between locations on the assumption that conditions do not vary significantly. However, no investigation can inspect each and every part of the site and therefore changes or variances in the physical and chemical site conditions as described in this report cannot be discounted.

The report is limited to those aspects of land contamination specifically reported on and is necessarily restricted and no liability is accepted for any other aspect especially concerning gradual or sudden pollution incidents. The opinions expressed cannot be absolute due to the limitations of time and resources imposed by the agreed brief and the possibility of unrecorded previous use and abuse of the site and adjacent sites. The report concentrates on the site as defined in the report and provides an opinion on surrounding sites. If migrating pollution or contamination (past or present) exists further extensive research will be required before the effects can be better determined.

2 FIGURES



KEY

-  BOREHOLE
-  WINDOW SAMPLE
-  INSPECTION PIT
-  PROPOSED LOCATION OF MODULAR UNITS
-  DEMOLITION/LANDSCAPING
-  BLOCK D PROPOSED DEVELOPMENT

DRAFT ISSUE

Rev	Description	Date	PP	RT	CC
D01	DRAFT ISSUE	20.12.2021			

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Client
GLEEDS ADVISORY LIMITED

Project Name
HINCKLEY

Sheet Title
GROUND INVESTIGATION LAYOUT PLAN

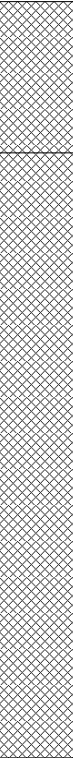
TTE Project Number	Drawn By	Date	Checked By	Date	Approved By	Date	Scale	Sheet No
B030162	OM/PP	17.12.21	RT	20.12.21	CC	20.12.21	1:1,250	50
Client Project Number	Originator	Volume/System	Level/Location	Type/Code	Role	Number	Revision	
B030162	TTE	00	XX	DR	U	0001	D01	

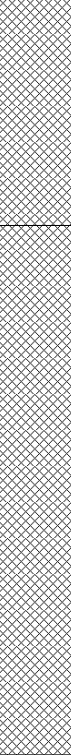
3 BOREHOLE LOGS

TETRA TECH Project: Hinckley Location: Hinckley Academy, LE10 1LE Client: Department for Education Location Details Eastings: 444079.00 Northings: 294592.00 Level: 123.46 mAOD Depth: 15.00 m Logger: Type: CP Orientation: ° Inclination: 90° Status FINAL Borehole Number BH01						Sheet 1 of 1																			
						Method, Plant and Crew						Diameter		Casing		Drilling Progress by Time						Scale: 1:75			
						From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Date	Time	Depth (m)	Casing (m)	Water (m)	Checked By: HA					
0.00	15.00	Cable Percussion	Dando 2500 Mk2 Rig 10	SI Drilling			14.50	150						Approved By: RT											
														Start Date: 20/11/2021											
														Finish Date: 21/11/2021											
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing													
												Depth (m)	Ref	Tests / Results											
MADE GROUND: Mortared herringbone brick. MADE GROND: Medium dense orange brown slightly gravelly SAND. Sand is fine to coarse. Gravel comprises fine medium flint. (BASE FILL) MADE GROUND: Firm brown slightly sandy gravelly CLAY. Gravel is subangular to subrounded, fine to coarse flint with occasional brick, concrete and asphalt fragments. Sand is fine to coarse. Stiff reddish brown slightly gravelly sandy CLAY. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse. (OADBY MEMBER)								0.10	123.36			0.50	D1												
								0.30	123.16								0.80 - 1.20	B1							
								1.30	122.16										1.30	D2					
																					1.50 - 1.95	D3			
																							SPT(S) 1.50m, N=19 (2,3/4,4,5,6)		
								3.00	D4																
																			3.50 - 3.95	D5	SPT(S) 3.50m, N=25 (2,3/5,5,7,8)				
								4.60	118.86															4.50 - 4.95	U2
																			5.00	D6					
SPT(S) 6.00m, N=23 (2,3/4,6,6,7)																									
			6.00 - 6.45	B2																					
					6.00 - 6.45	D7	SPT(S) 7.50m, N=25 (3,3/4,6,7,8)																		
7.50 - 7.95	D8																								
		8.70	114.76	9.00 - 9.45						B3															
					SPT(S) 9.00m, N=28 (2,3/5,7,7,9)																				
10.40	113.06					10.50 - 10.95	D9	SPT(S) 10.50m, N=6 (1,0/1,1,2,2)																	
											12.00 - 12.45	D10	SPT(S) 12.00m, N=24 (2,3/4,6,6,8)												
		13.50 - 13.95	D11	SPT(S) 13.50m, N=29 (3,4/5,7,8,9)																					
14.00 - 14.40	B4						SPT(S) 14.50m, N=35 (3,4/6,8,9,12)																		
										14.50 - 14.95	D12														
		EOH at 15.00m - Target depth										15.00	108.46												
Observations / Remarks												Chiselling			Water Added		Hammer Information								
1. Location cleared with CAT and GPR scanning. 2. Groundwater strike occurred at 13.20 rising to10.71m bgl (20 minutes). 3. Installed with 50mm diameter HDPE standpipe, slotted with filter and 10mm diameter pea-shingle surround from 14.50 to 1.00m bgl. Bentonite seal from 1.00 to 0.50m bgl. Finished with a gas tap and flush fitting concreted steel cover.										From (m)	To (m)	Time (mins)	From (m)	To (m)	Serial No.	Energy Ratio %									
														4.60	13.20										
										Groundwater							Project Number								
Strike (m)	Casing (m)	Sealed (m)	Time (min)	Rose To (m)	Remarks	784-B030162																			
13.20	12	-	0	10.71																					

4 WINDOW SAMPLE AND INSPECTION PIT LOGS

Tt TETRA TECH	Project: Hinckley		Location Details				Status		Pit Number	
	Location: Hinckley Academy, LE10 1LE		Easting: 443999.00 Northing: 294614.00				FINAL		IP01	
Client: Department for Education			Level: 130.84mAOD Depth: 1.00m						Sheet 1 of 1	
			Logger: Type: IP							
Hole Information Pit Dimensions 0.30m 0.30m Orientation: ° Shoring: None Stability: Stable Plant: Hand Tools			Groundwater						Scale: 1:10	
			Strike (m)		Rose To (m)		After (mins)		Remarks	
									Approved By: RT	
									Start Date: 20/11/2021	
									Finish Date: 20/11/2021	
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing		
MADE GROUND: Grass over soft dark brown slightly gravelly sandy SILT with frequent rootlets and rare fragments of brick. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse.				0.20	130.64			Depth (m)	Ref	Tests / Results
MADE GROUND: Soft brown slightly gravelly sandy SILT with occasional rootlets. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse.								0.50	ES1	
EOH at 1.00m - Target depth				1.00	129.84					

	Project: Hinckley		Location Details Easting: 444022.00 Northing: 294576.00				Status FINAL		Pit Number IP02	
	Location: Hinckley Academy, LE10 1LE		Level: 128.10mAOD Depth: 1.00m							
	Client: Department for Education		Logger: Type: IP						Sheet 1 of 1	
	Hole Information		Groundwater						Scale: 1:10	
Pit Dimensions 0.30m 0.30m		Orientation: ° Shoring: None Stability: Stable Plant: Hand Tools		Strike (m)	Rose To (m)	After (mins)	Remarks	Checked By: HA		
								Approved By: RT		
								Start Date: 20/11/2021		
								Finish Date: 20/11/2021		
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing		
MADE GROUND: Grass over soft dark brown slightly gravelly sandy SILT with frequent rootlets and rare fragments of brick. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse.				0.20	127.90			0.50	ES1	
MADE GROUND: Firm brown slightly gravelly sandy SILT with occasional rootlets and rare fragments of brick. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse.. (										
EOH at 1.00m - Target depth				1.00	127.10					
										</

	Project: Hinckley		Location Details					Status		Pit Number	
	Location: Hinckley Academy, LE10 1LE		Easting: 443857.00 Northing: 294494.00					FINAL		IP03	
	Client: Department for Education		Level: 128.70mAOD Depth: 1.00m Logger: Type: IP								
			Groundwater					Scale: 1:10			
Hole Information			Strike (m)		Rose To (m)	After (mins)	Remarks		Checked By: HA		
Pit Dimensions 0.30m			Orientation: °						Approved By: RT		
			Shoring: None						Start Date: 20/11/2021		
			Stability: Stable						Finish Date: 20/11/2021		
			Plant: Hand Tools								
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing			
								Depth (m)	Ref	Tests / Results	
MADE GROUND: Grass over soft dark brown slightly gravelly sandy SILT with frequent rootlets. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse.				0.30	128.40				0.50	ES1	
MADE GROUND: Soft dark brown slightly gravelly sandy SILT with frequent rootlets. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse. (Disturbed OADBY MEMBER)											
EOH at 1.00m - Target depth											
				1.00	127.70						1
											2
Observations / Remarks										11th Floor, Angel Court, London EC2R 7HJ 020 7250 7500	
1. Location cleared with CAT and GPR scanning. 2. No groundwater encountered. 3. Backfilled with arisings										Project Number 784-B030162	

Tt TETRA TECH	Project: Hinckley		Location Details				Status		Pit Number		
	Location: Hinckley Academy, LE10 1LE		Easting: 443882.00 Northing: 294474.00				FINAL		IP04		
	Client: Department for Education		Level: 128.70mAOD Depth: 1.00m Logger: Type: IP								
0.30m 0.30m	Hole Information		Groundwater						Scale: 1:10		
	Orientation: ° Shoring: None Stability: Stable Plant: HAnd Tools	Strike (m)	Rose To (m)	After (mins)	Remarks		Checked By: HA				
							Approved By: RT				
							Start Date: 20/11/2021 Finish Date: 20/11/2021				
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing			
MADE GROUND: Grass over soft dark brown slightly gravelly sandy SILT with frequent rootlets. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse.				0.30	128.40			0.50	ES1		
MADE GROUND: Soft dark brown slightly gravelly sandy SILT with frequent rootlets. Gravel is subangular to subrounded fine to medium flint. Sand is fine to coarse. (Disturbed OADBY MEMBER)											
EOH at 1.00m - Target depth											
				1.00	127.70						
Observations / Remarks											11th Floor, Angel Court, London EC2R 7HJ 020 7250 7500
1. Location cleared with CAT and GPR scanning. 2. No groundwater encountered. 3. Backfilled with arisings											Project Number 784-B030162

	Project: Hinckley		Location Details					Status		Pit Number		
	Location: Hinckley Academy, LE10 1LE		Easting: 443861.00 Northing: 294480.00					FINAL		IP05		
	Client: Department for Education		Level: 128.70mAOD Depth: 1.00m Logger: SC Type: IP									
			Groundwater					Scale: 1:10				
Hole Information			Strike (m)		Rose To (m)	After (mins)	Remarks	Checked By: HA				
Pit Dimensions 0.35m			Orientation: °					Approved By: RT				
Shoring: None								Start Date: 02/12/2021				
Stability: Stable								Finish Date: 02/12/2021				
Plant: Hand Tools												
Strata Description			Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Backfill	Samples and Testing				
								Depth (m)	Ref	Tests / Results		
MADE GROUND: Soft dark brown slightly gravelly slightly sandy silty CLAY with abundant rootlets. Gravel is angular to sub-rounded fine to to medium quartzite and flint. Sand is fine to coarse.				0.18	128.52			0.10 0.10	D1 ES2			
MADE GROUND: Dark grey to black slightly ashy slightly sandy angular to sub-angular fine to coarse GRAVEL of quartzite, sandstone and coal with rare metal.				0.26	128.44			0.20	ES3			
Soft brown to reddish brown slightly gravelly sandy CLAY. Gravel is sub-angular to sub-rounded fine to coarse quartzite and sandstone. Sand is fine to coarse. (OADBY MEMBER)								0.30 0.30	D4 ES5			
								0.40 - 0.80	B6			
EOH at 1.00m - Target depth				1.00	127.70			1.00	D7	1		
										2		
Observations / Remarks										11th Floor, Angel Court, London EC2R 7HJ 020 7250 7500		
1. Location cleared with CAT and GPR scanning. 2. No groundwater encountered. 3. Backfilled with arisings										Project Number 784-B030162		

Tt TETRA TECH Project: Hinckley Location: Hinckley Academy, LE10 1LE Client: Department for Education						Location Details Easting: 444099.00 Level: 123.72mAOD Logger: Northing: 294657.00 Depth: 5.00m Type: WLS Inclination: °						Status FINAL		Borehole Number WS01				
												Sheet 1 of 1						
Method, Plant and Crew					Diameter		Casing		Groundwater						Scale: 1:25			
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (m:ns)	Remarks		Checked By: HA		
0.00	1.00	Inspection Pit	Dynamic Windowless Sampling		1.00	300	2.00	120								Approved By: RT		
					2.00	110										Start Date: 20/11/2021		
					3.00	100										Finish Date: 20/11/2021		
					4.00	90												
					5.00	80												
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing						
MADE GROUND: Soft to firm dark brown, slightly gravelly silty CLAY. Gravel comprises subangular to subrounded, fine to medium flint with concrete, asphalt and brick fragments. (TOPSOIL) MGR								1.00	122.72			Depth (m)	Ref	Tests / Results				
												0.20	ES1					
												0.90	ES2	SPT(S) 1.00m, N=11 (2,2/3,3,2,3)				
												1.20 - 1.60	B1					
MADE GROUND: Stiff dark brown slightly gravelly silty CLAY. Gravel is subangular to subrounded, fine to medium flint with rare brick fragments and pockets of orangish brown sand. at 2.00m bgl cobble size part brick fragment								2.20	121.52			2.50 - 3.00	B2	SPT(S) 2.00m, N=12 (2,2/2,3,3,4)				
MADE GROUND: Stiff to very stiff reddish brown slightly gravelly silty CLAY. Gravel is subangular to subrounded, fine to medium flint with rare asphalt and brick fragments and occasional roots.								4.60	119.12			3.50 - 4.00	B3	SPT(S) 3.00m, N=20 (3,3/3,5,6,6)				
Medium dense orangish brown silty fine to medium SAND. Gravel is subangular to subrounded fine to medium flint. (WOOLSTON SAND and GRAVEL)								5.00	118.72			4.60 - 5.00	B4	SPT(S) 4.00m, N=21 (4,4/5,5,5,6)				
EOH at 5.00m - Refusal															SPT(S) 5.00m, N=25 (5,5/6,6,6,7)			
Observations / Remarks												Sampling Runs				Hammer Information		
1. Location cleared with CAT and GPR scanning. 2. No groundwater encountered. 3. Installed with 50mm diameter HDPE standpipe, slotted with filter and 10mm diameter pea-shingle surround from 4.60 to 1.00m bgl. Bentonite seal from 1.00 to 0.50m bgl. Finished with a gas tap and flush fitting concreted steel cover.												From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %
												1.00	2.00	110	100			
												2.00	3.00	100	100			
												3.00	4.00	90	100			
												4.00	5.00	80	100			
												Project Number						
												784-B030162						

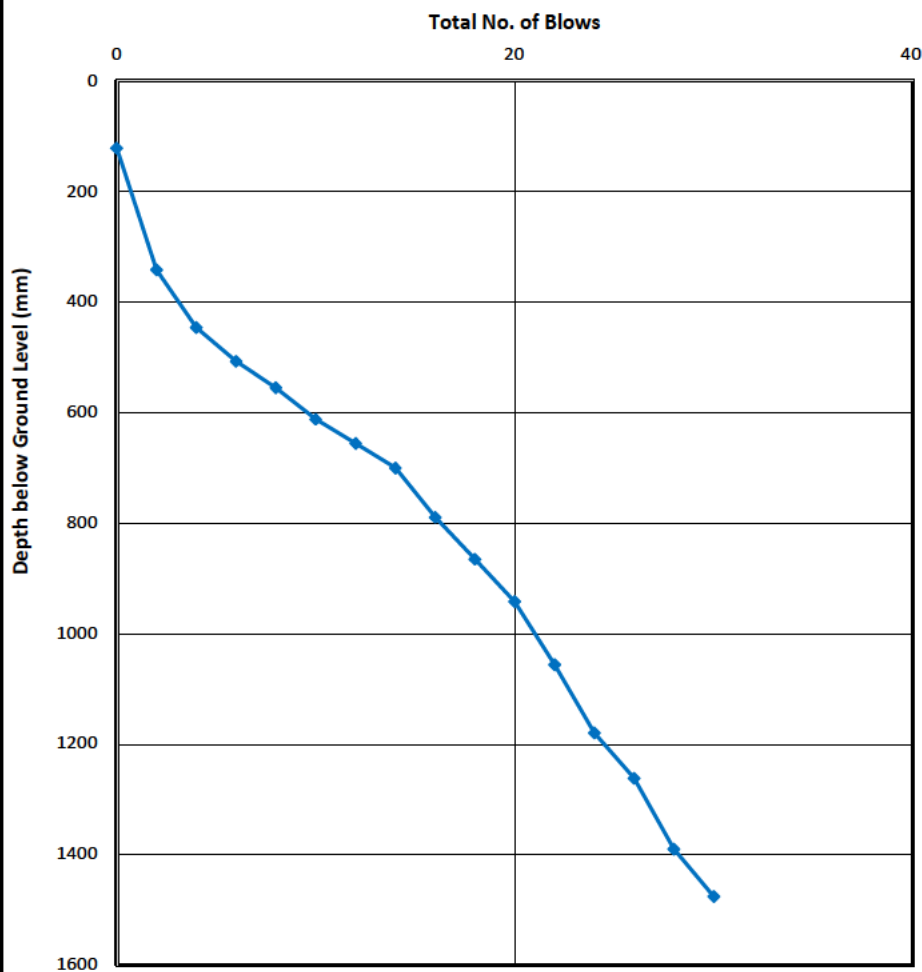
TETRA TECH Project: Hinckley Location: Hinckley Academy, LE10 1LE Client: Department for Education						Location Details						Status		Borehole Number			
						Easting: 444048.00 Northing: 294651.00						FINAL		WS02			
						Level: 123.60m AOD Depth: 3.80m											
						Logger: Type: WLS						Sheet 1 of 1					
						Inclination: °											
Method, Plant and Crew					Diameter		Casing		Groundwater						Scale: 1:25		
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (mins)	Remarks	Checked By: HA		
															Approved By: RT		
														Start Date: 20/11/2021	Finish Date: 20/11/2021		
Strata Description						Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing						
											Depth (m)	Ref	Tests / Results				
MADE GROUND: Bitumen bound macadam. (ASPHALT)							0.10	123.50			0.30	E51	SPT(S) 1.00m, N=17 (3,3/4,4,4,5)				
MADE GROUND: Stiff reddish brown slightly sandy gravelly CLAY with occasional fragments of brick and asphalt and pockets of grey silt. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse.																	
Pocket of orangish brown fine to medium sand at 1.50m depth							1.50 - 2.00	B1	SPT(S) 2.00m, N=19 (4,4/4,5,5,5)								
							2.50 - 3.00	B2	SPT(S) 3.00m, N=20 (5,5/5,5,5,5)								
EOH at 3.80m - Refusal							3.80	119.80		3.50 - 3.80	B3						
Observations / Remarks											Sampling Runs			Hammer Information			
1. Location cleared with CAT and GPR scanning. 2. No groundwater encountered. 3. Installed with 50mm diameter HDPE standpipe, slotted with filter and 10mm diameter pea-shingle surround from 3.80 to 1.00m bgl. Bentonite seal from 1.00 to 0.50m bgl. Finished with a gas tap and flush fitting concreted steel cover.											From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %
											Project Number						
784-B030162																	

TETRA TECH Project: Hinckley Location: Hinckley Academy, LE10 1LE Client: Department for Education						Location Details						Status		Borehole Number		
						Easting: 444026.00 Northing: 294626.00 Level: 128.20mAOD Depth: 3.90m Logger: Type: WLS Inclination: °						FINAL		WS03		
																Sheet 1 of 1
Method, Plant and Crew					Diameter		Casing		Groundwater						Scale: 1:25	
From (m)	To (m)	Type	Plant Used	Crew	Depth (m)	Diam (mm)	Depth(m)	Diam (mm)	Strike (m)	Casing (m)	Sealed (m)	Rose To (m)	Time (m:ns)	Remarks	Checked By: HA	
															Approved By: RT	
Strata Description							Legend	Depth (m)	Reduced Level (mAOD)	Water Level (m)	Inst / Backfill	Samples and Testing				
												Depth (m)	Ref	Tests / Results		
MADE GROUND: Soft to firm dark brown slightly gravelly sandy CLAY with occasional fragments of brick and roots. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse.								1.00	127.20			0.30	ES1	SPT(S) 1.00m, N=12 (2,3/3,3,3,3) 1		
MADE GROUND: Stiff brown slightly gravelly sandy CLAY with occasional rootlets and rare fragments of brick. Gravel is subangular to subrounded fine to coarse flint. Sand is fine to coarse.												0.90	ES2			
												1.50 - 2.00	B1			
												2.50 - 3.00	B2			
												3.50 - 3.90	B3			
Pocket of orangish brown fine to medium sand at 2.40m depth														SPT(S) 2.00m, N=14 (3,3/3,3,4,4) 2		
EOH at 3.90m - Refusal								3.90	124.30					SPT(S) 3.00m, N=16 (3,4/4,4,4,4) 3		
														SPT(S) 4.00m, N=60 (9,9/14,15,15,16) 4		
															5	
Observations / Remarks										Sampling Runs				Hammer Information		
1. Location cleared with CAT and GPR scanning. 2. No groundwater encountered. 3. Installed with 50mm diameter HDPE standpipe, slotted with filter and 10mm diameter pea-shingle surround from 3.90 to 1.00m bgl. Bentonite seal from 1.00 to 0.50m bgl. Finished with a gas tap and flush fitting concreted steel cover.										From (m)	To (m)	Diam (mm)	Recovery %	Remarks	Serial No.	Energy Ratio %
										Project Number						
784-B030162																

5 DCP DATA

DCP w. In Situ CBR v1.1 (03/09/2018)

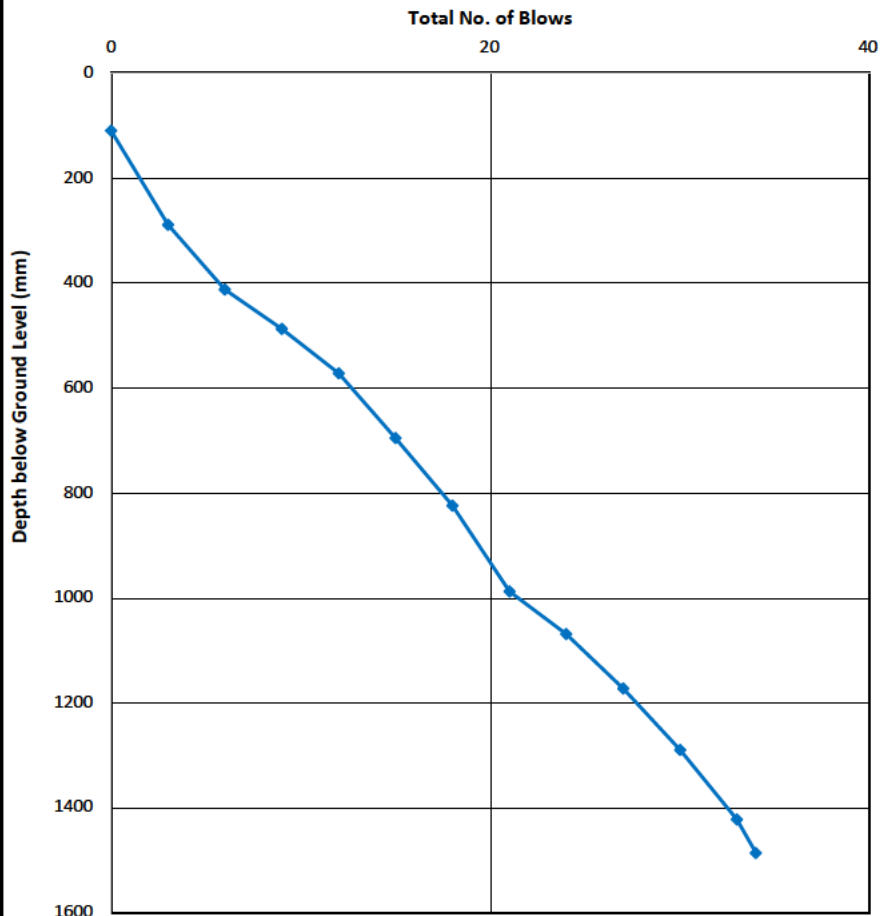
Client	Department for Education	Tetra Tech 11th Floor, Angel Court, London EC2R 7HJ Tel: 020 7250 7500 Tt TETRA TECH					
Project No:	784-8030162						
Hole Number:	TRL01						
Final Depth (m):	1.47						
Easting (x):	443994						
Northing (y):	294614.00	Start Depth (mm)	0	Zero Reading (mm)	0	Test Number	1
Elevation (m AOD):	130.84	Logged by:	SC				
Weather:	Cold Dry	Logged Date:	02/12/2021				

[illegible]

CBR values derived from DCP by Highways specification: $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 (\text{Log}_{10}(\text{mm/blow}))$

DCP w. In Situ CBR v1.1 (03/09/2018)

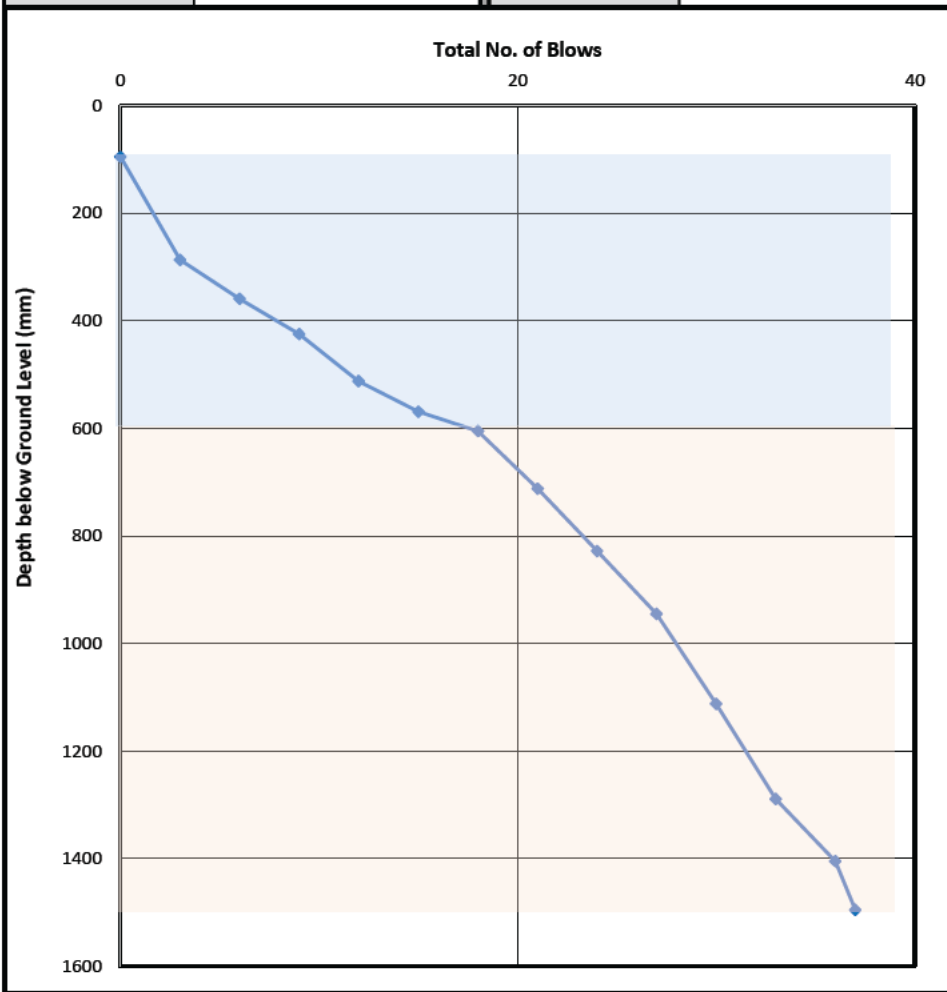
Total No. of Blows	Data
--------------------	------



Depth Range Start (mm BGL)	Depth Range End (mm BGL)	Average penetration / blow (mm)	Average CBR value (%)
0	1485	38.00	6.459
Checked by : RT			Final
CBR values derived from DCP by Highways specification: $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 (\text{Log}_{10}(\text{mm/blow}))$			

DCP w. In Situ CBR v1.1 (03/09/2018)

Client	Department for Education	 TETRA TECH Tetra Tech 11th Floor, Angel Court, London EC2R 7HJ Tel: 020 7250 7500					
Project No:	784-B030162						
Hole Number:	TRL04						
Final Depth (m):	1.49						
Easting (x):	443882						
Northing (y):	294474.00	Start Depth (mm)	0	Zero Reading (mm)	0	Test Number	1
Elevation (m AOD):	128.70	Logged by:	SC				
Weather:	Cold Dry	Logged Date:	02/12/2021				

[illegible]

CBR values derived from DCP by Highways specification: $\text{Log}_{10}(\text{CBR}) = 2.48 - 1.057 (\text{Log}_{10}(\text{mm/blow}))$

6 GROUNDWATER & GROUND GAS & MONITORING RESULTS

TETRA TECH ENVIRONMENT

Geneva Building, Lakeview Drive, Sherwood Business Park, Annesley, Nottingham, NG15 0ED
Tel: 01623 684550



TETRA TECH

GROUNDWATER / GAS MONITORING RECORD SHEET

Client:	D of E	Job No.:	784-B030162	Instruments Used:	Infrared gas analyser
Project:	Hinckley	Date:	02-Dec-21	Make / Model:	GA5000
Weather:	Clear, sunny	Monitored By:	SC	Serial Number:	

Installation No.	Elevation of cover (m agl)	Peak ¹		Steady ²					PID (ppm)	Total gas flow rate (l/hr)	Peak CH ₄ flow rate (l/hr)	Peak CO ₂ flow rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (mbgl)	Base Depth (m bgl)	Remarks
		CH ₄	CO ₂	CH ₄	CO ₂	O ₂	CO	H ₂ S								
		(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(ppm)	(ppm)								
BH01	0.00	0.1	2.9	0.1	2.9	15.5	0	0	1.1	-0.9	-0.001	-0.026	998	10.44	13.39	
WS01	0.00	0.1	0.3	0.1	0.3	21.1	0	0	0.2	0.0	0.000	0.000	999	DRY	4.35	
WS02	0.00	0.1	1.6	0.1	1.5	20.6	0	0	0.4	0.0	0.000	0.000	998	DRY	3.20	
WS03	0.00	0.1	3.5	0.1	3.2	18.5	0	0	0.2	0.0	0.000	0.000	997	DRY	3.71	

Background Gas Levels:

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.1	0.1	21.1	998
After Monitoring	0.1	0.1	21.0	999

Characteristic Gas Situation	
1	
2	
3	
4	

¹ The peak reading is the maximum recorded level during a monitoring event.

² The steady reading is the level which remained constant after approximately 1 minute.

Geneva Building, Lakeview Drive, Sherwood Business Park, Annesley, Nottingham, NG15 0ED
Tel: 01623 684550



TETRA TECH

GROUNDWATER / GAS MONITORING RECORD SHEET

[illegible]

Background Gas Levels:

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.1	0.1	20.9	972
After Monitoring	0.1	0.1	21.1	973

Characteristic Gas Situation	
1	
2	
3	
4	

¹ The peak reading is the maximum recorded level during a monitoring event.

² The steady reading is the level which remained constant after approximately 1 minute.

TETRA TECH ENVIRONMENT

Geneva Building, Lakeview Drive, Sherwood Business Park, Annesley, Nottingham, NG15 0ED
Tel: 01623 684550



GROUNDWATER / GAS MONITORING RECORD SHEET

Client:	D of E	Job No.:	784-B030162	Instruments Used:	Infrared gas analyser											
Project:	Hinckley	Date:	8.2.22	Make / Model:	GA5000											
Weather:	Overcast	Monitored By:	SC	Serial Number:												

Installation No.	Elevation of cover (m agl)	Peak ¹		Steady ²					PID (ppm)	Total gas flow rate (l/hr)	Peak CH ₄ flow rate (l/hr)	Peak CO ₂ flow rate (l/hr)	Atmospheric Pressure (mbar)	Water Depth (mbgl)	Base Depth (m bgl)	Remarks
		CH ₄	CO ₂	CH ₄	CO ₂	O ₂	CO	H ₂ S								
		(% vol)	(% vol)	(% vol)	(% vol)	(% vol)	(ppm)	(ppm)								
BH01	0.00	0.1	2.9	0.1	2.7	15.6	0	0	0.2	0.1	0.000	0.003	1010	10.22	13.36	
WS01	0.00	0.0	0.1	0.0	0.1	21.4	0	0	0.0	0.0	0.000	0.000	1010	DRY	4.34	
WS02	0.00	0.1	0.8	0.0	0.8	20.2	0	0	0.1	-2.5	-0.003	-0.020	1010	DRY	3.21	
WS03	0.00	0.1	1.2	0.1	1.2	18.6	0	0	0.2	0.0	0.000	0.000	1010	DRY	3.68	

Background Gas Levels:

	CH ₄ (%)	CO ₂ (%)	O ₂ (%)	Atmos (mbar)
Before Monitoring	0.1	0.1	20.8	1010
After Monitoring	0.1	0.1	21.1	1010

Characteristic Gas Situation	
1	
2	
3	
4	

¹ The peak reading is the maximum recorded level during a monitoring event.
² The steady reading is the level which remained constant after approximately 1 minute.

7 LABORATORY GEOTECHNICAL ASSESSMENT CERTIFICATES



Contract Number: 57009

Client Ref: **784-B030162**

Report Date: **17-12-2021**

Client PO:

Client **Tetra Tech**
WYG ENVIRONMENT
100 St John Street
London
EC1M 4EH

Contract Title: **Hinckley**
For the attention of: **Richard Tonge**

Date Received: **01-12-2021**

Date Completed: **17-12-2021**

Test Description	Qty
Moisture Content BS 1377:1990 - Part 2 : 3.2 - * UKAS	8
4 Point Liquid & Plastic Limit BS 1377:1990 - Part 2 : 4.3 & 5.3 - * UKAS	7
PSD Wet & Dry Sieve method BS 1377:1990 - Part 2 : 9.2 - * UKAS	10
PSD: Sedimentation by pipette carried out with Wet Sieve (Wet Sieve must also be selected) BS 1377:1990 - Part 2 : 9.4 - * UKAS	8
BRE Reduced Suite includes pH, water & acid soluble sulphate and total sulphur Sub-contracted Test	2
Water Soluble Sulphate 2:1 extract Sub-contracted Test	2
pH value of soil Sub-contracted Test	2

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)

Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)



Laboratory Report



Contract Number: 57009

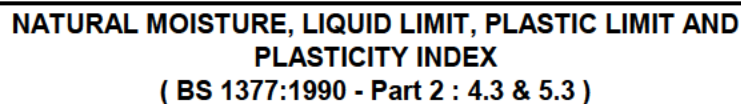
Test Description	Qty
Quick Undrained Triaxial Compression test - single specimen at one confining pressure (100mm or 38mm diameter) BS 1377:1990 - Part 7 : 8 - * UKAS	1
Samples Received - @ Non Accredited Test	28
Disposal of samples for job	1

Notes: Observations and Interpretations are outside the UKAS Accreditation
* - denotes test included in laboratory scope of accreditation
- denotes test carried out by approved contractor
@ - denotes non accredited tests

This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved Signatories:

Emma Sharp (Business Support Manager) - Paul Evans (Director) - Richard John (Quality/Technical Manager)
Shaun Jones (Laboratory manager) - Shaun Thomas (Site Manager) - Wayne Honey (Quality Assistant / Administrator / Health and Safety Coordinator)



Contract Number	57009	
Site Name	Hinckley	
Date Tested	09/12/2021	
	DESCRIPTIONS	

[illegible]

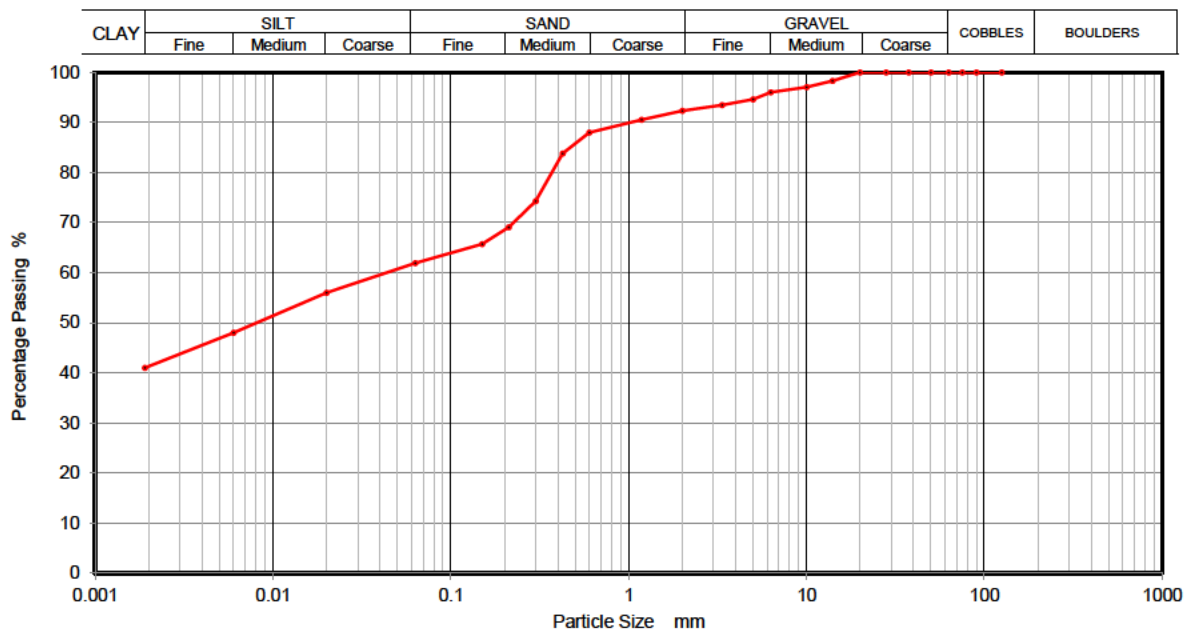
Operators	Checked	17/12/2021	Richard John (Advanced Testing Manager)
Darcy Etheridge	Approved	17/12/2021	Paul Evans (Quality/Technical Manager)





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	57009
		Borehole/Pit No.	BH01
Site Name	Hinckley	Sample No.	2
Soil Description	Brown slightly fine to medium gravelly silty fine to coarse sandy CLAY	Depth Top	1.30
		Depth Base	
Date Tested	14/12/2021	Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	56
90	100	0.0060	48
75	100	0.0020	41
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	98		
10	97		
6.3	96		
5	95		
3.35	93		
2	92		
1.18	91		
0.6	88		
0.425	84		
0.3	74		
0.212	69		
0.15	66		
0.063	62		

Sample Proportions	% dry mass
Cobbles	0
Gravel	8
Sand	30
Silt	21
Clay	41

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

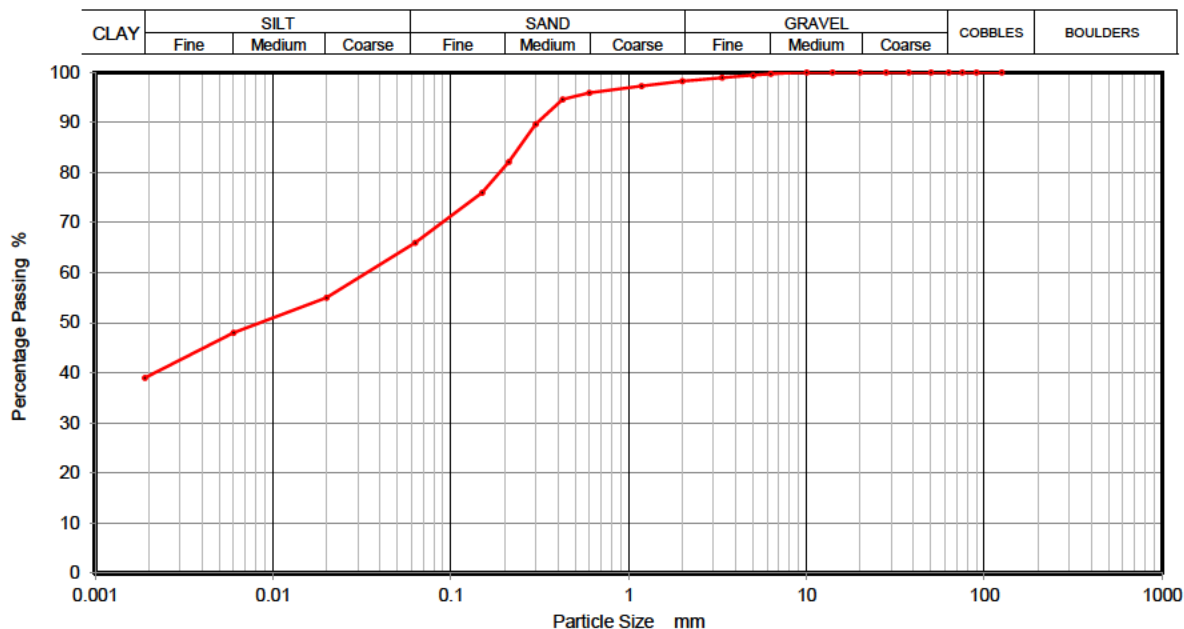
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	57009
	Borehole/Pit No. BH01
Site Name	Hinckley
Soil Description	Reddish brown slightly fine to medium gravelly silty fine to coarse sandy CLAY
	Depth Top 3.00
Date Tested	14/12/2021
Sample No.	4
Depth Base	
Sample Type	D



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	55
90	100	0.0060	48
75	100	0.0020	39
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	99		
3.35	99		
2	98		
1.18	97		
0.6	96		
0.425	95		
0.3	90		
0.212	82		
0.15	76		
0.063	66		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	32
Silt	27
Clay	39

Remarks

Preparation and testing in accordance with BS1377 unless noted below

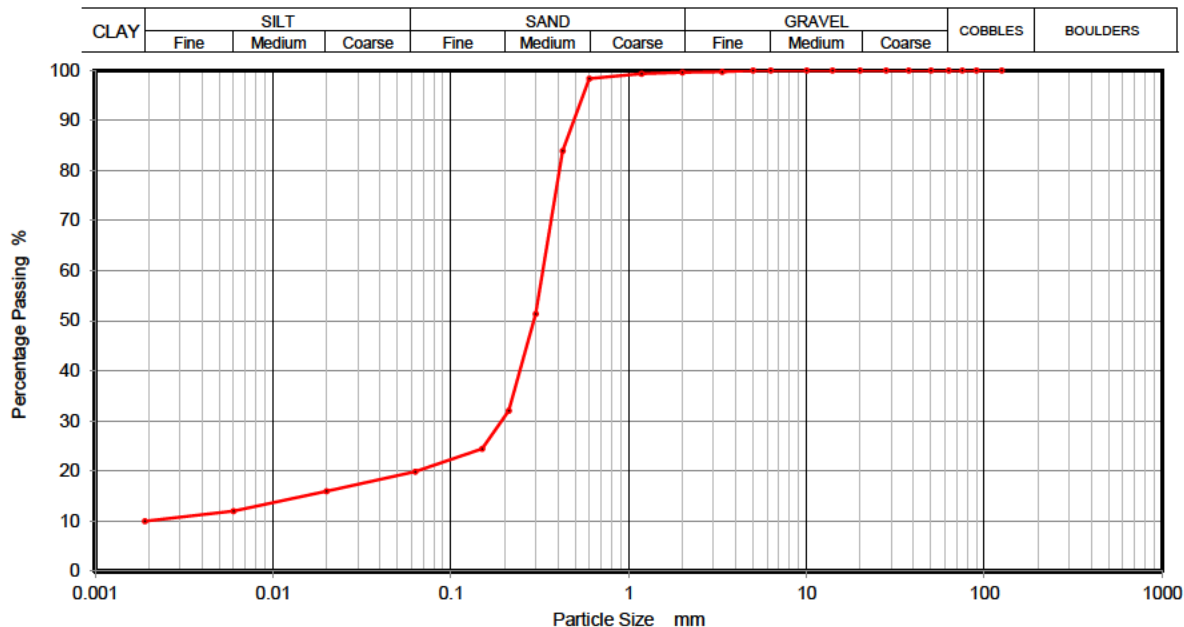
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	57009
		Borehole/Pit No.	BH01
Site Name	Hinckley	Sample No.	2
Soil Description	Brown silty clayey fine to coarse SAND	Depth Top	6.00
		Depth Base	6.45
Date Tested	14/12/2021	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	16
90	100	0.0060	12
75	100	0.0020	10
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	99		
0.6	98		
0.425	84		
0.3	51		
0.212	32		
0.15	24		
0.063	20		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	80
Silt	10
Clay	10

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 57009

Borehole/Pit No. BH01

Site Name Hinckley

Sample No. 3

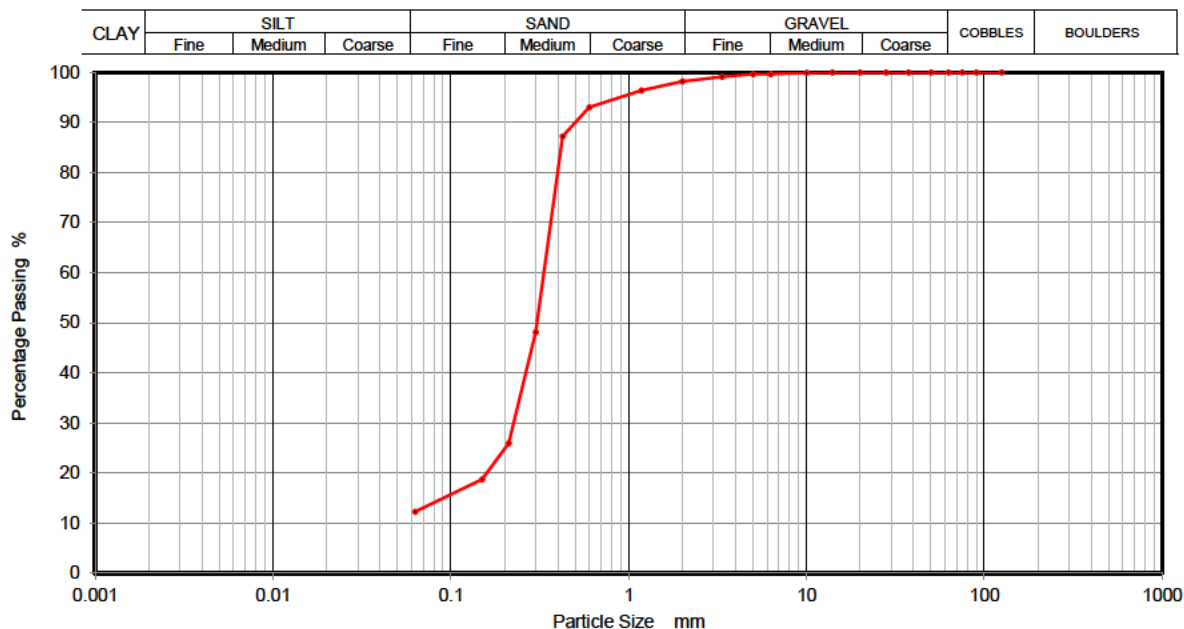
Soil Description Brown slightly fine to medium gravelly clayey/silty fine to coarse SAND

Depth Top 9.00

Depth Base 9.45

Date Tested 14/12/2021

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	99		
2	98		
1.18	96		
0.6	93		
0.425	87		
0.3	48		
0.212	26		
0.15	19		
0.063	12		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	86
Silt and Clay	12

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve, Clause 9.2

Contract Number 57009

Borehole/Pit No. BH01

Site Name Hinckley

Sample No. 4

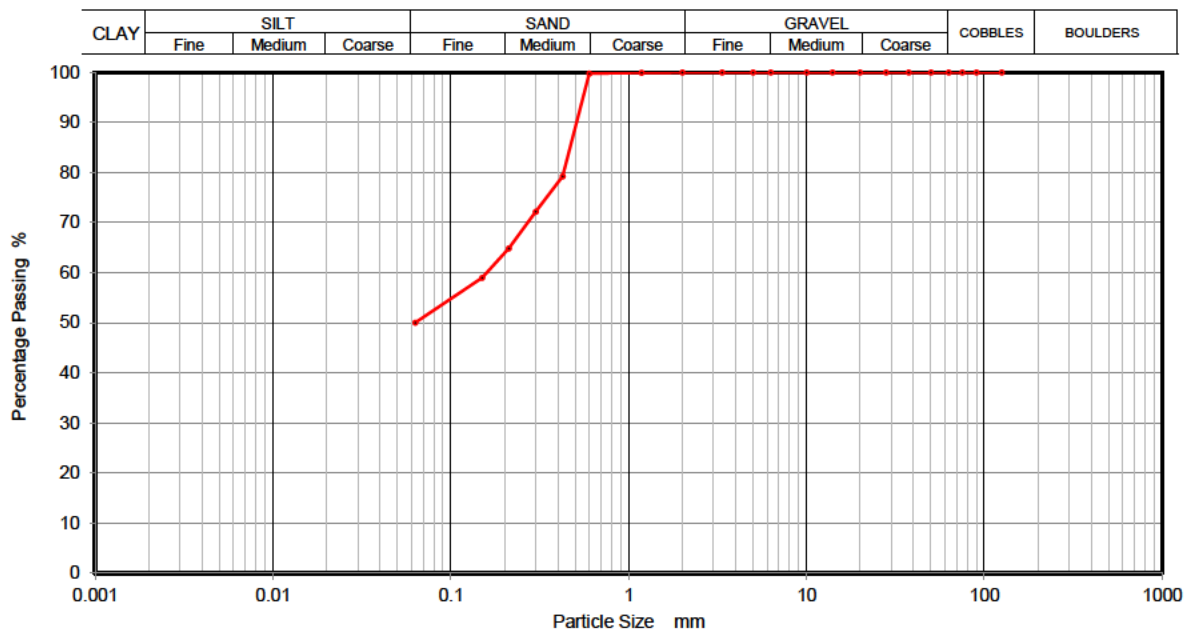
Soil Description Brown silty/clayey fine to medium SAND

Depth Top 14.50

Depth Base 14.95

Date Tested 14/12/2021

Sample Type B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100		
90	100		
75	100		
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	100		
5	100		
3.35	100		
2	100		
1.18	100		
0.6	100		
0.425	79		
0.3	72		
0.212	65		
0.15	59		
0.063	50		

Sample Proportions	% dry mass
Cobbles	0
Gravel	0
Sand	50
Silt and Clay	50

Remarks

Preparation and testing in accordance with BS1377 unless noted below

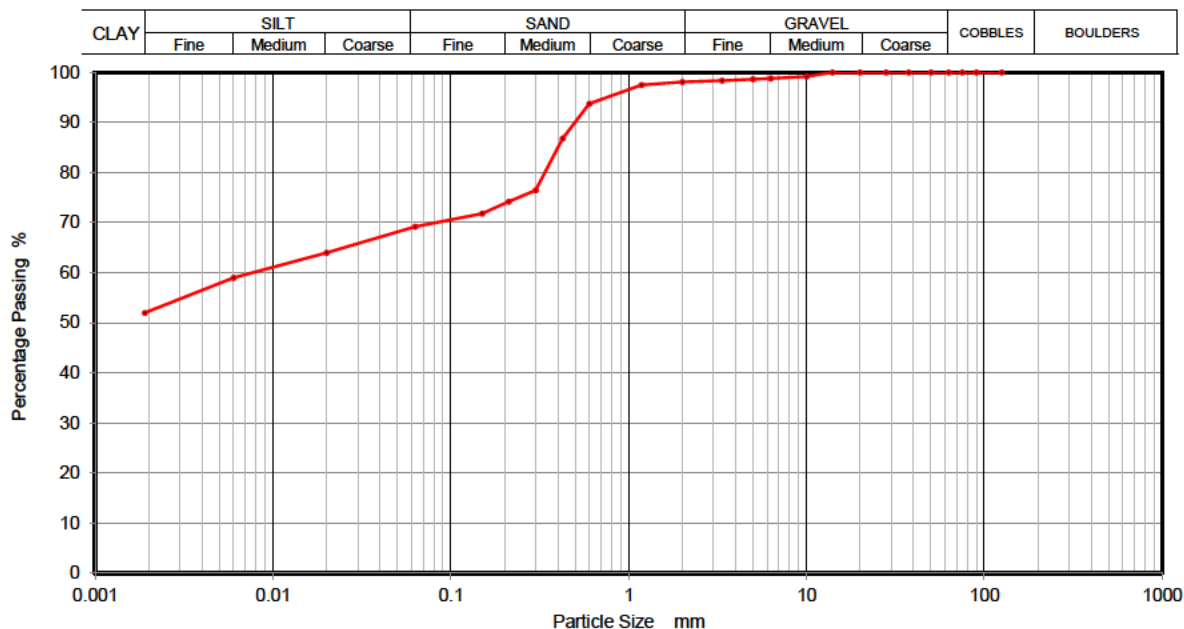
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	57009
	Borehole/Pit No. WS01
Site Name	Hinckley
Soil Description	Depth Top 2.50
	Depth Base 3.00
Date Tested	14/12/2021
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	64
90	100	0.0060	59
75	100	0.0020	52
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	99		
6.3	99		
5	99		
3.35	98		
2	98		
1.18	97		
0.6	94		
0.425	87		
0.3	76		
0.212	74		
0.15	72		
0.063	69		

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	29
Silt	17
Clay	52

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

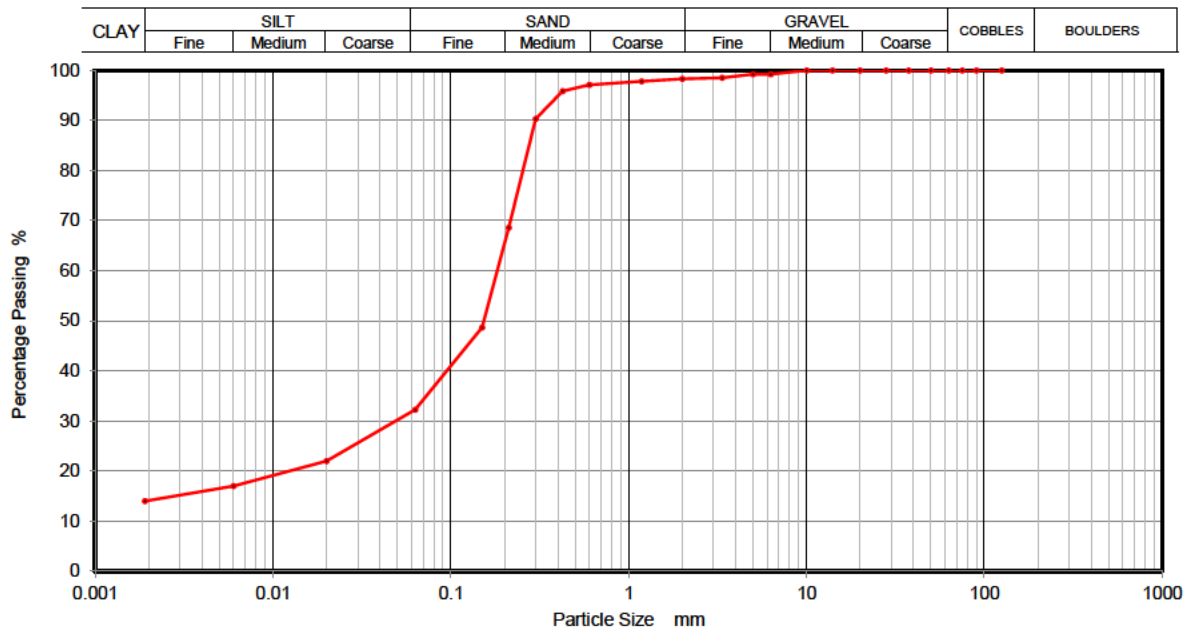
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

	PARTICLE SIZE DISTRIBUTION BS 1377 Part 2:1990 Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4	Contract Number	57009
		Borehole/Pit No.	WS01
Site Name	Hinckley	Sample No.	4
Soil Description	Reddish brown slightly fine to medium gravelly clayey silty fine to coarse SAND	Depth Top	4.60
		Depth Base	5.00
Date Tested	14/12/2021	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	22
90	100	0.0060	17
75	100	0.0020	14
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	99		
2	98		
1.18	98		
0.6	97		
0.425	96		
0.3	90		
0.212	69		
0.15	49		
0.063	32		

MC in accordance with BS1377 Part 2 1990 Clause 3.2	
Moisture Content %	11

Sample Proportions	% dry mass
Cobbles	0
Gravel	2
Sand	66
Silt	18
Clay	14

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

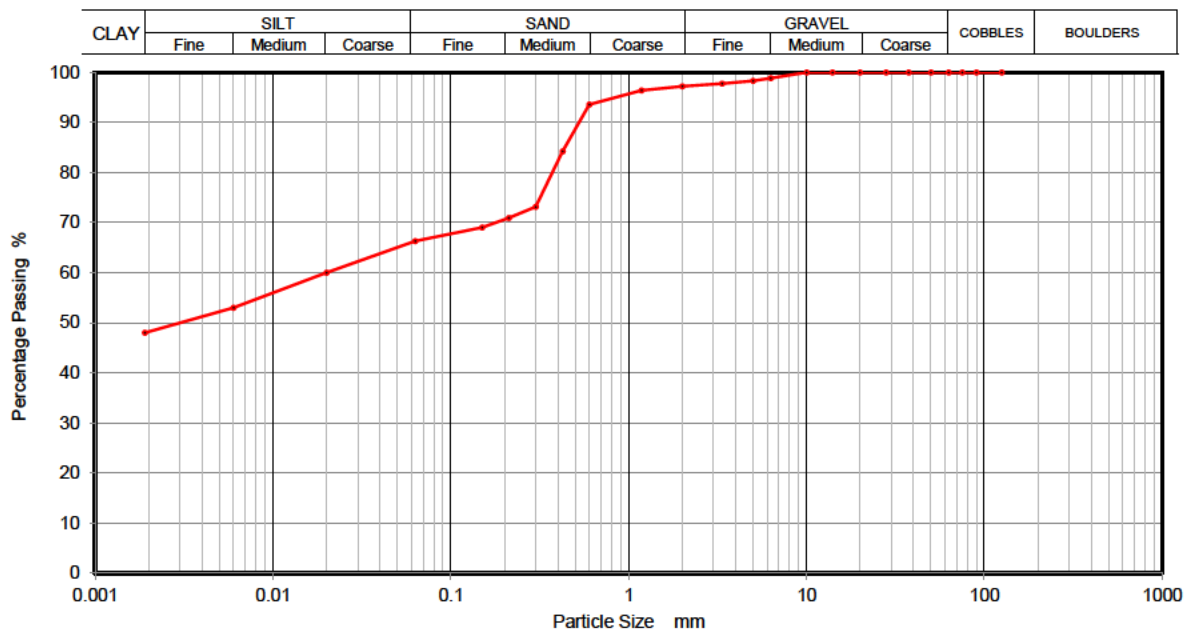
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	57009
	Borehole/Pit No. WS02
Site Name	Hinckley
Soil Description	Reddish brown slightly fine to medium gravelly silty fine to coarse sandy CLAY
	Depth Top 3.50
	Depth Base 3.80
Date Tested	14/12/2021
Sample Type	B



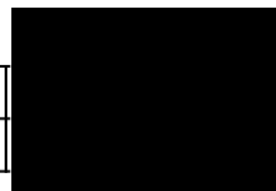
Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	60
90	100	0.0060	53
75	100	0.0020	48
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	98		
3.35	98		
2	97		
1.18	96		
0.6	94		
0.425	84		
0.3	73		
0.212	71		
0.15	69		
0.063	66		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	31
Silt	18
Clay	48

Remarks

Preparation and testing in accordance with BS1377 unless noted below

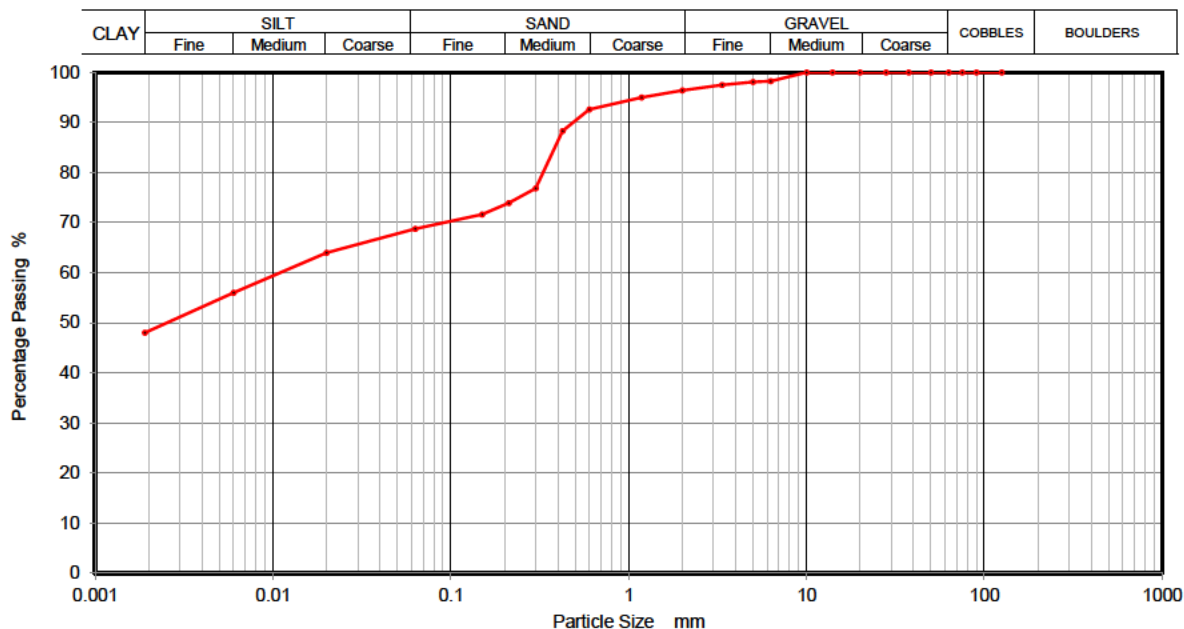
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

		Contract Number	57009
		Borehole/Pit No.	WS03
Site Name	Hinckley	Sample No.	2
Soil Description	Reddish brown slightly fine to medium gravelly silty fine to coarse sandy CLAY	Depth Top	2.50
		Depth Base	3.00
Date Tested	14/12/2021	Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	64
90	100	0.0060	56
75	100	0.0020	48
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	98		
5	98		
3.35	97		
2	96		
1.18	95		
0.6	93		
0.425	88		
0.3	77		
0.212	74		
0.15	72		
0.063	69		

Sample Proportions	% dry mass
Cobbles	0
Gravel	4
Sand	27
Silt	21
Clay	48

Remarks
 Preparation and testing in accordance with BS1377 unless noted below

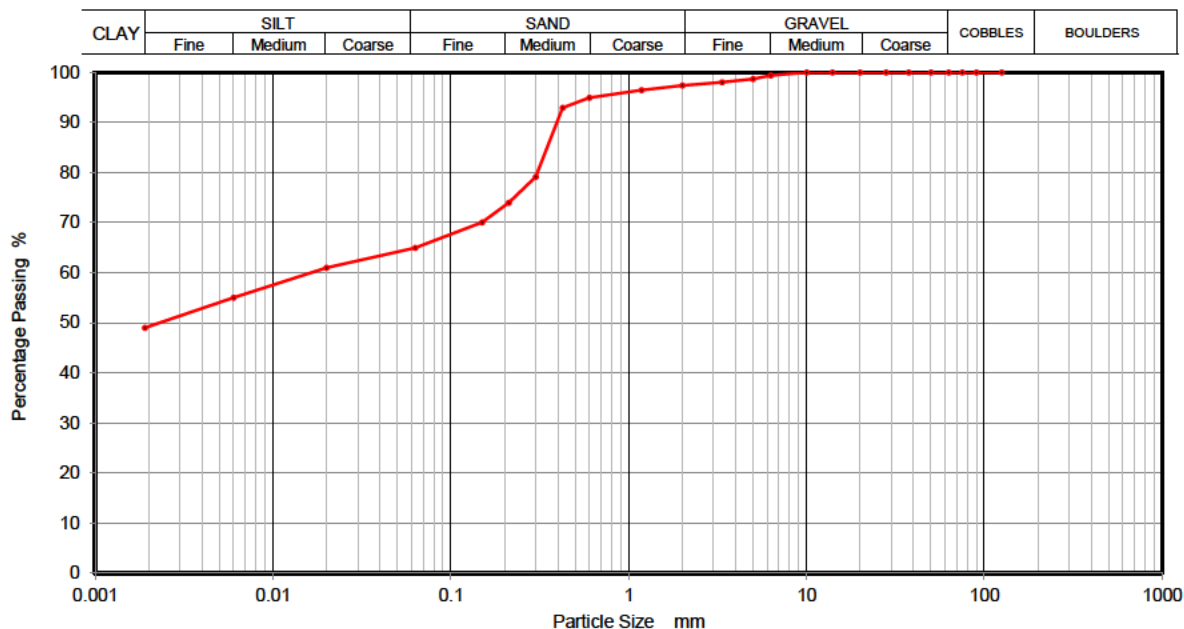
Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





PARTICLE SIZE DISTRIBUTION
BS 1377 Part 2:1990
Wet Sieve & Pipette Analysis, Clause 9.2 & 9.4

Contract Number	57009
	Borehole/Pit No.
Site Name	Hinckley
Soil Description	Reddish brown slightly fine to medium gravelly silty fine to coarse sandy CLAY
	Depth Top
Date Tested	14/12/2021
Sample No.	3
Depth Base	3.90
Sample Type	B



Sieving		Sedimentation	
Particle Size mm	% Passing	Particle Size mm	% Passing
125	100	0.0200	61
90	100	0.0060	55
75	100	0.0020	49
63	100		
50	100		
37.5	100		
28	100		
20	100		
14	100		
10	100		
6.3	99		
5	99		
3.35	98		
2	97		
1.18	96		
0.6	95		
0.425	93		
0.3	79		
0.212	74		
0.15	70		
0.063	65		

Sample Proportions	% dry mass
Cobbles	0
Gravel	3
Sand	32
Silt	16
Clay	49

Remarks

Preparation and testing in accordance with BS1377 unless noted below

Operator	Checked	16/12/2021	Richard John
David	Approved	17/12/2021	Paul Evans





**Single Stage Unconsolidated-Undrained Triaxial
Test
BS 1377 : 1990 Part 7 : 8**

Contract Number 57009

Borehole/Pit No. BH01

Site Name Hinckley

Sample No. 1

Soil Description Brown fine to medium gravelly silty CLAY

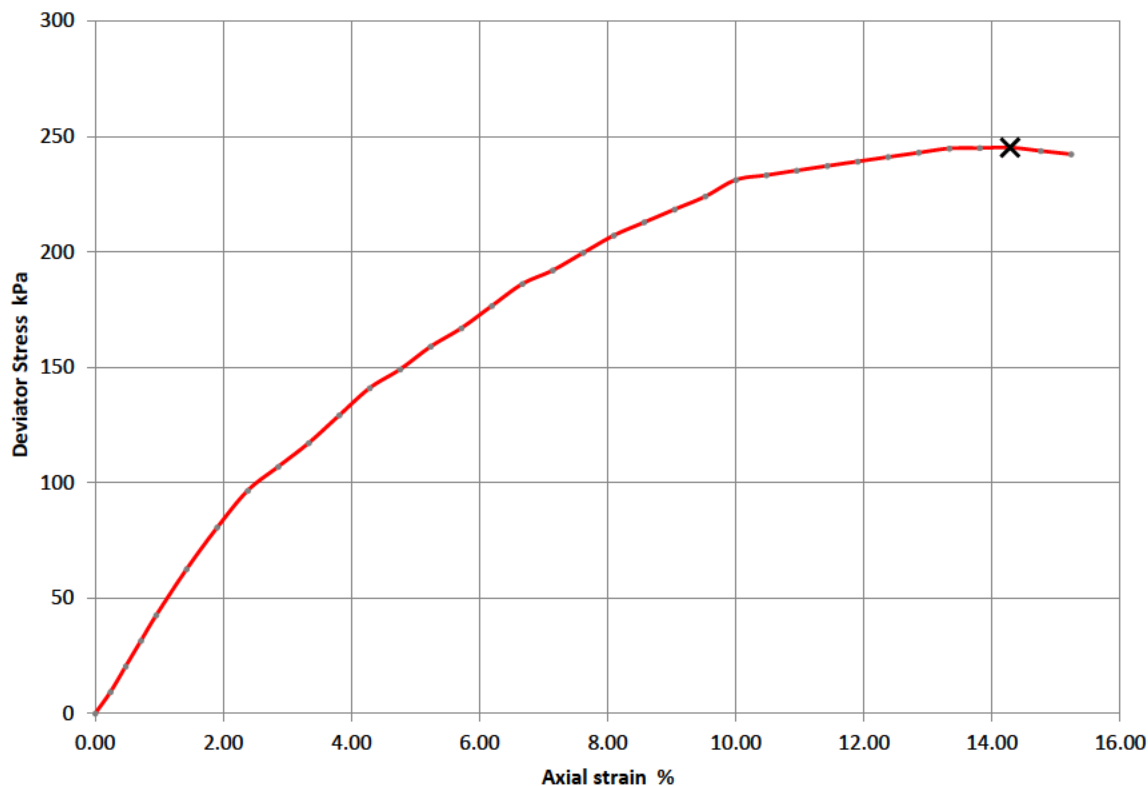
Depth Top (m) 2.50

Depth Base (m)

Date Tested 15/12/2021

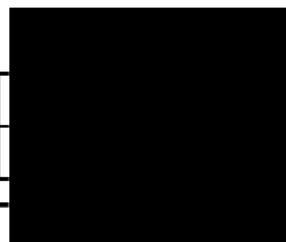
Sample Type U

Technician Daniel B



Moisture Content (%)	16
Bulk Density (Mg/m ³)	1.98
Dry Density (Mg/m ³)	1.71
Specimen Length (mm)	210
Specimen Diameter (mm)	105
Cell Pressure (kPa)	50
Deviator Stress (kPa)	245
Undrained Shear Strength (kPa)	123
Failure Strain (%)	14
Mode Of Failure	Brittle
Membrane Used/Thickness	Rubber/0.3mm
Rate of Strain (%/min)	1.43

Checked	16/12/2021	Richard John
Approved	17/12/2021	Paul Evans





ANALYTICAL TEST REPORT

Contract no: 103703

Contract name: Hinckley

Client reference: 784-B030162

Clients name: Geo Site & Testing Services

Clients address: Unit 3 and 4 Heol Aur
Dafen Industrial Estate, Dafen
Llanelli, Carmarthenshire
SA14 8QN

Samples received: 09 December 2021

Analysis started: 09 December 2021

Analysis completed: 16 December 2021

Report issued: 16 December 2021

Key

U	UKAS accredited test
M	MCERTS & UKAS accredited test
\$	Test carried out by an approved subcontractor
I/S	Insufficient sample to carry out test
N/S	Sample not suitable for testing

Approved by:



Rachael Burton
Reporting Team Lead

Chemtech Environmental Limited

SOILS

Lab number			103703-1	103703-2	103703-3	103703-4
Sample id			BH01	WS01	WS02	WS03
Depth (m)			1.50-1.95	2.50-3.00	1.50-2.00	1.50-2.00
Sample Type			D3	B2	B1	B1
Date sampled			-	-	-	-
Test	Method	Units				
pH	CE004 ^U	un ts	8.6	8.6	8.5	8.6
Sulphate (2:1 water soluble)	CE061 ^U	mg/l SO ₄	62	41	72	53
Sulphate (total)	CE062 ^U	mg/kg SO ₄	335	-	363	-
Sulphate (total)	CE062 ^U	% w/w SO ₄	0.03	-	0.04	-
Sulphur (total)	CE119	mg/kg S	159	-	185	-
Sulphur (total)	CE119	% w/w S	0.02	-	0.02	-

Chemtech Environmental Limited

METHOD DETAILS

METHOD	SOILS	METHOD SUMMARY	SAMPLE	STATUS	LOD	UNITS
CE004	pH	Based on BS 1377, pH Meter	As received	U	-	units
CE061	Sulphate (2:1 water soluble)	Aqueous extraction, ICP-OES	Dry	U	10	mg/l SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	100	mg/kg SO ₄
CE062	Sulphate (total)	Acid extraction, ICP-OES	Dry	U	0.01	% w/w SO ₄
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		100	mg/kg S
CE119	Sulphur (total)	Acid extraction, ICP-OES	Dry		0.01	% w/w S

Chemtech Environmental Limited

DEVIATING SAMPLE INFORMATION

Comments

Sample deviation is determined in accordance with the UKAS note "Guidance on Deviating Samples" and based on reference standards and laboratory trials.

For samples identified as deviating, test result(s) may be compromised and may not be representative of the sample at the time of sampling.

Chemtech Environmental Ltd cannot be held responsible for the integrity of sample(s) received if Chemtech Environmental Ltd did not undertake the sampling. Such samples may be deviating.

Key

N	No (not deviating sample)
Y	Yes (deviating sample)
NSD	Sampling date not provided
NST	Sampling time not provided (waters only)
EHT	Sample exceeded holding time(s)
IC	Sample not received in appropriate containers
HP	Headspace present in sample container
NCF	Sample not chemically fixed (where appropriate)
OR	Other (specify)

Lab ref	Sample id	Depth (m)	Deviating	Tests (Reason for deviation)
103730-1	BH01	1.50-1.95	Y	All (NSD)
103730-2	WS01	2.50-3.00	Y	All (NSD)
103730-3	WS02	1.50-2.00	Y	All (NSD)
103730-4	WS03	1.50-2.00	Y	All (NSD)

Chemtech Environmental Limited

Additional Information

Notes

Opinions and interpretations expressed herein are outside the UKAS accreditation scope.

Unless otherwise stated, Chemtech Environmental Ltd was not responsible for sampling.

All testing carried out at Unit 6 Parkhead, Stanley, DH9 7YB, except for subcontracted testing.

Methods, procedures and performance data are available on request.

Results reported herein relate only to the material supplied to the laboratory.

This report shall not be reproduced except in full, without prior written approval.

Samples will be disposed of 6 weeks from initial receipt unless otherwise instructed.

For soils and solids, all results are reported on a dry basis. Samples dried at no more than 30°C in a drying cabinet.

Analytical results are inclusive of stones, where applicable.

8 LABORATORY GEOENVIRONMENTAL ASSESSMENT CERTIFICATES

Tetra Tech
11th Floor, 1 Angel Court,
London
EC2R 7HJ



Attention :	Richard Tonge
Date :	30th November, 2021
Your reference :	B030162
Our reference :	Test Report 21/18688 Batch 1
Location :	Hinckley
Date samples received :	25th November, 2021
Status :	Final Report
Issue :	1

Ten samples were received for analysis on 25th November, 2021 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge
EMT Job No: 21/18688

Report : Solid

Solids V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-3	4-6	10-12	13-15	16-18	28-30					Please see attached notes for all abbreviations and acronyms		
Sample ID	WS01	WS02	IP01	IP02	IP03	WS03							
Depth	0 20	0 30	0 50	0 50	0 50	0 90							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T							
Sample Date	20/11/2021	20/11/2021	20/11/2021	20/11/2021	20/11/2021	20/11/2021							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021	25/11/2021					LOD/LOR	Units	Method No.
Arsenic [#]	10.2	6.2	14.8	20.7	16.5	14.4					<0.5	mg/kg	TM30/PM15
Beryllium	1.3	1.2	1.5	1.6	1.6	1.6					<0.5	mg/kg	TM30/PM15
Cadmium [#]	0.2	0.1	0.3	0.4	0.4	0.4					<0.1	mg/kg	TM30/PM15
Chromium [#]	55.7	46.0	53.7	62.7	60.4	60.0					<0.5	mg/kg	TM30/PM15
Copper [#]	23	20	28	36	33	30					<1	mg/kg	TM30/PM15
Lead [#]	30	13	57	66	90	65					<5	mg/kg	TM30/PM15
Mercury [#]	<0.1	<0.1	<0.1	<0.1	0.2	<0.1					<0.1	mg/kg	TM30/PM15
Nickel [#]	29.1	28.0	29.3	28.6	26.7	27.6					<0.7	mg/kg	TM30/PM15
Selenium [#]	<1	<1	1	<1	<1	1					<1	mg/kg	TM30/PM15
Vanadium	44	38	41	50	48	45					<1	mg/kg	TM30/PM15
Water Soluble Boron [#]	1.4	0.8	1.9	1.7	1.6	1.4					<0.1	mg/kg	TM74/PM32
Zinc [#]	83	64	119	127	108	89					<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene [#]	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03					<0.03	mg/kg	TM4/PM8
Acenaphthene [#]	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05					<0.05	mg/kg	TM4/PM8
Fluorene [#]	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
Phenanthrene [#]	<0.03	<0.03	0.17	0.36	<0.03	<0.03					<0.03	mg/kg	TM4/PM8
Anthracene [#]	<0.04	<0.04	0.09	0.09	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
Fluoranthene [#]	<0.03	<0.03	0.38	0.71	0.09	0.07					<0.03	mg/kg	TM4/PM8
Pyrene [#]	<0.03	<0.03	0.33	0.57	0.08	0.06					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene [#]	<0.06	<0.06	0.21	0.30	0.09	<0.06					<0.06	mg/kg	TM4/PM8
Chrysene [#]	<0.02	<0.02	0.18	0.30	0.05	0.05					<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene [#]	<0.07	<0.07	0.33	0.44	0.10	<0.07					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene [#]	<0.04	<0.04	0.16	0.23	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene [#]	<0.04	<0.04	0.15	0.20	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene [#]	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene [#]	<0.04	<0.04	0.15	0.15	<0.04	<0.04					<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	2.2	3.4	<0.6	<0.6					<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	0.24	0.32	0.07	<0.05					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	0.09	0.12	0.03	<0.02					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	92	96	95	96	98					<0	%	TM4/PM8
EPH >C10-C40 (EH_1D_Total) [#]	<30	<30	258	182	30	<30					<30	mg/kg	TM5/PM8
GRO (>C5-C10) (HS_1D_Total)	<0.1	<0.1	0.3	<0.1	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
MTBE [#]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM36/PM12
Benzene [#]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM36/PM12
Toluene [#]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM36/PM12
Ethylbenzene [#]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM36/PM12
m/p-Xylene [#]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM36/PM12
o-Xylene [#]	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005					<0.005	mg/kg	TM36/PM12

Element Materials Technology

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge
EMT Job No: 21/18688

Report : CEN 10:1 1 Batch

Solids V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	22-24	28-30									Please see attached notes for all abbreviations and acronyms		
Sample ID	WS01	WS03											
Depth	0.90	0.90											
COC No / misc													
Containers	V J T	V J T											
Sample Date	20/11/2021	20/11/2021											
Sample Type	Soil	Soil											
Batch Number	1	1									LOD/LOR	Units	Method No.
Date of Receipt	25/11/2021	25/11/2021											
Dissolved Antimony [#]	<2	2									<2	ug/l	TM30/PM14
Dissolved Arsenic [#]	<2.5	<2.5									<2.5	ug/l	TM30/PM14
Dissolved Barium [#]	79	29									<3	ug/l	TM30/PM14
Dissolved Boron [#]	25	15									<12	ug/l	TM30/PM14
Dissolved Cadmium [#]	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Chromium [#]	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper [#]	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead [#]	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury [#]	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel [#]	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium [#]	<3	<3									<3	ug/l	TM30/PM14
Dissolved Zinc [#]	<3	<3									<3	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1 ^{SV}	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Acenaphthene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Fluorene	0.03 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Phenanthrene	0.03 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Anthracene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Fluoranthene	0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Pyrene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Benzo(a)anthracene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Chrysene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Benzo(bk)fluoranthene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Benzo(a)pyrene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
PAH 16 Total	<0.1 ^{SV}	<0.1									<0.1	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01 ^{SV}	<0.01									<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	67 ^{SV}	73									<0	%	TM4/PM30
EPH (C8-C44)	<10	<10									<10	ug/l	TM5/PM30
GRO (>C5-C10)	<100	<100									<100	ug/l	TM36/PM69
Total Phenols HPLC	<0.005	<0.005									<0.005	mg/l	TM26/PM0
Sulphate as SO4 [#]	13.7	3.7									<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as NH4 [#]	0.10	0.03									<0.03	mg/l	TM38/PM0
pH	7.61	6.50									<0.01	pH units	TM73/PM0

Element Materials Technology

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge
EMT Job No: 21/18688

Report : CEN 10:1 1 Batch

Solids V=60g VOC jar, J=250g glass jar, T=plastic tub

[illegible]

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge

Note

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Date Of Analysis	Analysis	Result
21/18688	1	WS01	0.20	3	26/11/2021	General Description (Bulk Analysis)	Soil/Stone
					26/11/2021	Asbestos Fibres	NAD
					26/11/2021	Asbestos ACM	NAD
					26/11/2021	Asbestos Type	NAD
					26/11/2021	Asbestos Level Screen	NAD
21/18688	1	WS02	0.30	6	26/11/2021	General Description (Bulk Analysis)	Soil/Stone
					26/11/2021	Asbestos Fibres	NAD
					26/11/2021	Asbestos ACM	NAD
					26/11/2021	Asbestos Type	NAD
					26/11/2021	Asbestos Level Screen	NAD
21/18688	1	IP01	0.50	12	26/11/2021	General Description (Bulk Analysis)	Soil/Stone
					26/11/2021	Asbestos Fibres	NAD
					26/11/2021	Asbestos ACM	NAD
					26/11/2021	Asbestos Type	NAD
					26/11/2021	Asbestos Level Screen	NAD
21/18688	1	IP02	0.50	15	26/11/2021	General Description (Bulk Analysis)	Soil/Stone
					26/11/2021	Asbestos Fibres	NAD
					26/11/2021	Asbestos ACM	NAD
					26/11/2021	Asbestos Type	NAD
					26/11/2021	Asbestos Level Screen	NAD
21/18688	1	IP03	0.50	18	26/11/2021	General Description (Bulk Analysis)	Soil/Stone
					26/11/2021	Asbestos Fibres	NAD
					26/11/2021	Asbestos ACM	NAD
					26/11/2021	Asbestos Type	NAD
					26/11/2021	Asbestos Level Screen	NAD
21/18688	1	WS03	0.90	30	26/11/2021	General Description (Bulk Analysis)	Soil/Stone
					26/11/2021	Asbestos Fibres	NAD
					26/11/2021	Asbestos ACM	NAD
					26/11/2021	Asbestos Type	NAD
					26/11/2021	Asbestos Level Screen	NAD

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/18688

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/18688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5 2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270D v5 2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5 2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCF D. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCF D. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009; SO LS by Modified USEPA 6010B, Rev 2, Dec.1996; Modified EPA Method 3050B, Rev 2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes		AR	Yes

EMT Job No: 21/18688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009: SO LS by Modified USEP 6010B, Rev 2, Dec.1996; Modified EPA Method 3050B, Rev 2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009: SO LS by Modified USEP 6010B, Rev 2, Dec.1996; Modified EPA Method 3050B, Rev 2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM69	One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev 2 1993), o-Phosphate 365.2 (Rev 2 1993), TON 353.1 (Rev 2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev 2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev 2 1993), o-Phosphate 365.2 (Rev 2 1993), TON 353.1 (Rev 2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev 2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1 2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No

EMT Job No: 21/18688

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.			AR	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2 2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.			AR	

Tetra Tech
11th Floor, 1 Angel Court,
London
EC2R 7HJ



Attention :	Richard Tonge
Date :	24th December, 2021
Your reference :	B030162
Our reference :	Test Report 21/19421 Batch 1
Location :	Hinckley Academy
Date samples received :	4th December, 2021
Status :	Final report
Issue :	1

Three samples were received for analysis on 4th December, 2021 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Authorised By:



Phil Sommerton BSc
Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley Academy
Contact: Richard Tonge
EMT Job No: 21/19421

Report : Solid

Solids V=60g VOC jar, J=250g glass jar, T=plastic tub

EMT Sample No.	1-4	5-8									Please see attached notes for all abbreviations and acronyms		
Sample ID	IP05	IP05											
Depth	0.10	0.20											
COC No / misc													
Containers	V J T	V J T											
Sample Date	02/12/2021	02/12/2021											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	04/12/2021	04/12/2021									LOD/LOR	Units	Method No.
Arsenic #	10.6	7.4									<0.5	mg/kg	TM30/PM15
Beryllium	1.2	3.1									<0.5	mg/kg	TM30/PM15
Cadmium #	0.5	1.5									<0.1	mg/kg	TM30/PM15
Chromium #	72.1	35.9									<0.5	mg/kg	TM30/PM15
Copper #	24	53									<1	mg/kg	TM30/PM15
Lead #	62	72									<5	mg/kg	TM30/PM15
Mercury #	0.1	0.2									<0.1	mg/kg	TM30/PM15
Nickel #	22.7	48.9									<0.7	mg/kg	TM30/PM15
Selenium #	1	<1									<1	mg/kg	TM30/PM15
Vanadium	42	62									<1	mg/kg	TM30/PM15
Water Soluble Boron #	2.1	2.1									<0.1	mg/kg	TM74/PM32
Zinc #	160	546									<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03									<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05									<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.14	<0.03									<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.28	<0.03									<0.03	mg/kg	TM4/PM8
Pyrene #	0.21	<0.03									<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.14	<0.06									<0.06	mg/kg	TM4/PM8
Chrysene #	0.11	<0.02									<0.02	mg/kg	TM4/PM8
Benzo(b)fluoranthene #	0.18	<0.07									<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.11	<0.04									<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.07	<0.04									<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04									<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.07	<0.04									<0.04	mg/kg	TM4/PM8
PAH 16 Total	1.3	<0.6									<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.13	<0.05									<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.05	<0.02									<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	99	93									<0	%	TM4/PM8
EPH >C10-C40 (EH_1D_Total) #	62	<30									<30	mg/kg	TM5/PM8
GRO (>C5-C10) (HS_1D_Total)	0.2										<0.1	mg/kg	TM36/PM12
MTBE #	<0.005										<0.005	mg/kg	TM36/PM12
Benzene #	<0.005										<0.005	mg/kg	TM36/PM12
Toluene #	0.015										<0.005	mg/kg	TM36/PM12
Ethylbenzene #	<0.005										<0.005	mg/kg	TM36/PM12
m/p-Xylene #	<0.005										<0.005	mg/kg	TM36/PM12
o-Xylene #	<0.005										<0.005	mg/kg	TM36/PM12

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley Academy
Contact: Richard Tonge
EMT Job No: 21/19421

Solids V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley Academy
Contact: Richard Tonge

Note

Asbestos Screen analysis is carried out in accordance with our documented in-house methods PM042 and TM065 and HSG 248 by Stereo and Polarised Light Microscopy using Dispersion Staining Techniques and is covered by our UKAS accreditation. Detailed Gravimetric Quantification and PCOM Fibre Analysis is carried out in accordance with our documented in-house methods PM042 and TM131 and HSG 248 using Stereo and Polarised Light Microscopy and Phase Contrast Optical Microscopy (PCOM). Samples are retained for not less than 6 months from the date of analysis unless specifically requested.

Opinions, including ACM type and Asbestos level less than 0.1%, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Element Materials Technology consultant, Element Materials Technology cannot be responsible for inaccurate or unrepresentative sampling.

[illegible]

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley Academy
Contact: Richard Tonge

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19421

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

Please include all sections of this report if it is reproduced

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19421

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5 2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5 2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCF D. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.	Yes		AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009: SO LS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009: SO LS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-F D. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-F D. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

EMT Job No: 21/19421

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365 2 (Rev.2 1993), TON 353.1 (Rev 2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 First edition (2006)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1 2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

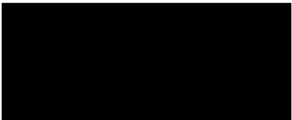
Tetra Tech
11th Floor, 1 Angel Court,
London
EC2R 7HJ



Attention :	Richard Tonge
Date :	17th December, 2021
Your reference :	B030162
Our reference :	Test Report 21/19883 Batch 1
Location :	Hinckley
Date samples received :	11th December, 2021
Status :	Final Report
Issue :	1

One sample was received for analysis on 11th December, 2021 and was scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.



Bruce Leslie
Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge
EMT Job No: 21/19883

Report : Liquid

Liquids/products V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HNO₃

EMT Sample No.	1-7										Please see attached notes for all abbreviations and acronyms		
Sample ID	BH01												
Depth													
COC No / misc													
Containers	V H H N N P G												
Sample Date	08/12/2021												
Sample Type	Ground Water												
Batch Number	1												
Date of Receipt	11/12/2021										LOD/LOR	Units	Method No.
Dissolved Antimony [#]	<2										<2	ug/l	TM30/PM14
Dissolved Arsenic [#]	<2.5										<2.5	ug/l	TM30/PM14
Dissolved Barium [#]	199										<3	ug/l	TM30/PM14
Dissolved Boron	64										<12	ug/l	TM30/PM14
Dissolved Cadmium [#]	<0.5										<0.5	ug/l	TM30/PM14
Total Dissolved Chromium [#]	3.0										<1.5	ug/l	TM30/PM14
Dissolved Copper [#]	<7										<7	ug/l	TM30/PM14
Dissolved Lead [#]	<5										<5	ug/l	TM30/PM14
Dissolved Mercury [#]	<1										<1	ug/l	TM30/PM14
Dissolved Nickel [#]	<2										<2	ug/l	TM30/PM14
Dissolved Selenium [#]	<3										<3	ug/l	TM30/PM14
Dissolved Zinc [#]	32										<3	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1										<0.1	ug/l	TM4/PM30
Acenaphthylene	<0.01										<0.01	ug/l	TM4/PM30
Acenaphthene	<0.01										<0.01	ug/l	TM4/PM30
Fluorene	<0.01										<0.01	ug/l	TM4/PM30
Phenanthrene	<0.01										<0.01	ug/l	TM4/PM30
Anthracene	<0.01										<0.01	ug/l	TM4/PM30
Fluoranthene	<0.01										<0.01	ug/l	TM4/PM30
Pyrene	0.01										<0.01	ug/l	TM4/PM30
Benzo(a)anthracene	<0.01										<0.01	ug/l	TM4/PM30
Chrysene	<0.01										<0.01	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01										<0.01	ug/l	TM4/PM30
Benzo(a)pyrene	<0.01										<0.01	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.01										<0.01	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01										<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.01										<0.01	ug/l	TM4/PM30
PAH 16 Total	<0.1										<0.1	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.01										<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.01										<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	70										<0	%	TM4/PM30
GRO (>C5-C10)	<10										<10	ug/l	TM36/PM12
EPH (C8-C44)	<10										<10	ug/l	TM5/PM30
Phenol [#]	<0.01										<0.01	mg/l	TM26/PM0
Sulphate as SO4 [#]	57.9										<0.5	mg/l	TM38/PM0
Ammoniacal Nitrogen as NH4 [#]	0.11										<0.03	mg/l	TM38/PM0

Element Materials Technology

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge
EMT Job No: 21/19883

Report : Liquid

Liquids/products V=40ml vial, G=glass bottle, P=plastic bottle
H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃

[illegible]

Client Name: Tetra Tech
Reference: B030162
Location: Hinckley
Contact: Richard Tonge

[illegible]

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating. Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 21/19883

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Sufficient amount of sample must be received to carry out the testing specified. Where an insufficient amount of sample has been received the testing may not meet the requirements of our accredited methods, as such accreditation may be removed.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

The calculation of Pyrite content assumes that all oxidisable sulphides present in the sample are pyrite. This may not be the case. The calculation may be an overestimate when other sulphides such as Barite (Barium Sulphate) are present.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 accreditation applies to surface water and groundwater and usually one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. The temperature of sample receipt is recorded on the confirmation schedules in order that the client can make an informed decision as to whether testing should still be undertaken.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

BLANKS

Where analytes have been found in the blank, the sample will be treated in accordance with our laboratory procedure for dealing with contaminated blanks.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.

Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

REPORTS FROM THE SOUTH AFRICA LABORATORY

Any method number not prefixed with SA has been undertaken in our UK laboratory unless reported as subcontracted.

Measurement Uncertainty

Measurement uncertainty defines the range of values that could reasonably be attributed to the measured quantity. This range of values has not been included within the reported results. Uncertainty expressed as a percentage can be provided upon request.

ABBREVIATIONS and ACRONYMS USED

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NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above calibration range, the result should be considered the minimum value. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

HWOL ACRONYMS AND OPERATORS USED

HS	Headspace Analysis.
EH	Extractable Hydrocarbons - i.e. everything extracted by the solvent.
CU	Clean-up - e.g. by florisil, silica gel.
1D	GC - Single coil gas chromatography.
Total	Aliphatics & Aromatics.
AL	Aliphatics only.
AR	Aromatics only.
2D	GC-GC - Double coil gas chromatography.
#1	EH_Total but with humics mathematically subtracted
#2	EU_Total but with fatty acids mathematically subtracted
_	Operator - underscore to separate acronyms (exception for +).
+	Operator to indicate cumulative e.g. EH+HS_Total or EH_CU+HS_Total
MS	Mass Spectrometry.

EMT Job No: 21/19883

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5 2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCF D. For waters the solvent extracts dissolved phase plus a sheen if present.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.	Yes			
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009: SO LS by Modified USEP 6010B, Rev 2, Dec.1996; Modified EPA Method 3050B, Rev 2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev 2, Dec 1996; Modified BS EN ISO 11885:2009: SO LS by Modified USEP 6010B, Rev 2, Dec.1996; Modified EPA Method 3050B, Rev 2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-F D. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev 2 1993), o-Phosphate 365 2 (Rev 2 1993), TON 353.1 (Rev 2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev 2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM75	Modified US EPA method 310.1 (1978). Determination of Alkalinity by Metrohm automated titration analyser.	PM0	No preparation is required.	Yes			

9 QUALITATIVE RISK ASSESSMENT MATRIX

This qualitative risk assessment has been undertaken in accordance with CIRIA C552: Contaminated Land Risk Assessment, A Guide to Good Practice (Rudland et al., 2001). The CIRIA C552 risk categories and the assessment methodology are detailed in the following Table 15.

Table 15 Definition of Magnitude of Consequence

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species.

The likelihood of an event (probability) takes into account both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given in Table 16.

Table 16 Definition of Probability of Exposure

Category	Definition
High Likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low Likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.
Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the matrix presented in Table 17, in order to give a level of risk for each potential hazard.

Table 17 Risk Assessment Matrix

		Potential Severity			
		Severe	Medium	Mild	Minor
Probability of Risk	High Likelihood	Very High	High	Moderate	Low / Moderate
	Likely	High	Moderate	Low / Moderate	Low
	Low Likelihood	Moderate	Low / Moderate	Low	Very Low
	Unlikely	Low / Moderate	Low	Very Low	Very Low

Appendix E – Severn Trent Asset Maps



John
Cleveland
College

Date: 08/08/21

Scale: 1:1250

Map Centre: 443935,294391

Data updated: 14/07/21

Our Ref: 617667 - 2

Clean Water Plan

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Hydrant	Wave	Aspect
		
		
Motor	Water Main	Duct

utilitysite@outlook.com



GENERAL CONDITIONS AND PRECAUTIONS TO BE TAKEN WHEN CARRYING OUT WORK ADJACENT TO SEVERN TRENT WATERS APPARATUS

Please ensure that a copy of these conditions is passed to your representative and/or your contractor on site. If any damage is caused to Severn Trent Water Limited (STW) apparatus (defined below), the person, contractor or subcontractor responsible must inform STW immediately on: **0800 783 4444 (24 hours)**

- These general conditions and precautions apply to the public, sewerage, water distribution and cables in ducts including (but not limited to) sewers which are the subject of an Agreement under Section 104 of the Water Industry Act 1991(a legal agreement between a developer and STW, where a developer agrees to build sewers to an agreed standard, which STW will then adopt), mains installed in accordance with an agreement for the self-construction of water mains entered into with STW and the assets described at condition 1) of these general conditions and precautions. Such apparatus is referred to as STW Apparatus in these general conditions and precautions.
- Please be aware that due to The Private Sewers Transfer Regulations June 2011, the number of public sewers has increased, but many of these are not shown on the public sewer record. However, some idea of their positions may be obtained from the position of inspection covers and their existence must be anticipated.
- On request, STW will issue a copy of the plan showing the approximate locations of STW Apparatus although in certain instances a charge will be made. The position of private drains, private sewers and water service pipes to properties are not normally shown but their presence must be anticipated. This plan and the information supplied with it is furnished as a general guide only and STW does not guarantee its accuracy.
- STW does not update these plans on a regular basis. Therefore the position and depth of STW Apparatus may change and this plan is issued subject to any such change. Before any works are carried out, you should confirm whether any changes to the plan have been made since it was issued.
- The plan must not be relied upon in the event of excavations or other works in the vicinity of STW Apparatus. It is your responsibility to ascertain the precise location of any STW Apparatus prior to undertaking any development or other works (including but not limited to excavations).
- No person or company shall be relieved from liability for loss and/or damage caused to STW Apparatus by reason of the actual position and/or depths of STW Apparatus being different from those shown on the plan.

In order to achieve safe working conditions adjacent to any STW Apparatus the following should be observed:

- All STW Apparatus should be located by hand digging prior to the use of mechanical excavators.
- All information set out in any plans received from us, or given by our staff at the site of the works, about the position and depth of the mains, is approximate. Every possible precaution should be taken to avoid damage to STW Apparatus. You or your contractor must ensure the safety of STW Apparatus and will be responsible for the cost of repairing any loss and/or damage caused (including without limitation replacement parts).
- Water mains are normally laid at a depth of 900mm. No records are kept of customer service pipes which are normally laid at a depth of 750mm, but some idea of their positions may be obtained from the position of stop tap covers and their existence must be anticipated.
- During construction work, where heavy plant will cross the line of STW Apparatus, specific crossing points must be agreed with STW and suitably reinforced where required. These crossing points should be clearly marked and crossing of the line of STW Apparatus at other locations must be prevented.
- Where it is proposed to carry out piling or boring within 20 metres of any STW Apparatus, STW should be consulted to enable any affected STW Apparatus to be surveyed prior to the works commencing.
- Where excavation of trenches adjacent to any STW Apparatus affects its support, the STW Apparatus must be supported to the satisfaction of STW. Water mains and some sewers are pressurised and can fail if excavation removes support to thrust blocks to bends and other fittings.
- Where a trench is excavated crossing or parallel to the line of any STW Apparatus, the backfill should be adequately compacted to prevent any settlement which could subsequently cause damage to the STW Apparatus. In special cases, it may be necessary to provide permanent support to STW Apparatus which has been exposed over a length of the excavation before backfilling and reinstatement is carried out. There should be no concrete backfill in contact with the STW Apparatus.
- No other apparatus should be laid along the line of STW Apparatus irrespective of clearance. Above ground apparatus must not be located within a minimum of 3 metres either side of the centre line of STW Apparatus for smaller sized pipes and 6 metres either side for larger sized pipes without prior approval. No manhole or chamber shall be built over or around any STW Apparatus.
- A minimum radial clearance of 300 millimetres should be allowed between any plant or equipment being installed and existing STW Apparatus. We reserve the right to increase this distance where strategic assets are affected.
- Where any STW Apparatus coated with a special wrapping is damaged, even to a minor extent, STW must be notified and the trench left open until the damage has been inspected and the necessary repairs have been carried out. In the case of any material damage to any STW Apparatus causing leakage, weakening of the mechanical strength of the pipe or corrosion-protection damage, the necessary remedial work will be recharged to you.
- It may be necessary to adjust the finished level of any surface boxes which may fall within your proposed construction. Please ensure that these are not damaged, buried or otherwise rendered inaccessible as a result of the works and that all stop taps, valves, hydrants, etc. remain accessible and operable. Minor reduction in existing levels may result in conflict with STW Apparatus such as valve spindles or tops of hydrants housed under the surface boxes. Checks should be made during site investigations to ascertain the level of such STW Apparatus in order to determine any necessary alterations in advance of the works.
- With regard to any proposed resurfacing works, you are required to contact STW on the number given above to arrange a site inspection to establish the condition of any STW Apparatus in the nature of surface boxes or manhole covers and frames affected by the works. STW will then advise on any measures to be taken, in the event of this a proportionate charge will be made.
- You are advised that STW will not agree to either the erection of posts, directly over or within 1.0 metre of valves and hydrants.
- No explosives are to be used in the vicinity of any STW Apparatus without prior consultation with STW.

TREE PLANTING RESTRICTIONS

There are many problems with the location of trees adjacent to sewers, water mains and other STW Apparatus and these can lead to the loss of trees and hence amenity to the area which many people may have become used to. It is best if the problem is not created in the first place. Set out below are the recommendations for tree planting in close proximity to public sewers, water mains and other STW Apparatus.

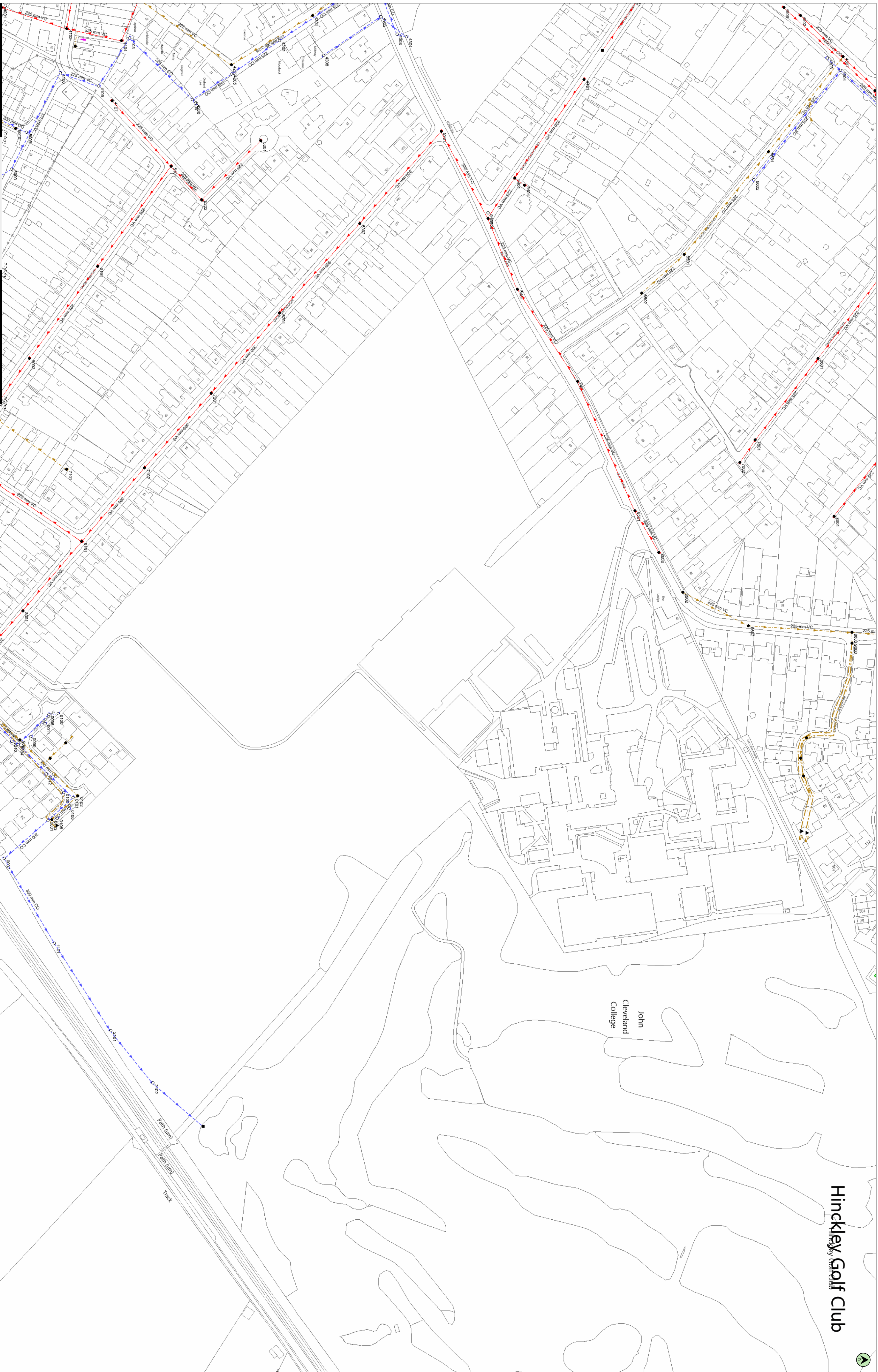
Please ensure that, in relation to STW Apparatus, the mature root systems and canopies of any tree planted do not and will not encroach within the recommended distances specified in the notes below.

16. Both Poplar and Willow trees have extensive root systems and should not be planted within 12 metres of a sewer, water main or other STW Apparatus.

17. The following trees and those of similar size, be they deciduous or evergreen, should not be planted within 6 metres of a sewer, water main or other STW Apparatus. E.g. Ash, Beech, Birch, most Cornifers, Elm, Horse Chestnut, Lime, Oak, Sycamore, Apple and Pear. Asset Protection Statements Updated May 2014

18. STW personnel require a clear path to conduct surveys etc. No shrubs or bushes should be planted within 2 metre of the centre line of a sewer, water main or other STW Apparatus.

19. In certain circumstances, both STW and landowners may wish to plant shrubs/bushes in close proximity to a sewer, water main or other STW Apparatus for screening purposes. The following are shallow rooting and are suitable for this purpose. Blackthorn, Broom, Cotoneaster, Elder, Hazel, Laurel, Pivet, Quickhorn, Snowberry, and most ornamental flowering shrubs.



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Appendix F – GPR Utilities Survey