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Report No 4302R001-3

PLOTS 9 & 10 FIRST STREET GROUND INVESTIGATION REPORT

Carried out for:

ASK Property Developments



PLOTS 9 & 10 FIRST STREET

GROUND INVESTIGATION REPORT

Date: January 2020

Report No 4302R001-3

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DISCLAIMER

This site investigation contract was completed by TerraConsult Ltd on the basis of a specification and scope of works and terms and conditions agreed with the client. This report was compiled with all reasonable skill and care, bearing in mind the project objectives, the agreed scope of works, the prevailing site conditions, the budget, the degree of manpower and resources allocated to the project as agreed.

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PLOTS 9 & 10 FIRST STREET

GROUND INVESTIGATION REPORT

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PLOTS 9 & 10 FIRST STREET

GROUND INVESTIGATION REPORT

1 INTRODUCTION

TerraConsult Limited (TCL) was commissioned by ASK Property Developments to carry out a ground investigation for the proposed residential, office and retail development.

This report presents the factual records of the fieldwork and laboratory testing. The data is also presented separately in digital format following AGS4 (2011).

The scope of the investigation, which was specified by Ramboll UK Ltd, comprised:

- o boreholes formed by rotary drilling techniques;
- o boreholes formed by dynamic sample techniques;
- o in situ testing;
 - variable head permeability testing;
- o post fieldwork monitoring;
- o geoenvironmental laboratory testing;
- o factual report (GIR) and AGS data.

The investigation was carried out in accordance with the contract specification and relevant standards (see References). The fieldwork was carried out 25/06/19 - 01/07/19. Post fieldwork monitoring is currently on hold due to access restrictions.

Whilst every attempt is made to record full details of the strata encountered in the exploratory holes, techniques of exploratory hole formation and sampling will inevitably lead to disturbance, mixing or loss of material in some soils and rocks.

All information given in this report is based on the ground conditions encountered during the site work and on the results of laboratory and field tests performed during the investigation. However, there may be conditions at the site that have not been taken into account, such as unpredictable soil strata, contaminant concentrations and water conditions between or below exploratory holes. It should be noted that groundwater levels, gas concentrations and gas flows usually vary due to seasonal, atmospheric and/or other effects and may at times differ to those measured during the investigation.

2 SITE DESCRIPTION

2.1 Location and Topography

The site is located First Street, Manchester. The approximate centre of the site is located at Ordnance Survey National Grid Reference SJ 837 972. The site location is shown on drawing 4302D001-1.

2.2 Published Geology

The online British Geological Survey (BGS) Geoindex 1:50,000 scale map shows the site to be underlain by Glaciaofluvial Sheet Deposits of Devensian age over sandstone of the Chester Formation.

3 FIELDWORK

3.1 General

Fieldwork was undertaken 25/06/19 - 01/07/19. The scope of the works, as provided by Ramboll UK Ltd comprised:

Table 1: Scope of Intrusive Works and In Situ Testing	
Exploratory Hole/In Situ Test Type	Proposed number
Rotary open hole borehole to 20m	6
Dynamic sample borehole to 5m	5
Rising head permeability tests	14

The exploratory hole locations were selected by Ramboll UK Ltd. The locations were set out by dGPS.

3.2 Exploratory Holes

The exploratory holes were logged by an engineer in accordance with the recommendations of BS5930:2015, which incorporates the requirements of BS EN ISO 14688-1, 14688-2 and 14689-1. Methods of formation and geological descriptions, together with sample records, in situ test results and observations made during formation of the exploratory hole are given in the logs presented in Appendix A and should be read in conjunction with the Key included therein.

A summary of weather conditions during the investigation is also presented in Appendix A.

A summary of the exploratory holes formed is listed in the following table.

Table 2: Summary of Exploratory Positions							
Exploratory position:	Type:	Final depth:	Easting (mE):	Northing (mN):	Level (m OD):	Start date:	End date:
BH01	RC	15.00	383707.17	397261.16	30.97	25/06/19	26/06/19
BH02	RC	13.00	383732.50	397245.28	32.93	27/06/19	28/06/19
BH03	RC	11.50	383741.75	397228.73	33.27	28/06/19	01/07/19
BH04	RC	15.00	383760.75	397291.10	31.07	26/06/19	26/06/19
BH05	RC	15.00	383799.72	397285.87	30.98	25/06/19	25/06/19
BH06	RC	10.00	383781.21	397249.98	31.92	27/06/19	27/06/19
WS01	WLS	5.00	383723.58	397272.65	30.92	28/06/19	28/06/19
WS02	WLS	5.00	383732.08	397224.66	33.34	28/06/19	28/06/19
WS03	WLS	1.90	383789.52	397315.57	30.89	28/06/19	28/06/19
WS03A	WLS	1.90	383789.52	397317.30	30.81	28/06/19	28/06/19
WS04	WLS	3.80	383820.67	397270.46	32.12	28/06/19	28/06/19

Type: CP – cable percussion; RO – rotary open hole; RC – rotary core; WLS – windowless sample; DP – dynamic probe; TP – trial pit

Prior to commencement, all exploratory positions were checked for services by reference to available plans, visual inspection and CAT/Genny survey. Inspection pits were excavated by hand and rechecked with a CAT at all borehole and dynamic sample/probe locations.

3.3 Sampling

Soil samples for geochemical analysis were taken in accordance with the specification and stored in cool boxes for despatch directly to Concept Life Sciences.

3.4 In Situ Testing

Table 4: Summary of In Situ Testing			
In Situ test:	Number undertaken:	Method:	Remarks:
Variable head permeability tests	14	BS EN ISO 22282-1 2012 BS EN ISO 22282-2 2012	

Results are presented in Appendix B.

3.5 Instrumentation and Monitoring

Details of instrumentation installed is presented on the exploratory hole logs. Following installation, the instrumentation was commissioned to show that it was functioning in the correct manner.

A summary of the installed instrumentation is listed in the following table.

Table 5: Summary of Instrumentation							
Exploratory position:	Instrument type:	Instrument reference:	Internal diameter (mm):	Installed depth (m bgl):	Depth (m AOD):	Top of response zone (m bgl)	Base of response zone (m bgl)
BH01	SP	1	51	7.00	23.97	4.00	7.00
BH02	SP	1	51	13.00	19.93	10.00	13.00
BH03	SP	1	51	11.50	21.77	10.00	11.50
BH04	SP	1	51	15.00	16.07	6.00	15.00
BH05	SP	1	51	15.00	15.98	5.00	15.00
BH06	SP	1	51	9.50	22.42	6.50	9.50
WS01	SP	1	51	5.00	25.92	3.20	5.00
WS02	SP	1	51	3.50	29.84	2.50	3.50
WS04	SP	1	51	3.80	28.32	2.80	3.80

Type: SP – Standpipe piezometer;

Records of monitoring and gas/groundwater sampling carried out by TerraConsult during and after the fieldwork period to the date of issue of this report are presented in Appendix C. Calibration certificates are presented in Appendix E.

3.6 Surveying

On completion of the fieldworks, all exploratory positions were surveyed by use of dGPS. Coordinates and reduced levels to Ordnance Survey are provided on the exploratory hole logs and test reports. The exploratory hole positions are shown on drawing 4302D002-1.

4 LABORATORY TESTING

4.1 Geoenvironmental Testing

The testing was scheduled by Ramboll UK Ltd and carried out by Concept Life Sciences. The testing is summarised below and the results are presented in Appendix D together with details of specific suites.

5 REFERENCES

AGS: 2010: Electronic transfer of geotechnical and geoenvironmental data (Edition 4 including addendum 3, 2011). Association of Geotechnical and Geoenvironmental Specialists.

BS 5930 : 2015 : Code of practice for site investigation. British Standards Institution.

BS 10175 : 2011 + A2:2017: Investigation of potentially contaminated sites – Code of Practice. British Standards Institution

BS EN 1997-1: 2004 : Eurocode 7 – Geotechnical Design – Part 1: General rules. Including UK National Appendix of November 2007. British Standards Institution.

BS EN ISO 14688-1 : 2002 : Geotechnical investigation and testing – Identification and classification of soil – Part 1: Identification and description. British Standards Institution.

BS EN ISO 14688-2 : 2004 : Geotechnical investigation and testing – Identification and classification of soil – Part 2: Principles for a classification. British Standards Institution.

BS EN ISO 14689-1 : 2003 : Geotechnical investigation and testing – Identification and classification of rock – Part 1: Identification and description. British Standards Institution.

BS EN ISO 22282-1 : 2012 : Geotechnical investigation and testing – Geohydraulic testing – Part 1: General rules.

BS EN ISO 22282-2 : 2012 : Geotechnical investigation and testing – Geohydraulic testing – Part 1: Water permeability tests in a borehole using open systems.

BS EN ISO 22475-1 : 2006 : Geotechnical investigation and testing – Sampling methods and groundwater measurements – Part 1: Technical principals for execution (July 2011 reprint). British Standards Institution.

6 LICENCES

British Geological Survey Reproduction Licence Number: IPR/187-68CF CO8/053-CSL

Ordnance Survey Reproduction Licence Number. 100035365

DRAWINGS

4302D001-1 – Site Location Plan

4302D002-1 – Exploratory Hole Location Plan



Address: First Street, Manchester	Notes:
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N

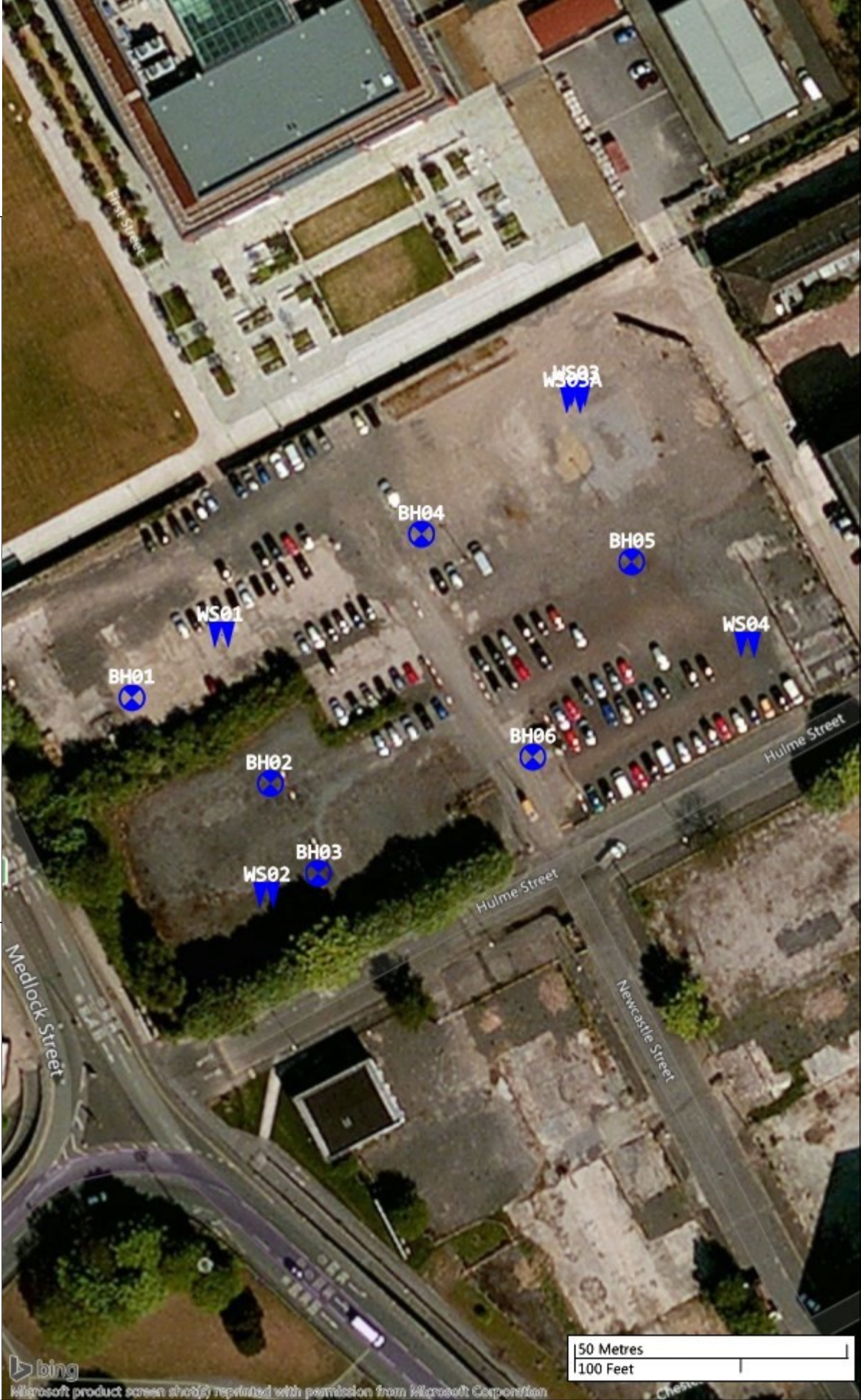
Legend Key

Locations By Type - RC

Locations By Type - WLS

Remarks:

None



APPENDICES

APPENDIX A Exploratory Hole Records

APPENDIX B In Situ Testing Results

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APPENDIX E Calibration Certificates

APPENDIX A

Exploratory Hole Records

Key sheet

Boreholes

Dynamic samples

Exploratory Hole Key Sheet

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SAMPLES:

Undisturbed:	
U	Driven tube sample
UT	Thin wall driven tube sample
TW	Pushed thin wall tube sample
P	Pushed piston sample
L	Liner sample (from windowless or similar sampler), full recovery unless otherwise stated
CBR	CBR mould sample
BLK	Block sample
C	Core sample (from rotary core) taken for laboratory testing
Disturbed:	
D	Small sample
B	Bulk sample
AMAL	Amalgamated sample
Environmental:	
ES	Environmental soil sample
EW	Environmental water sample
Comments:	Sample reference numbers are assigned to every sample taken. A sample reference of 'NR' indicates that an attempt was made to take a tube sample; however, there was no recovery. Sample recovery is given as a percentage.

TESTS:

SPT S or SPT C	Standard Penetration Test, open shoe (S) or solid cone (C)
	The Standard Penetration Test is defined in BS EN ISO 22476-3 (2005). The incremental blow counts are given in the Field Records column; each increment is 75mm unless stated otherwise and any penetration under self weight in mm (SW) is noted. Where the full 300mm test drive is achieved the total number of blows for the test drive is presented as N = ** in the Test column. Where the test drive blows reach 50 (either in total or for a single increment) the total blow count beyond the seating drive is given (without the N = prefix).
ICBR	In situ CBR
IV	In situ vane shear strength, peak (p) and remoulded (r), kPa
HV	Hand vane shear strength, peak (p) and remoulded (r), kPa
PP	Pocket penetrometer test, converted to shear strength, kPa
KFH, KRH, KPI	Variable head permeability tests (KFH = falling head test, KRH = rising head test, KPI = packer test), permeability value
PID/FID	Photo-ionisation detector/Flame-ionisation detector
	Test results provided in Field Records column

DRILLING RECORDS:

The mechanical indices (TCR/SCR/RQD & If) are defined in BS 5930: 2015 and BS EN ISO 22575-1 (2006)

TCR	Total Core Recovery, %
SCR	Solid Core Recovery, %
RQD	Rock Quality Designation, %
If	Fracture spacing, mm. Minimum, typical and maximum spacings are presented.
NI	Non intact is used where the core is fragmented.
CRF	Core recovered (length in m) in the following run
AZCL	Assessed zone of core loss
NR	Not recovered

GROUNDWATER:



Groundwater strike



Groundwater level after standing period

DEPTH REMARKS:

EoS	End of Shift
SoS	Start of Shift
EoBH	End of Borehole

INSTRUMENTATION:

Details of installations are given on the Record. Legend column shows installed instrument depths including slotted pipe section or tip depth, response zone filter material type and layers of backfill. The type of instrument installed is indicated by a code adjacent to the Legend column at the base of the instrument.

SP	Standpipe
SPIE	Standpipe piezometer
PPIE	Pneumatic piezometer
EPIE	Electronic piezometer
AP	Access pipe
GMP	Gas monitoring standpipe
(xx)	Internal diameter (mm)
ICE	Biaxial inclinometer
ICM	Inclinometer tubing for use with probe
SLIP	Slip indicator
ESET	Electronic settlement cell/gauge
ETM	Magnetic extensometer settlement point
ETR	Rod extensometer

EXPLORATORY HOLE TYPE:

CP	Cable percussion
DP	Dynamic probe
DCP	Dynamic cone penetrometer
HA	Hand auger
IP	Inspection pit
OP	Observation pit/trench
PC	Pavement core
RC	Rotary core
RO	Rotary open hole
SH	Shaft
SNC	Sonic (resonance)
TP	Trial pit/trench
TRAV	Traverse
WLS	Windowless (dynamic) sample
WS	Window (dynamic) sample



Project: **First Street Plots 9 & 10**
 Project No: **4302**
 Client: **ASK Property Developments**

Reference

KEY SHEET

Sheet 1 of 1

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Sheet 1 of 2

Borehole Log

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Borehole formation details:

Location details:

[illegible]

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
			15.97	15.00	Borehole ends at 15.00 m (Termination reason: Target depth)						
	Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:

Struck: Rose to: Casing: Sealed:

Diameter & casing:

Dia (mm): Depth: Casing:
15.00

Depth related remarks:

From to: Remarks:

Flush details:

Depth:	Type:	Return:	Colour:
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Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in meters.

Log issue: DRAFT
Scale: 1:50

Project:	First Street Plots 9 & 10
Project No:	4302
Client:	ASK Property Developments

Exploratory position reference:	
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BH01

Sheet 2 of 2

Borehole Log

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Borehole formation details:											Location details:	
Type: IP RO	From: 0.00 1.20	To: 1.20 13.00	Start date: 27-06-19 28-06-19	End date: 27-06-19 28-06-19	Crew: IB/JC IB/JC	Plant: Hand tools Dando 250	Barrel type: n/a n/a	Drill bit: n/a Duplex	Logger: IB IB	Logged: 27-06-19 28-06-19	Remarks:	mE: 383732.50 mN: 397245.28 mAOD: 32.93 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
				(1.20)	Sandy GRAVEL of brick fragments. (MADE GROUND)						
			31.73	1.20	Sandy gravelly CLAY. (GLACIOFLUVIAL SHEET DEPOSITS) <i>1.20 - 8.90 m: Bands of sand and gravel</i>						
				(7.70)							
			24.03	8.90	SANDSTONE. (CHESTER FORMATION) <i>8.90 - 9.90 m: Weak</i>						
	(51) Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:		Depth related remarks:				Flush details:			
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	From	to:	Remarks:		Depth:	Type:	Return:	Colour:
					Casing: 13.00					0.00 - 13.00	air/mist		

<div><div>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.</div></div>		Project: First Street Plots 9 & 10 Project No: 4302 Client: ASK Property Developments		Exploratory position reference: BH02	
Log issue: DRAFT Scale: 1:50		Sheet 1 of 2			

Borehole Log

TerraConsult

Borehole formation details:

Type:	From:	To:	Start date:	End date:	Crew:	Plant:	Barrel type:	Drill bit:	Logger:	Logged:	Remarks:
IP	0.00	1.20	27-06-19	27-06-19	IB/JC	Hand tools	n/a	n/a	IB	27-06-19	mE: 383732.50 mN: 397245.28 mAOD: 32.93 Grid: OSGR
RO	1.20	13.00	28-06-19	28-06-19	IB/JC	Dando 250	n/a	Duplex	IB	28-06-19	

Location details:

mE:	383732.50
mN:	397245.28
mAOD:	32.93
Grid:	OSGB

						Samples & In Situ Testing					
Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
<div><div></div><div></div></div>				(4.10)							
	SP (51)		19.93	13.00	Borehole ends at 13.00 m (Termination reason: Refusal)						
	Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:

Struck: Rose to: Casing: Sealed:

Diameter & casing:

Dia (mm): Depth: Casing:
13.00

Depth related remarks:

From to: Remarks:

Flush details:

Depth: Type: Return: Colour:



Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in meters.

Log issue: DRAFT
Scale: 1:50

Project:	First Street Plots 9 & 10
Project No:	4302
Client:	ASK Property Developments

Exploratory position reference:	
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BH02

Borehole Log

TerraConsult

Borehole formation details:											Location details:	
Type: IP RO	From: 0.00 1.20	To: 1.20 11.50	Start date: 28-06-19 01-07-19	End date: 28-06-19 01-07-19	Crew: IB/JC IB/JC	Plant: Hand tools Dando 250	Barrel type: n/a n/a	Drill bit: n/a Duplex	Logger: IB IB	Logged: 28-06-19 01-07-19	Remarks:	mE: 383741.67 mN: 397228.73 mAOD: 33.27 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
			33.17	0.10	Asphalt. (MADE GROUND)						
				(0.50)	COBBLES. (MADE GROUND)						
			32.67	0.60	Sandy GRAVEL. (MADE GROUND)						
				(4.40)							
			28.27	5.00	Grey CLAY. (GLACIOFLUVIAL SHEET DEPOSITS)						
				(5.00)							
			23.27	10.00							
	(51) Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:		
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing: 11.50	From	to:	Remarks:	Depth: 0.00 - 11.50	Type: air/mist	Return: Colour:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: First Street Plots 9 & 10 Project No: 4302 Client: ASK Property Developments		Exploratory position reference: BH03 Sheet 1 of 2	
Log issue:	DRAFT				
Scale:	1:50				

Borehole Log

TerraConsult

Borehole formation details:												Location details:	
Type: IP RO	From: 0.00 1.20	To: 1.20 11.50	Start date: 28-06-19 01-07-19	End date: 28-06-19 01-07-19	Crew: IB/JC IB/JC	Plant: Hand tools Dando 250	Barrel type: n/a n/a	Drill bit: n/a Duplex	Logger: IB IB	Logged: 28-06-19 01-07-19	Remarks:	mE: 383741.67 mN: 397228.73 mAOD: 33.27 Grid: OSGB	
Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing							
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples		
				(1.50)	SANDSTONE. (CHESTER FORMATION)								
					10.00 - 11.00 m: Weak								
SP (51)			21.77	11.50	Borehole ends at 11.50 m (Termination reason: Refusal)								
	Inst (Ø)					Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks		
Groundwater entries: Struck: Rose to: Casing: Sealed:			Diameter & casing: Dia (mm): Depth: Casing: 11.50		Depth related remarks: From to: Remarks:			Flush details: Depth: Type: Return: Colour:					
Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters. Log issue: DRAFT Scale: 1:50					Project: First Street Plots 9 & 10 Project No: 4302 Client: ASK Property Developments					Exploratory position reference: BH03 Sheet 2 of 2			

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Sheet 1 of 2

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Sheet 2 of 2

Borehole Log

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Borehole formation details:											Location details:	
Type: IP RO	From: 0.00 1.20	To: 1.20 15.00	Start date: 25-06-19 25-06-19	End date: 25-06-19 25-06-19	Crew: IB/JC IB/JC	Plant: Hand tools Dando 250	Barrel type: n/a n/a	Drill bit: n/a Duplex	Logger: IB IB	Logged: 25-06-19 25-06-19	Remarks:	mE: 383799.72 mN: 397285.87 mAOD: 30.98 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
					GRAVEL. (MADE GROUND)						
			30.38	0.60	Grey CLAY. (MADE GROUND)						
			29.78	1.20	Brown sandy CLAY. (GLACIOFLUVIAL SHEET DEPOSITS)						
			26.38	4.60	Weak SANDSTONE. (CHESTER FORMATION)						
			22.98	8.00	GRAVEL. (CHESTER FORMATION)						
			22.38	8.60	SANDSTONE. (CHESTER FORMATION)						

Groundwater entries:				Diameter & casing:			Depth related remarks:			Flush details:		
Struck:	Rose to:	Casing:	Sealed:	Dia (mm):	Depth:	Casing:	From:	to:	Remarks:	Depth:	Type:	Return:
						15.00				0.00 - 15.00	air/mist	Colour:

 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in meters.		Project: First Street Plots 9 & 10 Project No: 4302 Client: ASK Property Developments		Exploratory position reference: BH05 Sheet 1 of 2	
Log issue: DRAFT Scale: 1:50					

Borehole Log

TerraConsult

Borehole formation details:

Type:	From:	To:	Start date:	End date:	Crew:	Plant:	Barrel type:	Drill bit:	Logger:	Logged:	Remarks:
IP	0.00	1.20	25-06-19	25-06-19	IB/JC	Hand tools	n/a	n/a	IB	25-06-19	
RO	1.20	15.00	25-06-19	25-06-19	IB/JC	Dando 250	n/a	Duplex	IB	25-06-19	

Location details:

mE:	383799.72
mN:	397285.87
mAOD:	30.98
Grid:	OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
SP (51)	15.98	15.00	Borehole ends at 15.00 m (Termination reason: Target depth)								
Inst (Ø)						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks

Groundwater entries:

Struck: Rose to: Casing: Sealed:

Diameter & casing:

Dia (mm):	Depth:	Casing:
		15.00

Depth related remarks:

From	to:	Remarks:
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Flush details:

Depth:	Type:	Return:	Colour:
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Notes: For explanation of symbols and abbreviations see Key Sheet.
All depths and reduced levels are in meters.

Log issue: DRAFT
Scale: 1:50

Project:	First Street Plots 9 & 10
Project No:	4302
Client:	ASK Property Developments

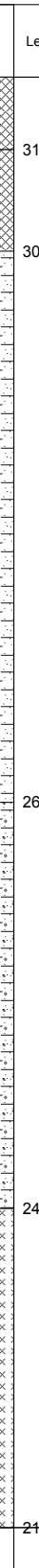
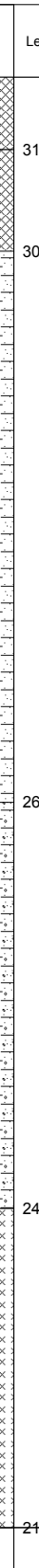
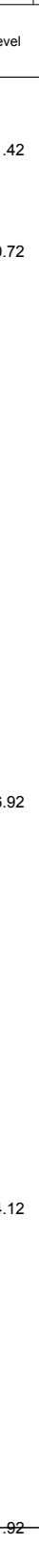
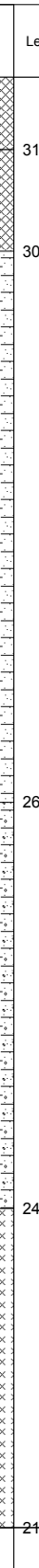
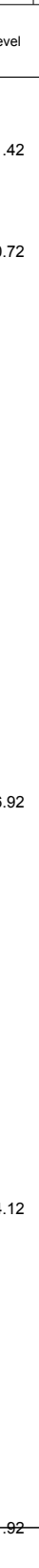
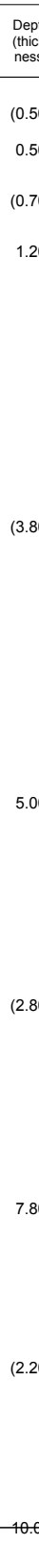
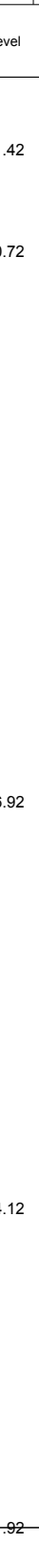
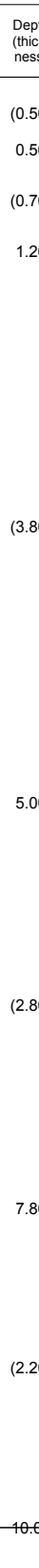
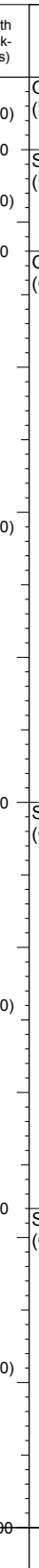
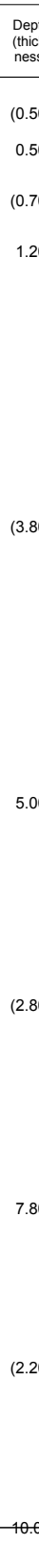
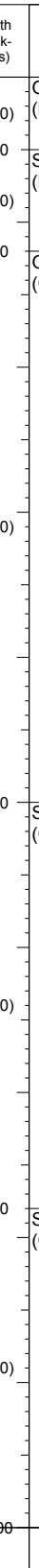
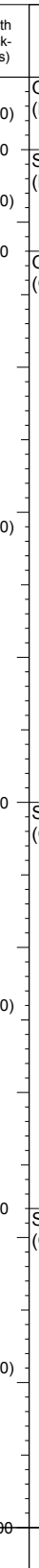
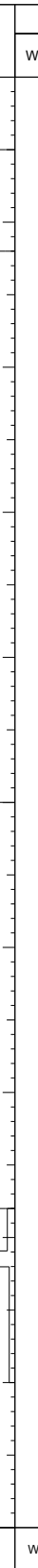
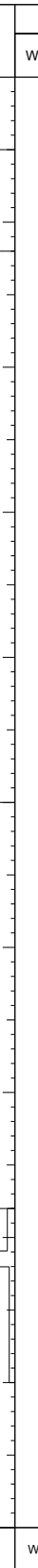
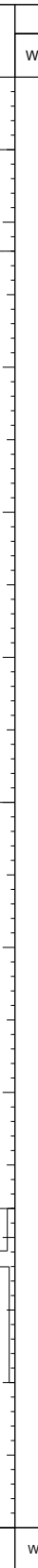
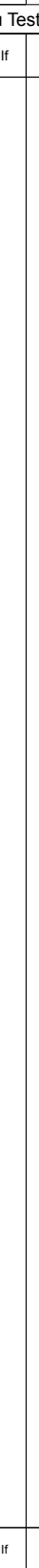
Exploratory position reference:	
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BH05

Borehole Log

TerraConsult

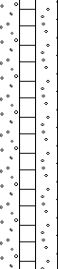
Borehole formation details:											Location details:	
Type: IP RO	From: 0.00 1.20	To: 1.20 10.00	Start date: 27-06-19 27-06-19	End date: 27-06-19 27-06-19	Crew: IB/JC IB/JC	Plant: Hand tools Dando 250	Barrel type: n/a n/a	Drill bit: n/a Duplex	Logger: IB IB	Logged: 27-06-19 27-06-19	Remarks:	mE: 383781.21 mN: 397249.98 mAOD: 31.92 Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing					
						Water	Casing	Depth/Core Run	TCR SCR RQD	If	Results/remarks/ samples
				(0.50)	GRAVEL. (MADE GROUND)						
			31.42	0.50	Sandy CLAY. (MADE GROUND)						
				(0.70)							
			30.72	1.20	Grey sandy CLAY. (GLACIOFLUVIAL SHEET DEPOSITS)						
				(3.80)							
				(3.80)							
			26.92	5.00	Sandy gravelly CLAY. (GLACIOFLUVIAL SHEET DEPOSITS)						
				(2.80)							
			24.12	7.80	SANDSTONE. (CHESTER FORMATION)						
				(2.20)							
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											
											

Dynamic Sample Log

TerraConsult

Borehole formation details:										Location details:	
Type:	From:	To:	Start date:	End date:	Crew:	Plant:	Logger:	Logged:	Remarks:	mE:	383723.58
IP	0.00	0.20	28-06-19	28-06-19	IB/JC	Hydraulic breaker	NA	28-06-19		mN:	397272.65
IP	0.20	1.20	28-06-19	28-06-19	IB/JC	Hand tools	NA	28-06-19		mAOD:	30.92
WLS	1.20	5.00	28-06-19	28-06-19	PM	Archway Dart	NA	28-06-19		Grid:	OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results
			30.72	0.20	Concrete (CONCRETE)					
				(1.10)	Soft brown slightly sandy gravelly CLAY. Gravel is fine to coarse, angular to subangular of brick. Sand is fine to coarse. (MADE GROUND)					
			29.62	1.30	Soft dark grey and black slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of brick and sandstone. Organic odour, occasional roots. Sand is fine to coarse. (MADE GROUND)			1.40 - 1.60 1.40 - 1.60	D2 ES1	
			29.12	1.80	Soft dark grey sandy slightly gravelly CLAY. Gravel is fine to ocase, subrounded to rounded of sandstone. (ALLUVIUM)			1.90 - 2.00	D3	
				(1.40)						
			27.72	3.20	Dark grey silty sandy GRAVEL. Gravel is fine to coarse, subrounded to rounded of sandstone. Sand is fine to coarse. (ALLUVIUM)			3.50 - 3.60	D4	
				(0.60)						
			27.12	3.80	Soft dark grey slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subrounded to rounded of sandstone. Sand is fine to coarse. (ALLUVIUM)					
			27.02	3.90	Dark grey silty sandy GRAVEL. Gravel is fine to coarse, subrounded to rounded of sandstone. Sand is fine to coarse. (ALLUVIUM)					
				(1.10)						
			25.92	5.00	Dynamic sample ends at 5.00 m (Target depth)					

Groundwater entries:		Casing:		Depth related remarks:				Run details:			
Struck: Rose to: Casing: Sealed:		Cased to: Diameter (mm):		From to: Remarks				From: to: Ø Duration: Recovery:			
 Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.		Project: First Street Plots 9 & 10						Exploratory position reference:			
Log issue: FINAL		Project No: 4302						WS01			
Scale: 1:50		Client: ASK Property Developments									
								Sheet 1 of 1			

Dynamic Sample Log

TerraConsult

Borehole formation details:										Location details:	
Type: IP WLS	From: 0.00 1.20	To: 1.20 5.00	Start date: 28-06-19 28-06-19	End date: 28-06-19 28-06-19	Crew: PM PM	Plant: Hand tools Archway Dart	Logger: NA NA	Logged: 28-06-19 28-06-19	Remarks:	mE: 383732.08	mN: 397224.66
										mAOD: 33.34	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results
					Grey very sandy fine to coarse, subangular GRAVEL of brick and concrete. Frequent cobbles of brick and concrete. Sand is fine to coarse. (MADE GROUND)					
				(1.30)						
				32.04 1.30	Brown very gravelly fine to coarse SAND. Gravel is fine to medium, subangular to subrounded of mudstone and sandstone. (MADE GROUND)			1.50	ES1	
				31.54 1.80	Soft to firm brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of brick and sandstone. Sand is fine to coarse. Rare plastic. (MADE GROUND)			1.80	D2	
				(0.70)						
				30.84 2.50	Light brown sandy fine to coarse, subangular to subrounded GRAVEL of sandstone. Sand is fine to coarse. (GLACIOFLUVIAL SHEET DEPOSITS)			2.80	D3	
				(1.00)						
				29.84 3.50	Very stiff greyish brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, subangular to subrounded of sandstone. Sand is fine to coarse. (GLACIOFLUVIAL SHEET DEPOSITS)					
				(1.50)						
				28.34 5.00	Dynamic sample ends at 5.00 m (Target depth)					

Groundwater entries:				Casing:		Depth related remarks:				Run details:			
Struck: Rose to: Casing: Sealed:				Cased to: Diameter (mm):		From to: Remarks				From: to: Ø Duration: Recovery:			
<div><div></div><div>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.</div></div>				Project: First Street Plots 9 & 10						Exploratory position reference:			
Log issue: FINAL				Project No: 4302						<div>WS02</div>			
Scale: 1:50				Client: ASK Property Developments									
										Sheet 1 of 1			

TerraConsultSheet 1 of 1

Dynamic Sample Log

TerraConsult

Borehole formation details:										Location details:	
Type:	From:	To:	Start date:	End date:	Crew:	Plant:	Logger:	Logged:	Remarks:	mE:	383788.78
IP	0.00	1.20	01-07-19	01-07-19		Hand Tools	IB	01-07-19		mN:	397315.57
RO	1.20	1.30	01-07-19	01-07-19	IB/JC	Dando 250	IB	01-07-19		mAOD:	30.89
										Grid:	OSGB

[illegible]

Groundwater entries:		Casing:	Depth related remarks:	Run details:
Struck: Rose to: Casing: Sealed:	Cased to: Diameter (mm):	From to: Remarks	From: to: Ø Duration: Recovery:	
<div><div></div><div>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.</div></div> <div>Log issue: FINAL</div> <div>Scale: 1:50</div>		<div>Project: First Street Plots 9 & 10</div> <div>Project No: 4302</div> <div>Client: ASK Property Developments</div>		<div>Exploratory position reference:</div> <div>WS03A</div> <div>Sheet 1 of 1</div>

Dynamic Sample Log

TerraConsult

Borehole formation details:										Location details:	
Type: IP WLS	From: 0.00 1.20	To: 1.20 3.80	Start date: 28-06-19 28-06-19	End date: 28-06-19 28-06-19	Crew: PM PM	Plant: Hand tools Hydraulic breaker	Logger: NA NA	Logged: 28-06-19 28-06-19	Remarks:	mE: 383820.70	mN: 397270.46
										mAOD: 32.12	Grid: OSGB

Backfill/ Instal'n	Water- strike	Legend	Level	Depth (thick- ness)	Stratum Description	Samples & In Situ Testing				
						Water	Casing	Depth	Type & No	Results
					Reddish brown very sandy fine to coarse subangular GRAVEL of concrete and brick. (MADE GROUND)					
				(1.30)						
			30.82	1.30	Firm dark brown and redish brown slightly sandy very gravelly CLAY. Gravel is fine to coarse, subangular of brick, concrete, bitumin and sandstone. (MADE GROUND)			1.40	ES1	
				(2.50)				2.50 - 2.80	ES2	
								3.50 - 3.80	D3	
			28.32	3.80	Dynamic sample ends at 3.80 m (Refusal on Obstruction)					

Groundwater entries:		Casing:		Depth related remarks:			Run details:		
Struck: Rose to: Casing: Sealed:		Cased to: Diameter (mm):		From to: Remarks			From: to: Ø Duration: Recovery:		
<div><div>AGS</div><div>Notes: For explanation of symbols and abbreviations see Key Sheet. All depths and reduced levels are in metres.</div></div> <div>Log issue: FINAL</div> <div>Scale: 1:50</div>		Project: First Street Plots 9 & 10					Exploratory position reference:		
		Project No: 4302					<div>WS04</div>		
		Client: ASK Property Developments					Sheet 1 of 1		

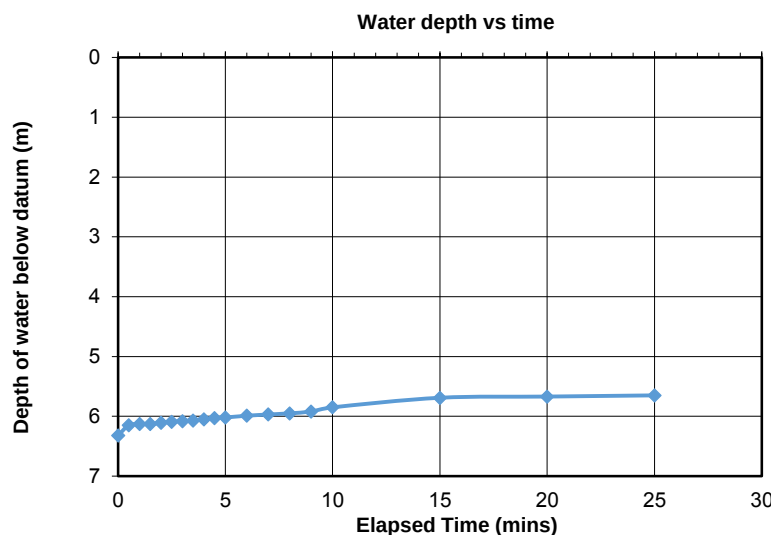
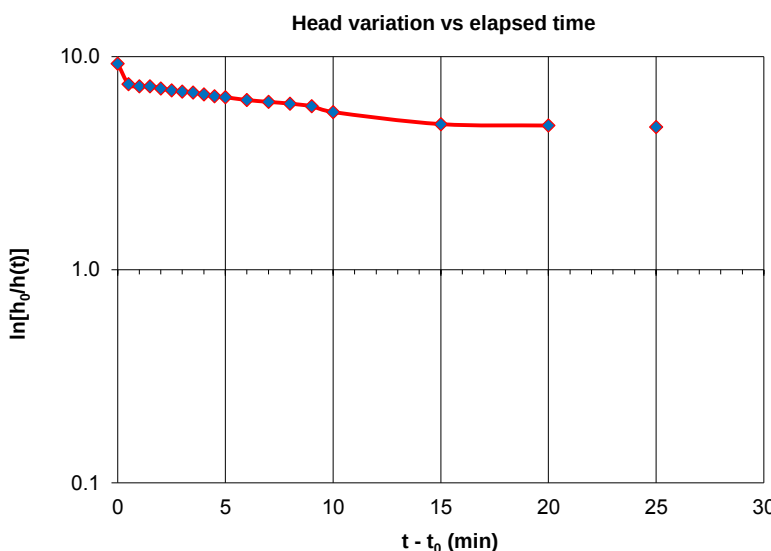
APPENDIX B

In Situ Testing Results

Variable head permeability test

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	6.32	m
Final head ($h(t)$) at (t)	5.65	m
Length of response zone (L)	3.00	m
Cross sectional area (S)	0.00	m ²

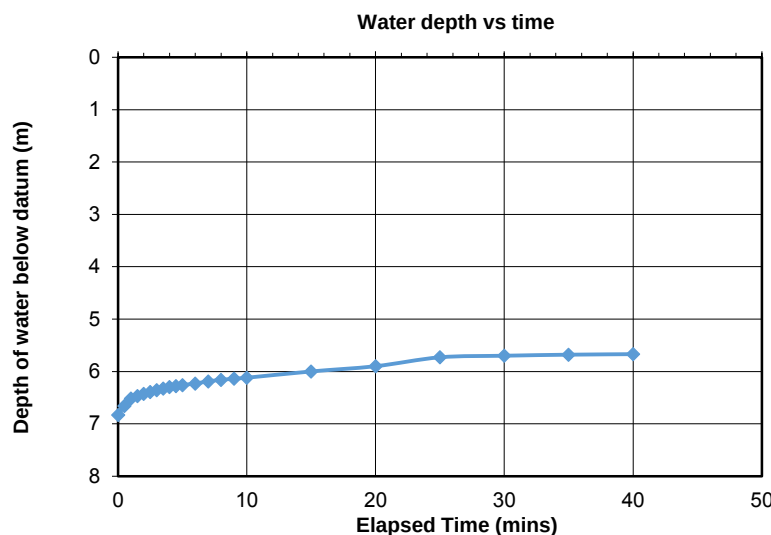
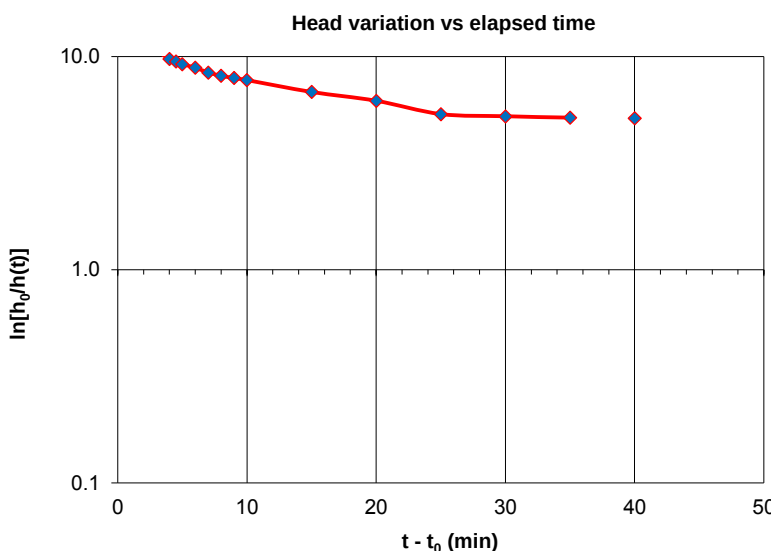
[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

k = 3.86E-08 m/s

Exploratory position reference:
BH01

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	6.83	m
Final head ($h(t)$) at (t)	5.67	m
Length of response zone (L)	3.00	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

k = 4.01E-08 m/s

0

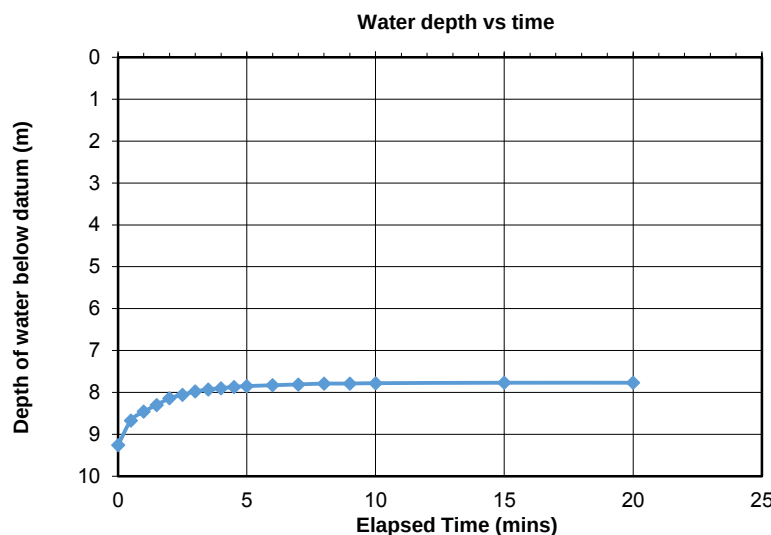
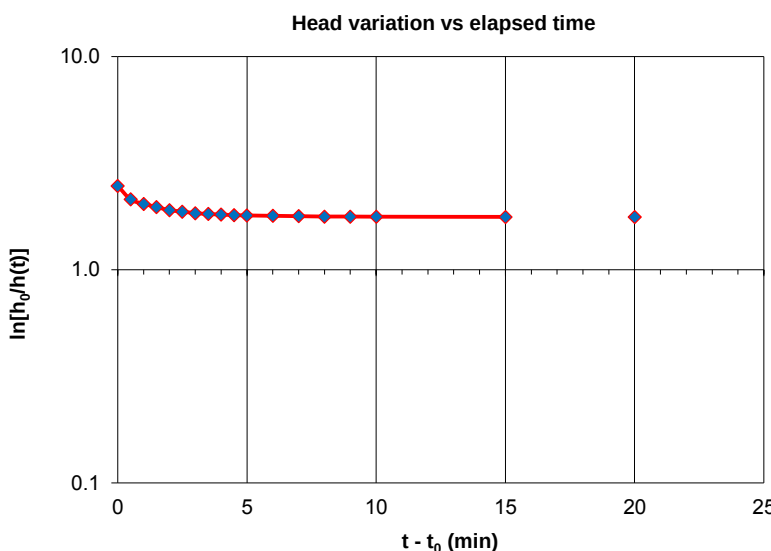
Exploratory position reference:
BH01

TerraConsult

Time (t_0)	0	mins
Time (t)	20	mins

Head of water

Initial head (h_0) at (t_0)	9.26	m
Final head ($h(t)$) at (t)	7.77	m
Length of response zone (L)	3.00	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

0

Exploratory position reference:
BH02

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	9.10	m
Final head ($h(t)$) at (t)	7.76	m
Length of response zone (L)	3.00	m
Cross sectional area (S)	0.00	m ²

Figure 1 is a semi-log plot titled "Head variation vs elapsed time". The vertical axis (y-axis) is labeled $\ln[h_0/h(t)]$ and has a logarithmic scale with major ticks at 0.1, 1.0, and 10.0. The horizontal axis (x-axis) is labeled $t - t_0 \text{ (min)}$ and has a linear scale from 0 to 30 with major ticks every 5 units. The plot shows experimental data points as red diamonds and a fitted curve as a solid red line. The data points start at approximately (0, 2.5) and decrease rapidly, reaching a plateau of about 1.7 by $t - t_0 = 2$ minutes, which they maintain until $t - t_0 = 25$ minutes.

$t - t_0 \text{ (min)}$	$\ln[h_0/h(t)]$
0	2.5
0.5	2.0
1	1.8
1.5	1.75
2	1.7
2.5	1.7
3	1.7
3.5	1.7
4	1.7
4.5	1.7
5	1.7
6	1.7
7	1.7
8	1.7
9	1.7
10	1.7
15	1.7
20	1.7
25	1.7

0

BH02

TerraConsult

Time (t_0)	0	mins
Time (t)	10	mins

Head of water

Initial head (h_0) at (t_0)	8.76	m
Final head ($h(t)$) at (t)	8.12	m
Length of response zone (L)	1.50	m
Cross sectional area (S)	0.00	m ²

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Figure 1 is a semi-log plot titled "Head variation vs elapsed time". The vertical axis (y-axis) is labeled $\ln[h_0/h(t)]$ and has a logarithmic scale with major ticks at 0.1, 1.0, and 10.0. The horizontal axis (x-axis) is labeled $t - t_0 \text{ (min)}$ and has a linear scale from 0 to 12 with major ticks every 2 units. The plot shows a series of data points (blue diamonds) connected by a red line. The data starts at approximately (0, 3.5), drops sharply to about (0.5, 2.5), and then levels off to a constant value of approximately 2.3 for the rest of the time shown (up to 10 minutes).

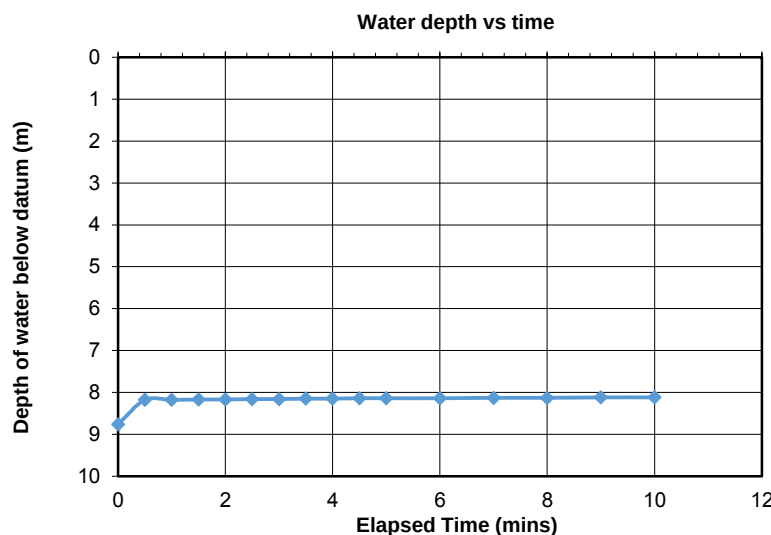
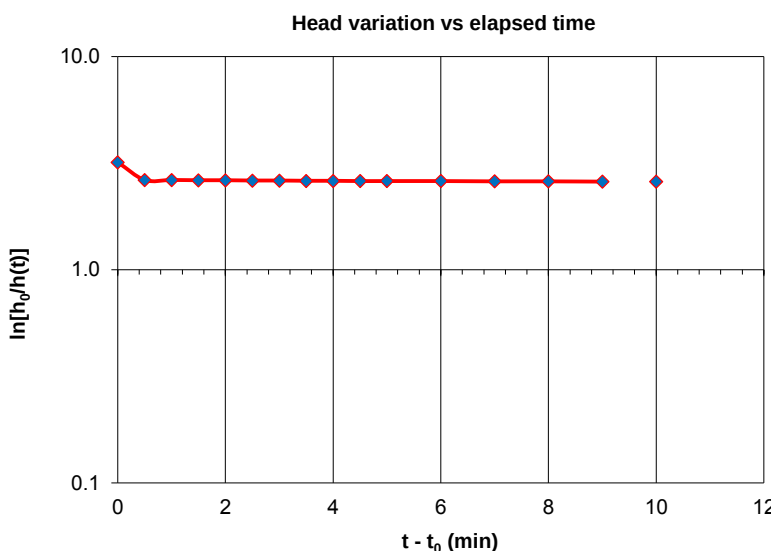
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

0

BH03

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	8.76	m
Final head ($h(t)$) at (t)	8.12	m
Length of response zone (L)	1.50	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

0

Exploratory position reference:
BH03

TerraConsult

Time (t_0)	0	mins
Time (t)	30	mins

Head of water

Initial head (h_0) at (t_0)	8.37	m
Final head ($h(t)$) at (t)	8.11	m
Length of response zone (L)	1.50	m
Cross sectional area (S)	0.00	m ²

--	--

Figure 1 is a semi-log plot titled "Head variation vs elapsed time". The vertical axis (y-axis) is labeled $\ln[h_d/h(t)]$ and has a logarithmic scale with major ticks at 0.1, 1.0, and 10.0. The horizontal axis (x-axis) is labeled $t - t_0 \text{ (min)}$ and has a linear scale from 0 to 35 with major ticks every 5 units. The plot shows a series of data points represented by blue diamonds. A red line connects the points from $t - t_0 = 0$ to 25 minutes, showing a rapid initial drop followed by a steady, nearly linear decrease on the logarithmic scale. A single data point is also plotted at $t - t_0 = 30$ minutes.

$t - t_0 \text{ (min)}$	$\ln[h_d/h(t)]$
0	3.5
0.5	2.8
1	2.5
2	2.4
3	2.3
4	2.2
5	2.1
6	2.0
7	1.9
8	1.8
9	1.7
10	1.6
15	1.4
20	1.2
25	1.0
30	0.8

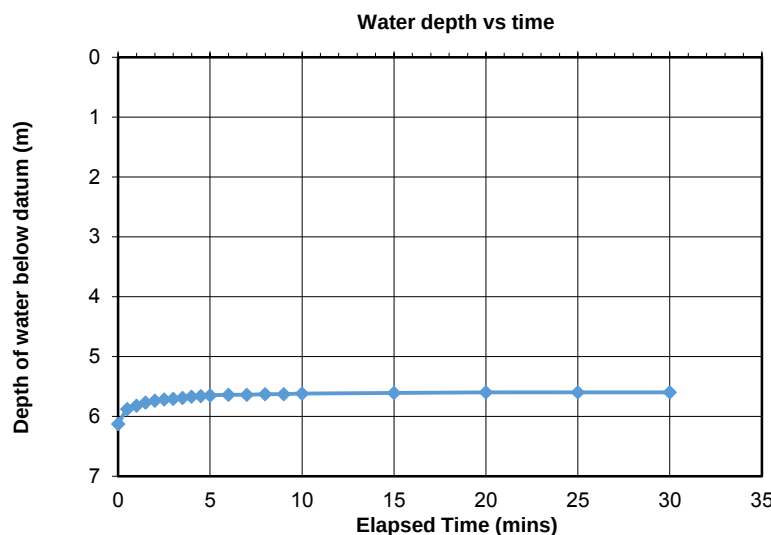
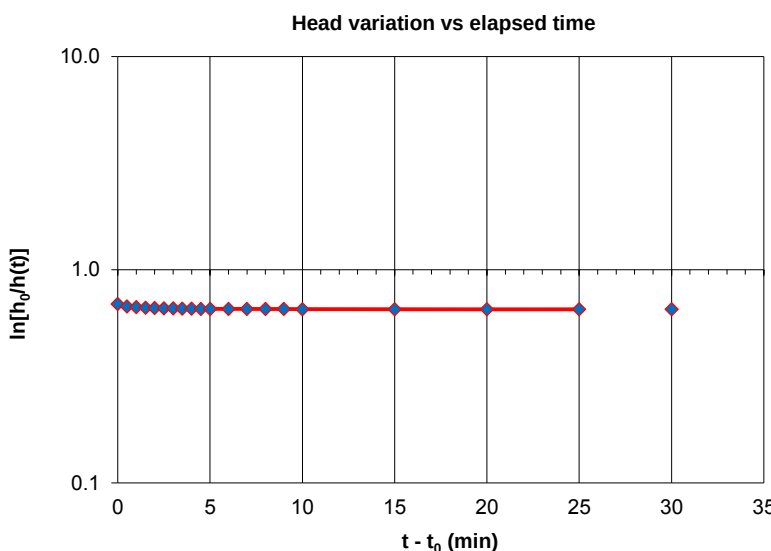
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

0

BH03

TerraConsult

Head of water	
Initial head (h_0) at (t_0)	6.13 m
Final head ($h(t)$) at (t)	5.60 m
Length of response zone (L)	9.00 m
Cross sectional area (S)	0.00 m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

0

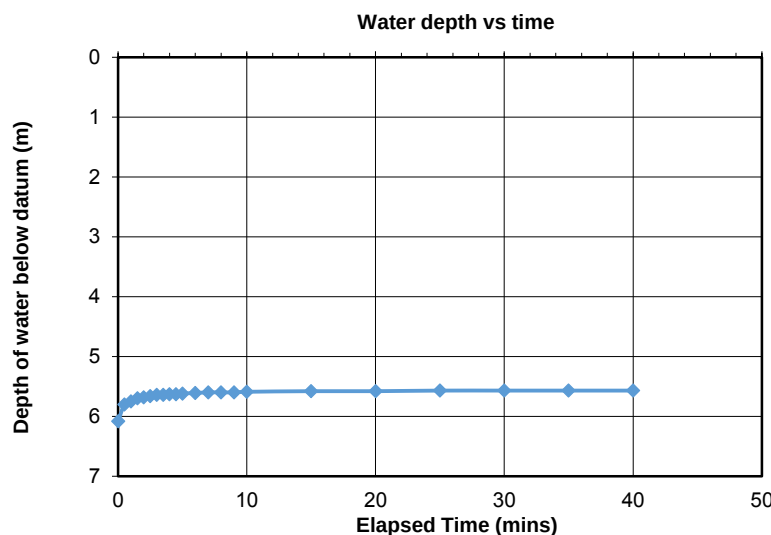
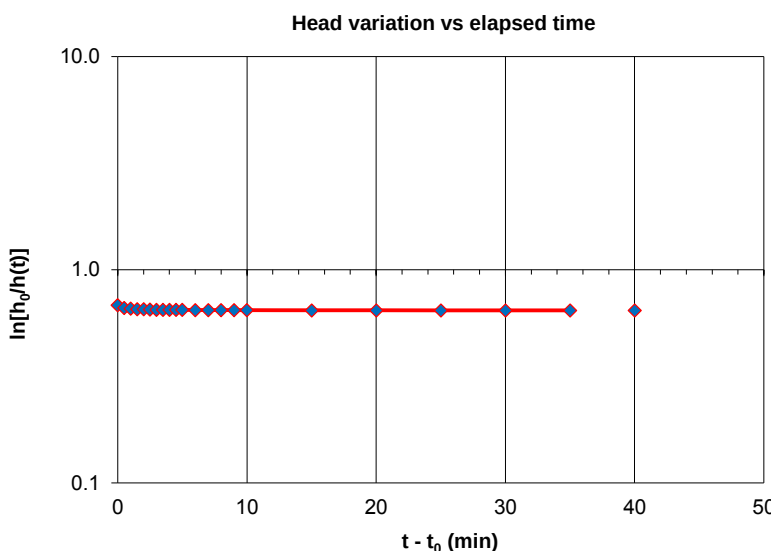
BH04

TerraConsult

Time (t_0)	0	mins
Time (t)	40	mins

Head of water

Initial head (h_0) at (t_0)	6.08	m
Final head ($h(t)$) at (t)	5.57	m
Length of response zone (L)	9.00	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

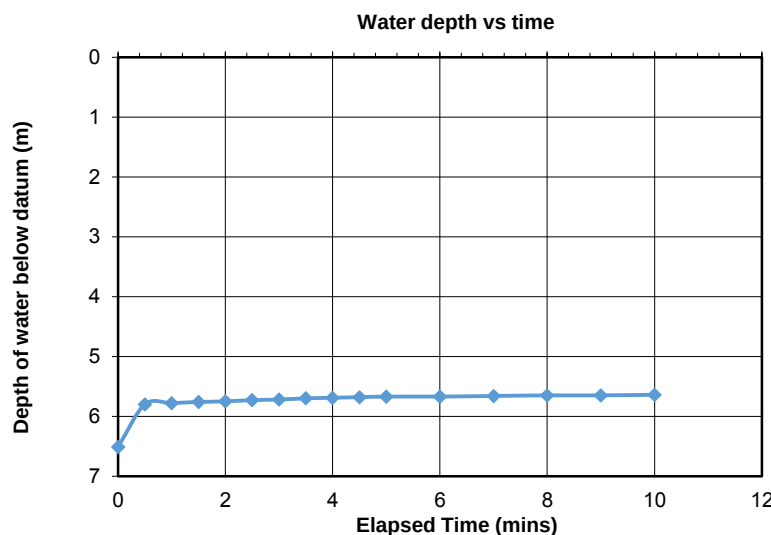
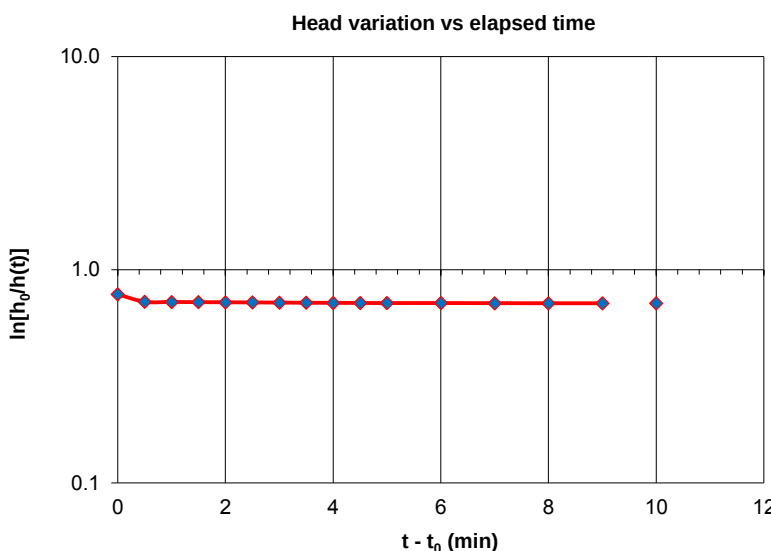
0

Exploratory position reference:

BH04

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	6.51	m
Final head ($h(t)$) at (t)	5.64	m
Length of response zone (L)	10.00	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

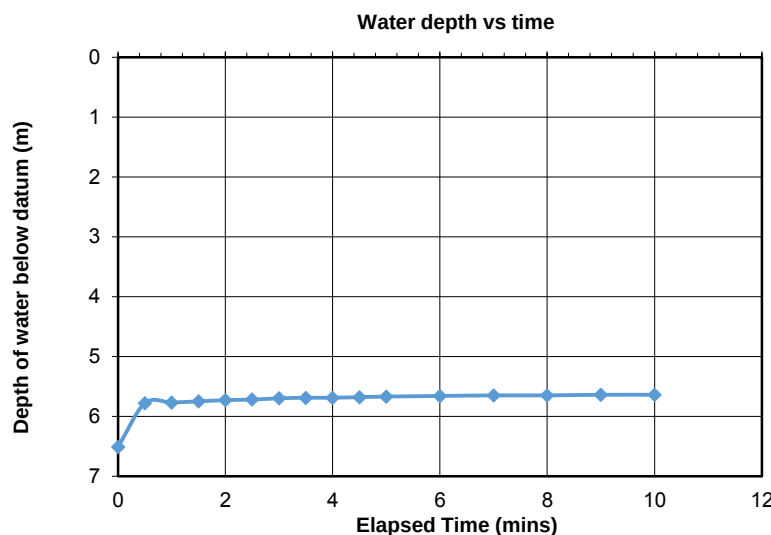
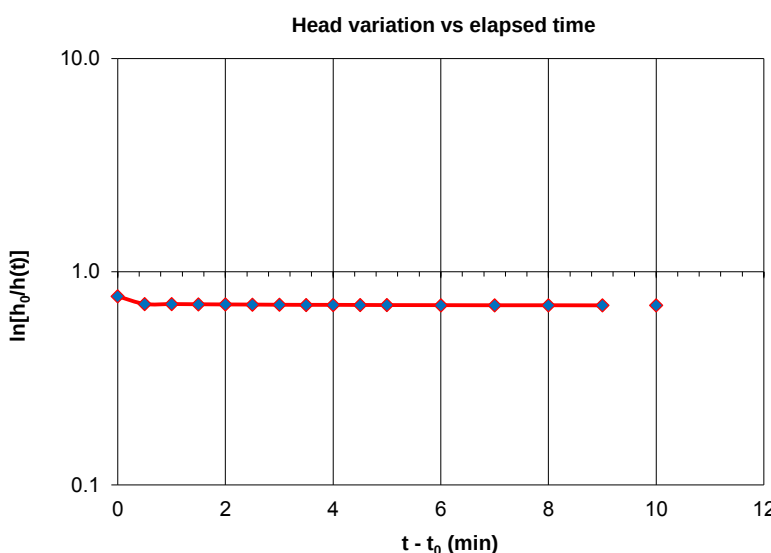
k = 4.64E-08 m/s

Exploratory position reference:

BH05

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	6.51	m
Final head ($h(t)$) at (t)	5.64	m
Length of response zone (L)	10.00	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

k = 4.64E-08 m/s

0

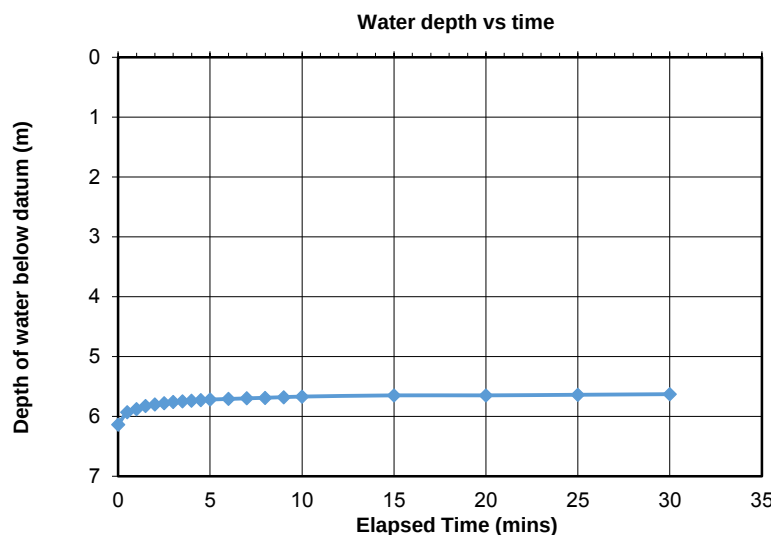
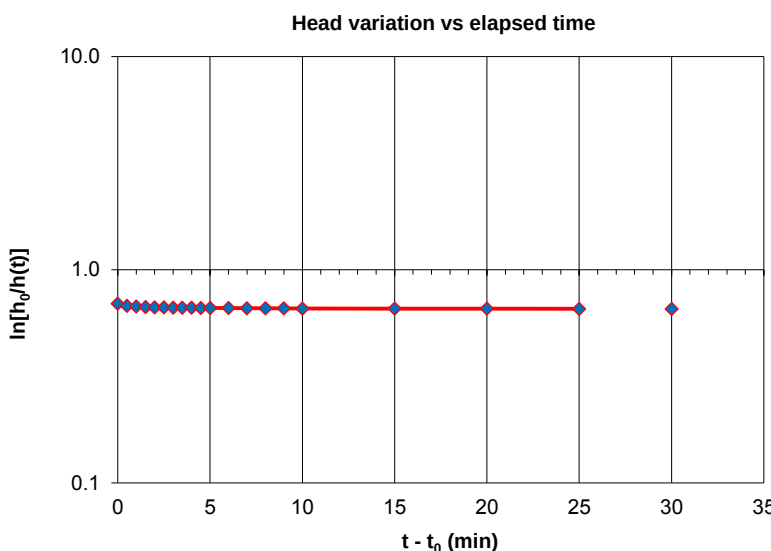
Exploratory position reference:
BH05

TerraConsult

Time (t_0)	0	mins
Time (t)	30	mins

Head of water

Initial head (h_0) at (t_0)	6.14	m
Final head ($h(t)$) at (t)	5.63	m
Length of response zone (L)	10.00	m
Cross sectional area (S)	0.00	m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

k = 9.35E-09 m/s

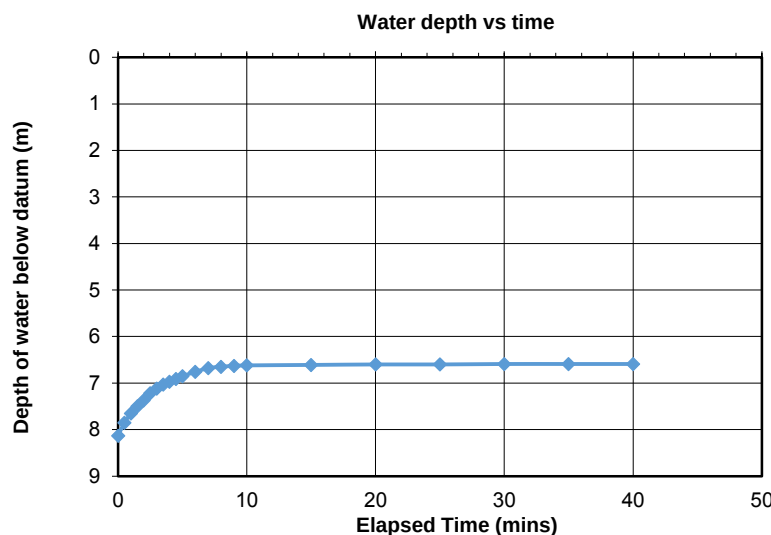
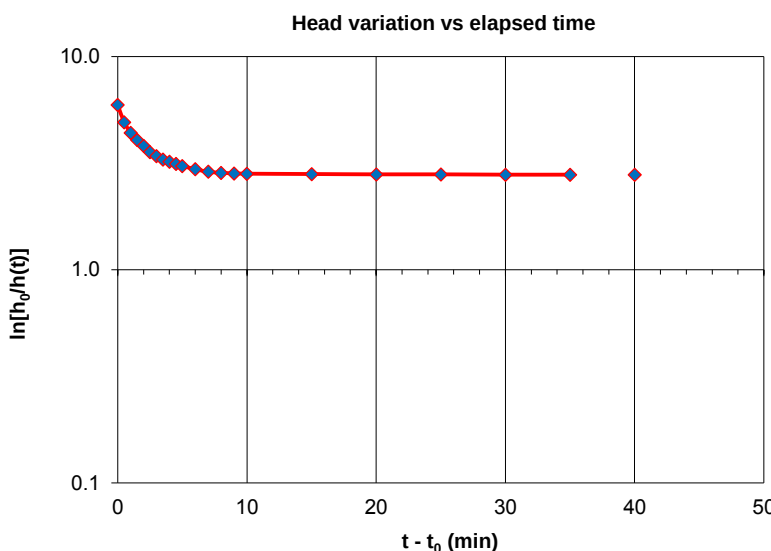
Calculated by:	NA	Project:	First St, Plots 9 & 10
Checked by:	DD	Project No:	4302
Issue:	FINAL	Client:	ASK Property Developments

Exploratory position reference:

BH05

TerraConsult

Head of water	
Initial head (h_0) at (t_0)	8.13 m
Final head ($h(t)$) at (t)	6.59 m
Length of response zone (L)	3.00 m
Cross sectional area (S)	0.00 m ²

[illegible]
$$k = \frac{S \ln(h_0/h(t))}{F(t - t_0)}$$

k = 4.52E-08 m/s

Exploratory position reference:
BH06

TerraConsult

Head of water		
Initial head (h_0) at (t_0)	8.13	m
Final head ($h(t)$) at (t)	6.59	m
Length of response zone (L)	3.00	m
Cross sectional area (S)	0.00	m ²

Figure 1 is a semi-log plot showing the variation of the natural logarithm of the ratio of head to initial head, $\ln[h_0/h(t)]$, versus elapsed time $t - t_0$ (min). The y-axis is logarithmic, ranging from 0.1 to 10.0. The x-axis is linear, ranging from 0 to 50 minutes. Two data series are plotted: one with red diamonds and a solid red line, and another with blue diamonds and a dashed blue line. Both series start at approximately 6.5 at $t = 0$ and decrease rapidly, reaching a plateau of about 2.5 after 10 minutes. The red series plateaus slightly earlier than the blue series.

0

BH06

APPENDIX C

Instrumentation Sampling and Monitoring Records

Groundwater and gas monitoring records

Gas & Groundwater Monitoring Record

TerraConsult

Project No:	4302	Project:	First St Plots 9 & 10	State of Ground: Wind : Wind direction: Cloud cover: Precipitation: Pressure trend:	Dry Negligable Southerly Partial None falling
Date:	23/10/2019				
Operator:	PW				
Equipment used (include s/n):	Dipmeter GFM435 s/n 12417 PID RAE systems MiniRae Lite s/n 595-002472				

Detection limits:									0.1 % vol	0.1 %	0.1 % vol	0.1 % vol	0.1 % vol	1.0 ppm	NA		
Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (oC)	Depth of Installation (m BGL)	Time of Reading hh:mm	Depth to Groundwater (m BGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	PID reading (ppm)	Remarks
BH01	1	1012	7	7.00	11:00	5.22	57	7.2	0.0	0.0	0.6	3.0	10.0	0.0		13.0	
WS01	1	1011	9	4.07	11:30	3.36	1	0.1	0.0	0.0	2.3	7.9	10.0	0.0		7.4	
BH06	1			9.35		6.25											
BH04	1			14.26		5.19											
BH05	1			10.45		5.04											
WS04	1			3.55		3.44											
	1																
	1																

Gas readings are steady state

Gas & Groundwater Monitoring Record

TerraConsult

Project No:	4302	Project:	First St Plots 9 & 10	State of Ground: Wind : Wind direction: Cloud cover: Precipitation: Pressure trend:	Dry
Date:	03/12/2019				Light
Operator:	AC				Northerly
Equipment used (include s/n):	Dipmeter				Clear
					None
					Steady

Detection limits:									0.1 % vol	0.1 %	0.1 % vol	0.1 % vol	0.1 % vol	1.0 ppm	NA		
Borehole ID	Inst ID	Barometric Pressure (mbars)	Air temp (oC)	Depth of Installation (m BGL)	Time of Reading hh:mm	Depth to Groundwater (m BGL)	Differential Pressure (Pa)	FlowRate (l/hr)	CH4 (% vol)	CH4 (% LEL)	O2 (% vol)	CO2 (% vol)	CO (ppm)	H2S (ppm)	Nitrogen (%vol)	PID reading (ppm)	Remarks
BH01	1		3	7.00	N/A	5.42											
WS01	1		3	4.07	N/A	3.40											
BH06	1		3	9.35	N/A	6.39											
BH04	1		3	14.26	N/A	5.21											
BH05	1		3	10.45	N/A	4.11											
WS04	1		3	3.55	N/A	3.47											
WS03A	1		3	Blocked	N/A	Blocked											Blocked with Bentonite (See Photo)
RP17	1		3	2.12	N/A	DAMP											

TerraConsult

Project No:	4302	Project:	First St Plots 9 & 10	
Date:	09/01/2020			State of Ground:
Operator:	PW			Wind :
Equipment used (include s/n):	Dipmeter			Wind direction:
				Cloud cover:
				Precipitation:
				Pressure trend:
				Dry
				Light
				Northerly
				Clear
				None
				N/A

[illegible]

APPENDIX D

Geoenvironmental Laboratory Test Results

Report References: CLS 832149

Concept Life Sciences

Certificate of Analysis

Hadfield House
Hadfield Street
Cornbrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: 832149-1

Date of Report: 10-Jul-2019

Customer: TerraConsult Limited
Unit 34
Bold Business Centre
Bold Lane
Sutton
St Helens
WA9 4TX

Customer Contact: Mr Derek Daniels

Customer Job Reference: 4302

Customer Purchase Order: PO-005344

Customer Site Reference: First street

Date Job Received at Concept: 01-Jul-2019

Date Analysis Started: 04-Jul-2019

Date Analysis Completed: 10-Jul-2019

The results reported relate to samples received in the laboratory and may not be representative of a whole batch.

Customers are responsible for information provided where, if incorrect, it could affect the validity of the results.

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

This report should not be reproduced except in full without the written approval of the laboratory

Tests covered by this certificate were conducted in accordance with Concept Life Sciences SOPs

All results have been reviewed in accordance with QMSection 15 of the Concept Life Sciences, Analytical Services Quality Manual



Report checked
and authorised by :
Aneta Dybek-Echtermeyer
Customer Service Advisor

Issued by :
Aneta Dybek-Echte
Customer Service

Waste Acceptance Criteria

Customer Sample Reference : WS01
 Our Sample Reference : 832149 004
 Project Site : First street
 Customer Reference : 4302
 Wet Sample in Dish Weight : 100
 Sample in Dish @ 105C : 94.2
 Depth : 3.50
 Empty Dish Weight : 0
 Hole ID : WS01
 Bottom Depth : 3.60
 Test Portion Mass (g) : 175
 Date Sampled : 28-JUN-2019
 AGS Type : D
 AGS Sample Reference : 4
 Matrix Class : Clay

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	0.9	3.0	5.0	6.0
Loss on Ignition	Grav	0.1	%	N	2.4			10.0
BTEX (Sum)	Calc	0.040	mg/kg	U	⁽¹³⁾ <0.040	6.0		
PCB EC7 (Sum)	Calc	0.070	mg/kg	U	⁽⁹⁾ <0.070	1.0		
Total Petroleum Hydrocarbons C10-C40 (Sum)	Calc	1	mg/kg	N	⁽¹³⁾ 5800	500.0		
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
pH	Probe			M	5.8		> 6.0	
Acid Neutralising Capacity (pH 4)	Titration	2	Mol/kg	N	<2			
Acid Neutralising Capacity (pH 7)	Titration	2	Mol/kg	N	<2			
Phenols (Total-Mono)	Colorimetry (CF)	1	mg/kg	M	<1			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	0.035	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	0.038	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	0.12	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	<0.00020	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	<10	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	0.013	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	0.037	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	30	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	1.3	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	0.032	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	0.017	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	0.016	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	44	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	1000	mg/kg	N	<1000	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	<0.020	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

As detailed in- Waste Classification. Guidance on the classification and assessment of waste. Technical Guidance WM3:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427077/LIT_10121.pdf

Landfill WAC analysis (specifically leaching test results) should not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Waste Acceptance Criteria

Customer Sample Reference : WS02
 Our Sample Reference : 832149 007
 Project Site : First street
 Customer Reference : 4302
 Wet Sample in Dish Weight : 100
 Empty Dish Weight : 0
 Hole ID : WS02
 Sample in Dish @ 105C : 91.7
 Depth : 2.80
 Test Portion Mass (g) : 175
 Date Sampled : 28-JUN-2019
 AGS Type : D
 AGS Sample Reference : 3
 Matrix Class : Clay

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	1.2	3.0	5.0	6.0
Loss on Ignition	Grav	0.1	%	N	3.6			10.0
BTEX (Sum)	Calc	0.040	mg/kg	U	⁽¹³⁾ <0.040	6.0		
PCB EC7 (Sum)	Calc	0.007	mg/kg	U	⁽¹⁰⁷⁾ <0.007	1.0		
Total Petroleum Hydrocarbons C10-C40 (Sum)	Calc	1	mg/kg	N	⁽¹³⁾ 7	500.0		
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
pH	Probe			M	7.7		> 6.0	
Acid Neutralising Capacity (pH 4)	Titration	2	Mol/kg	N	<2			
Acid Neutralising Capacity (pH 7)	Titration	2	Mol/kg	N	<2			
Phenols (Total-Mono)	Colorimetry (CF)	1	mg/kg	M	<1			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	0.0026	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	0.26	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	0.00025	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	35	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	0.028	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	<0.0050	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	10	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	<0.50	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	0.018	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	0.018	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	0.012	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	140	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	1000	mg/kg	N	<1000	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	<0.020	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

* Waste Sampling and Testing for Disposal at Landfill, EBPRI 11507B, Environment Agency (England and Wales) March 2013

As detailed in- Waste Classification. Guidance on the classification and assessment of waste. Technical Guidance WM3:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427077/LIT_10121.pdf

Landfill WAC analysis (specifically leaching test results) should not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Waste Acceptance Criteria

Customer Sample Reference : WS04
 Our Sample Reference : 832149 011
 Project Site : First street
 Customer Reference : 4302
 Hole ID : WS04
 Test Portion Mass (g) : 175
 Sample in Dish @ 105C : 81.2
 Empty Dish Weight : 0
 Depth : 3.50
 Wet Sample in Dish Weight : 100
 Bottom Depth : 3.80
 Date Sampled : 28-JUN-2019
 AGS Type : D
 AGS Sample Reference : 3
 Matrix Class : Topsoil

Soil					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	4.0	3.0	5.0	6.0
Loss on Ignition	Grav	0.1	%	N	5.7			10.0
BTEX (Sum)	Calc	0.040	mg/kg	U	⁽¹³⁾ <0.040	6.0		
PCB EC7 (Sum)	Calc	0.007	mg/kg	U	⁽¹⁰⁷⁾ <0.007	1.0		
Total Petroleum Hydrocarbons C10-C40 (Sum)	Calc	1	mg/kg	N	⁽¹³⁾ 79	500.0		
PAH (Sum)	Calc	1.6	mg/kg	N	41	100.0		
pH	Probe			M	8.2		> 6.0	
Acid Neutralising Capacity (pH 4)	Titration	2	Mol/kg	N	<2			
Acid Neutralising Capacity (pH 7)	Titration	2	Mol/kg	N	<2			
Phenols (Total-Mono)	Colorimetry (CF)	1	mg/kg	M	<1			

Data for BS EN 12457-2 (10:1)					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony	Calc WAC ICP/MS	0.010	mg/kg	N	0.067	0.06	0.7	5.0
Arsenic	Calc WAC ICP/MS	0.0020	mg/kg	N	0.090	0.5	2.0	25.0
Barium	Calc WAC ICP/MS	0.010	mg/kg	N	0.34	20.0	100.0	300.0
Cadmium	Calc WAC ICP/MS	0.00020	mg/kg	N	<0.00020	0.04	1.0	5.0
Chloride	Calc (W)	10	mg/kg	N	<10	800.0	15000.0	25000.0
Chromium	Calc WAC ICP/MS	0.010	mg/kg	N	0.031	0.5	10.0	70.0
Copper	Calc WAC ICP/MS	0.0050	mg/kg	N	0.14	2.0	50.0	100.0
Dissolved Organic Carbon	Calc	10	mg/kg	N	18	500.0	800.0	1000.0
Fluoride	Calc (W)	0.50	mg/kg	N	2.7	10.0	150.0	500.0
Lead	Calc WAC ICP/MS	0.0030	mg/kg	N	0.043	0.5	10.0	50.0
Mercury	Calc WAC ICP/MS	0.00050	mg/kg	N	0.00050	0.01	0.2	2.0
Molybdenum	Calc WAC ICP/MS	0.010	mg/kg	N	0.054	0.5	10.0	30.0
Nickel	Calc WAC ICP/MS	0.010	mg/kg	N	<0.010	0.4	10.0	40.0
Phenols (Total-Mono)	Calc	1.0	mg/kg	N	<1.0	1.0		
Selenium	Calc WAC ICP/MS	0.0050	mg/kg	N	0.014	0.1	0.5	7.0
Sulphate	Calc (W)	5	mg/kg	N	450	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	1000	mg/kg	N	1400	4000.0	60000.0	100000.0
Zinc	Calc WAC ICP/MS	0.020	mg/kg	N	0.027	4.0	50.0	200.0

Following the recommendation from the Environment Agency (England and Wales)*, the leachate preparation in this report has been carried out to BS EN 12457-2 : One Stage batch test at a liquid to solid ratio of 10 l/kg. This is also compliant with Schedule 10 of the Environmental Permitting Regulations 2010.

Note : This is the minimum amount of testing which is required.

Further testing may be required if :

- evidence of immediately leachable parameters becomes available.
- evidence to indicate that the sample could be classified as hazardous under H1-H14 of the Waste(England and Wales) Regulations 2011(as amended) becomes available.

Acceptance of waste at landfill is always at the discretion of the Landfill Operator.

As detailed in- Waste Classification. Guidance on the classification and assessment of waste. Technical Guidance WM3:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/427077/LIT_10121.pdf

Landfill WAC analysis (specifically leaching test results) should not be used for hazardous waste classification purposes. This analysis is only applicable for hazardous waste landfill acceptance and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil MCERTS Preparation							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		AR	AR	AR			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Moisture @105C	Grav (1 Dec) (105 C)	0.1	%	N	5.8	8.3	19

Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil MCERTS Preparation							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		M40	M40	M40			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Retained on 10mm sieve	Grav	0.1	%	N	<0.1	<0.1	<0.1

Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil Asbestos							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		A40	A40	A40			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Asbestos ID	PLM			SU	N.D.	N.D.	N.D.

Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil WAC suite							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		A40	A40	A40			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Boron (water-soluble)	ICP/OES	1	mg/kg	N	<1	<1	<1
Chromium (trivalent)	Calc	2	mg/kg	N	11	21	15
(Water Soluble) Sulphate expressed as SO4	2:1 Extraction/ICP/OES (TRL 447 T1)	0.05	g/l	M	<0.05	0.09	0.17
Sulphide	Colorimetry	10	mg/kg	N	<10	<10	<10

Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil WAC suite							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		AR	AR	AR			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Chromium (hexavalent)	ICP/OES	0.1	mg/kg	N	<0.1	<0.1	<0.1
Cyanide (Total)	Colorimetry (CF)	1	mg/kg	M	<1	<1	<1

Concept Reference: 832149							
Project Site: First street							
Customer Reference: 4302							
Soil		Analysed as Soil					
WAC suite							
Concept Reference				832149 004	832149 007	832149 011	
Customer Sample Reference				WS01	WS02	WS04	
Test Sample				M40	M40	M40	
Hole ID				WS01	WS02	WS04	
Bottom Depth				3.60		3.80	
Depth				3.50	2.80	3.50	
Date Sampled				28-JUN-2019	28-JUN-2019	28-JUN-2019	
AGS Type				D	D	D	
AGS Sample Reference				4	3	3	
Matrix Class				Clay	Clay	Topsoil	
Determinand	Method	LOD	Units	Symbol			
Arsenic	ICP/OES	2	mg/kg	M	<2	6	25
Cadmium	ICP/OES	1	mg/kg	M	<1	<1	1
Chromium	ICP/OES	1	mg/kg	M	11	21	15
Copper	ICP/OES	1	mg/kg	M	12	22	1300
Lead	ICP/OES	1	mg/kg	M	7	11	1400
Mercury	ICP/OES	1	mg/kg	M	<1	<1	5
Nickel	ICP/OES	1	mg/kg	M	13	31	21
Selenium	ICP/OES	3	mg/kg	M	<3	<3	<3
Zinc	ICP/OES	1	mg/kg	M	38	55	640

Concept Reference: 832149 Project Site: First street Customer Reference: 4302							
Soil		Analysed as Soil					
BTEX							
Concept Reference				832149 004	832149 007	832149 011	
Customer Sample Reference				WS01	WS02	WS04	
Test Sample				M105	M105	M105	
Hole ID				WS01	WS02	WS04	
Bottom Depth				3.60		3.80	
Depth				3.50	2.80	3.50	
Date Sampled				28-JUN-2019	28-JUN-2019	28-JUN-2019	
AGS Type				D	D	D	
AGS Sample Reference				4	3	3	
Matrix Class				Clay	Clay	Topsoil	
Determinand	Method	LOD	Units	Symbol			
Benzene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10 ⁽¹³⁾	<10 ⁽¹³⁾	<10 ⁽¹³⁾
Toluene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10
EthylBenzene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10
Meta/Para-Xylene	GC/MS (Head Space)(MCERTS)	10	µg/kg	M	<10	<10	<10
Ortho-Xylene	GC/MS (Head Space)(MCERTS)	10	ua/ka	M	<10	<10	<10

Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil PCB EC7							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		AR	AR	AR			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Polychlorinated biphenyl BZ#101	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1
Polychlorinated biphenyl BZ#118	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1
Polychlorinated biphenyl BZ#138	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1
Polychlorinated biphenyl BZ#153	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1
Polychlorinated biphenyl BZ#180	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1
Polychlorinated biphenyl BZ#28	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1
Polychlorinated biphenyl BZ#52	GC/MS (SIR)	1	µg/kg	M	<10 ⁽⁹⁾	<1	<1

Concept Reference: 832149 Project Site: First street Customer Reference: 4302 Soil Analysed as Soil TerraConsult PAHs							
Concept Reference		832149 004	832149 007	832149 011			
Customer Sample Reference		WS01	WS02	WS04			
Test Sample		M105	M105	M105			
Hole ID		WS01	WS02	WS04			
Bottom Depth		3.60		3.80			
Depth		3.50	2.80	3.50			
Date Sampled		28-JUN-2019	28-JUN-2019	28-JUN-2019			
AGS Type		D	D	D			
AGS Sample Reference		4	3	3			
Matrix Class		Clay	Clay	Topsoil			
Determinand	Method	LOD	Units	Symbol			
Naphthalene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	<0.1
Acenaphthylene	GC/MS (MCERTS)	0.1	mg/kg	U	<0.1	<0.1	<0.1
Acenaphthene	GC/MS (MCERTS)	0.1	mg/kg	M	0.1	<0.1	0.4
Fluorene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	0.3
Phenanthrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	5.7
Anthracene	GC/MS (MCERTS)	0.1	mg/kg	U	<0.1	<0.1	1.2
Fluoranthene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	7.1
Pyrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	6.4
Benzo(a)Anthracene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	4.0
Chrysene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	4.1
Benzo(b)fluoranthene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	2.6
Benzo(k)fluoranthene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	2.1
Benzo(a)Pyrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	2.9
Indeno(123-cd)Pyrene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	1.5
Dibenzo(ah)Anthracene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	0.5
Benzo(ghi)Perylene	GC/MS (MCERTS)	0.1	mg/kg	M	<0.1	<0.1	2.0
Coronene	GC/MS (MCERTS)	0.1	mg/kg	N	<0.1	<0.1	0.4
PAH EA(8)	Calc	0.1	mg/kg	N	<0.1	<0.1	22

Concept Reference: 832149							
Project Site: First street							
Customer Reference: 4302							
Soil		Analysed as Soil					
TPH banded (C5-C40)							
Concept Reference				832149 004	832149 007	832149 011	
Customer Sample Reference				WS01	WS02	WS04	
Test Sample				M105	M105	M105	
Hole ID				WS01	WS02	WS04	
Bottom Depth				3.60		3.80	
Depth				3.50	2.80	3.50	
Date Sampled				28-JUN-2019	28-JUN-2019	28-JUN-2019	
AGS Type				D	D	D	
AGS Sample Reference				4	3	3	
Matrix Class				Clay	Clay	Topsoil	
Determinand		Method	LOD	Units	Symbol		
Total Petroleum Hydrocarbons (C5-C10)		GC/MS (Headspace)	0.10	mg/kg	N	<0.10	<0.10
Total Petroleum Hydrocarbons (C10-C12)		GC/FID (MCERTS)	1	mg/kg	M	<10 ^(13.9)	<1 ⁽¹³⁾
Total Petroleum Hydrocarbons (C12-C16)		GC/FID (MCERTS)	1	mg/kg	M	45 ⁽¹³⁾	<1 ⁽¹³⁾
Total Petroleum Hydrocarbons (C16-C21)		GC/FID (MCERTS)	1	mg/kg	M	170 ⁽¹³⁾	<1 ⁽¹³⁾
Total Petroleum Hydrocarbons (C21-C35)		GC/FID (MCERTS)	1	mg/kg	M	5300 ⁽¹³⁾	7 ⁽¹³⁾
Total Petroleum Hydrocarbons (C35-C40)		GC/FID	1	mg/kg	N	280 ⁽¹³⁾	<1 ⁽¹³⁾
Total Petroleum Hydrocarbons C5-C40 (sum)		Calc	10	mg/kg	N	5800 ⁽¹³⁾	<10 ⁽¹³⁾
							79 ⁽¹³⁾

Concept Reference: 832149									
Project Site: First street									
Customer Reference: 4302									
Leachate to BS EN 12457-2 (10:1)		Analysed as Water							
Waste Acceptance Criteria									
Concept Reference				832149 004		832149 007		832149 011	
Customer Sample Reference				WS01		WS02		WS04	
Test Sample				10:1		10:1		10:1	
Hole ID				WS01		WS02		WS04	
Bottom Depth				3.60				3.80	
Depth				3.50		2.80		3.50	
Date Sampled				28-JUN-2019		28-JUN-2019		28-JUN-2019	
AGS Type				D		D		D	
AGS Sample Reference				4		3		3	
Matrix Class				Clay		Clay		Topsoil	
Determinand		Method		LOD	Units	Symbol			
Arsenic (Dissolved)		ICP/MS (Filtered)		0.2	µg/l	U	3.8	0.3	9.0
Barium (Dissolved)		ICP/MS (Filtered)		1	µg/l	U	12	26	34
Molybdenum (Dissolved)		ICP/MS (Filtered)		1	µg/l	N	3	2	5
Total Dissolved Solids		Grav		100	mg/l	N	<100	<100	140
Phenols (Total-Mono)		Colorimetry		0.1	mg/l	U	<0.1	<0.1	<0.1
Dissolved Organic Carbon		OX/IR		1	mg/l	N	3	1	2
Electrical Conductivity		Probe		10	µS/cm	N	57	120	230
Antimony (Dissolved)		ICP/MS (Filtered)		1	µg/l	U	3	<1	7
Cadmium (Dissolved)		ICP/MS (Filtered)		0.02	µg/l	U	<0.02	0.03	<0.02
Chromium (Dissolved)		ICP/MS (Filtered)		1	µg/l	U	1	3	3
Copper (Dissolved)		ICP/MS (Filtered)		0.5	µg/l	U	3.7	<0.5	14
Lead (Dissolved)		ICP/MS (Filtered)		0.3	µg/l	U	<0.3	<0.3	4.3
Mercury (Dissolved)		ICP/MS (Filtered)		0.05	µg/l	U	<0.05	<0.05	0.05
Nickel (Dissolved)		ICP/MS (Filtered)		1	µg/l	U	2	2	<1
Selenium (Dissolved)		ICP/MS (Filtered)		0.5	µg/l	U	1.6	1.2	1.4
Zinc (Dissolved)		ICP/MS (Filtered)		2	µg/l	U	<2	<2	3
Chloride		Discrete Analyser		1	mg/l	U	<1	4	<1
Fluoride		Discrete Analyser		0.05	mg/l	U	0.13	<0.05	0.27
Sulphate		Discrete Analyser		0.5	mg/l	U	4.4	14	45

Index to symbols used in 832149-1

Value	Description
AR	As Received

M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
10:1 S	Data for BS EN 12457-2 (10:1)
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
10:1	Leachate to BS EN 12457-2 (10:1)
A40	Assisted dried < 40C
N.D.	Not Detected
107	1,1,2-trichloroethylene is the same as trichloroethylene
13	Results have been blank corrected.
9	LOD raised due to dilution of sample
S	Analysis was subcontracted
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Asbestos was subcontracted to REC Asbestos.
Samples submitted for GC/MS (Headspace) analysis were submitted in inappropriate containers. It is possible therefore that the results provided may be compromised.



APPENDIX E

Calibration Certificates

Gas monitor(s)

TEST DATE AND CONDITIONS			
Date		07/05/19	
Atmospheric Pressure		997	mB
Ambient Temperature		21.3	°C
Envionics Serial No.		5089	

**GFM436 Final Inspection & Calibration
Check Certificate**

GAS DATA LTD	
Unit 4, Fairfield Court	
Seven Stars Estate	
Wheler Rd	
Coventry	
CV3 4LJ	
Tel 02476303311	Fax 02476307711



Customer	Terraconsult Ltd
Certificate Number	120971
Order Number	322394

Serial Number	12417
Software Version	G436-00.0027/0009

Recalibration DUE Date
07/05/20

Instrument Checks			
Keyboard	✓		Display Contrast
Pump Flow In	450	Accept > 200 cc/min	Pump Flow @ -200mB
Clock Set / Running	✓		Labels Fitted

Gas Checks						
Sensor	CH ₄		CO ₂		O ₂	
	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %	Instrument Gas	True Gas Value %
	Readings %		Readings %		Readings %	
	60.2	60	40	40	20.9	20.9
	Accept ±3.0		Accept ±3.0		Accept ±0.5	
	5	5	5	5	6	6
	Accept ±0.3		Accept ±0.3		Accept ±0.3	
Zero Reading 100% N2	0	0	0	0	0	0
	Accept ±0.0		Accept ±0.0		Accept ±0.1	

Optional Gas Checks						
Applied Gas & Range		Concentration Tested @ (ppm)	Instrument Readings (ppm)			
Gas Type	Range (ppm)		Zero Reading		Instrument Gas Reading	
H2S	5000	1500	0	Accept ±0.0	1500	Accept ±5.0
CO	2000	1000	0	Accept ±0.0	1000	Accept ±5.0
Hexane	2.0%	2.0%	0	Accept ±0.0	1.99	Accept ±10.0



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waste management
environmental &
ground engineering
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EMS 573194

