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APPENDIX ES17.1

FACTUAL REPORT OF THE 2019/2020 SITE INVESTIGATION IN THE PROPOSED WESTERN EXTENSION AREA (REPORT REFERENCE AU/KCW/JRC/2936/01 DATED JUNE 2020)

Technical advisers on environmental issues

FACTUAL REPORT OF A SITE INVESTIGATION IN A POTENTIAL EXTENSION TO EAST NORTHANTS RESOURCE MANAGEMENT FACILITY AND CONSTRUCTION QUALITY ASSURANCE VERIFICATION REPORT FOR THE INSTALLATION OF GROUNDWATER AND LANDFILL GAS MONITORING BOREHOLES DRILLED DURING THE SITE INVESTIGATION

Report reference: AU/KCW/JRC/2936/01
June 2020

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This report has been prepared by MJCA with all reasonable skill, care and diligence, and taking account of the Services and the Terms agreed between MJCA and the Client. This report is confidential to the client and MJCA accepts no responsibility whatsoever to third parties to whom this report, or any part thereof, is made known, unless formally agreed by MJCA beforehand. Any such party relies upon the report at their own risk.

1. Introduction

1.1 MJCA is commissioned by Augean PLC to undertake a site investigation on land adjacent to East Northants Resource Management Facility (ENRMF). The primary objective of the site investigation is to determine the elevation and depth to the boundary between the base of the Rutland Formation and the top of the Lincolnshire Limestone Formation across an area of a potential extension of the landfill at ENRMF and to assess the nature of the Rutland Formation. MJCA is commissioned to prepare a Construction Quality Assurance (CQA) Verification Report for the aspects of the site investigation which comprise the installation of sixteen combined groundwater and landfill gas monitoring boreholes round the perimeter of the potential extension area. The site works were carried out from November 2019 to March 2020.

1.2 ENRMF comprises a hazardous waste and low level radioactive waste (LLW) landfill and a soil treatment facility. The current landfill site is centred approximately on National Grid Reference (NGR) TF 008 000 approximately 15km west of Peterborough, approximately 1.7km east south east of Duddington and approximately 2.6km north of Kings Cliffe. The area of investigation is adjacent to the western boundary, to the south west and to the north west of the current landfill site. The location of the site is shown on Figure 1.

1.3 The void for the landfill at ENRMF extends through glacial clay (formerly referred to as boulder clay) and the Blisworth Limestone Formation where these formations are present and into the clay of the Rutland Formation of the Jurassic Great Oolite Group. The Jurassic Great Oolite Group is underlain in turn by the Lincolnshire Limestone Formation, the Grantham Formation comprising sands, silts, clays and mudstones and the Northampton Sand Formation comprising sandstones with subordinate limestones of the Jurassic Inferior Oolite Group. The Grantham Formation is discontinuous locally and often the Lincolnshire Limestone is underlain directly by the Northampton Sand Formation. The Northampton Sand Formation is underlain by the Whitby Mudstone Formation.

1.4 The Blisworth Limestone Formation and the Lincolnshire Limestone Formation are designated as principal aquifers by the Environment Agency. Principal aquifers have

high intergranular and/or fracture permeability meaning that they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. The Blisworth Limestone Formation where present at the site is thin and of insignificant resource value. The site is not located in a source protection zone (SPZ).

1.5 The glacial till and the Grantham Formation are designated as secondary undifferentiated aquifers, the Northampton Sand Formation is designated a secondary A aquifer and the Rutland Formation is designated a secondary B aquifer. Secondary undifferentiated aquifers have been assigned in cases where it has not been possible to attribute either category A or B to a rock type and has variable characteristics. Secondary A aquifers are permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. Secondary B aquifers are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

1.6 The objective of the intrusive site investigation is to establish that a natural low permeability geological barrier is present over the Lincolnshire Limestone Formation principal aquifer at the site. The elevation of the boundary between the base of the Rutland Formation and the top of the Lincolnshire Limestone Formation in the potential landfill extension area at ENRMF will be used to inform an assessment of the thickness of Rutland Formation that would need to be left in-situ during construction of a western, south western and north western landfill area at ENRMF. The scope of the site investigation has been agreed with the Environment Agency. A copy of the agreed scope is presented at Appendix A.

1.7 MJCA site personnel in the capacity of CQA Inspector were present for the duration of the site works between 18 November 2019 and 12 March 2020 to verify the drilling of the boreholes and the installation of the monitoring facilities in the boreholes. The drilling contractor returned to the site on 17 March 2020 to complete demobilisation and confirm blockage of borehole K33. The monitoring boreholes were constructed and this CQA Verification Report has been prepared in accordance with Environment Agency guidance generally.

1.8 A description of the site works carried out together with records of the boreholes drilled during the site works and copies of relevant CQA documentation are presented in this report.

2. Description and results of the site works

2.1 Between 18 November 2019 and 17 March 2020 twenty seven boreholes were drilled in the potential landfill extension area to investigate the ground conditions and in particular the depth to the Lincolnshire Limestone Formation and the nature of the Rutland Formation overlying the Lincolnshire Limestone Formation in accordance with the scope of the site investigation agreed with the Environment Agency (Appendix A). Sixteen boreholes referenced boreholes K22 to K37 located round the perimeter of the potential landfill extension area were completed with groundwater and landfill gas monitoring installations. A further ten boreholes (KCW_1/19 to KCW_10/19) were drilled to a depth of approximately 1m below the top of the Lincolnshire Limestone Formation and were backfilled with bentonite pellets and a bentonite and cement grout. The boreholes KCW_1/19 to KCW_10/19 were drilled to provide further information about the geology within and round the perimeter of the potential landfill extension area. One borehole (K35) was abandoned due to a stuck core barrel and was backfilled with bentonite pellets and a bentonite and cement grout. The borehole was re-drilled and completed with a groundwater and landfill gas monitoring installation (K35A). The locations of the boreholes are shown on Figure 2.

2.2 Following the excavation of a hand inspection pit to 1.2m below ground level (bgl) the boreholes were drilled generally using a rotary core drilling method at a core diameter of approximately 112mm and a nominal borehole diameter of 150mm using a water flush. All boreholes were drilled initially using percussive methods to depths of approximately 2.2 to 2.7m. Boreholes K31 and K35A were drilled in part using rotary open hole techniques at a nominal diameter of 150mm using an air/mist and water flush respectively. Temporary 168mm diameter casing was installed to depths of between 2.2mbgl and 7.2mbgl in boreholes K23 to K30, K33, K36, KCW_1/19 to KCW_5/19 and KCW_7/19 to KCW_10/19 to maintain the integrity of the boreholes during drilling. Temporary 124mm, 168mm and 200mm diameter casing was variably installed to depths of between 12.0mbgl and 31.7mbgl in boreholes K22, K31 to K35A, K37 and KCW_6/19 to facilitate drilling through fractured limestones and sandstones and weakly consolidated sands. In some circumstances it was

necessary to use the casing to facilitate methods to free stuck casing and core barrels.

2.3 Boreholes K22 to K34 and K35A to K37 located round the perimeter of the potential landfill extension area were terminated within the upper 2.1m of the Whitby Mudstone Formation at depths of between 27.75mbgl (or 53.90m above Ordnance Datum (mAOD)) and 38.50mbgl (or 50.39mAOD). Boreholes KCW_1/19 to KCW_4/19 and KCW_7/19 to KCW_10/19 drilled within and round the perimeter of the area of the potential landfill extension were terminated within the upper 5.05m of the Lincolnshire Limestone Formation at depths of between 9.7mbgl (or 72.48mAOD) and 19.7mbgl (or 68.52mAOD). Boreholes KCW_5/19 and KCW_6/19 are located within the area of the potential landfill extension and were terminated within the upper 1.75m of the Whitby Mudstone Formation at depths of between 27.8mbgl (or 52.53mAOD) and 28.0mbgl (or 52.55mAOD).

2.4 The borehole arisings were logged generally in accordance with BS5930:2015 Code of Practice for Ground Investigations. The borehole records are presented at Appendix B. Photographs of cores recovered from the boreholes are presented at Appendix C. The drilling logs recorded by the drilling contractor are provided at Appendix D.

2.5 Measurements were recorded of the lengths of total core recovered (TCR). Where the arising comprised competent bedrock, measurements of the length of solid core recovery (SCR), rock quality designation (RQD) and the fracture index (FI) were also recorded. Some of the TCR measurements did not comprise the full length drilled in a core run therefore where it is possible to determine the position where there had been loss of core this was recorded. The majority of the loss of core recorded during the drilling comprised weak strata, such as soft clays or weakly consolidated sands, and the action of the coring and water flush resulted in the weak strata being recovered as non-intact. The TCR, SCR, RQD and FI recorded together with details of any loss of core are recorded on the borehole records presented at Appendix B.

2.6 Discontinuities and weathering observed in the cores are recorded in the description of the strata in accordance with BS BS5930:2015 Code of Practice for Ground Investigations generally. In the limestone stratum occasional features were observed

which are considered to be attributable to dissolution activity. Where observed these features are recorded on the borehole logs. Based on the observations of arisings and observations made by lead drillers on the progress of drilling and drilling conditions, there are few discontinuities which are greater than 1cm and no discontinuities greater than 10cm were proven.

2.7 With the exception of borehole K31 all boreholes were drilled using a water flush. Borehole K31 was drilled using rotary open hole techniques with an air/mist flush from depths of 11.75mbgl to 12.70mbgl and from 13.10mbgl to 15.10mbgl. In the majority of the boreholes there was a loss of water flush at a depth which correlated with near to the top of the Lincolnshire Limestone Formation. The only exceptions were observed in boreholes KCW_7/19, KCW_8/19 and KCW_10/19. These boreholes were terminated at a depth of 1.1m to 1.5m into the Lincolnshire Limestone Formation.

2.8 Drilling methods using rotary coring techniques with a water flush precludes the recording of the depth of groundwater strikes. Where there was a loss of water flush in the borehole the water level in each borehole was monitored for a period of up to 25 minutes in order to assess if the borehole had intercepted groundwater. If the borehole had not intercepted groundwater the water flush level fell at variable rates until recorded dry in the borehole whereas if the borehole had intercepted groundwater the water flush level in the borehole remained stable in the borehole and was considered to correlate approximately with a groundwater level. The water flush levels and rest groundwater levels recorded at the start of each shift are recorded on the drillers logs presented at Appendix D. The resting groundwater levels recorded during monitoring carried out on completion of the site works on 11 March 2020 are presented in Table 1.

2.9 Borehole K35 was drilled to a depth of 28.1mbgl although was abandoned after the core barrel became stuck in weakly consolidated and unconsolidated sand. It was necessary to abandon the core barrel together with 10m of drill pipe in the borehole. The borehole was backfilled with bentonite pellets to the level of the top of the Lincolnshire Limestone Formation and was backfilled above this with bentonite and cement grout to ground level. A replacement borehole (K35A) was drilled approximately 5m to the west of borehole K35.

2.10 Boreholes KCW_1/19 to KCW_4/19 and KCW_7/19 to KCW_10/19 were backfilled with bentonite pellets to a level approximately level with the top of the Lincolnshire Limestone Formation and hydrated with clean water. The boreholes were backfilled above this with a bentonite and cement grout to ground level using a tremie pipe. Borehole KCW_5/19 was backfilled with bentonite and cement grout from 27.80mbgl to 21.70mbgl, bentonite pellets from 21.70mbgl to 14.5mbgl, bentonite and cement grout from 14.5mbgl to 3.0mbgl and bentonite pellets to ground level. Borehole KCW_6/19 was backfilled with bentonite pellets from 28.0mbgl to 17.0mbgl, bentonite and cement grout from 17.0mbgl to 7.85mbgl and bentonite pellets to ground level. A tremie pipe was used to backfill with the bentonite and cement grout.

2.11 At boreholes K22 to K34 and K35A to K37 located round the perimeter of the potential landfill extension area combined groundwater and landfill gas monitoring facilities were installed in the Lincolnshire Limestone Formation, Grantham Formation and Northampton Sand Formation. The monitoring installations comprise approximately 18m to 22m lengths of 63mm outer diameter (OD) slotted high density polyethylene (HDPE) standpipe with a geotextile sleeve (Geosock). Approximately 0.4m to 2.1m lengths of 63mm OD plain HDPE standpipe were installed at the base of the monitoring boreholes to bring the base of the slotted pipe adjacent to the groundwater bearing strata and to act as a sump to collect fines settling out in the borehole. The slotted pipe in the boreholes extends from approximately the level of the top of the Lincolnshire Limestone Formation to approximately the level of the top of the Whitby Mudstone Formation. A 63mm OD plain HDPE standpipe was installed above the slotted pipe to ground surface in the boreholes.

2.12 The geotextile sleeve used to cover the slotted section of the monitoring borehole comprised a Geosock which is a permeable filter geotextile sleeve with a nominal pore size diameter of 300µm. Performance information for the construction products used for the monitoring facilities is presented at Appendix E. The Geosock sleeve was fitted to the slotted sections of the pipe before the slotted sections were installed in the borehole. The CQA Inspector verified that the Geosock sleeve was not damaged and that all slots in the pipe were appropriately covered by the Geosock sleeve. The ends of the Geosock sleeve were secured firmly to the pipe.

2.13 The monitoring borehole annuli were backfilled with 2mm to 5mm washed gravel from the base of the borehole to approximately 1m above the top of the slotted pipe. No evidence of bridging was observed during the installation of the gravel pack and the installation was verified by the CQA Inspector. Approximately 0.5m thickness of bentonite pellets was placed above the gravel pack in the monitoring boreholes to prevent the bentonite and cement grout infiltrating the gravel pack. The annuli of the monitoring boreholes above the bentonite pellets were sealed with bentonite and cement grout emplaced using a tremie pipe. Each monitoring standpipe was fitted at the base with an end cap and at the top with a gas tight cap with an integral gas monitoring tap.

2.14 The monitoring standpipes in all of the boreholes are protected by lockable raised metal headworks concreted securely at ground level. The borehole reference is marked on the borehole headworks. The headworks for boreholes K22 to K32 and K35A to K37 are protected by fencing. It was agreed with the farmer that protective fencing was not needed around the headworks for boreholes K33 and K34. A photographic log including the construction materials used in the monitoring facilities and an example of a finished borehole is presented at Appendix F. A record comprising the site diary forms for the drilling of the boreholes and the details of the borehole installations are presented at Appendix G.

2.15 The monitoring standpipe in borehole K33 is blocked at a depth of 18.7mbgl which is 1m below the top of the slotted pipe and 2.1m below the base of the bentonite seal. It is considered likely that the bentonite grout has infiltrated the gravel pack and the slotted HDPE monitoring standpipe. It is proposed that the monitoring borehole will be re-drilled consistent with the agreed methodology. An addendum to this report will be provided to the Environment Agency as Construction Quality Assurance Verification of the replacement borehole.

2.16 Inertial pumps have been placed in the boreholes to facilitate groundwater purging following installation of the boreholes and for future groundwater sampling. The boreholes were developed using an actuator attached to the inertia pump at ground level. Development was continued until the groundwater was observed as reasonably free of suspended solids and for approximately three well volumes. This

work was undertaken by Augean personnel on 20 and 21 May 2020. Records of the purging exercise are provided in Table 2.

2.17 The borehole location coordinates and the ground level and the cover level were surveyed relative to Ordnance Datum on completion of the drilling works and the information is presented in Table 1 and on the borehole logs at Appendix B.

2.18 A total of fourteen samples of the Rutland Formation were collected from the core from boreholes K23, K26, K28, K29, K31, K34, K37, KCW_1/19, KCW_7/19, KCW_8/19 and KCW_10/19 and summitted to a laboratory for vertical hydraulic conductivity testing of the undisturbed core samples. The samples were taken at different depths near the base of the Rutland Formation or glacial Till depending on which strata was present above the Lincolnshire Limestone Formation. The testing reports are presented at Appendix H.

TABLES

Table 1

The approximate location and depth of boreholes drilled between November 2019 and March 2020

Borehole reference	Easting	Northing	Cover level (mAOD)	Ground level (mAOD)	Depth of borehole (mbgl)[1]	Top of response zone (mbgl)	Base of response zone (mbgl)	Depth to groundwater [2] (mbgl)	Groundwater level (mAOD)
K22	500180.35	299831.88	89.10	88.69	35.70	18.80	35.70	25.18	63.51
K23	500196.19	299961.90	86.91	86.56	34.20	12.20	34.20	22.27	64.29
K24	500276.09	300084.81	83.65	83.19	30.80	6.70	30.80	17.87	65.32
K25	500268.54	300217.48	82.32	81.77	28.00	5.00	28.00	17.72	64.05
K26	500207.01	300526.01	88.74	88.23	38.20	14.00	37.25	15.80	72.43
K27	500248.12	300789.28	89.96	89.52	36.70	12.00	35.50	16.88	72.64
K28	500303.86	300677.11	89.26	88.89	38.50	13.15	38.25	16.13	72.76
K29	500351.81	300588.85	87.34	86.93	37.25	12.60	35.40	14.16	72.77
K30	500409.72	300497.98	84.63	84.22	35.75	11.10	34.75	11.35	72.87
K31	500439.05	300407.43	82.53	82.08	32.10	8.20	32.10	9.00	73.08
K32	500450.33	300307.59	82.02	81.65	27.75	4.75	27.45	7.98	73.67
K33	500440.58	299675.00		86.91	34.20	16.70	34.20	[3]	[3]
K34	500439.57	299540.08	85.58	85.42	33.80	14.00	33.35	23.23	62.19
K35	500334.88	299543.12		86.68	28.10			[4]	[4]
K35A	500330.02	299544.12	87.21	86.78	34.50	11.00	34.10	24.84	61.94
K36	500236.31	299546.95	88.10	87.79	34.80	11.90	34.80	26.48	61.31
K37	500154.75	299549.68	89.42	88.97	35.60	13.10	35.40	27.56	61.41
KCW_1/19	500181.07	300683.41		89.64	16.10				
KCW_2/19	500323.61	300483.24		86.39	14.70				
KCW_3/19	500259.65	300357.72		82.90	10.20				
KCW_4/19	500360.11	300340.84		82.16	9.70				

Table 1

The approximate location and depth of boreholes drilled between November 2019 and March 2020

Borehole reference	Easting	Northing	Cover level (mAOD)	Ground level (mAOD)	Depth of borehole (mbgl)[1]	Top of response zone (mbgl)	Base of response zone (mbgl)	Depth to groundwater [2] (mbgl)	Groundwater level (mAOD)
KCW_5/19	500366.18	300242.25		80.33	27.80				
KCW_6/19	500349.13	300158.24		80.55	28.00				
KCW_7/19	500339.37	299972.11		86.45	12.50				
KCW_8/19	500316.31	299850.34		87.60	16.30				
KCW_9/19	500165.33	299688.76		89.34	16.20				
KCW_10/19	500299.51	299699.82		88.22	19.70				

Notes:
mAOD – metres above Ordnance Datum
mbgl - metres below ground level

[1] The depth to the base of the borehole.

[2] The depth to groundwater was recorded on 11 March 2020.

[3] Borehole K33 is blocked at 18.70mbgl approximately 1m below the top of the slotted pipe. The borehole is recorded as dry.

[4] Borehole K35 was abandoned and backfilled with bentonite pellets and a bentonite and cement grout.

Table 2

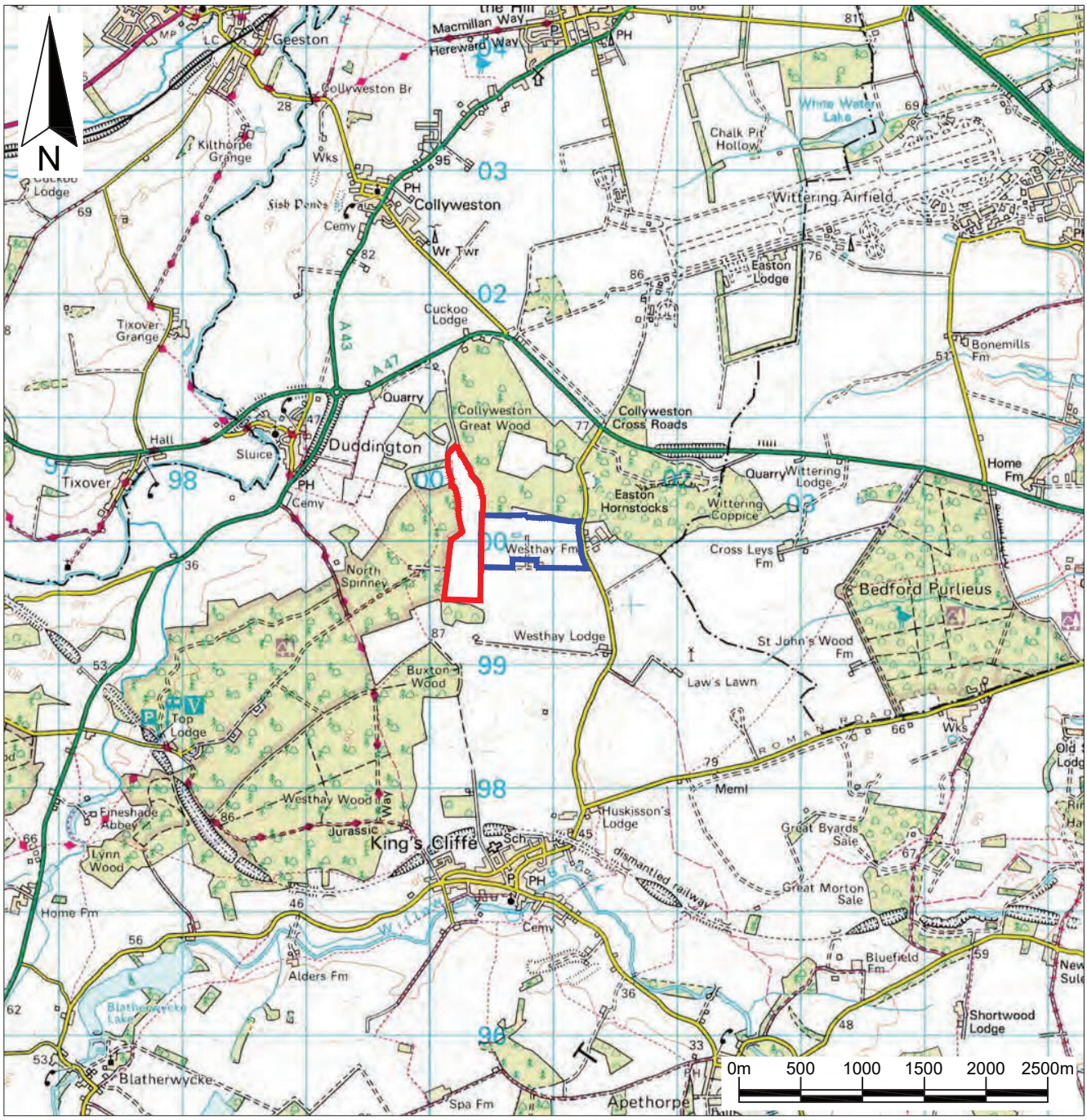
Records of groundwater purged from the monitoring boreholes on 20 and 21 May 2020

Borehole reference	Date	Depth of borehole (mbgl)	Depth to groundwater (mbgl)	Depth of water column (m)	One well volume in standpipe (litres)	Volume of groundwater purged from borehole (litres)[1]	Number of well volumes removed during purging
K22	21/05/2020	35.75	25.58	10.17	20.3	60	2.9
K23	21/05/2020	34.22	22.59	11.63	23.3	66	2.8
K24	20/05/2020	30.84	19.66	11.18	22.4	66	3.0
K25	20/05/2020	27.67	19.77	7.90	15.8	48	3.0
K26	20/05/2020	37.55	18.22	19.33	38.7	120	3.1
K27	20/05/2020	37.12	18.82	18.30	36.6	108	3.0
K28	20/05/2020	37.43	18.18	19.25	38.5	114	3.0
K29	20/05/2020	35.29	16.87	18.42	36.8	108	2.9
K30	20/05/2020	35.04	14.39	20.65	41.3	126	3.1
K31	20/05/2020	32.10	13.29	18.81	37.6	114	3.0
K32	20/05/2020	27.55	15.69	11.86	23.7	72	3.0
K34	21/05/2020	34.00	23.98	10.02	20.0	60	3.0
K35A	21/05/2020	33.98	25.86	8.12	16.2	48	3.0
K36	21/05/2020	33.80	26.93	6.87	13.7	42	3.1
K37	21/05/2020	34.43	28.26	6.17	12.3	36	2.9

Notes

1. Development was continued until the groundwater was observed as reasonably free of suspended solids.

FIGURES



Key / Notes

DCO boundary for the East Northants Resource Management Facility (ENRMF)

Approximate location of potential landfill extension area at ENRMF

Rev	Status	Drn	App	Chk	Date
	Final	KR	ML	JRC	19/06/20

Site
EAST NORTHANTS RESOURCE MANAGEMENT FACILITY

Client
Augean PLC specialists in waste management

Title
The site location

Figure 1

Scale
1:50,000@A4

Drawing Ref
AU/KCW/05-20/21755

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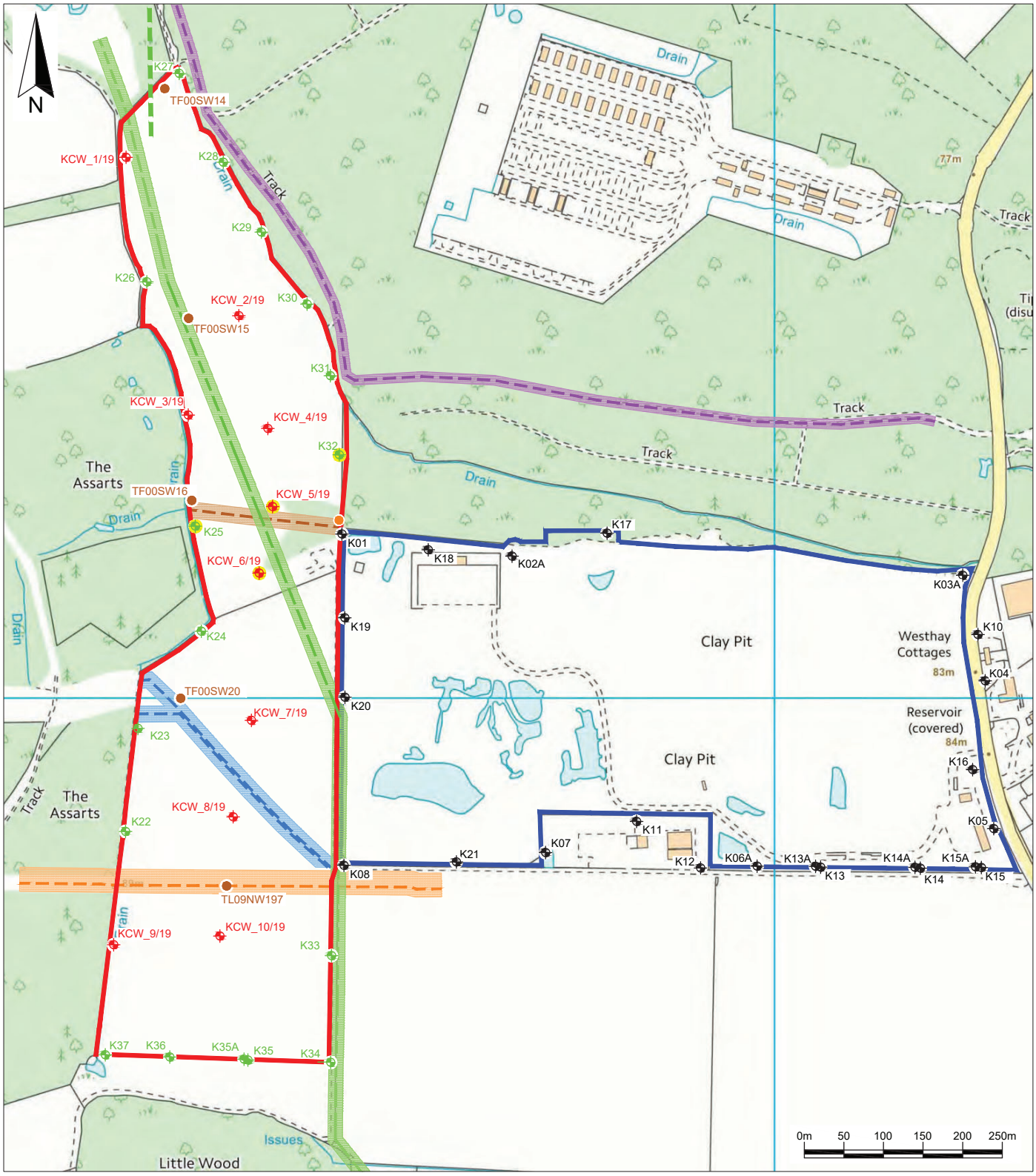

Key / Notes

- DCO boundary for the East Northants Resource Management Facility (ENRMF)
- Approximate location of potential landfill extension area at ENRMF
- Approximate location of a swallow hole
- K01 Location of a monitoring borehole
- KCW_7/19 Location of a site investigation borehole
- K22 Location of a new groundwater and landfill gas monitoring borehole
- TF00SW20 Approximate location of a British Geological Survey (BGS) borehole
- Buffer zone with 10m stand off to the south of the centre of the route of the gas pipeline and 20m standoff to the north of the centre of the route of the gas pipeline
- Redundant MOD pipeline
- Buffer zone with 10m stand off either side of the centre of the route of the water pipeline
- Buffer zone with 6m stand off either side of the centre of the route of the oil pipeline
- Buffer zone with 9m stand off either side of the centre of the route of the overhead cables
- Buffer zone with 10m stand off either side of the centre of the route of the drainage pipe

Rev	Status	Drn	App	Chk	Date
	Final	SW	ML	JRC	19/06/20

Site: EAST NORTHANTS RESOURCE MANAGEMENT FACILITY

Client: Augean PLC

Title: Borehole location plan for the potential landfill extension site investigation

Figure 2

Scale: 1:5,000@A3

Drawing Ref: AU/KCW/03-20/21686

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APPENDICES

APPENDIX A

SCOPE OF THE SITE INVESTIGATION AGREED WITH THE ENVIRONMENT AGENCY

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10 December 2018
Our ref: AU/KCE/JRC/2936/01

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CONFIDENTIAL

SENT BY EMAIL ONLY

Dear Jim

ENRMF – Potential landfill extension site investigation

Further to our meeting in September 2017 and our recent telephone conversation we confirm that Augean are currently negotiating a land deal which provides the potential for the continuation of landfilling at East Northants Resource Management Facility (ENRMF) to the west and north west of the site. As discussed, as the land deal has not yet been finalised the proposals are confidential at this stage. In the interest of expediting site investigation works following completion of the land deal, we present in this letter the scope for the proposed site investigation to establish the elevation of the boundary between the base of the Rutland Formation and the top of the Lincolnshire Limestone Formation across the potential landfill extension area at ENRMF together with the nature of the Rutland Formation. As discussed, we would like to agree the scope of the site investigation with the Environment Agency so that the works can take place as soon as possible. The site investigation will not be carried out until the land deal is complete and the proposals are in the public domain. It is hoped that the site works will commence in January 2019.

Geological setting

In summary, the geology at the potential landfill extension area comprises glacial till (formerly boulder clay), where present, overlying the Blisworth Limestone Formation in the north of the potential extension area and in the remainder of the potential extension area overlying the Rutland Formation. The Rutland Formation underlies the Blisworth Limestone Formation and is underlain in turn by the Lincolnshire Limestone Formation, Grantham Formation (where present), Northampton Sand Formation and the Whitby Mudstone Formation.

The Blisworth Limestone Formation and the Lincolnshire Limestone Formation are designated as Principal aquifers by the Environment Agency. Principal aquifers have high intergranular and/or fracture permeability meaning that they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. The Blisworth Limestone Formation where present at the site is thin and of insignificant resource value. The site is not located in a source protection zone (SPZ).

The glacial till is designated as a secondary undifferentiated aquifer and the Rutland Formation is designated a Secondary B aquifer. Secondary undifferentiated aquifers have been

assigned in cases where it has not been possible to attribute either category A or B to a rock type and has variable characteristics. Secondary B aquifers are predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

Landfill location position statement

It is stated in the Environment Agency landfill location position statement E1[1] that:

> *"The Environment Agency will normally object to any proposed landfill site in groundwater SPZ1.*
>
> *For all other proposed landfill site locations, a risk assessment must be conducted based on the nature and quantity of the wastes and the natural setting and properties of the location. Where this risk assessment demonstrates that active long-term site management is essential to prevent long-term groundwater pollution, the Environment Agency will object to sites:*
>
> - *below the water table in any strata where the groundwater provides an important contribution to river flow, or other sensitive receptors*
> - *within SPZ2 or 3*
> - *on or in a principal aquifer"*

The Environment Agency set out in the landfill location position statement E1 the circumstances where an SPZ2, SPZ3 or principal aquifers may be a suitable landfill location:

> *"There may be cases where substantial, natural low permeability geological barriers overlie a ..... principal aquifer at a proposed landfill location. In such cases, the natural barrier must be sufficient to prevent long-term pollution from the proposed landfill, and satisfy the requirements of the Landfill Directive. ..... For example, a principal aquifer may be shown on the aquifer designation bedrock maps, but the aquifer may actually be known to be overlain by a significant thickness of low permeability clay drift.*
>
> *The Environment Agency will only take such circumstances into consideration when reviewing a landfill's planning and permit application, where all of the following are met:*
>
> - *the proposed landfill site is located outside any designated SPZ1 or 2*
> - *the presence of natural low-permeability geological barriers can be demonstrated, where necessary by site-specific investigation*
> - *the proposed landfill site is above the water table in situations where groundwater provides an important contribution to river flow or other sensitive receptors such as surface waters and groundwater dependent terrestrial ecosystems*
> - *Where it can be shown that a natural geological barrier exists, the applicant will need to demonstrate (where necessary by quantitative risk assessment) that the vulnerability of the groundwater to pollution can be*

[1] Environment Agency. 2018. Environment Agency's approach to groundwater protection. Version 1.2 dated February 2018.

considered lessened by the presence of the barrier, and adequately compensates for the risk of long-term degradation of artificial sealing layers, leachate collection systems and other active management control systems.

…..Whether or not a natural geological barrier overlying an aquifer is 'substantial' for the purposes of disapplying position statement E1 will depend on the outcome of the quantitative risk assessment. You will need to take into account the thickness, permeability and uniformity of the natural geological barrier. A barrier will not be considered 'substantial' for a landfill development if there is unpredictable variability in its layers, or if there are natural or artificial by-pass routes that could compromise its overall protective integrity. There should be a minimum of several metres of natural material in a substantial barrier, such that:

- *any variations in its thickness over a site are insignificant in terms of the performance of the barrier*
- *any construction/excavation activity at the site poses no risk of breaching the integrity of the barrier*
- *it is clear that the geological barrier is substantial from a basic assessment of the site, which may include confirmatory site investigation data but without the necessity of very detailed site investigation or detailed quantitative risk assessment.*

Note: The Environment Agency will not normally regard the aquifer materials themselves as forming part of a low permeability geological barrier when considering a proposed landfill on or within an SPZ3 or a principal aquifer. A landfill in these locations is only potentially acceptable where a separate, natural, low permeability geological barrier is acting to protect the aquifer….."

Objectives

The purpose of the proposed intrusive site investigation is to establish that a natural low permeability geological barrier is present over the Lincolnshire Limestone Formation Principal aquifer at the site. The elevation of the boundary between the base of Rutland Formation and the top of the Lincolnshire Limestone Formation in the potential landfill extension area at ENRMF will be used to inform an assessment of the thickness of Rutland Formation that would need to be left in-situ during the construction of a western and north western landfill area at ENRMF in accordance with the Environment Agency landfill location position statement[1 above].

Available information

Borehole information at and in the vicinity of the site has been made available on the British Geological Survey (BGS) website since the previous applications for ENRMF were submitted and the current development consent and Environmental Permits were granted. From the available BGS borehole information, the boundary between the base of the Rutland Formation and top of the Lincolnshire Limestone Formation at the site and in the potential extension area has been interpreted and a contour plan has been prepared showing the elevation of the boundary. This contour plan has been compared with the model created from site investigation information collected in the current landfill area including during the site investigation works carried out at ENRMF in 2013. The comparison is shown on the plan presented as Annex 1 to this letter. The two contour plots generally correspond, with the closer spaced site investigation boreholes in the current landfill area refining the contours produced from the BGS data.

The BGS data provides an initial guide to the elevation of the top of the Lincolnshire Limestone in the potential landfill extension area. It is anticipated that the top of the limestone will fall from approximately 76 metres above Ordnance Datum (mAOD) in the north and west of the potential extension area to approximately 71mAOD in the east and approximately 70mAOD in the south of the potential landfill extension area as shown at Annex 1.

A plan showing the depth to the top of the Lincolnshire Limestone Formation based on the BGS borehole information is shown on the plan presented as Annex 2 to this letter. As you are aware there is a swallow hole located adjacent to the north western corner of the current landfill area. Consistent with the situation in the western area of the current landfill, the BGS borehole data shows that the top of the Lincolnshire Limestone Formation is approximately 6m below ground level (mbgl) to 7mbgl in the vicinity to the swallow hole and increases significantly to the south. This significant increase in depth is seen also to the north. As can be seen on the plan at Annex 2, the depth to the top of the Lincolnshire Limestone Formation increases to approximately 14mbgl in the north and up to 18mbgl in the south of the potential landfill extension area.

Site investigation proposals

The proposed intrusive site investigation for the potential extension area has been designed to complement the geological model based on the BGS data presented at Annexes 1 and 2. It is proposed that the intrusive site investigation will comprise the drilling of 21 boreholes by rotary coring techniques from ground level to at least 1m below the boundary between the base of the Rutland Formation and into the top of the Lincolnshire Limestone Formation. It is proposed that 13 of the boreholes are drilled round the perimeter of the site and will be completed with monitoring installations in the Lincolnshire Limestone Formation. The remaining 8 boreholes will be backfilled with bentonite to ground level. A representative number of samples of the Rutland Formation shall be collected for permeability testing. The proposed site investigation boreholes shall be drilled generally between the locations of the BGS boreholes and the monitoring boreholes along the western and northern boundary of the current ENRMF landfill site to give an approximate spacing between boreholes of 100m to 150m across the potential landfill extension area. The proposed boreholes have been positioned where practicable allowing for the presence of utilities crossing the site. Boreholes proposed in the centre of the site are more closely spaced better to define the depth to the top of and the nature of the Lincolnshire Limestone Formation in proximity to the swallow hole. The proposed locations of the 21 boreholes and the locations of the BGS boreholes and monitoring boreholes drilled previously are shown on Figure 1 (drawing reference AU/KCE/12-18/20965). Further boreholes may be drilled should there be significant differences to the anticipated depth to the top of the Lincolnshire Limestone Formation.

At the locations of the proposed monitoring boreholes drilling shall continue using rotary open hole techniques through the Lincolnshire Limestone Formation to 1m below the top of the Whitby Mudstone Formation. It is proposed that the monitoring installations will comprise screened sections from the base of the Rutland Formation to the top of the Whitby Mudstone Formation for the purpose of monitoring groundwater levels in the Lincolnshire Limestone, Grantham Formation and Northampton Sand Formation consistent with monitoring facilities installed in current monitoring boreholes at ENRMF. Where the Grantham Formation is not present it is considered that the Lincolnshire Limestone and the Northampton Sand Formation comprise two layers of a single aquifer with the Whitby Mudstone Formation at the base. It is proposed that the boreholes in the vicinity of the swallow hole are drilled using rotary coring techniques through the Lincolnshire Limestone Formation to 1m below the top of the Whitby Mudstone Formation to facilitate the assessment of the nature of the Lincolnshire Limestone Formation in proximity to the swallow hole.

The site investigation will be supervised by a suitably qualified and experienced geologist or geotechnical engineer who will record the strata intercepted and the depths of water strikes as necessary and where possible, generally in accordance with British Standard 5930:2015 "Code of practice for ground investigations" and Environment Agency guidance[2, 3 & 4]. The supervising geologist or geotechnical engineer will confirm the drilling techniques used, the materials used in the installation of monitoring facilities and in the backfilling of the boreholes and will verify that Construction Quality Assurance (CQA) procedures are followed. The locations of the boreholes will be surveyed relative to Ordnance Datum. On completion of the site investigation a CQA validation report will be prepared describing the construction details of each monitoring facility or borehole backfill and presenting the borehole records prepared by the supervising geologist or geotechnical engineer. The CQA validation report will be submitted to the Environment Agency prior to discussions on the thickness of Rutland Formation that should be left in-situ if a landfill is constructed in this potential extension area in accordance with the Environment Agency landfill position statement[1above].

We should be pleased to arrange a conference call or a meeting to discuss the proposed site investigation work if this would be of assistance. As you are aware it is proposed that the site investigation is progressed in early 2019 therefore we should be grateful for your comments so that we may agree the scope of the works as soon as possible. Should you have any queries or need any further details please do not hesitate to contact us.

Yours sincerely

pp M Leeds

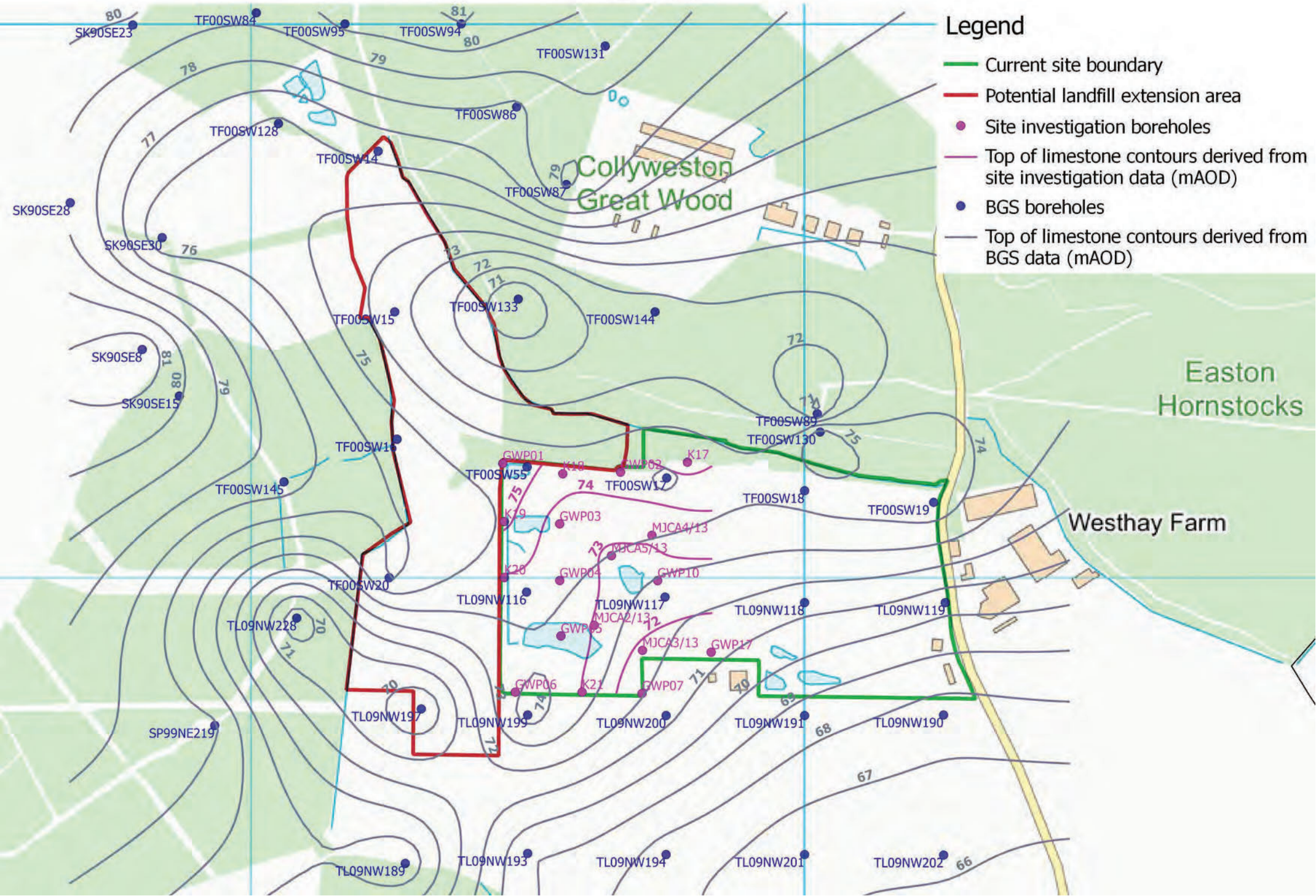
Jo Congo

cc A Pawson, Environment Agency
G Wilson, Augean plc
P Oldfield, Augean plc

Encs Annex 1 – Top of the Lincolnshire Limestone Formation (mAOD)
Annex 2 – Depth to the top of the Lincolnshire Limestone Formation (mbgl)
Figure 1 (drawing reference: AU/KCE/12-18/20965) – Proposed borehole locations

[2] Environment Agency. 2003. Guidance on monitoring of landfill leachate, groundwater and surface water. Report reference LFTGN02.
[3] Environment Agency. 2006. Guidance on the design and installation of groundwater quality monitoring points. Science Report SC020093.
[4] Environment Agency. 2012. Good practice for decommissioning redundant boreholes and wells. Product Code: LIT 6478 / 657_12. Updated October 2012.

Annex 1


Legend
Current site boundary
Potential landfill extension area
Site investigation boreholes
Top of limestone contours derived from site investigation data (mAOD)
BGS boreholes
Top of limestone contours derived from BGS data (mAOD)
Collyweston Great Wood
Easton Hornstocks
Westhay Farm
SK90SE23
TF00SW84
TF00SW95
TF00SW94
TF00SW131
TF00SW86
TF00SW128
TF00SW14
TF00SW87
SK90SE28
SK90SE30
TF00SW133
TF00SW15
TF00SW144
SK90SE8
SK90SE15
TF00SW89
TF00SW130
TF00SW16
TF00SW145
GWP01
K18
GWP02
K17
TF00SW55
TF00SW17
TF00SW18
TF00SW19
K19
GWP03
MJCA4/13
MJCA5/13
K20
GWP04
GWP10
TF00SW20
TL09NW116
TL09NW117
TL09NW118
TL09NW119
TL09NW228
MJCA2/13
GWP05
MJCA3/13
GWP17
GWP06
K21
GWP07
TL09NW197
TL09NW199
TL09NW200
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TL09NW190
SP99NE219
TL09NW189
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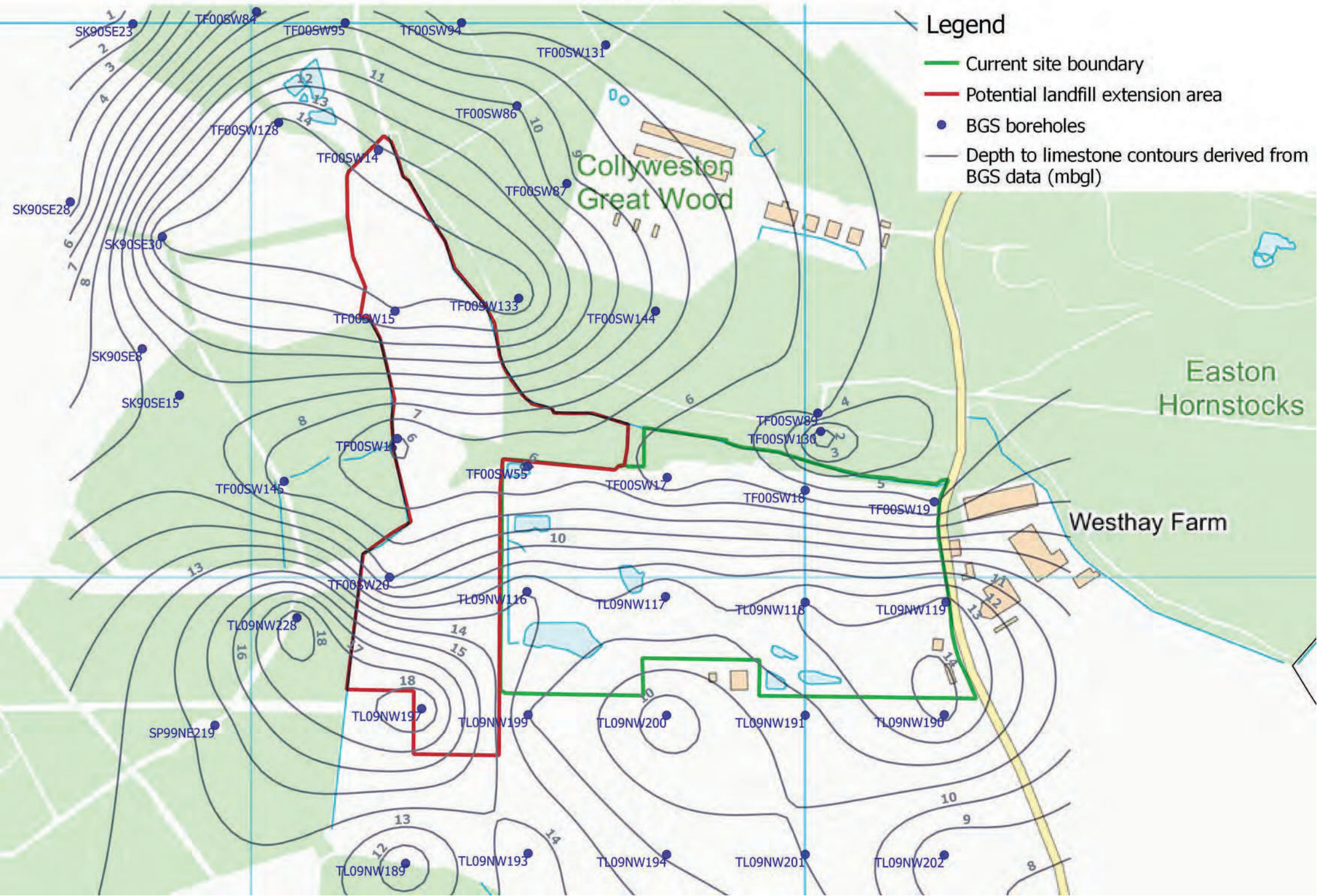
TL09NW201
TL09NW202

Annex 2


Legend
Current site boundary
Potential landfill extension area
BGS boreholes
Depth to limestone contours derived from BGS data (mbgl)
Collyweston Great Wood
Easton Hornstocks
Westhay Farm
SK90SE23
TF00SW84
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TF00SW131
TF00SW86
TF00SW128
TF00SW14
TF00SW87
SK90SE28
SK90SE30
TF00SW15
TF00SW133
TF00SW144
SK90SE8
SK90SE15
TF00SW89
TF00SW130
TF00SW16
TF00SW55
TF00SW17
TF00SW145
TF00SW18
TF00SW19
TF00SW20
TL09NW116
TL09NW117
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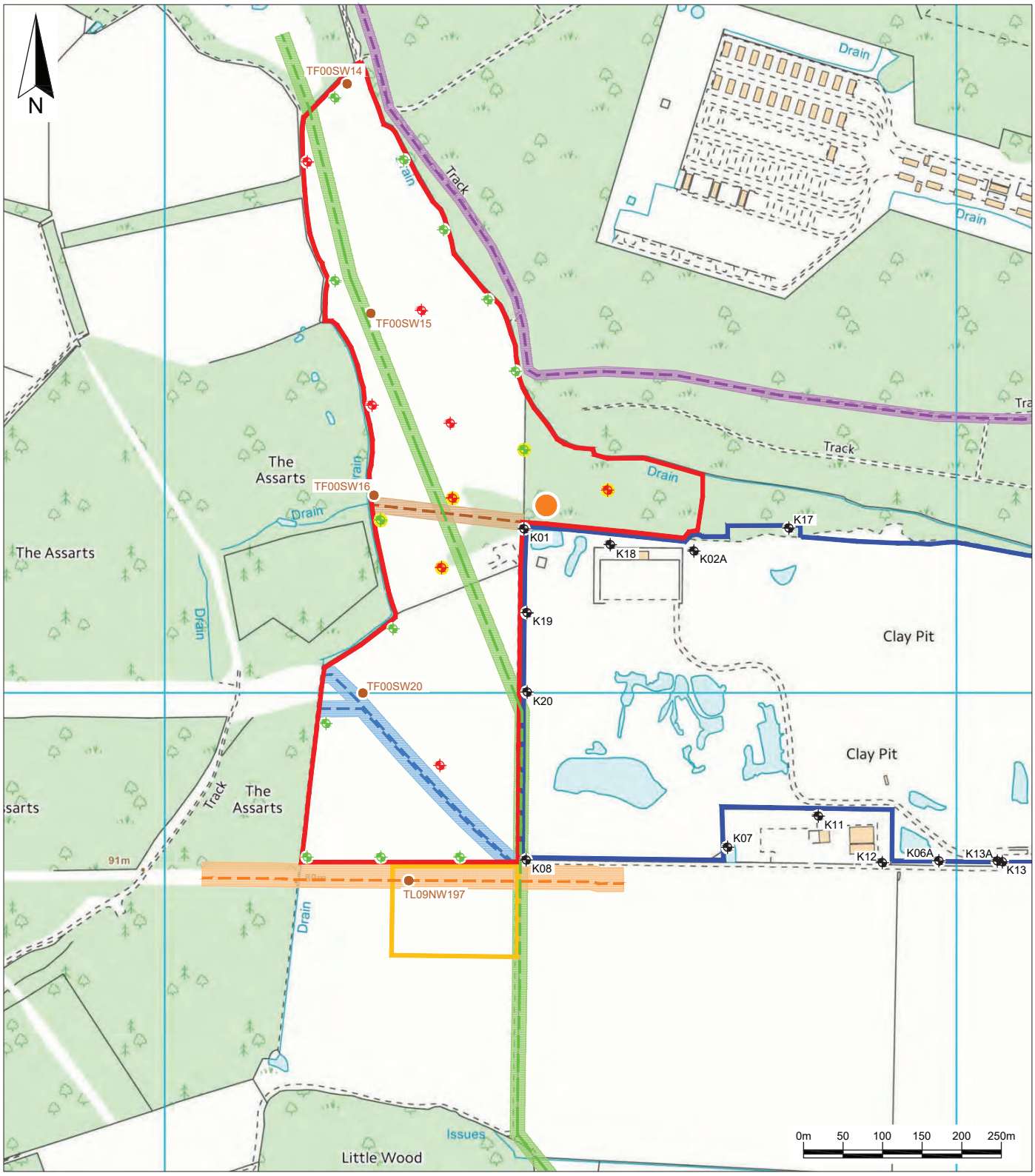
TL09NW201
TL09NW202



Key / Notes

- DCO boundary for the East Northants Resource Management Facility (ENRMF)
- Approximate location of proposed landfill extension area at ENRMF
- Proposed relocation of the treatment plant
- Approximate location of a swallow hole
- K01 Approximate location of a monitoring borehole
- Proposed location of a site investigation borehole
- Proposed location of a site investigation borehole which will be completed with a monitoring installation in the Lincolnshire Limestone Formation
- Borehole where it is proposed to core through the Lincolnshire Limestone Formation
- TF00SW20 Approximate location of a British Geological Survey (BGS) borehole
- Buffer zone with 10m stand off to the south of the centre of the route of the gas pipeline and 20m standoff to the north of the centre of the route of the gas pipeline
- Buffer zone with 10m stand off either side of the centre of the route of the water pipeline
- Buffer zone with 6m stand off either side of the centre of the route of the oil pipeline
- Buffer zone with 9m stand off either side of the centre of the route of the overhead cables
- Buffer zone with 10m stand off either side of the centre of the route of the drainage pipe

Rev	Status	Drn	App	Chk	Date
	Final	KR	SBA	LH	10/12/18

Site: EAST NORTHANTS RESOURCE MANAGEMENT FACILITY

Client: Augean PLC

Title: Proposed borehole locations for the potential landfill extension site investigation

Figure 1 | Scale 1:5,000@A3

Drawing Ref: AU/KCE/12-18/20965

MJCA Technical advisers on environmental issues
Baddesley Colliery Offices, Main Road, Baxterley, Atherstone, Warwickshire, CV9 2LE.
Telephone : 01827 717891
Fax : 01827 718507

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Jo Congo

From: Jo Congo
Sent: 17 December 2018 09:30
To: Branson, Jim
Cc: Pawson, Adam L
Subject: RE: ENRMF – Potential landfill extension site investigation

CONFIDENTIAL

Dear Jim

Thank you for your e-mail agreeing to the proposed scope of a site investigation in the potential landfill extension area at ENRMF.

We confirm that the area of the potential extension has changed since our meeting in September 2017 as a result of the negotiations and discussions with the landowner.

We will confirm the timescale for the site investigation once the land deal is complete and the proposals are in the public domain.

Kind regards

Jo Congo
MJCA
Baddesley Colliery Offices
Main Road
Baxterley
Atherstone
Warwickshire
CV9 2LE

Tel: 01827 717891
Fax: 01827 718507
www.mjca.co.uk

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Our Ref: AU/KCE/JRC/2936/01

We extend to all our clients and colleagues our best wishes for a Happy Christmas and a successful New Year.
Our offices will be closed on Monday 24 December and will reopen at 8.30am on Wednesday 2 January 2019.
An emergency telephone response service will be in operation for 24, 27, 28 and 31 December 2018.

From: Branson, Jim [redacted]
Sent: 14 December 2018 15:29
To: Jo Congo <JoCongo@mjca.co.uk>

Cc: Pawson, Adam L [redacted]
Subject: RE: ENRMF – Potential landfill extension site investigation

Good Afternoon Jo,

We have reviewed your site investigation proposals, in conjunction with the existing geological information, for the extension areas and consider that they are appropriate for assessing the thickness of deposits over the Lincolnshire Limestone.

However, we were surprised to see the land to the north west of the site included as we thought the extension proposals were to be to the south, south west and west of the existing site. Have the areas changed since our original meeting about the extension?

Regards

Jim Branson
Technical Specialist - Groundwater & Contaminated Land

Lincolnshire and Northamptonshire Area
Environment Agency
✉ Ceres House, Searby Road, Lincoln, LN2 4DW.
☎ 02030254983
☎ [redacted]
www.gov.uk/environment-agency

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3) Was our service Professional?
4) Did we have a friendly and polite Attitude?
5) Overall did you get the right Result from us?

Any other comments?

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From: Jo Congo [redacted]
Sent: 10 December 2018 15:40
To: Branson, Jim < [redacted] >
Cc: Gene Wilson [redacted]; Peter Oldfield [redacted]; Pawson, Adam L [redacted] >
Subject: ENRMF – Potential landfill extension site investigation

Please find attached documents regarding ENRMF – Potential landfill extension site investigation.

Kind regards,

Jo Congo

MJCA
Baddesley Colliery Offices
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Baxterley
Atherstone
Warwickshire
CV9 2LE

Tel: 01827 717891
Fax: 01827 718507
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MJCA
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Telephone 01827 717891 Fax: 01827 718507
Email: mjca@mjca.co.uk
www.mjca.co.uk

21 November 2019
Our ref: AU/KCW/JRC/2936/01

J Branson
Environment Agency
Ceres House
2 Searby Road
Lincoln
LN2 4DT

CONFIDENTIAL

SENT BY EMAIL ONLY

Dear Jim

East Northants Resource Management Facility (ENRMF) – Potential landfill extension site investigation

Further to our letter of 10 December 2018 and our e-mail of 15 November 2019 we present in this letter an update to the agreed scope for the site investigation on the land to the west of ENRMF. Following completion of the land deal, the potential extension area has extended to include land to the south west of ENRMF and omits the land to the north of the western landfill area on the currently permitted site. Revisions to the locations of and additional site investigation boreholes are proposed in this updated scope of works to include the revised area of potential extension.

Updated site investigation proposals

It is proposed that the scope of the intrusive site investigation presented in our letter of 10 December 2018 is updated to include the revised locations of and additional boreholes shown on Figure 1 (Drawing reference AU/KCW/11-19/21476) enclosed with this letter. The updated scope of works comprises the drilling of 26 boreholes by rotary coring techniques from ground level to at least 1m below the boundary between the base of the Rutland Formation and into the top of the Lincolnshire Limestone Formation. It is proposed that 16 of the boreholes are drilled round the perimeter of the site and will be completed with monitoring installations in the Lincolnshire Limestone Formation. The remaining 10 boreholes will be backfilled with bentonite to ground level.

The proposed permeability testing, borehole spacing, site investigation techniques, monitoring borehole installation and backfill details and the site investigation supervision and reporting set out in our letter of 10 December 2018 remain unchanged.

We trust that the updates and revisions to the agreed site investigation are acceptable to you. Consistent with our e-mail of 15 November 2019 the site investigation on the land to the west of ENRMF commenced on 18 November 2019 in the northern area of the potential extension where there are limited revisions to the agreed scope of the site investigation. We should be grateful for your comments on the updated scope of the site investigation at your earliest convenience. The site investigation in the southern area of the potential extension will not

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commence until the updated scope of works has been agreed with you. Should you have any queries or need any further details please do not hesitate to contact us.

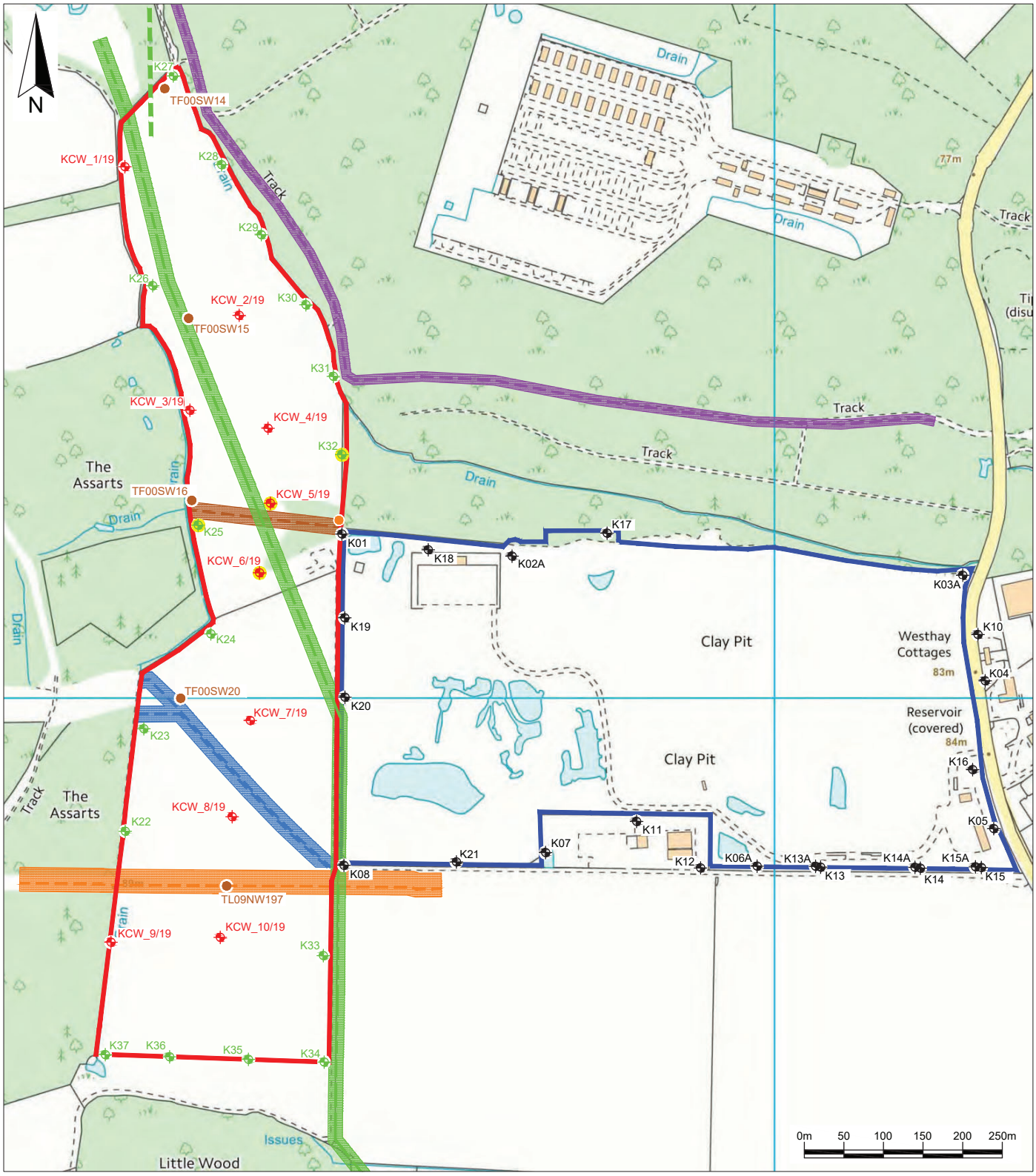
Yours sincerely

[redacted]

Jo Congo

cc A Pawson, Environment Agency
G Wilson, Augean plc
P Oldfield, Augean plc

Encs Figure 1 (drawing reference: AU/KCW/11-19/21476) – Updated proposed borehole locations



Key / Notes

- DCO boundary for the East Northants Resource Management Facility (ENRMF)
- Approximate location of potential landfill extension area at ENRMF
- Approximate location of a swallow hole
- K01 Approximate location of a monitoring borehole
- KCW_7/19 Proposed location of a site investigation borehole
- K22 Proposed location of a site investigation borehole which will be completed with a monitoring installation in the Lincolnshire Limestone Formation
- Borehole where it is proposed to core through the Lincolnshire Limestone Formation
- TF00SW20 Approximate location of a British Geological Survey (BGS) borehole
- Buffer zone with 10m stand off to the south of the centre of the route of the gas pipeline and 20m standoff to the north of the centre of the route of the gas pipeline
- Buffer zone with 10m stand off either side of the centre of the route of the water pipeline
- Buffer zone with 6m stand off either side of the centre of the route of the oil pipeline
- Buffer zone with 9m stand off either side of the centre of the route of the overhead cables
- Buffer zone with 10m stand off either side of the centre of the route of the drainage pipe
- Redundant MOD pipeline

Rev	Status	Drn	App	Chk	Date
	Final	HM	JRC	KE	21/11/19

Site: EAST NORTHANTS RESOURCE MANAGEMENT FACILITY

Client: Augean PLC

Title: Proposed borehole locations for the potential landfill extension site investigation

Figure 1

Scale: 1:5,000@A3

Drawing Ref: AU/KCW/11-19/21476

MJCA
Technical advisers on environmental issues
Baddesley Colliery Offices,
Main Road, Baxterley, Atherstone,
Warwickshire, CV9 2LE.
Telephone : 01827 717891
Fax : 01827 718507

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Jo Congo

From: Branson, Jim [redacted]
Sent: 22 November 2019 11:18
To: Jo Congo
Cc: [redacted]
Subject: RE: East Northants Resource Management Facility (ENRMF) – Potential landfill extension site investigation

Jo,

We have reviewed your proposals for the revised site investigation of the potential extension area which we find appropriate and have no additional comments to make.

Regards

Jim Branson
Technical Specialist - Groundwater & Contaminated Land

Lincolnshire and Northamptonshire Area
Environment Agency
✉ Ceres House, Searby Road, Lincoln, LN2 4DW.
☎ 02030254983
[redacted]
www.gov.uk/environment-agency

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3) Was our service Professional?
4) Did we have a friendly and polite Attitude?
5) Overall did you get the right Result from us?

Any other comments?

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From: Jo Congo [redacted]
Sent: 21 November 2019 15:37
To: Branson, Jim [redacted]>
Cc: [redacted]
Subject: East Northants Resource Management Facility (ENRMF) – Potential landfill extension site investigation

21 November 2019

Dear Jim

Please find attached documents regarding ENRMF – Potential landfill extension site investigation.

Kind regards

Jo Congo

MJCA
Baddesley Colliery Offices
Main Road
Baxterley
Atherstone
Warwickshire
CV9 2LE

Tel: 01827 717891
Fax: 01827 718507
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APPENDIX B

RECORDS OF BOREHOLES DRILLED AT THE SITE BEWEEN NOVEMBER 2019 AND MARCH 2020

Geotechnical Engineering Limited

BOREHOLE LOG

K22

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	1 of 4
Start Date	14 January 2020	Easting	500180.4	Scale	1 : 50
End Date	21 January 2020	Northing	299831.9 Ground level 88.69mOD	Depth	35.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
14/01/20 1310hrs 14/01/20 1345hrs Dry								Vegetation over soft dark brown CLAY. Frequent roots (up to 5mm diam) and rootlets.	0.30	88.39	
								Firm dark brown slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse limestone and sandstone.	1.20	87.49	
15/01/20 1045hrs Dry	1L	1.20 - 2.70	Nil					Firm dark brown mottled dark grey slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium limestone, chalk, flint and sandstone.	2.75	85.94	
	2C	2.70 - 4.20	2.70		99			Stiff dark brown slightly sandy slightly gravelly CLAY with a low subangular limestone cobble content. Gravel is subangular and subrounded fine to coarse limestone, chalk, sandstone and flint.			
	3C	4.20 - 5.70	2.70		100						
	4C	5.70 - 7.20	2.70		100						
	6C	7.20 - 8.70	2.70		94						
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m Waterflush rotary core drilled (146mm) 2.70-35.70m.

CASING: 168mm to 32.90m.

BACKFILL: On 22/01/2020 a slotted standpipe (50mm) was installed to 35.70m, granular response zone 35.70-18.80m, bentonite:cement grout 18.80-0.50m, concrete and raised cover 0.50-0.00m.

REMARKS: Driller notes loss of flush returns 21.00-35.70m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

K22

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 4
Start Date	14 January 2020	Easting	500180.4			Scale	1 : 50
End Date	21 January 2020	Northing	299831.9	Ground level	88.69mOD	Depth	35.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	7C	8.70 - 10.20	2.70		100						
	8C	10.20 - 11.70	2.70		100						
15/01/20 1615hrs 2.10m											
16/01/20 0810hrs 2.10m	9C	11.70 - 12.20	2.70		100						
	10C	12.20 - 12.70	2.70		98						
	11C	12.70 - 13.20	2.70		100						
	12C	13.20 - 14.70	2.70		100						
	13C	14.70 - 16.20	2.70		100			15.10m: Subangular limestone cobble.			
	14C	16.20 - 17.70	2.70		100			16.20 - 16.90m: Firm dark grey slightly gravelly clay. Gravel is subangular to rounded fine to coarse limestone, chalk, flint and sandstone.			
	15C	17.70 - 19.20	2.70		100						
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K22

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 4
Start Date	14 January 2020	Easting	500180.4	Scale	1 : 50
End Date	21 January 2020	Northing	299831.9 Ground level 88.69mOD	Depth	35.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
								18.40m: Cobble sized clast of brecciated limestone.			
	16C	19.20 - 20.70	2.70		100 0 0				19.70	68.99	
						NI		Strong light brown oolitic sandy LIMESTONE and thinly bedded oolitic fine SANDSTONE. Fractures are 20° and 40° closely spaced intersecting planar rough stained orange. 19.70 - 21.30m: Fractures are extremely closely and very closely spaced. Locally disintegrated to gravelly fine and medium sand. Gravel is subangular and subrounded fine to coarse lithorelics of limestone.			
	17C	20.70 - 22.20	2.70		96 15 13						
						NI 70 130					
	18C	22.20 - 22.40	2.70		100 0 0			22.10m: Shell fragment replaced by calcite.			
	19C	22.40 - 23.70	2.70		50 20 0				23.00	65.69	
						NR		Medium strong light brown bioturbated silty fine SANDSTONE with frequent burrows. Fractures are subhorizontal and 70° closely spaced undulating rough. 23.00 - 23.70m: Assessed zone of core loss.			
16/01/20 1515hrs 22.50m											
17/01/20 0810hrs Dry	21C	23.70 - 25.20	2.70		100 90 15	NI 90 190					
	22C	25.20 - 26.70	2.70		60 36 13						
						NR		26.00 - 26.70m: Assessed zone of core loss.			
									26.70	61.99	
	23C	26.70 - 27.20	2.70		80 80 80	40 100 240		Strong light brown and grey oolitic fine and medium SANDSTONE. Fractures are subhorizontal mainly closely spaced undulating rough.			
	24C	27.20 - 28.20	2.70		100 100 80						
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K22

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	4 of 4
Start Date	14 January 2020	Easting	500180.4			Scale	1 : 50
End Date	21 January 2020	Northing	299831.9	Ground level	88.69mOD	Depth	35.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
									28.20	60.49	
	25C	28.20 - 29.70	2.70		100 70 30	NA		Dark grey CLAY. (Drilling disturbed recovered as soft).	28.65	60.04	
						NI 90 270		28.65 - 29.30m: Grey and orangish brown clayey sandstone. Weak orangish brown and light brown fine and medium SANDSTONE. Fractures are subhorizontal, 60° and subvertical mainly closely spaced undulating rough with up to 3mm orangish brown penetrative staining.			
	26C	29.70 - 31.20	2.70		99 27 18						
17/01/20 1320hrs 25.00m											
20/01/20 1020hrs 24.50m	27C	31.20 - 32.70	2.70		91 83 23				31.40	57.29	
						NI 86 300		Medium strong locally weak greenish grey and light grey fine and medium SANDSTONE. Fractures are subhorizontal and 80° to subvertical mainly closely spaced undulating rough with up to 3mm orangish brown penetrative staining. 31.90 - 34.10m: Silty, bioturbated.			
	28C	32.70 - 32.80	2.70		100 100 0						
	29C	32.80 - 34.20			80 80 0						
20/01/20 1645hrs 24.50m									34.10	54.59	
21/01/20 0810hrs 25.30m	30C	34.20 - 34.85	2.70		96 46 46	NI 100 300		Strong grey SILTSTONE with frequent shell fragments (up to 15mm). Single 70° planar smooth fracture. 34.10 - 34.30m: Stiff grey clay.	34.70	53.99	
						NA		Firm dark grey CLAY.			
	31C	34.85 - 35.70	2.70		96						
21/01/20 1715hrs 18.00m									35.70	52.99	
								Borehole completed at 35.70m.			
									{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K23

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 4
Start Date	9 January 2020	Easting	500196.2			Scale	1 : 50
End Date	14 January 2020	Northing	299961.9	Ground level	86.56mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
09/01/20 1115hrs									Turf over topsoil (Driller's description).	0.20	86.36	
									Slightly gravelly CLAY (Driller's description).	1.20	85.36	
	1L	1.20	2.70	Nil					Soft dark grey and brown slightly gravelly CLAY. Gravel is subangular to subrounded fine to coarse limestone. Rare pockets of orange fine sand.	1.90	84.66	
	2C	2.70	4.20	2.70		100	NA		Firm dark brown and dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse limestone, chalk, siltstone and sandstone.			
	3C	4.20	5.70	2.70		100						
									5.20m: Cobble sized clast of bioclastic limestone.			
	4C	5.70	7.20	2.70		100						
	5C	7.20	8.70	2.70		100						
									Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m Waterflush rotary core drilled (146mm) 2.70-34.20m.

CASING: 168mm diam to 2.70m.

BACKFILL: On completion, a slotted standpipe (50mm) was installed to 34.20m (slotted section 32.20-13.20m), granular response zone 34.20-12.20m, bentonite seal 12.20-11.70m, cement:bentonite grout 11.70-0.50m, concrete and raised cover 0.50-0.00m.

REMARKS: Driller notes reduced flush returns 14.10-14.70 (45% returned) and loss of flush returns 14.70-34.20m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K23

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 4
Start Date	9 January 2020	Easting	500196.2			Scale	1 : 50
End Date	14 January 2020	Northing	299961.9	Ground level	86.56mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.70 - 10.20	2.70		87						
	7C	10.20 - 11.70	2.70		100			Stiff dark grey slightly gravelly silty CLAY. Gravel is subangular and subrounded fine to coarse limestone, chalk and sandstone and flint.	10.20	76.36	
09/01/20 1615hrs 1.50m									11.50	75.06	
10/01/20 0800hrs 2.40m	8C	11.70 - 13.20	2.70		95			Stiff dark brown slightly gravelly slightly sandy CLAY. Gravel is subangular and subrounded fine to coarse limestone and sandstone. 12.40m: Roots replaced with calcite (up to 220mm).	12.95	73.61	
	9C	13.20 - 13.40	2.70		100	NI		Weak highly fractured very thinly bedded light greyish brown oolitic LIMESTONE with very closely spaced thin and thick laminae of clay. Locally recovered non intact as subangular fine to coarse gravel.			
	10C	13.40 - 14.10	2.70		100 83 0	NI 70 190		Weak locally medium strong thinly bedded light brown oolitic LIMESTONE. Fractures are subhorizontal closely spaced undulating rough stained orangish brown.	13.70	72.86	
	11C	14.10 - 14.70	2.70		90 60 30						
	12C	14.70 - 16.20	2.70		190 60 35			15.50 - 16.10m: Strong light brown oolitic limestone. 15.60 - 15.85m: Subvertical undulating rough fracture.			
	13C	16.20 - 17.70	2.70		86 86 60			16.80 - 16.90m: Disintegrated to gravelly sand. Gravel is angular fine and medium calcareous siltstone lithorelicts.	16.95	69.61	
	14C	17.70 - 19.20	2.70		100 100	50 280 340		Weak light orangish brown bioturbated fine SANDSTONE with prominent inclined burrows. Fractures are subhorizontal closely and medium spaced undulating rough.	17.50	69.06	
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K23

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 4
Start Date	9 January 2020	Easting	500196.2	Scale	1 : 50
End Date	14 January 2020	Northing	299961.9 Ground level 86.56mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
					90			Weak light brown bioclastic sandy LIMESTONE. Fractures are subhorizontal medium spaced undulating rough.			
	15C	19.20 - 20.70	2.70		98 98 94						
10/01/20 1330hrs 16.10m											
13/01/20 0950hrs 20.00m	16C	20.70 - 22.20	2.70		86 86 80	100		Very weak orangish brown (bioturbated) LIMESTONE. Non intact.	20.80	65.76	
						NI 150 290		Strong light grey and light brown crystalline LIMESTONE.	20.90	65.66	
								Very weak orangish brown bioturbated fine SANDSTONE. Non intact.	21.05	65.51	
								Medium strong locally weak very thinly bedded light brown and light grey bioturbated silty flne SANDSTONE with abundant burrows infilled with light orange fine sand. Frequent shell fossils. Fractures are subhorizontal closely and medium spaced undulating rough.	21.15	65.41	
	17C	22.20 - 23.70	2.70		98 86 66						
						NI 80 120		Weak locally medium strong light brown fine SANDSTONE with abundant burrows infilled with fine sand. Locally recovered non intact. Bedding fractures are probably subhorizontal closely spaced undulating rough, surfaces weakened. 23.70 - 24.05m: Assessed zone of core loss.	23.35	63.21	
	18C	23.70 - 25.20	2.70		76 47 25						
						500		Medium strong light brown and grey bioclastic oolitic fine and medium SANDSTONE. Fractures are subhorizontal medium spaced undulating rough.	24.50	62.06	
	19C	25.20 - 26.70	2.70		94 50 34						
						NA		Very stiff thinly laminated dark grey slightly gravelly CLAY. Gravel is subangular fine to coarse lithorelicts of extremely weak mudstone. 26.10 - 26.30m: Thin bed of grey limestone, recovered non intact.	25.80	60.76	
	20C	26.70 - 28.20	2.70		100 100 82	60 110 370		Weak and medium strong light greyish brown and light grey fine SANDSTONE with frequent very thin and thin beds of limestone. Fractures are subhorizontal rarely 60° and subvertical closely and medium spaced undulating rough.	26.60	59.96	
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K23

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	4 of 4
Start Date	9 January 2020	Easting	500196.2			Scale	1 : 50
End Date	14 January 2020	Northing	299961.9	Ground level	86.56mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	21C	28.20	29.70	2.70		98 98 95			28.50 - 28.55m: Frequent shell fossils. 28.60 - 29.20m: Subvertical stepped rough fracture. 28.65 - 28.85m: Dark greenish brown. 29.15 - 29.20m: Abundant shell fossils.			
	22C	29.70	31.20	2.70		97 97 91	300		29.70 - 29.80m: 80° planar smooth fracture with dark orange staining.	29.85	56.71	
							90 350 500		Very weak very thinly bedded dark grey sandy SILTSTONE. Fractures are subhorizontal medium spaced planar smooth.	30.50	56.06	
	23C	31.20	32.70	2.70		100 80 80			Medium strong to strong thinly bedded bluish grey and light grey bioclastic silty fine SANDSTONE locally tending to sandy siltstone. Fractures are subhorizontal closely and medium spaced undulating rough.			
13/01/20 1610hrs 21.00m							NA		32.30m: Mudstone cobble.	32.40	54.16	
14/01/20 0805hrs 22.50m	24C	32.70	34.20	2.70		100			Very stiff/extremely weak thinly laminated fissured dark grey CLAY/MUDSTONE. Fissures are subvertical planar smooth incipient.			
14/01/20 0920hrs 22.50m									33.80 - 34.20m: Brownish grey.	34.20	52.36	
									Borehole completed at 34.20m.	{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35673	EC

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BOREHOLE LOG

K24

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	1 of 4
Start Date	6 January 2020	Easting	500276.1	Scale	1 : 50
End Date	9 January 2020	Northing	300084.8 Ground level 83.19mOD	Depth	30.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
06/01/20 1105hrs								Turf over topsoil (Driller's description).	0.20	82.99	
								Slightly gravelly CLAY (Driller's description).	1.20	81.99	
	1L	1.20 - 2.70						Firm light grey mottled orange CLAY. Frequent lenses of orange sand and rare rootlets.	1.60	81.59	
								Stiff brown and grey slightly sandy CLAY. Frequent roots.	1.95	81.24	
								Firm grey CLAY with closely spaced thick laminae of red and orange fine sand.	3.05	80.14	
	2C	2.70 - 4.20	2.70		96	NA					
								Firm grey CLAY. Frequent rootlets.	3.25	79.94	
								Firm grey silty CLAY. Frequent rootlets.			
								3.70 - 3.80m: Mottled orange.	3.90	79.29	
								Light grey clayey fine SAND.	4.20	78.99	
	3C	4.20 - 5.70	2.70		100			Grey clayey fine SAND. Single vertical root (5mm diam).	4.45	78.74	
								Firm dark grey CLAY. Rare rootlets.	4.65	78.54	
								Very stiff light grey clayey SILT.	5.70	77.49	
	4C	5.70 - 7.20	2.70		100			Very stiff light grey sandy clayey SILT. Sand is fine.			
06/01/20 1645hrs 1.30m											
07/01/20 0800hrs 1.70m	5C	7.20 - 8.70	2.70		99 53 40			7.35 - 7.40m: Dark red siderite cemented conglomeratic cobble.	7.40	75.79	
						NI			7.80	75.39	
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m. Waterflush rotary core drilled (146mm) 2.70-30.80m.

CASING: 168mm diam to 2.70m.

BACKFILL: On completion, a slotted standpipe (50mm) was installed to 30.80m (slotted section 28.70-7.70m), granular response zone 30.80-6.70m, bentonite seal 6.70-6.20m, cement:bentonite grout 6.20-0.50m, concrete and raised cover 0.50-0.00m.

REMARKS: Drilling completed 08/01/20, installation completed 09/01/20. Driller notes loss of flush returns 8.70-30.80m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K24

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	2 of 4
Start Date	6 January 2020	Easting	500276.1	Scale	1 : 50
End Date	9 January 2020	Northing	300084.8 Ground level 83.19mOD	Depth	30.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						100 200		Soft light grey and light brown CLAY (50mm) over light grey clayey fine SAND with frequent pockets of orange fine sand. 7.65 - 7.80m: Thin bed of dark red siderite cemented conglomerate.	8.65	74.54	
	6C	8.70 - 10.20	2.70		100 93 93	350 250		Weak light brown fine SANDSTONE. Fractures are subhorizontal closely and medium spaced undulating rough. 7.90 - 8.30m: Subvertical fracture undulating rough with red and black staining.	9.00	74.19	
						40 350 400		Strong light grey oolitic LIMESTONE.	9.50	73.69	
	7C	10.20 - 11.70	2.70		100 100 82			Weak orangish brown fine SANDSTONE. Fractures are subhorizontal medium spaced undulating rough. 9.00 - 9.45m: Subvertical fracture undulating rough.			
	8C	11.70 - 13.20	2.70		100 100 100			Medium strong light brown oolitic LIMESTONE. Fractures are subhorizontal medium spaced undulating rough. 10.60 - 10.65m: Weak. 11.10 - 11.55m: Subvertical undulating rough fracture.	12.15	71.04	
	9C	13.20 - 14.70	2.70		100 96 70	130 300 350		Medium strong light grey and light brown crystalline LIMESTONE. Rare small burrows. Fractures are subhorizontal closely and medium spaced undulating rough.	13.35	69.84	
						50 120 200		Weak light brown fine and medium SANDSTONE. Rare carbonaceous debris. Fractures are subhorizontal closely spaced undulating rough. 13.50m: Very thin bed of light brown mudstone recovered a soft clay.	13.70	69.49	
	10C	14.70 - 16.20	2.70		100 100 94	300 150 250 400		Weak light brownish grey fine SANDSTONE. Prominent sand filled burrows (up to 8mm). 14.00 - 14.70m: Medium strong. With thin beds of oolitic limestone.	14.70	68.49	
								Medium strong light brown oolitic LIMESTONE. Fractures are subhorizontal closely and medium spaced undulating rough. 15.55m: Shell fossil (80mm) replaced with white calcite.			
	11C	16.20 - 17.70	2.70		100 100 97	700		Strong light brown oolitic LIMESTONE. 16.80 - 17.00m: Bluish grey.	16.50	66.69	
						450		17.20m: Subhorizontal undulating rough fracture.			
	12C	17.70 - 19.20	2.70		93 92	NI 180 400		17.55 - 17.65m: Medium strong. Frequent shell debris.	17.65	65.54	
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K24

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 4
Start Date	6 January 2020	Easting	500276.1	Scale	1 : 50
End Date	9 January 2020	Northing	300084.8 Ground level 83.19mOD	Depth	30.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
					83			Weak brown sandy LIMESTONE. Abundant burrows infilled with dark brown fine sand. 18.00 - 18.25m: Strong light grey and brown oolitic and bioclastic sandstone.	18.25	64.94	
						150		Weak brown fine SANDSTONE with prominent nodular cements. 18.65 - 20.50m: Larger sand filled burrows.	18.90	64.29	
	13C	19.20 - 20.70	2.70		98 98 95	550		Medium strong locally weak and locally strong light brownish grey locally grey fine and medium SANDSTONE and bioturbated slightly silty and silty fine SANDSTONE. Abundant burrows infilled with brown clayey sand. Fractures are subhorizontal to 20° very closely to medium spaced undulating rough.			
						NI 80 300					
	14C	20.70 - 22.20	2.70		100 100 64						
						30 280 370		Strong grey and light greyish brown oolitic sandy LIMESTONE and oolitic fine and medium sandstone. Fractures are subhorizontal to 20° medium spaced planar rough stained orangish brown with (up to 20mm) penetrative discolouration.	21.20	61.99	
	15C	22.20 - 23.70	2.70		90 80 76	NA		Very stiff thinly laminated greyish brown becoming dark grey slightly gravelly becoming gravelly CLAY. Gravel is subangular fine to coarse lithorelicts of extremely weak mudstone.	22.40	60.79	
						NI 150 200		Weak to locally medium strong grey, greyish brown and dark grey fine SANDSTONE, SILTSTONE and very silty fine SANDSTONE. Fractures are subhorizontal to 20° closely spaced undulating rough. 22.85 - 23.05m: Very weak dark grey mudstone.	22.75	60.44	
						NI			23.70	59.49	
	16C	23.70 - 24.80	2.70		91 20 8			Medium strong and strong brownish grey fine SANDSTONE and silty SANDSTONE. Fractures are subhorizontal to 20° closely spaced undulating rough. 23.85 - 24.80m: Core fragmented. Intersecting subhorizontal and subvertical fractures.			
07/01/20 1525hrs 18.80m											
08/01/20 0800hrs 19.80m	17C	24.80 - 26.30	2.70		100 89 70	NI 120 220		24.90 - 25.30m: Subvertical planar rough fracture.	25.85	57.34	
						150 220 400		Very weak dark greenish grey calcareous sandy SILTSTONE. Fractures are subhorizontal closely and medium spaced undulating rough.			
	18C	26.30 - 27.80	2.70		100 96 93				27.00	56.19	
						50 250 450		Strong light grey very silty fine SANDSTONE with frequent shell fossils. Fractures are subhorizontal medium spaced undulating rough. 27.15 - 27.35m: Shell fossils replaced with calcite.	27.55	55.64	
	19C	27.80 - 29.30	2.70		77			Medium strong grey bioturbated SILTSTONE. Fractures are subhorizontal medium spaced undulating rough.			
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35673	EC

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Geotechnical Engineering Limited

BOREHOLE LOG

K24

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	4 of 4
Start Date	6 January 2020	Easting	500276.1			Scale	1 : 50
End Date	9 January 2020	Northing	300084.8	Ground level	83.19mOD	Depth	30.80 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						100 95						
							150 250 600		28.65 - 28.70m: Irregular contact containing reworked coarse gravel sized clasts of unit below.	28.70	54.49	
	20C	29.30	30.80	2.70		86 86 86			Very weak thinly laminated dark grey MUDSTONE. Fractures are subhorizontal closely and medium spaced planar smooth. 29.70 - 29.95m: Subvertical planar smooth fracture.			
08/01/20 1245hrs 16.80m										30.80	52.39	
									Borehole completed at 30.80m.			
										{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K25

CLIENT	MJCA					Sheet	1 of 4
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	25 November 2019	Easting	500268.5				
End Date	28 November 2019	Northing	300217.5	Ground level	81.77mOD	Depth	28.20 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
25/11/19 0915hrs									Soft dark brown and grey CLAY.	1.20	80.57	
	1L	1.20	2.70						Soft greenish dark grey CLAY with rare carbonaceous rootlets up to 100mm in length. 1.65 - 1.75m: Thin lenses of orange fine sand.	2.05	79.72	
									Stiff to very stiff light grey clayey SILT.	2.50	79.27	
									Stiff to very stiff light grey silty CLAY.	2.85	78.92	
	2C	2.70	4.20	2.70		93	NA		Stiff and very stiff dark grey slightly sandy CLAY. Sand is fine.	3.65	78.12	
									Stiff and very stiff light grey and grey clayey SILT.	4.45	77.32	
	3C	4.20	5.70	2.70		95 13 13	NI 200 NA		Weak and medium strong brown mottled orange with red and orange staining silty fine SANDSTONE. 4.65 - 4.70m: Non intact.	4.70	77.07	
									Stiff light grey silty CLAY. 5.10m: Translucent crystal (130mm length).	5.15	76.62	
25/11/19 1730hrs 1.50m									Stiff light grey and orangish brown sandy silty CLAY. Sand is fine.	5.70	76.07	
26/11/19 0810hrs 3.30m	4C	5.70	7.20	2.70		87 52 30	NI		5.60 - 5.70m: Soft light grey and brown sandy clay.	5.80	75.97	
									Drilling disturbed. Recovered as brownish red siderite cemented semi-voided limestone GRAVEL. (Possibly siderite nodules).	6.50	75.27	
							200 400 550		Weak fractured light grey and light brown slightly clayey oolitic LIMESTONE. Non intact, recovered angular to subrounded fine to coarse limestone gravel. 6.00 - 6.15m: Soft greyish brown gravelly sandy CLAY. 6.15 - 6.45m: Subvertical undulated rough fracture stained red.			
	5C	7.20	8.70	7.20		100 100 92			Strong light grey and light brown oolitic LIMESTONE. Fractures are medium and widely spaced subhorizontal undulating locally with a little broken rock infill. 6.90 - 7.20m: Subvertical undulated rough fracture.			
									Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m Waterflush rotary core drilled (146mm) 2.70-28.20m.

CASING: 168mm to 7.20m.

BACKFILL: On completion, a slotted standpipe (50mm) was installed to 28.00m (slotted section 27.00-6.00m), granular response zone 28.20-5.00m, bentonite seal 5.00-4.50m, grout 4.50-0.80m, gravel drain 0.80-0.50m, concrete and stopcock cover 0.50-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K25

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	2 of 4
Start Date	25 November 2019	Easting	500268.5	Scale	1 : 50
End Date	28 November 2019	Northing	300217.5 Ground level 81.77mOD	Depth	28.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
								8.10 - 8.60m: Subvertical undulated rough with gravelly clay infill. Gravel is subangular to subrounded, fine to medium oolitic limestone.			
	6C	8.70 - 10.20	7.20		96 91 91						
	7C	10.20 - 11.70	7.20		100 86 76	NI 270 400		Strong light greyish brown and orangish brown oolitic LIMESTONE locally with fine sand associated with voids/burrow fills. 10.45 - 10.60m: Non intact.	10.25	71.52	
						60 90 200		Strong light grey crystalline LIMESTONE. Fractures are 70° undulating rough and subvertical closely spaced planar rough open.	11.05	70.72	
	8C	11.70 - 13.20	7.20		92 89 51	30 45 130		Strong light grey orangish brown slightly silty slighty sandy oolitic LIMESTONE. Sand is fine. Fractures are very closely and closely spaced subhorizontal undulating rough.	11.70	70.07	
						30 100 200		Weak light brownish grey fine SANDSTONE partially voided, bioturbation locally disintegrated to fine sandy sandstone gravel. Prominent inclined burrows.	12.35	69.42	
						170 250 420		Strong to very strong light grey and orangish brown slightly sandy locally nodular oolitic LIMESTONE. Fractures are closely and medium spaced subhorizontal undulating rough moderately wide aperture.	12.90	68.87	
	9C	13.20 - 14.70	7.20		95 95 89						
	10C	14.70 - 16.20	7.20		100 100 98			15.10 - 15.15m: Grey band.			
	11C	16.20 - 17.70	7.20		80 67 60	NI		Drilling disturbed and possible zone of core loss recovered as subangular and subrounded fine to coarse SANDSTONE gravel.	16.20	65.57	
						90 110 200		Strong orangish light brown silty semi-voided bioturbated fine SANDSTONE. Fractures are closely spaced subhorizontal undulating rough.	16.55	65.22	
	12C	17.70 - 19.20	7.20		93 88			Very stong dark bluish grey and light greyish brown slightly silty bioturbated fine SANDSTONE.	17.50	64.27	
									17.90	63.87	
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

K25

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 4
Start Date	25 November 2019	Easting	500268.5	Scale	1 : 50
End Date	28 November 2019	Northing	300217.5 Ground level 81.77mOD	Depth	28.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
					88	NI 370 420		Strong light greyish brown, grey and orange partially voided and bioturbated slightly silty and silty fine SANDSTONE. Fractures are closely and medium spaced subhorizontal undulating rough open to moderately wide aperture. 18.20 - 18.40m: Non intact.			
	13C	19.20 - 20.70	7.20		98 94 82	80 110 300		Very strong and strong ripple cross-laminated and very thinly bedded light brown and dark bluish grey silty fine SANDSTONE closely interbedded with cross stratified fine SANDSTONE. Fractures are subhorizontal close to medium spaced planar smooth and rough open to wide aperture.	19.45	62.32	
26/11/19 1730hrs 7.30m									20.80	60.97	
27/11/19 0710hrs 10.10m	14C	20.70 - 22.20	7.20		98 52 46	NA		Stiff thinly laminated dark greyish black CLAY.	21.10	60.67	
						40		Weak orangish brown silty fine SANDSTONE with frequent carbonaceous rootlets. Fractures are very closely spaced subhorizontal undulating rough.	21.35	60.42	
						NA			21.65	60.12	
						50		Very stiff locally soft dark greyish black SILT tending to CLAY.	21.85	59.92	
						40 160 300		Strong grey and dark grey silty fine SANDSTONE. Fractures are very closely spaced subhorizontal undulating rough.			
	15C	22.20 - 23.70	7.20		99 99 62			Strong brown, light grey and brownish grey fine SANDSTONE. Fractures set 1 subhorizontal closely to medium spaced undulated rough open to moderately wide aperture. Fracture set 2 70° to subvertical widely spaced undulated rough open to moderately wide aperture.			
	16C	23.70 - 25.20	7.20		100 94 90				24.40	57.37	
27/11/19 1700hrs 7.90m						NI 200 400		Strong thinly to medium bedded dark bluish grey very silty fine SANDSTONE and sandy SILTSTONE. Fractures are closely locally medium spaced subhorizontal undulating rough. 24.40 - 24.50m: Recovered as angular to subrounded fine to coarse gravel.			
28/11/19 0730hrs 9.60m	17C	25.20 - 26.70	7.20		100 100 94				25.50	56.27	
						60 240 450		Strong locally weak thinly to medium bedded light grey and grey SILTSTONE interbedded with sandy SILTSTONE. Thin bands of abundant shell debris. Fractures are closely to medium spaced undulating rough open to moderately wide aperture.	26.65	55.12	
	18C	26.70 - 28.20	7.20		100 90 90			Medium strong dark grey SILTSTONE bioturbated with coarse gravel sized mudstone clasts. 26.65 - 26.80m: Contact angular to rounded fine to coarse gravelly clay.	27.30	54.47	
						500		Very weak thinly laminated dark grey MUDSTONE. Fractures are very closely spaced subhorizontal planar smooth open. 27.60m: Nodular band of pyrite.			
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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Geotechnical Engineering Limited

BOREHOLE LOG

K25

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	4 of 4
Start Date	25 November 2019	Easting	500268.5			Scale	1 : 50
End Date	28 November 2019	Northing	300217.5	Ground level	81.77mOD	Depth	28.20 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
										28.20	53.57	
28/11/19 1700hrs 19.60m									Borehole completed at 28.20m.			
										{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	28/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.23	E 500 207.24 N 300 526.01	K26

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 6

CORE					STRATA					
Scale	Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						87.83	0.40	Soft brown gravelly clay TOPSOIL.			
1						87.03	(0.80) 1.20	Light brown weathered LIMESTONE.			
						86.53	(0.50) 1.70	Very hard light grey coarsely crystalline LIMESTONE. Non-intact recovered as cobbles and gravel.			
2						86.10	2.13	Weak brown and grey brown sandy coarsely crystalline LIMESTONE. Non-intact recovered as cobbles and gravel between 1.7m and 2.05m.			
						85.94	2.29	Firm brown grey CLAY.			
						85.66	2.57	Stiff light bluish grey CLAY with carbonaceous rootlets.			
	1.20-2.70	83	59			85.53	2.70	Very stiff light bluish grey sandy CLAY with carbonaceous rootlets.			
3						85.00	(0.53) 3.23	Very stiff dark grey CLAY.			
						84.41	(0.59) 3.82	Very stiff bluish grey CLAY with carbonaceous debris and shelly material.			
4	2.70-4.00	104	104			84.23	4.00	Stiff bluish grey CLAY.			
						84.06	4.17	Firm to soft grey SILT.			
						83.77	4.46	Very stiff to stiff very dark grey CLAY.			
						83.37	4.86	Very stiff to stiff dark grey CLAY.			
5						82.92	(0.45) 5.31	Very stiff greenish grey and grey CLAY with frequent shelly laminae.			
	4.00-5.50	101	101			82.73	5.50	Weak grey bioturbated SILTSTONE with abundant shelly material.			
6						81.69	(1.04) 6.54	Weak grey SILTSTONE and subordinate very stiff SILT. Bioturbated and shelly.			
						81.43	6.80	Very stiff bluish grey CLAY.			
	5.50-7.00	93	83			81.23	7.00	Weak greenish grey SILTSTONE.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/01/20	16.00	2.70	15.72			
24/01/20	32.50	2.70	16.12			
28/01/20	38.20	2.70	17.64			
11/03/20	37.25		15.69			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.2 to 37.25 mbgl. Plain HDPE pipe installed between 37.25 and 36.85 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.85 and 15.0 mbgl. Plain HDPE pipe installed from 15.0 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.5 mbgl and grout and bentonite pellets to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: D. Williams, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	38.2m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	28/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.23	E 500 207.24 N 300 526.01	K26

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						80.89	7.34	Very stiff dark grey brown CLAY with carbonaceous rootlets.			
						80.35	(0.54) 7.88	Very stiff bluish grey CLAY with mud-filled and carbonaceous roots and shelly material towards the base.			
8	7.00-8.50	97	97			79.73	(0.62) 8.50	Very stiff bluish grey and grey CLAY with frequent shelly laminae and mud-filled and carbonaceous roots.			
						79.38	8.85	Weak bluish grey MUDSTONE with mud-filled and carbonaceous roots.			
9						78.70	(0.68) 9.53	Very stiff bluish grey locally sandy CLAY displaying soft sediment deformation and inclined bedding highlighted by sandy and shelly laminae with mud-filled rootlets towards the top.			
						78.46	9.77	Very stiff grey and bluish grey bioturbated sandy CLAY.			
10	8.50-10.00	98	94			78.23	10.00	Weak dark grey laminated to bioturbated MUDSTONE and subordinate CLAY.			
						78.01	10.22	Very stiff brown bioturbated CLAY.			
						77.68	10.55	Very stiff brown sandy CLAY with soft sediment deformation and carbonaceous roots.			
11	10.00-11.50	101	101			76.73	(0.95) 11.50	Very stiff brown CLAY. Bioturbated with carbonaceous roots and rootlets.			
12						75.23	(1.50) 13.00	Stiff to very stiff bluish grey CLAY with carbonaceous roots and rootlets.			
13	11.50-13.00	101	101			74.33	(0.90) 13.90	Very stiff grey SILT with mud-filled and carbonaceous roots and rootlets.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/01/20	16.00	2.70	15.72			
24/01/20	32.50	2.70	16.12			
28/01/20	38.20	2.70	17.64			
11/03/20	37.25		15.69			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.2 to 37.25 mbgl. Plain HDPE pipe installed between 37.25 and 36.85 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.85 and 15.0 mbgl. Plain HDPE pipe installed from 15.0 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.5 mbgl and grout and bentonite pellets to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: D. Williams, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	38.2m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	28/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.23	E 500 207.24 N 300 526.01	K26

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						73.92	14.31	Very stiff light grey SILT. *(continued)*			
	13.00-14.50	108	108			73.73	14.50	Very stiff orange brown sandy SILT.			
						73.56	14.67	Very stiff orange brown sandy CLAY.			
	14.50-14.95	NA	NA	NA	NA	73.28	14.95	Weak red brown, grey and orange brown sideritic unit in which foliated siderite cement nodules occur as clasts (up to cobble size) in a sandy CLAY matrix.			
15						73.10	15.13	Weak orange brown LIMESTONE. Subhorizontal undulating smooth open fracture.			
							(0.87)	Medium strong light orange brown oolitic LIMESTONE. Very close to closely spaced fractures between 15.35 to 15.62m. Fractures are subhorizontal undulating rough and open to tight.			
16	14.50-16.00 14.95-16.00	103 NA	101 NA	NA 92	NA 2	72.23	16.00				
							(1.10)	Very strong light brown grey sandy oolitic LIMESTONE. Medium spaced subhorizontal undulating and planar rough open to moderately wide fractures are cross-cut by a large subvertical undulating rough moderately wide fracture. Between 16.80 and 17.10 subhorizontal fractures are very closely spaced and tight. Also observed are undulating subvertical calcite-filled or very tight fractures.			
17						71.13	17.10				
	16.00-17.50	95	95	92	7			Very strong light brown grey sandy oolitic LIMESTONE. Medium spaced subhorizontal planar and undulating rough open to moderately wide fractures.			
18							(1.90)				
19	17.50-19.00	95	95	95	3	69.23	19.00				
							(0.58)	Very strong light brown grey fine grained variably oolitic bioturbated SANDSTONE. Medium spaced subhorizontal undulating rough open to moderately wide fractures.			
						68.65	19.58				
	19.00-19.90	NA	NA	100	3	68.33	19.90	Very strong light brown very fine grained bioturbated SANDSTONE.			
20							(0.60)	Very strong light brown grey fine grained variably oolitic bioturbated SANDSTONE. Very closely spaced subhorizontal and low angle undulating rough tight to moderately wide fractures cross cut by a large subvertical undulating rough moderately wide fracture.			
	19.00-20.50 19.90-20.50	93 NA	86 NA	NA 40	NA 11	67.73	20.50				
							(0.66)				

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/01/20	16.00	2.70	15.72			
24/01/20	32.50	2.70	16.12			
28/01/20	38.20	2.70	17.64			
11/03/20	37.25		15.69			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.2 to 37.25 mbgl. Plain HDPE pipe installed between 37.25 and 36.85 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.85 and 15.0 mbgl. Plain HDPE pipe installed from 15.0 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.5 mbgl and grout and bentonite pellets to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: D. Williams, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	38.2m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	28/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.23	E 500 207.24 N 300 526.01	K26

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	20.50-21.16	NA	NA	100	2	67.07	21.16	Very strong light brown grey fine grained variably oolitic bioturbated SANDSTONE. Closely spaced subhorizontal undulating rough open to moderately wide fractures at 20.73 to 20.80m. *(continued)*			
							(0.84)	Medium strong light brown and light brown grey mainly very fine grained bioturbated SANDSTONE with nodular cements and oolitic fine grained bioturbated SANDSTONE. Very close to closely spaced subhorizontal planar undulating rough open to moderately wide fractures and two subvertical undulating rough moderately wide fractures. Non-intact recovered as gravel where nodular cements are observed.			
22	20.50-22.00	95	91	NA	NA	66.23	22.00				
	21.16-22.00	NA	NA	32	9	66.03	22.20				
								Medium strong light brown very fine grained bioturbated SANDSTONE with irregular and inclined burrow fills of soft sand.			
23								Strong brown and light brown grey fine grained bioturbated and variably oolitic SANDSTONE and subordinate oolitic LIMESTONE. Close to locally medium spaced subhorizontal planar and undulating rough open to moderately wide fractures. Subvertical undulating rough fracture from 22.86 to 23.36m.			
	22.00-23.50	100	100	71	11		(2.40)				
24											
						63.63	24.60				
								Medium strong to weak light brown and light grey brown very fine grained and fine grained locally oolitic, shelly and bioturbated SANDSTONE displaying prominent nodular cements. Drilling induced fracturing where nodular cements are observed.			
25	23.50-25.00	101	87	66	7	63.23	25.00				
						63.03	25.20				
								Medium strong light brown and light grey brown fine grained bioturbated shelly SANDSTONE. Non-intact recovered as cobbles and gravel.			
							(1.30)	Very strong light brown grey oolitic LIMESTONE. Displays diffuse cross-stratification with local bioturbated intervals. Medium to closely spaced low angle planar fractures.			
26											
	25.00-26.50	85	69	58	5	61.73	26.50				
							(1.08)	Strong light brown, light orange brown oolitic LIMESTONE. Mainly bioturbated with diffuse cross-stratification. Close to very closely spaced subhorizontal and low angle undulating and planar rough open to moderately wide fractures. Subvertical undulating rough moderately wide fracture from 26.85 to 27.55m.			
27											
						60.65	27.58				
	26.50-28.00	90	82	33	13	60.23	28.00	Medium strong light brown grey, brown and grey brown sandy oolitic LIMESTONE displaying diffuse cross-stratification and bioturbation with highly subordinate fine and very fine grained			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/01/20	16.00	2.70	15.72			
24/01/20	32.50	2.70	16.12			
28/01/20	38.20	2.70	17.64			
11/03/20	37.25		15.69			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.2 to 37.25 mbgl. Plain HDPE pipe installed between 37.25 and 36.85 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.85 and 15.0 mbgl. Plain HDPE pipe installed from 15.0 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.5 mbgl and grout and bentonite pellets to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: D. Williams, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	38.2m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	28/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.23	E 500 207.24 N 300 526.01	K26

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 6

CORE

Scale	Depth	TCR	SCR	RQD	FI
29	28.00-28.97	NA	NA	93	3
	28.00-29.50	97	97	NA	NA
	28.97-29.50	NA	NA	47	6
30					
31	29.50-31.00	15	15	10	1
	31.00-31.14	NA	NA	0	1
32	31.14-31.98	NA	NA	NA	NA
	31.00-32.50	98	91	NA	NA
	31.98-32.50	NA	NA	58	7
33	32.50-32.92	NA	NA	38	5
34	32.50-34.00	93	88	NA	NA
	32.92-34.00	NA	NA	85	5
	34.00-34.46	NA	NA	91	1

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION
	(1.00)	ripple cross-laminated and bioturbated silty very thinly bedded SANDSTONE. Non-intact from 27.58 to 27.70m recovered as gravel. Closely spaced subhorizontal undulating rough moderately wide fractures.
59.23	29.00	Very strong grey and light brown grey cross-stratified oolitic LIMESTONE with occasional fine gravel-grade mudstone clasts. Silty drapes between 28.49m and 28.51m. Very to extremely close subhorizontal undulating rough moderately wide fractures at 28.49 to 28.55m.
	(0.45)	
58.78	29.45	Strong grey and dark grey very fine grained silty SANDSTONE and local fine grained oolitic SANDSTONE. Very fine sandstones are variably bioturbated and ripple cross-laminated with thin silt laminae. Closely spaced subhorizontal undulating irregular rough and smooth open to moderately wide fractures.
58.51	29.72	
	(1.28)	Very strong grey and light brown fine grained variably oolitic and shelly bioturbated slightly silty SANDSTONE.
		No recovery. Probably due to the wash out of orange sand/soft sandstone.
57.23	31.00	
57.09	31.14	Medium strong orange brown and light brown very fine grained slightly silty and ripple cross-laminated SANDSTONE. Single subhorizontal planar smooth fracture (may be drilling induced).
56.95	31.28	Very stiff to stiff very dark grey CLAY.
56.58	31.65	Stiff grey and grey brown sandy SILT with mud-filled and carbonaceous roots and rootlets.
56.30	31.93	Very stiff dark grey CLAY with carbonaceous rootlets.
56.13	32.10	Weak dark orange brown fine grained clayey SANDSTONE. Extremely closely spaced subhorizontal undulating rough tight to open fractures. Non-intact and recovered as gravel with drilling induced fractures.
55.73	32.50	Very strong greenish grey brown fine grained slightly silty bioturbated SANDSTONE. Closely spaced subhorizontal planar to low angle undulating rough moderately wide fractures and irregular wispy calcite filled fractures/voids.
	(1.38)	Strong and locally medium strong brown and grey brown fine grained SANDSTONE. Slightly silty towards top. Diffuse cross-stratification and local bioturbation. Between 32.50 and 32.92m close to medium spaced subhorizontal fractures are cross-cut by a subvertical branched and reconnecting fracture. Fractures appear tight to moderately wide. Between 33.10 and 33.17m core is non-intact and recovered as gravel possibly associated with very closely spaced subhorizontal fractures. Between 33.65 to 33.88 fractures are closely spaced subhorizontal to low angle undulating rough and open with a subvertical branched and reconnecting tight to open fracture.
54.35	33.88	
	(0.68)	
53.67	34.56	
	(0.63)	Strong grey fine grained mainly very silty bioturbated SANDSTONE. Medium spaced subhorizontal to low angle planar

Legend | Water | Instrument/Backfill

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/01/20	16.00	2.70	15.72			
24/01/20	32.50	2.70	16.12			
28/01/20	38.20	2.70	17.64			
11/03/20	37.25		15.69			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.2 to 37.25 mbgl. Plain HDPE pipe installed between 37.25 and 36.85 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.85 and 15.0 mbgl. Plain HDPE pipe installed from 15.0 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.5 mbgl and grout and bentonite pellets to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: D. Williams, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	38.2m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	28/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.23	E 500 207.24 N 300 526.01	K26

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	6 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						53.04	35.19	rough open fractures.			
	34.00-35.50 34.46-35.50	93 NA	93 NA	NA 46	NA 9			Weak to locally medium strong dark grey and grey thinly bedded SILTSTONE and fine grained very silty SANDSTONE. Bioturbated throughout. Close to very closely spaced subhorizontal undulating and branching /reconnecting rough open to tight fractures and high angle branching/reconnecting rough open fracture. *(continued)*			
36							(1.56)	Strong to medium strong and locally weak medium and thinly bedded bioturbated SILTSTONE and sandy SILTSTONE. Very close, close and locally medium spaced subhorizontal undulating rough moderately wide fractures.			
						51.48	36.75				
37	35.50-37.00	83	83	57	9		(0.60)	Strong grey bioturbated SILTSTONE with medium gravel to cobble grade rounded mudstone clasts at base. Single subhorizontal undulating rough moderately wide fracture.			
						50.88	37.35				
38							(0.85)	Very stiff dark grey bioturbated CLAY tending towards weak MUDSTONE.			
	37.00-38.20	123	123	114	1	50.03	38.20				
39								END OF BOREHOLE			
40											
41											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/01/20	16.00	2.70	15.72			
24/01/20	32.50	2.70	16.12			
28/01/20	38.20	2.70	17.64			
11/03/20	37.25		15.69			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.2 to 37.25 mbgl. Plain HDPE pipe installed between 37.25 and 36.85 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.85 and 15.0 mbgl. Plain HDPE pipe installed from 15.0 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.5 mbgl and grout and bentonite pellets to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: D. Williams, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	38.2m

Geotechnical Engineering Limited

BOREHOLE LOG

K27

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 4
Start Date	16 December 2019	Easting	500248.1			Scale	1 : 50
End Date	19 December 2019	Northing	300789.3	Ground level	89.52mOD	Depth	36.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
16/12/19 1245hrs								Turf over soft dark brown CLAY.	0.30	89.22	
								Soft dark brown CLAY.			
16/12/19 1315hrs Dry									1.20	88.32	
17/12/19 0825hrs Dry	1L	1.20 - 2.70	Nil					Soft light grey CLAY. Frequent rootlets. 2.10 - 2.50m: Dark grey.	2.50	87.02	
	2L	2.70 - 2.90	2.70					Firm brownish grey slightly sandy CLAY. Frequent lenses of orangish brown fine sand.	2.90	86.62	
	3C	2.90 - 4.20	2.70		81	NA		Brownish grey clayey fine and medium SAND. Abundant shell debris.	4.00	85.52	
	4C	4.20 - 5.70	2.70		100			Brownish grey clayey fine to coarse sand sized SHELL DEBRIS.	4.25	85.27	
								Firm dark grey and brown slightly sandy CLAY.	4.40	85.12	
								Firm (friable) dark grey silty CLAY.	4.70	84.82	
								Firm (friable) dark greenish grey sandy CLAY. Frequent shell debris and rootlets.	4.85	84.67	
								Very stiff dark grey becoming bluish grey slightly sandy CLAY. Frequent black roots and rootlets. 5.33 - 5.35m: Pocket of dark grey silt.	5.45	84.07	
	5C	5.70 - 7.20	2.70		100			Very stiff greenish grey sandy CLAY with abundant shell debris.	6.35	83.17	
								Very stiff dark greenish grey CLAY with frequent shell debris. Frequent black wood debris throughout.	7.10	82.42	
	6C	7.20 - 8.70	2.70		100			Stiff dark grey slightly sandy silty CLAY with abundant shell debris.			
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.60m Waterflush rotary core drilled (146mm) 2.60-36.70m.

CASING: 168mm to 2.70m.

BACKFILL: On completion, a standpipe (50mm) was installed to 35.50m (slotted section 34.00-13.00m), granular response zone 36.70-12.00m, bentonite seal 12.00-11.50m, cement:bentonite grout 11.50-0.50m, concrete and raised cover 0.50-0.00m.

REMARKS: Driller notes loss of flush 12.90-36.70m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

K27

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 4
Start Date	16 December 2019	Easting	500248.1			Scale	1 : 50
End Date	19 December 2019	Northing	300789.3	Ground level	89.52mOD	Depth	36.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
									8.15	81.37	
								Stiff dark brown slightly sandy silty CLAY. Frequent black rootlets.	8.40	81.12	
								Stiff dark grey sandy CLAY. Abundant black rootlets.			
	7C	8.70 - 10.20	2.70		96						
									9.15	80.37	
								Stiff light grey slightly sandy silty CLAY. Frequent orangish brown staining.			
	8C	10.20 - 11.70	2.70		97						
									10.65	78.87	
								Stiff grey CLAY.			
									11.45	78.07	
								Stiff light grey slightly sandy CLAY.			
	9C	11.70 - 13.20	2.70		100				11.90	77.62	
								Stiff light grey CLAY.			
									12.40	77.12	
								Stiff light grey silty CLAY.	12.70	76.82	
17/12/19 1605hrs 12.90m						150		Orangish brown fine SAND.	12.80	76.72	
						120 350 550		Extremely weak (siderite cemented) grey and reddish brown fine to coarse SANDSTONE.	12.95	76.57	
18/12/19 0955hrs Dry	10C	13.20 - 14.70	2.70		96 96 96			Weak light brown oolitic LIMESTONE. Fractures are subhorizontal medium rarely closely spaced undulating rough frequently stained orangish brown.			
								14.30 - 14.50m: 50° planar rough fracture.			
	11C	14.70 - 16.20	2.70		100 100 100						
	12C	16.20 - 17.70	2.70		100 92 92			16.20 - 16.50m: Vertical undulating rough fracture.			
	13C	17.70 - 19.20	2.70		84 84			17.55 - 17.70m: Frequent burrows infilled with brown fine and medium sand.			
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

K27

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 4
Start Date	16 December 2019	Easting	500248.1	Scale	1 : 50
End Date	19 December 2019	Northing	300789.3 Ground level 89.52mOD	Depth	36.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
					84						
						350		18.90 - 19.10m: Frequent burrows infilled with brown fine and medium sand.	19.10	70.42	
	14C	19.20 - 20.70	2.70		100 98 98			Medium strong light brown calcareous fine SANDSTONE.	19.55	69.97	
						400		Weak light brown oolitic LIMESTONE with abundant burrows infilled with fine sand.	19.95	69.57	
						150 350 600		Weak light brown oolitic LIMESTONE. Fractures are subhorizontal closely and medium spaced undulating rough.			
	15C	20.70 - 22.20	2.70		100 100 100			21.20 - 21.90m: Subvertical undulating rough fracture with localised orange staining.			
						NI 50 120		Medium strong light brown fine SANDSTONE. Fractures are subhorizontal very closely and closely spaced undulating rough.	21.85	67.67	
	16C	22.20 - 23.70	2.70		96 96 83				22.55	66.97	
						400		22.50m: Belemnite.			
						60 220 270		Medium strong light brown oolitic LIMESTONE with subordinate thinly bedded fine sandstone. Fractures are subhorizontal closely and medium spaced undulating rough. 23.07 - 23.24m: Nodular. Cemented ooids, sand and shell debris.			
	17C	23.70 - 25.20	2.70		86 86 56			24.50 - 24.55m: Nodular. Frequent burrows.			
	18C	25.20 - 26.70	2.70		73 53 40	NR		Assessed zone of core loss.	25.20	64.32	
						NI		Strong grey and light brown LIMESTONE. Rare voids (up to 20mm). Fractures are subhorizontal closely and medium spaced undulating rough stained brown with up to 80mm penetrative discolouration. 25.65 - 25.85m: Light brown oolitic limestone with frequent burrows. Recovered non intact as subrounded medium and coarse gravel sized fragments.	25.60	63.92	
						60 250 550					
	19C	26.70 - 28.20	2.70		80 80 80						
18/12/19 1615hrs 16.90m								27.65 - 28.20m: Grey.			
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

K27

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	4 of 4
Start Date	16 December 2019	Easting	500248.1	Scale	1 : 50
End Date	19 December 2019	Northing	300789.3 Ground level 89.52mOD	Depth	36.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
								27.95 - 28.00m: Brown medium sand.	28.20	61.32	
19/12/19 0815hrs 16.90m	20C	28.20 - 29.70	2.70		66 27 27	NR		Assessed zone of core loss.	28.70	60.82	
						NA		(Soft) black CLAY.	28.95	60.57	
						NI NI 50		Very weak (siderite cemented) reddish brown and orangish brown fine SANDSTONE. Recovered non intact.	29.30	60.22	
						100 150 300		Extremely weak light grey and brown silty SANDSTONE. Fractures are subhorizontal closely and medium spaced planar rough.	29.80	59.72	
	21C	29.70 - 31.20	2.70		90 90 73	70 250 350		Medium strong brown and brownish grey (bioturbated) fine and medim SANDSTONE with medium spaced very thin beds of grey limestone. Fractures are subhorizontal closely and medium spaced planar rough. 29.90 - 30.25m: 80° undulating rough fracture.	31.20	58.32	
	22C	31.20 - 32.70	2.70		100 100 76	80 220 260		Medium strong bluish grey and light grey fine and medium SANDSTONE. Frequent burrows (voids up to 20mm). Fractures subhorizontal medium spaced and subvertical undulating rough.	31.90	57.62	
						450		Medium strong bluish grey calcareous sandy SILTSTONE with closely spaced very thin beds of shell debris.	32.35	57.17	
	23C	32.70 - 34.20	2.70		98 98 98	100 200 400		Medium strong bluish grey calcareous SILTSTONE with subordinate thin beds of sandy siltstone. Fractures are subhorizontal to 10° closely and medium spaced planar smooth.	33.75	55.77	
						120 200 300		Weak light grey calcareous SILTSTONE. Fractures are subhorizontal closely and medium spaced planar rough.	34.50	55.02	
	24C	34.20 - 35.20	2.70		100 30 30	NA		Very stiff dark grey CLAY.	36.10	53.42	
	25C	35.20 - 36.70	2.70		100 40 40						
19/12/19 1330hrs Dry						450		Weak light grey calcareous MUDSTONE.			
						150		36.55 - 36.60m: 30° planar rough fracture.	36.70	52.82	
								Borehole completed at 36.70m.			
									{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:15 CD EC

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	09/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.89	E 500 303.86 N 300 677.11	K28

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						88.39	(0.50) 0.50	Clayey TOPSOIL			
1						87.69	(0.70) 1.20	Weathered LIMESTONE			
						87.37	1.52	Medium Strong brown grey coarsely crystalline LIMESTONE with shelly material and crinoid fragments. Non-intact recovered as gravel.			
						87.01	1.88	Soft grey and orange brown CLAY with carbonaceous rootlets and calcite nodules.			
2	1.20-2.50	117	97			86.39	(0.62) 2.50	Stiff orange brown sandy CLAY with carbonaceous rootlets and rare shelly laminae.			
3						85.34	(1.05) 3.55	Strong light brown grey coarsely crystalline LIMESTONE with shelly debris crinoid debris and ooids. Non-intact recovered as gravel.			
4	2.50-4.00	55	32			84.89	(0.45) 4.00	Very stiff dark grey and locally grey brown CLAY. Irregular subhorizontal breaks associated with organic rich fissile clay.			
						84.55	4.34	Very stiff dark grey brown CLAY.			
						84.21	4.68	Stiff bluish grey CLAY. Soft sediment deformation with shelly material, carbonaceous debris and carbonaceous rootlets.			
5						83.63	(0.58) 5.26	Very stiff bluish grey sandy CLAY with abundant shelly debris.			
6	4.00-5.50	102	97			82.84	(0.79) 6.05	Medium strong to weak grey sandy SILTSTONE with abundant shelly debris. Bioturbated in part.			
						82.69	6.20	Soft dark grey CLAY.			
						82.51	6.38	Firm bluish grey sandy CLAY with shelly debris and carbonaceous rootlets.			
						82.24	6.65	Very stiff brown CLAY with carbonaceous rootlets.			
	5.50-7.00	99	99			81.89	7.00	Very stiff light bluish grey CLAY. Locally bioturbated with inclined laminae and mud-filled and carbonaceous roots and rootlets.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
07/01/20	29.50	2.40	16.52			
08/01/20	38.50	2.40	16.78			
11/03/20	38.25		16.13			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.5 to 38.25 mbgl. Plain HDPE pipe installed between 38.25 and 36.15 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.15 and 14.15 mbgl. Plain HDPE pipe installed from 14.15 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.15 mbgl, benonite pellets to 12.65 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Van Breda

Type and Diameter	Depth
Rotary coring 150mm	38.5m

MJCA
Technical advisers on environmental issues
Baddesley Colliery Offices,
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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	09/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.89	E 500 303.86 N 300 677.11	K28

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
								6.90 - 7.00 Sandy CLAY.			
							(0.87)	Very stiff light bluish grey CLAY with clay-filled roots and shelly debris. 7.25 - 7.60 Sandy CLAY			
						81.02	7.87				
8							(0.89)	Very stiff bluish grey CLAY with clay-filled roots. 8.26 - 8.76 Abundant shelly debris with carbonaceous roots and rootlets.			
	7.00-8.50	108	108			80.13	8.76				
9						79.70	9.19	Very stiff dark bluish grey and grey sandy SILT with carbonaceous roots and rootlets.			
	8.50-9.40	108	108			79.58	9.31	Strong grey and light grey very fine grained silty SANDSTONE. Ripple cross-laminated with shelly debris.			
						79.49	(0.45) 9.40	Soft dark grey sandy CLAY with shelly debris.			
						79.04	9.85	Very stiff to stiff bluish grey CLAY with shelly laminae.			
10						78.75	10.14	Firm grey, greenish grey and dark purplish brown CLAY. Carbonaceous roots and rootlets and a large clay-filled root.			
						78.31	(0.44) 10.58	Stiff to very stiff dark bluish grey CLAY with carbonaceous rootlets.			
	9.40-10.90	97	97			77.99	10.90	Firm dark grey, dark brown and dark bluish grey CLAY with carbonaceous roots and rootlets.			
11	10.90-11.30	97	97			77.59	11.30	Very stiff dark brown sandy CLAY with carbonaceous rootlets.			
						77.19	11.70	Very stiff brown CLAY with carbonaceous, clay-filled and siderite replaced rootlets. Siderite replaced carbonaceous laminae.			
12							(1.05)	Very stiff dark brown CLAY with sand-filled cracks. Siderite cemented sand laminae and rare carbonaceous laminae.			
	11.30-12.75	95	95			76.14	12.75				
13						76.01	12.88	Weak light grey brown and orange brown sandy SILTSTONE with carbonaceous roots.			
						75.83	13.06	Medium strong orange brown and light orange brown very fine grained silty SANDSTONE. Soft sediment deformation with carbonaceous roots. Siderite filled subvertical fracture.			
						75.66	13.23				
						75.30	13.59	Very stiff light grey and orange brown SILT with carbonaceous roots.			
							(0.45)	Very stiff to weak orange brown very fine grained silty			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
07/01/20	29.50	2.40	16.52			
08/01/20	38.50	2.40	16.78			
11/03/20	38.25		16.13			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.5 to 38.25 mbgl. Plain HDPE pipe installed between 38.25 and 36.15 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.15 and 14.15 mbgl. Plain HDPE pipe installed from 14.15 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.15 mbgl, benonite pellets to 12.65 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Van Breda

Type and Diameter	Depth
Rotary coring 150mm	38.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	09/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.89	E 500 303.86 N 300 677.11	K28

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 6

CORE

Depth	TCR	SCR	RQD	FI
12.75-14.25	109	100		
14.25-14.96	NA	NA	82	8
14.25-15.80	101	97	NA	NA
14.96-15.80	NA	NA	100	1
15.80-16.50	NA	NA	100	1
16.50-16.80	NA	NA	47	5
15.80-17.40	88	83	NA	1
16.80-17.40	NA	NA	100	
17.40-18.66	NA	NA	100	2
17.40-18.90	100	103	NA	NA
18.66-19.20	NA	NA	31	5
19.20-19.77	NA	NA	100	0
18.90-20.50	94	86	NA	NA
19.77-20.50	NA	NA	79	7

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION
74.85	14.04	SAND/SANDSTONE with diffuse cross-stratification.
74.71	14.18	Very stiff brown grey and light grey brown SILT. Sand-filled cracks, inclined thin and thick laminae and soft sediment deformation. *(continued)*
74.64	14.25	Very soft orange brown very fine grained very clayey SAND. Red iron mineralisation at 13.59m.
74.26	14.63	
73.93	14.96	Weak orange brown very fine grained clayey SANDSTONE.
73.28	15.61	Medium strong light orange brown very fine grained SANDSTONE with rare shelly debris. Irregular cements are locally associated with siderite filled high-angle and sub-horizontal fractures. 14.47 - 14.50 Non-intact core recovered as gravel between two very closely spaced subhorizontal undulating smooth and open fractures. (0.65)
72.39	16.50	Weak light orange brown and very light grey very fine grained SANDSTONE. Variably oolitic and shelly with irregular cements. Interval highly fractured with very closely to closely spaced irregular, subhorizontal, subvertical and high angle tight fractures. (0.89)
72.09	16.80	Strong light brown grey fine grained variably oolitic SANDSTONE. Rare shelly debris.
70.23	18.66	Very strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal planar and undulating rough open fractures. Strong light brown grey and light grey brown sandy oolitic LIMESTONE. Very close to closely spaced low angle planar and undulating rough open to tight fractures. Very strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal and low angle planar and undulating rough open to moderately wide fractures. (1.86)
69.84	19.05	Strong light brown grey and orange brown very fine grained variably oolitic SANDSTONE. 18.99 - 19.05 Observed ooid dissolution.
69.31	19.58	Very strong light grey brown oolitic LIMESTONE. 19.14 - 19.20 Non-intact recovered as cobbles and gravel possibly due to very closely spaced low angle and high angle fractures. (0.53)
68.63	20.26	Strong light grey brown and light brown grey, variably sandy oolitic LIMESTONE. Prominent nodular cements associated with burrow fills. Closely spaced low angle and subhorizontal undulating and irregular rough open to tight fractures and subvertical undulating and branching/reconnecting fracture at 19.88 to 20.05. (0.68)
67.96	20.93	Medium strong light brown and light brown grey very fine grained bioturbated SANDSTONE. Prominent inclined and subvertical burrow fills with associated cements. (0.67)

Legend

Water

Instrument/ Backfill

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
07/01/20	29.50	2.40	16.52			
08/01/20	38.50	2.40	16.78			
11/03/20	38.25		16.13			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.5 to 38.25 mbgl. Plain HDPE pipe installed between 38.25 and 36.15 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.15 and 14.15 mbgl. Plain HDPE pipe installed from 14.15 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.15 mbgl, benonite pellets to 12.65 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18

Crew: P. Hetherington, M. Van Breda

Type and Diameter	Depth
Rotary coring 150mm	38.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	09/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.89	E 500 303.86 N 300 677.11	K28

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						67.86	21.03	Strong light grey brown oolitic LIMESTONE. Possible fractured contacts with subhorizontal undulating rough very tight and open fractures. *(continued)*			
						67.38	(0.48) 21.51	Medium strong light brown and light grey brown very fine grained bioturbated SANDSTONE. Prominent large burrow fills and inclined and subvertical burrow fills. 21.23 Non-intact recovered as gravel possibly due to subhorizontal fracture.			
22	20.50-22.00	94	91	86	5		(1.84)	Very strong and strong light brown grey and grey variably sandy oolitic LIMESTONE. Local diffuse stratification. Close to medium spaced subhorizontal undulating to planar rough open fractures.			
23						65.54	23.35				
	22.00-23.50	111	105	93	8		(0.85)	Medium strong light brown grey and light grey brown very fine grained bioturbated SANDSTONE. Prominent nodular cements. Drilling induced fractures.			
24						64.69	24.20				
						64.27	24.62	Medium strong light brown grey and light grey brown fine grained bioturbated SANDSTONE with abundant shelly debris and ooids towards the base. Drilling induced fractures.			
25	23.50-25.00	91	89	63	1		(1.88)	Very strong light grey and light brown grey sandy oolitic LIMESTONE. Stratified with wave ripple cross-lamination and diffuse cross-stratification. Locally bioturbated. Medium to closely spaced low angle and subhorizontal planar and undulating rough tight to moderately wide fractures.			
26											
	25.00-26.50	99	95	73	9	62.39	26.50				
						62.21	26.68	No recovery.			
27							(0.92)	Strong light orange brown and light brown grey locally sandy oolitic LIMESTONE. Beds are stratified and locally wave ripple cross-laminated. Close to very closely spaced low angle undulating and planar rough open fractures. High angle undulating, rough open fracture at 27.45 to 27.60m.			
	26.50-27.60	NA	NA	25	11	61.29	27.60				
	26.50-28.00	88	80	NA	NA						

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
07/01/20	29.50	2.40	16.52			
08/01/20	38.50	2.40	16.78			
11/03/20	38.25		16.13			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.5 to 38.25 mbgl. Plain HDPE pipe installed between 38.25 and 36.15 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.15 and 14.15 mbgl. Plain HDPE pipe installed from 14.15 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.15 mbgl, benonite pellets to 12.65 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Van Breda

Type and Diameter	Depth
Rotary coring 150mm	38.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	09/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.89	E 500 303.86 N 300 677.11	K28

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 6

CORE

Scale	Depth	TCR	SCR	RQD	FI
	27.60-28.00	NA	NA	80	1
	28.00-28.43	NA	NA	74	4
	28.43-28.84	NA	NA	100	0
29	28.00-29.50	103	100	NA	NA
	28.84-29.50	NA	NA	76	6
	29.50-29.64	NA	NA	100	0
30					
31	29.50-31.00	83	79	NA	NA
	29.64-31.00	NA	NA		
32					
	31.00-32.50	101	99	85	8
33					
34	32.50-34.00	102	102	97	10

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION
	(0.90)	Strong light orange brown oolitic LIMESTONE. Stratified and wave rippled with bioturbated units. Subhorizontal undulating rough open fracture at 27.90m. Very closely spaced low angle undulating rough and open to moderately wide fractures at 28.32 to 28.43m. High angle and subvertical undulating and irregular tight fracture at 28.0 to 28.32m. *(continued)*
60.39	28.50	
	(0.87)	Very strong to strong light grey brown, light brown grey and grey sandy oolitic LIMESTONE with diffuse cross-stratification. Abundant shelly debris and mudstone clasts to medium gravel grade. Close to very closely spaced subhorizontal and low angle undulating rough open fractures from 28.84 to 29.17m.
59.52	29.37	
59.25	29.64	Very strong light grey and light brown grey very fine grained silty and slightly silty bioturbated SANDSTONE.
	(0.94)	Extremely weak orange brown very fine grained bioturbated SANDSTONE and weakly consolidated SAND. More competent parts display drilling induced fractures.
58.31	30.58	
58.21	30.68	Very stiff dark grey CLAY.
	(0.58)	Very stiff dark grey and dark grey brown sandy SILT with clay-filled and carbonaceous rootlets and soft sediment deformation.
57.63	31.26	
	(0.54)	Strong grey, brown grey and brown fine grained slightly silty and silty SANDSTONE. Bioturbated with carbonaceous rootlets. Closely spaced subhorizontal undulating rough open fractures.
57.09	31.80	
	(0.70)	Very strong brown and light brown fine grained bioturbated SANDSTONE. Fracture zone at 31.8 to 32.12m comprising very closely spaced subhorizontal, low angle and high angle rough open fractures.
56.39	32.50	
	(0.59)	Very strong brown and light brown fine grained bioturbated SANDSTONE. Very closely spaced and branching/reconnecting high angle to subvertical tight fractures.
55.80	33.09	
55.69	33.20	Very strong grey brown and grey fine grained slightly silty bioturbated SANDSTONE with shelly debris. Very closely spaced subhorizontal undulating rough open to tight fractures.
	(2.02)	Very strong grey, brown grey and bluish grey fine grained silty SANDSTONE. Medium to closely spaced subhorizontal undulating rough tight to open fractures.

Legend

Water

Instrument/ Backfill

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
07/01/20	29.50	2.40	16.52			
08/01/20	38.50	2.40	16.78			
11/03/20	38.25		16.13			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.5 to 38.25 mbgl. Plain HDPE pipe installed between 38.25 and 36.15 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.15 and 14.15 mbgl. Plain HDPE pipe installed from 14.15 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.15 mbgl, benonite pellets to 12.65 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18

Crew: P. Hetherington, M. Van Breda

Type and Diameter	Depth
Rotary coring 150mm	38.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	09/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.89	E 500 303.86 N 300 677.11	K28

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	6 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						53.67	35.22				
	34.00-35.50	97	97	92	5		(0.84)	Very strong grey very fine grained very silty bioturbated SANDSTONE.			
36						52.83	36.06				
							(0.63)	Weak dark grey bioturbated SILTSTONE.			
						52.20	36.69				
37	35.50-37.00	87	87	54	0			Very stiff dark grey bioturbated CLAY.			
	37.00-37.50	87	87	NA	NA		(1.81)				
38											
	37.50-38.50	96	96	89	0	50.39	38.50				
								END OF BOREHOLE			
39											
40											
41											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
07/01/20	29.50	2.40	16.52			
08/01/20	38.50	2.40	16.78			
11/03/20	38.25		16.13			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 38.5 to 38.25 mbgl. Plain HDPE pipe installed between 38.25 and 36.15 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 36.15 and 14.15 mbgl. Plain HDPE pipe installed from 14.15 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.15 mbgl, benonite pellets to 12.65 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Van Breda

Type and Diameter	Depth
Rotary coring 150mm	38.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	19/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.93	E 500 351.81 N 300 588.85	K29

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 6

CORE						STRATA					
Scale	Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						86.43	(0.50) 0.50	Clayey TOPSOIL.			
						86.13	0.80	Orange brown gravelly CLAY.			
1						85.73	1.20	Weathered LIMESTONE.			
						85.20	(0.53) 1.73	Very soft to firm grey and orange brown sandy CLAY with carbonaceous rootlets.			
2						84.63	(0.57) 2.30	Firm to very stiff grey CLAY with inclined shelly laminae.			
	1.20-2.60	107	107			84.33	2.60	Very stiff bluish dark grey CLAY.			
						84.00	2.93	Soft to firm grey and orange brown CLAY. Occasionally shelly.			
3						83.58	3.35	Firm to very stiff bluish dark grey CLAY.			
						83.13	(0.45) 3.80	Stiff grey CLAY with shelly laminae carbonaceous roots and rootlets.			
	2.60-3.90	109	109					Very stiff to firm grey mainly bioturbated sandy CLAY.			
4								3.80 - 3.94 Carbonaceous roots.			
								3.94 - 4.24 Shelly debris in uppermost 30cm			
							(1.25)				
5						81.88	5.05				
						81.33	(0.55) 5.60	Stiff bluish grey, brown and grey brown sandy CLAY with carbonaceous roots and shelly laminae.			
	3.90-5.60	89	89								
6						80.49	(0.84) 6.44	Stiff dark bluish grey CLAY with carbonaceous rootlets.			
						79.93	(0.56) 7.00	Stiff bluish light grey CLAY. Abundant shelly debris and carbonaceous roots.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
17/12/19	18.80	2.50	14.28			
18/12/19	32.75	2.50	14.28			
20/12/19	35.40		13.94			
11/03/20	35.40		14.16			

REMARKS / INSTALLATIONS

Core from 37.25 to 36.56 mbgl not recovered. Unrecovered cuttings backfill borehole to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.4 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.4 and 13.4 mbgl. Plain HDPE pipe installed from 13.4 mbgl to above ground level. Borehole annulus backfilled with gravel to 12.6 mbgl, benonite pellets to 11.9 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	37.25m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	19/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.93	E 500 351.81 N 300 588.85	K29

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thickness)	STRATA DESCRIPTION	Legend	Water	Instrument/ Backfill
	5.60-7.10	101	101					Very stiff grey CLAY. Laminated with thin shelly laminae.			
						79.83	7.10	Firm grey CLAY with shelly debris.			
						79.62	7.31	Very stiff dark grey brown CLAY.			
						79.22	7.71				
8						78.62	(0.60) 8.31	Very stiff dark grey brown CLAY with abundant shelly debris and carbonaceous debris up to coarse pebble grade and carbonaceous rootlets.			
	7.10-8.50	107	107			78.46	8.47	Weak grey very fine grained very clayey SANDSTONE.			
						78.28	8.65	Bioturbated with shelly debris.			
								Stiff bluish grey CLAY.			
9						77.93	9.00	Stiff bluish grey sandy CLAY with shelly debris.			
						77.65	9.28	Very stiff to firm brown and grey brown CLAY with carbonaceous rootlets.			
	8.50-9.75	97	97			77.18	(0.47) 9.75	Very stiff greenish grey CLAY with carbonaceous rootlets.			
10						76.81	10.12	No recovery.			
						76.73	10.20	Firm greenish grey CLAY.			
						76.38	10.55	Stiff to firm brown CLAY.			
11	9.75-11.55	83	83			75.38	(1.00) 11.55	Very stiff brown locally sandy SILT. Bioturbated with large sand-filled cracks and carbonaceous rootlets.			
12						74.89	(0.49) 12.04	Weak brown SILTSTONE. Locally sandy with soft sediment deformation and sheared fabrics. Some inclined laminae towards base. Coaly debris to medium gravel grade.			
						74.73	12.20	Firm grey brown and dark grey very fine grained very silty SAND.			
						74.24	(0.49) 12.69	Very stiff light grey SILT and CLAY in fining upward unit with carbonaceous rootlets.			
	11.55-12.85	119	115			74.08	12.85	Very stiff orange brown and red brown sandy SILT. Basal 5cm is medium strong and composed of ferriferous ooids.			
13						73.60	(0.48) 13.33	Weak orange brown clayey SILT.			
							(1.12)	Strong light brown grey oolitic LIMESTONE. Closely spaced subhorizontal undulating rough open to moderately wide fractures and high angle to subvertical branching/reconnecting rough open to moderately wide fractures.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
17/12/19	18.80	2.50	14.28			
18/12/19	32.75	2.50	14.28			
20/12/19	35.40		13.94			
11/03/20	35.40		14.16			

REMARKS / INSTALLATIONS

Core from 37.25 to 36.56 mbgl not recovered. Unrecovered cuttings backfill borehole to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.4 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.4 and 13.4 mbgl. Plain HDPE pipe installed from 13.4 mbgl to above ground level. Borehole annulus backfilled with gravel to 12.6 mbgl, benonite pellets to 11.9 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	37.25m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	19/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.93	E 500 351.81 N 300 588.85	K29

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	12.85-14.45	92	92	78	12	72.48	14.45				
15							(1.50)	Very strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal undulating rough open to moderately wide fractures.			
	14.45-15.95	88	87	87	4	70.98	15.95				
16							(1.50)	Very strong light grey brown oolitic LIMESTONE. Wide spaced subhorizontal undulating rough open to moderately wide fractures.			
17	15.95-17.45	96	96	96	2	69.48	17.45				
18						68.38	(1.10) 18.55	Very strong light grey brown and grey oolitic LIMESTONE. Close to medium spaced high angle and subhorizontal undulating to planar rough open to wide fractures.			
19	17.45-18.80	90	90	90	3	67.61	(0.77) 19.32	Medium strong light brown and light brown grey sandy oolitic LIMESTONE. Prominent small cavities and nodular cements associated with burrow fills. Very closely spaced subhorizontal and low angle planar to undulating rough open to wide fractures.			
20	18.80-20.40	98	98	88	7	66.53	(1.08) 20.40	Medium strong light brown and light grey brown very fine grained locally oolitic SANDSTONE. Prominent nodular cements associated with burrow network. Large inclined burrows near base. Small cavities associated with burrow fills and shell dissolution. Close to medium spaced subhorizontal rough open to wide fractures.			
								Strong light brown, light grey brown and grey sandy oolitic LIMESTONE. Close to medium spaced subhorizontal and low angle planar and undulating rough open to wide fractures.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
17/12/19	18.80	2.50	14.28			
18/12/19	32.75	2.50	14.28			
20/12/19	35.40		13.94			
11/03/20	35.40		14.16			

REMARKS / INSTALLATIONS

Core from 37.25 to 36.56 mbgl not recovered. Unrecovered cuttings backfill borehole to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.4 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.4 and 13.4 mbgl. Plain HDPE pipe installed from 13.4 mbgl to above ground level. Borehole annulus backfilled with gravel to 12.6 mbgl, benonite pellets to 11.9 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	37.25m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	19/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.93	E 500 351.81 N 300 588.85	K29

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
22	20.40-21.90	100	100	95	6	64.61	(1.92) 22.32	Strong light brown, light grey brown and grey sandy oolitic LIMESTONE. Close to medium spaced subhorizontal and low angle planar and undulating rough open to wide fractures. *(continued)*			
23	21.90-23.40	97	97	97	4	63.53	(1.08) 23.40	Medium strong light brown very fine grained locally oolitic very fine and fine grained bioturbated SANDSTONE. Prominent nodular cements and small cavities associated with burrow fills and some shell dissolution. Medium spaced subhorizontal undulating rough open to moderately wide fractures.			
24	23.40-24.90	89	73	71	5	63.09 62.88 62.64	(0.44) 23.84 24.05 24.29	Very strong light grey brown oolitic fine grained SANDSTONE. Trough cross-stratification and bioturbated intervals with prominent nodular cements and small cavities. Close to very closely spaced subhorizontal undulating rough open to wide fractures. Non-intact recovered as gravel comprising cement nodules of very fine SANDSTONE. Medium strong light brown and light brown grey oolitic very fine grained bioturbated SANDSTONE. Prominent nodular cements associated with burrow fills and some small cavities.			
25 26	24.90-26.40	77	70	47	7	60.53	(2.11) 26.40	Very strong light brown grey and light brown variably oolitic mainly fine grained SANDSTONE. Non-intact recovered as gravel comprising cement nodules at 24.45 to 24.59m and 25.69 to 25.80m. Trough cross-stratification and current ripple cross-lamination observed locally. Medium to closely spaced subhorizontal and low angle planar and undulating rough open to wide fractures.			
27						59.61	(0.92) 27.32	Medium strong light brown and light grey brown fine grained variably oolitic SANDSTONE. Non-intact recovered as gravel and cobbles with core loss and loose sand on core surfaces.			
	26.40-27.80	57	29	20	3		(1.06)				

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
17/12/19	18.80	2.50	14.28			
18/12/19	32.75	2.50	14.28			
20/12/19	35.40		13.94			
11/03/20	35.40		14.16			

REMARKS / INSTALLATIONS

Core from 37.25 to 36.56 mbgl not recovered. Unrecovered cuttings backfill borehole to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.4 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.4 and 13.4 mbgl. Plain HDPE pipe installed from 13.4 mbgl to above ground level. Borehole annulus backfilled with gravel to 12.6 mbgl, benonite pellets to 11.9 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	37.25m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	19/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.93	E 500 351.81 N 300 588.85	K29

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 6

CORE

Depth	TCR	SCR	RQD	FI
27.80-28.15	100	77	69	0
28.15-29.65	57	46	37	0
29.65-31.15	103	97	62	8
31.15-32.75	92	91	71	11
32.75-34.25	101	101	101	9

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION
58.55	28.38	Very strong and medium strong fine grained variably oolitic bioturbated SANDSTONE. Mainly very strong with thin and very thin beds of medium strong sandstone that is generally non-intact and recovered as gravel and comprising nodular cements. Very closely spaced low angle tight to open fractures at 27.34 to 27.68m. *(continued)*
	(0.80)	
57.75	29.18	Medium strong light brown fine grained oolitic SANDSTONE. Non-intact recovered as gravel and cobbles.
57.63	29.30	Weak orange and red brown fine grained rippled SANDSTONE. High porosity including small cavities.
57.44	29.49	Very stiff dark grey CLAY.
57.28	29.65	Stiff grey, orange brown and dark grey very fine grained very clayey SAND with carbonaceous rootlets.
57.19	29.74	Extremely weak orange brown and dark grey fine grained clayey and oolitic SANDSTONE. Non-intact recovered as gravel.
57.10	29.83	Weak orange brown very fine grained clayey SANDSTONE with carbonaceous rootlets.
56.87	30.06	Very stiff dark grey, brown grey and orange brown very fine grained very clayey SAND with carbonaceous rootlets.
56.71	30.22	Medium strong light grey brown and grey very fine grained gravelly SANDSTONE with clasts comprising medium and coarse gravel grade mudstone.
56.28	30.65	Strong light grey brown and bluish grey very fine grained silty SANDSTONE. Mainly bioturbated. Closely spaced subhorizontal undulating rough open to moderately wide fractures and subvertical to high angle branching and reconnecting fractures.
	(1.35)	
54.93	32.00	Very strong brown grey and light brown grey fine grained SANDSTONE. Cross-stratified and locally bioturbated with shelly debris. Medium spaced subhorizontal to low angle and high angle undulating rough open to moderately wide fractures.
	(0.75)	
54.18	32.75	Very strong to weak light grey brown, grey brown and bluish grey very fine grained very silty SANDSTONE. Bioturbated throughout. Locally non-intact recovered as cobbles and gravel with close to medium spaced subhorizontal and subvertical fractures. Fractures may be in part drilling induced.
	(1.79)	Very strong light grey brown, bluish grey and bluish dark grey very fine grained very silty bioturbated SANDSTONE with subordinate thinly bedded SILTSTONE. Occasionally shelly. Closely spaced subhorizontal planar to undulating rough open fractures. Subvertical fracture at 32.75 to 33.0m and high angle fracture from 33.80 to 34.10.
52.39	34.54	
52.16	34.77	Very strong grey bioturbated SILTSTONE.

Scale: 29, 30, 31, 32, 33, 34

Water | Instrument/Backfill

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
17/12/19	18.80	2.50	14.28			
18/12/19	32.75	2.50	14.28			
20/12/19	35.40		13.94			
11/03/20	35.40		14.16			

REMARKS / INSTALLATIONS

Core from 37.25 to 36.56 mbgl not recovered. Unrecovered cuttings backfill borehole to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.4 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.4 and 13.4 mbgl. Plain HDPE pipe installed from 13.4 mbgl to above ground level. Borehole annulus backfilled with gravel to 12.6 mbgl, benonite pellets to 11.9 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	37.25m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	19/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.93	E 500 351.81 N 300 588.85	K29

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	6 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						51.71	(0.45) 35.22	Very strong dark grey bioturbated SILTSTONE with gravelly SILTSTONE at base between 35.10 and 35.22m. Clasts comprise cobbles and fine to coarse gravel grade mudstone. Subhorizontal undulating rough moderately wide fracture at 34.86m. *(continued)*			
36	34.25-35.75	92	92	92	3	50.37	(1.34) 36.56	Very stiff dark grey bioturbated CLAY tending to extremely weak MUDSTONE. Medium to closely spaced subhorizontal planar fractures.			
37	35.75-37.25	55	55	49	4	49.68	(0.69) 37.25	No recovery.			
								END OF BOREHOLE			
38											
39											
40											
41											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
17/12/19	18.80	2.50	14.28			
18/12/19	32.75	2.50	14.28			
20/12/19	35.40		13.94			
11/03/20	35.40		14.16			

REMARKS / INSTALLATIONS

Core from 37.25 to 36.56 mbgl not recovered. Unrecovered cuttings backfill borehole to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.4 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.4 and 13.4 mbgl. Plain HDPE pipe installed from 13.4 mbgl to above ground level. Borehole annulus backfilled with gravel to 12.6 mbgl, benonite pellets to 11.9 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Goodman

Type and Diameter	Depth
Rotary coring 150mm	37.25m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	12/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	84.22	E 500 409.72 N 300 497.98	K30

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						83.62	(0.60) 0.60	Brown Clayey TOPSOIL.			
1						83.02	(0.60) 1.20	Soft dark grey CLAY.			
2						82.06	(0.96) 2.16	Soft to firm grey, greenish grey and orange brown CLAY.			
	1.20-2.30	108	108			81.97	2.25	Stiff grey brown and orange brown sandy CLAY with shelly debris.			
	2.30-2.60	100	67			81.62	2.60	Very soft and friable brown sandy CLAY with abundant shelly debris.			
						81.42	2.80	Very soft grey brown, greenish grey and orange brown CLAY.			
3						81.24	2.98	Weak brown very fine grained silty SANDSTONE with abundant shelly debris. Non-intact recovered as gravel.			
						80.79	(0.45) 3.43	Medium strong brown very fine grained silty SANDSTONE with abundant shelly debris.			
						80.47	3.75	Stiff dark grey CLAY.			
4	2.60-4.10	101	91			80.03	(0.44) 4.19	Very stiff bluish dark grey CLAY with carbonaceous rootlets.			
						79.64	4.58	No recovery.			
						79.30	4.92	Very stiff bluish dark grey CLAY with carbonaceous rootlets.			
5	4.10-5.60	68	68			78.62	(0.68) 5.60	Very stiff bluish grey and grey CLAY with carbonaceous roots and rootlets.			
6						77.95	(0.67) 6.27	Soft to firm bluish grey CLAY. Shelly with carbonaceous roots.			
						77.73	6.49	Very stiff light grey and bluish grey shell bed with CLAY matrix. Carbonaceous roots.			
	5.60-6.90	122	122				(0.93)	Very stiff bluish grey CLAY. Locally shelly. 6.72 - 6.90 SILT.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/12/19	19.10	2.60	11.4			
12/12/19	35.75	2.60	11.35			
20/12/19	35.25		11.07			
11/03/20	35.25		11.35			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.75 to 34.75 mbgl. Plain HDPE pipe installed between 34.75 and 33.25 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.25 and 12.25 mbgl. Plain HDPE pipe installed from 12.25 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.1 mbgl, benonite pellets to 10.55 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	35.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	12/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	84.22	E 500 409.72 N 300 497.98	K30

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						76.80	7.42	Very stiff bluish grey CLAY. Locally shelly. *(continued)*			
						76.47	7.75	Stiff dark brown and bluish grey CLAY with carbonaceous rootlets.			
8							(0.55)	Very stiff to firm bluish grey CLAY with carbonaceous roots and rootlets.			
	6.90-8.30	114	114			75.92	8.30				
9							(1.77)	Weak brown laminated and bioturbated SILTSTONE with carbonaceous rootlets in top 60cm. 8.90 - 9.36 Sand-filled cracks. 9.40 Thick laminae of coaly debris.			
	8.30-9.90	94	94								
10						74.15	10.07				
							(0.60)	Very stiff light grey CLAY with carbonaceous rootlets.			
						73.55	10.67				
						73.28	10.94	Weak light grey SILTSTONE displaying soft sediment deformation.			
11							(0.46)	Strong light grey SILTSTONE with a fluidised fabric.			
	9.90-11.40	102	100			72.82	11.40				
						72.62	11.60	Very stiff light grey SILT. Inclined bedding with carbonaceous rootlets.			
						72.38	11.84	Very stiff light grey brown SILT with carbonaceous rootlets.			
12							(0.71)	Very stiff brown grey or orange brown CLAY.			
						71.67	12.55				
							(0.45)	Medium strong orange brown very fine grained clayey SANDSTONE.			
13	11.40-13.00	96	93			71.22	13.00				
							(1.00)	Medium strong to very strong light grey brown and orange brown sandy oolitic LIMESTONE. Close to medium spaced subhorizontal undulating rough open to moderately wide fractures.			
	13.00-14.00	103	103	88	3	70.22	14.00				

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/12/19	19.10	2.60	11.4			
12/12/19	35.75	2.60	11.35			
20/12/19	35.25		11.07			
11/03/20	35.25		11.35			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.75 to 34.75 mbgl. Plain HDPE pipe installed between 34.75 and 33.25 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.25 and 12.25 mbgl. Plain HDPE pipe installed from 12.25 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.1 mbgl, benonite pellets to 10.55 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	35.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	12/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	84.22	E 500 409.72 N 300 497.98	K30

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						69.45	(0.77) 14.77	Very strong light grey brown oolitic LIMESTONE. Very closely spaced subhorizontal undulating and stepped rough open to moderately wide fractures at 14.24 to 14.34m and large subvertical branching/reconnecting rough open to moderately wide fracture from 14.0 to 14.77m.			
15	14.00-15.05	100	90	90	4	69.09	15.13	Strong orange brown sandy oolitic LIMESTONE.			
16	15.05-16.15	75	75	62	6	68.07	(1.02) 16.15	Very strong light grey brown ooltic LIMESTONE. Large subvertical branching/reconnecting rough open to moderately wide fractures from 15.13 to 16.08m and medium spaced subhorizontal rough tight to open fractures			
						67.32	(0.75) 16.90	Very strong light grey brown oolitic LIMESTONE. Subvertical very tight siderite filled fracture at 16.15 to 16.35m. Subhorizontal undulating, rough open fracture 5cm above base.			
17						67.06	17.16	Medium strong fine grained SANDSTONE with prominent small cavities and nodular cements associated with burrow fills and small cavities.			
	16.15-17.60	110	110	101	5	66.62	(0.44) 17.60	Very strong light grey brown oolitic LIMESTONE. Large planar subvertical rough open fracture at 17.20 to 17.32.			
						66.47	17.75	Non-intact recovered as cobble to medium gravel grade siderite nodules and oolitic limestone clasts.			
18						66.27	17.95	Medium strong orange brown oolitic LIMESTONE with prominent small cavities.			
						66.04	18.18	Very stiff to firm grey dark grey and orange brown very fine grained very clayey SAND with abundant carbonaceous rootlets and carbonaceous debris.			
						65.68	18.54	Extremely weak orange brown very fined grained SANDSTONE. Large sand-filled roots are partially open.			
19	17.60-19.10	97	80	59	1			Very strong light grey brown oolitic LIMESTONE. Diffuse stratification at 19.10 to 19.35m. Locally sandy with small cavities. Medium to closely spaced subhorizontal undulating rough open to moderately wide fractures and subvertical open joints.			
20							(2.72)	20.10 - 20.30 Calcite cements fill voids and replace shells.			
	19.10-20.60	91	90	77	8			20.75 - 21.18 Light grey cement.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/12/19	19.10	2.60	11.4			
12/12/19	35.75	2.60	11.35			
20/12/19	35.25		11.07			
11/03/20	35.25		11.35			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.75 to 34.75 mbgl. Plain HDPE pipe installed between 34.75 and 33.25 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.25 and 12.25 mbgl. Plain HDPE pipe installed from 12.25 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.1 mbgl, benonite pellets to 10.55 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	35.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	12/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	84.22	E 500 409.72 N 300 497.98	K30

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 6

CORE

Scale	Depth	TCR	SCR	RQD	FI
22	20.60-22.10	100	96	90	3
23	22.10-23.60	91	85	64	8
24					
25	23.60-25.10	87	87	87	4
26	25.10-26.60	84	67	60	0
27					

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
62.96	21.26				
62.42	(0.54) 21.80	Medium strong orange brown and light grey brown very fine grained bioturbated SANDSTONE. Prominent small cavities associated with burrow fills and shell dissolution. Closely spaced subhorizontal undulating rough open fractures.			
61.57	(0.85) 22.65	Medium strong to very strong orange brown and light grey brown fine grained and locally oolitic bioturbated SANDSTONE. Prominent small cavities at 22.16 to 22.40m.			
61.32	22.90	Very strong grey and light grey brown very fine grained SANDSTONE.			
61.04	23.18	Medium strong to weak orange brown and light grey brown very fine grained bioturbated SANDSTONE. Nodular cements and small cavities associated with burrow fills. Very closely spaced subhorizontal undulating rough open fractures.			
60.79	23.43				
60.55	23.67	Strong light grey brown and orange brown very fine grained slightly silty bioturbated SANDSTONE. Subhorizontal undulating rough open to moderately fracture.			
59.52	(1.03) 24.70	Strong grey brown and dark grey very fine grained silty bioturbated SANDSTONE. Subhorizontal undulating rough open to wide fracture.			
59.07	(0.45) 25.15	Very strong grey and dark grey very fine grained silty to slightly silty bioturbated SANDSTONE interbedded with subordinate thinly bedded very fine grained planar stratified SANDSTONE. Medium spaced subhorizontal undulating rough open fractures.			
58.82	25.40	Very strong grey very fine grained slightly silty bioturbated SANDSTONE.			
58.42	25.80	No recovery.			
57.62	(0.80) 26.60	Very strong to strong grey, grey brown and dark grey very fined grained silty bioturbated SANDSTONE. Some small cavities.			
57.39	26.83	Very strong to medium strong brown light grey brown and grey very fine grained bioturbated SANDSTONE. Locally non-intact recovered as gravel comprising cement nodules.			
56.99	27.23	Low recovery. Non-intact recovered as gravel comprising cemented very fine sand (burrow fills).			
56.76	27.46	Strong light grey brown and grey fine grained shelly and oolitic bioturbated and diffusely stratified SANDSTONE with thin non-intact intervals recovered as gravel comprising very fine SANDSTONE. Medium to fine gravel sized coal fragments.			
	(0.64)	Stiff to firm dark grey to black laminated CLAY.			
		Very stiff grey and orange brown sandy CLAY with carbonaceous roots.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/12/19	19.10	2.60	11.4			
12/12/19	35.75	2.60	11.35			
20/12/19	35.25		11.07			
11/03/20	35.25		11.35			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.75 to 34.75 mbgl. Plain HDPE pipe installed between 34.75 and 33.25 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.25 and 12.25 mbgl. Plain HDPE pipe installed from 12.25 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.1 mbgl, benonite pellets to 10.55 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	35.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	12/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	84.22	E 500 409.72 N 300 497.98	K30

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thick-ness)	STRATA DESCRIPTION	Legend	Water	Instrument/ Backfill
	26.60-28.10	90	81	78	0	56.12	28.10				
						55.97	28.25	Very strong orange brown and grey brown fine grained SANDSTONE with siderite replaced rootlets and siderite cements. Extremely closely spaced subhorizontal branching/reconnecting rough open to tight fractures.			
29							(1.58)	Very strong light grey brown and brown fine grained stratified and locally bioturbated SANDSTONE. Extremely closely to closely spaced subhorizontal undulating planar rough tight to wide fractures and subvertical and high-angle rough undulating moderately wide to tight fractures.			
	28.10-29.60	100	85	63	24	54.39	29.83				
30							(1.27)	Very strong bluish grey mainly fine grained SANDSTONE displaying diffuse stratification and bioturbation. Close to medium spaced subhorizontal to low angle rough undulating open to moderately wide fractures.			
31	29.60-31.10	104	103	93	8	53.12	31.10				
32							(2.65)	Strong bluish dark grey and grey very fine grained mainly very silty bioturbated SANDSTONE and subordinate sandy SILTSTONE. Locally shelly. Medium spaced subhorizontal and high-angle rough open to moderately wide fractures.			
	31.10-32.60	78	73	73	3						
33											
	32.60-33.80	113	113	105	4	50.47	33.75	33.62 - 33.75 Medium strong sandy SILTSTONE.			
34						50.42	33.80	Weak dark grey laminated MUDSTONE with fine to medium gravel grade clasts of cemented mudstone.			
							(1.95)	Very stiff dark grey laminated to bioturbated CLAY tending towards extremely weak MUDSTONE.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/12/19	19.10	2.60	11.4			
12/12/19	35.75	2.60	11.35			
20/12/19	35.25		11.07			
11/03/20	35.25		11.35			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.75 to 34.75 mbgl. Plain HDPE pipe installed between 34.75 and 33.25 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.25 and 12.25 mbgl. Plain HDPE pipe installed from 12.25 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.1 mbgl, benonite pellets to 10.55 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	35.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	12/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	84.22	E 500 409.72 N 300 497.98	K30

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	6 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	33.80-35.15	43	43	32	0			Very stiff dark grey laminated to bioturbated CLAY tending towards extremely weak MUDSTONE. *(continued)*			
	35.15-35.75	73	67	55	0	48.47	35.75				
								END OF BOREHOLE			
36											
37											
38											
39											
40											
41											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/12/19	19.10	2.60	11.4			
12/12/19	35.75	2.60	11.35			
20/12/19	35.25		11.07			
11/03/20	35.25		11.35			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.75 to 34.75 mbgl. Plain HDPE pipe installed between 34.75 and 33.25 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.25 and 12.25 mbgl. Plain HDPE pipe installed from 12.25 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.1 mbgl, benonite pellets to 10.55 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	35.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	06/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	82.08	E 500 439.05 N 300 407.43	K31

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 5

CORE					STRATA					
Scale	Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						81.68	0.40	Soft brown Clayey TOPSOIL.			
1						80.88	(0.80) 1.20	Soft grey CLAY.			
						80.71	1.37	Soft grey green, grey brown, orange brown and light grey sandy CLAY.			
2						79.77	(0.94) 2.31	Firm grey, dark grey and orange brown CLAY with carbonaceous rootlets.			
	1.20-2.70	99	99			79.38	2.70	Stiff grey brown CLAY with carbonaceous rootlets.			
3						78.50	(0.73) 3.58	Firm grey brown, grey, orange brown and light grey sandy CLAY. Carbonaceous roots and rootlets.			
	2.85-3.90	112	112			78.18	3.90	Stiff dark bluish grey and dark grey CLAY with carbonaceous rootlets.			
4						77.83	4.25	3.58 - 3.73 Sandy in uppermost 15cm. Soft dark bluish grey, orange brown and light grey sandy CLAY.			
						77.70	4.38	Very stiff dark grey and light grey SILT with abundant shelly debris.			
						77.33	4.75	Very stiff dark grey and light grey sandy SILT with carbonaceous rootlets. Locally shelly.			
5						77.22	4.86	Medium strong very fine grained silty SANDSTONE with abundant shelly debris.			
	3.90-5.40	90	90			76.63	(0.59) 5.45	Very stiff dark grey and orange brown CLAY. Locally shelly.			
						76.33	5.75	Very stiff dark grey brown and dark grey CLAY. Laminated to bioturbated with carbonaceous rootlets.			
6						75.73	(0.60) 6.35	Very stiff dark grey CLAY with carbonaceous roots and rootlets.			
	5.40-6.90	101	101			75.18	(0.55) 6.90	Very stiff dark brown grey CLAY with carbonaceous rootlets.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/12/19	25.10	13.00	8.78			
06/12/19	32.50	13.00	9.2			
20/12/19	32.10		8.67			
11/03/20	32.10		9.00			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 32.5 to 32.1 mbgl. Plain HDPE pipe installed between 32.1 and 30.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 30.5 and 9.5 mbgl. Plain HDPE pipe installed from 9.5 mbgl to above ground level. Borehole annulus backfilled with gravel to 8.2 mbgl, benonite pellets to 7.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring and rotary open hole 150mm	32.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	06/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	82.08	E 500 439.05 N 300 407.43	K31

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						74.81	7.27	Very stiff dark grey CLAY with carbonaceous rootlets. *(continued)*			
	6.90-7.76	108	108				(1.92)	Very stiff grey SILT with carbonaceous rootlets and roots.			
8											
9						72.89	9.19				
	7.76-9.40	99	99			72.68	9.40	Very stiff brown and orange brown CLAY.			
						72.52	9.56	Firm brown, dark brown and grey SILT with carbonaceous rootlets.			
						72.45	9.63	Siderite cemented unit displaying foliated fabric. Considered to be fragmented re-worked siderite nodules.			
10	9.40-10.20	98	94			71.88	(0.57) 10.20	Medium strong orange brown very fine grained SANDSTONE. Single subhorizontal undulating smooth open to moderately wide fracture at 9.68m. High angle and subvertical branching/reconnecting tight to open fracture rough from 9.78 to 10.20m.			
						71.36	(0.52) 10.72	Medium orange brown fine grained SANDSTONE. Bioturbated and shelly with belemnite guard. Single subhorizontal undulating rough open fracture.			
11	10.20-11.75	99	99	99	2	70.33	(1.03) 11.75	Very strong light grey brown oolitic LIMESTONE. Single subhorizontal undulating rough open to moderately wide fracture at 11.53m.			
12						69.38	(0.95) 12.70	LIMESTONE. 11.75 - 12.70 Open hole using air/mist and therefore no core recovery.			
13	12.70-13.10	92	92	92	1	68.98	13.10	Very strong light grey brown fine grained oolitic and shelly SANDSTONE. Single subhorizontal undulating rough moderately wide fracture at 12.89m.			
							(1.00)	LIMESTONE. 13.10 - 14.10 Open hole using air/mist and therefore no core recovery.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/12/19	25.10	13.00	8.78			
06/12/19	32.50	13.00	9.2			
20/12/19	32.10		8.67			
11/03/20	32.10		9.00			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 32.5 to 32.1 mbgl. Plain HDPE pipe installed between 32.1 and 30.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 30.5 and 9.5 mbgl. Plain HDPE pipe installed from 9.5 mbgl to above ground level. Borehole annulus backfilled with gravel to 8.2 mbgl, benonite pellets to 7.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring and rotary open hole 150mm	32.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	06/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	82.08	E 500 439.05 N 300 407.43	K31

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 5

CORE

Depth	TCR	SCR	RQD	FI
15.10-16.20	100	100	86	9
16.20-17.70	103	103	93	4
17.70-19.20	106	106	97	5
19.20-20.70	79	69	57	5

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION
67.98	14.10	
67.78	14.30	SAND. 14.10 - 14.30 Open hole using air/mist and therefore no core recovery.
66.98	(0.80) 15.10	LIMESTONE. 14.30 - 15.10 Open hole using air/mist and therefore no core recovery.
66.78	15.30	Very strong light grey oolitic LIMESTONE displaying diffuse stratification. Closely spaced subhorizontal silt-filled fracture and a subhorizontal rough open to tight fracture.
66.42	15.66	Medium strong orange brown, brown and dark grey very fine grained and locally silty ripple cross-laminated SANDSTONE with carbonaceous roots and rootlets. Occasionally shelly with prominent small cavities. Closely spaced subhorizontal undulating rough open fractures and subvertical stepped rough open to moderately wide fractures.
66.12	15.96	Very strong light grey brown and light brown sandy oolitic LIMESTONE. Closely spaced subhorizontal planar and undulating open to moderately wide rough fractures.
65.77	16.31	Strong light grey, brown and light brown very fine grained SANDSTONE with prominent inclined burrows.
64.38	(1.39) 17.70	Very strong light grey brown, orange brown and grey variably sandy oolitic LIMESTONE displaying diffuse stratification. Close to medium spaced subhorizontal open to moderately wide rough fractures. Single subvertical planar open rough fracture at 17.61-17.70m.
63.58	(0.80) 18.50	Very strong light grey brown and grey oolitic LIMESTONE. Single subhorizontal undulating rough open fracture at 17.87m.
62.88	(0.70) 19.20	Strong light grey brown and grey very fine grained SANDSTONE with small cavities associated with burrow fills. Subordinate thinly bedded oolitic LIMESTONES. Close to medium spaced subhorizontal to low angle rough open to moderately wide fractures.
61.97	(0.91) 20.11	Strong and very strong light grey brown and orange brown fine grained and locally very fine grained SANDSTONE with locally abundant shelly debris and prominent small cavities. Non-intact recovered as gravel from 19.51 to 19.60m. Closely spaced subhorizontal undulating rough open fractures.
61.60	20.48	Non intact recovered as gravel comprising cement nodules associated with burrow fills. Loose very fine sand outwith burrow fills has been washed away during drilling.
	(0.56)	

Scale: 15, 16, 17, 18, 19, 20

Legend / Water / Instrument/Backfill

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/12/19	25.10	13.00	8.78			
06/12/19	32.50	13.00	9.2			
20/12/19	32.10		8.67			
11/03/20	32.10		9.00			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 32.5 to 32.1 mbgl. Plain HDPE pipe installed between 32.1 and 30.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 30.5 and 9.5 mbgl. Plain HDPE pipe installed from 9.5 mbgl to above ground level. Borehole annulus backfilled with gravel to 8.2 mbgl, benonite pellets to 7.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring and rotary open hole 150mm	32.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	06/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	82.08	E 500 439.05 N 300 407.43	K31

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 5

CORE

Depth	TCR	SCR	RQD	FI
20.70-22.20	99	99	97	7
22.20-23.60	98	98	94	4
23.60-25.10	104	101	93	5
25.10-26.60	103	100	41	13

STRATA

Reduced Level	Depth (Thickness)	DESCRIPTION
61.04	21.04	Medium strong light brown fine grained silty bioturbated SANDSTONE. High angle undulating rough open fracture at 20.7. Single subhorizontal rough planar open to wide fracture at 20.95m. *(continued)*
	(1.21)	Very strong light grey and dark grey very fine grained mainly silty bioturbated SANDSTONE. Close to medium spaced subhorizontal undulating rough tight to open fractures. Subvertical calcite veins at 21.70 to 21.80m.
59.83	22.25	
	(1.35)	Very strong grey and dark grey very fine, fine and locally medium grained SANDSTONE. Planar stratified beds are thin to medium bedded and interbed with silty bioturbated units. Medium grained planar stratified unit contains ooids. Close to medium spaced subhorizontal undulating rough tight to open fractures.
58.48	23.60	
58.23	23.85	Very strong grey, dark grey and orange brown fine grained slightly silty SANDSTONE. Shelly with coarse gravel size coal clast. Subhorizontal planar rough open fracture.
	(0.47)	Strong grey and brown grey very fine grained slightly silty bioturbated SANDSTONE. Closely spaced subhorizontal low angle undulating rough open to tight fractures.
57.76	24.32	
57.49	24.59	Very stiff to firm and locally fissile very dark grey to black CLAY.
57.35	24.73	Very stiff dark grey SILT with carbonaceous roots.
57.13	24.95	Medium strong to weak grey brown and dark grey very silty SANDSTONE with carbonaceous roots.
56.98	25.10	Strong to weak grey to dark grey very silty bioturbated SANDSTONE.
	(1.50)	Very strong light green grey and brown fine grained bioturbated and diffusely stratified SANDSTONE. Occasionally shelly. Closely spaced sub-horizontal and low angle planar and undulating rough open to moderately wide fractures and large subvertical and high angle undulating branching/reconnecting rough open fractures from 25.27 to 26.24m.
55.48	26.60	
	(1.97)	Strong bluish dark grey very fine grained very silty SANDSTONE and sandy SILTSTONE closely interbedded with silty SANDSTONE. Mainly bioturbated and locally shelly. Close to medium spaced subhorizontal low angle undulating rough open fractures and large high angle branching/reconnnecting rough open fracture from 26.95 to 27.50.

Scale: 22, 23, 24, 25, 26, 27

Legend / Water / Instrument/Backfill

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/12/19	25.10	13.00	8.78			
06/12/19	32.50	13.00	9.2			
20/12/19	32.10		8.67			
11/03/20	32.10		9.00			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 32.5 to 32.1 mbgl. Plain HDPE pipe installed between 32.1 and 30.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 30.5 and 9.5 mbgl. Plain HDPE pipe installed from 9.5 mbgl to above ground level. Borehole annulus backfilled with gravel to 8.2 mbgl, benonite pellets to 7.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring and rotary open hole 150mm	32.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	06/12/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	82.08	E 500 439.05 N 300 407.43	K31

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	26.60-28.20	100	96	88	7	53.51	28.57				
						53.06	(0.45) 29.02	Strong dark and light grey sandy SILTSTONE closely interbedded with SILTSTONE. Bioturbated with locally abundant shelly debris.			
29						52.10	(0.96) 29.98	Strong and very strong light to dark grey, very fine grained highly silty SANDSTONE closely and very closely interbedded with SILTSTONE. Bioturbated with locally abundant shelly debris including articulated bivalves. Single moderately wide planar smooth fracture at 1.15m.			
	28.20-29.70	75	75	75	1						
30						51.15	(0.95) 30.93	Strong grey and dark grey SILTSTONE and sandy SILTSTONE. Bioturbated with shelly debris. Very close and medium spaced subhorizontal undulating rough open to moderately wide fractures. 30.68 - 30.93 Basal 25cm is gravelly with medium gravel size clasts comprising possible phosphate and carbonate nodules.			
31	29.70-31.00	100	98	93	3						
32	31.00-32.50	102	102	102	1	49.58	(1.57) 32.50	Very stiff dark grey bioturbated CLAY. High angle tight to very tight fracture at 31.88m. Large cement nodule at 32.25m.			
33								END OF BOREHOLE			
34											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/12/19	25.10	13.00	8.78			
06/12/19	32.50	13.00	9.2			
20/12/19	32.10		8.67			
11/03/20	32.10		9.00			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 32.5 to 32.1 mbgl. Plain HDPE pipe installed between 32.1 and 30.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 30.5 and 9.5 mbgl. Plain HDPE pipe installed from 9.5 mbgl to above ground level. Borehole annulus backfilled with gravel to 8.2 mbgl, benonite pellets to 7.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring and rotary open hole 150mm	32.5m

MJCA
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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	29/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	81.65	E 500 450.33 N 300 307.59	K32

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 4

CORE					STRATA					
Scale	Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(0.50)	Soft clayey TOPSOIL.			
						81.15	0.50				
							(0.70)	Soft grey CLAY.			
1						80.45	1.20				
	1.20-1.60	100	100			80.05	1.60	Firm dark grey brown and orange brown CLAY.			
2							(1.35)	Very stiff brown grey, orange brown and light grey sandy CLAY.			
	1.60-2.95	102	102			78.70	2.95				
3						78.33	3.32	Dark brown fine to medium gravel size angular mudstone clasts in very soft dark brown CLAY.			
						78.18	3.47	Firm dark brown grey and orange brown CLAY.			
4							(0.98)	Very stiff to soft light grey brown and orange brown sandy SILT with large silt-filled root structure.			
	2.95-4.45	107	107			77.20	4.45				
5							(1.23)	Very stiff to stiff dark grey, light grey and orange brown CLAY with sand-filled and carbonaceous rootlets. Large siderite cement nodule. Wide spaced subhorizontal fractures.			
						75.97	5.68				
	4.45-5.95	100	97			75.90	5.75	Strong red brown siderite cemented unit.			
6						75.70	5.95	Weak orange brown finely crystalline LIMESTONE.			
							(1.50)	Very strong to weak light grey brown and orange brown oolitic LIMESTONE. Moderately wide to open subvertical undulating smooth fracture from 7.00 to 7.45m and a single subhorizontal wide to open rough undulating fracture at 7.00m. 5.95 - 6.32 Non-intact. Recovered as gravel. 6.45 - 6.76 Non-intact. Partially recovered as gravel.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/03/19	27.45		7.98			
28/11/19	14.95		7.45			
20/12/19	27.45		7.92			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 27.75 to 27.45 mbgl. Plain HDPE pipe installed between 27.45 and 26.75 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 26.75 and 5.75 mbgl. Plain HDPE pipe installed from 5.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 4.75 mbgl, benonite pellets to 4.25 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	27.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	29/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	81.65	E 500 450.33 N 300 307.59	K32

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	5.95-7.45	83	55	55	4	74.20	7.45				
8							(1.50)	Very Strong orange brown and light grey brown oolitic LIMESTONE. Close to medium spaced undulating rough open to moderately wide subhorizontal fractures with subvertical fractures at 7.80 to 7.95 and 8.64 to 8.73. 7.45 - 7.52 Top 7 cm non-intact and recovered as gravel with high angle rough and undulating fracture.			
	7.45-8.95	100	95	89	9	72.70	8.95				
9								Very strong to medium strong orange brown and light grey brown oolitic LIMESTONE. Medium to closely spaced subhorizontal undulating rough and smooth open to wide fractures. Large high angle to subvertical undulating rough moderately wide fractures from 9.74 to 10.35m and from 10.71 to 11.21m.			
10	8.95-10.45	100	97	88	9		(3.00)				
11											
	10.45-11.95	100	99	77	11	69.70	11.95				
12						68.95	(0.75) 12.70	Strong and locally weak light grey brown and orange brown oolitic and variably sandy LIMESTONE. Very fine grained sand associated with burrow fills and small cavities. Outwith the burrow fills limestone is cemented. Closely spaced subhorizontal stepped and smooth undulating open to moderately wide fractures.			
13	11.95-13.45	97	91	85	8			Very strong to strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal and high-angle rough undulating open to moderately wide fractures.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/03/19	27.45		7.98			
28/11/19	14.95		7.45			
20/12/19	27.45		7.92			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 27.75 to 27.45 mbgl. Plain HDPE pipe installed between 27.45 and 26.75 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 26.75 and 5.75 mbgl. Plain HDPE pipe installed from 5.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 4.75 mbgl, benonite pellets to 4.25 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	27.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	29/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	81.65	E 500 450.33 N 300 307.59	K32

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(2.60)	13.95 - 14.01 Weak and sandy LIMESTONE. Very strong to strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal and high-angle rough undulating open to moderately wide fractures. *(continued)* 14.27 - 14.47 Medium strong LIMESTONE with small cavities.			
15	13.45-14.95	103	103	93	4			14.95 - 15.05 Non-intact and recovered as gravel.			
						66.35	15.30				
							(0.48)	Strong light brown grey very fine grained locally shelly and oolitic bioturbated SANDSTONE. Some small cavities associated with burrow fills. Medium spaced subhorizontal undulating rough open to moderately wide fractures.			
						65.87	15.78				
16	14.95-16.25	100	87	69	8			Medium strong light brown grey and light brown very fine grained locally slightly silty oolitic and shelly bioturbated SANDSTONE. Some small cavities associated with burrow fills. Closely spaced subhorizontal undulating rough and planar smooth open to wide fractures.			
							(1.97)				
17											
	16.25-17.75	97	82	62	7	63.90	17.75				
18								Very strong very fine grained slightly silty to silty ripple cross-laminated, planar stratified and bioturbated SANDSTONE. Locally fine grained. Medium spaced subhorizontal rough open to wide fractures.			
19							(2.50)				
	17.75-19.35	97	97	97	5						
20											
						61.40	20.25				
						61.05	20.60	Weak orange brown fine grained SANDSTONE. Highly fractured with branching and reconnecting fractures that are subvertical and open to tight.			
	19.35-20.85	100	81	81	4	60.80	20.85	Firm dark grey to black laminated CLAY.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/03/19	27.45		7.98			
28/11/19	14.95		7.45			
20/12/19	27.45		7.92			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 27.75 to 27.45 mbgl. Plain HDPE pipe installed between 27.45 and 26.75 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 26.75 and 5.75 mbgl. Plain HDPE pipe installed from 5.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 4.75 mbgl, benonite pellets to 4.25 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	27.75m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	29/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	81.65	E 500 450.33 N 300 307.59	K32

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thickness)	STRATA DESCRIPTION	Legend	Water	Instrument/ Backfill
						60.48	21.17	Medium strong to weak orange brown grey fine grained very silty SANDSTONE. *(continued)*			
						60.24	21.41	Very stiff grey and blue grey sandy SILT.			
22	20.85-22.45	99	99	62	14	58.82	(1.42) 22.83	Very strong grey and grey brown very fine grained SANDSTONE that is diffusely stratified. Medium to closely spaced subhorizontal undulating rough open to tight fractures and large subvertical and high-angle undulating and branching/reconnecting open to wide fractures.			
23						58.05	(0.77) 23.60	Strong bluish dark grey and grey fine grained silty SANDSTONE. Diffusely stratified, bioturbated and locally shelly. Siderite cement and moderately wide calcite filled void at base. Medium to closely spaced subhorizontal to low-angle stepped and undulating rough open to tight fractures. Some subvertical to high angle branching and reconnecting fractures.			
24	22.45-23.95	100	98	98	11	57.70	23.95	Weak bluish dark grey fine grained very silty bioturbated SANDSTONE. Branching and reconnecting subvertical open fracture and closely spaced subhorizontal open to tight fractures.			
						57.30	24.35	Strong dark grey and bluish dark grey bioturbated sandy SILTSTONE.			
25	23.95-24.75	91	84	64	3		(1.95)	Very strong grey, light grey and dark grey very fine grained mainly very silty SANDSTONE and subordinate thinly bedded sandy SILTSTONE. Bioturbated throughout and locally shelly. Close to medium spaced subhorizontal rough planar to undulating open to moderately wide fractures and large subvertical stepped and undulating moderately wide fracture from 25.80 to 26.30m.			
26	24.75-26.30	100	97	88	9	55.35	26.30				
						55.10	26.55	Soft dark brown fine grained very silty SAND.			
27						54.63	(0.47) 27.02	Strong grey very fine grained very silty bioturbated SANDSTONE. Fine to medium grade gravel lag comprising siltstone clasts at base. Occasionally shelly. Subhorizontal undulating rough open to moderately wide fracture and subvertical undulating rough open to moderately wide fracture in uppermost 10cm.			
	26.30-27.75	95	93	86	3	53.90	(0.73) 27.75	Very stiff dark grey laminated to bioturbated CLAY.			
								END OF BOREHOLE			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
11/03/19	27.45		7.98			
28/11/19	14.95		7.45			
20/12/19	27.45		7.92			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 27.75 to 27.45 mbgl. Plain HDPE pipe installed between 27.45 and 26.75 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 26.75 and 5.75 mbgl. Plain HDPE pipe installed from 5.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 4.75 mbgl, benonite pellets to 4.25 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	27.75m

Geotechnical Engineering Limited

BOREHOLE LOG

K33

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 4
Start Date	6 February 2020	Easting	500440.6			Scale	1 : 50
End Date	11 March 2020	Northing	299675.0	Ground level	86.91mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
06/02/20 0830hrs								Firm dark brown slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse sandstone, limestone, chert and chalk. Rare rootlets.	1.20	85.71	
	1C	1.20 - 2.70	Nil		100			Stiff locally firm dark brown and dark grey slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse sandstone, limestone, chert and chalk.			
	2C	2.70 - 4.20	2.70		100			3.00 - 3.15m: Slightly sandy.			
	3C	4.20 - 5.70	2.70		100			4.55 - 4.65m: Slightly sandy.			
								5.10m: Limestone cobble.			
								5.35m: Limestone cobble.			
	4C	5.70 - 7.20	2.70		100			5.70 - 7.05m: Stiff dark brown and dark grey slightly gravelly slightly sandy clay.			
06/02/20 1725hrs 1.80m											
07/02/20 0720hrs 2.30m	5C	7.20 - 8.70	2.70		100						
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m. Waterflush rotary core drilled (146mm) 2.70-34.20m.

CASING: 168mm diam to 25.30m, casing parted in hole. 200mm diam advanced to 25.00m and 168mm diam retrieved. 168mm diam readvanced to 26.70m

BACKFILL: On 11/03/2020, a slotted standpipe (50mm) was installed to 34.20m (slotted section 33.70-17.70m), granular response zone 34.20-16.70m, bentonite seal 16.70-16.00m, cement:bentonite grout 16.00-5.90m, bentonite seal 5.90-0.50m, concrete and raised cover 0.50-0.00m.

REMARKS: During period 12/02/2020 to 06/03/2020 168mm diameter casing became stuck and parted in hole; 200mm casing overdrilled to 25.00m to allow retrieval; 168mm diam casing readvanced to 26.70m; 200mm diam casing withdrawn prior to continuation of drilling.

Standpipe blocked at 18.70m, suspected grout infiltrating gravel pack and slotted pipe during installation of monitoring facilities.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:19 CD/EC EC

Geotechnical Engineering Limited

BOREHOLE LOG

K33

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 4
Start Date	6 February 2020	Easting	500440.6			Scale	1 : 50
End Date	11 March 2020	Northing	299675.0	Ground level	86.91mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.70 - 10.20	2.70		100						
	7C	10.20 - 11.70	2.70		100						
	8C	11.70 - 13.20	2.70		86			12.40 - 12.80m: Medium strong light grey and light brown limestone cobbles recovered non intact as angular fine to coarse gravel sized fragments.	12.80	74.11	
	9C	13.20 - 14.70	2.70		100			Stiff dark grey slightly sandy slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse chert, limestone, sandstone and chalk.			
07/02/20 1430hrs 3.70m											
10/02/20 0930hrs 2.90m	10C	14.70 - 16.20	2.70		100			14.65m: Limestone cobble.			
								15.30m: Limestone cobble.			
								15.75m: Limestone cobble.			
	11C	16.20 - 17.70	2.70		83						
10/02/20 1800hrs 0.00m									17.70	69.21	
	12C	17.70 - 19.20	14.70		100 43	NI 60					
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:19 CD/EC EC

Geotechnical Engineering Limited

BOREHOLE LOG

K33

CLIENT	MJCA					Sheet	3 of 4
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	6 February 2020	Easting	500440.6				
End Date	11 March 2020	Northing	299675.0	Ground level	86.91mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
11/02/20 0720hrs 3.80m					10	150		Weak light brown oolitic LIMESTONE locally recovered non-intact as subangular and subrounded fine to coarse gravel. Fractures are subhorizontal rarely 40° closely spaced undulating rough.			
	13C	19.20 - 20.70	14.70		100 83 13						
	14C	20.70 - 22.20	14.70		100 93 0				20.90	66.01	
						NI 100 150		Medium strong locally weak light brown bioclastic LIMESTONE with rare burrows. Fractures are subhorizontal closely spaced undulating rough.	21.55	65.36	
						50 150 430		Strong light brown and light grey fine SANDSTONE. Fractures are subhorizontal closely and medium spaced planar smooth. 22.10 - 23.00m: Light grey.			
	15C	22.20 - 23.70	14.70		73 53 42				23.00	63.91	
						NA		Light greyish brown fine and medium SAND. 23.30 - 25.20m: Limited recovery.			
	16C	23.70 - 25.20	14.70		56						
	17C	25.20 - 26.70	14.70		93						
11/02/20 1800hrs 7.90m									26.70	60.21	
09/03/20 0930hrs 0.00m	18C	26.70 - 28.20	26.70		57 7 0	NR		Assessed zone of core loss.	27.35	59.56	
						NI		Orangish brown silty fine and medium SAND. Locally extremely weakly cemented.	27.75	59.16	
						NA					
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:20 CD/EC EC

Geotechnical Engineering Limited

BOREHOLE LOG

K33

CLIENT	MJCA					Sheet	4 of 4
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	6 February 2020	Easting	500440.6				
End Date	11 March 2020	Northing	299675.0	Ground level	86.91mOD	Depth	34.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						NA		Stiff fissured thinly laminated dark grey CLAY. Fissures are subvertical very closely spaced stained orange.	28.05	58.86	
	19C	28.20 - 29.70	26.70		83 29 7	NR			28.20	58.71	
						NI		Orangish brown silty fine and medium SAND with frequent thin laminae of grey clay. Rare pockets (up to 10mm) of black carbonaceous material.	28.45	58.46	
						NI 70 120		Assessed zone of core loss.	28.90	58.01	
09/03/20 1830hrs 0.00m								Weak highly fractured dark greenish grey, orangish brown and reddish brown slightly calcareous fine and medium SANDSTONE. Localised nodular fabric. Fractures are randomly orientated probably very closely spaced surfaces irregular and stained dark brown and black. Frequent voids (<2mm) and shell fragments (up to 20mm). Recovered non intact as angular coarse gravel sized fragments.			
10/03/20 0725hrs 20.10m	20C	29.70 - 31.20	26.70		100 79 49				30.15	56.76	
						NI 90 180		Weak medium bedded (locally thickly laminated) locally bioclastic fine and medium SANDSTONE with medium spaced thin beds of weak grey bioclastic limestone. Fractures are 10-20° rarely subvertical very closely and closely spaced undulating rough stained brown. 29.95 - 30.15m: Shell fossils replaced by white calcite.			
	21C	31.20 - 32.70	26.70		100 88 85	450		Weak dark greenish grey silty fine and medium SANDSTONE with medium spaced thin beds of weak grey and greenish grey bioclastic siltstone. Fractures are 10-20° closely spaced undulating rough stained orangish brown. 30.15 - 30.40m: Subvertical planar smooth fracture stained orangish brown. 30.50 - 31.00m: Intersecting subvertical irregular rough fractures stained orangish brown. 31.30 - 31.90m: Fractures are medium spaced. 31.75 - 31.90m: Very thinly bedded.	31.90	55.01	
						NI 270 370 440					
	22C	32.70 - 34.20	26.70		88 43 41						
						NA		Weak thinly bedded grey and light grey locally bioclastic SILTSTONE locally tending to calcareous silty fine sandstone. Fractures are 10° medium spaced planar rough infilled (up to 10mm) with grey silty clay. 32.70 - 33.30m: With closely spaced thick laminae of dark grey calcareous siltstone. 33.30 - 33.40m: Light brownish grey calcareous siltstone. Burrows (10mm diam) infilled with shell debris.	33.40	53.51	
10/03/20 1755hrs 6.20m									34.20	52.71	
								Very stiff fissured thinly laminated dark grey CLAY. Fissures are subvertical very closely spaced planar smooth. 33.70m: Tending to extremely weak mudstone. 34.05m: 50mm light brown claystone nodule.			
								Borehole completed at 34.20m.	{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:20 CD/EC EC

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	03/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	85.42	E 500 439.57 N 299 540.08	K34

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(1.20)	Soft brown and grey CLAY with gravel.			
1						84.22	1.20				
							(2.10)	Stiff to firm dark grey and brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse subangular to subrounded chalk, flint and sandstone. Rare cobbles of rounded orange brown fine grained sandstone.			
2	1.20-2.50	167	156								
3						82.12	3.30				
							(2.20)	Firm dark brown slightly gravelly CLAY. Gravel is fine to coarse angular to subrounded flint, quartz and sandstone.			
4	2.50-4.00	100	100								
5	4.00-5.50	100	100			79.92	5.50				
								Stiff dark grey brown and dark grey slightly gravelly CLAY. Gravel is fine to coarse flint, sandstone and limestone with cobbles of light grey limestone between 5.5 and 6.0m.			
6	5.50-7.00	100	100								

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
02/03/20	27.80	27.60	22.45			
03/03/20	28.80	28.30	DRY			
11/03/20	33.35		23.23			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 33.80 to 33.35 mbgl. Plain HDPE pipe installed between 33.35 and 32.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 32.5 and 14.75 mbgl. Plain HDPE pipe installed from 14.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.40 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary Coring 150mm	33.8m

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AU/KCW/JRC/2936/01	85.42	E 500 439.57 N 299 540.08	K34

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
								Stiff dark grey brown and dark grey slightly gravelly CLAY. Gravel is fine to coarse flint, sandstone and limestone with cobbles of light grey limestone between 5.5 and 6.0m. *(continued)*			
8								7.90 - 8.26 Sandy clay. Sand is fine to medium.			
	7.00-8.50	93	93				(6.00)	8.50 - 8.76 Sandy clay. Sand is fine to medium.			
9											
10	8.50-10.00	87	87								
11											
	10.00-11.50	100	100			73.92	11.50				
								Stiff dark grey slightly gravelly CLAY. Gravel is fine to coarse flint, sandstone and limestone.			
12											
							(1.95)				
13	11.50-13.00	100	100					12.80 Cobble of orange oolitic limestone.			
						71.97	13.45				
	13.00-13.70	71	57			71.72	13.70	Non-intact recovered as cobbles of bluish grey silty sandstone.			
						71.40	14.02	Very soft dark grey gravelly CLAY and fragmented light grey sandstone cobbles.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
02/03/20	27.80	27.60	22.45			
03/03/20	28.80	28.30	DRY			
11/03/20	33.35		23.23			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 33.80 to 33.35 mbgl. Plain HDPE pipe installed between 33.35 and 32.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 32.5 and 14.75 mbgl. Plain HDPE pipe installed from 14.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.40 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary Coring 150mm	33.8m

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BOREHOLE LOG

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ENRMF Potential landfill extension site investigation	Augean	03/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	85.42	E 500 439.57 N 299 540.08	K34

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						71.07	14.35	Stiff dark grey brown and grey gravelly CLAY with a light orange brown limestone cobble.			
	13.70-14.50	131	116	NA	NA	70.65	14.77	Stiff brown sandy gravelly CLAY. Gravel is fine to coarse and comprises clasts of mixed lithology.			
15							(1.23)	Medium strong light brown grey oolitic LIMESTONE. Close to very closely spaced subhorizontal planar and undulating rough fractures and branching/reconnecting and high angle planar and irregular fractures. Fractures are generally open to moderately wide.			
16	14.50-16.00	82	57	19	>15	69.42	16.00				
17	16.00-17.40	100	47	12	>20		(2.25)	Weak or extremely weak light brown locally oolitic fine grained SANDSTONE and medium to thinly bedded variably sandy oolitic LIMESTONE. Inclined burrows at 16.35m. Core non-intact and recovered as gravel and cobbles from 16.0 to 17.40m and 17.95 to 18.25m associated with intense fracturing some of which may be drilling induced. Fractures generally appear close to very closely spaced subhorizontal, subvertical and high angle branching/reconnecting undulating and rough with open to tight apertures.			
18	17.40-18.25	NA	NA	13	>15	67.17	18.25				
	17.40-18.80	101	57	NA	NA	66.62	(0.55) 18.80	Strong light brown grey oolitic LIMESTONE. Medium spaced subhorizontal undulating rough tight to open fractures.			
19	18.25-18.80	NA	NA	84	2	65.45	(1.17) 19.97	Very strong light brown grey oolitic LIMESTONE. Close to medium spaced subhorizontal undulating rough moderately wide to tight fractures.			
20	18.80-20.30	86	86	86	4		(0.73)	Very strong light brown grey fine grained bioturbated and locally slightly silty SANDSTONE with occasional shelly debris. Medium spaced subhorizontal and low angle planar open to moderately wide fractures.			
	20.30-20.70	NA	NA	100	1	64.72	20.70				

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
02/03/20	27.80	27.60	22.45			
03/03/20	28.80	28.30	DRY			
11/03/20	33.35		23.23			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 33.80 to 33.35 mbgl. Plain HDPE pipe installed between 33.35 and 32.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 32.5 and 14.75 mbgl. Plain HDPE pipe installed from 14.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.40 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary Coring 150mm	33.8m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	03/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	85.42	E 500 439.57 N 299 540.08	K34

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(0.60)				
						64.12	21.30	Weakly consolidated light brown orange brown and red brown fine grained SAND displaying low angle and trough cross-stratification. *(continued)*			
								No recovery.			
	20.30-21.80	67	67	NA	NA						
	20.70-21.80	NA	NA								
22							(1.25)				
						62.87	22.55			▼	
								Weakly consolidated light brown, light orange brown and orange brown very fine grained SAND displaying diffuse cross-stratification.			
23							(0.75)				
	21.80-23.30	50	50	NA	NA	62.12	23.30			▼	
								Weakly to moderately consolidated light brown and light orange brown very fine grained bioturbated SAND.			
24											
	23.30-24.80	102	102	NA	NA		(3.00)				
25								Thinly interbedded silty and slightly silty sand below 25.26m			
26											
	24.80-26.30	100	100	NA	NA	59.12	26.30				
								Weakly consolidated brown very fine grained very silty SAND.			
						58.78	26.64				
								Moderately consolidated light brown very fine grained silty bioturbated SAND.			
27							(0.75)				
	26.30-27.32	NA	NA	NA	NA	58.03	27.39				
								Medium strong grey, orange brown and red brown fine grained SANDSTONE and very thinly bedded very silty or clayey SANDSTONE. Bioturbated and rooted. Single subhorizontal undulating rough tight fracture.			
	26.30-27.80	105	105	NA	NA	57.62	27.80				
	27.32-27.80	NA	NA	100	1						

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
02/03/20	27.80	27.60	22.45			
03/03/20	28.80	28.30	DRY			
11/03/20	33.35		23.23			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 33.80 to 33.35 mbgl. Plain HDPE pipe installed between 33.35 and 32.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 32.5 and 14.75 mbgl. Plain HDPE pipe installed from 14.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.40 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary Coring 150mm	33.8m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	03/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	85.42	E 500 439.57 N 299 540.08	K34

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
29	27.80-29.30	96	96	82	8	55.62	(2.00) 29.80	Very strong to locally medium strong brown grey, brown and grey brown fine grained thinly to very thinly bedded SANDSTONES and silty SANDSTONES. Diffuse stratification with occasional shelly material. Close to very closely spaced subhorizontal undulating rough mainly moderately wide to wide fractures. High angle planar fracture at base. *(continued)*			
30	29.30-30.80	103	103	81	9	54.62	(1.00) 30.80	Medium strong grey and light grey fine grained silty and very silty SANDSTONES. Occasional shelly debris, thin and thick silt laminae, bi-directional current ripples, trough cross-stratification and bioturbated intervals. Medium to closely spaced subhorizontal and low angle undulating and locally branching/reconnecting rough open to wide fractures.			
31 32	30.80-32.30	98	98	80	10	52.82	(1.80) 32.60	Medium strong and locally weak greenish grey and grey fine grained very silty SANDSTONE and subordinate thin sandy SILTSTONE beds. Dominantly bioturbated with relict stratification. Occasionally abundant shelly material. Medium to closely spaced subhorizontal and low angle undulating and planar rough tight to moderately wide fractures and siderite-filled/cemented fractures. Non-intact recovered as gravel at 32.18 to 32.30 and 32.47m.			
33	32.30-33.80	100	93	66	5	51.62	(1.20) 33.80	Very stiff dark grey bioturbated CLAY.			
34								END OF BOREHOLE			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
02/03/20	27.80	27.60	22.45			
03/03/20	28.80	28.30	DRY			
11/03/20	33.35		23.23			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 33.80 to 33.35 mbgl. Plain HDPE pipe installed between 33.35 and 32.5 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 32.5 and 14.75 mbgl. Plain HDPE pipe installed from 14.75 mbgl to above ground level. Borehole annulus backfilled with gravel to 14.0 mbgl, benonite pellets to 13.40 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary Coring 150mm	33.8m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	14/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.68	E 500 334.88 N 299 543.12	K35

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
1						85.48	(1.20) 1.20	Soft grey and brown CLAY with fine to coarse gravel and cobbles.			
						85.08	1.60	Firm grey brown and brown grey CLAY with occasional fine to medium gravel size clasts comprising dark grey brown mudstone, chalk and light brown sandstone.			
						84.98	1.70	Medium strong light grey and grey limestone cobble			
2	1.20-2.45	116	116			84.23	(0.75) 2.45	Stiff to very stiff brown grey CLAY with coarse to fine gravel size clasts comprising chalk, grey siltstone, quartzose/chert clasts, light grey brown sandstone with an oolitic limestone cobble towards the base.			
	2.45-2.65	0	0			84.03	2.65	No recovery.			
3						83.68	3.00	Soft dark grey brown gravelly CLAY with coarse to medium gravel size clasts comprising grey siltstone, grey limestone, red brown siltstone and quartzose/chert clasts.			
4	2.65-4.00	98	98			82.68	(1.00) 4.00	Very stiff brown CLAY with fine to coarse gravel size clasts comprising chalk, dark grey mudstone, grey siltstone and quartzose/chert clasts.			
5	4.00-5.50	108	108			81.18	(1.50) 5.50	Stiff brown CLAY with fine to coarse gravel size clasts comprising grey siltstone, red mudstone, grey limestone, chalk and quartzose/chert clasts.			
6	5.50-7.00	107	107			79.68	(1.50) 7.00	Stiff grey brown CLAY with cobble to fine gravel size clasts of grey sandstone and siltstone, light brown sandstone and limestone, chalk and dark grey mudstone.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/02/20	28.10	13.20	DRY			

REMARKS / INSTALLATIONS

Backfilled with pellets to 12.20mbgl and with grout to ground level. Core barrel and 10m of drill rods abandoned in borehole from 25.2m to 14.0mbgl.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Murphy

Type and Diameter	Depth
Rotary Coring 150mm	28.1m

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AU/KCW/JRC/2936/01	86.68	E 500 334.88 N 299 543.12	K35

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
8	7.00-8.60	98	98				(3.10)	Very stiff dark grey locally gravelly CLAY with large cobbles of light grey sandstone and coarse to fine gravel size clasts of light brown sandstone, light grey sandstone, grey limestone, red brown mudstone, dark grey mudstone, grey siltstone and quartzose/chert clasts.			
9											
10	8.60-10.10	102	100			76.58	10.10				
						76.02	(0.56) 10.66	Very stiff dark grey brown CLAY with medium to fine gravel of mixed lithologies.			
11						75.44	(0.58) 11.24	Very soft dark grey gravelly CLAY (very soft due to being cut and dropped and not recovered for approximately 2 days).			
12	10.10-11.60	69	69			74.40	(1.04) 12.28	No recovery.			
	11.60-12.55	28	28	NA	NA	74.13	12.55	Strong orange brown oolitic SANDSTONE with a single subhorizontal planar rough tight to open fracture.			
	12.28-12.55	NA	NA	100	1	73.84	12.84	No recovery.			
13	12.55-13.10	47	40	40	1	73.58	13.10	Medium strong orange brown oolitic fine grained SANDSTONE. High angle branching and reconnecting tight to open fracture.			
						73.23	13.45	Medium strong orange brown oolitic medium grained SANDSTONE. High angle planar rough open fractures and two very closely spaced subhorizontal fractures. The latter are associated with further drilling induced fracturing and may also be drilling induced.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/02/20	28.10	13.20	DRY			

REMARKS / INSTALLATIONS

Backfilled with pellets to 12.20mbgl and with grout to ground level. Core barrel and 10m of drill rods abandoned in borehole from 25.2m to 14.0mbgl.

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Plant: P18
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Type and Diameter	Depth
Rotary Coring 150mm	28.1m

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ENRMF Potential landfill extension site investigation	Augean	14/03/2020

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Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thickness)	STRATA DESCRIPTION	Legend	Water	Instrument/ Backfill
							(1.15)	Strong light brown grey and light orange brown locally sandy oolitic LIMESTONE. *(continued)*			
	13.10-14.60	97	83	77	11	72.08	14.60				
15							(1.92)	Strong light brown grey and light orange brown oolitic LIMESTONE. Medium to closely spaced subhorizontal planar and undulating rough open to moderately wide fractures between 14.60 to 15.88m and subvertical and rough moderately wide fractures from 14.60 to 15.25m.			
16	14.60-16.10	103	100	100	1	70.16	16.52				
17							(0.68)	Strong light grey brown and light orange brown medium and fine grained oolitic SANDSTONES and thinly bedded oolitic LIMESTONE. Mainly medium spaced subhorizontal undulating rough open to tight fractures.			
	16.10-17.28	NA	NA	96	4	69.48	17.20				
	16.10-17.60	102	92	NA	NA	69.08	17.60	Medium strong to weak orange brown and light brown grey fine grained bioturbated SANDSTONE showing inclined burrow fills of soft sand. Very close to closely spaced subhorizontal fractures with some wash-out of loose sand (fractures may be drilling induced). Non-intact recovered as gravel from 17.27 to 17.39m associated with loose sand burrow fills and cemented rock.			
	17.28-17.60	NA	NA	53	3						
18							(1.70)	Medium strong orange brown and light brown grey fine grained variably oolitic SANDSTONE. Diffuse cross-stratification and ripple cross-lamination with bioturbation which broadly increases downwards. Some small cavities associated with shell dissolution. Medium to closely spaced subhorizontal undulating rough open to moderately wide fractures and large branching/reconnecting rough open to moderately wide fracture.			
19	17.60-19.10	88	84	77	7	67.38	19.30				
20							(1.30)	Strong light brown grey sandy oolitic LIMESTONE. Medium spaced subhorizontal undulating rough open to moderately wide fractures and a subvertical and tight to siderite-filled fracture with staining/cement halo.			
	19.10-20.60	103	101	101	5	66.08	20.60				
						65.93	20.75	Strong light brown grey oolitic LIMESTONE with subvertical undulating rough open fracture.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/02/20	28.10	13.20	DRY			

REMARKS / INSTALLATIONS

Backfilled with pellets to 12.20mbgl and with grout to ground level. Core barrel and 10m of drill rods abandoned in borehole from 25.2m to 14.0mbgl.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Murphy

Type and Diameter	Depth
Rotary Coring 150mm	28.1m

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BOREHOLE LOG

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ENRMF Potential landfill extension site investigation	Augean	14/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.68	E 500 334.88 N 299 543.12	K35

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	Reduced Level	Depth (Thickness)	STRATA DESCRIPTION	Legend	Water	Instrument/ Backfill
							(0.59)	Weak orange brown and light brown fine grained SANDSTONE. Bioturbated variably oolitic and shelly with irregular small burrow fills. Small cavities associated with burrow fills and shell dissolution. Closely spaced subhorizontal undulating rough open fractures (may be drilling induced). *(continued)*			
						65.34	21.34				
							(0.76)	Strong light grey brown and light brown grey fine grained locally oolitic and shelly SANDSTONE displaying diffuse cross-stratification and bioturbation with coarse to fine gravel grade carbonaceous clasts at base.			
22	20.60-22.10	92	92	52	11	64.58	22.10				
							(0.90)	Very strong grey and light brown very fine grained slightly silty SANDSTONES. Stratified (low angle and planar) and ripple cross-laminated (current and wave). Two closely spaced subhorizontal smooth planar undulating open fractures.			
23	22.10-23.00	NA	NA	100	2	63.68	23.00				
						63.52	23.16	No recovery. Probable loose sand. High angle fracture at upper contact with cemented sandstone.			
	22.10-23.60 23.00-23.60	95 NA	91 NA	NA 27	NA 5		(1.34)	Weak orange brown very fine grained SANDSTONE displaying low-angle cross-stratification. Extremely close to closely spaced subhorizontal undulating smooth and tight fractures (may be drilling induced).			
24						62.18	24.50				
							(0.60)	Weak to extremely weak light brown very fine grained slightly silty bioturbated SANDSTONE. Very closely spaced subhorizontal undulating and irregular smooth tight fractures and subvertical irregular and undulating smooth tight fractures (some may be drilling induced).			
25	23.60-25.10	91	86	7	23	61.58	25.10				
							(0.60)	Weak light orange brown very fine grained SANDSTONE. Dominantly bioturbated with relict trough cross-stratification. Extremely to very closely spaced subhorizontal low angle and smooth tight fractures (some may be drilling induced).			
						60.98	25.70				
26							(0.90)	Weak orange brown very fine grained slightly silty bioturbated SANDSTONE. Closely spaced sub-horizontal undulating smooth open to tight fractures (some may be drilling induced).			
	25.10-26.60	89	86	15	22	60.08	26.60				
27							(1.50)	No recovery.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/02/20	28.10	13.20	DRY			

REMARKS / INSTALLATIONS

Backfilled with pellets to 12.20mbgl and with grout to ground level. Core barrel and 10m of drill rods abandoned in borehole from 25.2m to 14.0mbgl.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Murphy

Type and Diameter	Depth
Rotary Coring 150mm	28.1m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	14/03/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.68	E 500 334.88 N 299 543.12	K35

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						58.58	28.10	END OF BOREHOLE			
29											
30											
31											
32											
33											
34											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
05/02/20	28.10	13.20	DRY			

REMARKS / INSTALLATIONS

Backfilled with pellets to 12.20mbgl and with grout to ground level. Core barrel and 10m of drill rods abandoned in borehole from 25.2m to 14.0mbgl.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, L. Murphy

Type and Diameter	Depth
Rotary Coring 150mm	28.1m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	24/02/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.78	E 500 330.02 N 299 544.12	K35A

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
1						85.58	(1.20) 1.20	Soft brown and grey CLAY with fine gravel to cobble size clasts.			
2	1.20-2.70	96	96			84.08	(1.50) 2.70	Firm to soft brown grey and grey gravelly CLAY with cobble to fine gravel size clasts of mixed lithologies.			
3	2.70-3.50	100	100			83.28	(0.80) 3.50	Stiff grey and brown grey CLAY with coarse to fine gravel size clasts of mixed lithologies including chalk.			
4								Open hole drilling through CLAY. Grey brown water flush.			
5											
6											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
20/02/20	22.30	21.10	Dry			
21/02/20	24.53	23.80	17.07			
11/03/20	34.10		25.14			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill the borehole from 34.5 to 34.1 mbgl. Plain HDPE pipe installed between 34.1 and 33.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.1 and 12.1 mbgl. Plain HDPE pipe installed from 12.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.0 mbgl, benonite pellets to 10.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, T. Peeter

Type and Diameter	Depth
Rotary Coring 150mm	34.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	24/02/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.78	E 500 330.02 N 299 544.12	K35A

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
								Open hole drilling through CLAY. Grey brown water flush. *(continued)*			
8							(8.70)				
9											
10											
11											
12						74.58	12.20				
								Light brown water flush interpreted as LIMESTONE.			
						74.48	12.30	Medium strong to strong light orange brown and light brown grey bioclastic LIMESTONE. Large subvertical undulating wide fracture partially filled with arisings. Probable subhorizontal undulating fracture which is associated with non-intact core.			
13							(1.00)				
	12.30-13.30	58	55	55	2	73.48	13.30				
								Strong light grey brown oolitic LIMESTONE. Close to medium spaced subhorizontal and low angle planar open to moderately wide rough fractures. High angle and subvertical planar and undulating rough open to moderately wide fractures at 13.65 to 13.74m, 14.14 to 14.30m and 14.63 to 14.80m.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
20/02/20	22.30	21.10	Dry			
21/02/20	24.53	23.80	17.07			
11/03/20	34.10		25.14			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill the borehole from 34.5 to 34.1 mbgl. Plain HDPE pipe installed between 34.1 and 33.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.1 and 12.1 mbgl. Plain HDPE pipe installed from 12.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.0 mbgl, benonite pellets to 10.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, T. Peeter

Type and Diameter	Depth
Rotary Coring 150mm	34.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	24/02/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.78	E 500 330.02 N 299 544.12	K35A

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(1.50)	Strong light grey brown oolitic LIMESTONE. Close to medium spaced subhorizontal and low angle planar open to moderately wide rough fractures. High angle and subvertical planar and undulating rough open to moderately wide fractures at 13.65 to 13.74m, 14.14 to 14.30m and 14.63 to 14.80m. *(continued)*			
	13.30-14.80	85	71	51	12	71.98	14.80				
15								Strong light brown grey and light orange brown locally sandy oolitic LIMESTONE. Medium spaced subhorizontal undulating planar rough open to moderately wide fractures. Subvertical to high angle and rough fracture from 16.05 to 16.75m.			
16	14.80-16.30	98	89	89	3		(2.67)				
17						69.31	17.47			▼	
	16.30-17.80	96	96	93	3	68.98	17.80	Unconsolidated orange brown very fine grained SAND.			
18						68.88	17.90	Non-intact recovered as gravel comprising light brown grey LIMESTONE.			
						68.20	(0.68) 18.58	Strong light brown grey, light grey brown and light orange brown variably oolitic, bioclastic and locally sandy LIMESTONE. Medium spaced subhorizontal undulating planar rough open to moderately wide fractures.			
19	17.80-19.30	100	93	93	2	67.48	(0.72) 19.30	Medium strong light brown fine grained locally oolitic and bioclastic SANDSTONE. Bioturbated with washout of loose sand in burrow fills.			
						67.28	19.50	Non-intact recovered as gravel and cobbles comprising fine grained SANDSTONE with nodular cements.			
20							(1.30)	Very strong light grey brown oolitic LIMESTONE. Widely spaced subhorizontal undulating rough open to moderately wide fractures.			
	19.30-20.80	97	84	77	2	65.98	20.80				
						65.82	20.96	Strong light brown oolitic LIMESTONE. Non-intact recovered as			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
20/02/20	22.30	21.10	Dry			
21/02/20	24.53	23.80	17.07			
11/03/20	34.10		25.14			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill the borehole from 34.5 to 34.1 mbgl. Plain HDPE pipe installed between 34.1 and 33.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.1 and 12.1 mbgl. Plain HDPE pipe installed from 12.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.0 mbgl, benonite pellets to 10.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, T. Peeter

Type and Diameter	Depth
Rotary Coring 150mm	34.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	24/02/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.78	E 500 330.02 N 299 544.12	K35A

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
								gravel from 20.80 to 20.90m.			
						65.11	(0.71) 21.67	Weak to strong light brown and light orange brown fine grained bioturbated SANDSTONE. Occasionally shelly and oolitic with loose sand infilling burrows. Closely spaced subhorizontal rough undulating open fractures (some may be drilling induced). *(continued)*			
22						64.66	(0.45) 22.12	Strong to very strong light brown and grey variably sandy oolitic LIMESTONE. Bioturbated with relict silt laminae and medium gravel size mudstone clasts. Close to medium spaced subhorizontal undulating rough open fractures.			
	20.80-22.30	92	89	65	6	64.48	22.30				
						64.13	22.65	Very strong grey very fine grained SANDSTONE. Ripple cross-laminated.			
						63.86	22.92	Non-intact recovered as gravel comprising light brown oolitic LIMESTONE			
23						63.24	(0.62) 23.54	Strong light brown and grey very fine grained ripple cross-laminated and bioturbated SANDSTONES. Closely spaced subhorizontal planar rough open to moderately wide fractures. Unconsolidated light grey bioturbated SAND with relict stratification.			
	22.30-23.80	85	37	16	8	62.98	23.80	Extremely weak orange brown very fine grained stratified SANDSTONE. Extremely closely spaced subhorizontal fractures are rough tight and may be drilling induced.			
24	23.80-24.55	0	NA	NA	NA	62.23	(0.75) 24.55	No recovery.			
						61.99	24.79	Weakly consolidated orange brown SAND.			
25	24.55-25.90	100	96	62	8	60.88	(1.11) 25.90	Weak to locally extremely weak orange brown very fine grained bioturbated SANDSTONE and slightly silty SANDSTONE. Close to very closely spaced subhorizontal and low angle undulating and planar smooth fractures (some may be drilling induced).		▼	
26						60.52	26.26	No recovery.			
						60.25	26.53	Unconsolidated to weakly consolidated orange brown very fine grained SAND.			
27	25.90-27.40	75	58	55	4	59.38	(0.87) 27.40	Weak orange brown and dark orange brown very fine grained slightly silty bioturbated SANDSTONE. Roots below 27.04 with dark orange iron staining. Close to medium spaced subhorizontal undulating and planar smooth fractures (some may be drilling induced).			
							(0.64)	Extremely weak to weak orange brown fine grained slightly silty bioturbated and rippled SANDSTONE. Closely spaced subhorizontal undulating fractures (may be drilling induced).			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
20/02/20	22.30	21.10	Dry			
21/02/20	24.53	23.80	17.07			
11/03/20	34.10		25.14			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill the borehole from 34.5 to 34.1 mbgl. Plain HDPE pipe installed between 34.1 and 33.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.1 and 12.1 mbgl. Plain HDPE pipe installed from 12.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.0 mbgl, benonite pellets to 10.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, T. Peeter

Type and Diameter	Depth
Rotary Coring 150mm	34.5m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	24/02/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	86.78	E 500 330.02 N 299 544.12	K35A

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 5

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						58.74	28.04	Mainly medium strong fine to medium grained SANDSTONE. Very clayey in top 5cm with siderite nodules from 28.20 to 28.27. Medium spaced subhorizontal planar and smooth fractures. Also observed are irregular subvertical, subhorizontal and branching/reconnecting siderite filled fractures towards base.			
						58.13	(0.61) 28.65				
	27.40-28.90	83	83	59	5	57.88	28.90	No recovery.			
29						57.68	29.10	Non-intact recovered as gravel and cobbles comprising medium strong greenish grey and red brown stained fine grained SANDSTONE.			
30	28.90-30.40	100	87	81	>10	56.38	(1.30) 30.40	Medium strong greenish grey locally silty fine grained SANDSTONE with shelly debris, diffuse stratification and bioturbated intervals. Close to medium spaced subhorizontal and high angle and subvertical planar and undulating partially filled (siderite) fractures. Also observed are irregular branching/reconnecting, subhorizontal, subvertical and high angle siderite filled fractures or fissures. Fissure at 29.60 has a shelly siderite cemented fill.			
31						55.48	(0.90) 31.30	Weak to medium strong light greenish grey fine grained silty and very silty SANDSTONES. Dominantly bioturbated with diffuse stratification. Fractures are closed spaced subhorizontal undulating rough and open. The fractures locally display iron mineralisation.			
32	30.40-31.50	92	92	82	5	53.78	(1.70) 33.00	Weak light grey to dark bluish grey fine grained very silty SANDSTONES and thinly bedded sandy SILTSTONE. Occasionally abundant shelly material and bioturbated throughout.			
33	31.50-33.00	100	100	97	5	53.27	(0.51) 33.51	Weak dark bluish grey bioturbated SILTSTONE with occasional shelly material, scattered medium gravel grade mudstone clasts and coarse gravel size mudstone clasts at base. Single subhorizontal undulating rough and open fracture.			
34	33.00-34.50	100	100	100	1	52.28	(0.99) 34.50	Firm dark grey bioturbated CLAY.			
								END OF BOREHOLE			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
20/02/20	22.30	21.10	Dry			
21/02/20	24.53	23.80	17.07			
11/03/20	34.10		25.14			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill the borehole from 34.5 to 34.1 mbgl. Plain HDPE pipe installed between 34.1 and 33.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 33.1 and 12.1 mbgl. Plain HDPE pipe installed from 12.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 11.0 mbgl, benonite pellets to 10.5 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds / R. White

DRILLING

Plant: P18
Crew: P. Hetherington, T. Peeter

Type and Diameter	Depth
Rotary Coring 150mm	34.5m

Geotechnical Engineering Limited

BOREHOLE LOG

K36

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 4
Start Date	27 January 2020	Easting	500236.3			Scale	1 : 50
End Date	5 February 2020	Northing	299547.0	Ground level	87.79mOD	Depth	34.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
30/01/20 1400hrs								Firm dark brown CLAY.	0.40	87.39	
								Firm dark grey and brown slightly gravelly CLAY. Gravel is subangular and subrounded fine and medium chalk, limestone, sandstone and flint.			
	1L	1.20 - 2.70	Nil					1.20 - 1.70m: Frequent carbonaceous rootlets.			
								2.20m: Limestone cobble.			
	2L	2.70 - 3.90	Nil								
30/01/20 1700hrs 1.40m								3.60m: Limestone cobble.			
31/01/20 0730hrs 0.00m	3C	3.90 - 5.40	3.90		100				4.15	83.64	
								Soft light brown slightly gravelly sandy CLAY. Gravel is subangular and subrounded fine to coarse limestone and sandstone. Frequent shell debris.	5.25	82.54	
	4C	5.40 - 6.90	3.90		100			Stiff locally firm light brown and dark grey slightly sandy CLAY. Rare wood debris.			
								5.85 - 5.95m: Soft clay with frequent shell debris.	5.95	81.84	
								Stiff dark grey silty CLAY. Frequent carbonaceous roots and woody debris. Rare subvertical planar smooth fissures.	6.35	81.44	
	5C	6.90 - 8.40	3.90		100			Firm light bluish grey slightly sandy CLAY. Abundant carbonaceous rootlets. 6.90 - 7.10m: Frequent thin beds of white shell debris.			
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-3.90m. Waterflush rotary core drilled (146mm) 3.90-34.80m.

CASING: 168mm to 3.90m.

BACKFILL: On 22/01/2020, a slotted standpipe (50mm) was installed to 34.55m (slotted section 33.90-12.90m), granular response zone 34.80-11.90m, bentonite seal 11.90-11.40m, bentonite:cement grout 11.40-0.50m, concrete and stopcock cover 0.50-0.00m.

REMARKS: Driler notes loss of flush returns below 12.70m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:24 CD EC

Geotechnical Engineering Limited

BOREHOLE LOG

K36

CLIENT	MJCA					Sheet	2 of 4
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	27 January 2020	Easting	500236.3				
End Date	5 February 2020	Northing	299547.0	Ground level	87.79mOD	Depth	34.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.40 - 9.90	3.90		100			8.80 - 8.95m: Abundant shell debris. 8.95 - 9.20m: Soft dark grey clay. 9.50 - 9.70m: Soft dark grey clay.	9.70	78.09	
	7C	9.90 - 11.40	3.90		100			Light grey clayey fine SAND. Frequent rootlets and yellowish orange staining.	10.40	77.39	
31/01/20 1400hrs 2.60m								Stiff dark grey silty CLAY. Frequent carbonaceous rootlets and pockets of orange and light grey fine sand.	11.05	76.74	
03/02/20 0730hrs 3.10m	8C	11.40 - 12.90	3.90		100			Light grey SILT with abundant orange staining.	12.20	75.59	
								Light grey orangish brown fine SAND. Fissures are 75° to subvertical very closely spaced irregular rough with orange staining.	12.90	74.89	
	9C	12.90 - 14.40	3.90		86 86 86	40 150 230		Very weak orangish brown bioturbated fine SANDSTONE. Fractures are subhorizontal closely and medium spaced planar rough. 13.54 - 13.88m: Subvertical planar rough fracture. 14.20 - 14.40m: Assessed zone of core loss.	14.40	73.39	
	10C	14.40 - 15.90	3.90		96 84 73	60 200 450		Weak light grey and light brown oolitic LIMESTONE. Fractures are subhorizontal closely and medium spaced undulating rough. 14.60 - 14.80m: Frequent shell debris. 14.90 - 15.05m: Subvertical undulating rough fracture with orange staining.			
	11C	15.90 - 17.40	3.90		100 100 95			16.60 - 17.40m: Subvertical undulating rough fracture with dark brown staining.	17.40	70.39	
	12C	17.40 - 18.90	3.90		95 95 84	NI 150 280 70		Weak light brown bioturbated LIMESTONE with frequent inclined sand filled burrows. Fractures are subhorizontal closely and medium spaced planar rough.	17.85	69.94	
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

K36

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 4
Start Date	27 January 2020	Easting	500236.3	Scale	1 : 50
End Date	5 February 2020	Northing	299547.0 Ground level 87.79mOD	Depth	34.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						150 200		Weak thinly and very thinly bedded light brown oolitic LIMESTONE and oolitic fine SANDSTONE with rare sand filled burrows. Fractures are subhorizontal closely spaced undulating rough.			
	13C	18.90 - 20.40	3.90		98 98 85			19.40 - 19.75m: Prominent sand filled burrows.	19.95	67.84	
						400 430 500		Medium strong light brown oolitic LIMESTONE. Fractures are subhorizontal medium spaced undulating rough.			
	14C	20.40 - 21.90	3.90		100 100 100						
	15C	21.90 - 23.40	3.90		73 56 51	NR		21.90 - 22.30m: Assessed zone of core loss.			
						NI			22.50	65.29	
						30 200 380		Medium strong light and dark grey silty fine SANDSTONE. Fractures are subhorizontal very closely to medium spaced undulating rough. 22.50 - 22.80m: Abundant sand filled burrows. Recovered non intact as subangular and subrounded fine to coarse sandstone gravel.			
	16C	23.40 - 24.90	3.90		100 100 82			24.10m: Subhorizontal planar smooth fracture with calcite mineralisation (4mm thickness). 24.30m: Subhorizontal planar smooth fracture with calcite mineralisation (3mm thickness).			
03/02/20 1730hrs 19.60m											
04/02/20 0730hrs 23.10m	17C	24.90 - 26.40	3.90		34 34 29						
						NR		Assessed zone of core loss.	25.40	62.39	
									26.40	61.39	
	18C	26.40 - 27.90	3.90		12 0 0	NI		Weak light brown SANDSTONE with rare shell fragments. Recovered non intact.	26.60	61.19	
						NR		Assessed zone of core loss.			
								Continued Next Page	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

K36

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	4 of 4
Start Date	27 January 2020	Easting	500236.3	Scale	1 : 50
End Date	5 February 2020	Northing	299547.0 Ground level 87.79mOD	Depth	34.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	19C	27.90 - 29.40	3.90		83 83 64	150 200 350		Weak dark brown bioturbated fine SANDSTONE with closely and medium spaced thin beds of weak fine and medium sandstone, containing thick laminae of carbonaceous material and silt with subangular fine and medium quartz gravel inclusions. Fractures are subhorizontal to 10° closely and medium spaced planar rough.	28.20	59.59	
	20C	29.40 - 30.90	3.90		93 93 81	150 200 350		Medium strong light yellowish brown and grey fine and medium SANDSTONE with closely and medium spaced thick laminae of weak reddish brown fine and medium sandstone and irregular thick laminae of carbonaceous material and silt. Fractures are subhorizontal to 10° closely and medium spaced planar rough.	30.10	57.69	
	21C	30.90 - 32.40	3.90		100 97 84	60 200 300		Medium strong light bluish grey, light brown and light grey fine and medium SANDSTONE with subordinate silty fine sandstone. Rare thin beds of shell debris. Fractures are subhorizontal to 10° closely and medium spaced planar rough.	31.15	56.64	
	22C	32.40 - 33.90	3.90		93 83 77			32.50 - 32.85m: Subvertical undulating rough fracture with orangish brown penetrative staining.	33.70	54.09	
04/02/20 1700hrs 19.80m	23C	33.90 - 34.80	3.90		100	NA		Firm dark grey CLAY.	34.80	52.99	
05/02/20 0730hrs 26.80m								Borehole completed at 34.80m.	{38.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:25 CD EC

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	17/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.97	E 500 154.75 N 299 549.68	K37

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(1.20)	Soft grey and brown CLAY with fine to coarse gravel.			
1						87.77	1.20				
						87.57	1.40	Very soft brown CLAY with LIMESTONE cobble.			
							(0.90)	Stiff brown and bluish grey slightly gravelly CLAY with coarse to fine gravel size clasts of light grey sandstone, white chalk, red brown siltstone and red chert.			
2	1.20-2.30	109	100			86.67	2.30				
						86.43	2.54	Soft Brown slightly gravelly CLAY with coarse to fine gravel size clasts of mainly chalk.			
							(1.26)	Very stiff to stiff brown slightly gravelly CLAY with coarse to fine gravel size clasts of white chalk, dark grey and red siltstone and brown and grey sandstone.			
3	2.30-3.80	101	101			85.17	3.80				
							(1.37)	Very stiff dark brown CLAY with coarse to fine gravel grade clasts of mixed lithology.			
4											
5						83.80	5.17				
	3.80-5.40	98	98			83.57	5.40	Very stiff brown, greenish grey and grey CLAY with inclined laminae and shelly debris.			
						83.34	5.63	Soft brown sandy CLAY with frequent shelly material.			
						83.22	5.75	Extremely weak unit comprising abundant shelly material in a sandy CLAY matrix.			
6							(0.80)	Very stiff brown grey and dark grey CLAY with soft sediment deformation and carbonaceous rootlets.			
						82.42	6.55				
							(0.45)	Very stiff bluish grey and dark grey CLAY with mud-filled roots and rootlets and shelly laminae.			
	5.40-7.00	96	96			81.97	7.00				

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
16/01/20	26.70	23.00	16.52			
11/03/20	35.40		27.48			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.6 to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.1 and 14.1 mbgl. Plain HDPE pipe installed from 14.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.1 mbgl, benonite pellets to 12.6 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, R. Smith

Type and Diameter	Depth
Rotary coring 150mm	35.6m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	17/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.97	E 500 154.75 N 299 549.68	K37

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						81.76	7.21	Firm to soft dark grey CLAY with common shelly laminae.			
						81.21	(0.55) 7.76	Very stiff bluish grey CLAY with mud-filled and carbonaceous rootlets and calcrete nodules.			
8	7.00-8.50	105	100			80.47	(0.74) 8.50	Very stiff bluish grey and bluish dark grey sandy CLAY with carbonaceous and mud-filled roots and rootlets and shelly laminae.			
9						79.83	(0.64) 9.14	Very stiff bluish grey and bluish dark grey bioturbated CLAY with rare sand laminae.			
						79.68	9.29	Firm dark grey and bluish grey CLAY with abundant shelly material.			
						79.17	(0.51) 9.80	Very stiff dark brown CLAY with carbonaceous roots and rootlets.			
10	8.50-10.00	109	109			78.72	(0.45) 10.25	Very stiff bluish grey, brown and grey brown CLAY with carbonaceous roots and rootlets.			
						78.27	(0.45) 10.70	Firm gey brown very fine grained very clayey SAND. Strongly fractured with high angle and subvertical irregular and branching/reconnecting siderite filled and tight fractures.			
11	10.00-11.40	104	100			77.57	(0.70) 11.40	Very stiff grey brown SILT with siderite filled irregular fractures.			
						77.11	(0.46) 11.86	Very stiff brown grey bioturbated CLAY with carbonaceous rootlets.			
12 13	11.40-12.90	104	104			75.37	(1.74) 13.60	Very stiff light grey, orange brown and red SILT. Deformed with orange and red staining and siderite filled fractures to 12.80m with very closely spaced high angle, subvertical, subhorizontal and low angle siderite-filled branching/reconnecting and irregular fractures.			
						75.03	13.94	Stiff and very stiff grey and dark grey CLAY and orange brown very clayey SAND with thin beds of gravel grade sideritic material.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
16/01/20	26.70	23.00	16.52			
11/03/20	35.40		27.48			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.6 to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.1 and 14.1 mbgl. Plain HDPE pipe installed from 14.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.1 mbgl, benonite pellets to 12.6 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, R. Smith

Type and Diameter	Depth
Rotary coring 150mm	35.6m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	17/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.97	E 500 154.75 N 299 549.68	K37

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	12.90-14.10	108	108			74.87	14.10	Very soft orange brown and brown very fine grained very clayey SAND. *(continued)*			
15							(1.50)	Very strong and strong light brown grey and light brown fine grained variably oolitic bioturbated SANDSTONE. Medium spaced subhorizontal and low angle undulating rough open to moderately wide fractures.			
	14.10-15.60	109	109	109	3	73.37	15.60				
16							(1.50)	Very strong light grey brown and light brown sandy oolitic LIMESTONE. Medium spaced subhorizontal, high angle and low angle undulating rough open to moderately wide fractures.		▼	
17	15.60-17.10	89	82	75	8	71.87	17.10				
						71.12	(0.75) 17.85	Strong light brown grey sandy oolitic LIMESTONE. Subhorizontal undulating rough open fracture.			
18						70.86	18.11	Strong light brown grey fine grained bioturbated SANDSTONE.			
						70.43	18.54	Very stiff brown, grey brown and dark grey very fine grained very clayey rippled SAND with a coal cobble.			
19	17.10-18.70	94	94	89	2		(1.75)	Strong light brown and light grey brown very fine grained bioturbated slightly silty bioturbated SANDSTONE and thinly bedded fine grained oolitic and shelly SANDSTONE. Later display diffuse cross-stratification highlighted by shelly debris and clasts of coal. Close to medium spaced subhorizontal undulating rough open to moderately wide fractures.			
20	18.70-20.20	105	97	85	8	68.68	20.29				
						67.97	(0.71) 21.00	Medium strong light brown fine grained bioturbated SANDSTONE. Locally oolitic with some small cavities associated with burrow fills.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
16/01/20	26.70	23.00	16.52			
11/03/20	35.40		27.48			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.6 to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.1 and 14.1 mbgl. Plain HDPE pipe installed from 14.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.1 mbgl, benonite pellets to 12.6 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, R. Smith

Type and Diameter	Depth
Rotary coring 150mm	35.6m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	17/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.97	E 500 154.75 N 299 549.68	K37

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	20.20-21.70	103	103	93	7		(1.55)	Strong and very strong light grey brown, light brown and grey fine grained variably shelly and oolitic bioturbated SANDSTONE and locally slightly silty SANDSTONE. Medium to closely spaced subhorizontal undulating rough open to tight fractures.			
22						66.42	22.55				
	21.70-22.70	108	99	95	1	66.27	22.70	Weak light brown fine grained SANDSTONE. Locally non-intact recovered as gravel due to loose or weakly cemented sand associated with burrow fills.			
23						65.95	23.02	No recovery.			
						65.81	23.16	Medium strong light brown fine grained bioturbated SANDSTONE. Loose or weakly cemented sand in-fills burrows.			
						65.43	23.54	Strong light brown and light grey brown fine grained silty bioturbated SANDSTONE. Subhorizontal undulating rough open fracture.			
	22.70-23.70	68	66	53	3						
24							(0.96)	Very strong light grey, grey and light brown grey fine grained dominantly silty SANDSTONE and subordinate thin SANDSTONE beds. Very closely to closely spaced fractures from 23.54 to 23.87 that are undulating rough and open to moderately wide.			
						64.47	24.50				
25							(0.80)	No recovery.			
	23.70-25.30	43	41	33	3	63.67	25.30				
						63.40	25.57	Very strong light grey and grey fine grained dominantly silty bioturbated SANDSTONE.			
26							(1.38)	Very strong to strong grey and light brown grey fine grained dominantly slightly silty bioturbated SANDSTONE. Occasional ooids, shelly debris and fine gravel size mudstone clasts. Medium to closely spaced subhorizontal undulating rough open to moderately wide fractures.			
	25.30-26.70	105	105	89	6						
						62.02	26.95				
27							(1.25)	No recovery.		▼	

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
16/01/20	26.70	23.00	16.52			
11/03/20	35.40		27.48			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.6 to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.1 and 14.1 mbgl. Plain HDPE pipe installed from 14.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.1 mbgl, benonite pellets to 12.6 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, R. Smith

Type and Diameter	Depth
Rotary coring 150mm	35.6m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	17/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.97	E 500 154.75 N 299 549.68	K37

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	5 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
	26.70-28.20	17	17	11	1	60.77	28.20	No recovery. *(continued)*			
						60.63	28.34	Weak light brown fine grained slightly silty bioturbated SANDSTONE.			
						60.31	28.66	Weak light brown and light orange brown fine grained slightly silty current ripple cross-laminated SANDSTONE. Close to very closely spaced subhorizontal undulating and branching/reconnecting rough open fractures.			
						60.04	28.93				
29						59.89	29.08	Very stiff to stiff orange brown, grey brown and dark grey very fine grained very clayey SAND.			
						59.55	29.42	Non-intact recovered as gravel and comprising weak brown and red brown fine grained very clayey SANDSTONE.			
	28.20-29.70	81	68	38	11	59.27	29.70	Strong brown fine grained SANDSTONE with large mud-filled roots. Subvertical siderite-filled planar fracture.			
30								No recovery. Loose sand on core surfaces.			
							(1.50)	Strong brown and grey brown fine grained SANDSTONE with large irregular mud-filled fissures near top. Close to very closely spaced subhorizontal undulating rough moderately wide fractures and large branching/reconnecting high angle siderite-filled fractures at 29.80 to 30.35m. Single subhorizontal undulating rough moderately wide fracture at 30.65. 30.50 Lag of coarse gravel grade mudstone clasts.			
31	29.70-31.20	77	75	57	8	57.77	31.20				
32							(1.47)	Strong grey brown, light grey brown and orange brown fine grained SANDSTONE and highly subordinate silty SANDSTONE. Bioturbated and shelly in part. Fine gravel grade mudstone clasts and thick silt laminae. Medium spaced subhorizontal undulating rough open fractures between 31.54 and 31.85m. Fractures are closely spaced with subvertical undulating siderite-filled fractures also seen.			
	31.20-32.40	128	128	113	7	56.30	32.67				
33							(1.68)	Medium strong grey, greenish grey and light grey fine grained very silty bioturbated SANDSTONE. Locally frequent shelly debris with light grey siltstone cobbles and coarse gravel at base. Medium to closely spaced subhorizontal undulating rough open to moderately wide fractures. Locally non-intact and recovered as gravel.			
34	32.40-34.00	101	96	82	10	54.62	34.35				
								Very stiff dark grey bioturbated CLAY.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
16/01/20	26.70	23.00	16.52			
11/03/20	35.40		27.48			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.6 to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.1 and 14.1 mbgl. Plain HDPE pipe installed from 14.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.1 mbgl, benonite pellets to 12.6 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, R. Smith

Type and Diameter	Depth
Rotary coring 150mm	35.6m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	17/01/2020

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	88.97	E 500 154.75 N 299 549.68	K37

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	6 of 6

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(1.25)	Very stiff dark grey bioturbated CLAY. *(continued)*			
	34.00-35.60	103	99	78	2	53.37	35.60				
								END OF BOREHOLE			
36											
37											
38											
39											
40											
41											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
16/01/20	26.70	23.00	16.52			
11/03/20	35.40		27.48			

REMARKS / INSTALLATIONS

Unrecovered cuttings fill borehole from 35.6 to 35.4 mbgl. Plain HDPE pipe installed between 35.4 and 34.1 mbgl. Slotted HDPE pipe with a filter geotextile sock installed between 34.1 and 14.1 mbgl. Plain HDPE pipe installed from 14.1 mbgl to above ground level. Borehole annulus backfilled with gravel to 13.1 mbgl, benonite pellets to 12.6 mbgl and grout to ground level. Pipe fitted with end cap and removable gas tight cap with gas tap. The monitoring standpipe is protected by raised headworks.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, R. Smith

Type and Diameter	Depth
Rotary coring 150mm	35.6m

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 1/19

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	1 of 2
Start Date	9 December 2019	Easting	500181.1	Scale	1 : 50
End Date	11 December 2019	Northing	300683.4 Ground level 89.64mOD	Depth	16.10 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)
09/12/19 1520hrs									Soft dark brownish grey CLAY (topsoil).	0.40	89.24
09/12/19 1610hrs 0.80m									Firm dark brown CLAY.	1.20	88.44
10/12/19 0905hrs 0.90m	1C	1.10	2.60	Nil		99 70 0			Strong light grey crystalline LIMESTONE with frequent shell debris.	1.53	88.11
							NI 30 90		Medium strong light brown and light grey LIMESTONE with abundant shell debris. Fractures are subhorizontal very closely and closely spaced undulating rough.	2.30	87.34
							NA		Firm light brown and bluish grey slightly sandy CLAY. Rare rootlets.	2.60	87.04
	2C	2.60	2.90	2.60		98			Very stiff dark greenish grey sandy CLAY with abundant rootlets and shell debris.	2.95	86.69
	3C	2.90	4.10	2.60		98			Stiff light grey slightly gravelly slightly sandy silty CLAY. Gravel is subangular to subrounded fine and medium grained.	4.10	85.54
	4C	4.10	5.60	2.60		71			Stiff bluish grey and grey silty CLAY. 4.60 - 4.80m: Soft black clay.	5.55	84.09
	5C	5.60	7.10	2.60		100 86 86	550		Strong light grey SILTSTONE thinly interbedded with stiff dark grey silty clay. Frequent shell debris. 6.30m: Subhorizontal planar rough fracture.	6.85	82.79
							NA		Firm greenish grey slightly sandy silty CLAY.	7.05	82.59
	6C	7.10	8.60	2.60		100			Stiff dark grey silty CLAY with rare rootlets. 7.27m: Subhorizontal planar smooth fissure.	7.80	81.84
									Stiff dark grey CLAY.		
									Continued Next Page	{8.00}	

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.60m Waterflush rotary core drilled (146mm) 2.60-16.10m

CASING: 168mm to 2.70m.

BACKFILL: On completion, hole backfilled with bentonite 16.10-15.20m, cement:bentonite grout 15.20-0.50m and arisings 0.50-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks
0.75				Seepage, in inspection pit.

AGS

CONTRACT	CHECKED
35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:28 CD EC

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 1/19

CLIENT	MJCA					Sheet	2 of 2
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	9 December 2019	Easting	500181.1			Depth	16.10 m
End Date	11 December 2019	Northing	300683.4	Ground level	89.64mOD		

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
									8.31	81.33	
								Stiff dark grey silty CLAY with abundant shell debris.	8.60	81.04	
	7C	8.60 - 10.10	2.60		86			Stiff dark grey silty CLAY with frequent rootlets.			
								9.10 - 9.85m: Very stiff dark grey clay with abundant rootlets.			
								9.75 - 9.85m: Very stiff dark grey clayey silt.	9.85	79.79	
								Soft dark grey CLAY.	10.25	79.39	
	8C	10.10 - 11.60	2.60		100 2 0			Very stiff greenish dark grey silty CLAY. Frequent bands of shell debris.	10.70	78.94	
								Stiff dark grey slightly sandy silty CLAY. Frequent rootlets.	11.35	78.29	
								Stiff dark grey clayey SILT.	11.55	78.09	
	9C	11.60 - 13.10	2.60		100 23 23	300		Weak light grey SILTSTONE. Single subvertical fracture planar smooth with orange staining.	11.95	77.69	
						NA		Stiff dark grey sandy CLAY.			
10/12/19 1630hrs 3.00m											
11/12/19 0715hrs 0.60m	10C	13.10 - 14.60	2.60		96				13.15	76.49	
								Very stiff dark grey slightly sandy silty CLAY. Rare rootlets.	13.55	76.09	
								Very stiff light grey clayey SILT.	13.90	75.74	
								Very stiff light grey silty SAND. Sand is fine.	14.15	75.49	
								Friable light grey sandy SILT. Sand is fine.	14.70	74.94	
	11C	14.60 - 16.10	2.60		97			Soft light yellowish brown CLAY.	14.90	74.74	
								Soft yellowish brown CLAY with nodular cemented siderite.	15.10	74.54	
11/12/20 0915hrs 2.00m								Light brown clayey fine SAND. 15.10 - 15.40m: Very closely spaced subparallel subvertical to 70° undulating rough fissures with siderite infill.	15.80	73.84	
								Light brown fine SAND.	16.10	73.54	
								Borehole completed at 16.10m.			
									{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	AGS	CONTRACT	CHECKED
						35673	EC

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BOREHOLE LOG

KCW 2/19

CLIENT	MJCA					Sheet	1 of 2
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	5 December 2019	Easting	500323.6			Depth	14.70 m
End Date	6 December 2019	Northing	300483.2	Ground level	86.39mOD		

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
05/12/19 0730hrs								Hand dug inspection pit Topsoil (300mm) over sandy gravelly CLAY (Driller's description).	0.80	85.59	
								Hand dug inspection pit Dark grey CLAY.	1.20	85.19	
	1L	1.20 - 2.70	Nil					Firm light brown and grey slightly sandy CLAY. Sand is fine.	1.75	84.64	
								Stiff locally soft light grey silty CLAY.	2.45	83.94	
								Stiff dark grey silty CLAY.	2.70	83.69	
	2C	2.70 - 4.20	2.70		99	NA		Soft light brown and light grey CLAY with frequent thin pockets of orange fine sand.	3.15	83.24	
								Very stiff locally stiff grey silty CLAY.	3.95	82.44	
								Very stiff grey clayey SILT with abundant shell fragments. 3.95 - 4.00m: Band of strong light grey siltstone.	4.10	82.29	
	3C	4.20 - 5.70	2.70		90 90 90	120		Weak grey bioturbated SILTSTONE.	5.75	80.64	
	4C	5.70 - 7.20	2.70		93	NA		Stiff grey CLAY with frequent fragments of carbonaceous material.	6.69	79.70	
	5C	7.20 - 8.10	2.70		100			Stiff greenish grey silty CLAY with frequent rootlets and shell fragments.			
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m Waterflush rotary core drilled (146mm) 2.70-14.70m

CASING: 168mm to 2.70m.

BACKFILL: On completion, the borehole was backfilled with bentonite pellets 14.70-13.90m, grout 13.90-0.50m (approx 250 litres), arisings 0.50-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 2/19

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	2 of 2
Start Date	5 December 2019	Easting	500323.6	Scale	1 : 50
End Date	6 December 2019	Northing	300483.2 Ground level 86.39mOD	Depth	14.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.10 - 8.70	2.70		42				8.20	78.19	
05/12/19 1700hrs 2.00m								Strong dark greenish grey SILTSTONE with abundant shell fragments.	8.45	77.94	
06/12/19 0730hrs 1.30m	7C	8.70 - 10.20	2.70		100			Stiff dark greenish grey slightly sandy silty CLAY with frequent shell fragments.	9.25	77.14	
								Stiff dark greenish grey slightly sandy silty CLAY. Sand is fine.	10.15	76.24	
	8C	10.20 - 11.70	2.70		100			Very stiff grey sandy silty CLAY. Sand is fine.	10.83	75.56	
								Stiff grey silty CLAY.	11.95	74.44	
	9C	11.70 - 13.20	2.70		100			Stiff light grey silty CLAY.	12.75	73.64	
								Firm and stiff light grey sandy CLAY. Sand is fine.	13.05	73.34	
	10C	13.20 - 14.70	2.70		96 66 66			Firm light orangish brown sandy CLAY.	13.40	72.99	
								Soft light grey and light brown CLAY.	13.60	72.79	
06/12/19 1700hrs 2.50m						NI 200 350		Weak light orangish brown silty fine SANDSTONE. Fractures are subhorizontal medium spaced undulating rough. 13.60 - 13.70m: Non intact recovered as gravel size red and dark brownish red siderite cemented foliated nodules.	14.70	71.69	
								Borehole completed at 14.70m.	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

AGS

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BOREHOLE LOG

KCW 3/19

CLIENT	MJCA					Sheet	1 of 2
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	29 November 2019	Easting	500259.7			Depth	10.20 m
End Date	3 December 2019	Northing	300357.7	Ground level	82.90mOD		

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
29/11/19 1130hrs 29/11/19 1210hrs Dry								Hand dug inspection pit Topsoil (300mm) over soft dark brown CLAY (Driller's description).	1.20	81.70	
03/12/19 0900hrs Dry	1L	1.20 - 2.70	Nil					Firm dark grey CLAY.	1.40	81.50	
								Soft locally firm light grey clayey SILT.	2.15	80.75	
								Stiff dark grey, light brown and light grey silty CLAY with rare orange lenses of fine sand.			
	2C	2.70 - 4.20	2.70		100 10 0				2.95	79.95	
						NI		Weak light and dark grey SILTSTONE with frequent carbonaceous rootlets.	3.30	79.60	
						NA		Stiff and very stiff dark grey slightly sandy CLAY. Sand is fine.	3.70	79.20	
								Very stiff grey and light grey clayey SILT with rare thin lenses of orangish brown fine sand.	4.05	78.85	
						50		Weak light grey sandy SILTSTONE. Sand is fine.	4.25	78.65	
	3C	4.20 - 5.70	2.70		97 47 37			Weak light grey slightly sandy SILTSTONE. 4.40 - 4.50m: Non intact.	4.50	78.40	
						NA		Stiff and very stiff light grey slightly clayey fine SAND.	5.05	77.85	
								Firm light grey and light brown sandy CLAY.	5.15	77.75	
						180 250 300		Strong orangish brown fine semi-voided SANDSTONE. Fractures are subhorizontal medium spaced undulated rough. 5.35m: Semi-voided calcite foliated mineralisation			
	4C	5.70 - 7.20	2.70		97 97 90				6.50	76.40	
						200 500 600		Strong light grey and light brown oolitic LIMESTONE. Fractures are subhorizontal medium and widely spaced planar and undulating rough.			
	5C	7.20 - 8.70	2.70		98 98 95						
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m Waterflush rotary core drilled (146mm) 2.70-10.20m.

CASING: 168mm to 2.70m.

BACKFILL: On completion, the borehole was backfilled with bentonite pellets 10.20-5.20m, grout 5.20-0.50m, arisings 0.50-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 3/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 2
Start Date	29 November 2019	Easting	500259.7			Scale	1 : 50
End Date	3 December 2019	Northing	300357.7	Ground level	82.90mOD	Depth	10.20 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.70 - 10.20		2.70		97 97 97						
							300		Medium strong light brown fine SANDSTONE. Fractures are subhorizontal medium spaced planar and undulating rough.	9.60	73.30	
03/12/19 1700hrs 6.30m										10.20	72.70	
									Borehole completed at 10.20m.	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 4/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 2
Start Date	4 December 2019	Easting	500360.1			Scale	1 : 50
End Date	4 December 2019	Northing	300340.8	Ground level	82.16mOD	Depth	9.70 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
04/12/19 1055hrs									Hand dug inspection pit Soft dark grey CLAY (Driller's description).	1.20	80.96	
	1L	1.20	2.20	Nil					Stiff dark greenish grey and grey CLAY with rare rootlets.	1.90	80.26	
									Stiff locally very stiff light grey clayey SILT. 2.00 - 2.10m: Medium strong light grey siltstone.	2.20	79.96	
	2C	2.20	3.70	2.20		100 0 0	NA		Stiff dark grey and grey silty CLAY.	2.60	79.56	
							NI		Weak light grey SILTSTONE locally recovered as angular and subangular fine to coarse gravel. 3.05 - 3.10m: Soft dark grey CLAY.	3.30	78.86	
							NA		Soft dark grey CLAY.	3.55	78.61	
	3C	3.70	4.80	2.20		100 53 53			Stiff light grey and light brown sandy CLAY.	4.00	78.16	
							100 150 200		Medium strong irregularly and distorted bedded light grey and orangish brown fine SANDSTONE. Fractures are subhorizontal closely spaced planar smooth.	4.80	77.36	
	4C	4.80	5.20	2.20		93 90 90	NA		Very stiff light grey sandy CLAY. Sand is fine.	5.00	77.16	
	5C	5.20	6.70	2.20		93 40 26			Orangish light brown slightly sandy CLAY. 5.25 - 5.30m: Non intact dark red foliated siderite cemented gravel size fragments	5.60	76.56	
							NI		5.40 - 5.50m: Non intact dark red foliated siderite cemented gravel size fragments			
									Weak slightly clayey crystalline LIMESTONE. Non intact.	6.15	76.01	
							180 350 450		Strong light grey oolitic LIMESTONE. Fractures are subhorizontal medium spaced undulating rough. 6.45 - 6.60m: Fracture 70° undulating rough.			
	6C	6.70	8.20	2.20		93 92 92						
									Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.20m Waterflush rotary core drilled (146mm) 2.20-9.70m

CASING: 168mm to 2.20m.

BACKFILL: On completion, the borehole was backfilled with bentonite pellets 9.70-5.20m, grout 5.20-0.50m, arisings 0.50-0.00m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 4/19

CLIENT	MJCA					Sheet	2 of 2
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	4 December 2019	Easting	500360.1			Depth	9.70 m
End Date	4 December 2019	Northing	300340.8	Ground level	82.16mOD		

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	7C	8.20 - 9.70	2.20		100 100 100						
04/12/19 1505hrs 6.20m									9.70	72.46	
								Borehole completed at 9.70m.			
									{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 5/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 3
Start Date	18 November 2019	Easting	500366.2			Scale	1 : 50
End Date	21 November 2019	Northing	300242.3	Ground level	80.33mOD	Depth	27.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
18/11/19 0915hrs								Hand dug inspection pit.	1.20	79.13	
	1L	1.20 - 2.70	Nil					Firm grey and orangish brown sandy CLAY.	1.75	78.58	
								Stiff dark greyish brown CLAY with rare carbonaceous root traces.	3.00	77.33	
	2C	2.70 - 4.20	2.70		93						
								Stiff and very stiff fissured light grey and grey mottled yellowish brown sandy CLAY with frequent lenses of dark orangish brown fine sand.	4.35	75.98	
	3C	4.20 - 5.70	2.70		83 23 23	NA					
								Firm light grey mottled orangish brown silty CLAY/clayey SILT.	4.70	75.63	
								Possible zone of core loss. Soft orange and reddish brown sandy gravelly CLAY. Gravel is subangular fine to coarse limestone and nodular siderite cement.	5.35	74.98	
						150 400 700		Strong locally very strong light grey and light brown oolitic locally shelly LIMESTONE. Fractures are subhorizontal typically medium occasionally widely spaced undulating rough open to moderately wide aperture, locally with broken rock infill.			
	4C	5.70 - 7.20	2.70		97 97 97						
18/11/19 1703hrs 1.50m											
19/11/19 0720hrs 4.10m	5C	7.20 - 8.70	2.70		100 100 100						
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m. Waterflush rotary core drilled (146mm) 2.70-27.80m.

CASING: 168mm diam to 2.70m.

BACKFILL: On completion, from 21/11/19 to 25/11/19, the borehole was backfilled with grout 27.80-21.70m (approx 450 litres), bentonite pellets 21.70-17.50m, grout 17.50-14.50m (approx 300 litres), bentonite pellets 14.50-0.50m, arisings 0.50-0.00m. The bentonite pellets were utilised to compensate for large grout takes.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 5/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 3
Start Date	18 November 2019	Easting	500366.2			Scale	1 : 50
End Date	21 November 2019	Northing	300242.3	Ground level	80.33mOD	Depth	27.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.70 - 10.20	2.70		100 100 95			9.30 - 9.60m: Thin laminae of clay and silt bands closely interbedded with oolitic limestone.			
	7C	10.20 - 11.70	2.70		100 93 81			10.95 - 11.05m: Disintegrated to yellowish brown gravelly fine sand. 10.95 - 11.70m: Fractures are closely spaced undulating rough with fine sand infill. 11.05 - 11.25m: Weak locally semi-voided with gravel sized voids, associated with prominent inclined burrows.			
	8C	11.70 - 13.20	2.70		100 100 100						
	9C	13.20 - 14.70	2.70		97 97 97			13.80 - 13.95m: Grey.			
	10C	14.70 - 16.20	2.70		93 83 56	70 110 130		Weak semi-voided greyish brown oolitic LIMESTONE. Fractures are subhorizontal to 30° closely spaced undulating rough locally discoloured orangish brown.	14.70	65.63	
						NI		15.30 - 15.50m: Non intact. Recovered as angular to subrounded medium and coarse gravel.			
						70 110 200					
	11C	16.20 - 17.40	2.70		95 95 95	90 200 500		Medium strong locally weak light brown and light grey bioturbated slightly silty to silty fine SANDSTONE. Fractures are subhorizontal closely and medium spaced undulating rough, open to moderately wide aperture, locally with clay infill.	16.00	64.33	
	12C	17.40 - 18.90	2.70		100 100 88			17.55 - 17.60m: Non intact. Recovered as angular to subrounded medium and coarse gravel.	17.85	62.48	
						180					
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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BOREHOLE LOG

KCW 5/19

CLIENT	MJCA				
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH			Sheet	3 of 3
Start Date	18 November 2019	Easting	500366.2	Scale	1 : 50
End Date	21 November 2019	Northing	300242.3 Ground level 80.33mOD	Depth	27.80 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
						240 450		Strong brown and dark grey bioturbated slightly silty fine SANDSTONE with thinly to medium bedded SANDSTONE. Fractures are subhorizontal closely to medium spaced undulating rough, open to moderataely wide aperture.			
19/11/19 1703hrs 2.70m	13C	18.90 - 19.20	2.70		67 67 43						
20/11/19 0805hrs 7.60m	14C	19.20 - 20.70	2.70		93 93 45				19.45	60.88	
						30 NA		Very weak very thinly bedded light brown oolitic LIMESTONE with very thin beds of dark brown fine sand.	19.60	60.73	
						NI 45 90		Stiff thinly laminated dark greyish black CLAY.	19.85	60.48	
						20 100 230		Very weak fractured orangish brown and grey fine SANDSTONE locally with carbonaceous partings. Fractures are very closely and closely spaced intersecting undulating rough. Locally disintegrated to sandy fine to coarse gravel.	20.50	59.83	
	15C	20.70 - 22.20	2.70		100 100 45			Medium strong indistinctly laminated grey and brown fine SANDSTONE. Fractures are subhorizontal very closely to medium spaced undulating rough open. 21.10 - 21.40m: Subvertical undulating rough fracture. 21.95 - 22.05m: Partially voided, voids up to 3mm diameter.			
	16C	22.20 - 23.70	2.70		99 82 73	NI 130 270		Weak and medium strong thickly laminated to thinly bedded grey very silty fine SANDSTONE interbedded with dark bluish grey sandy SILTSTONE. Fractures are subhorizontal very closely to medium spaced undulating rough open to moderately wide aperture (up to 5mm). 22.50 - 22.65m: Subvertical undulating rough with broken rock infill and orange staining. 22.95m: Subhorizontal undulating rough with up to 8mm calcite infill.	22.30	58.03	
	17C	23.70 - 25.20	2.70		99 99 93	100 180 500		Strong thinly bedded light grey SILTSTONE interbedded with weak grey very silty fine SANDSTONE with abundant shells and trace fossils. Fractures subhorizontal closely to medium spaced undulating rough open to moderately wide aperture (up to 4mm).	24.00	56.33	
	18C	25.20 - 26.70	2.70		97 57 57				25.60	54.73	
						110 130 200 NA		Weak grey sandy SILTSTONE locally disintegrated to claybound gravel. Fractures are subhorizontal closely spaced undulating and planar rough.	26.05	54.28	
20/11/19 1730hrs 7.40m								Very stiff thinly laminated grey becoming dark grey CLAY.			
21/11/19 0810hrs 8.00m	19C	26.70 - 27.80	2.70		100						
21/11/19 1730hrs 0.00m									27.80	52.53	
								Borehole completed at 27.80m.	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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MJCA
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Baxterley, Atherstone,
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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	22/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	80.55	E 500 349.13 N 300 158.24	KCW 6/19

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	1 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
1						79.35	(1.20) 1.20	Soft clayey TOPSOIL.			
						79.05	1.50	Soft dark grey and orange brown CLAY.			
	1.20-1.65	100	100								
2						78.45	2.10	Stiff to very stiff light grey and grey clayey and very clayey SAND with carbonaceous rootlets and sand filled roots.			
	1.65-2.55	100	100			78.00	2.55	Stiff grey, dark grey and orange brown sandy CLAY with carbonaceous rootlets.			
3						77.43	(0.57) 3.12	Very stiff grey, dark grey and orange brown sandy CLAY with carbonaceous rootlets.			
						77.21	3.34	Stiff dark grey brown CLAY with carbonaceous rootlets.			
						77.09	3.46	Very stiff dark grey sandy CLAY.			
4	2.55-4.05	100	100			76.32	(0.77) 4.23	Very stiff light grey sandy SILT with carbonaceous rootlets.			
5						75.59	(0.73) 4.96	Very stiff to firm light grey and orange brown CLAY and subordinate sandy SILT with sand filled rootlets.			
						75.50	5.05	Strong red brown sandy GRAVEL. Gravel is medium and comprises fragmented siderite nodules.			
	4.05-5.55	100	83			74.85	(0.65) 5.70	Strong light grey and orange brown finely crystalline LIMESTONE. Non-intact, partially recovered as gravel.			
6						74.10	(0.75) 6.45	Very strong light grey brown oolitic LIMESTONE. Single subhorizontal undulating rough open fracture.			
						74.00	6.55	Medium strong oolitic LIMESTONE. Non-intact recovered as gravel.			
7	5.55-7.05	90	83	77	2			Very strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal undulating smooth and rough open fractures.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/11/19	28.00	17.00	18.85			

REMARKS / INSTALLATIONS

Backfilled with bentonite pellets hydrated with clean water to 17mbgl, with grout to 7.85mbgl and with bentonite pellets to ground level.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	28m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	22/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	80.55	E 500 349.13 N 300 158.24	KCW 6/19

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	2 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
							(2.00)	Very strong light grey brown oolitic LIMESTONE. Medium spaced subhorizontal undulating smooth and rough open fractures. *(continued)*			
8											
	7.05-8.55	100	100	87	4	72.00	8.55				
							(1.25)	Strong light grey brown oolitic LIMESTONE with some small cavities. Close to medium spaced subhorizontal rough and smooth open fractures.			
9											
						70.75	9.80				
10	8.55-10.05	97	97	91	5		(1.75)	Very strong to medium strong light grey brown and grey oolitic LIMESTONE. Locally sandy associated with burrow fills. Some small cavities. Close to medium spaced subhorizontal to low angle rough and smooth open to moderately wide fractures.			
11											
	10.05-11.55	99	99	91	5	69.00	11.55				
12	11.55-12.07	NA	NA	56	4	68.48	(0.52) 12.07	Medium strong light brown very fine to medium grained SANDSTONE with small cavities. Closely spaced subhorizontal smooth undulating open fractures.			
13	11.55-13.05 12.07-13.05	107 NA	107 NA	NA 100	NA 2	66.99	(1.49) 13.56	Very strong to strong light grey brown and light brown oolitic LIMESTONE. Medium spaced subhorizontal smooth and rough undulating open fractures.			
						66.79	13.76	Medium strong light brown sandy and oolitic LIMESTONE. Closely spaced subhorizontal rough undulating open fractures.			
14						66.18	(0.61) 14.37	Very strong light grey brown and grey oolitic LIMESTONE. 13.98 - 14.16 Blue grey cement.			
	13.05-14.55	93	93	89	4		(0.68)	Strong light grey brown and light brown oolitic LIMESTONE. Locally sandy associated with burrow fills. Non-intact recovered as gravel where loose sand has washed out during drilling.			

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/11/19	28.00	17.00	18.85			

REMARKS / INSTALLATIONS

Backfilled with bentonite pellets hydrated with clean water to 17mbgl, with grout to 7.85mbgl and with bentonite pellets to ground level.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	28m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	22/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	80.55	E 500 349.13 N 300 158.24	KCW 6/19

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	3 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thickness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
						65.50	15.05	Very strong light grey brown, grey and light brown oolitic LIMESTONE with low angle cross-stratification and strong cement. Very tight subhorizontal rough undulating fracture with a silt fill.			
						65.08	15.47				
							(0.58)	No recovery. 15.47 - 16.05 Loose orange fine sand on contatcts.			
16	14.55-16.05	61	54	49	1	64.50	16.05				
							(1.50)	Medium strong to locally very strong light brown, light grey brown and grey very fine grained slightly silty and silty bioturbated SANDSTONE. Locally fine grained and oolitic associated with burrow fills. Very close to closely spaced subhorizontal smooth and rough undulating fractures.			
17											
	16.05-17.55	70	61	41	6	63.00	17.55				
							(0.57)	Medium strong grey brown, light brown and grey very fine grained silty SANDSTONE overlying a fine grained slightly silty SANDSTONE. Mainly bioturbated. Very close to closely spaced subhorizontal rough undulating open to tight clay lined fractures. 17.99 - 18.03 Non-intact recovered as gravel between two clay lined fractures.			
18						62.43	18.12				
	17.55-18.70	97	97	94	6		(1.67)	Very strong light brown grey and grey medium to coarse grained oolitic and shelly SANDSTONE. Relict low angle cross-stratification. Some small cavities towards the base. Widely spaced subhorizontal smooth and rough undulating open and tight fractures.		▼	
19						60.76	19.79				
							(0.51)	Stiff dark grey to black laminated CLAY. Single subhorizontal fracture.			
20	18.70-20.30	90	86	84	2	60.25	20.30				
							(1.12)	Medium strong to weak brown, dark grey and orange brown fine grained and silty or very silty SANDSTONE with a thinly bedded firm sand towards the top. Carbonaceous rootlets and roots. Highly fractured intervals with numerous subhorizontal, low-angle, high-angle and subvertical fractures between 20.5 to 21.06 and 21.20 to 21.61. Core is locally non-intact and recovered as gravel with fractures that are branching/reconnecting and open to moderately wide (some fractures may be drilling induced).			
21						59.13	21.42				
	20.30-21.80	106	99	42	>15		(1.93)	Strong grey, grey brown and bluish grey fine grained very silty SANDSTONE. Occasionally shelly. From 22.45 to 23.14 is a highly fractured interval with numerous subhorizontal subvertical and high-angle fractures with non-intact intervals recovered as gravel (may be partly drilling induced). Above 22.45 fractures are closely spaced subhorizontal to low angle undulating to planar rough and open to moderately wide.			
22											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/11/19	28.00	17.00	18.85			

REMARKS / INSTALLATIONS

Backfilled with bentonite pellets hydrated with clean water to 17mbgl, with grout to 7.85mbgl and with bentonite pellets to ground level.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	28m

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BOREHOLE LOG

Project	Client	Date Completed
ENRMF Potential landfill extension site investigation	Augean	22/11/2019

Project No.	Ground Level (mAOD)	Co-ordinates ()	Borehole No.
AU/KCW/JRC/2936/01	80.55	E 500 349.13 N 300 158.24	KCW 6/19

Contractor	Location	Sheet
Geotechnical Engineering Limited	East Northants Resource Management Facility	4 of 4

Scale	CORE Depth	TCR	SCR	RQD	FI	STRATA Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Water	Instrument/ Backfill
23	21.80-23.35	94	49	27	>15	57.20	23.35				
24	23.35-24.90	100	96	91	7	54.12	(3.08) 26.43	Strong grey, dark grey, blue grey very fine and fine grained very silty SANDSTONE, thinly to medium bedded with thin SILTSTONE beds. Bioturbated throughout with locally abundant shelly debris and articulated shells. Basal 10cm is gravelly with medium to coarse gravel comprising rounded mudstone clasts. Medium spaced subhorizontal rough undulating moderately wide to open fractures. Non-intact and recovered as gravel from 26.19 to 26.32m, may be zone of intense fracturing or drilling induced.			
25											
26	24.90-26.50	94	89	91	6	52.55	(1.57) 28.00	Stiff to very stiff laminated dark grey CLAY tending towards extremely weak MUDSTONE.			
27	26.50-28.00	102	102	98	5						
28								END OF BOREHOLE			
29											

GROUNDWATER

Date	Depth of hole	Depth of casing	Depth to water	Depth struck	Depth after 20 mins	Depth sealed
22/11/19	28.00	17.00	18.85			

REMARKS / INSTALLATIONS

Backfilled with bentonite pellets hydrated with clean water to 17mbgl, with grout to 7.85mbgl and with bentonite pellets to ground level.

LOGGED BY: M. Leeds

DRILLING

Plant: P18
Crew: P. Hetherington, M. Owen

Type and Diameter	Depth
Rotary coring 150mm	28m

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 7/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 2
Start Date	25 February 2020	Easting	500339.4			Scale	1 : 50
End Date	25 February 2020	Northing	299972.1	Ground level	86.45mOD	Depth	12.50 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
25/02/20 1000hrs	1B	0.20	0.40						Soft CLAY. (Driller's description)			
	2B	0.60	0.80									
	3B	1.00	1.20							1.20	85.25	
	4L	1.20	2.20	Nil					Soft brown and grey mottled orange slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse limestone. Rare carbonaceous rootlets. 1.80m: Cobble of limestone.	2.20	84.25	
	5C	2.20	3.50	2.20		100			Stiff dark brown slightly gravelly CLAY. Gravel is subangular and subrounded fine to coarse limestone, sandstone, chert and chalk.			
	6C	3.50	5.00	2.20		100						
	7C	5.00	6.50	2.20		97			5.10 - 5.12m: Dark brown sandy clay.	5.70	80.75	
									Stiff dark bluish grey CLAY. Rare rootlets. 6.40 - 6.75m: Abundant shell debris.			
	8C	6.50	8.00	2.20		97				6.75	79.70	
									Stiff dark bluish grey silty CLAY.			
									Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.
METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.20m. Waterflush rotary core drilled (146mm) 2.20-12.50m.
CASING: 168mm diam to 2.20m.
BACKFILL: On completion, hole backfilled with bentonite 12.50-11.00m, cement:bentonite grout 11.00-0.50m and arisings 0.50-0.00m.
REMARKS: Driller notes reduced flush returns 11.00-12.50m (40% returned).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 7/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 2
Start Date	25 February 2020	Easting	500339.4			Scale	1 : 50
End Date	25 February 2020	Northing	299972.1	Ground level	86.45mOD	Depth	12.50 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
	9C	8.00 - 9.50	2.20		97				8.30	78.15	
								Firm grey sandy CLAY. Rare rootlets.			
	10C	9.50 - 11.00	2.20		100				9.90	76.55	
								Very stiff light grey clayey SILT.			
	11C	11.00 - 12.50	2.20		100 20 0				11.40	75.05	
25/02/20 1500hrs 1.78m								Weak light orangish brown SANDSTONE. Single 60° fracture undulating rough intersected by two 50-60° closely spaced irregular rough fractures. 11.40 - 11.75m: Grey mottled orange. 11.55 - 11.75m: Red siderite cemented nodules.	12.50	73.95	
								Borehole completed at 12.50m.	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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Geotechnical Engineering Limited

BOREHOLE LOG

KCW 8/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 2
Start Date	26 February 2020	Easting	500316.3			Scale	1 : 50
End Date	26 February 2020	Northing	299850.3	Ground level	87.60mOD	Depth	16.30 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
26/02/20 0900hrs								Topsoil over soft dark brown slightly gravelly CLAY. Gravel is subangular fine to coarse limestone, chalk, sandstone and flint with frequent rootlets.			
	1L	1.20 - 1.80	Nil						1.80	85.80	
	2C	1.80 - 3.00	1.80		100			Firm dark brown slightly sandy slightly gravelly CLAY. Gravel is angular to rounded fine to coarse limestone, chalk, sandstone, chert and flint. Rare rootlets.			
	3C	3.00 - 4.30	2.20		95				4.30	83.30	
	4C	4.30 - 5.80	2.20		80			Stiff dark grey slightly gravelly CLAY. Gravel is angular to rounded fine to coarse limestone, sandstone, chalk and flint.			
	5C	5.80 - 7.30	2.20		100						
	6C	7.30 - 8.80	2.20		100						
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-1.80m. Waterflush rotary core drilled (146mm) 1.80-16.30m.

CASING: 168mm diam to 2.20m.

BACKFILL: On completion, hole backfilled with bentonite 16.30-15.00m, cement:bentonite grout 15.00-0.30m and arisings 0.30-0.00m.

REMARKS: Driller notes reduced flush returns 14.80-16.30m (70% returned, flush loss around 15.50m).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 8/19

CLIENT	MJCA					Sheet	2 of 2
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Scale	1 : 50
Start Date	26 February 2020	Easting	500316.3			Depth	16.30 m
End Date	26 February 2020	Northing	299850.3	Ground level	87.60mOD		

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	7C	8.80 - 10.30	2.20		100						
	8C	10.30 - 11.80	2.20		100			11.40m: Cobble of limestone.			
	9C	11.80 - 13.30	2.20		100						
	10C	13.30 - 14.80	2.20		100			14.00m: Lens of orange fine sand.	14.20	73.40	
	11C	14.80 - 16.30	2.20		93			Very stiff light brown mottled dark grey slightly gravelly sandy CLAY. Gravel is angular to rounded fine to coarse chalk, sandstone, bioclastic limestone, oolitic limestone and chert.			
	12Cs	15.00 - 15.20			9 0	NI NI 70		Weak thinly bedded light yellowish brown oolitic LIMESTONE locally recovered non intact. Bedding fractures are subhorizontal very closely and closely spaced undulating rough stained orange. Subvertical fractures are irregular.	15.20	72.40	
26/02/20 1545hrs 1.21m									16.30	71.30	
								Borehole completed at 16.30m.	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks
				Groundwater not encountered prior to use of water flush.

AGS

CONTRACT	CHECKED
35673	EC

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Geotechnical Engineering Limited

BOREHOLE LOG

KCW 9/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 2
Start Date	23 January 2020	Easting	500165.3			Scale	1 : 50
End Date	28 January 2020	Northing	299688.8	Ground level	89.34mOD	Depth	16.20 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
23/01/20 1120hrs									Turf over soft dark grey CLAY with frequent roots.	0.40	88.94	
	1L	1.20	2.70	Nil					Soft dark brown and dark grey slightly gravelly CLAY with a low cobble content. Gravel is subangular to rounded fine to coarse limestone, chalk, sandstone and flint.	2.70	86.64	
	2C	2.70	4.20	2.70		83	NA		Stiff dark brown and dark grey slightly gravelly slightly sandy CLAY with a low cobble content. Gravel is subangular to rounded fine to coarse limestone, chalk, sandstone and flint.			
23/01/20 1620hrs 1.30m												
24/01/20 0805hrs 1.40m	3C	4.20	5.70	2.70		100						
	4C	5.70	7.20	2.70		100						
	5C	7.20	8.70	2.70		100			7.75m: Cobble of medium strong dark green sandstone.			
									Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.70m Waterflush rotary core drilled (146mm) 2.70-16.20m.

CASING: 168mm to 2.70m.

BACKFILL: On completion, boreholoe backfilled with bentonite 16.20-13.90m and bentonite:cement grout 13.90-0.00m.

REMARKS: Driller notes loss of flush 14.00-16.20m.

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 9/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 2
Start Date	23 January 2020	Easting	500165.3			Scale	1 : 50
End Date	28 January 2020	Northing	299688.8	Ground level	89.34mOD	Depth	16.20 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range	I_f	instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.70 - 10.20	2.70		100						
	7C	10.20 - 11.70	2.70		99						
24/01/20 1250hrs 3.00m											
28/01/20 0915hrs 3.00m	8C	11.70 - 13.20	2.70		100						
	9C	13.20 - 14.70	2.70		100			Very stiff dark greenish brown slightly gravelly slightly sandy CLAY.	13.30	76.04	
								13.75m: Cobble of weak light brown oolitic limestone.	13.80	75.54	
								Light yellowish brown clayey fine SAND with frequent fine to coarse gravel sized sandstone lithorelicts. 13.80 - 14.30m: Subvertical undulating rough fissure.	14.70	74.64	
	10C	14.70 - 16.20	2.70		96 86 66	xx		Weak light brown oolitic SANDSTONE. Fractures are subhorizontal and 70° to subvertical closely spaced undulating and irregular rough. 15.00 - 15.60m: Locally extremely weak.			
28/01/20 1245hrs 2.90m									16.20	73.14	
								Borehole completed at 16.20m.	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

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Geotechnical Engineering Limited

BOREHOLE LOG

KCW 10/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	1 of 3
Start Date	27 February 2020	Easting	500299.5			Scale	1 : 50
End Date	28 February 2020	Northing	299699.8	Ground level	88.22mOD	Depth	19.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
27/02/20 0915hrs								Topsoil over stiff CLAY. (Driller's description)	1.20	87.02	
	1L	1.20 - 2.20	Nil					Firm light brown and dark brown mottled dark grey slightly gravelly CLAY. Gravel is angular to rounded fine to coarse chert, limestone, sandstone and chalk. Rare roots.	2.20	86.02	
	2C	2.20 - 3.70	2.20		100			Stiff dark brown slightly gravelly slightly sandy CLAY. Gravel is subangular to rounded fine to coarse chalk, sandstone and limestone. Rare roots.			
	3C	3.70 - 5.20	2.20		100				4.40	83.82	
								Stiff dark grey slightly gravelly CLAY. Gravel is subangular to rounded fine to coarse chalk, sandstone, limestone and chert.			
	4C	5.20 - 6.70	2.20		100						
	5C	6.70 - 8.20	2.20		100						
								Continued Next Page	{8.00}		

EQUIPMENT: Geotechnical Pioneer rig.

METHOD: Hand dug inspection pit 0.00-1.20m. Dynamic sampled (128mm) 1.20-2.20m. Waterflush rotary core drilled (146mm) 2.20-19.70m.

CASING: 168mm diam to 2.20m.

BACKFILL: On 28/02/20, hole backfilled with bentonite 19.70-18.00m, cement:bentonite grout 18.00-0.30m and arisings 0.30-0.00m.

REMARKS: Driller notes reduced flush returns 18.20-19.70m (70% returned).

EXPLORATORY HOLE LOGS SHOULD BE READ IN CONJUNCTION WITH KEY SHEETS

water strike (m)	casing (m)	rose to (m)	time to rise (min)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 10/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	2 of 3
Start Date	27 February 2020	Easting	500299.5			Scale	1 : 50
End Date	28 February 2020	Northing	299699.8	Ground level	88.22mOD	Depth	19.70 m

progress date/time water depth	sample no & type	depth (m) from to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
	6C	8.20 - 9.70	2.20		100						
	7C	9.70 - 11.20	2.20		100						
	8C	11.20 - 12.70	2.20		88			11.20 - 12.70m: Slightly sandy slightly gravelly.			
	9C	12.70 - 14.20	2.20		97						
	10Cs	13.80 - 14.00									
	11C	14.20 - 15.70	2.20		100						
	12C	15.70 - 17.20	2.20		97			15.75m: Cobble of limestone. 16.10 - 16.20m: Stiff dark grey silty clay.			
	13C	17.20 - 18.20	2.20		100						
	14Cs	17.60 - 17.80							17.90	70.32	
								Continued Next Page	{18.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:31 CD EC

Geotechnical Engineering Limited

BOREHOLE LOG

KCW 10/19

CLIENT	MJCA						
SITE	EAST NORTHANTS RESOURCE MANAGEMENT FACILITY, PETERBOROUGH					Sheet	3 of 3
Start Date	27 February 2020	Easting	500299.5			Scale	1 : 50
End Date	28 February 2020	Northing	299699.8	Ground level	88.22mOD	Depth	19.70 m

progress date/time water depth	sample no & type	depth (m) from	to	casing depth (m)	test type & value	samp. /core range		instru -ment	description	depth (m)	reduced level (m)	legend
	15C	18.20	19.70	2.20		50 5 0			Stiff light brown slightly gravelly sandy CLAY. Gravel is subangular to rounded fine and medium chalk sandstone and limestone.	18.20	70.02	
27/02/20 1645hrs 3.13m									Medium strong light brown oolitic LIMESTONE and weak light brown SANDSTONE. Recovered as angular to rounded fine to coarse gravel sized fragments. Limited recovery.	19.70	68.52	
28/02/20 0745hrs 3.46m									Borehole completed at 19.70m.	{28.00}		

water strike (m)	casing (m)	rose to (m)	time to rise (m)	remarks	CONTRACT	CHECKED
				Groundwater not encountered prior to use of water flush.	35673	EC

Geotechnical Engineering Ltd, Tel. 01452 527743 35673.GPJ TRIALJH.GPJ GEOTECH2.GLB 21/04/2020 11:39:31 CD EC

Borehole Log Legend

Soils

- Topsoil/ soil
- Made ground
- Boulders and cobbles
- Gravel
- Sand
- Silt
- Clay
- Peat

NOTE: Composite soil types will be signified by combined symbols, e.g.

- Gravelly sand

Rocks

- Chalk
- Limestone
- Conglomerate
- Breccia
- Sandstone
- Siltstone
- Mudstone
- Interbedded mudstone and siltstone
- Shale
- Ironstone
- Pyroclastic (volcanic ash)

Installations

- Slotted pipe with gravel pack
- Plain pipe with bentonite seal
- Backfilled with arisings
- Backfilled with Bentonite

Symbols

- Water strike
- Water level after 20mins
- Water level

mbgl metres below ground level

NB Depth (thickness) in metres
Reduced Level in metres above Ordnance Datum

Samples and Testing

TCR Total core recovery (%)

SCR Solid core recovery (%)

RQD Rock quality designation (%)

FI Fracture index (number of fractures per m)

NI Core not intact

Note
Fracture index is not reported for soil strata.

MJCA
Technical advisers on environmental issues
Baddesley Colliery Offices,
Main Road, Baxterley,
Atherstone,
Warwickshire, CV9 2LE
Telephone: 01827 717891
Facsimile: 01827 718507

Geotechnical Engineering Limited

KEY TO EXPLORATORY HOLE LOGS

Sample type

D Small disturbed	U Undisturbed	L Dynamic	ES Environmental - soil	Cs Core subsample (prepared)
B Bulk disturbed	UT Undisturbed thin wall	C Core	EW Environmental - water	Ls Dynamic subsample (prepared)
LB Large bulk disturbed	P Piston	W Water		

Test type

S SPT - Split spoon sampler followed by uncorrected SPT 'N' Value
C SPT - Solid cone followed by uncorrected SPT 'N' Value
(*250 - Where full test drive not completed, linearly extrapolated 'N' value reported, ** - Denotes no effective penetration)
H Hand vane - direct reading in kPa - not corrected for BS1377 (1990). Re* denotes refusal
M Mackintosh probe - number of blows to achieve 100mm penetration
Mx Mexe cone - average reading of equivalent CBR value in %
PP Pocket penetrometer - direct reading in kg/sq.cm
Vo Headspace vapour reading, uncorrected peak values in ppm, using a PID (calibrated with Isobutylene, using a 10.6eV bulb)

Sample/core range/l_f

Dynamic sample

Undisturbed sample - open drive including thin wall. Symbol length reflects recovery

x x = Total Core Recovery (TCR) as percentage of core run

y y = Solid Core Recovery (SCR) as percentage of core run. Assessment of core is based on full diameter.

z z = Rock Quality Designation (RQD). The amount of solid core greater than 100mm expressed as percentage of core run.

Where SPT has been carried out at beginning of core run, disturbed section of core excluded from SCR and RQD assessment.

l_f - fracture spacing - the modal fracture spacing (mm) over the indicated length of core. Where spacing varies significantly, the minimum, mode and maximum values are given. NI = non-intact core NA = not applicable

Instrumentation

Porous tip | Perforated standpipe | Granular response zone | Bentonite seal | Cement/ bentonite grout | Soil Backfill | Concrete

Stratum boundaries

Estimated boundary

Grading boundary

Logging

The logging of soils and rocks has been carried out in general accordance with BS 5930:2015.

Chalk is logged in general accordance with Lord et al (2002) CIRIA C574. Where possible, dynamic samples in chalk have been logged in accordance with CIRIA C574; descriptions and gradings (if presented) should be treated with caution given the potential for sample disturbance.

For rocks the term fracture has been used to identify a mechanical break within the core. Where possible incipient and drilling induced fractures have been excluded from the assessment of fracture state. Where doubt exists, a note has been made in the descriptions. All fractures are considered to be continuous unless otherwise reported.

Made Ground is readily identifiable when, within the material make up, man made constituents are evident. Where Made Ground appears to be reworked natural material the differentiation between in situ natural deposits and Made Ground is much more difficult to ascertain. The interpretation of Made Ground within the logs should therefore be treated with caution.

The descriptors "topsoil" and "tarmacadam" are used as generic terms and do not imply conformation to any particular standard or composition.

Rootlets are defined as being less than 2mm in diameter, roots are defined as in excess of 2mm diameter.

General Comments

The process of drilling and sampling will inevitably lead to disturbance, mixing or loss of material in some soil and rocks.

Indicated water levels are those recorded during the process of drilling or excavating exploratory holes and may not represent standing water levels.

All depths are measured along the axis of the borehole and are related to ground level at the point of entry. All inclinations are measured normal to the axis of the core.

Where provided, the stratigraphic names/geological rock units are for guidance only and may not be wholly accurate.

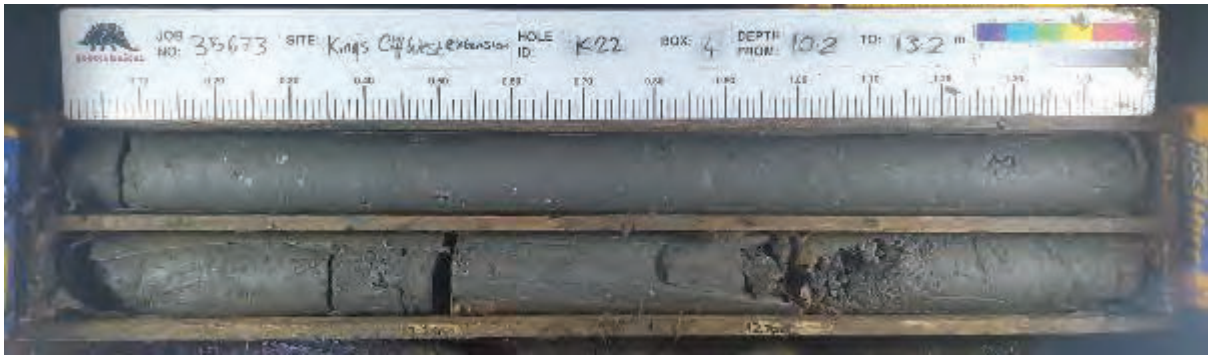
APPENDIX C

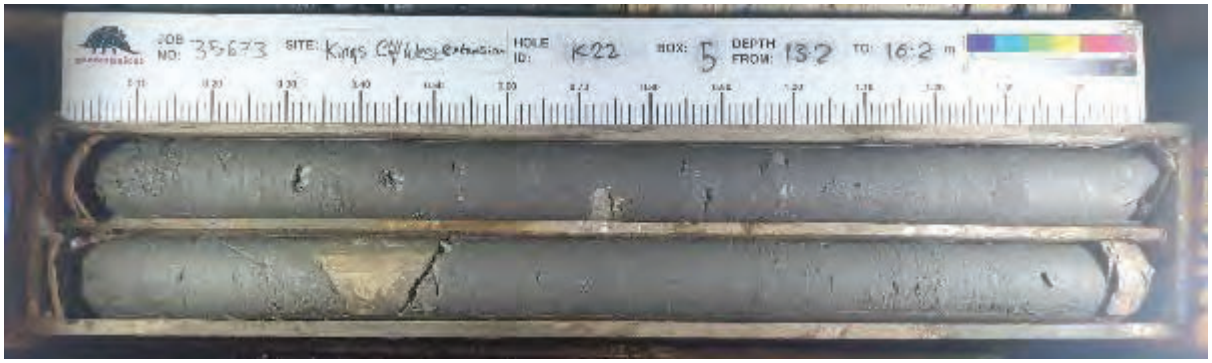
PHOTOGRAPHS OF CORE RECOVERED FROM BOREHOLES DRILLED AT THE SITE BETWEEN NOVEMBER 2019 AND MARCH 2020

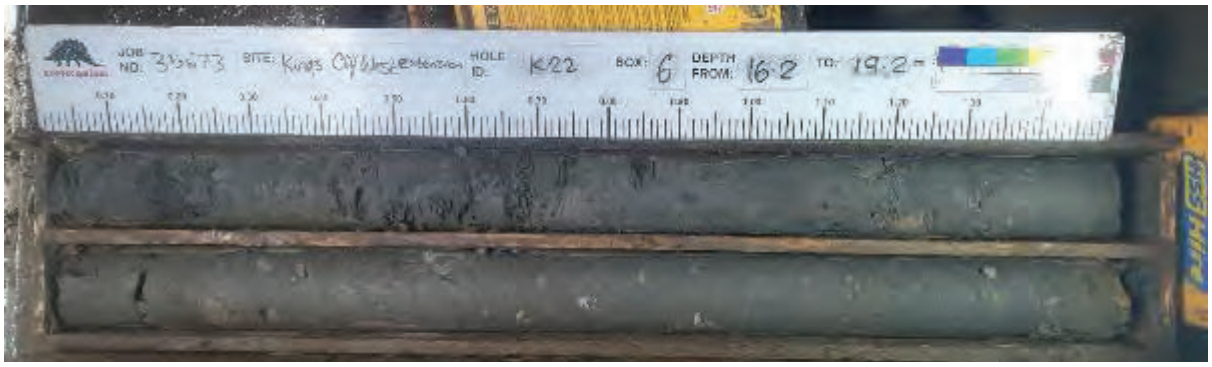
Borehole K22 – 1.2mbgl to 10.2mbgl[1]

[1] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

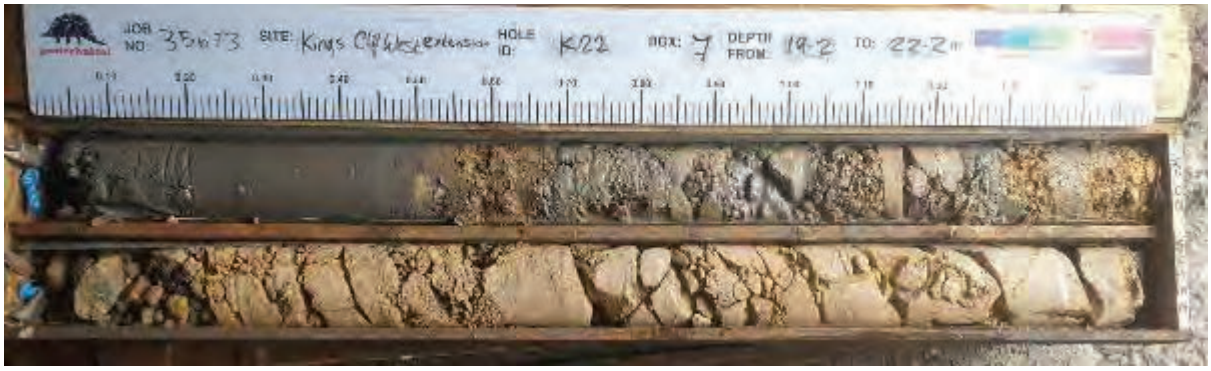
Borehole K22 - 10.2mbgl to 19.2mbgl



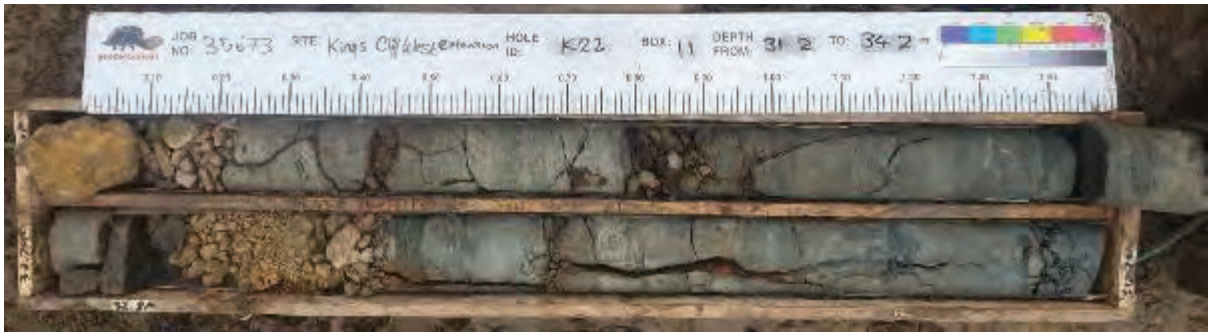




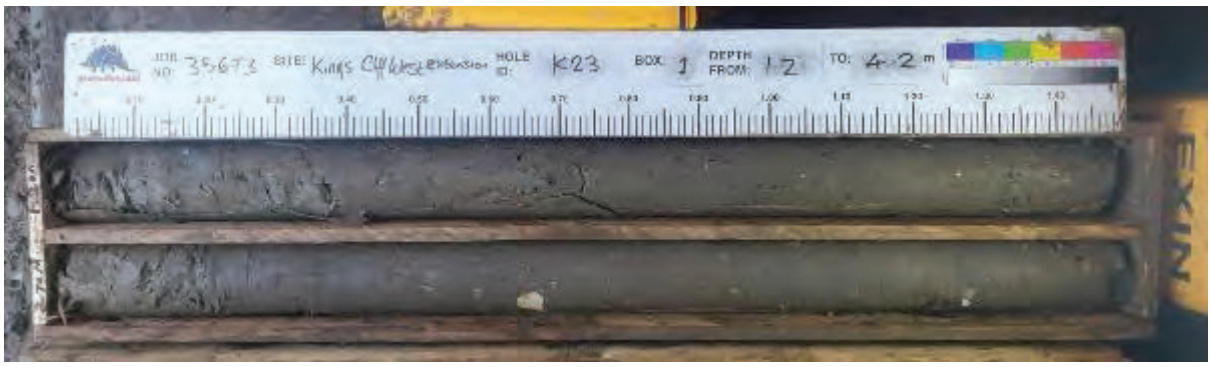
Borehole K22 – 19.2mbgl to 28.2mbgl

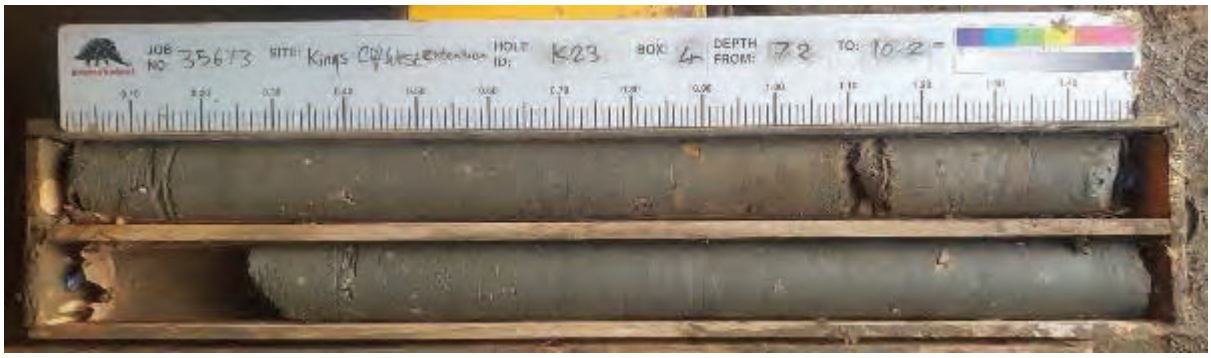


Borehole K22 – 28.2mbgl to 35.7mbgl



Borehole K23 – 1.2mbgl to 10.2mbgl[2] [3]

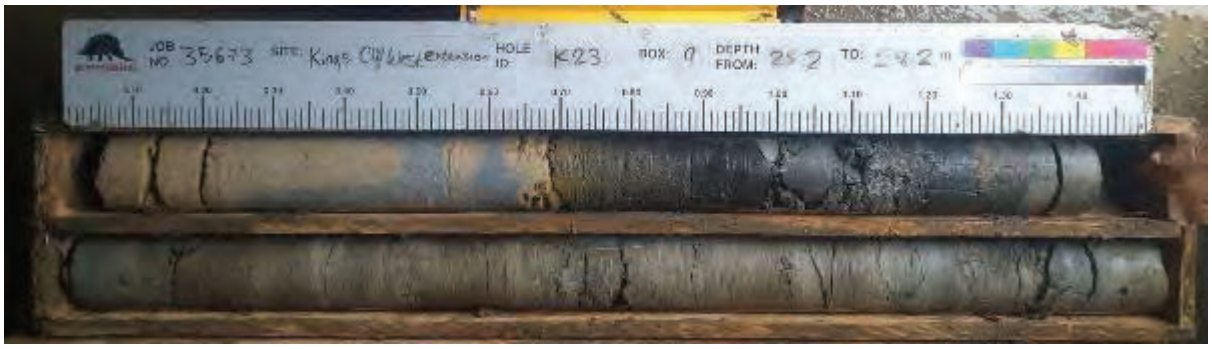




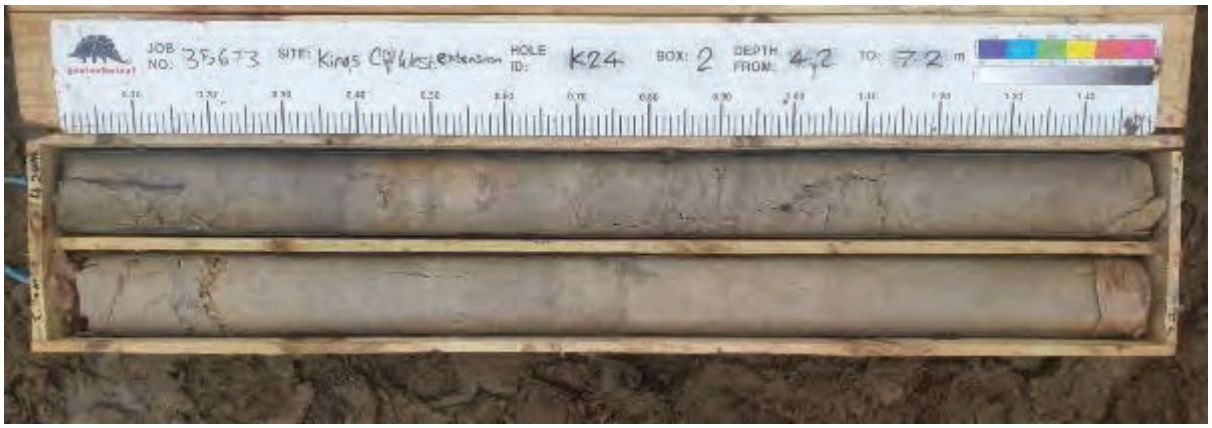
[2] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.
[3] Box reference sequence is incorrect for cores from 7.2mbgl to 25.2mbgl but the depths shown are correct..

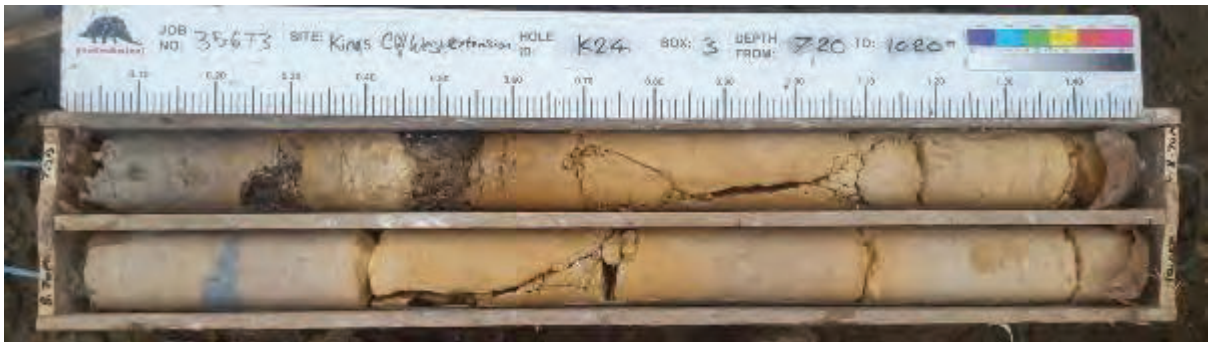
Borehole K23 – 10.2mbgl to 22.2mbgl

Borehole K23 – 22.2mbgl to 34.2mbgl



Borehole K24 – 1.2mbgl to 10.2mbgl[4]

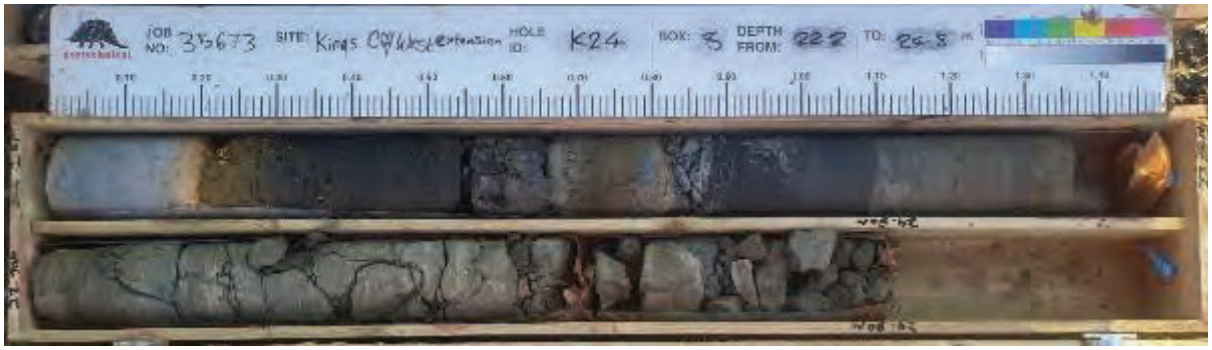


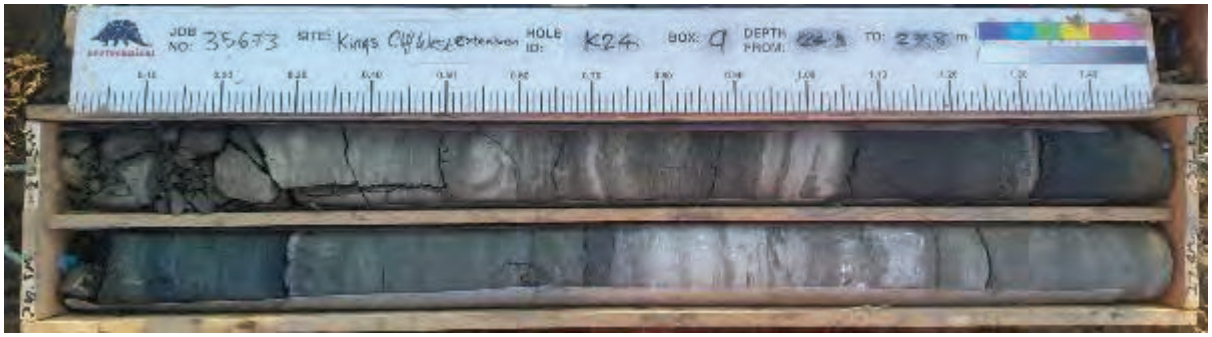


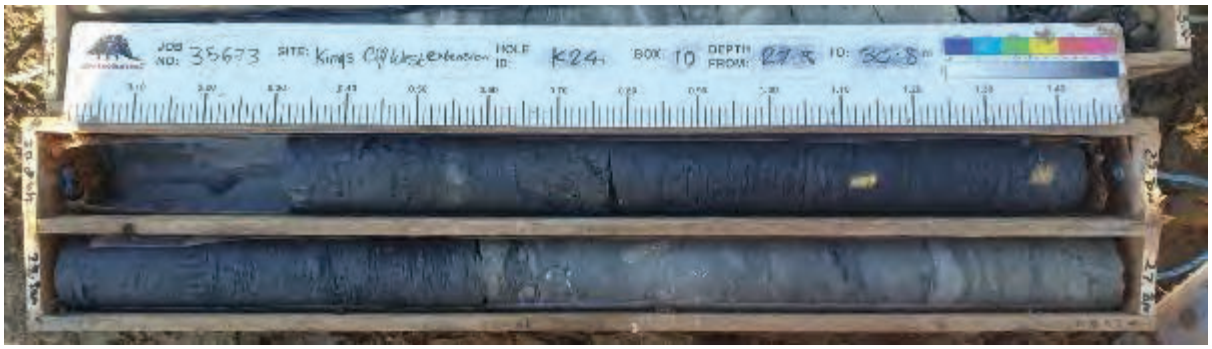
[4] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K24 – 10.2mbgl to 19.2mbgl

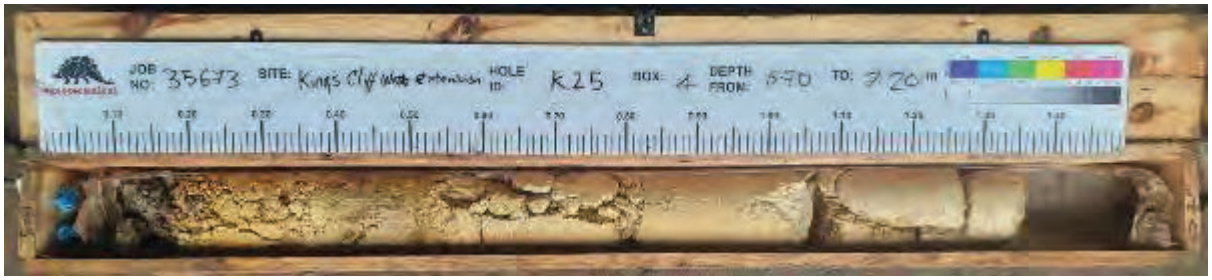
Borehole K24 – 19.2mbgl to 30.8mbgl





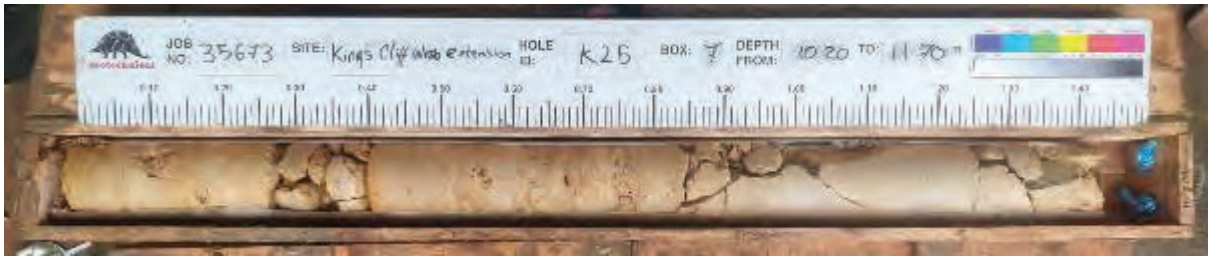


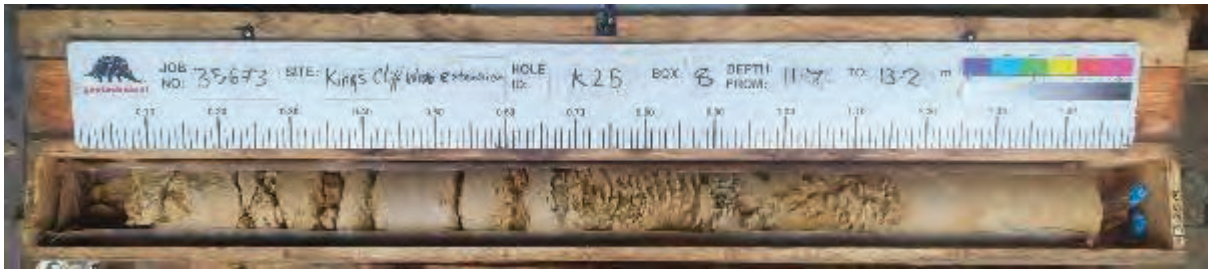
Borehole K25 – 1.2mbgl to 7.2mbgl[5]



[5] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

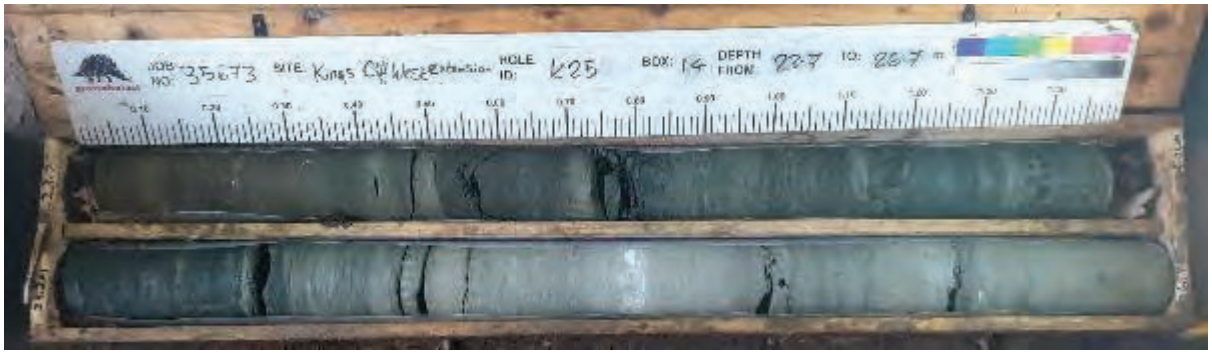
Borehole K25 – 7.2mbgl to 13.2mbgl





Borehole K25 – 13.2mbgl to 20.7mbgl

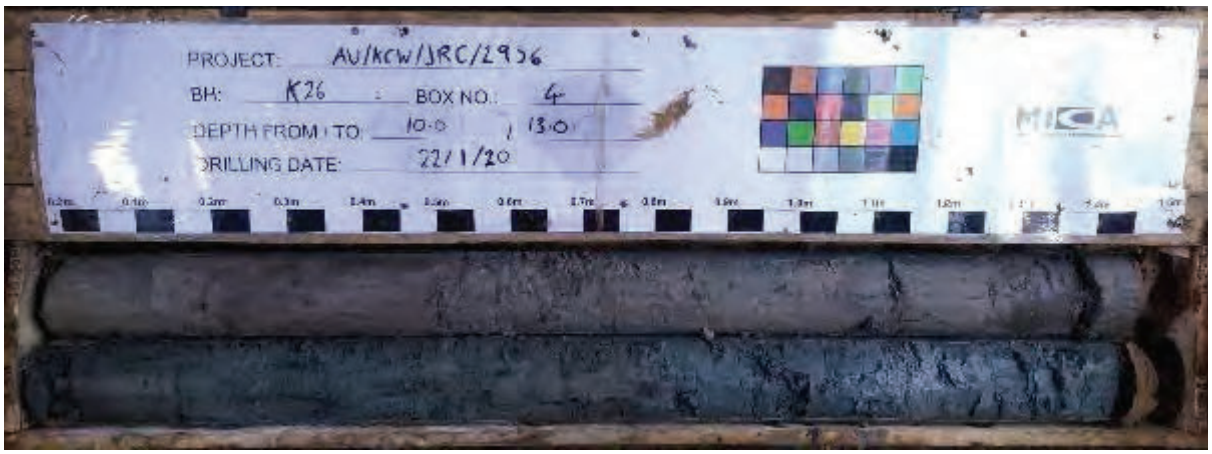
Borehole K25 – 20.7mbgl to 28.2mbgl



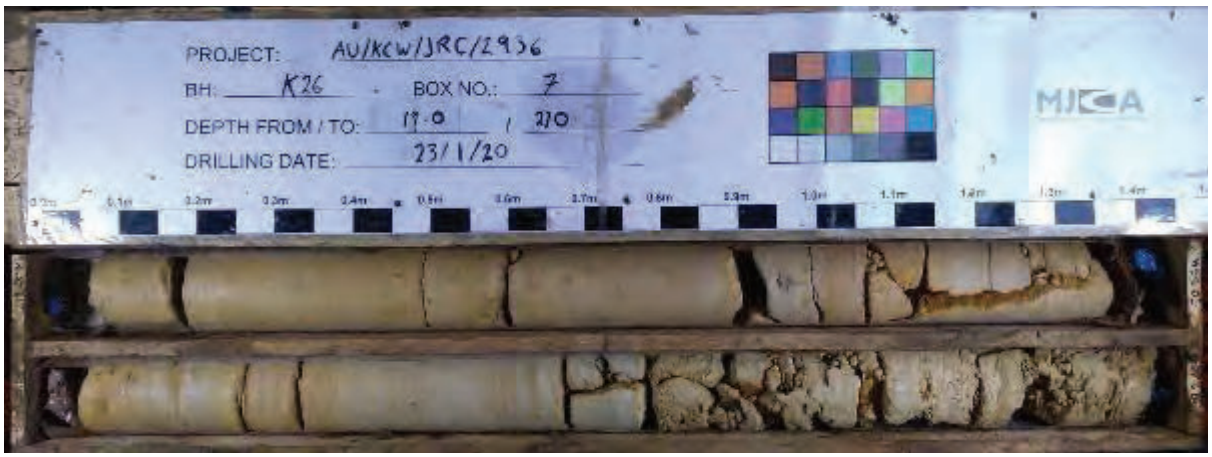
Borehole K26 – 1.2mbgl to 10.0mbgl[6]

[6] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K26 – 10.0mbgl to 19.0mbgl

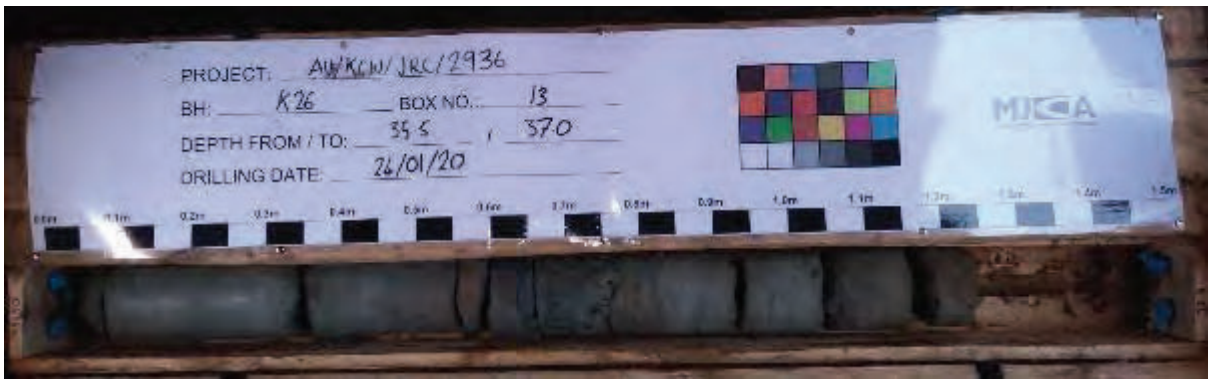


Borehole K26 – 19.0mbgl to 26.5mbgl



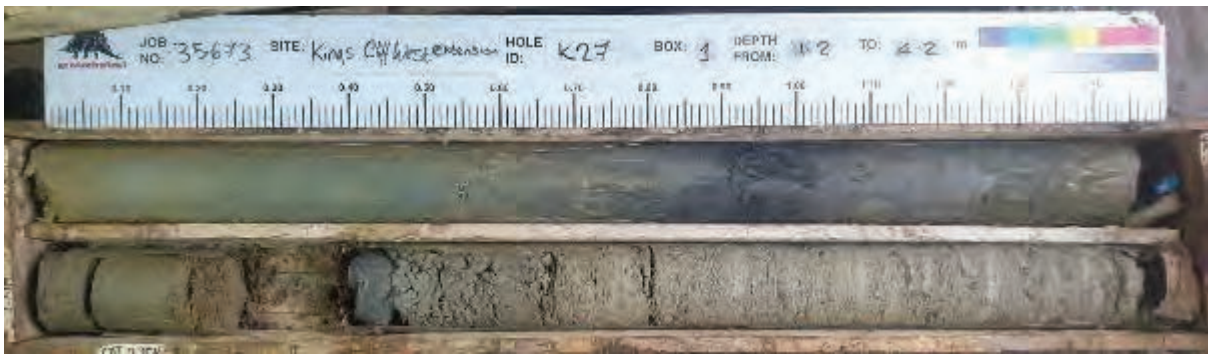
Borehole K26 – 26.5mbgl to 35.5mbgl

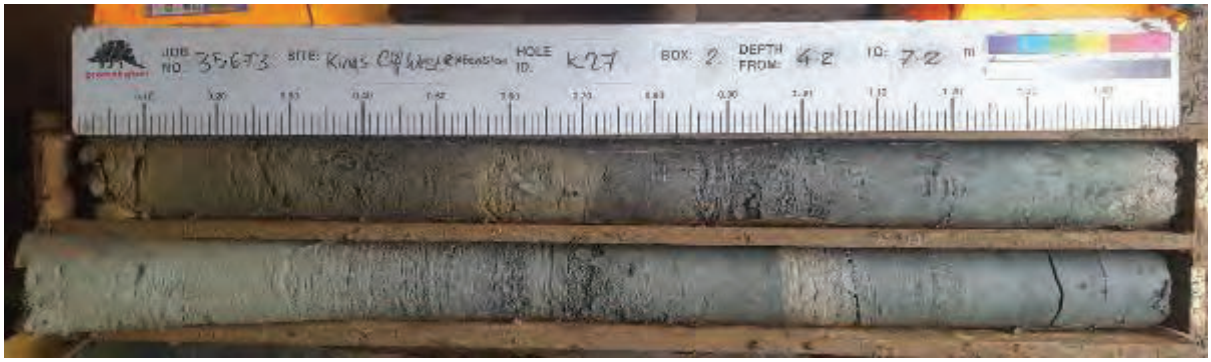
Borehole K26 – 35.5mbgl to 38.2mbgl[7]

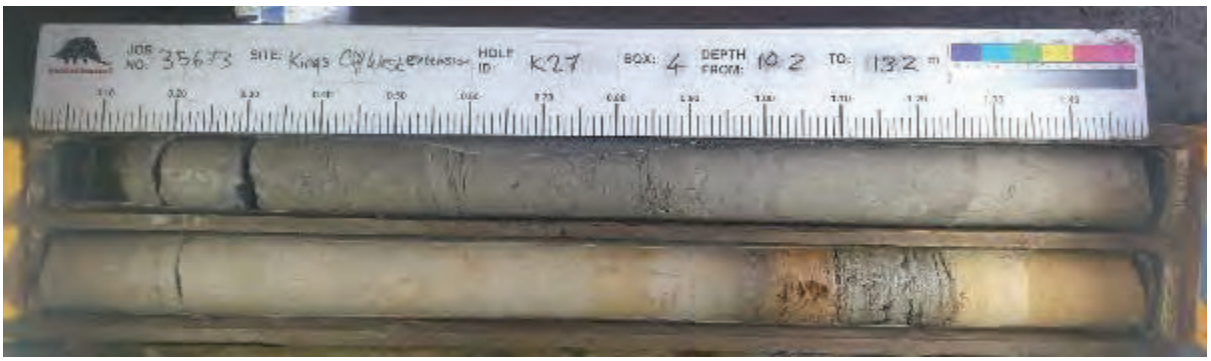


[7] Note that core from 35.5mbgl to 38.2mbgl was contained in a single box (box 13). The box was dropped prior to logging and photographing the core. In the photograph the core from 37.0mbgl to 38.2mbgl is shown in another box where it was placed due to box 13 being damaged.

Borehole K27 – 1.2mbgl to 13.2mbgl[8]

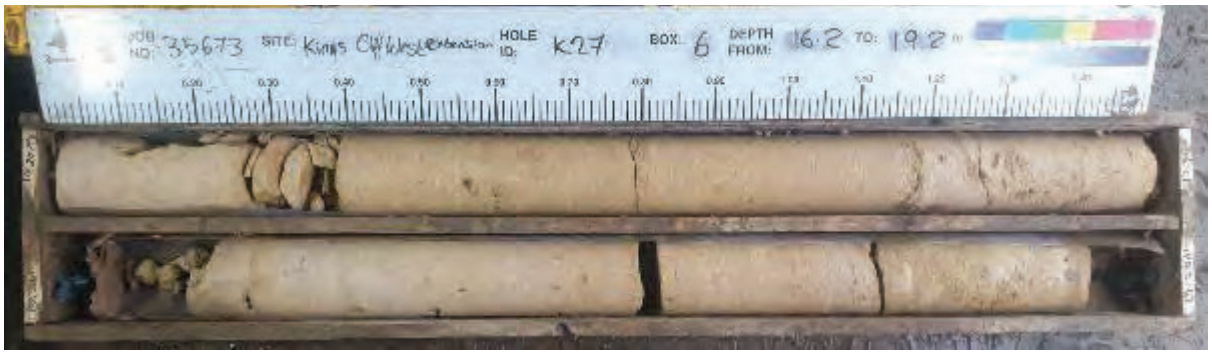




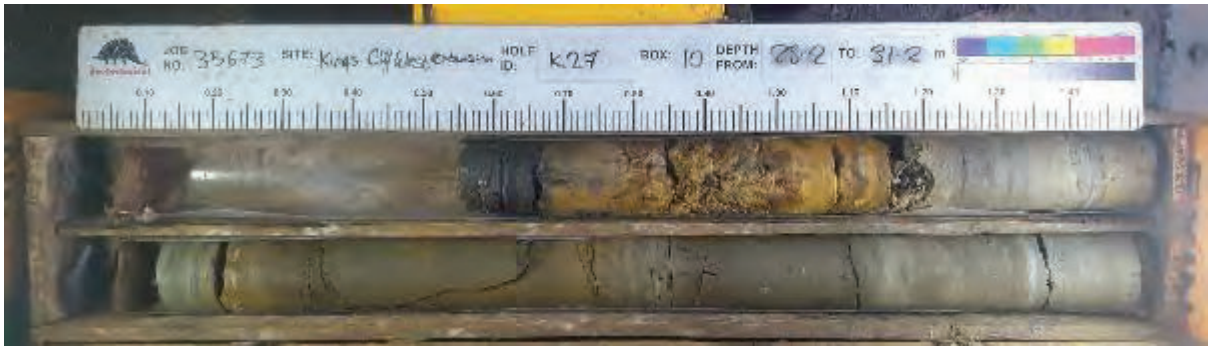


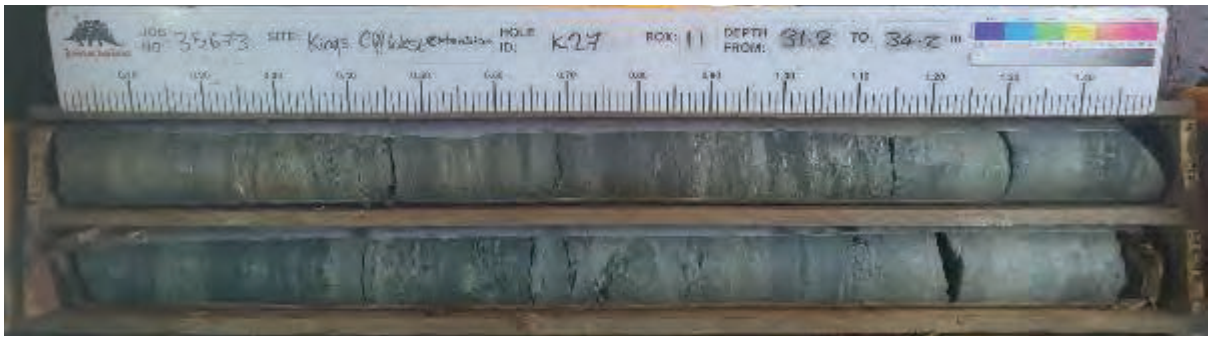
[8] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

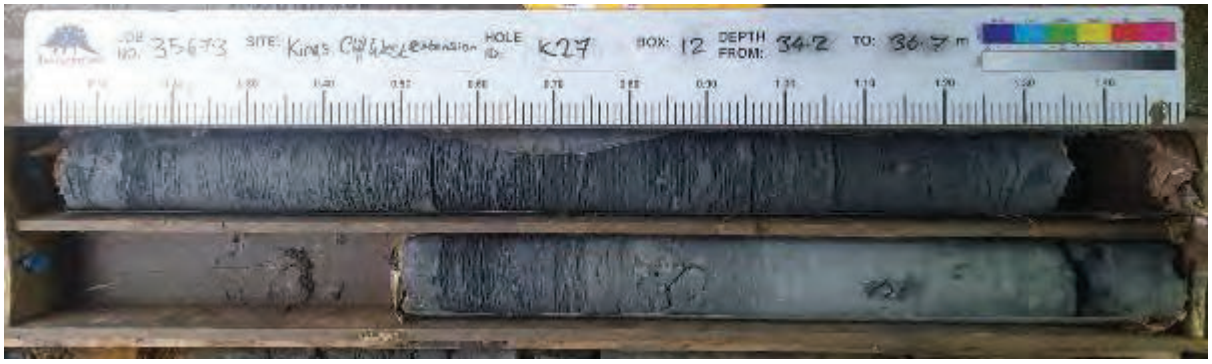
Borehole K27 – 13.2mbgl to 25.2mbgl



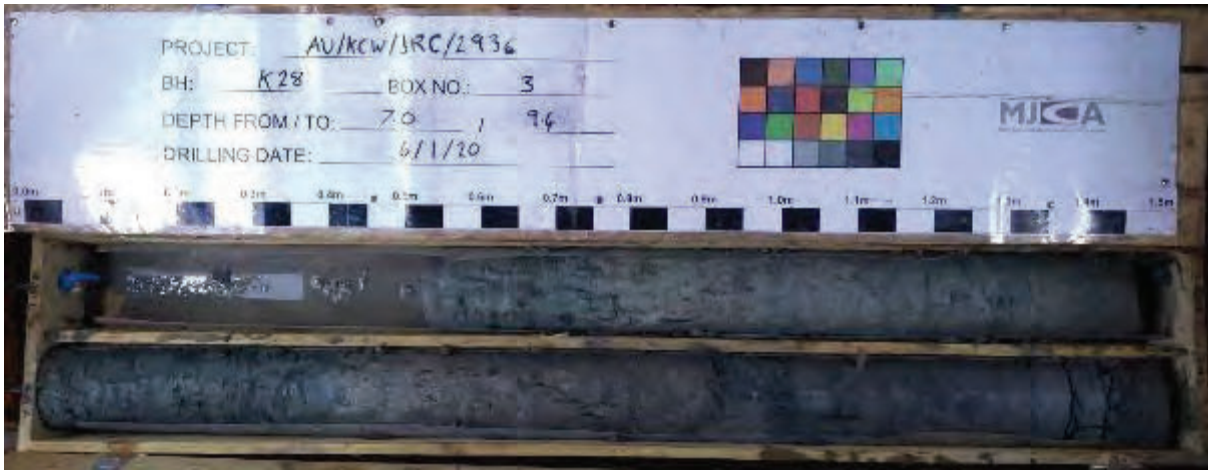
Borehole K27 – 25.2mbgl to 36.7mbgl





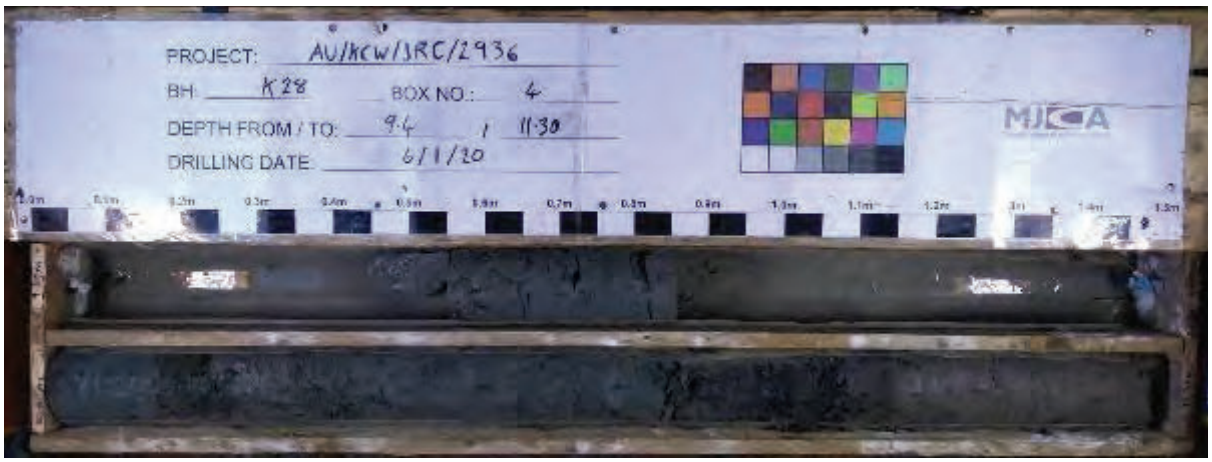


Borehole K28 – 1.2mbgl to 9.4mbgl[9]

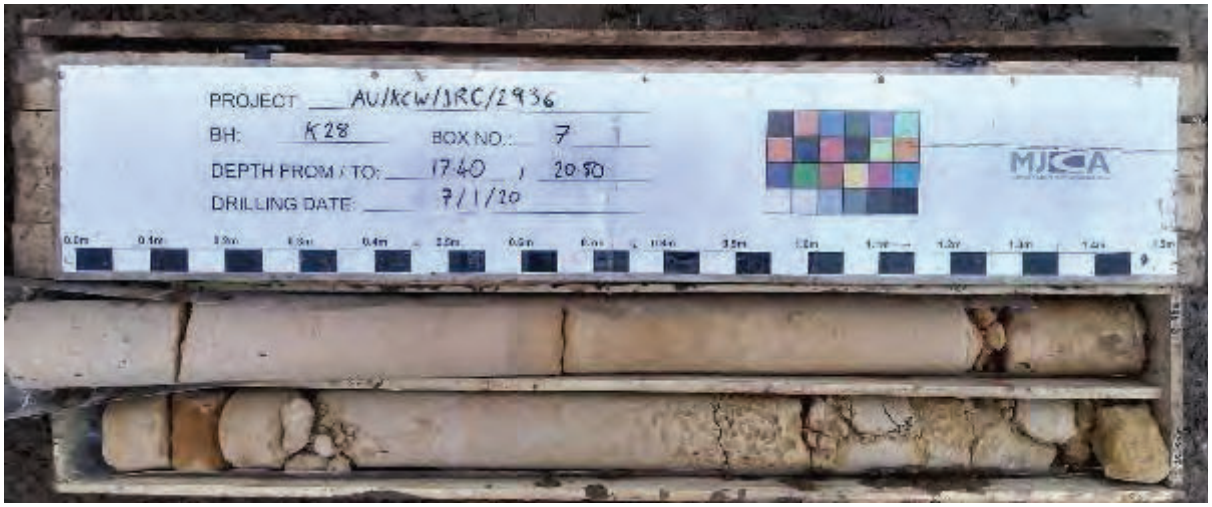


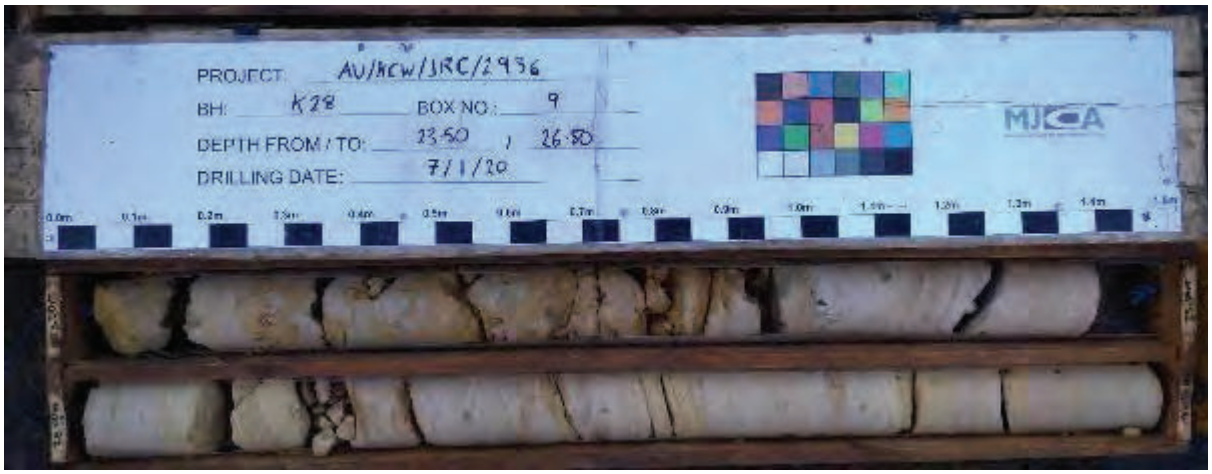
[9] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K28 – 9.4mbgl to 17.4mbgl



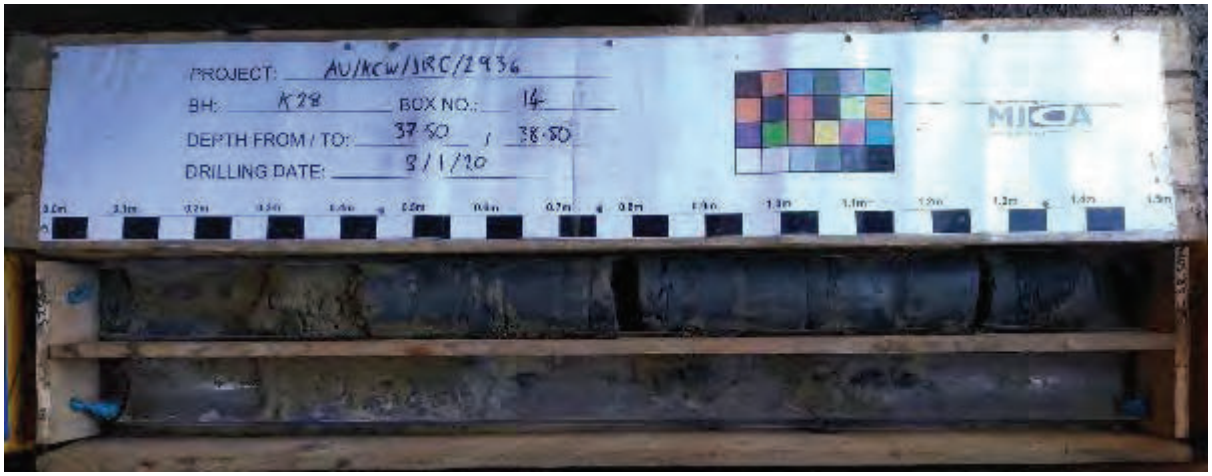
Borehole K28 – 17.4mbgl to 26.5mbgl





Borehole K28 – 26.5mbgl to 35.5mbgl

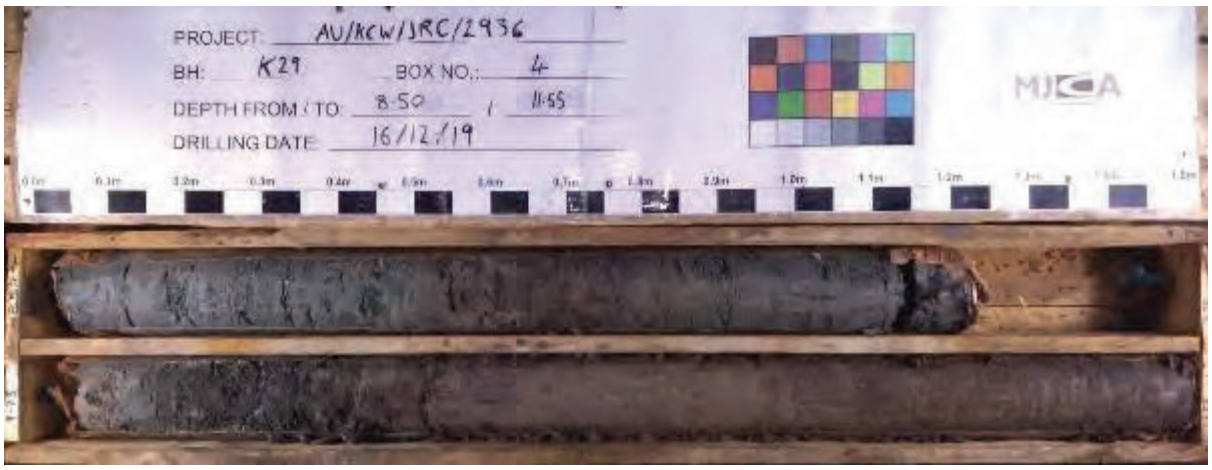
Borehole K28 – 35.5mbgl to 38.5mbgl



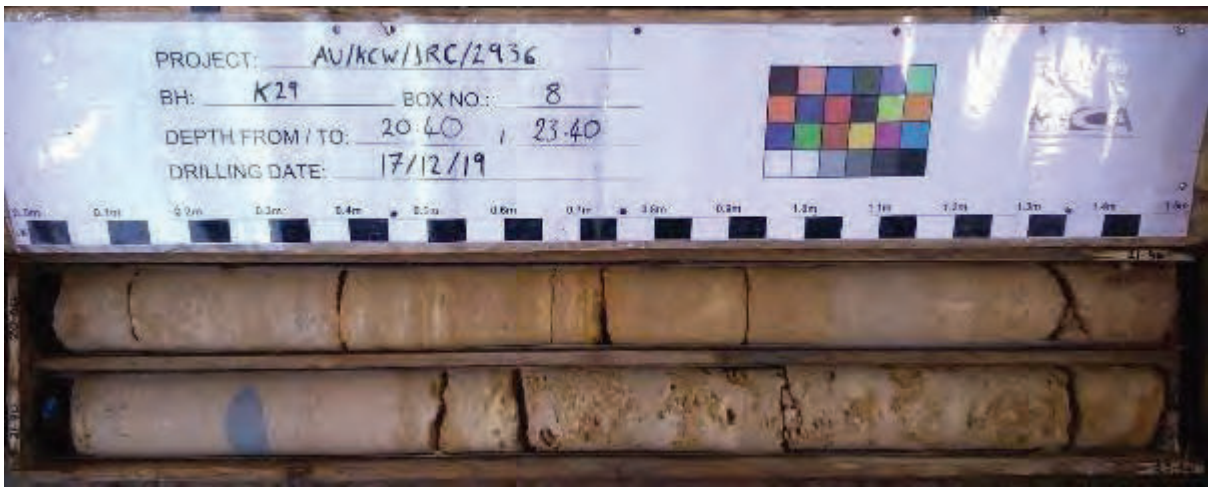
Borehole K29 – 1.2mbgl to 8.5mbgl[10]

[10] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K29 – 8.5mbgl to 17.45mbgl



Borehole K29 – 17.45mbgl to 26.4mbgl



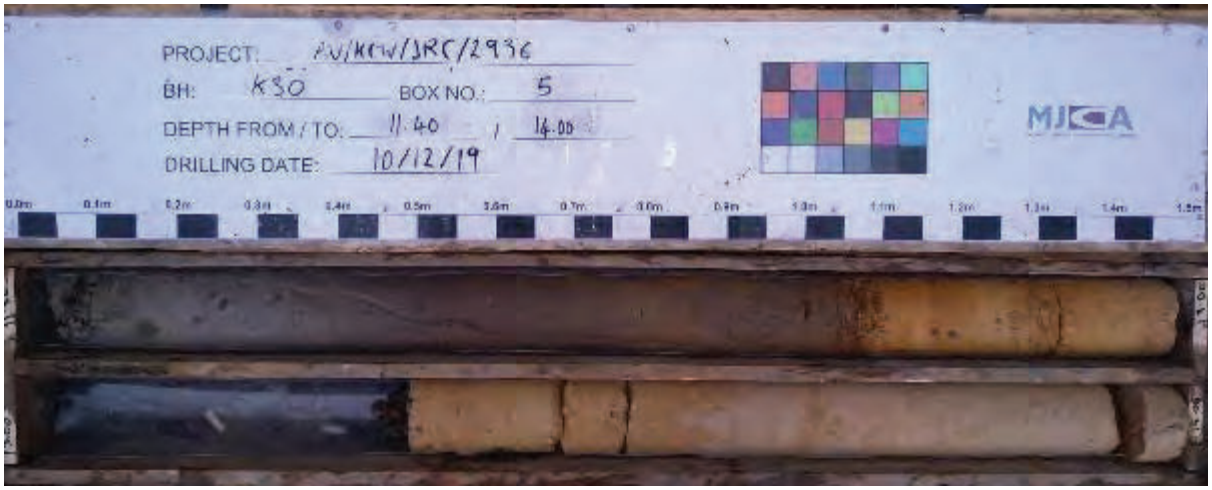
Borehole K29 – 26.4mbgl to 35.75mbgl

Borehole K29 – 35.75mbgl to 37.25mbgl

Borehole K30 – 1.2mbgl to 8.3mbgl[11]

[11] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K30 – 8.3mbgl to 16.15mbgl



Borehole K30 – 16.15mbgl to 25.1mbgl

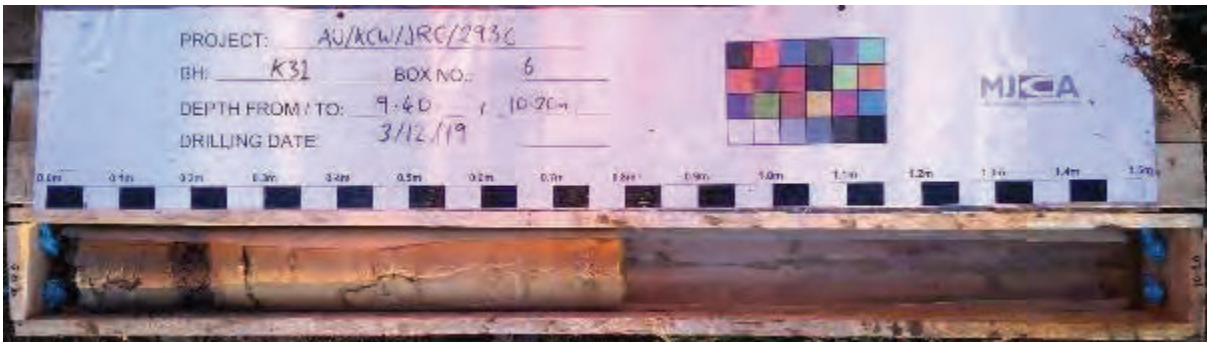
Borehole K30 – 25.1mbgl to 33.8mbgl

Borehole K30 – 33.8mbgl to 35.75mbgl

Borehole K31 – 1.2mbgl to 6.9mbgl[12]

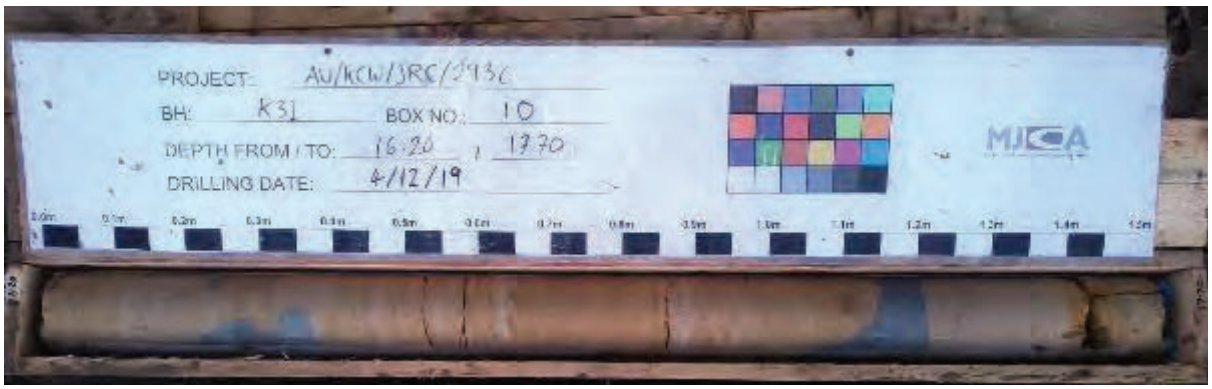
[12] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

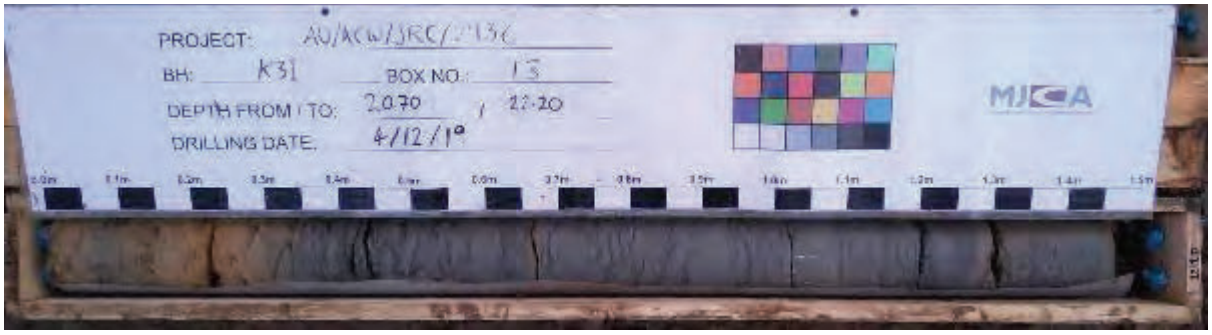
Borehole K31 – 6.9mbgl to 10.2mbgl



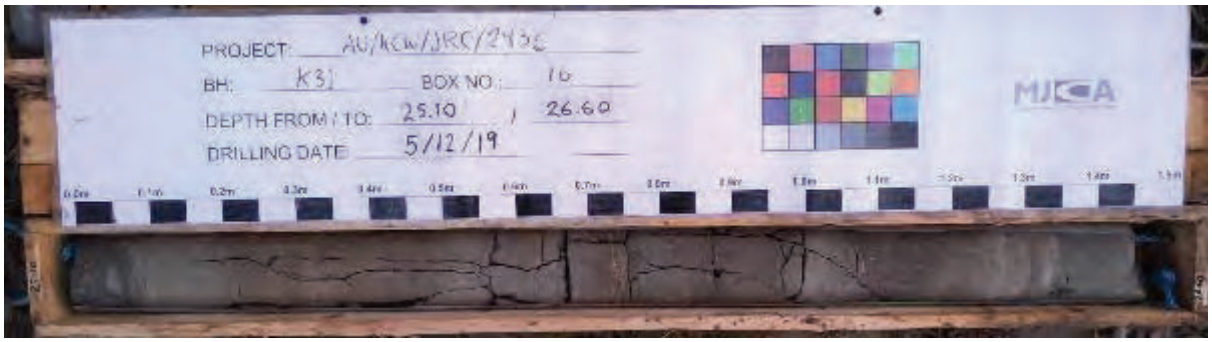
Borehole K31 – 10.2mbgl to 16.2mbgl

Borehole K31 – 16.2mbgl to 22.2mbgl

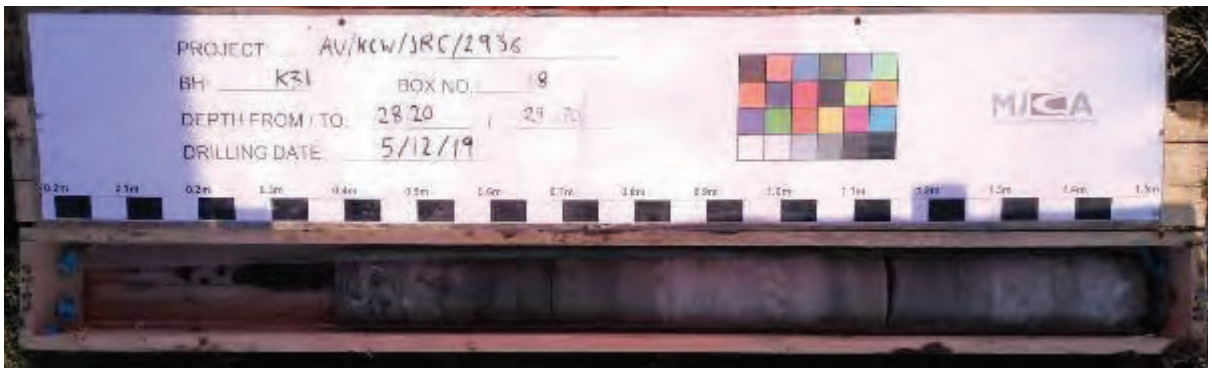


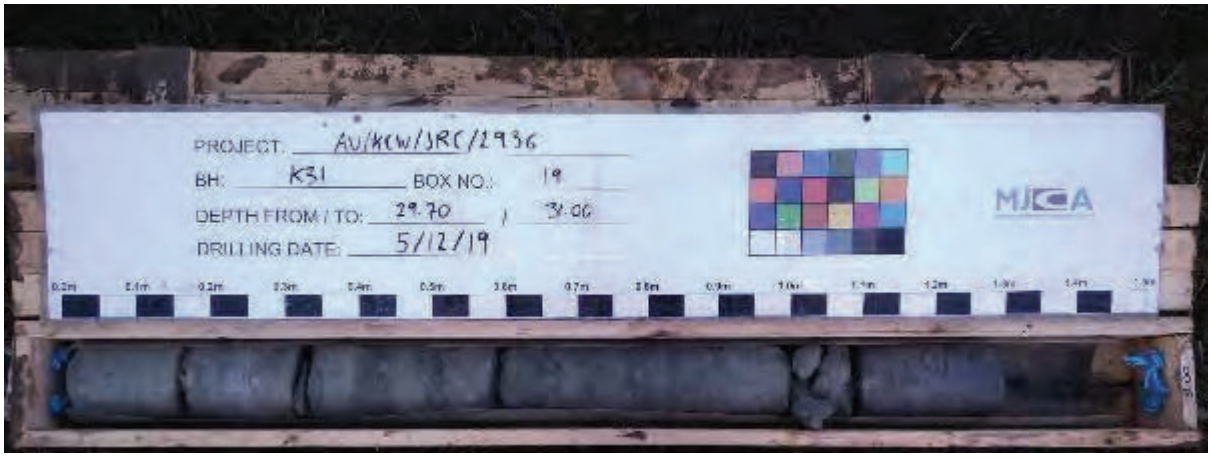


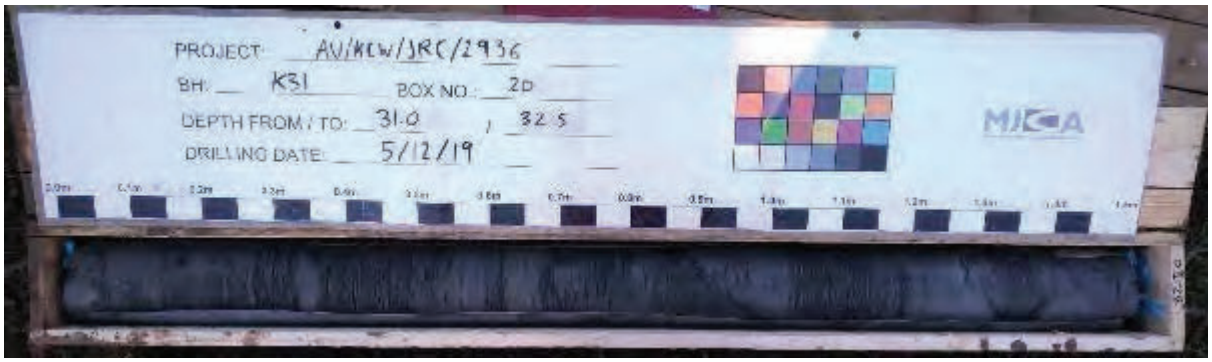
Borehole K31 – 22.2mbgl to 28.2mbgl



Borehole K31 – 28.2mbgl to 32.5mbgl





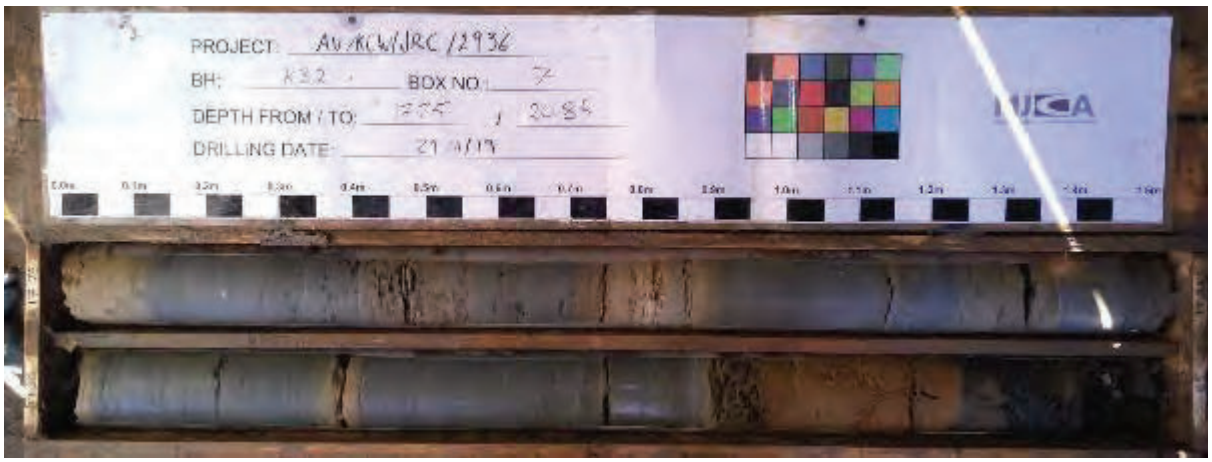


Borehole K32 – 1.2mbgl to 8.95mbgl[13]

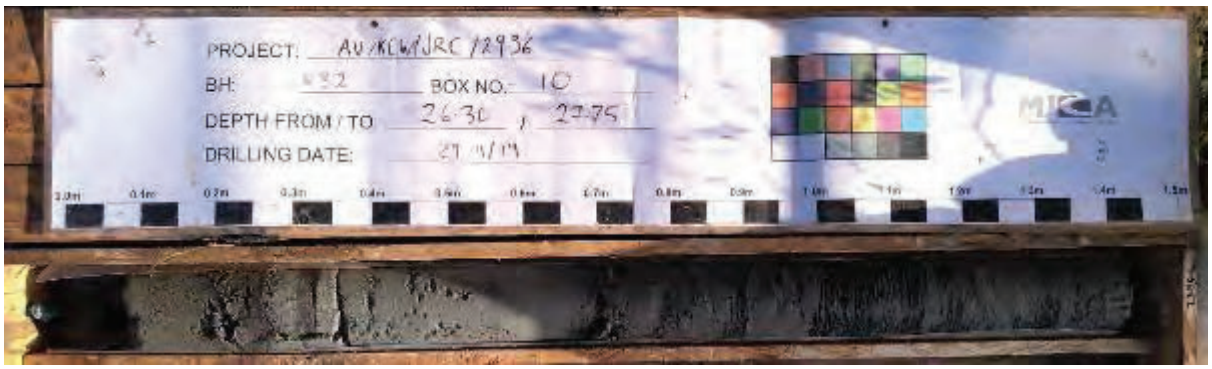
[13] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K32 – 8.95mbgl to 17.75mbgl

Borehole K32 – 17.75mbgl to 26.3mbgl



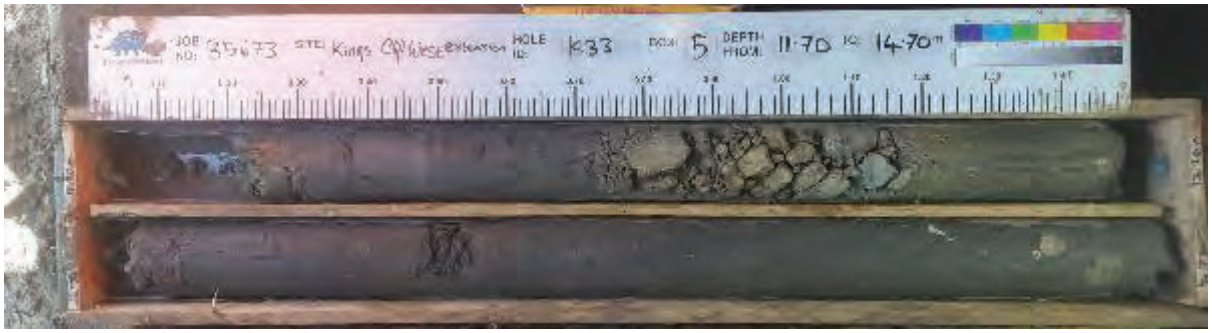
Borehole K32 – 26.3mbgl to 27.75mbgl

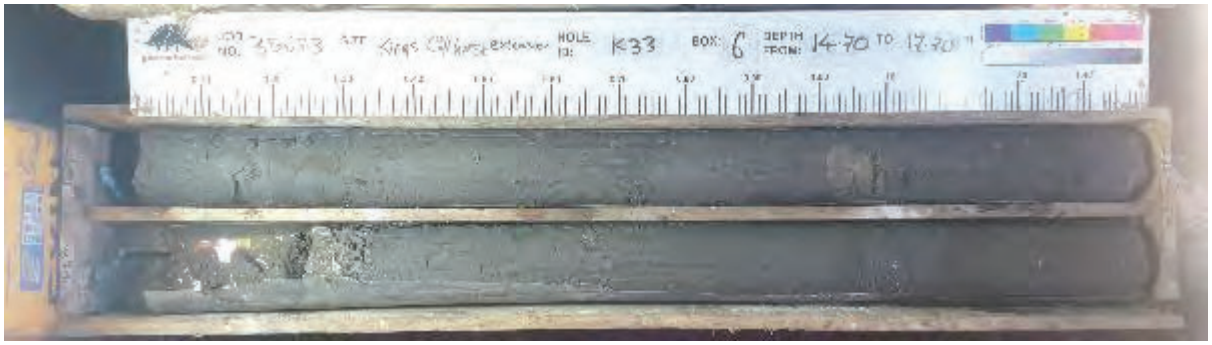


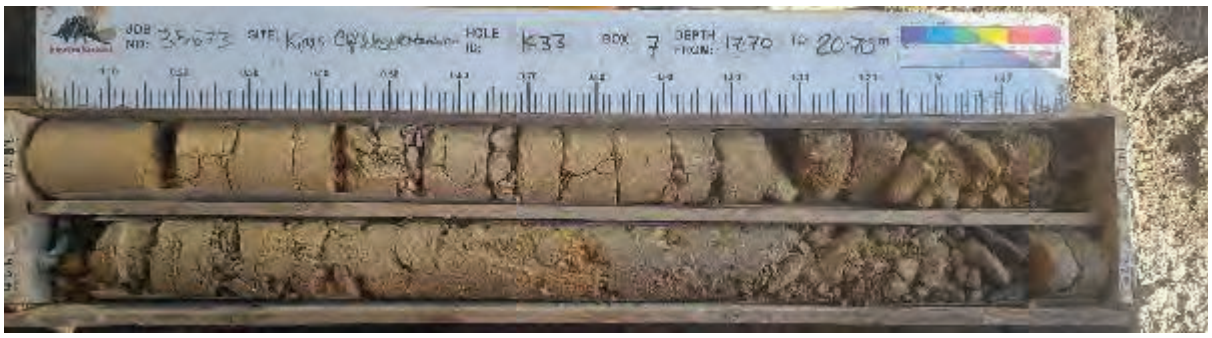
Borehole K33 – 1.2mbgl to 8.7mbgl[14]

[14] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

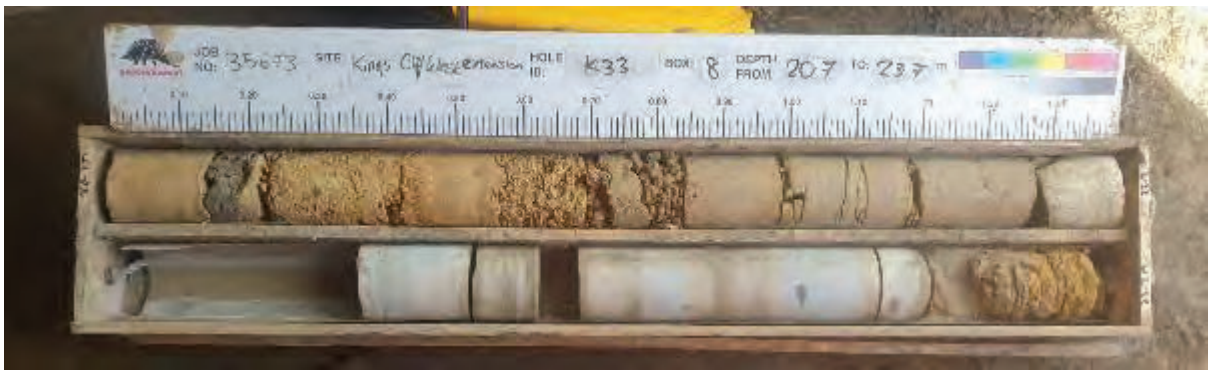
Borehole K33 – 8.7mbgl to 20.7mbgl

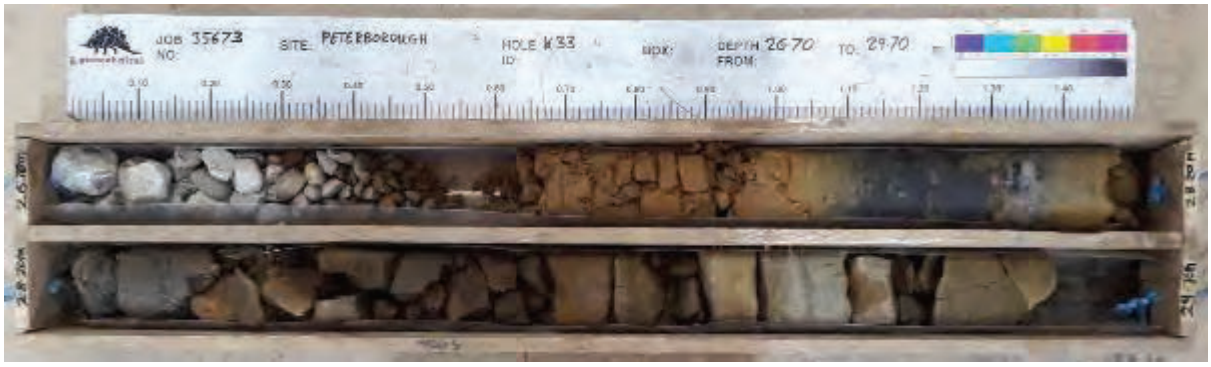


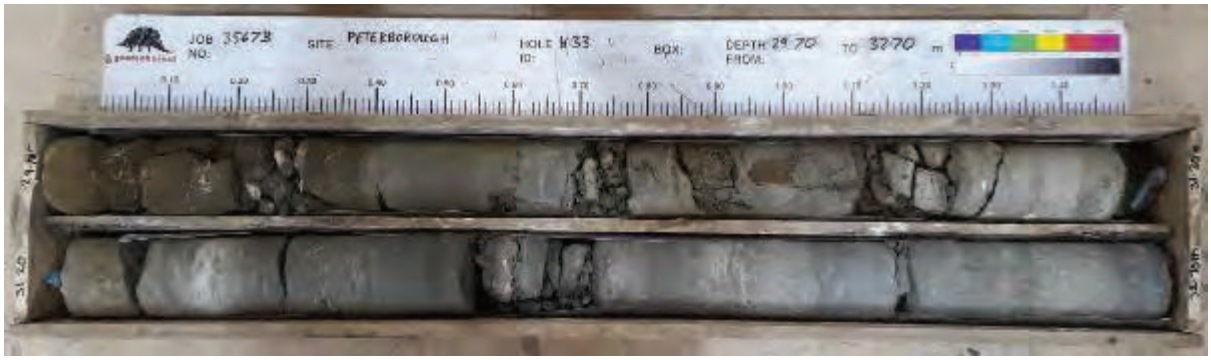




Borehole K33 – 20.7mbgl to 34.2mbgl[15]





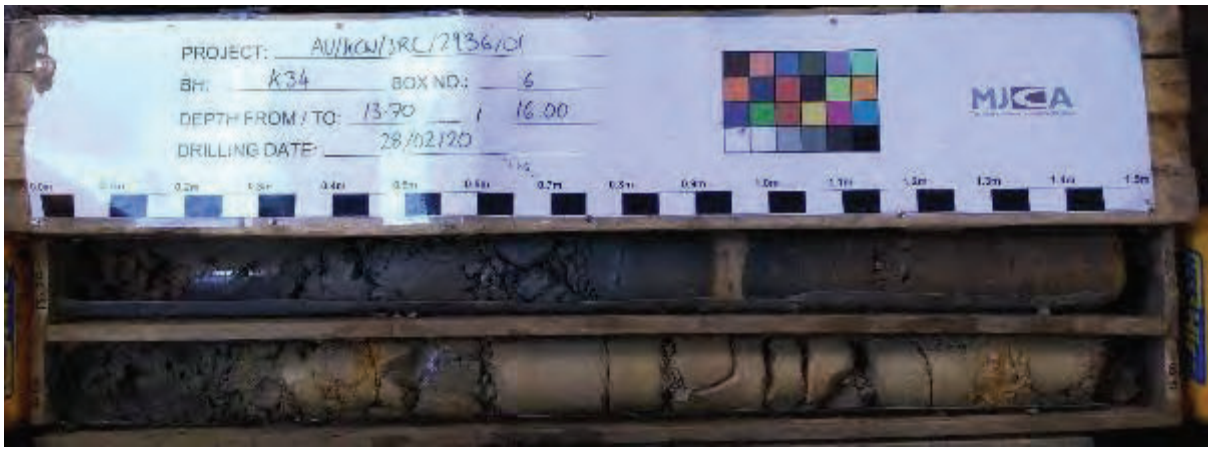


[15] Boxes from 26.7mbgl to 34.2mbgl are boxes 10, 11 and 12. No photograph of box 9 has been provided.

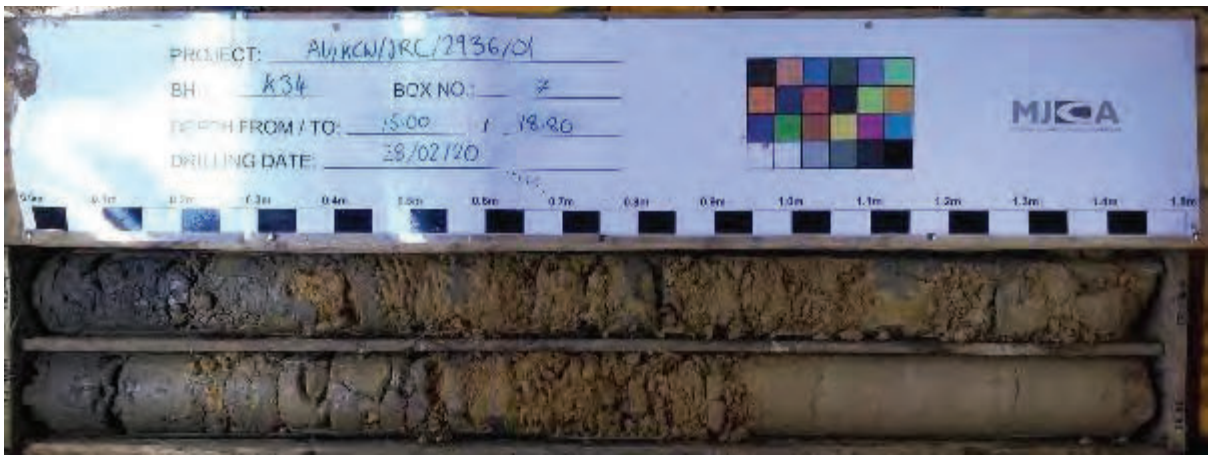
Borehole K34 – 1.2mbgl to 8.5mbgl[16]

[16] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K34 – 8.5mbgl to 16mbgl

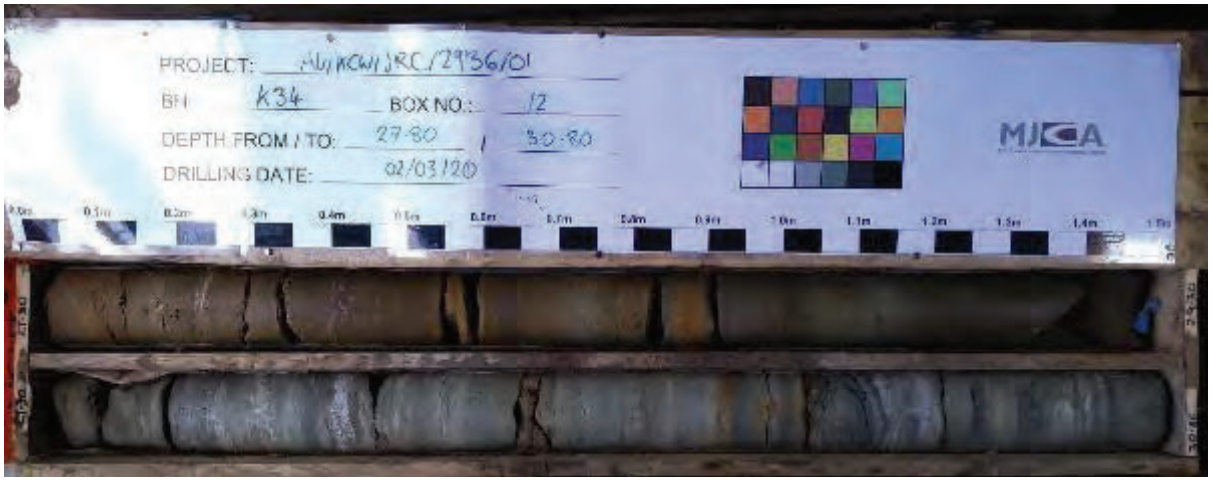


Borehole K34 – 16mbgl to 23.3mbgl[17]

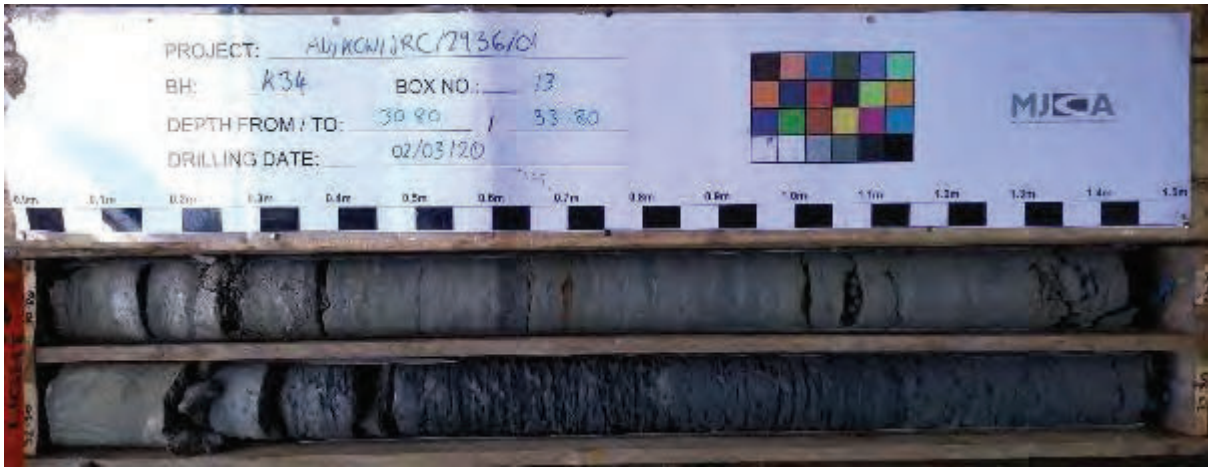


[17] Box 7 top depth labelled incorrectly. Top depth of box 7 is 16mbgl.

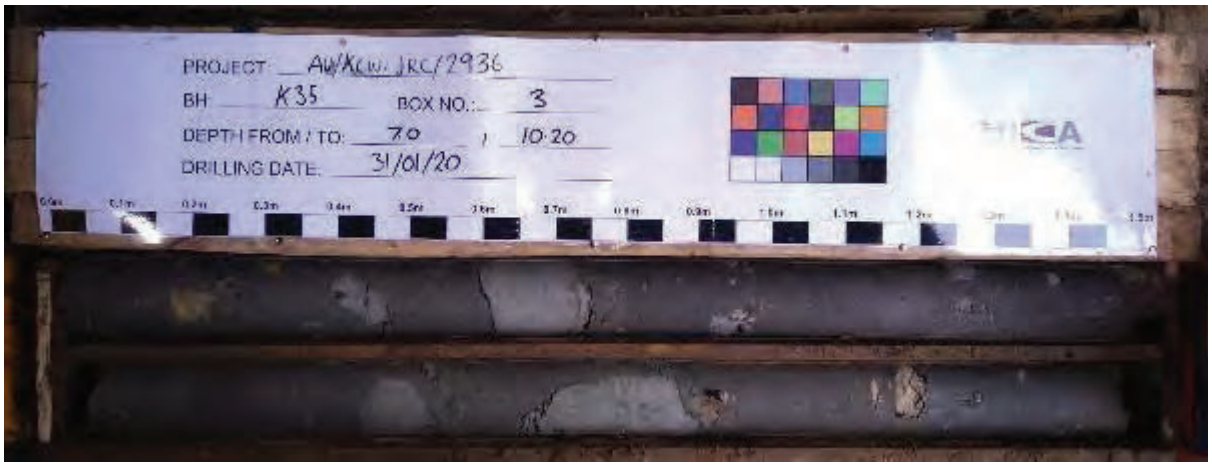
Borehole K34 – 23.3mbgl to 30.8mbgl



Borehole K34 – 30.8mbgl to 33.8mbgl



Borehole K35 – 1.2mbgl to 10.2mbgl[18] [19]



[18] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.
[19] Bottom depth of box 3 and top depth of box 4 labelled incorrectly. Bottom depth of box 3 and top depth of box 4 is 10.1mbgl.

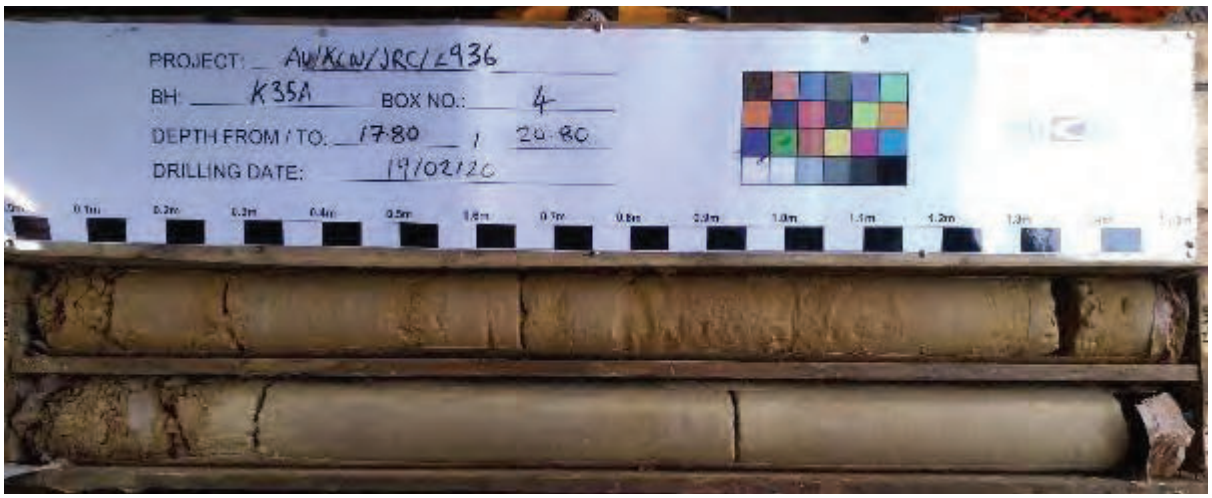
Borehole K35 – 10.2mbgl to 17.6mbgl

Borehole K35 – 17.6mbgl to 26.6mbgl

Borehole K35A – 1.2mbgl to 17.8mbgl[20] [21]

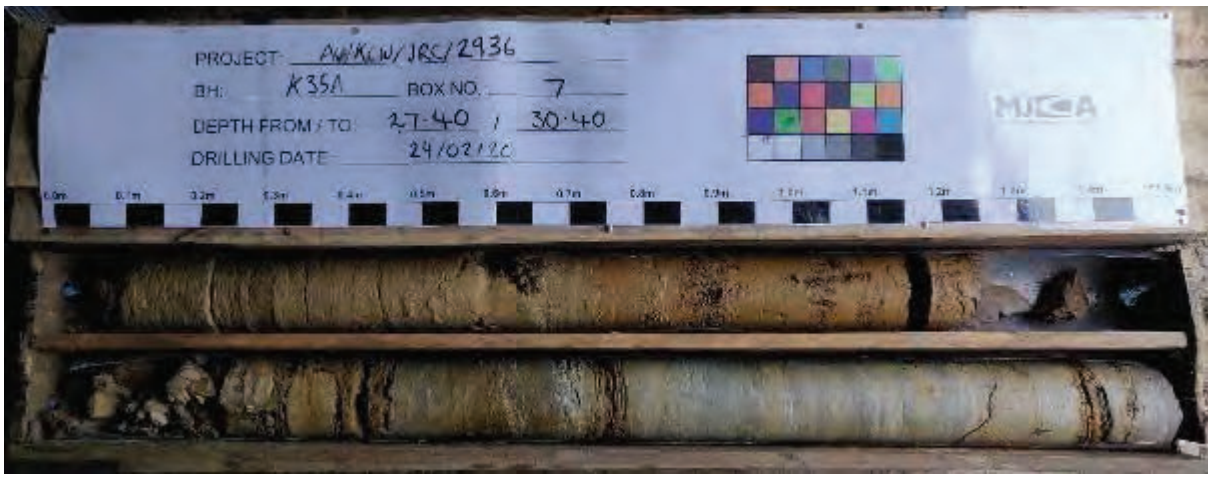
[20] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.
[21] Rotary open hole drilling between 3.5mbgl and 12.3mbgl and therefore there is no core

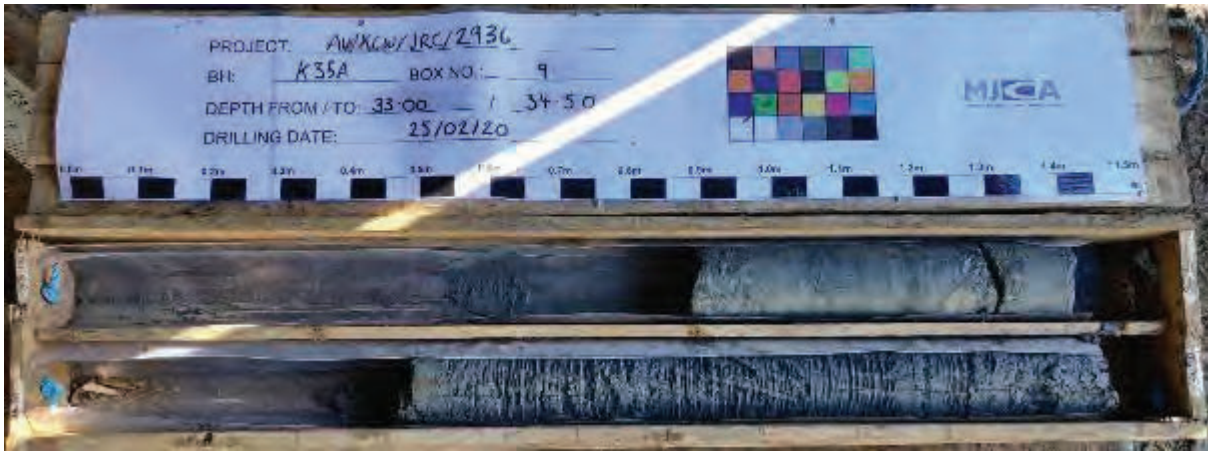
Borehole K35A – 17.8mbgl to 27.4mbgl[22]



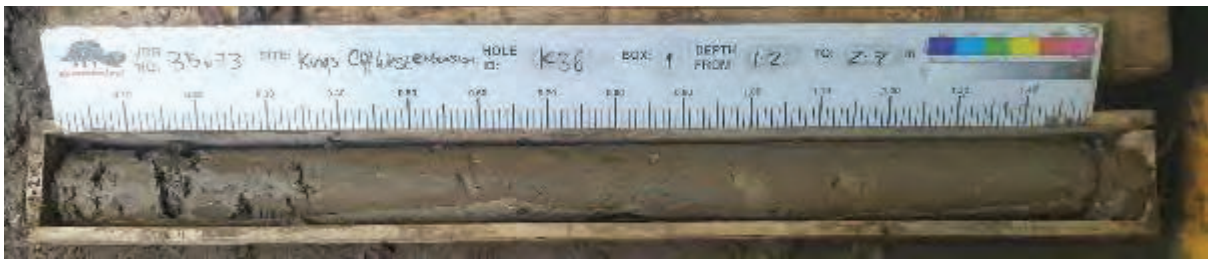
[22] No recovery between 23.8mbgl and 24.55mbgl.

Borehole K35A – 27.4mbgl to 34.5mbgl



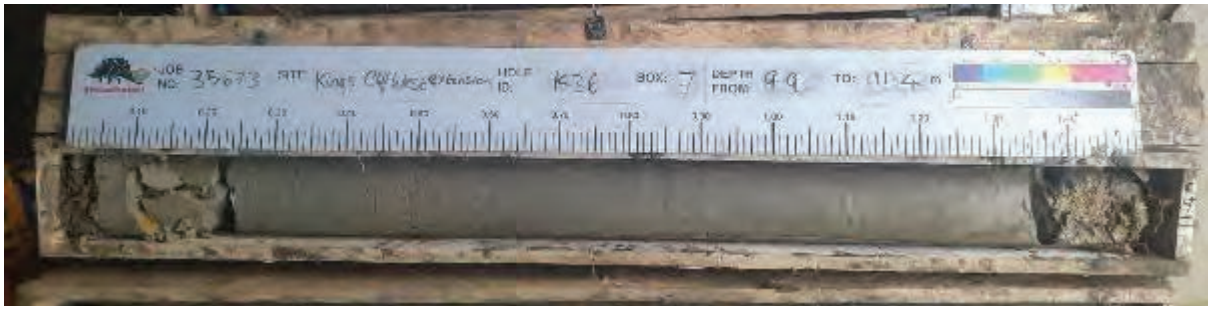


Borehole K36 – 1.2mbgl to 6.9mbgl[23]



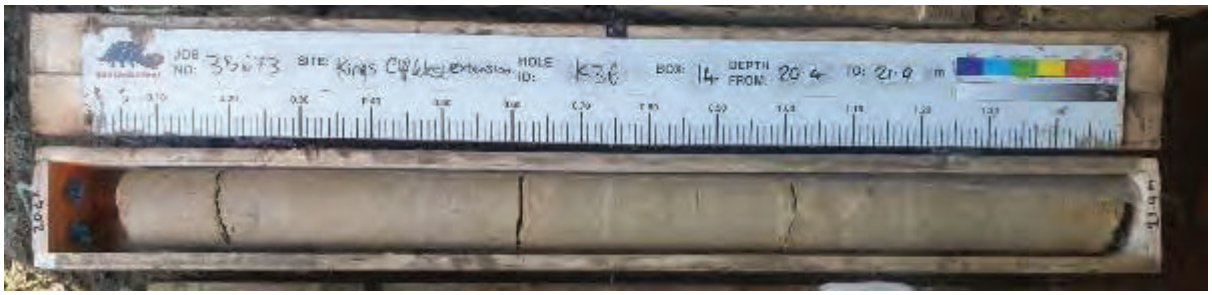
[23] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole K36 – 6.9mbgl to 12.9mbgl



Borehole K36 – 12.9mbgl to 18.9mbgl

Borehole K36 – 18.9mbgl to 23.4mbgl

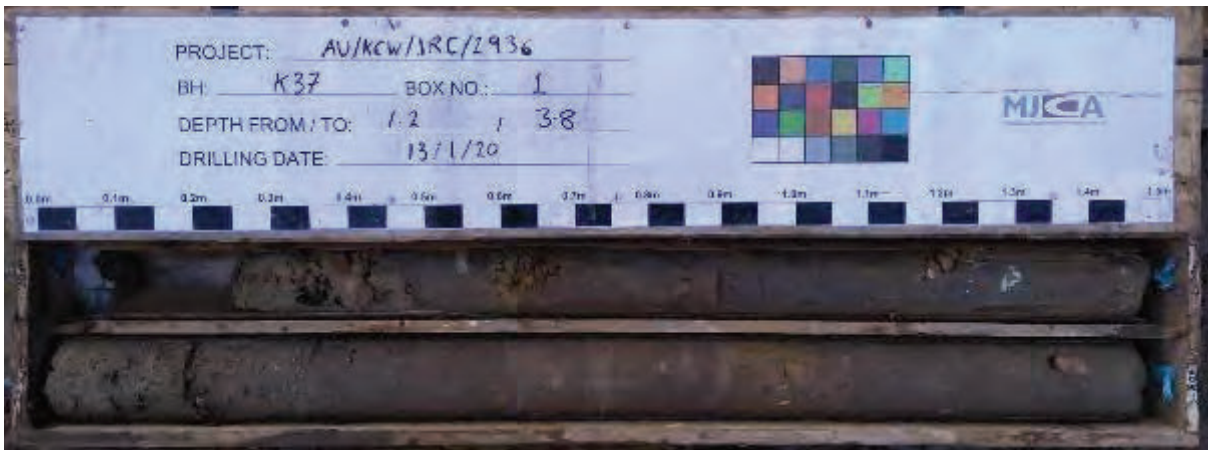


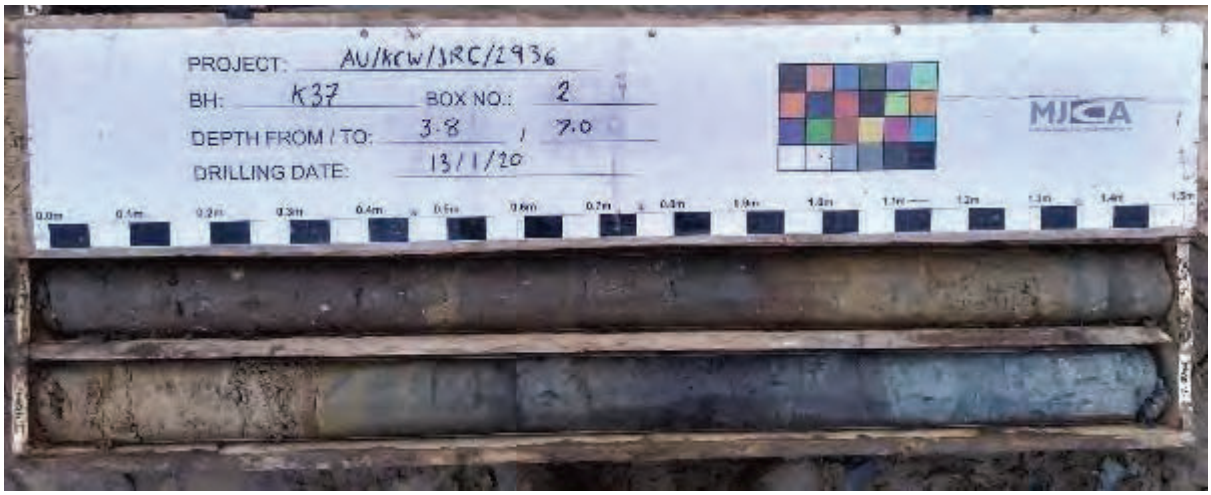
Borehole K36 – 23.4mbgl to 29.4mbgl[24]

[24] Photographic log of box 18 from 26.4mbgl to 27.9mbgl not provided.

Borehole K36 – 29.4mbgl to 33.9mbgl

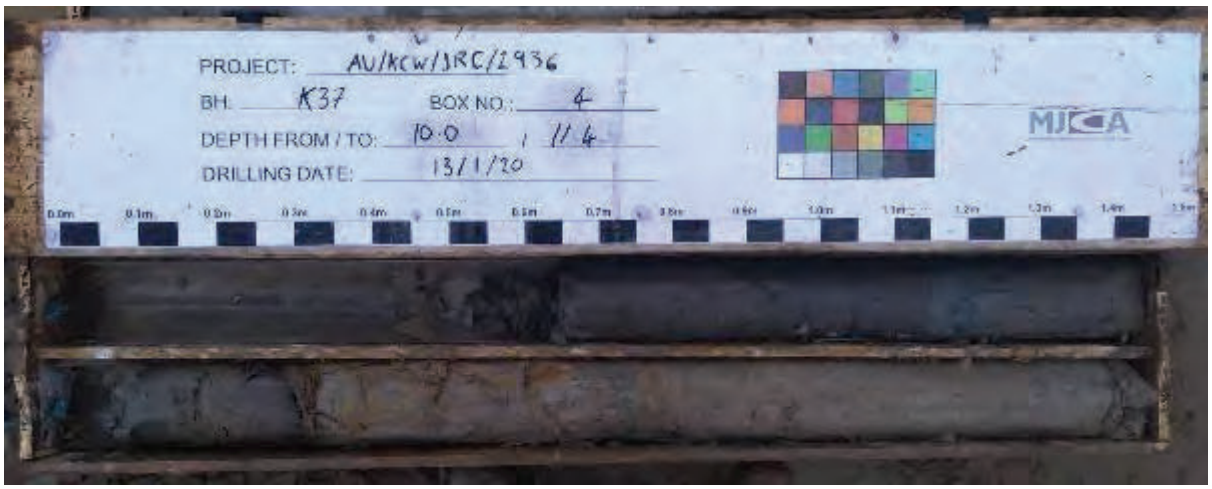
Borehole K37 – 1.2mbgl to 10mbgl[25]

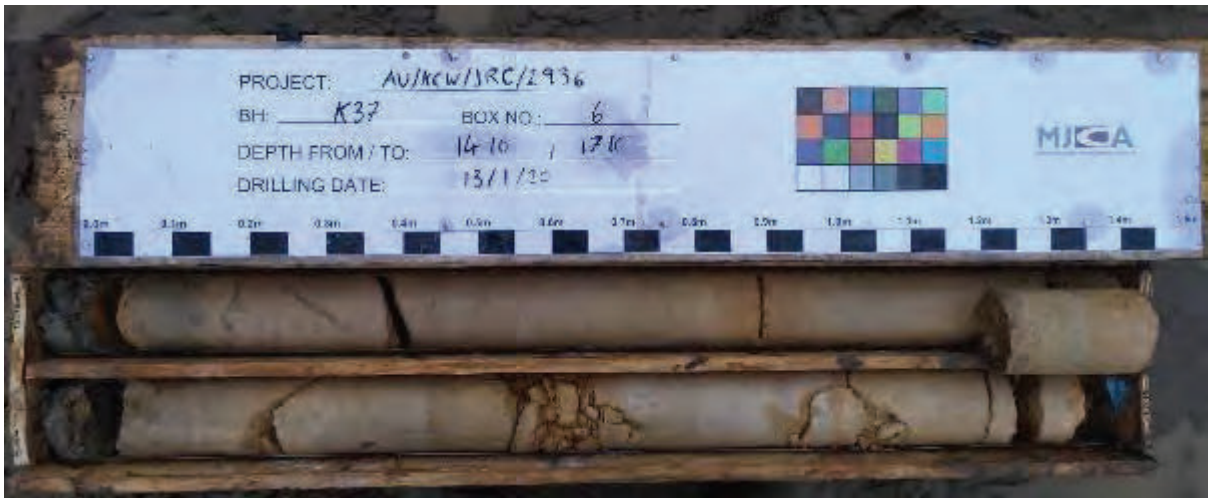




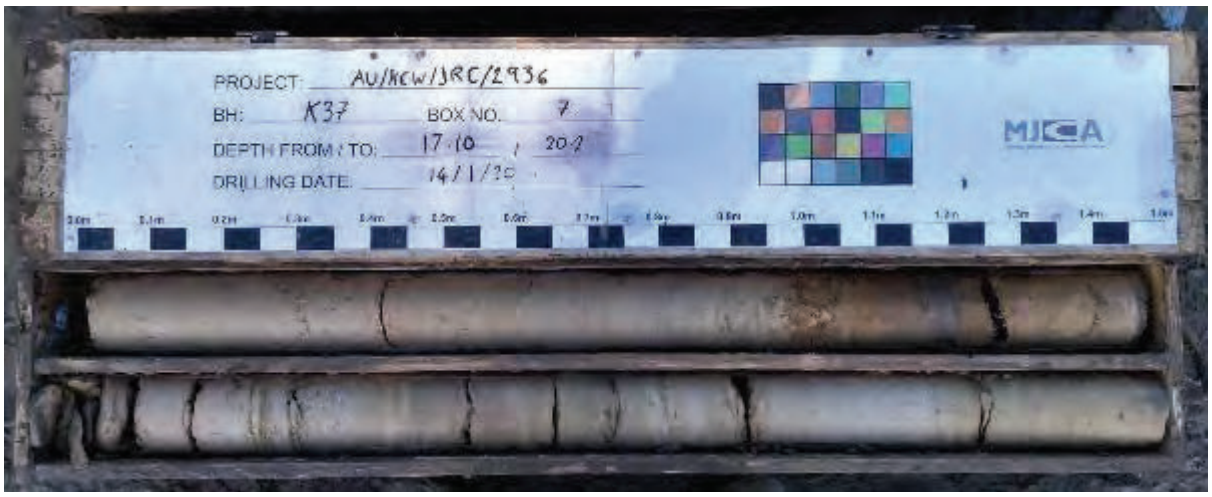
[25] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

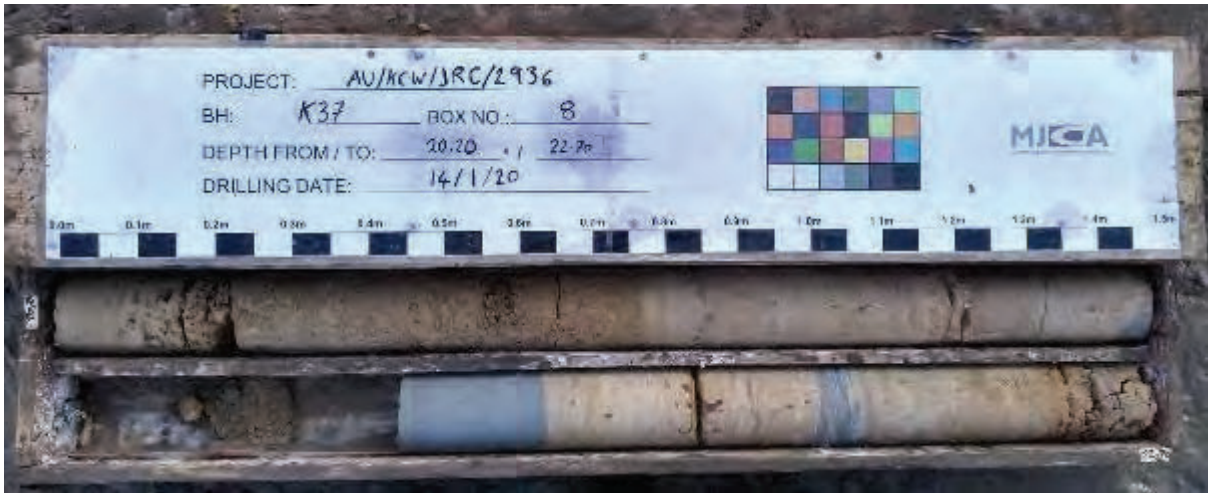
Borehole K37 – 10mbgl to 17.1mbgl



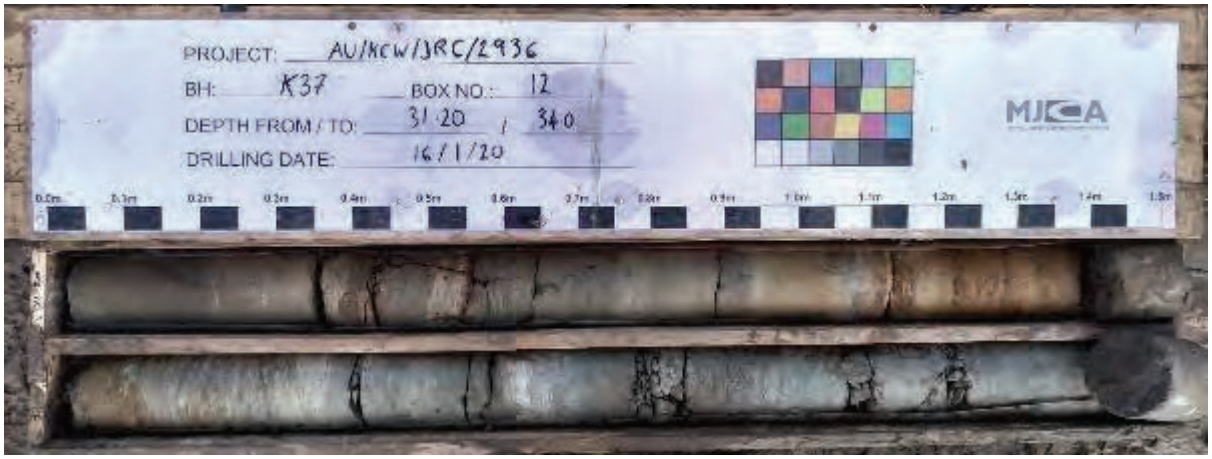


Borehole K37 – 17.1mbgl to 25.3mbgl



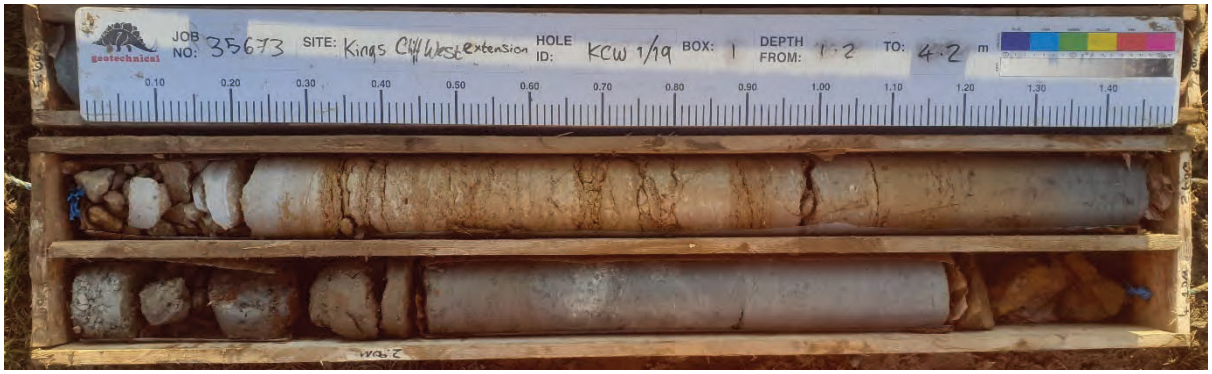


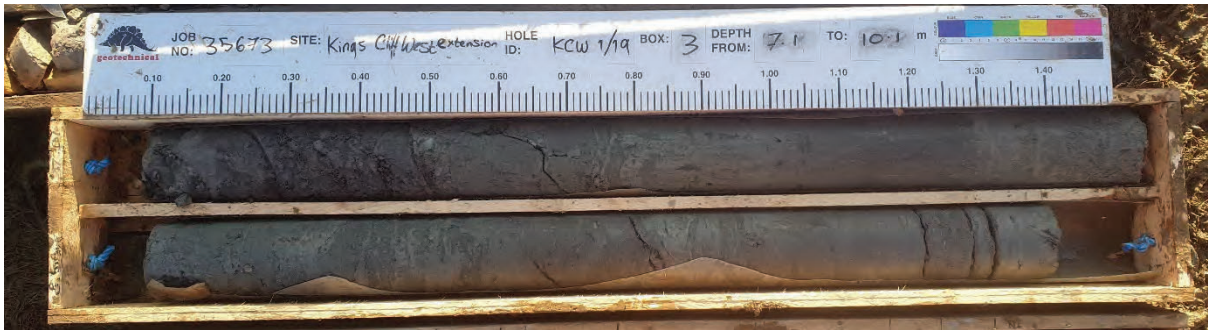
Borehole K37 – 25.3mbgl to 34mbgl



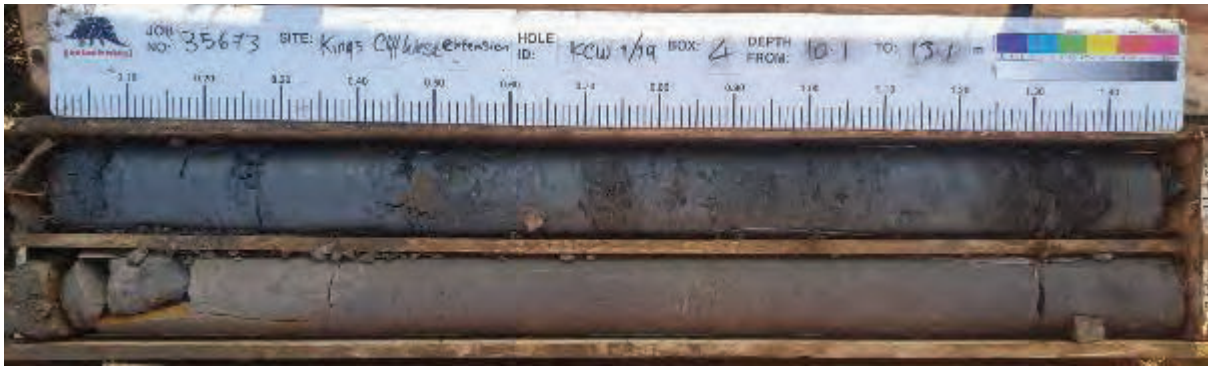
Borehole K37 – 34mbgl to 35.6mbgl

Borehole KCW 1/19 – 1.2mbgl to 10.1mbgl

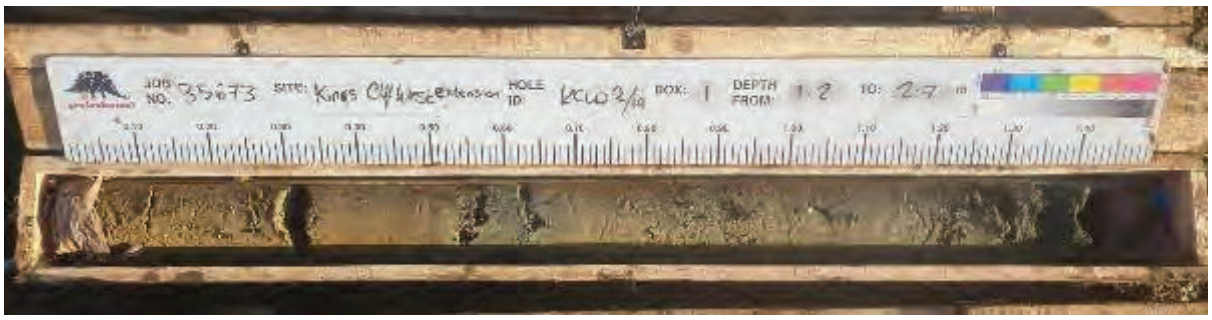




Borehole KCW 1/19 – 10.1mbgl to 16.1mbgl

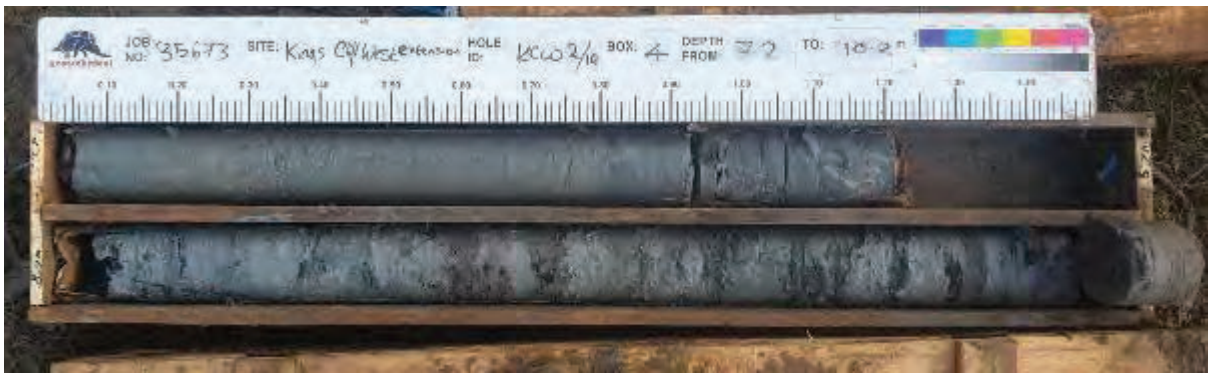


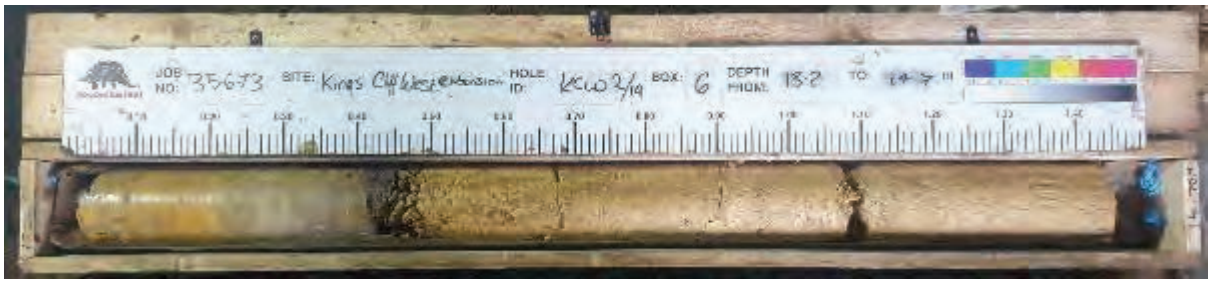
Borehole KCW 2/19 – 1.2mbgl to 7.2mbgl[26]



[26] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole KCW 2/19 – 7.2mbgl to 14.7mbgl

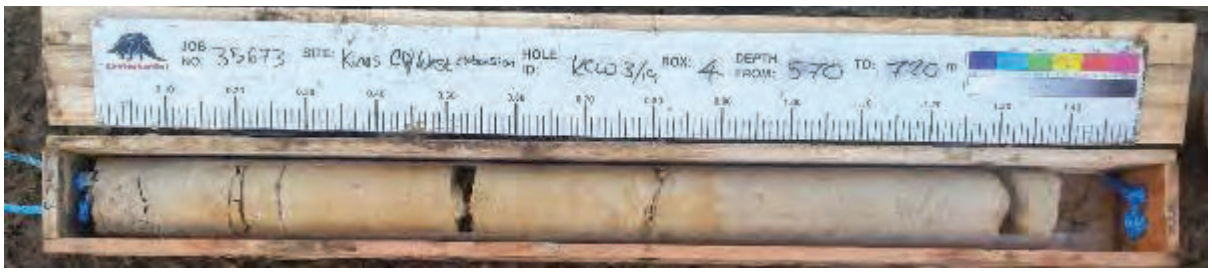


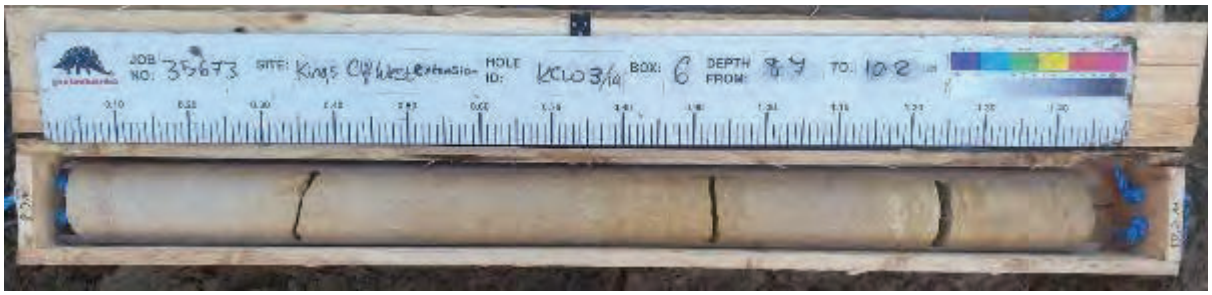


Borehole KCW 3/19 – 1.2mbgl to 5.7mbgl[27]

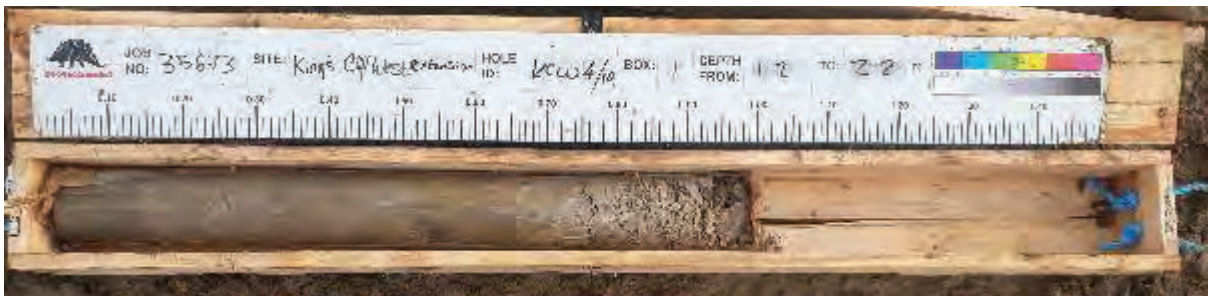
[27] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

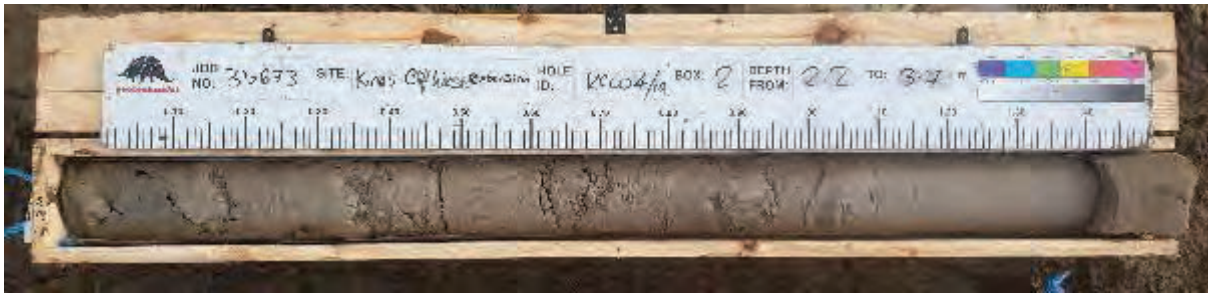
Borehole KCW 3/19 – 5.7mbgl to 10.2mbgl





Borehole KCW 4/19 – 1.2mbgl to 5.2mbgl[28]

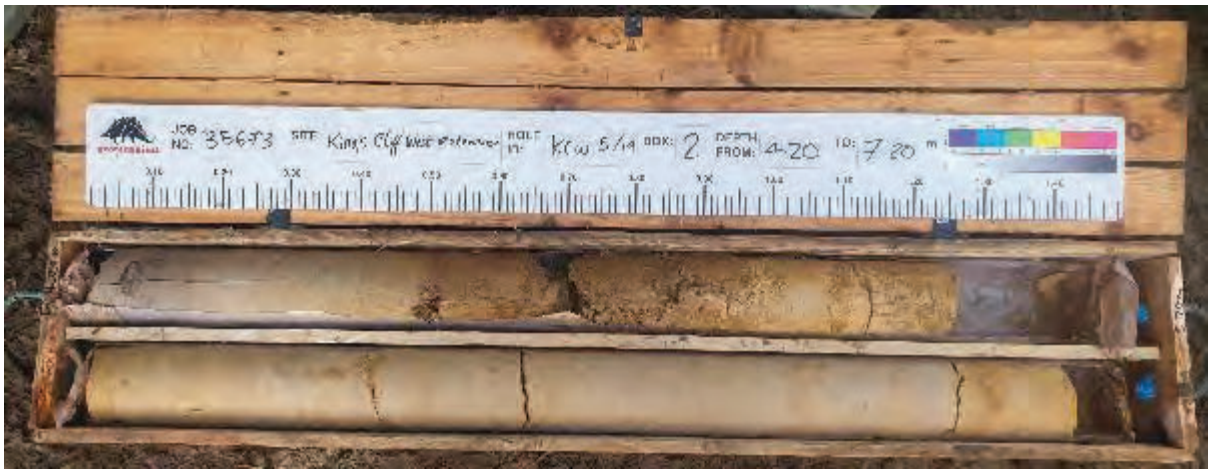


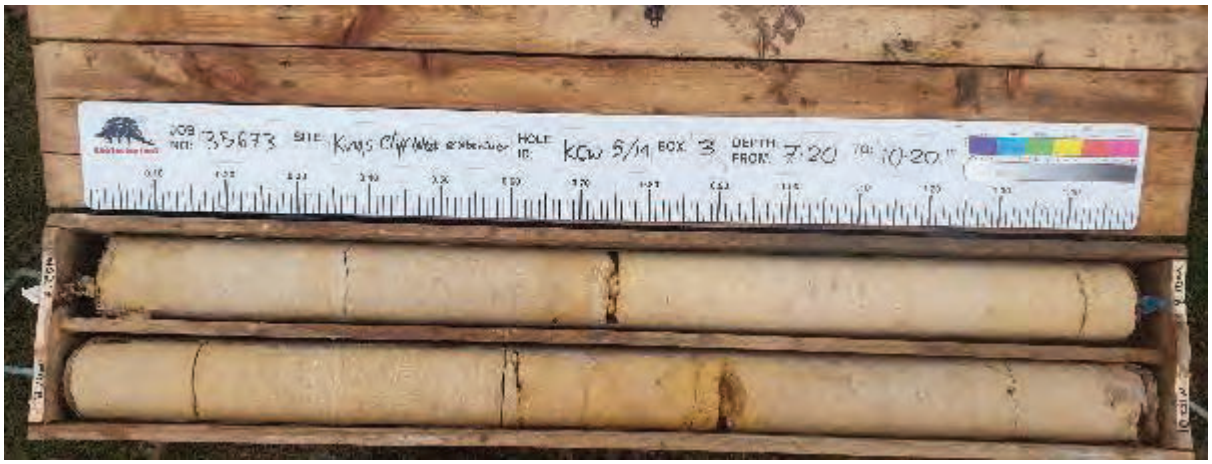


[28] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole KCW 4/19 – 5.2mbgl to 9.7mbgl

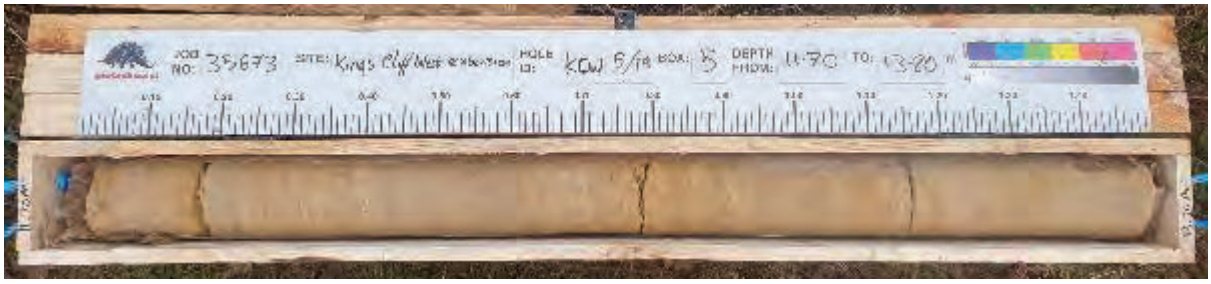
Borehole KCW 5/19 – 1.2mbgl to 10.2mbgl[29]





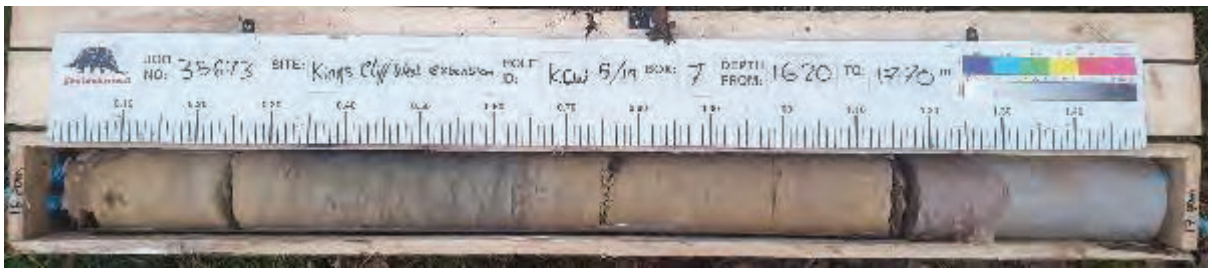
[29] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

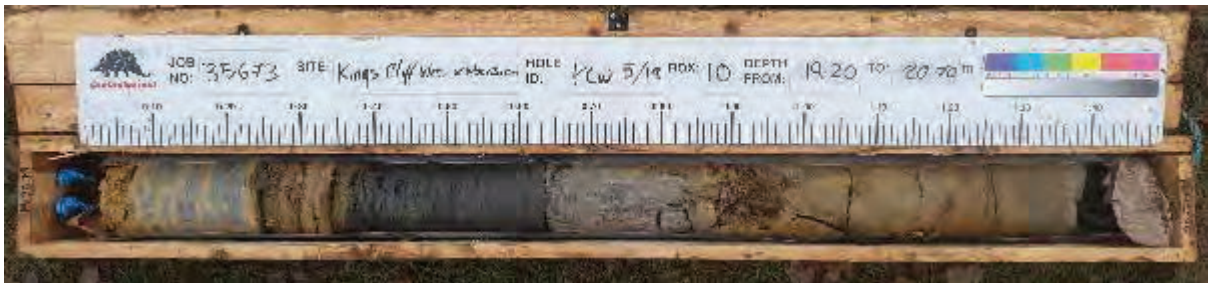
Borehole KCW 5/19 – 10.2mbgl to 16.2mbgl[30]



[30] Box numbers 6 to 9 between depths of 13.2mbgl and 19.2mbgl labelled incorrectly as 5 to 8.

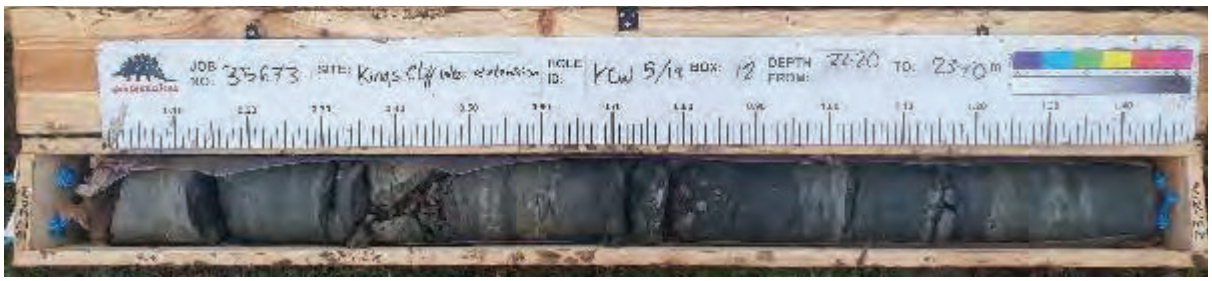
Borehole KCW 5/19 – 16.2mbgl to 22.2mbgl[31]

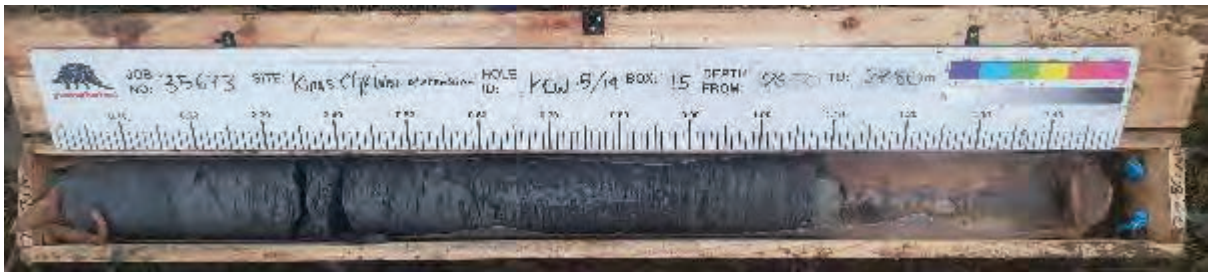




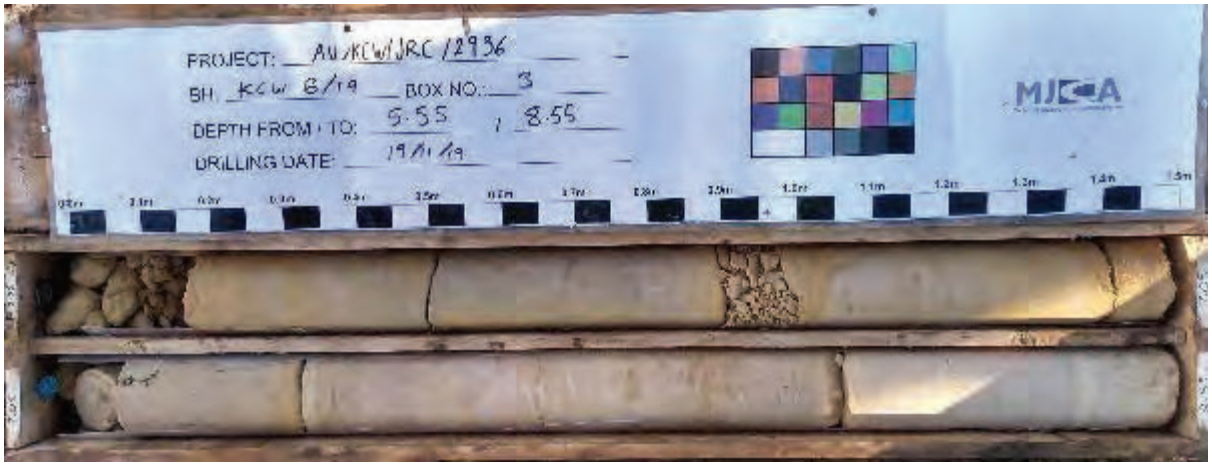
[31] Box 8 (labelled as 7) base depth labelled incorrectly. The depth is 17.40m. No photographic log available of core from 18.9 to 19.2m.

Borehole KCW 5/19 – 22.2mbgl to 27.8mbgl





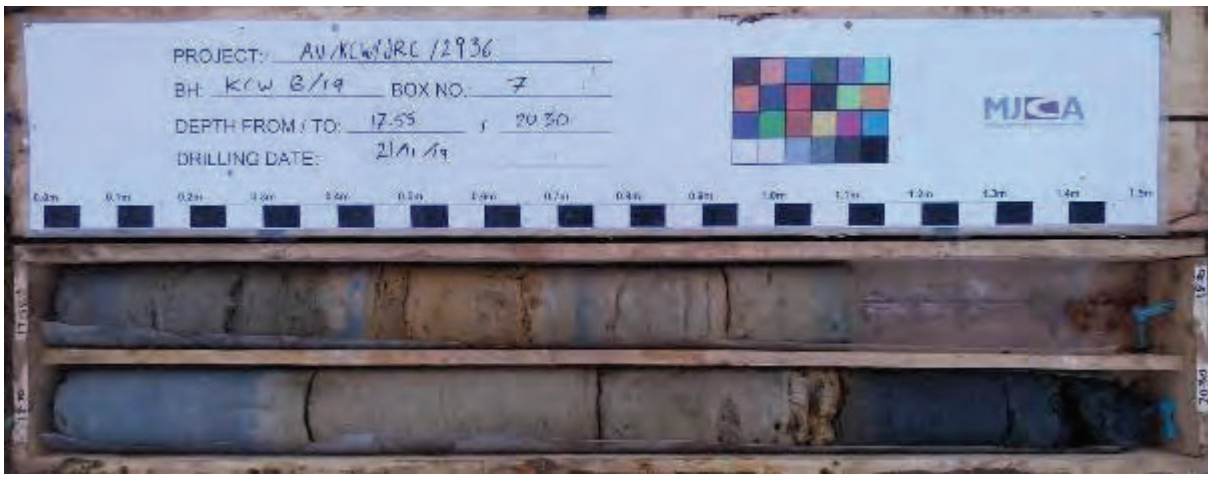
Borehole KCW 6/19 – 1.2mbgl to 8.55mbgl[32]



[32] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

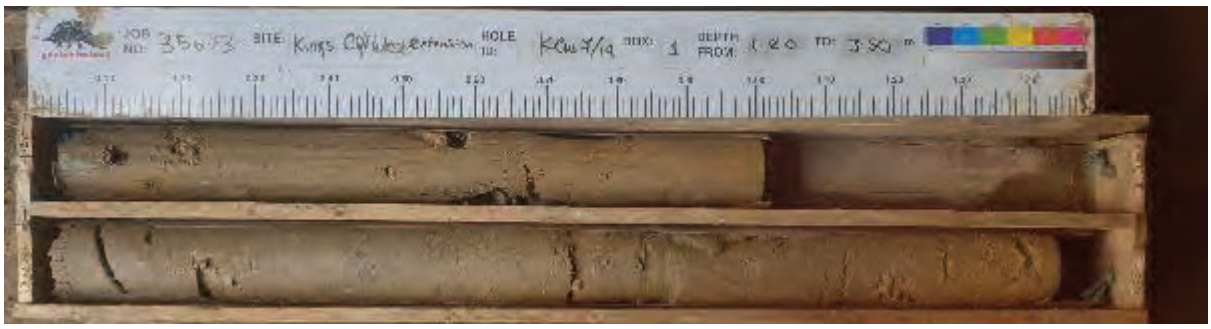
Borehole KCW 6/19 – 8.55mbgl to 17.55mbgl

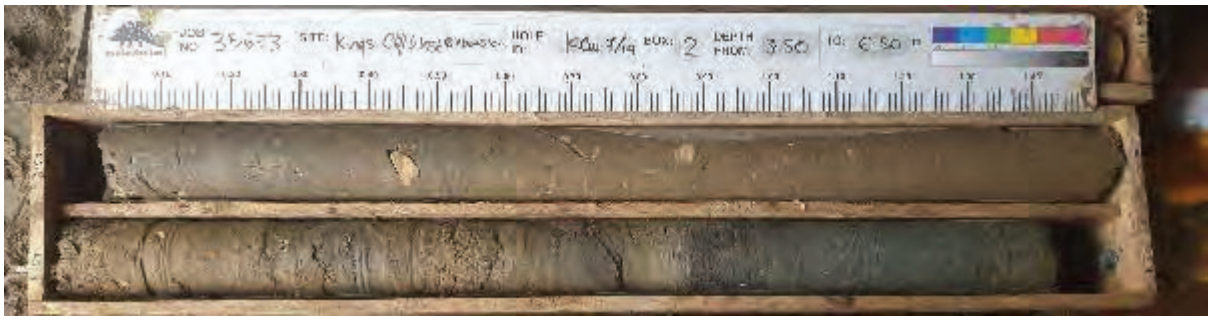
Borehole KCW 6/19 – 17.55mbgl to 26.5mbgl

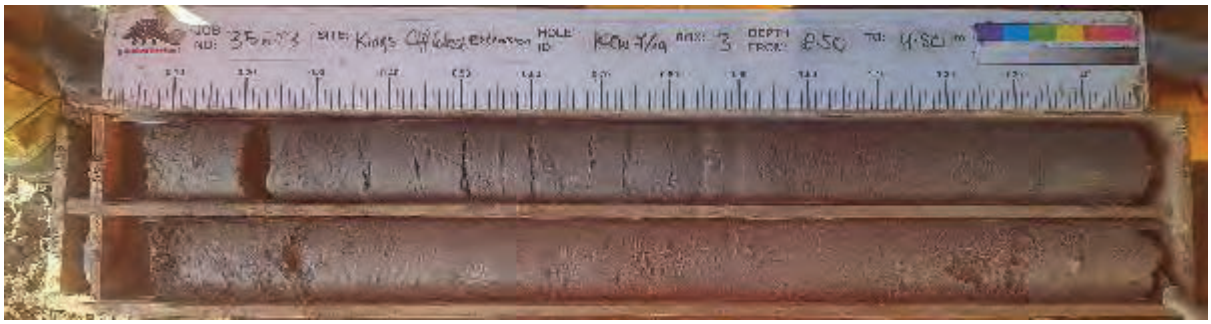


Borehole KCW 6/19 – 26.5mbgl to 28mbgl

Borehole KCW 7/19 – 1.2mbgl to 12.5mbgl[33]







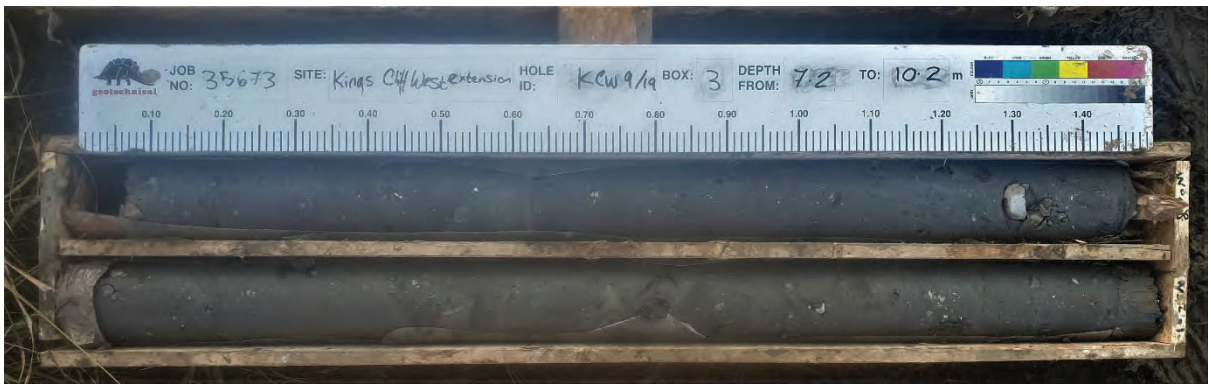
[33] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole KCW 8/19 – 1.2mbgl to 8.8mbgl[34]

[34] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

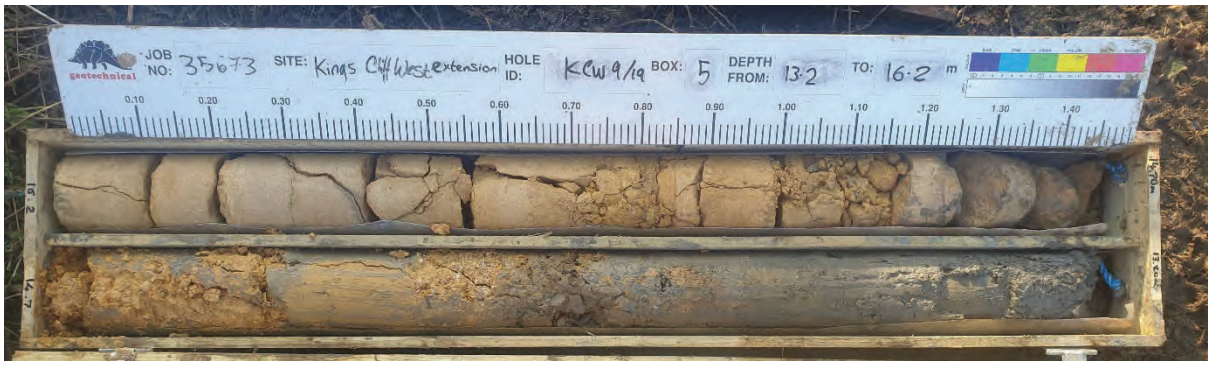
Borehole KCW 8/19 – 8.8mbgl to 16.3mbgl

Borehole KCW 9/19 – 1.2mbgl to 10.2mbgl[35]



35 Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.

Borehole KCW 9/19 – 10.2mbgl to 16.2mbgl[36]

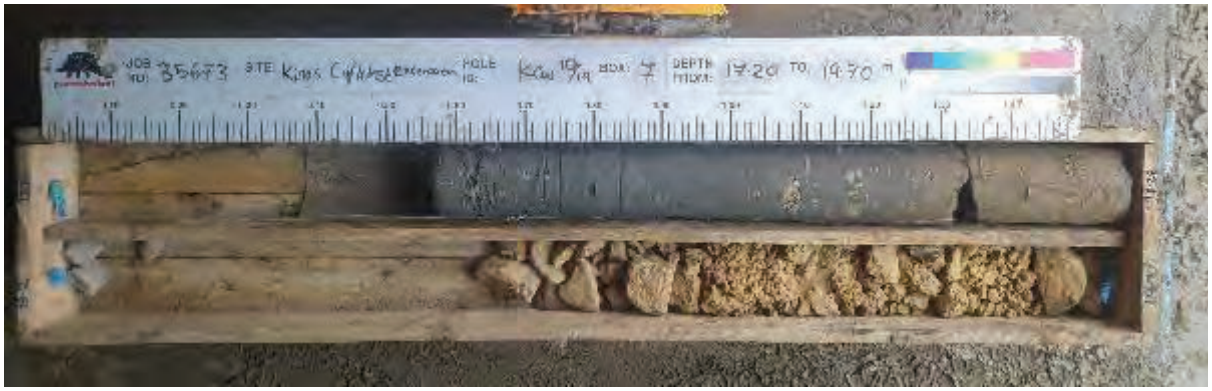


36 Box 5 – Top depth 13.2mbgl is bottom right and base depth 16.2mbgl is top left.

Borehole KCW 10/19 – 2.2mbgl to 11.2mbgl[37] [38]

[37] Unless otherwise stated the top depth of a core box is at the top left and the base depth is at the bottom right.
[38] No photographic log available of box 1.

Borehole KCW 10/19 – 11.2mbgl to 19.7mbgl



APPENDIX D

DRILLING LOGS RECORDED BY DRILLING CONTRACTOR

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1245			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1815	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1245		CAT Scanned: Yes
1245		Permit Completed: Yes
1245	0025	Prepare to move. Move some kit and track rig.
1310	0035	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1345	0125	Set up rig continue to move and set up kit.
1510	0220	Assist PH to case over. Water a priority for his rig.
1730	0045	Return to accommodation.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	14/01/2020	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	1 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1245			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1815	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. S DOWNER. 06.45HRS TO 18.15HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 18.15HRS.
		General; SHIFT. S YORK. 06.45HRS TO 18.15HRS.
		General; SHIFT. J CHAPMAN. 06.45HRS TO 18.15HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	14/01/2020	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	2 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.20	Stiff clay.	1	L		1.20	2.70	128	0015	1.50													0.00	Dry
		2	C		2.70	4.20			1.50														1.20
			RC		2.70	4.20		0019	1.50	95	brown											2.70	1.20
			RC		4.20	5.70		0018	1.50	95	brown											2.70	1.40
		3	C		4.20	5.70			1.50														1.40
			RC		5.70	7.20		0003	0.50	95	brown											2.70	1.60
		4	C		5.70	7.20			1.00														1.40
		5	C		5.70	7.20			0.50														1.60
			RC		5.70	7.20		0018	1.00	95	brown											2.70	1.40
			RC		7.20	8.70		0015	1.40	95	brown											2.70	1.50
		6	C		7.20	8.70			1.40														1.50
		7	C		8.70	10.20			1.50														1.60
			RC		8.70	10.20		0015	1.50	95	brown											2.70	1.60
		8	C		10.20	11.70			1.50														2.00
			RC		10.20	11.70		0019	1.50	95	brown											2.70	2.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1030	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	11.70	2.10	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	11.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0030	Drive to site.
0715	0330	Rig maintenance. Assist PH with casing over and freeing barrel.
1045	0530	Drill ops sample case core.
1615	0035	Tidy pack away secure rig and site load core un load at compound.
1650	0040	Return to accommodation.
		General; J CHAPMAN DRILLING.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	15/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	3 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1030	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	11.70	2.10	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.
		General; SHIFT. S YORK. 06.45HRS TO 17.30HRS.
		General; 3SHIFT. J CHAPMAN. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	15/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	4 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
11.70	Stiff boulder clay gravels.	9	C		11.70	12.20			0.50														2.10
			RC		11.70	12.20		0008	0.50	95	brown											2.70	2.10
		10	C		12.20	12.70			0.50														3.00
20.70	Fractured limestone.		RC		12.20	12.70		0011	0.50	95	brown											2.70	3.00
		11	C		12.70	13.20			0.50														2.80
			RC		12.70	13.20		0010	0.50	95	brown											2.70	2.80
22.20	Weak limestone gravels.	12	C		13.20	14.70			1.50														3.00
			RC		13.20	14.70		0017	1.50	95	brown											2.70	3.00
		13	C		14.70	16.20			1.50														3.10
			RC		14.70	16.20		0017	1.50	95	brown											2.70	3.10
		14	C		16.20	17.70			1.50														3.00
			RC		16.20	17.70		0018	1.50	95	brown											2.70	3.00
		15	C		17.70	19.20			1.50														3.00
			RC		17.70	19.20		0020	1.50	95	brown											2.70	3.00
		16	C		19.20	20.70			1.50														3.20
			RC		19.20	20.70		0018	1.50	95	brown											2.70	3.20
		17	C		20.70	22.20			1.50														3.50
			RC		20.70	22.20		0011	1.50	0	No return											2.70	3.50

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.70	2.10	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1745	23.70	22.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	11.70	23.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0050	Sign in ope up set up.
0810	0520	Drill ops core 2 x snagged liners.
1330	0030	Lunch.
1400	0100	Drill ops core.
1500	0015	Monitor water.
1515	0130	Drill ops core.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	16/01/2020	Day	Thursday
Rig type	Comacchio 305	Borehole Number	BH K22
Inclination		Orientation	
Sheet	5 of 18	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
		18	C		22.20	22.40			0.20														22.20
			RC		22.20	22.40		0007	0.20	0	No return											2.70	22.20
		20	C		22.40	23.70			0.20														22.40
		19	C		22.40	23.70			0.60														22.40
			RC		22.40	23.70		0003	0.20	0	No return											2.70	22.40
			RC		22.40	23.70		0010	0.60	0	No return											2.70	22.40

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.70	2.10	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	23.70	22.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1645	0025	Tidy pack away secure site and rig.
1710	0035	Return to accommodation.
		General; LOST FLUSH AT 21.00M.
		General; J CHAPMAN DRILLING.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.45HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.45HRS.
		General; SHIFT. S YORK. 06.45HRS TO 17.45HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	16/01/2020	**Day**	Thursday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	6 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.70	2.10	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	23.70	22.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; J CHAPMAN. 06.45HRS TO 17.45HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	16/01/2020	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	7 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
26.20	Fractured limestone.	21	C		23.70	25.20			1.40														23.70
			RC		23.70	25.20		0012	1.40	0	No return											2.70	23.70
			RC		25.20	26.70		0004	0.00	0	No return											2.70	25.20
27.80	Sandstone band.		RC		25.20	26.70		0004	0.00	0	No return											2.70	25.10
			RC		25.20	26.70		0012	0.70	0	No return											2.70	23.20
		22	C		25.20	26.70			0.70														23.20
28.00	Fractured limestone.	23	C		26.70	27.20			0.40														25.00
			RC		26.70	27.20		0010	0.40	0	No return											2.70	25.00
		24	C		27.20	28.20			1.00														24.50
28.30	Fractured sandstone.		RC		27.20	28.20		0011	1.00	0	No return											2.70	24.50
		25	C		28.20	29.70			1.50														24.80
			RC		28.20	29.70		0012	1.50	0	No return											2.70	24.80
		26	C		29.70	31.20			1.50														25.00
			RC		29.70	31.20		0012	1.50	0	No return											2.70	25.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	23.70	Dry	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	31.20	25.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	23.70	31.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0050	Sign in open up set up.
0810	0510	Drill ops core. 3 x snagged liner.
1320	0040	Tidy pack away core to compound load some kit to vans.
1400	0330	Return to GEL un load kit.
		General; J CHAPMAN DRILLING.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	17/01/2020	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	8 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	23.70	Dry	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	31.20	25.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.
		General; SHFT. S YORK. 06.45HRS TO 17.00HRS.
		General; SHIFT. J CHAPMAN. 06.45HRS TO 17.00HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	17/01/2020	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	9 of 18	**Completed**	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
31.20	Fractured sandstone.	27	C		31.20	32.70			1.50														24.50
			RC		31.20	32.70		0017	1.50	0	No return											2.70	24.50
		28	C		32.70	32.80			0.10														25.70
			RC		32.70	32.80		0009	0.10	0	No return											2.70	25.70
		29	C		32.80	34.20			1.40														25.90
			RC		32.80	34.20		0015	1.40	0	No return											2.70	25.90

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	31.20	24.50	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	34.20	24.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	31.20	34.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0430	Load kit then to site.
0930	0050	Un load sign in open up investigate slight oil leak in valve panel.
1020	0220	Drill ops core 1 x snagged liner.
1240	0255	Wait on dumper and water assist D Williams with moving and repairs to his rig.
1535	0110	Drill ops core.
1645	0015	Tidy pack away secure site and rig.
1700	0030	Drive to accommodation.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	20/01/2020	Day	Monday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	BH K22
Sheet	10 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	31.20	24.50	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	34.20	24.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. S DOWNER. 05.00HRS TO 17.30HRS.
		General; SHIFT J SMITH. 05.00HRS TO 17.30HRS.
		General; SHIFT S YORK. 05.00HRS TO 17.30HRS.
		General; SHIFT. J CHAPMAN. 05.00HRS TO 17.30HRS.
		General; J CHAPMAN DRILLING.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	20/01/2020	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	11 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
34.75	Clay mudstone?	30	C		34.20	34.85			0.65														25.30
			RC		34.20	34.85		0012	0.65	0	No return											2.70	25.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	34.20	25.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1815	35.70	18.00	31.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	2.70	31.00					S			
RC	146.30	34.20	35.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0050	Sign in open up set up.
0810	0110	Drill ops core.
0920	0025	Wait on water and pump to IBC.
0945	0315	Drill ops case over.
1300	0020	Wait on water.
1320	0050	Drill ops advance casing.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	21/01/2020	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	12 of 18	**Completed**	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	34.20	25.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1815	35.70	18.00	31.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1410	0010	Wait on water.
1420	0035	Drill ops advance casing.
1455	0015	Wait on water.
1510	0205	Drill ops advance casing and fish for rods barrel.
1715	0020	Tidy pack away secure site and rig.
1735	0040	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 18.15HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	21/01/2020	**Day**	Tuesday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	13 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	34.20	25.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1815	35.70	18.00	31.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH. 06.45HRS TO 18.15HRS
		General; SHIFT. J CHAPMAN. 06.45HRS TO 18.15HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	21/01/2020	**Day**	Tuesday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	14 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
34.75	Stiff clay. Mudstone.	31	C		34.20	35.70			0.70														26.50
			RC		34.20	35.70		0012	0.70	0	No return											32.90	26.50

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	35.70	30.00	31.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	18.30	0.00	16.50

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	34.20	35.80	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0050	Sign in open up set up.
0810	0030	Continue to advance casing and free barrel.
0840	0020	Wait on water and pump to tanks.
0900	0115	Drill ops advance casing pull barrel.
1015	0035	Await BH instruction.
1050	0055	Flush and clear out BH.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	22/01/2020	Day	Wednesday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	BH K22
Sheet	15 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	35.70	30.00	31.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	18.30	0.00	16.50

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1145	0105	Wait on dumper load then un load install equioment 30mins lunch.
1255	0405	Install BH and pull casing.
1700	0015	Tidy packvaway secure site and rig.
1715	0045	Return to accommodation.
		General; J CHAPMAN DRILLING AND INSTALLING BH.
		General; SHIFT. S DOWNER. 06.45HRS TO 18.00HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 18.00HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	22/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	16 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	35.70	30.00	31.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	18.30	0.00	16.50

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J CHAPMAN. 06.45HRS TO 18.00HRS.
		General; SHIFT. L MURPHY. 06.45HRS TO 18.00HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	22/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	17 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	18.30	0.00	16.50
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1045			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0040	Sign in open up set up.
0800	0225	Continue to pull casing. Mix and pump 300 L of grout 3:1 ratio.
1025	0020	Prepare to move.
		General; PLAIN PIPE FROM 35.70M TO 34.80M. GROUT FROM 18.30M TO 0.50M.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	23/01/2020	**Day**	Thursday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH K22
Sheet	18 of 18	**Completed**	Y

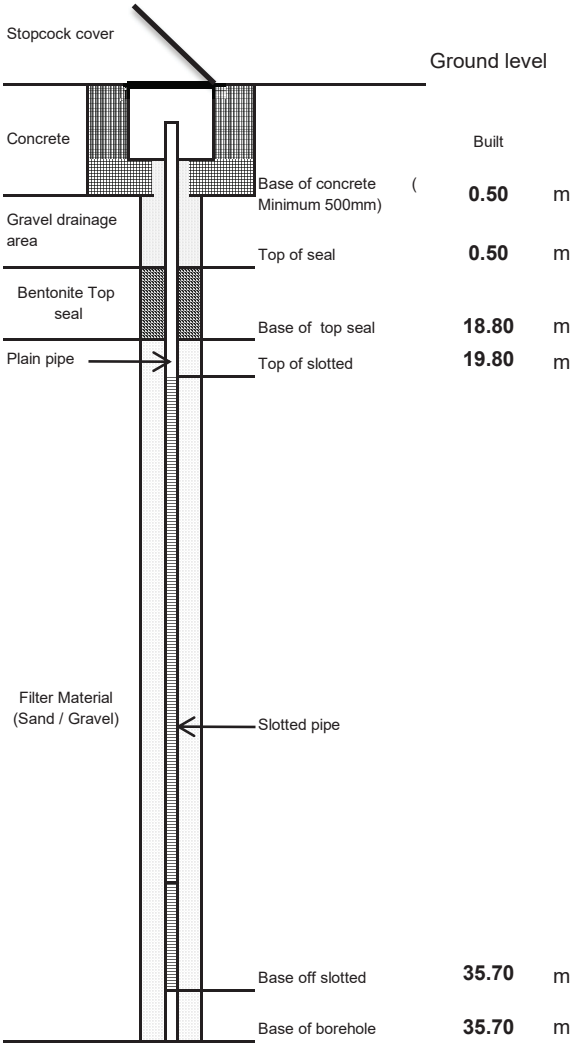
AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	168	mm
Slot size	1	mm
Geosock	Yes	
Gas tap	Single	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	25.00	m
Time of Initial reading	0945	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	0.50	0.50
Borehole seal top	18.80	0.50
Filter zone	35.70	18.80
Plain pipe	19.80	GL
Slotted zone	35.70	19.80
Base of borehole	35.70	

Remarks

25 x gravel 1 x bentonite pellets 2 x cement 2 x bentonite powder 1 x ballast used.

Rig type	Comacchio 305	**Project Title**			
Drilling Crew Details		Peterborough			
Support Operative	TBC				
Lead Driller	Simon Downer	**Project No**		35673	
Site category	Yellow	**Day**	Thursday	**Date**	January 23, 2020
Engineer	MJCA			**Borehole Number**	
Lead Driller's signature				**BH K22**	

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf topsoil.	1	L		1.20	2.70	128	0009	1.50													0.00	Dry
		2	C		2.70	4.20			1.50														1.00
			RC		2.70	4.20		0015	1.50	95	brown											2.70	1.00
0.10	Clay occasional gravels.	3	C		4.20	5.70			1.50														1.50
			RC		4.20	5.70		0015	1.50	95	brown											2.70	1.50
		4	C		5.70	7.20			1.50														1.50
1.20	Stiff clay.		RC		5.70	7.20		0015	1.50	95	brown											2.70	1.50
		5	C		7.20	8.70			1.50														1.70
			RC		7.20	8.70		0015	1.50	95	brown											2.70	1.70
7.20	Stiff sandy clay gravels.	6	C		8.70	10.20			1.40														2.00
			RC		8.70	10.20		0014	1.40	95	grey											2.70	2.00
		7	C		10.20	11.70			1.50														1.80
			RC		10.20	11.70		0016	1.50	95	grey											2.70	1.80

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	11.70	1.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	11.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0920	0155	Prepare to move and move all kit rig and heras.
1115	0035	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1150	0015	Set up rig and kit water to tanks.
1205	0410	Drill ops sample case core.
1615	0035	Tidy erect heras secure site and rig.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/01/2020	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K23
Sheet	1 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	11.70	1.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1650	0040	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. S YORK. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/01/2020	**Day**	Thursday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH K23
Sheet	2 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
11.70	Siff clay.	8	C		11.70	13.20			1.50														2.40
			RC		11.70	13.20		0013	1.50	90	grey											2.70	2.40
		9	C		13.20	13.40			0.20														3.00
14.10	Fractured limestone.		RC		13.20	13.40		0008	0.20	90	grey											2.70	3.00
		10	C		13.40	14.10			0.50														4.20
			RC		13.40	14.10		0010	0.50	80	brown											2.70	4.20
		11	C		14.10	14.70			0.60														4.60
			RC		14.10	14.70		0009	0.60	45	brown											2.70	4.60
		12	C		14.70	16.20			1.50														14.50
			RC		14.70	16.20		0012	1.50	0	No return											2.70	14.50
		13	C		16.20	17.70			1.40														16.20
			RC		16.20	17.70		0011	1.40	0	No return											2.70	16.20
		14	C		17.70	19.20			1.50														16.60
			RC		17.70	19.20		0010	1.50	0	No return											2.70	16.60
		15	C		19.20	20.70			1.50														19.20
			RC		19.20	20.70		0010	1.50	0	No return											2.70	19.20

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.70	2.40	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	20.70	16.10	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	11.70	20.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0030	Drive to site.
0715	0045	Sign in open up set up.
0800	0215	Drill ops core.
1015	0015	Monitor water.
1030	0110	Wait on water and pump to IBC.
1140	0150	Drill ops core.
1330	0030	Tidy secure rig and site load core move to compound and un load.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	10/01/2020	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	BH K23
Inclination		**Orientation**	
Sheet	3 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.70	2.40	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	20.70	16.10	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1400	0445	Return to GEL. Un load some kit.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.45HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.45HRS.
		General; SH8FT S YORK. 06.45HRS TO 17.00HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	10/01/2020	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	BH K23
Sheet	4 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
22.20	Limestone with sandstone bands.	16	C		20.70	22.20			1.40														20.00
			RC		20.70	22.20		0012	1.40	0	No return											2.70	20.00
		17	C		22.20	23.70			1.50														20.00
25.90	Sandstone.		RC		22.20	23.70		0010	1.50	0	No return											2.70	20.00
		18	C		23.70	25.20			1.20														22.00
			RC		23.70	25.20		0012	1.20	0	No return											2.70	22.00
32.30	Clay.	19	C		25.20	26.70			1.40														21.70
			RC		25.20	26.70		0012	1.40	0	No return											2.70	21.70
		20	C		26.70	28.20			1.50														21.20
			RC		26.70	28.20		0011	1.50	0	No return											2.70	21.20
		21	C		28.20	29.70			1.50														21.20
			RC		28.20	29.70		0009	1.50	0	No return											2.70	21.20
		22	C		29.70	31.20			1.50														21.10
			RC		29.70	31.20		0009	1.50	0	No return											2.70	21.10
			RC		31.20	32.70		0003	0.40	0	No return											2.70	20.90
		24	C		31.20	32.70			0.40														20.90
			RC		31.20	32.70		0012	1.10	0	No return											2.70	21.00
		23	C		31.20	32.70			1.10														21.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	20.70	20.00	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1745	32.70	21.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	20.70	32.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0345	Load kit drive to site.
0845	0105	Sign in open up set up concrete cover in. J Chapman induction.
0950	0135	Drill ops core.
1125	0025	Wait on water and pump to IBC.
1150	0110	Drill ops core.
1300	0030	Lunch.
1330	0240	Drill ops core.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	13/01/2020	Day	Monday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	BH K23
Sheet	5 of 7	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	20.70	20.00	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	32.70	21.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1610	0100	Strip barrel resolve issues. Tidy pack awy secure site and rig take core to compound and un load.
1710	0035	Drive to accommodation.
		General; SHIFT. S DOWNER. 05.00HRS TO 17.45HRS.
		General; SHIFT. J SMITH. 05.00HRS TO 17.45HRS.
		General; SHIFT. S YORK. 05.00HRS TO 17.45HRS.
		General; SHIFT. J CHAPMAN. 05.00HRS TO 17.45HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	13/01/2020	**Day**	Monday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH K23
Sheet	6 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
32.70	Stiff clay	25	C		32.70	34.20			1.50														21.00
			RC		32.70	34.20		0003	1.50	0	No return											2.70	21.00
			RC		32.70	34.20		0018	0.00	0	No return											2.70	22.50

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	32.70	22.50	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1240			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	32.70	34.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0045	Sign in open up set up.
0805	0115	Drill ops core.
0930	0050	Collect and un load install.
		General; 34.20M TO 32.20M PLAIN PIPE.
		General; 11.70M TO 0.50M GROUT 3:1 RATIO 250L
1025	0215	Install and pull casing mix and pump grout.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	Project No	35673
Date	14/01/2020	Day	Tuesday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	BH K23
Sheet	7 of 7	Completed	Y

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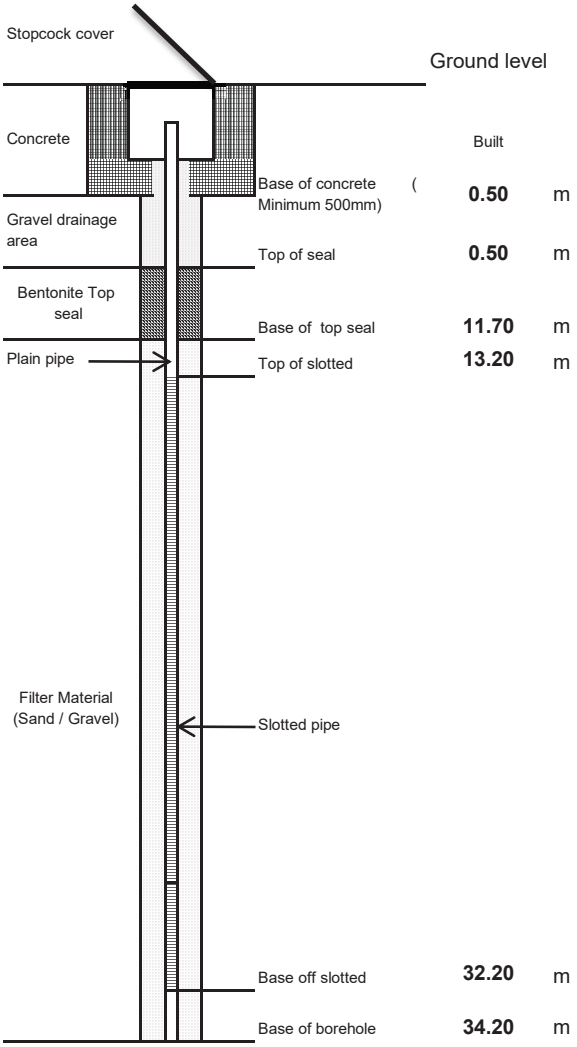
GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	146	mm
Slot size	1	mm
Geosock	Yes	
Gas tap	Single	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	20.30	m
Time of Initial reading	1145	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	0.50	0.50
Borehole seal top	11.70	0.50
Filter zone	34.20	11.70
Plain pipe	13.20	GL
Slotted zone	32.20	13.20
Base of borehole	34.20	

Remarks

21 x gravel 1 x bentonite pellats 2 x benronite powder 1 x cement 1 x ballast used.

Rig type	Comacchio 305	**Project Title**			
Drilling Crew Details		Peterborough			
Support Operative	TBC				
Lead Driller	Simon Downer	**Project No**		35673	
Site category	Yellow	**Day**	Tuesday	**Date**	January 14, 2020
Engineer	MJCA			**Borehole Number**	
Lead Driller's signature				**BH K23**	

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf topsoil.	1	L		1.20	2.70	128	0012	1.50													0.00	Dry
		2	C		2.70	4.20			1.50														0.00
			RC		2.70	4.20		0019	1.50	95	brown											2.70	0.00
0.20	Clay occasional gravels.	3	C		4.20	5.70			1.50														1.00
			RC		4.20	5.70		0014	1.50	95	brown											2.70	1.00
		4	C		5.70	7.20			1.50														1.30
1.20	Stiff clay.		RC		5.70	7.20		0012	1.50	95	brown											2.70	1.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	7.20	1.30	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	7.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0645	0315	Drive to site.
1000	0050	Wait on BH position concrete 1 x cover in.
1050	0015	Track rig to position.
1105	0035	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1140	0225	Un load boxes from van wait on dumper load kit return to position set up rig and kit.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	06/01/2020	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	1 of 9	**Completed**	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	7.20	1.30	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1405	0240	Drill ops sample case and core.
1645	0025	Tidy secure site set up heras.
1710	0035	Drive to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.45HRS.
		General; SHIFT. J SMITH. 05.00HRS TO 17.45HRS.
		General; SHIFT. S YORK. 05.00HRS TO 17.45HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	06/01/2020	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	2 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
7.70	Fractured limestone.	5	C		7.20	8.70			1.50														1.70
			RC		7.20	8.70		0013	1.50	75	brown											2.70	1.70
			RC		8.70	10.20		0013	1.50	0	No return											2.70	8.20
20.70	Limestone with sandstone bands.	6	C		8.70	10.20			1.50														8.20
		7	C		10.20	11.70			1.50														9.30
			RC		10.20	11.70		0011	1.50	0	No return											2.70	9.30
22.20	Fractured sandstone.		RC		11.70	13.20		0012	1.50	0	No return											2.70	10.50
		8	C		11.70	13.20			1.50														10.50
			RC		13.20	14.70		0010	1.50	0	No return											2.70	12.30
		9	C		13.20	14.70			1.50														12.30
			RC		14.70	16.20		0010	1.50	0	No return											2.70	11.70
		10	C		14.70	16.20			1.50														11.70
		11	C		16.20	17.70			1.50														11.70
			RC		16.20	17.70		0010	1.50	0	No return											2.70	11.70
		12	C		17.70	19.20			1.50														12.20
			RC		17.70	19.20		0010	1.50	0	No return											2.70	12.20
		13	C		19.20	20.70			1.50														15.60
			RC		19.20	20.70		0011	1.50	0	No return											2.70	15.60

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	7.20	1.70	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	24.80	18.80	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	7.20	24.80	T6S-146	Rigid		PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0030	Drive to site.
0715	0045	Sign in open up set up.
0800	0020	Drill ops core.
0820	0020	Monitor water.
0840	0035	Drill ops core.
0915	0020	Monitor water.
0935	0035	Dril ops core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	07/01/2020	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	3 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		20.70	22.20		0012	1.50	0	No return											2.70	14.90
		14	C		20.70	22.20			1.50														14.90
		15	C		22.20	23.70			1.50														13.60
			RC		22.20	23.70		0013	1.50	0	No return											2.70	13.60
			RC		23.70	24.80		0012	1.10	0	No return											2.70	13.50
		16	C		23.70	24.80			1.10														13.50

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	7.20	1.70	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	24.80	18.80	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1010	0045	Wait on water pump to IBC.
1055	0135	Drill ops core.
1230	0030	Lunch.
1300	0015	Drill ops core.
1315	0020	Monitor water.
1335	0055	Drill ops core.
1430	0030	Wait on water pump to IBC.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	07/01/2020	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	4 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	7.20	1.70	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	24.80	18.80	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1500	0025	Drill ops core.
1525	0045	Wait on water pump to IBC.
1610	0040	Load core tidycsecure rig and site. Un load core at compound.
1650	0040	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.
		General; SHIFT. S YORK. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	07/01/2020	**Day**	Tuesday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	5 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
24.80	Fractured sandstone.	17	C		24.80	26.30			1.50														19.80
			RC		24.80	26.30		0012	1.50	0	No return											2.70	19.80
		18	C		26.30	27.80			1.50														17.20
28.80	Stiff clay.		RC		26.30	27.80		0013	1.50	0	No return											2.70	17.20
		19	C		27.80	29.30			1.50														17.40
			RC		27.80	29.30		0015	1.50	0	No return											2.70	17.40
		20	C		29.30	30.80			1.35														16.70
			RC		29.30	30.80		0006	1.35	0	No return											2.70	16.70
			RC		29.30	30.80		0018	0.00	0	No return											2.70	16.80

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	24.80	19.80	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	6.20	0.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	24.80	30.80	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0030	Dive to site.
0715	0045	Sign in open up set up.
0800	0055	Drill ops core.
0855	0015	Wait on water and pump to IBC.
0910	0025	Drill ops core.
0935	0025	Wait on water pump to IBC.
1000	0040	Drill ops core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	08/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	6 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	24.80	19.80	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	6.20	0.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1040	0020	Wait on water pump to IBC.
1100	0040	Drill ops core.
1140	0040	Wait on water pump to IBC.
1220	0025	Drill ops core.
1245	0025	Wait on BH install instruction.
1310	0040	Wait on tracked dumper.
1350	0030	Load install move to position and un load.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	08/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	7 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	24.80	19.80	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	6.20	0.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1420	0155	Install BH.
1615	0035	Tidy secure site and rig take core to compound and un load.
1650	0040	Return to accommodation.
		General; INSTALL DETAILS TO FOLLOW TOMORROW.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHFT. J SMITH. 06.45HRS TO 17.30HRS.
		General; SHIFT S YORK. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	08/01/2020	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	8 of 9	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	6.20	0.00	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
0910			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0200	Sign in open setup. Pull casing mix and pump grout. 3:1 ratio 100L
		General; PLAIN PIPE 28.70M TO 30.80M. GROUT 6.20M TO 0.50M.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/01/2020	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 24
Sheet	9 of 9	**Completed**	Y

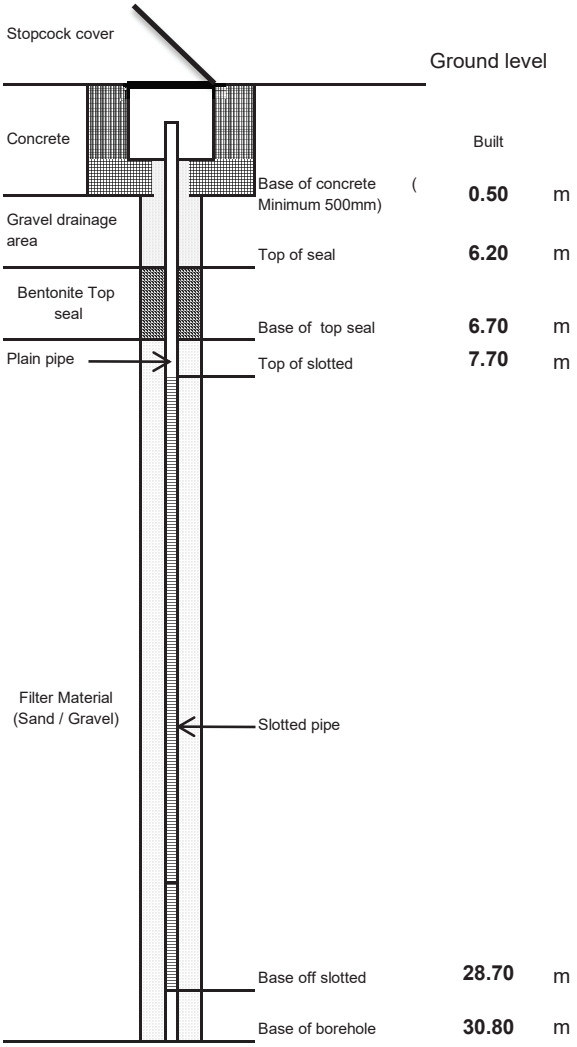
AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	146	mm
Slot size	1	mm
Geosock	Yes	
Gas tap	None	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	18.80	m
Time of Initial reading	0900	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	6.20	0.50
Borehole seal top	6.70	6.20
Filter zone	30.80	6.70
Plain pipe	7.70	GL
Slotted zone	28.70	7.70
Base of borehole	30.80	

Remarks

22 X Gravel 1 x bentonite pellets 1 x bentonite powder 1 x cement used.

Rig type	Comacchio 305	**Project Title**			
Drilling Crew Details		Peterborough			
Support Operative	TBC				
Lead Driller	Simon Downer	**Project No**		35673	
Site category	Yellow	**Day**	Thursday	**Date**	January 9, 2020
Engineer	MJCA			**Borehole Number**	
Lead Driller's signature				**K 24**	

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf.	1	L		1.20	2.70	128	0012	1.50													0.00	Dry
		2	C		2.70	4.20			1.45														1.20
			RC		2.70	4.20		0020	1.45	90	brown											2.70	1.20
0.10	Topsoil.	3	C		4.20	5.70			1.50														1.50
			RC		4.20	5.70		0015	1.50	90	brown											2.70	1.50
0.30	Clay.																						
1.20	Stiff clay.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	5.70	2.70	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	5.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SELBY. 05.00HRS TO 17.30HRS.
0500		CAT Scanned: Yes
0500		Permit Completed: Yes
0915	0230	Cat position prepare to move track rig and move kit etc. (rig bogged down for 40mins)
1145	0025	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1210	0020	Set up rig and some kit.
1230	0030	Lunch.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	25/11/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	1 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	5.70	2.70	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1300	0015	Continue to set up.
1315	0015	Drill ops sample.
1330	0045	Wait on water then pump to tanks.
1415	0030	Drill ops case set upto core.
1445	0055	Wait on water and pump to tanks
1540	0100	Drill ops core.
1640	0020	Tidy away secure site and rig.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	25/11/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	2 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	5.70	2.70	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1700	0030	Drive to accommodation.
		General; SHIFT. S DOWNER 05.00HRS TO 17.30HRS
		General; SHIFT J SMITH. 05.00HRS TO 1730HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	25/11/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	3 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
5.70	Fractured limestone.	4	C		5.70	7.20			1.40														3.30
			RC		5.70	7.20		0010	1.40	0	No return											2.70	3.30
		5	C		7.20	8.70			1.50														7.00
8.70	Sandy clay band.		RC		7.20	8.70		0012	1.50	0	No return											7.20	7.00
		6	C		8.70	10.20			1.50														7.40
			RC		8.70	10.20		0012	1.50	0	No return											7.20	7.40
9.00	Fractured limestone.		RC		10.20	11.70		0013	1.50	0	No return											7.20	7.30
		7	C		10.20	11.70			1.50														7.30
		8	C		11.70	13.20			1.50														7.40
			RC		11.70	13.20		0012	1.50	0	No return											7.20	7.40
			RC		13.20	14.70		0012	1.50	0	No return											7.20	7.30
		9	C		13.20	14.70			1.50														7.30
			RC		14.70	16.20		0012	1.50	0	No return											7.20	7.20
		10	C		14.70	16.20			1.50														7.20
			RC		16.20	17.70		0012	1.30	0	No return											7.20	7.20
		11	C		16.20	17.70			1.30														7.20
		12	C		17.70	18.30			0.60														7.40
			RC		17.70	18.30		0010	0.60	0	No return											7.20	7.40

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	5.70	3.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	20.70	7.20	7.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	2.70	7.20					S			
RC	146.30	5.20	20.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0020	Drive to site.
0705	0105	Assist un loading of fuel bowser and 2 compressor open up and set up.
0810	0050	Drill ops core and case.
0900	0040	Wait on water and pump to tanks.
0940	0025	Drill ops case and set up to core.
1005	0020	Drill ops core.
1025	0015	Pump water to tanks.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	26/11/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	4 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		18.30	19.20		0009	0.90	0	No return											7.20	7.40
		13	C		18.30	19.20			0.90														7.40
		14	C		19.20	20.70			1.50														7.30
			RC		19.20	20.70		0015	1.50	0	No return											7.20	7.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	5.70	3.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	20.70	7.20	7.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1040	0040	Drill ops core.
1120	0110	Wait on water and pump to tanks.
1230	0100	Drill ops core.
1330	0030	Lunch.
1400	0020	Wait on water and pump to tanks.
1420	0040	Drill ops core.
1500	0015	Pump water to tanks.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	26/11/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	5 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	5.70	3.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	20.70	7.20	7.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1515	0025	Drill ops core.
1540	0020	Wait on wateand pump to tanks.
1600	0100	Assist P Hetherington with stuck casing tidy secure site an rig.
1700	0030	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH 06.45HRS TO 17.30HRS.
		General; SHIFT. J SELBY 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	26/11/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	6 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
20.70	Fractured limestone.	15	C		20.70	22.20			1.50														10.10
			RC		20.70	22.20		0015	1.50	0	No return											7.20	10.10
		16	C		22.20	23.70			1.50														8.40
22.20	Sandstone.		RC		22.20	23.70		0013	1.50	0	No return											7.20	8.40
		17	C		23.70	25.20			1.50														7.80
			RC		23.70	25.20		0013	1.50	0	No return											7.20	7.80

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	20.70	10.10	7.20

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	25.20	7.90	7.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	20.70	25.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0050	Wait for others sign in open up and set up.
0800	0140	Wait on water. P HETHERINGTON has priority re casing.
0840	0150	Drill ops core.
1130	0530	Wait on water. PH has priority re casong assist PH with casing.
1700	0030	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Drizzle	Project No	35673
Date	27/11/2019	Day	Wednesday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	K 25
Sheet	7 of 10	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	20.70	10.10	7.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	25.20	7.90	7.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH 06.45HRS TO 17.30HRS.
		General; SHIFT. J SELBY 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Drizzle	**Project No**	35673
Date	27/11/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	8 of 10	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
25.20	Sandstone.	18	C		25.20	26.70			1.50														9.60
			RC		25.20	26.70		0015	1.50	0	No return											7.20	9.60
		19	C		26.70	28.20			1.50														19.60
27.00	Very stiff clay.		RC		26.70	28.20		0017	1.50	0	No return											7.20	19.60

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	25.20	9.60	7.20

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	25.20	28.20	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0020	Drive to site.
0705	0105	Sign in open up set up pump water to tanks.
0810	0150	Drill ops core.
1000	0040	Await BH install instruction.
1040	0050	Collect and load install equipment and un load at position.
1130	0215	Install BH and pull casing.
1345	0030	Lunch.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	Project No	35673
Date	28/11/2019	Day	Thursday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	K 25
Sheet	9 of 10	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	25.20	9.60	7.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1415	0115	Mix and pump grout to BH. 150L AT 3:1Ratio.
1530	0130	Prepare to move.
1700	0030	Return to accomodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS
		General; SHIFT. J SMITH 06.45HRS TO 17.30HRS.
		General; SHIFT. J SELBY. 06.45HRS TO 17.30HRS.
		General; PLAIN PIPE 28.00M TO 27.00M. GROUT 4.50M TO 0.80M.IN INSTALL.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	28/11/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K 25
Sheet	10 of 10	**Completed**	Y

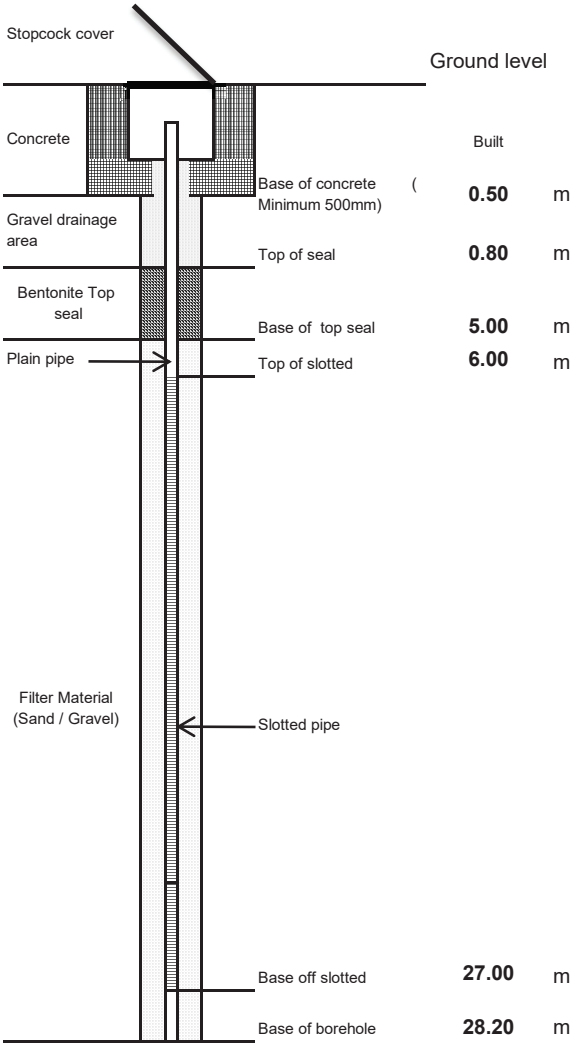
AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	146	mm
Slot size	1	mm
Geosock	Yes	
Gas tap	Single	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	16.10	m
Time of Initial reading	1530	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	0.80	0.50
Borehole seal top	5.00	0.80
Filter zone	28.20	5.00
Plain pipe	6.00	GL
Slotted zone	27.00	6.00
Base of borehole	28.20	

Remarks

21 x Gravel 2 x bentonite pellets 1 x bentonite powder 1 x cement 1 x ballast.

Rig type	Comacchio 305	**Project Title**			
Drilling Crew Details		Peterborough			
Support Operative	TBC				
Lead Driller	Simon Downer	**Project No**		35673	
Site category	Yellow	**Day**	Thursday	**Date**	November 28, 2019
Engineer	MJCA			**Borehole Number**	
Lead Driller's signature				**K 25**	

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Brown clay top soil.																						
0.40	Light brown weathered limestone.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
0545	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1200	0230	Moving equipment to BHK26, Tacking rig to compound for repair.
1430	0100	Repairing clamp ram and leg ram.
0500	0045	loading equipment on van.
0545	0345	Mob to site.
0930	0030	Standing: Induction
1000	0145	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1145	0015	Reinstate BHK37.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	20/01/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	1 of 9	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
0545	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1530	0030	Tracking rig from compound to BHK26.
1600	0045	Set up rig and work area
1645	0015	Securing site and packed away.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	20/01/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	2 of 9	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.20	Weathered rock.	1	C		1.20	2.70			1.50														0.30
			RC		1.20	2.70		0015	1.50	65	grey											1.20	0.30
2.20	Stiff grey clay.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
0645	2.70	0.86	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	0.00	2.70					S			
RC	146.30	1.20	2.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0045	Mob to site
0730	0030	Set up work area.
0800	0100	Standing: Waiting for water.
0900	0045	Drilling.
0945	0100	Standing: Waiting for water.
1045	0015	Drilling.
1100	0515	Standing: Stopped drilling as p20 is priority foe water.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	21/01/2020	**Day**	Tuesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	3 of 9	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
0645	2.70	0.86	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1615	0045	Filling water tanks.
1700	0015	Pack up and secured site.
		General; Hadto case to 2.70.
		General; Working hours DW LG 06.45am to 18.00pm

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Sunny	**Project No**	35673
Date	21/01/2020	**Day**	Tuesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	4 of 9	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	2.70	1.40	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	16.00	15.72	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	Project No	35673
Date	22/01/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	BHK26
Sheet	5 of 9	Completed	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		2.70	4.00		0020	1.30	95	grey											2.70	1.66
		2	C		2.70	4.00			1.30														0.66
			RC		4.00	5.50		0025	1.50	95	grey											2.70	1.82
		3	C		4.00	5.50			1.50														0.82
			RC		5.50	7.00		0025	1.50	95	grey											2.70	1.76
		4	C		5.50	7.00			1.50														0.62
			RC		7.00	8.50		0030	1.50	95	grey											2.70	1.83
		5	C		7.00	8.50			1.50														0.86
			RC		8.50	10.00		0030	1.50	95	grey											2.70	1.93
		6	C		8.50	10.00			1.50														1.93
			RC		10.00	11.50		0045	1.50	95	grey											2.70	1.72
		7	C		10.00	11.50			1.50														1.72
			RC		11.50	13.00		0035	1.50	95	grey											2.70	1.68
		8	C		11.50	13.00			1.50														1.68
			RC		13.00	14.50		0035	1.50	95	grey											2.70	1.68
		9	C		13.00	14.50			1.50														1.68
			RC		13.00	14.50		0030	1.50	95	grey											2.70	1.82
		10	C		13.00	14.50			1.50														1.82

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	16.00	15.72	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	2.70	16.00	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0645	0045	Mob to site.
0730	0030	Sign in,Set up work area.
0800	0030	Filling ibc with water.
0830	0445	Drilling.
1315	0045	Break.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	22/01/2020	**Day**	Wednesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	6 of 9	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		14.50	16.00		0015	1.50	40	grey											2.70	1.83
		11	C		14.50	16.00			1.50														1.83

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	16.00	15.72	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1400	0030	Loading core, Filling water bowser.
1430	0230	Drilling.
1700	0030	Pack up, Secured site.
		General; Lost flush around 15.50m

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	Project No	35673
Date	22/01/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	BHK26
Sheet	7 of 9	Completed	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
29.50	Sand.	20	C		26.50	28.00			1.50														16.20
			RC		26.50	28.00		0025	1.50	0	No return											2.70	16.20
		21	C		28.00	29.50			1.50														16.11
31.00	Grey sandstone.		RC		28.00	29.50		0035	1.50	0	No return											2.70	16.11
		22	C		29.50	31.00			0.30														16.06
			RC		29.50	31.00		0020	0.30	0	No return											2.70	16.06
		23	C		31.00	32.50			1.50														16.12
			RC		31.00	32.50		0025	1.50	0	No return											2.70	16.12

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	26.50	16.16	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1700	32.50	16.12	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	26.50	32.50	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0045	Mob to site.
0730	0015	Set up work area.
0745	0100	Drlling.
0845	0015	Standing: Waiting for water.
0900	0045	Drilling.
0945	0045	Standing: Waiting for water.
1030	0045	Drilling.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	24/01/2020	**Day**	Friday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	8 of 9	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJC Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	26.50	16.16	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1700	32.50	16.12	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1115	0030	Standing: Waiting for water, Filling water tanks.
1145	0115	Drilling.
1300	0030	Filling ibc and water tanks.
1315	0045	Stopped drilling, Tidying work away, Packed away, Secured site.
1400	0300	Arrived back at yard.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Green		
Project Engineer	cameron		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	24/01/2020	**Day**	Friday
Rig type		**Borehole Number**	
Inclination		**Orientation**	BHK26
Sheet	9 of 9	**Completed**	N

AGS

Produced by KeyLogbook

neering Limited

S DAILY REPORT

EA

N PLC PETERBOROUGH

DATE 27/1/20

SHEET 1/1

CONTRACT No. 35673

BOREHOLE K26

ICTION RECORD

nove	no.	hr	dynamic sampling	m	hr
up	no.	hr	core drilling	5.70 m	hr
down	no.	hr	CFA	m	hr
e		3.45 hr	HSFA	m	hr
ons		hr	penetration testing	no	hr
		hr	undisturbed sampling	no	hr
		hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WEL
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push
HDPE							gravel	25kg bags	stopcock		gas
UPVC							bentonite pellets	25kg bags	traffic rated		
Triloc							bentonite powder	25kg bags	manhole		WAT
19mm							cement	25kg bags	padlocks		befo
							ballast	25kg bags			afte

AMPLING RECORD

depth (m bgl) from	to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)
50	34.00	1.50	1.50	SW	2.70	16.20				GL	
.00	35.50	1.50	1.50			17.02					
.50	37.00	1.50	1.20			13.21					
.00	38.20	1.20	1.50			16.27					

m bgl)

o.m.		struck at		settled at
5	10	15	20	
		before water flush		
		after pulling casing		

/

REMARKS

DRIVE TO SITE 3H
BRIEF 15m
AWAIT INSTALL INSTRUCTION 30m
GET INSTALL PIPEWORK READY 1H

driller P HETHERINGTON

assistant driller L GOODMAN

landrover

ering Limited

S DAILY REPORT

A

PLC PETERBOROUGH

DATE 28/1/20

SHEET 1/1

CONTRACT No. 35673

BOREHOLE K26

CTION RECORD

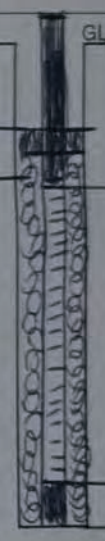
ve	no.	hr	dynamic sampling	m	hr
	no.	hr	core drilling	m	hr
wn	1 no.	hr	CFA	m	hr
		hr	HSFA	m	hr
s		hr	penetration testing	no	hr
		hr	undisturbed sampling	no	hr
		hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WE
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25 25kg bags	helmet	1	pus
HDPE	1		7	2		5	gravel	25kg bags	stopcock		gas
UPVC							bentonite pellets	1 25kg bags	traffic rated		
Triloc							bentonite powder	2 25kg bags	manhole		WAT
19mm							cement	2 25kg bags	padlocks		befo
							ballast	2 25kg bags			afte

MPLING RECORD

epth (m bgl)		drilled	recov'd	casing		water depth	penetration test		strata description	installation / backfilling	depth (m bgl)
n	to	(m)	(m)	size (mm)	depth (m bgl)	(m bgl)	seating	test drive			
									GROUT (GL)	GL	
									BENTONITE PELLETS 13.50		
									14.m WASHED SAND		1
											3
											3



bgl)

n.		struck at		settled at
	10	15	20	
		before water flush		
		after pulling casing		

REMARKS

HOLE DIPPING AT 37.25
INSTALL 8.00 - 14.30 PULL CASING IH AS STUCK
STANDING ONE TO NO POSITION TO MOVE TO 14.

driller [redacted]

assistar [redacted]

landrover

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Grass turf.																						
0.10	Clayey soil.																						
0.30	Clay.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1715	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500		CAT Scanned: Yes
0500		Permit Completed: Yes
1245	0030	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1325	0255	Track rig 250m.m set up. Move kit set up. Move heras set up. Fill IBC tidy secure site.
1620	0020	Return to compound.
1640	0035	Drive to accommodation.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	16/12/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	1 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.20	Firm clay.	1	L		1.20	2.70	128	0005	1.50													0.00	Dry
		2	L		2.70	2.90	128	0005	0.20													2.70	0.50
		3	C		2.90	4.20			1.20														1.00
2.90	Stiff clay.		RC		2.90	4.20		0010	1.20	90	brown											2.70	1.00
		4	C		4.20	5.70			1.50														1.20
			RC		4.20	5.70		0015	1.50	90	brown											2.70	1.20
12.90	Limestone.		RC		5.70	7.20		0015	1.50	95	grey											2.70	1.20
		5	C		5.70	7.20			1.50														1.20
		6	C		7.20	8.70			1.50														1.30
			RC		7.20	8.70		0015	1.50	95	grey											2.70	1.30
			RC		8.70	10.20		0003	0.75	95	grey											2.70	1.20
		7	C		8.70	10.20			0.75														1.20
		8	C		8.70	10.20			0.75														1.20
			RC		8.70	10.20		0015	0.75	95	grey											2.70	1.20
			RC		8.70	10.20		0015	0.00	95	grey											2.70	1.40
			RC		10.20	11.70		0003	1.45	95	grey											2.70	1.30
		9	C		10.20	11.70			1.45														1.30
			RC		10.20	11.70		0003	0.00	95	grey											2.70	1.40

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	13.20	12.90	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	1.20	2.70					S			
DS	128.00	1.20	2.90								
RC	146.30	2.90	13.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0050	Wait on client and access.
0800	0025	Walk to position and open up.
0825	0450	Drill ops sample case set up to core and core.
1315	0035	Lunch.
1350	0155	Drill ops core.
1545	0020	Lost flush at 12.90m. Client instructs to monitor water for 20 mins.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	17/12/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	2 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
		10	C		11.70	13.20			1.50														1.30
			RC		11.70	13.20		0013	1.50	95	grey											2.70	1.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	13.20	12.90	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1605	0055	Await BH instruction. Tidy secure position return to compound.
1700	0030	Return to accommodaion.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.
		General; SHIFT. J KENNEDY. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	17/12/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	3 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
13.20	Fractured limestone.	11	C		13.20	14.70			1.50														Dry
			RC		13.20	14.70		0011	1.50	0	No return											2.70	Dry
		12	C		14.70	16.20			1.50														14.35
26.50	Sandstone.		RC		14.70	16.20		0010	1.50	0	No return											2.70	14.35
		13	C		16.20	17.70			1.50														Dry
			RC		16.20	17.70		0010	1.50	0	No return											2.70	Dry
		14	C		17.70	19.20			1.50														16.90
			RC		17.70	19.20		0009	1.50	0	No return											2.70	16.90
		15	C		19.20	20.70			1.50														16.90
			RC		19.20	20.70		0009	1.50	0	No return											2.70	16.90
		16	C		20.70	22.20			1.50														16.90
			RC		20.70	22.20		0008	1.50	0	No return											2.70	16.90
		17	C		22.20	23.70			1.50														16.90
			RC		22.20	23.70		0010	1.50	0	No return											2.70	16.90
		18	C		23.70	25.20			1.35														16.90
			RC		23.70	25.20		0010	1.35	0	No return											2.70	16.90
		19	C		25.20	26.70			1.20														16.90
			RC		25.20	26.70		0012	1.20	0	No return											2.70	16.90

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	13.20	Dry	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	28.20	16.90	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	13.20	28.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0245	Client instructs to drill with air. Wait on tractor to move compressor.
0955	0020	Client instructs to continue with water and to monitor water after each core run. Drill ops core.
1015	0020	Monitor water.
1035	0045	Wait on water and pump to tanks.
1120	0015	Drill ops core.
1135	0010	Monitor water.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	18/12/2019	Day	Wednesday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	K27
Sheet	4 of 11	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		26.70	28.20		0011	1.30	0	No return											2.70	1.30
		20	C		26.70	28.20			1.30														1.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	13.20	Dry	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	28.20	16.90	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1145	0015	Drill ops core.
1200	0015	Monitor water.
1215	0015	Drill ops core.
1230	0005	Monitor water.
1235	0040	Drill ops core.
1315	0100	Wait on water and pump to tanks.
1415	0040	Drill ops core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	18/12/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	5 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	13.20	Dry	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	28.20	16.90	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1455	0030	Wait on water and pump to tanks.
1525	0050	Drill ops core.
1615	0045	Pump water to tanks load core securesite and return to compound.
1700	0030	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS
		General; SHIFT. J SMITH 06.45HRS TO 17.30HRS.
		General; SHIFT. J KENNEDY. 06.45HRS TO 17.30HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	18/12/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	6 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
28.20	Fractured sandstone.	21	C		28.20	29.70			1.10														16.90
			RC		28.20	29.70		0012	1.10	0	No return											2.70	16.90
		22	C		29.70	31.20			1.50														16.90
35.00	Mudstone		RC		29.70	31.20		0014	1.50	0	No return											2.70	16.90
		23	C		31.20	32.70			1.50														16.90
			RC		31.20	32.70		0010	1.50	0	No return											2.70	16.90
		24	C		32.70	34.20			1.50														16.90
			RC		32.70	34.20		0010	1.50	0	No return											2.70	16.90
		25	C		34.20	35.20			1.00														16.90
			RC		34.20	35.20		0012	1.00	0	No return											2.70	16.90
		26	C		35.20	36.70			1.45														16.90
			RC		35.20	36.70		0017	1.45	0	No return											2.70	16.90

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	28.20	16.90	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1715	11.50	0.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	28.20	36.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0105	Load kit go to position open up.
0815	0045	Drill ops core.
0900	0035	Problem withbinner core barrel catcher sleeve and box. Remedy.
0935	0055	Drill ops core.
1030	0040	Wait on water.
1110	0220	Drill ops core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Rain	**Project No**	35673
Date	19/12/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	7 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	28.20	16.90	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1715	11.50	0.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1330	0010	Await BH install instruction.
1340	0105	Pump water to tanks colect install and un load at position.
1445	0130	Install BH.
1615	0030	Tidy secure position return to position.
1645	0030	Return to accommodation.
		General; INSTALL DETAIL TO FOLLOW TOMORROW.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.15HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Rain	**Project No**	35673
Date	19/12/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	8 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	28.20	16.90	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1715	11.50	0.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH. 06.45HRS TO 17.15HRS.
		General; SHIFT. J KENNEDY. 06.45HRS TO 17.15HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Rain	**Project No**	35673
Date	19/12/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	9 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.50	0.00	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1700			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0400	Mix and pump grout 250L 3:1Ratio to BH pull casing. Move all kit and rig off site load to vehicles.
1210	0330	Return to GEL.
		General; BENTONITE PELLETS 12.00M TO 11.50M THEN GROUT TO 0.50M.
		General; PLAIN PIPE 35.50M TO BASE OF SLOTTED PIPE T 34.00M
		General; SHIFT. S DOWNER. 06.45HRS TO 17.00HRS
		General; SHIFT. J SMITH. 06.45HRS TO 17.00HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Rain	**Project No**	35673
Date	20/12/2019	**Day**	Friday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	10 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	11.50	0.00	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1700			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J KENNEDY 06.45HRS TO 17.00HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Rain	**Project No**	35673
Date	20/12/2019	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	K27
Sheet	11 of 11	**Completed**	Y

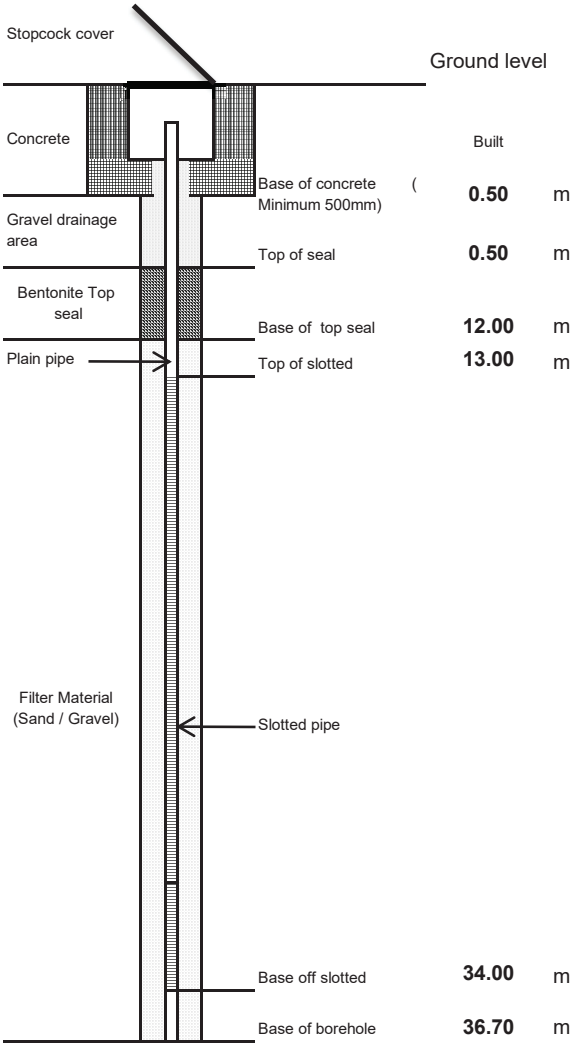
AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	146	mm
Slot size	1	mm
Geosock	Yes	
Gas tap	None	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	16.80	m
Time of Initial reading	1130	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	0.50	0.50
Borehole seal top	12.00	0.50
Filter zone	36.70	12.00
Plain pipe	13.00	GL
Slotted zone	34.00	13.00
Base of borehole	36.70	

Remarks

20 x gravel 1 x bentonite pellets 2 x powde 1 x cement used.

Rig type	Comacchio 305	**Project Title**			
Drilling Crew Details		Peterborough			
Support Operative	TBC				
Lead Driller	Simon Downer	**Project No**		35673	
Site category	Yellow	**Day**	Friday	**Date**	December 20, 2019
Engineer	MJCA			**Borehole Number**	
Lead Driller's signature				**K27**	

AGS

Produced by KeyLogbook

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 6·01·20 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K28

TIME AND PRODUCTION RECORD

from	5 00	rig move	1 no.	·50 hr	dynamic sampling	1·30 m	hr
to	18·30	rig up	1 no.	hr	core drilling	8·80 m	hr
hrs	11·30 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				2·50 hr	HSFA	m	hr
awaiting access/instructions				·20 hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	1·00 m
							ballast	25kg bags			after ~~am~~/pm	2·20 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1X	128	1·20	2·50	1·30	1·40			1·10				GL		
		FLUSH CASING				SW	2·40							
2C	146	2·50	4·00	1·50	·75		1·80	→ WATER						
3C	146	4·00	5·50	1·50	1·50		1·82	→ WATER						
4C	146	5·50	7·00	1·50	1·50		2·08	→ WATER						
5C	146	7.00	8·50	1·50	1·00		2·42	→ WATER						
6C	146	8·50	9·40	0·90	1·50		2·53	→ WATER						
7C	146	9·40	10·90	1·50	0·40									
8C	146	10·90	11·30	0·40	1·50		2·20	→ WATER						

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

30m LOAD KIT ON TRACK DUMPER
30m TRACK RIG 30m SET UP
CASING AT 2·40 REST ARE WATER DEPTHS.

weather DRY

dri[redacted]
ass[redacted]

landrover

rig P.18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

SITE ARGEAN PLC PETERBOROUGH

DATE 7.1.20

SHEET 1/1

CONTRACT No. 35673

BOREHOLE 28

TIME AND PRODUCTION RECORD

from	7.00	rig move	no.	hr	dynamic sampling	m	hr
to	17.30	rig up	no.	hr	core drilling	18.20 m	hr
hrs	10.30 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				50 min hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	2.55 m
							ballast	25kg bags			after am/pm	16.52 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
9c	146	11.30	12.75	1.45	1.43	5w	2.40	2.55				GL		
10c	146	12.75	14.25	1.50	1.50			5.20						
11c	146	14.25	15.80	1.55	1.60			14.86						
12c	146	15.80	17.40	1.60	1.50			16.63	MONITOR WATER					
13c	146	17.40	18.90	1.50	1.60			16.56						
14c	146	18.90	20.50	1.60	1.55			16.56						
15c	146	20.50	22.00	1.50	1.50			16.52						
16c	146	22.00	23.50	1.50	1.50			16.58						
17c	146	23.50	25.00	1.50	1.35			16.56						
18c	146	25.00	26.50	1.50	1.50			16.54						
19c	146	26.50	28.00	1.50	1.35			16.55						
20c	146	28.00	29.50	1.50	1.55			16.52						

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking 14.86	5 14.88	10 14.77	15 14.78	20 14.85
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

MONITOR WATER AT 16.56, 16.58. 40m MONITOR WATER
LOST FLUSH AT 14.20

weather DRY

[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 8·1·20

CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K28

TIME AND PRODUCTION RECORD

from	7.00	rig move	no.	hr	dynamic sampling	m	hr
to	18·00	rig up	no.	hr	core drilling	9 m	hr
hrs	11·00 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				50 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m) 1.0	1.5	3.0	CASING (m) 1.0	1.5	3.0	RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
							washed sand	25kg bags	helmet		push on cap	1 no.
HDPE	1		7			6	gravel	1 25kg bags	stopcock		gas valve	1 no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	16·60 m
							ballast	25kg bags			after am/pm	16·78 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	test drive	strata description	installation / backfilling	depth (m bgl)	installation description
21c	146	29·50	31·00	1·50	1·30	5W	2·40	16·70				GL		PLAIN GL
22c	146	31·00	32·50	1·50	1·50			16·64						
23c	146	32·50	34·00	1·50	1·50			16·65						
24c	146	34·00	35·50	1·50	1·50			16·69						
25c	146	35·50	37·00	1·50	·55			16·58						SLOTTED 14·10
	146	37·00	37·50	·50	NR									
26c	146	37·30	37·50	0	1·50			16·61						
27c	146	37·50	38·50	1·00	1·10			16·78						
														PLAIN 36·10
											GRAVEL 38·20			38·20 DEPTH

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

AWAIT INSTALL INSTRUCTIONS 30m
AWAIT CHANGE OF ASSISTANT DRILLER (INDUCTION) 30m

weather DRY

[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 9.1.20

CONTRACT No. 35673

SITE AUREAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K28

TIME AND PRODUCTION RECORD

from	7.00	rig move	1 no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling	m	hr
hrs	10.15 hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site				.49 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	20 25kg bags	helmet	1	push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	2 25kg bags	manhole		WATER LEVELS	
19mm							cement	2 25kg bags	padlocks		before am/pm	m
							ballast	2 25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
												GL		
														SEE PIPE DEPTHS ON 8.1.20 LOGS
											GROUT TO GL			
											12.65 BENTONITE PELLETS			
											13.15 m WASHED SAND			

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

PULL AND REDO PIPE 30.m
15m AWAIT NEXT POSITION. 13.15 - 13.45 DIG NEXT INSPECTION PIT
PIT DUG TO .75. ABANDONED POSITION DUE TO C.A.T READINGS
40m CHECK BH LOCATIONS. 1H MOVE KIT + TRACK RIG

weather DRY

drille [redacted]
assis

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 10-1-20

CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K28

TIME AND PRODUCTION RECORD

from	7-00	rig move	1 no.	hr	dynamic sampling	m	hr
to	17-00	rig up	no.	hr	core drilling	m	hr
hrs	10 hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site				3 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test seating	penetration test test drive	penetration test test drive	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
															GL		

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

8-00 AM – 11 AM DEMOB FROM K28 TO K37
11-00 – 13-00 SET UP POSITION + DIG PIT TO 1.20m
13-00 – 13-30 LOAD RIG ON FLAT BED.
13-30 LEAVE SITE

weather DRY

dri[redacted]
as[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 13-12-19 CONTRACT No. 35673

SITE ANGLIAN PCC PETERBOROUGH SHEET 111 BOREHOLE K29

TIME AND PRODUCTION RECORD

from	7.00	rig move	2 no.	hr	dynamic sampling	1.4 m	hr
to	18.00	rig up	1 no.	hr	core drilling	5.9 m	hr
hrs	11 hr	rig down	2 no.	hr	CFA	m	hr
transport to and from site				5 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	0.80 m
							ballast	25kg bags			after ~~am~~/pm	1.90 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1x	128	1.20	2.60	1.40	1.40							GL		
2C	146	2.60	3.90	1.30	1.40									
	FLUSH CASING					SW	2.50							
3C	146	3.90	5.50	1.60	1.50									
4C	146	5.50	7.10	1.60	1.50									
5C	146	7.10	8.50	1.40	1.50									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

TRAVEL TO SITE 4.30am - 7.00am DIG PIT TO 1.20

weather DRY	drille[redacted]	landrover	rig PIX
	assis[redacted]		

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 16-12-19 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K29

TIME AND PRODUCTION RECORD

from	5:00	rig move	1 no.	hr	dynamic sampling	m	hr
to	18:00	rig up	1 no.	hr	core drilling	8.95 m	hr
hrs	13.00 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				3.5 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	2.05 m
							ballast	25kg bags			after ~~am~~/pm	14.11 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
6C	146	8.50	9.75	1.25	1.25							GL		
7C	146	9.75	11.25	1.50	1.50									
8C	146	11.25	12.85	1.60	1.55									
9C	146	12.85	14.45	1.60	1.50									
10C	146	14.45	15.95	1.50	1.45									
11C	146	15.95	17.45	1.50	1.45									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

MONITOR WATER AT 13.96, 14.02, 14.08, 14.03, 14.03
25m TOTAL

weather DRY

driller [redacted]
assist

landrover

rig A8

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 17-12-19 CONTRACT No. 35673

SITE ANGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K29

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.30	rig up	no.	hr	core drilling	13.60 m	hr
hrs	10.15 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				20 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	14.28 m
							ballast	25kg bags			after ~~am~~/pm	14.16 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive				strata description	installation / backfilling	depth (m bgl)	installation description
12c	146	17.45	18.80	1.35	1.35										GL		
13c	146	18.80	20.40	1.60	1.60												
14c	146	20.40	21.90	1.50	1.50												
15c	146	21.90	23.40	1.50	1.50												
16c	146	23.40	24.90	1.50	1.40												
17c	146	24.90	26.40	1.50	1.20												
18c	146	26.40	27.80	1.40	0.90												
19c	146	27.80	28.15	0.25	0.40												
20c	146	28.15	29.65	1.50	0.90												
21c	146	29.65	31.15	1.50	1.50												

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

AWAIT WATER 2 HOURS

weather DRY	driller [redacted]	landrover	rig P18
	assis [redacted]		

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 18-12-19

CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K29

TIME AND PRODUCTION RECORD

from	7-15	rig move	no.	hr	dynamic sampling		m	hr
to	17-30	rig up	no.	hr	core drilling	6	m	hr
hrs	10.15 hr	rig down	no.	hr	CFA		m	hr
transport to and from site				.30 hr	HSFA		m	hr
awaiting access/instructions				.45 hr	penetration testing		no	hr
				hr	undisturbed sampling		no	hr
				hr	installing		m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	5 25kg bags	helmet		push on cap	no.
HDPE			7	1		5	gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated		END CAP	1 no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	14-28 m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
22c	146	31-15	32-75	1-60	1-50							GL		PLAIN
23c	146	32-75	34-25	1-50	1-55									
24c	146	34-25	35-75	1-50	1-50									
25c	146	35-75	37-25	1-50	0-95									21-00 m SLOTTED
											29-60 WASHED SAND			34-46 1m PLAIN
														35-46

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

AWAITING WATER 2HOURS
AWAIT INSTRUCTION FROM CLIENT 45m
STARTED INSTALL TODAY. TO BE COMPLETED ON 19-12-19 DUE TO LOSS OF LIGHT

weather Dry

drill [redacted]
assi

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 19.12.19 CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K29

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.30	rig up	no.	hr	core drilling	m	hr
hrs	10.15 hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site				.39 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet	1	push on cap	1 no.
HDPE							gravel	15 25kg bags	stopcock		gas valve	1 no.
UPVC							bentonite pellets	.5 25kg bags	traffic rated			no.
Triloc							bentonite powder	2 25kg bags	manhole		WATER LEVELS	
19mm							cement	2.5 25kg bags	padlocks		before am/pm	m
							ballast	2 25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
											GROUT 0.4m	GL		
														14.84 BLAIN
											BENTONITE PELLETS 11.90			
											GRAVEL 12.60			
														21m SLOTTED
											1m BLAIN			
														35.46

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

ALVAIT WATER 4.5m.
MADE UP 400 LTRS OF GROUT
PLEASE REFER TO 18.12.19 LOGS FOR START OF INSTALL
MOVE KIT TO K28.

weather	DRY / RAIN	driller [redacted]	landrover
		assistant [redacted]	rig F18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 9-12-19 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K30

TIME AND PRODUCTION RECORD

from	5.00	rig move	1 no.	hr	dynamic sampling	1.10 m	hr
to	18.00	rig up	1 no.	hr	core drilling 3.30	m	hr
hrs	11 hr	rig down	0 no.	hr	CFA	m	hr
transport to and from site 3.50				hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after ~~am~~/pm	1.90 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1x	128	1.20	2.30	1.10	1.10							GL		
2C	146	2.30	2.60	0.30	0.30	SW	2.60							
3C	146	2.60	4.10	1.50	1.50									
4C	146	4.10	5.60	1.50	1.00									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at 1.00		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

DIG PIT 30 m
AWAIT WATER 30 m
AWAIT TO GET RIG FROM LOCKED AREA 1 H
FIXING WATER SWIVEL

weather DRY

dri[redacted]
as[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 10-12-19 CONTRACT No. 35673

SITE AUGEAN DLC PETERBOROUGH SHEET 1/1 BOREHOLE K30

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.30	rig up	no.	hr	core drilling	12 m	hr
hrs	10.15 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				40 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	1.62 m
							ballast	25kg bags			after ~~am~~/pm	10.74 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
5C	146	5.60	6.90	1.30	1.60							GL		
6C	146	6.90	8.30	1.40	1.60									
7C	146	8.30	9.90	1.60	1.50									
8C	146	9.90	11.40	1.50	1.60									
9C	146	11.40	13.00	1.60	1.50									
MONITOR WATER AT CLIENT REQUEST SEE WATER DEPTHS														
10C	146	13.00	14.00	1.00	1.05									
MONITOR WATER AT CLIENT REQUEST SEE REMARKS														
11C	146	14.00	15.05	1.05	1.06									
12C	146	15.05	16.15	1.10	0.85									
13C	146	16.15	17.60	1.45	1.60									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at 1.10
after striking	5 0.86	10 1.0	15 1.09	20 1.10
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

FIX WATER SWIVEL
MONITOR WATER AT 14m AT 5m INTERVALS - 10.91, 11.11, 11.17, 11.17, 11.22, 11.27, 11.27, 11.27, 11.27, 11.32, 11.32, 11.32, 11.35, 11.35, 11.35, 11.36, 11.36. 1.45 H IN TOTAL

weather	RAIN / CLOUDY

driller	[redacted]
assist	

landrover	rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 11-12-19 CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K30

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling 16.20	m	hr
hrs	10 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				4.9 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	11.40 m
							ballast	25kg bags			after am/pm	10.88 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive					strata description	installation / backfilling	depth (m bgl)	installation description
	146	CLEAN OUT RUN (CUTTINGS)														GL		
14c	146	17.60	19.10	1.50	1.50													
15c	146	19.10	20.60	1.50	1.40													
16c	146	20.60	22.10	1.50	1.50													
17c	146	22.10	23.60	1.50	1.45													
18c	146	23.60	25.10	1.50	1.55													
19c	146	25.10	26.60	1.50	1.25													
20c	146	26.60	28.10	1.50	1.30													
21c	146	28.10	29.60	1.50	1.60													
22c	146	29.60	31.10	1.50	1.60													
23c	146	31.10	32.60	1.50	1.00													
24c	146	32.60	33.80	1.20	1.40													

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

weather DRY / RAIN

[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 12.12.19

CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K30

TIME AND PRODUCTION RECORD

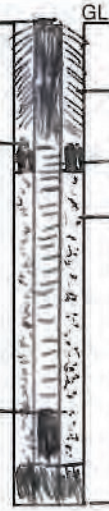
from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.30	rig up	no	hr	core drilling 1.95	m	hr
hrs	10.15 hr	rig down	no	hr	CFA	m	hr
transport to and from site 2.5				hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	21 25kg bags	helmet	1	push on cap	1 no.
HDPE			7			5	gravel	25kg bags	stopcock		gas valve	1 no.
UPVC							bentonite pellets	5 25kg bags	traffic rated			no.
Triloc							bentonite powder	2 25kg bags	manhole		WATER LEVELS	
19mm							cement	1.5 25kg bags	padlocks		before am/pm	11.35 m
							ballast	2 25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
25c	146	33.80	35.15	1.35	.60m						PLAIN TO GROUND	GL		
26c	146	33.15	35.75	.60	.40									GROUT 10.60-0.4m
											SLOTTED 12.25			BENTONITE 11.10-10.60m
														WASHED SAND 34.75-11.10m
											PLAIN 33.25			
											(34.75 COLLAPSED MATERIAL)			35.75m



WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

PULL 2.60 OF CASING, INSTALL

weather RAIN

drill[redacted]

assi[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 2.12.19 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K31

TIME AND PRODUCTION RECORD

from	5.00	rig move	2 no.	hr	dynamic sampling	2.70 m	hr
to	18.00	rig up	2 no.	hr	core drilling	m	hr
hrs	13 hr	rig down	2 no.	hr	CFA	m	hr
transport to and from site				4 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after ~~am~~/pm	1.55 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1x	128	1.20	2.70	1.50	1.50						TOP SOIL/CLAY	GL		
2x	128	1.20	3.90	1.20	1.20									

WATER DEPTHS (m bgl)

a.m.	p.m.	struck at 2.70	settled at 2.60	
after striking	5 2.65	10 2.65	15	20
sample taken at		before water flush		
before pulling casing		after pulling casing		

REMARKS

FINNISH INSTALL ON K32. 5 BAGS FILTER SAND + 300 LTRS GROUT AND 2 BAGS OF BALLAST AND 0.3 BAG OF CEMENT
K31 - DIG PIT 40 MINUTES

weather DRY

dri[redacted]
as[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 3.12.19 CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K31

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	18.00	rig up	no.	hr	core drilling	7.85 m	hr
hrs	11.15 hr	rig down	no.	hr	~~CFA~~ O/H	0.95 m	hr
transport to and from site				1.40 hr	HSFA	m	hr
awaiting access/instructions				0.39 hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m) 1.0	1.5	3.0	CASING (m) 1.0	1.5	3.0	RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
							washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	1.20 m
							ballast	25kg bags			after am/pm	9.27 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	test drive	strata description	installation / backfilling	depth (m bgl)	installation description
3C	146	3.90	5.40	1.50	1.50	SW	4.00					GL		
4C	146	5.40	6.90	1.50	1.50									
5C	146	6.90	8.40	1.50	1.00									
6C	146	8.40	9.40	1.00	1.60									
7C	146	9.40	10.20	0.80	0.80									
8C	146	10.20	11.75	1.55	1.55									
OH	OH	11.75	12.70	0.95	N/A									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

SETTING UP AIR MIST / AWAIT PART FROM PLUMLE CENTRE 2.5H
OPEN HOLED FROM 11.75 TO 12.70
FLUSH IN CASING / SET UP AIR MIST

weather DRY

[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 4.12.19 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K31

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling	8.90 m	hr
hrs	10 hr	rig down	no.	hr	~~CFA~~ O/H	2 m	~~hr~~
transport to and from site				40 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	8.76 m
							ballast	25kg bags			after ~~am~~/pm	8.25 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
9c	146	12.70	13.10	0.40	0.40	SW	13.00					GL		
	O/H	13.10	15.10	2.00	N/A									
10c	146	15.10	16.20	1.10	1.10									
11c	146	16.20	17.70	1.50	1.50									
12c	146	17.70	19.20	1.50	1.50									
13c	146	19.20	20.70	1.50	1.20									
14c	146	20.70	22.20	1.50	1.35									
15c	146	22.20	23.60	1.40	1.60									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

FLUSHED IN 13m CASING PAST WATER STRIKE AT CLIENTS REQUEST. 45m. SWITCH TO WATER CORING AT CLIENTS REQUEST 30m. SWITCH TO AIR MIST/O.H. AT CLIENTS REQUEST 1H. FLUSH WATER FROM HOLE 30m. SWITCH BACK TO CORING AT REQUEST 30m

weather	driller	landrover	rig
DRY	[redacted]		P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 5-12-18 CONTRACT No. 35673

SITE AMGEN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K31

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	18.00	rig up	no.	hr	core drilling	8.90 m	hr
hrs	10.45 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				45 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	8.78 m
							ballast	25kg bags			after ~~am~~/pm	9.98 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive					strata description	installation / backfilling	depth (m bgl)	installation description
16c	146	23.60	25.10	1.50	1.60	SW	13.00									GL		
17c	146	25.10	26.60	1.50	1.50													
18c	146	26.60	28.20	1.60	1.60													
19c	146	28.20	29.70	1.50	1.10													
20c	146	29.70	31.00	1.30	1.40													
21c	146	31.00	32.50	1.50	1.30													

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

AWAITING WATER 1.05 HOURS

weather DRY

[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 6-12-19 CONTRACT No. 35673

SITE AMGEAN PLC PETERBOROUGH SHEET 1-1 BOREHOLE K31

TIME AND PRODUCTION RECORD

from	7.15	rig move	1 no.	hr	dynamic sampling	m	hr
to	17.30	rig up	1 no.	hr	core drilling	m	hr
hrs	10.15 hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site 3.5				hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
												GL		
												BS		

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

weather

driller
assistant driller

landrover	rig

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 6.12.19 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K31

TIME AND PRODUCTION RECORD

from	7.15	rig move	1 no.	hr	dynamic sampling	m	hr
to	17.30	rig up	0 no.	hr	core drilling	m	hr
hrs	10.15 hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site			3.5	hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	23 25kg bags	helmet	1	push on cap	1 no.
HDPE							gravel	25kg bags	stopcock		gas valve	1 no.
UPVC							bentonite pellets	1 25kg bags	traffic rated			no.
Triloc							bentonite powder	2 25kg bags	manhole		WATER LEVELS	
19mm							cement	2 25kg bags	padlocks		before am/pm	9.20 m
							ballast	2 25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
											GROUT 0-50	GL		0 PLAIN
											BENTONITE 7.50			SLOTTED 9.50
											GRAVEL 8.20			
														30.50 PLAIN
											COLLAPSED 32.10 MATERIAL			32.50

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

CARRY OUT INSTALL
PULL 13.00 m OF SW CASING
RIG DOWN + MOVE TO COMPOUND 15m

weather DRY / RAIN

dri[redacted]
ass[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 25-11-19 CONTRACT No. 35763

SITE ANGLEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K3Q

TIME AND PRODUCTION RECORD

from	5.00	rig move	1 no.	hr	dynamic sampling	.40 m	hr
to	17.30	rig up	1 no.	hr	core drilling	m	hr
hrs	11.5 hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site			3.20 hr		HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive					strata description	installation / backfilling	depth (m bgl)	installation description
1x	128	1.20	1.60	.40	.40	SW	1.60	0								GL		

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

FINNISH BACKFILL ON KCW 6/19 + KIT MOVE TO POSITION 5H
DIG PIT 30m
AWAITING WATER 1.5H

weather DRY / DRIZZLE

[redacted]

landrover rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 26.11.19 CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K32

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.45	rig up	no.	hr	core drilling	13.35 m	hr
hrs	10.5 hr	rig down	no.	hr	CFA	m	hr
transport to and from site			0.25	hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	0.00 m
							ballast	25kg bags			after ~~am~~/pm	0.05 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive					strata description	installation / backfilling	depth (m bgl)	installation description
2c	146	1.60	2.95	1.35	1.35	SW	1.60	0								GL		
3c	146	2.95	4.45	1.50	1.50													
4c	146	4.45	5.95	1.50	1.50													
5c	146	5.95	7.45	1.50	1.30													
6c	146	7.45	8.95	1.50	1.50													
7c	146	8.95	10.45	1.50	1.50													
8c	146	10.45	13.95	1.50	1.50													
9c	146	13.95	13.45	1.50	1.50													
10c	146	13.45	14.95	1.50	1.50													
						SW	12.00	0										

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

AWAITING WATER 1-45 FLUSH CASING 3H
1H TRYING TO GET SW CASING UNSTUCK

weather DRIZZLE / DRY

dril[redacted]
ass[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 27.11.19 CONTRACT No. 35673

SITE ANGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K32

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	18.00	rig up	no.	hr	core drilling	m	hr
hrs	11.75 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				.35 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	0.70 m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive				strata description	installation / backfilling	depth (m bgl)	installation description
		FLUSH CASING 8INCH TO 12.20m													GL		

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

1H FILLING TANKS / MIXING POLYMER
1.5H AWAITING ARRIVAL OF 8INCH CASING
5.5H FLUSHING IN 8INCH CASING
SW CASING NOW FREE ATTEMPT TO REMOVE TOMORROW

weather DRY / DRIZZLE

driller [redacted]
assistant

landrover rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 28-11-19 CONTRACT No. 356733

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K32

TIME AND PRODUCTION RECORD

from	07.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling	19.75	hr
hrs	10 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				.42 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	7.45 m
							ballast	25kg bags			after am/pm	8.72 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive			strata description	installation / backfilling	depth (m bgl)	installation description
11c	146	14.95	14.95				—	CLEAN OUT					CLEAN OUT RUN	GL		
12c	146	14.95	16.25	1.30	1.30											
13c	146	16.25	17.75	1.50	1.50											
14c	146	17.75	19.25	1.50	1.50											
15c	146	19.25	20.85	1.60	1.50											
16c	146	20.85	22.45	1.60	1.60											
17c	146	22.45	23.95	1.50	1.50											
18c	146	23.95	24.35	.40	.40											
19c	146	24.35	25.45	1.10	.40											

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

1.5 HOURS BLEEDING/REMOVING SW CASING

weather DRY / RAIN

driller [redacted]

assista

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 28-11-19

CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K32

TIME AND PRODUCTION RECORD

from	07.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling	10.50 m	hr
hrs	10.00 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				.40 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	7.45 m
							ballast	25kg bags			after ~~am~~/pm	8.42 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive					strata description	installation / backfilling	depth (m bgl)	installation description
	146	14.95	14.95	0	0		CLEAN OUT									GL		
11c	146	14.95	16.25	1.30	1.30													
12c	146	16.25	17.75	1.50	1.50													
13c	146	17.75	19.25	1.50	1.50													
14c	146	19.25	20.85	1.60	1.50													
15c	146	20.85	22.45	1.60	1.60													
16c	146	22.45	23.95	1.50	1.50													
17c	146	23.95	24.35	0.40	0.40													
18c	146	24.35	25.45	1.10	0.40													

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

1.5 H BREAKING / REMOVING SW CASING

weather DRY / RAIN

dri [redacted]

as

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 29-11-19 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K32

TIME AND PRODUCTION RECORD

from	7.15	rig move	1 no.	hr	dynamic sampling	m	hr
to	18.30	rig up	no.	hr	core drilling	m	hr
hrs	11.15 hr	rig down	1 no.	1 hr	CFA	m	hr
transport to and from site				4 hr	HSFA	m	hr
awaiting access/instructions				1 hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	27.45 m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	35 25kg bags	helmet	1	push on cap	1 no.
HDPE			7			3	gravel	25kg bags	stopcock		gas valve	1 no.
UPVC							bentonite pellets	1.5 25kg bags	traffic rated			no.
Triloc							bentonite powder	1.5 25kg bags	manhole		WATER LEVELS	
19mm							cement	0.5 25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
												GL		
													4.25	GROUT
													4.75	BENTONITE PELLETS
													5.75	
														FILTER SAND
													26.75	
														PLAIN HDPE
													27.45	

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

INSTALL + PULL 8" CASING 3.5 H
BACKFILL FILTER SAND TO 6.34 COMPLETED INSTALL ON
2.12.19. SEE LOG
RIG DOWN AND MOVED TO COMPOUND 1 H

weather DRY

driller [redacted]

assista [redacted]

landrover

rig P18

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	J.C	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	L.M	**BOREHOLE No.**	K33
		ASST. DRILLER:	M.C	**HAMMER ID:**	N/A
DATE:	6.6.2020	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	P20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**			**REMARKS**
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	11:45	**SITE HOURS**	10:25	8:30 AM	9:30 AM	01:00	dig pit
CORE BOXES USED	0	No.		9:30 AM	10:15 AM	00:45	set up rig and position
FLUSH MEDIA				10:15 AM	11:00 AM	00:45	wait for water PH priority
FINAL CAT SCAN	Yes			11:00 AM	2:30 PM	03:30	Sample case and core
INSPECTION PIT	Yes	1 hour	Hrs	2:30 PM	3:00 PM	00:30	lunch
STANDPIPE REGION	None	No.		3:00 PM	5:25 PM	02:25	Core

GROUNDWATER

HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
Y								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
		1	D	128	1.20m	2.70m	1.5m	1.5m			Dry															stiff clay					
		2	C	T6-146	2.70m	4.20m	1.5m	1.5m	SW	2.70m	1.4m															stiff bolder clay		Med	95	Low	PDC
		3	C	T6-146	4.20m	5.70m	1.5m	1.5m	SW	2.70m	1.5m															stiff bolder clay		Med	95	Low	PDC
		4	C	T6-146	5.70m	7.20m	1.5m	1.5m	SW	2.70m	1.8m															stiff bolder clay		Med	95	Med	PDC

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**J.C**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**L.M**	**BOREHOLE No.**	**K33**
		ASST. DRILLER:	**M.C**	**HAMMER ID:**	**N/A**
DATE:	**7.2.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**P20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**			**REMARKS**
END OF SHIFT	5:45 PM	**FINISH ON SITE**	2:30 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	11:00	**SITE HOURS**	07:10			00:00	am water depth 2.3m
CORE BOXES USED	0	No.				00:00	pm water depth 3.7m
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
		5	C	T6-146	7.20m	8.70m	1.5m	1.5m	SW	2.7m	2.3m															cliff boulder clay	Med	Med	95	Med	PDC
		6	C	T6-146	8.70m	10.20m	1.5m	1.5m	SW	2.70m	2.4m															stiff boulder clay	Med	Med	95	Med	PDC
		7	C	T6-146	10.20m	11.70m	1.5m	1.5m	SW	2.70m	2.9m															stiff boulder clay	Med	Med	90	Med	PDC
		8	C	T6-146	11.70m	13.20m	1.5m	1.5m	SW	2.70m	2.9m															stiff boulder clay	Med	Med	90	Med	PDC
		9	C	T6-146	13.20m	14.70m	1.5m	1.5m	SW	2.70m	3.10m															stiff boulder clay	Med	Med	80	Med	PDC

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	J.C	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	M.C	**BOREHOLE No.**	K33
		ASST. DRILLER:	L.M	**HAMMER ID:**	N/A
DATE:	10.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	5:00 AM	**START ON SITE**	9:30 AM	**TIME**		
END OF SHIFT	6:45 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	13:45	**SITE HOURS**	08:30			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
am water depth 2.90m									
pm water depth 0.00m									
hole collapsed to 11.10m had to case down to 14.70m									
x2 clear out runs bring bh back to depth 17.70m	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
		10	C	T6-146	14.70	16.20	1.50	1.50	SW	2.70	2.90															stiff boulder clay	Med	Med	70	Med	PDC
		11	C	T6-146	16.20	17.70	1.50	1.50	SW	2.70	3.60																Med	Med	70	Med	PDC

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	J.C	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	M.C	**BOREHOLE No.**	k33
		ASST. DRILLER:	L.M	**HAMMER ID:**	N/A
DATE:	11.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

				TIME			REMARKS
START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM				
END OF SHIFT	6:45 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	12:00	**SITE HOURS**	10:40			00:00	am water depth 3.80m
CORE BOXES USED	0	No.				00:00	pm water depth 7.90m
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
		12	C	T6-146	17.70	19.20	1.50	1.50	SW	14.70	3.80															stiff boulder clay into weathered limestone	Med	Med	50	Med	PDC
		13	C	T6-146	19.20	20.70	1.50	1.50	SW	14.70	3.90															weathered limestone	Med	Med	50	Med	PDC
		14	C	T6-146	20.70	22.20	1.50	1.50	SW	14.70	7.40															limestone	Med	Med	50	Med	PDC
		15	C	T6-146	22.20	23.70	1.50	1.50	SW	14.70	7.80															limestone	Med	Med	50	Med	Surface set
		16	C	T6-146	23.70	25.20	1.50	1.00	SW	14.70	7.90															sandy limestone	Med	Med	50	Med	PDC
		17	C	T6-146	25.20	26.70	1.50	1.50	SW	14.70	8.10															sandy limestone	Med	Med	50	Med	PDC

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**J.C**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**M.C**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:	**L.M**	**HAMMER ID:**	**N/A**
DATE:	**12.2.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**rig no.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**			**REMARKS**
END OF SHIFT	6:15 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	11:30	**SITE HOURS**	10:25			00:00	am water depth 18.60m
CORE BOXES USED	0	No.				00:00	barrel stuck on first run 1hour to get out 10am
FLUSH MEDIA						00:00	hole collapsed to 21.40m from 26.70m
FINAL CAT SCAN						00:00	waiting for sw to be brought up from gloucester
INSPECTION PIT			Hrs			00:00	assist PH all day pulling casing and rods 10am-5pm
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:	LM	**HAMMER ID:**	N/A
DATE:	13.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	P20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:45 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	12:00	**SITE HOURS**	10:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
Case of to depth 26.70m									
Casing stuck 2pm at 25.30m									
Try from 2pm till 5.30pm to try and free									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:	LM	**HAMMER ID:**	N/A
DATE:	14.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	5:45 PM	**FINISH ON SITE**	2:30 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:00	**SITE HOURS**	07:10			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
Try free casing from 0800am-12.30pm									
Casing parted 12.30pm									
Prepare water for mon 17th									
wait for 8inch to be delieverd mon 17th	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	STRATA DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:		**HAMMER ID:**	N/A
DATE:	17.20.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	5:00 AM	**START ON SITE**	9:00 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	13:30	**SITE HOURS**	08:45			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER: HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
change clamp ram on rig 0945am-11.30am									
8inch delieved 12.30pm									
12.30pm-1.30pm load 8inch to position									
1.30pm-17.30pm reem down 8inch	NA								
final depth of 8inch today 16.60m									

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	STRATA DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:		**HAMMER ID:**	N/A
DATE:	18.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	7:00 PM	**FINISH ON SITE**	12:00 AM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	12:15	**SITE HOURS**	16:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8inch									
wait for water 2hours in all									
1430pm sub on 8inch plug broke wait for welder to come site 19.2.20									
assist PH for rest of day	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:		**HAMMER ID:**	N/A
DATE:	19.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:45 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	12:00	**SITE HOURS**	10:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8 inch									
wait for water 3hours in all									
1600pm weld gone on plug again , wait for one to be brought up from Glos									
assist PH until end of day	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:		**HAMMER ID:**	N/A
DATE:	20.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:50 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:45	**SITE HOURS**	10:30			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
8inch plug arrived at 1230pm									
case down 8inch last length 1m									
cased down 8cm since 1300pm									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:		**HAMMER ID:**	N/A
DATE:	21.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	5:30 PM	**FINISH ON SITE**	2:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	10:45	**SITE HOURS**	06:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER: HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8inch									
wait for water 2 hours in all									
cased down 10cm all day									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	TP	**BOREHOLE No.**	k33
		ASST. DRILLER:	MO	**HAMMER ID:**	N/A
DATE:	24.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	5:00 AM	**START ON SITE**	8:45 AM	**TIME**		
END OF SHIFT	6:45 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	13:45	**SITE HOURS**	09:00			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS
case down 8inch
wait for water 2 hours in all
cased down 8cm all day

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	TP	**BOREHOLE No.**	k33
		ASST. DRILLER:	MN	**HAMMER ID:**	N/A
DATE:	25.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:50 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:45	**SITE HOURS**	10:30			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER: HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8 inch casing									
cased 3cm									
pulled 8 inch to check shoe and run back in 24.50m									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	TP	**BOREHOLE No.**	k33
		ASST. DRILLER:	MN	**HAMMER ID:**	N/A
DATE:	26.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:50 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:45	**SITE HOURS**	10:30			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8 inch									
cased down 65cm all day									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	TP	**BOREHOLE No.**	k33
		ASST. DRILLER:	MN	**HAMMER ID:**	N/A
DATE:	27.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:45	**SITE HOURS**	10:25			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8inch									
4cm in all									
pump stopped working at 14.30pm wait for parts brought up from Glos tomorrow am									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	TP	**BOREHOLE No.**	k33
		ASST. DRILLER:	MN	**HAMMER ID:**	N/A
DATE:	28.2.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	5:45 PM	**FINISH ON SITE**	2:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:00	**SITE HOURS**	06:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
pump brought up at 0830 from glos was damaged and didn't work									
stood until new pump was fixed									
assisted PH with bh									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**JC**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**MC**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:		**HAMMER ID:**	**N/A**
DATE:	**2.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	5:00 AM	**START ON SITE**	8:45 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	13:30	**SITE HOURS**	09:00			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS
fit new pump
case off 8 inch
cased 12cm in all

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**JC**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**MC**	**BOREHOLE No.**	**K33**
		ASST. DRILLER:	**DO**	**HAMMER ID:**	**N/A**
DATE:	**3.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**			**REMARKS**
END OF SHIFT	6:45 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	12:00	**SITE HOURS**	10:40			00:00	case down 8 inch
CORE BOXES USED	0	No.				00:00	cased down 30cm all day
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**JC**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**MC**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:	**MO**	**HAMMER ID:**	**n/a**
DATE:	**4.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	6:30 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	11:45	**SITE HOURS**	10:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	**GROUNDWATER**								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
case down 8 ich									
cased down 1.7m									
final depth of 8ich 25m									
pull 9m of S casing and run back to depth of 26.70m	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**JC**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**MC**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:	**MO**	**HAMMER ID:**	**n/a**
DATE:	**5.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**			**REMARKS**
END OF SHIFT	6:30 PM	**FINISH ON SITE**	6:00 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	11:45	**SITE HOURS**	10:40			00:00	pull 8 inch casing all day
CORE BOXES USED	0	No.				00:00	pulled 18m all day
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**JC**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**MC**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:	**MO**	**HAMMER ID:**	**n/a**
DATE:	**6.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:20 AM	**TIME**		
END OF SHIFT	5:30 PM	**FINISH ON SITE**	2:00 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	10:45	**SITE HOURS**	06:40			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER: HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
pull rest of 8inch 7m in all									
set up rig for coring									
load 8inch and SW on 10 tonne									
stop rig around 12.00pm as instructed ny client due to hydrualic leak on slide	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	STRATA DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**JC**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**MC**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:		**HAMMER ID:**	**n/a**
DATE:	**9.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	5:00 AM	**START ON SITE**	9:30 AM	**TIME**		
END OF SHIFT	7:00 PM	**FINISH ON SITE**	6:30 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	14:00	**SITE HOURS**	09:00			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	GROUNDWATER								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
chande hydrualic hose on slide									
change clamp ram									
	NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
9.3.20		18	C	T6-146	26.70	28.20	1.50	1.20	SW	26.70	0.00															sand					
9.3.20		19	C	T6-146	28.20	28.90	0.70	0.70	SW	28.20	0.00															limestone					
9.3.20		20	C	T6-146	28.90	29.70	0.80	0.80	SW	28.20	0.00															limestone/sandstone					

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	MJCA	**DRILLER:**	JC	**CONTRACT No.**	35673
SITE:	Peterborough	**ASST. DRILLER:**	MC	**BOREHOLE No.**	k33
		ASST. DRILLER:		**HAMMER ID:**	n/a
DATE:	10.3.20	**METHOD:**	Geotechnical Pioneer Rig	**RIG No.**	p20

START OF SHIFT	6:45 AM	**START ON SITE**	7:25 AM	**TIME**			**REMARKS**
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:55 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	11:45	**SITE HOURS**	10:30			00:00	am water depth 20.10m
CORE BOXES USED	0	No.				00:00	whitby clay in at 33.60m
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	STRATA DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
		21	C	T6-146	29.70	31.20	1.50	1.50	SW	29.70																limestone	Med	Med	60	Med	PDC
		22	C	T6-146	31.20	32.70	1.50	1.50	SW	31.20	6.20															limestone	Med	Med	60	Med	PDC
		23	C	T6-146	32.70	34.20	1.50	1.50	SW	32.70	6.20															limestone into whitby clay					

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**jc**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**mc**	**BOREHOLE No.**	**k33**
		ASST. DRILLER:		**HAMMER ID:**	**n/a**
DATE:	**11.3.20**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:15 AM	**TIME**		
END OF SHIFT	6:45 PM	**FINISH ON SITE**	3:15 PM	**FROM**	**TO**	**HOURS**
SHIFT HOURS	12:00	**SITE HOURS**	08:00			00:00
CORE BOXES USED	0	No.				00:00
FLUSH MEDIA						00:00
FINAL CAT SCAN						00:00
INSPECTION PIT			Hrs			00:00
STANDPIPE REGION	None	No.				00:00

REMARKS	**GROUNDWATER**								
	HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
pull sw casing									
install and dmob									
7 mixes of grout 3:1									
install 34.20m-33.70m plain pipe	NA								
install gravel brought up to 16.70m 1m past slotted									
install benny from 16.70m up to 16.00m									

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	jc	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	mc	**BOREHOLE No.**	**k33**
		ASST. DRILLER:		**HAMMER ID:**	**n/a**
DATE:	**12.3.30**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	5:00 AM	**START ON SITE**	8:15 AM	**TIME**			**REMARKS**
END OF SHIFT	5:30 PM	**FINISH ON SITE**	2:10 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	12:30	**SITE HOURS**	05:55			00:00	finish off install
CORE BOXES USED	0	No.				00:00	d mob containers and kit
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST												CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.20	stiff clay	1	L		1.20	2.20	128	0000	1.00													0.00	Dry
			RC		2.20	2.50		0000	0.30	90	brown											2.20	1.80
		2	C		2.20	2.50			0.30														1.80
13.70	stiff clay		RC		2.50	4.00		0000	1.50	95	brown											2.20	2.44
		3	C		2.50	4.00			1.50														2.44
		4	C		4.00	5.50			1.50														2.02
			RC		4.00	5.50		0000	1.50	95	brown											2.20	2.02
			RC		5.50	7.00		0000	1.50	95	brown											2.20	1.95
		5	C		5.50	7.00			1.50														1.95
		6	C		7.00	8.50			1.50														2.76
			RC		7.00	8.50		0000	1.50	98	brown											2.20	2.76
		7	C		8.50	10.00			1.60														2.76
			RC		8.50	10.00		0000	1.60	98	brown											2.20	2.76
		8	C		10.00	11.50			1.50														2.87
			RC		10.00	11.50		0000	1.50	98	brown											2.20	2.87
		9	C		11.50	13.00			1.50														2.69
			RC		11.50	13.00		0000	1.50	98	brown											2.20	2.69
		10	C		13.00	13.70			0.60														3.51

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	13.70	3.51	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	154.00	0.00	2.20					S			
DS	128.00	1.20	2.20								
RC	146.30	2.20	13.70	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0700		CAT Scanned: Yes
0700		Permit Completed: Yes
0800	0100	8.00 to 9.00 set up rig a kit on position
0900	0030	9.00 to 9.30 dig pit to 1.20
0930	0730	9.30 to 17.00 drill ops
1700	0030	17.00 to 17.30 set up heras fencing
1840	0000	hours 7.00 to 18.00 m van breda assistant

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	Project No	35673
Date	26/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k34
Sheet	1 of 7	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		13.00	13.70		0000	0.60	95	brown											2.20	3.51

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	13.70	3.51	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	Project No	35673
Date	26/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k34
Sheet	2 of 7	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
13.70	clay	11	C		13.70	14.50			0.80														7.31
			RC		13.70	14.50		0000	0.80	90	brown											2.20	7.31
		12	C		14.50	16.00			1.50														6.84
14.40	clay with bands of limestone		RC		14.50	16.00		0000	1.50	90	brown											2.20	6.84
		13	C		16.00	17.40			1.60														9.23
			RC		16.00	17.40		0000	1.60	80	brown											2.20	9.23
18.30	limestone	14	C		17.40	18.80			1.50														8.94
			RC		17.40	18.80		0000	1.50	70	brown											2.20	8.94
		15	C		18.80	20.30			1.50														17.05
21.00	sand		RC		18.80	20.30		0000	1.50	25	brown											2.20	17.05
		16	C		20.30	21.80			1.10														17.84
			RC		20.30	21.80		0000	1.10	25	brown											2.20	17.84

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	13.70	3.05	2.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	21.80	0.00	21.80

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	154.00	2.20	21.80					S			
RC	146.30	13.70	21.80	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0700		CAT Scanned: Yes
0800	0630	8.00 to 14.30 drill ops
1430	0245	14.30 to 17.15 flush casing to 21.80

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Showers	**Project No**	35673
Date	27/02/2020	**Day**	Thursday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k34
Sheet	3 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
26.30	sand	17	C		23.30	24.80			1.50														6.37
			RC		23.30	24.80		0000	1.50	0	No return											23.20	6.37
		18	C		24.80	26.30			1.50														7.02
26.30	sandstone		RC		24.80	26.30		0000	1.50	0	No return											24.80	7.02
		19	C		26.30	27.80			1.50														4.31
			RC		26.30	27.80		0000	1.50	0	No return											26.20	4.31

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	23.30	6.30	21.80
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1700	27.80	4.31	27.60

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	154.00	23.20	27.60					S			
RC	146.30	23.30	27.80	T6-146	Rigid	120.00	PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0530	8.00 to 13.30 drill ops
1330	0030	13.30 to 14.00 pack up kit
1400	0300	14.00 to 17.00 drive to yard

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Rain	Project No	35673
Date	28/02/2020	Day	Friday
Rig type		Borehole Number	
Inclination		Orientation	k34
Sheet	4 of 7	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		27.80	29.30		0000	1.45	0	No return											27.60	7.00
		20	C		27.80	29.30			1.45														7.00
			RC		29.30	30.80		0000	1.60	0	No return											27.60	7.34
		21	C		29.30	30.80			1.60														7.34
			RC		30.80	32.30		0000	1.60	0	No return											27.60	7.27
		22	C		30.80	32.30			1.60														7.27
			RC		32.30	33.80		0000	0.20	0	No return											27.60	7.68
		23	C		32.30	33.80			0.20														7.68
			RC		33.80	33.80		0000	1.05	0	No return											27.60	29.52
		24	C		33.80	33.80			1.05														29.52

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	27.80	22.45	27.60
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	33.80	Dry	23.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	154.00	27.60	23.20					S			
RC	146.30	27.80	33.80	T6-146	Rigid	120.00	PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0100	5.00 to 6.00 load van
0600	0300	6.00 to 9.00 drive to site
0900	0030	9.00 to 9.30 unload van and sign in
0930	0100	9.30 to 10.30 await assistant driller due to inductions
1030	0415	10.30 to 14.45 drill ops
1445	0015	14.45 to 15.00 await install details
1500	0030	15.00 to 15.30 load and take install kit to position

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	02/03/2020	Day	Monday
Rig type		Borehole Number	
Inclination		Orientation	k34
Sheet	5 of 7	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	27.80	22.45	27.60
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	33.80	Dry	23.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1530	0145	15.30 to 17.15 start install. put install pipe down hole. start pouring gravel down hole and start pulling casing
1715	0015	17.15 to 17.30 pack up kit
2210	0000	please see 3.3.20 logs for install details

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	**Project No**	35673
Date	02/03/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k34
Sheet	6 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	28.80	Dry	28.30
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1700			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0230	8.00 to 10.30 pull casing and gravel borehole
1030	0115	10.45 to 11.45 mix and pour grout
1145	0130	11.45 to 13.30 demob kit
1330	0330	13.30 to 17.00 drive back to yard

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	03/03/2020	Day	Tuesday
Rig type		Borehole Number	
Inclination		Orientation	k34
Sheet	7 of 7	Completed	Y

AGS

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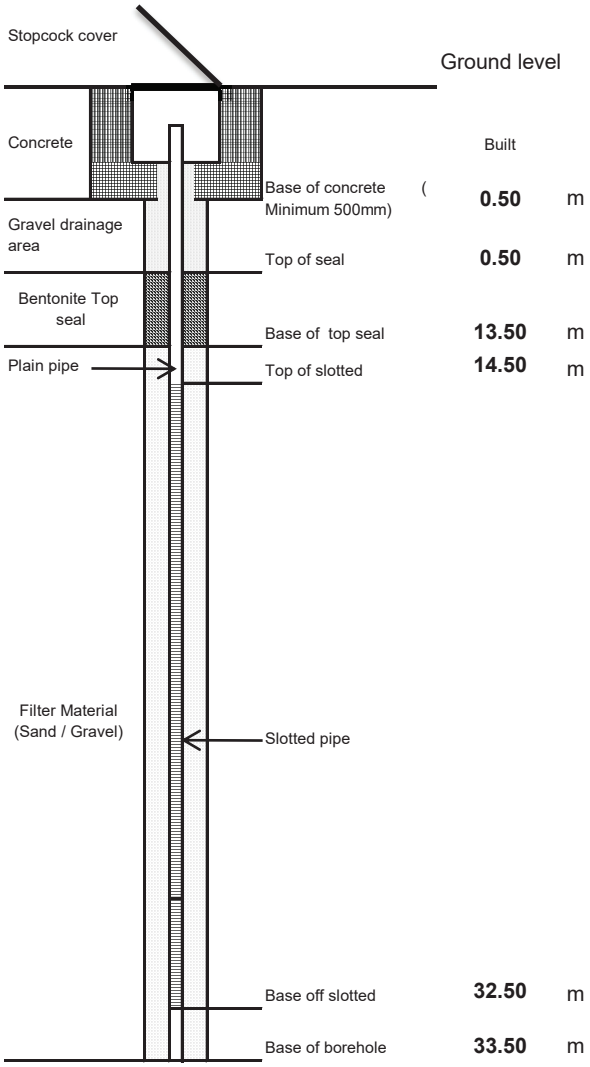
GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	146	mm
Slot size		mm
Geosock	Yes	
Gas tap	Single	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	7.68	m
Time of Initial reading	1145	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	0.50	0.50
Borehole seal top	13.50	0.50
Filter zone	33.50	13.50
Plain pipe	14.50	GL
Slotted zone	32.50	14.50
Base of borehole	33.50	

Remarks

25 bags of gravel used. 2 bags of bentonite powder used.2 bags of cement used.2 bags of ballast used.17m of plain pipe used.18m of slotted used.

Rig type		**Project Title**			
Drilling Crew Details		augean plc			
Support Operative	.				
Lead Driller	Paul Hetherington	**Project No**		35673	
Site category	Green	**Day**	Tuesday	**Date**	March 3, 2020
Engineer	cameron davidson			**Borehole Number**	
Lead Driller's signature				**k34**	

AGS

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GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
2.45	firm boulder clay		RC		2.45	2.65		0000	0.00	90	brown											0.00	0.00
		2	C		2.65	4.00			1.30														2.08
			RC		2.65	4.00		0000	1.30	90	brown											2.50	2.08
		3	C		4.00	5.50			1.60														2.69
			RC		4.00	5.50		0000	1.60	90	brown											2.50	2.69
		4	C		5.50	7.00			1.55														2.69
			RC		5.50	7.00		0000	1.55	90	brown											2.50	2.69
		5	C		7.00	8.60			1.60														3.05
			RC		7.00	8.60		0000	1.60	90	brown											2.50	3.05
		6	C		8.60	10.10			1.50														3.20
			RC		8.60	10.10		0000	1.50	90	brown											2.50	3.20
			RC		10.10	11.60		0000	0.00	90	brown											2.50	3.00
			RC		10.10	11.60		0000	0.00	90	brown											2.50	3.00
			RC		10.10	11.60		0000	0.55	90	brown											2.50	3.00
		7	C		10.10	11.60			0.55														3.00
		8	C		11.60	12.10			0.50														2.30
			RC		11.60	12.10		0000	0.50	90	brown											2.50	2.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	12.10	2.30	2.50

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	2.45	12.10	T6-146	Rigid	120.00	PCD			Water	No
C	156.00	2.50	2.50					S			

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0700		CAT Scanned: Yes
0700		Permit Completed: Yes
		General;
		General; start shift 7.00 TO 17.30
		General; LEFT SITE 14.30

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	**Project No**	35673
Date	31/01/2020	**Day**	Friday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35
Sheet	1 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		10.10	11.60		0000	0.40	90	brown											2.50	2.35
		9	C		10.10	11.60			0.40														2.35
			RC		11.60	12.55		0000	0.95	90	brown											2.50	3.25
		10	C		11.60	12.55			0.95														3.25
			RC		12.55	13.10		0000	0.55	0	No return											2.50	Dry
		11	C		12.55	13.10			0.55														Dry
			RC		13.10	14.60		0000	1.60	0	No return											2.50	Dry
		12	C		13.10	14.60			1.60														Dry
			RC		14.60	16.10		0000	1.60	0	No return											2.50	Dry
		13	C		14.60	16.10			1.60														Dry
			RC		16.10	17.60		0000	1.50	0	No return											2.50	Dry
		14	C		16.10	17.60			1.50														Dry
			RC		17.60	19.10		0000	1.40	0	No return											2.50	Dry
		15	C		17.60	19.10			1.40														Dry

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	10.10	2.05	2.50
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	19.10	Dry	2.50

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	2.50	2.50					S			
RC	146.30	11.60	19.10	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0100	yard 5.00 to 6.00 load van
0600	0300	6.00 to 9.00 drive to site
1300	0100	1 hour spent breaking down 146 barrel
1500	0100	30 minutes spent checking pump on the rig
0500	0000	shift hours 5.00 to 18.30

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Drizzle	**Project No**	35673
Date	03/02/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35
Sheet	2 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
22.10	hard	16	C		19.10	20.60			1.50														Dry
			RC		19.10	20.60		0000	1.50	0	No return											2.50	Dry
		17	C		20.60	22.10			1.40														Dry
23.00	soft		RC		20.60	22.10		0000	1.40	0	No return											2.50	Dry
		18	C		22.10	23.60			1.40														20.88
			RC		22.10	23.60		0000	1.40	0	No return											2.50	20.88
		19	C		23.60	25.10			1.45														22.38
			RC		23.60	25.10		0000	1.45	0	No return											2.50	22.38
		20	C		25.10	26.60			1.40														24.24
			RC		25.10	26.60		0000	1.40	0	No return											2.50	24.24
		21	C		26.60	28.10			0.35														20.68
			RC		26.60	28.10		0000	0.35	0	No return											2.50	20.68

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	19.20	19.20	2.50
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	28.10	Dry	13.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	2.50	13.20					S			
RC	146.30	19.10	28.10	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1430	0120	tried to free up 146 corebarrel from 14.30 to 15.45
1615	0100	flush casing from 16.15 to 17.15
1015	0045	10.15 to 10.45 NVQ with andy frogley
0925	0015	9.25 to 9.40 awaiting water
		General; hours 7.00 to 18.30

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	**Project No**	35673
Date	04/02/2020	**Day**	Tuesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35
Sheet	3 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	28.10	Dry	13.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	28.10	Dry	21.80

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	13.20	21.70					S			

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0900	0050	Dayworks: Running in casing
0800	0100	await water and fill water tanks 8.00 to 9.00
0950	0040	await water 9.50 to 10.30
1030	0215	Dayworks: Running in casing
1245	0005	12.45 to 12.50 check pump
1250	0040	Dayworks: Running in casing
1330	0010	13.30 to 13.40 awaiting water

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	05/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	4 of 18	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	28.10	Dry	13.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	28.10	Dry	21.80

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1340	0020	Dayworks: Running in casing
1400	0030	14.00 to14.30 awaiting water
1430	0100	Dayworks: Running in casing
1530	0015	awaiting water 15.30 to 15.45
1545	0015	Dayworks: Running in casing
1600	0030	16.00 to 16.30 awaiting water
1630	0030	Dayworks: Running in casing

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	05/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	5 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details				Drilling Equipment Details												Ground Water Record									Backfill (m)		
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)	Type	From (m)	To (m)
0700	28.10	Dry	13.20																								
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1800	28.10	Dry	21.80																								

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1700	0015	break casing and antifreeze rig

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	05/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	6 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details				Drilling Equipment Details												Ground Water Record									Backfill (m)		
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)	Type	From (m)	To (m)
0700	22.00	18.50	20.70																								
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1815	22.00	22.00	22.00																								

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0900	0100	8.00 to 9.00 sort out kit grease rig and empty out antifreeze
0900	0030	Dayworks: Withdrawing casing
0930	0045	Dayworks: Running in casing
1015	0045	10.15 to 11.00 flush casing
1100	0040	11.00 to 11.40 await water
1140	0435	flush casing
1640	0035	flush casing

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	06/02/2020	Day	Thursday
Rig type		Borehole Number	
Inclination		Orientation	k35
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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details				Drilling Equipment Details												Ground Water Record									Backfill (m)		
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)	Type	From (m)	To (m)
0700	22.00	18.50	20.70																								
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1815	22.00	22.00	22.00																								

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1715	0010	anti freeze rig

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	06/02/2020	Day	Thursday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	8 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details				Drilling Equipment Details												Ground Water Record									Backfill (m)		
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)	Type	From (m)	To (m)
0700	22.20	20.20	22.20																								
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1730	22.20	19.80	22.20																								

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0030	8.00 to 8.30 sort out diesel antifreeze and grease rig
0830	0030	8.30 to 9.00 await water
0900	0100	9.00 to 10.00 flush casing
1000	0030	10.00 to 10.30 await water
1030	0030	10.30 to 11.00 flush casing
1100	0245	11.00 to 13.45 top up water antifreeze rig and tidy site
1400	0330	14.00 to 17.30 drive to yard.

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	Project No	35673
Date	07/02/2020	Day	Friday
Rig type		Borehole Number	
Inclination		Orientation	k35
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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details				Drilling Equipment Details												Ground Water Record									Backfill (m)		
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)	Type	From (m)	To (m)
0700	22.20	20.20	22.20																								
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1730	22.20	19.80	22.20																								

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1945	0000	hours 7.00 to 17.30

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	Project No	35673
Date	07/02/2020	Day	Friday
Rig type		Borehole Number	
Inclination		Orientation	k35
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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	22.20	20.80	22.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1845	24.80	Dry	22.40

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	124.00	0.00	25.00					P			

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0100	5.00 to 6.00 load van at yard
0600	0300	6.00 to 9.00 drive to site
0900	0030	9.00 to 9.30 await arrival of assistant driller
0930	0030	9.30 to 10.00 await for inductions
1000	0030	10.00 to 10.30 set up grease rig take out antifreeze
1030	0300	Dayworks: Running in casing
1330	0145	Dayworks: Withdrawing casing pw 13.30 to 15.15

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Variable	**Project No**	35673
Date	10/02/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35
Sheet	11 of 18	**Completed**	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	22.20	20.80	22.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1845	24.80	Dry	22.40

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1515	0215	flush in sw casing 15.15 to 17.30
1730	0015	17.30 to 17.45 antifreeze rig and pack up
2050	0000	hours were 5.00 to18.45

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Variable	Project No	35673
Date	10/02/2020	Day	Monday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	12 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	24.80	20.52	22.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	24.40	19.23	9.10

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	124.00	0.00	24.60					P			

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0830	0030	8.00 to 8.30 rig checks and antifreeze
0830	0045	8.30 to 9.15 flush sw casing
0915	0015	9.15 to 9.30 await water
0930	0120	9.30 to 10.50 flush sw casing
1050	0040	10.50 to 11.30 await water
1130	0130	11.30 to 13.00 flush sw casing
1310	0040	13.10 to 13.50 run in pw casing

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	**Project No**	35673
Date	11/02/2020	**Day**	Tuesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35
Sheet	13 of 18	**Completed**	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details				Drilling Equipment Details												Ground Water Record									Backfill (m)		
Start time (hhmm)	Hole (m)	Water (m)	Casing (m)	Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer	Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)	Type	From (m)	To (m)
0700	24.80	20.52	22.20																								
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)																								
1800	24.40	19.23	9.10																								

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1400	0300	14.00 to 17.00 pull sw casing
1700	0015	17.00 to 17.15 antifreeze and tidy kit
1900	0000	hours 7.00 to 18.00
0000	0000	sw casing at 9.10m at end of shift

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Sunny	Project No	35673
Date	11/02/2020	Day	Tuesday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	14 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	22.80	Dry	22.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	22.80	18.52	19.10

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0030	8.00 to 8.30 rig check and antifreeze
0830	0100	8.30 to 9.30 pull out sw to check tc bit
0930	0030	9.30 to 10.00 run in sw casing
1000	0050	10.00 to 10.50 flush in casing to 25.20
1050	0025	10.50 to 11.15 try to free 146 barrel
1125	0015	11.25 to 11.40 flush in pw casing from 24.55 to 25.10
1140	0050	11.40 to 12.30 try to flush sw casing

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Showers	Project No	35673
Date	12/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	15 of 18	Completed	Y

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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	22.80	Dry	22.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	22.80	18.52	19.10

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1230	0100	12.30 to 13.30 lunch
1330	0230	13.30 to 16.00 pull sw casing
1600	0115	16.00 to 17.15 pull pw casing to 19.20
1730	0000	17.15 t0 17.30 antifreeze rig
1910	0000	7.00 to 18.00 hours

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Showers	Project No	35673
Date	12/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k35
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Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	22.20	Dry	19.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0030	8.00 to 8.30 rig checks remove antifreeze
0830	0100	8.30 to 9.30 pull pw casing
0930	0030	9.30 to 10.00 break and remove 16.50 of nwy rods
1000	0030	10.00 to 10.30 drain water tanks and await instruction from client
1030	0030	10.30 to 11.00 load backfill and await fresh water
1100	0130	11.00 to 12.30 backfill
1230	0100	12.30 to 13.30 lunch

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

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Weather	Showers	**Project No**	35673
Date	13/02/2020	**Day**	Thursday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35
Sheet	17 of 18	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	22.20	Dry	19.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1800	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	23.00	12.20
Grout	12.20	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1330	0230	13.30 to 16.00 mix and pump grout
1600	0030	16.00 to 16.30 monitor grout and top up as required
1600	0030	16.30 to 17.00 tidy up area and antifreeze rig
0000	0000	used 16 bags of bentonite. used 4 bags of bentonite powder and 2.3 bags of cement to mix 1000 litres of grout
2020	0000	hole completed with 146 barrel and 3 3m nwy rods at base of hole

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

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Weather	Showers	Project No	35673
Date	13/02/2020	Day	Thursday
Rig type		Borehole Number	
Inclination		Orientation	k35
Sheet	18 of 18	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
		1	L		1.20	2.70	128	0000	1.50													0.00	Dry
		2	L		2.70	3.50	128	0000	0.80													2.60	0.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	4.60	0.00	4.60

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	0.00	4.60					S			

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0700		CAT Scanned: Yes
0700		Permit Completed: Yes
0800	0030	Dayworks: Moving rig to borehole position
0830	0045	Dayworks: Breaking out within pit
0915	0045	9.15 to 10.00 set up rig and top up water tanks
1000	0030	Dayworks: Erecting Heras fencing
1030	0030	10.30 to 11.00 drilling

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Fine	**Project No**	35673
Date	14/02/2020	**Day**	Friday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35a
Sheet	1 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	4.60	0.00	4.60

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1100	0015	Dayworks: Running in casing
1100	0015	11.15 to 11.45 drilling
1145	0145	11.45 to 13.30 flush in casing
1330	0015	13.30 to 13.45 pack up kit and antifreeze rig
1400	0330	14.00 to 17.30 drive to gloucester

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

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Weather	Fine	Project No	35673
Date	14/02/2020	Day	Friday
Rig type		Borehole Number	
Inclination		Orientation	k35a
Sheet	2 of 11	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RO		4.00	5.70		0000		90	brown											4.00	0.00
			RO		5.70	7.20		0000		90	brown											5.60	0.00
			RO		7.20	8.70		0000		90	brown											5.60	0.00
			RO		8.70	10.20		0000		90	brown											5.60	0.00
			RO		10.20	11.70		0000		90	brown											5.60	0.00
			RO		11.70	12.20		0000		90	brown											5.60	0.00
			RO		12.20	12.30		0000		90	yellow											7.10	0.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	4.00	0.00	4.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	12.30	0.00	12.30

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	4.00	10.40					S			
RO	140.00	4.00	12.30				PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0200	5.00 to 7.00 sort van
0700	0330	7.00 to 10.30 drive to site
1030	0045	10.30 to 11.15 await induction of assistant and rig checks
1115	0600	11.15 to 17.15 drilling ops
0500	1300	hours 5.00 to 18.00

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Showers	**Project No**	35673
Date	17/02/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35a
Sheet	3 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
12.30	limestone		RO		12.30	12.30		0000		0	No return											11.40	0.00
		3	C		12.30	13.30			0.60														12.50
			RC		12.30	13.30		0000	0.60	0	No return											12.10	12.50
		4	C		13.30	14.80			1.40														13.52
			RC		13.30	14.80		0000	1.40	0	No return											12.60	13.52
		5	C		14.80	16.30			1.50														13.75
			RC		14.80	16.30		0000	1.50	0	No return											14.60	13.75
		6	C		16.30	17.80			1.50														14.21
			RC		16.30	17.80		0000	1.50	0	No return											16.00	14.21

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	12.30	0.00	10.40
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	17.80	12.70	16.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	11.10	16.00					S			
RC	146.30	12.30	17.80	T6-146	Rigid	120.00	PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0915	8.00 to 17.15 drilling ops
0845	0015	8.45 to 9.00 reset rig
1420	0050	14.20 to 15.30 rig down to reset timbers and reset rig
0700	1100	hours 7.00 to 18.00
1930	0000	toby jones is my assistant driller

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Showers	**Project No**	35673
Date	18/02/2020	**Day**	Tuesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	
			k35a
Sheet	4 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		17.80	19.30		0000	1.50	0	No return											17.40	4.34
		7	C		17.80	19.30			1.50														4.34
			RC		19.30	20.80		0000	1.50	0	No return											18.90	4.15
		8	C		19.30	20.80			1.50														4.15
			RC		20.80	22.30		0000	1.60	0	No return											19.60	4.52
		9	C		20.80	22.30			1.60														4.52

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	17.80	Dry	16.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	22.30	0.00	21.90

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	16.00	21.90					S			
RC	146.30	17.80	22.30	T6-146	Rigid	120.00	PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0015	8.00 to 8.15 rig checks
0815	0300	8.15 to 11.50 drill ops
1130	0030	11.30 to 12.00 await water
1200	0145	12.00 to 13.45 drill ops
1345	0030	13.45 to 14.45 lunch
1415	0100	14.15 to 15.15 flush casing
1515	0020	15.15 to 15.35 drilling

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

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Weather	Showers	**Project No**	35673
Date	19/02/2020	**Day**	Wednesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35a
Sheet	5 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	17.80	Dry	16.00
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1830	22.30	0.00	21.90

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1535	0015	15.35 to 15.50 reset rig
1550	0140	15.50 to 17.30 flush casing
1730	0015	17.30 to 17.45 antifreeze rig
1935	0000	hours 7.00 to 18.30 toby peters second man

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

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Weather	Showers	Project No	35673
Date	19/02/2020	Day	Wednesday
Rig type		Borehole Number	
Inclination		Orientation	k35a
Sheet	6 of 11	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		22.30	23.80		0000	1.20	0	No return											21.10	Dry
		10	C		22.30	23.80			1.20														Dry

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	22.30	Dry	21.10
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	23.80	6.45	23.80

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	21.10	24.10					S			

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0930	8.00 to 17.45 drill ops
1730	0015	17.30 to 17.45 antifreeze rig

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Rain	Project No	35673
Date	20/02/2020	Day	Thursday
Rig type		Borehole Number	
Inclination		Orientation	k35a
Sheet	7 of 11	Completed	Y

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
23.80	soft sands		RC		23.80	24.55		0000	0.00	0	No return											23.80	4.27
		11	C		24.55	25.90			1.35														16.51
			RC		24.55	25.90		0000	1.35	60	yellow											24.55	16.51
30.20	hard grey sandstone	12	C		25.90	27.40			1.20														4.73
			RC		25.90	27.40		0000	1.20	60	yellow											25.90	4.73
		13	C		27.40	28.90			1.30														4.14
			RC		27.40	28.90		0000	1.30	65	yellow											27.40	4.14
		14	C		28.90	30.40			1.50														4.46
			RC		28.90	30.40		0000	1.50	65	clear											28.90	4.46

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	24.53	17.07	23.80
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1700	30.40	4.82	28.90

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	156.00	23.80	28.90					S			
RC	146.30	23.80	30.40	T6-146	Rigid	120.00	PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0500	8.00 13.00 drilling ops
1300	0030	13.00 to 13.30 pack up kit
1345	0300	13.45 to 16.45 drive to geotech yard
1645	0015	16.45 to 17.00 drop van at iveco

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

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Weather	Fine	Project No	35673
Date	21/02/2020	Day	Friday
Rig type		Borehole Number	
Inclination		Orientation	k35a
Sheet	8 of 11	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
30.40	hard sandstone	15	C		30.40	31.50			1.00														4.53
			RC		30.40	31.50		0000	1.00	60	grey											28.90	4.53
		16	C		31.00	33.00			1.50														4.60
33.00	mudstone		RC		31.00	33.00		0000	1.50	60	grey											28.90	4.60
		17	C		33.00	34.50			0.50														12.60
			RC		33.00	34.50		0000	0.50	30	black											28.90	12.60
		18	C		34.50	34.50			1.00														13.05
			RC		34.50	34.50		0000	1.00	0	No return											28.90	13.05

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	30.40	5.30	28.90
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	24.80	10.43	24.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	30.40	34.50	T6-146	Rigid	120.00	PCD			Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0145	5.00 to 6.45 sort out van
0645	0400	6.45 to 10.45 drive to site
1100	0345	11.00 to 14.45 drilling ops
1445	0030	14.45 to 15.15 sort out install details with client
1515	0030	15.15 to 15.45 load install and take to position
1515	0200	15.15 to 17.15 start install by getting pipework into ground and putting 9 bags of washed sand down borehole whilst pulling casing. please see 25.02.20 logs for details
2110	0000	hours are 05.00 to 18.30

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Cloudy	**Project No**	35673
Date	24/02/2020	**Day**	Monday
Rig type		**Borehole Number**	
Inclination		**Orientation**	k35a
Sheet	9 of 11	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	30.40	5.30	28.90
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1830	24.80	10.43	24.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
2115	0000	m. van breda was assistant

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Cloudy	Project No	35673
Date	24/02/2020	Day	Monday
Rig type		Borehole Number	
Inclination		Orientation	k35a
Sheet	10 of 11	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of mjca Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0700	24.80	Dry	24.20
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1830			

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0800	0400	8.00 to 12.00 gravel and pull casing
1200	0030	12.00 to 12.30 sort out kit for grouting
1230	0300	12.30 to 15.30
1530	0015	15.30 to 15.45 install tophat cover
1545	0130	15.45 to 17.15 move kit to new position
2015	0000	7.00 to 18.30 hours. m van breda assistant

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Paul Hetherington		3923461
Site category	Green		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

augean plc

Weather	Showers	Project No	35673
Date	25/02/2020	Day	Tuesday
Rig type		Borehole Number	
Inclination		Orientation	k35a
Sheet	11 of 11	Completed	Y

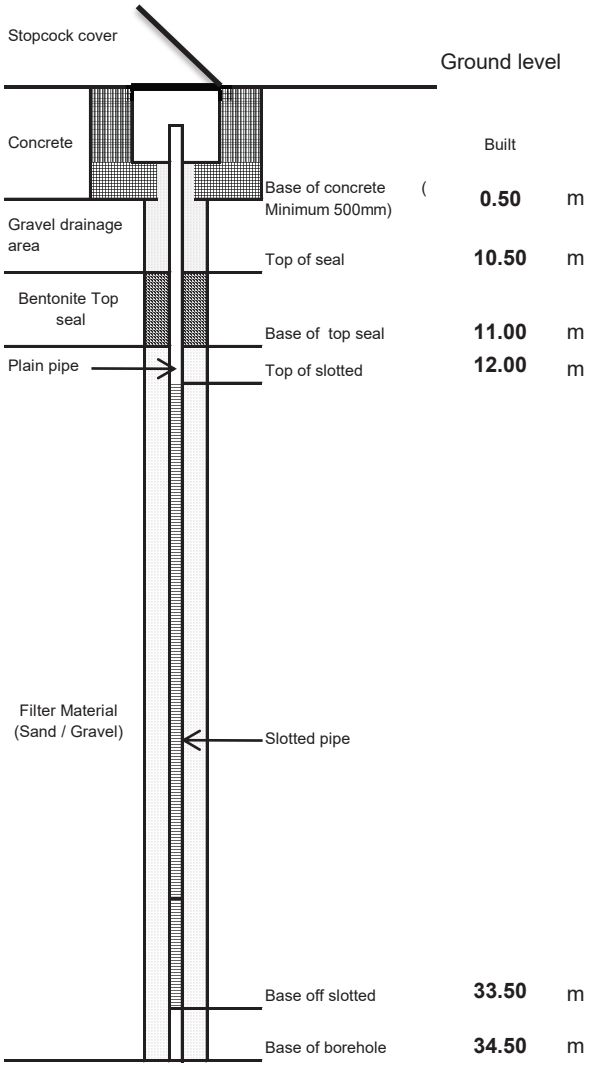
AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD

Summary of Standpipe Installation

Schematic Diagram
(not to scale)



Installation Details

Standpipe diameter (id)	50	mm
Borehole diameter	146	mm
Slot size		mm
Geosock	Yes	
Gas tap	Single	
Filter type	Gravel	
Type of cover	Upright	
Initial reading	Dry	m
Time of Initial reading	1550	hhmm

	Base (m)	Top (m)
Concrete	0.50	GL
Gravel drainage	10.50	0.50
Borehole seal top	11.00	10.50
Filter zone	34.50	11.00
Plain pipe	12.00	GL
Slotted zone	33.50	12.00
Base of borehole	34.50	

Remarks

34.50 to 33.50 plain 50mm pipe acting as sump.bentonite seal from 11.00m to 10.50m. grout from 10.50m to 0.5m. 28 bags of gravel. 1 bag of bentonite.3 bags of cement.4 bags of bentonite powder.2 bags of ballast.

Rig type		**Project Title**			
Drilling Crew Details		augean plc			
Support Operative	.				
Lead Driller	Paul Hetherington	**Project No**		35673	
Site category	Green	**Day**	Tuesday	**Date**	February 25, 2020
Engineer	cameron davidson			**Borehole Number**	
Lead Driller's signature				**k35a**	

AGS

Produced by KeyLogbook

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT Mjca

SITE Peterborough

DATE 30.01.2020

SHEET 1 of 1

CONTRACT No. 35643

BOREHOLE K36

TIME AND PRODUCTION RECORD

from		rig move	no.	hr	dynamic sampling	m	hr
to		rig up	no.	hr	core drilling	m	hr
hrs	hr	rig down	no.	hr	CFA	m	hr
transport to and from site				1½ hr	HSFA	m	hr
awaiting access/~~instructions~~				4 hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1D	128	1.20m	2.70m	1.5m	1.5m	/	/	Dry				GL		
2D	128	2.70m	3.90m	1.2m	1.2m	/	/	Dry						
						SW	3.9m	1.4m						
0645-	0720-	Drive to site												
0720-	1200-	Sign in wait for track marks												
1200-	1400-	track rig, move kit to new borehole												
1400-	1430-	Dig inspection pit on BH												
1430-	1445-	Set up rig												
1445-	1500-	Wait for water												
1500-	1700-	D/O Sample and Case												
1700-	1715-	Pack away, secure site												
1715-	1800-	Drive to diggs												

WATER DEPTHS (m bgl)

a.m.	p.m.	1.4m	struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

Flushed Casing to 3.9m
Pm Water depth 1.4m

weather: Dry Overcast

driller: Josh Chapman

assistant driller: Mike Cobb, Sam York

landrover: VX60 CUK

rig: P20

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 31/01/2020

CONTRACT No. 35673

SITE Peterborough

SHEET 1 of 1

BOREHOLE K36

TIME AND PRODUCTION RECORD

from		rig move	no.	hr	dynamic sampling	m	hr
to		rig up	no.	hr	core drilling	m	hr
hrs	hr	rig down	no.	hr	CFA	m	hr
transport to and from site				4 hr	HSFA	m	hr
awaiting access/instructions				/ hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
3c	146	Clear out		run		SW	3.90m	0.m				GL		
4c	146	3.90m	5.40m	1.5m	1.5m	SW	3.90m	1.6m						
5c	146	5.40m	6.90m	1.5m	1.5m	SW	3.90m	1.7m						
6c	146	6.90m	8.40m	1.5m	1.5m	SW	3.90m	1.8m						
7c	146	9.90m	11.40m	1.5m	1.5m	SW	3.90m	2.1m						
0645-	0720	- Drive to site												
0720-	0815-	Sign in open site												
0815-	0830-	Set up position kit												
0830-	1400	- D/o coring												
1400-	1430	- pack up secure site												
1430-	1745-	Drive back to yard												

WATER DEPTHS (m bgl)

a.m. 0m	p.m.	2.6m	struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

weather Dry Overcast

REMARKS

driller Josh Chapman

assistant driller Mike Cobb, Sam York

landrover VK60 CUK

rig P20

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 3-02-2020

CONTRACT No. 35673

SITE Peterborough

SHEET 1 of 1

BOREHOLE K3C

TIME AND PRODUCTION RECORD

from		rig move	no.	hr	dynamic sampling	m	hr
to		rig up	no.	hr	core drilling	m	hr
hrs	hr	rig down	no.	hr	CFA	m	hr
transport to and from site				5 hr	HSFA	m	hr
awaiting ~~access~~/instructions				30 min hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
8c	146	11.40m	12.90m	1.5m	1.5m	SW	3.90m	3.10m			Stiff Clay into weathered limestone	GL		
9c	146	12.90m	14.40m	1.5m	1.5m	SW	3.90m	Dry			weathered limestone			
10c	146	14.40m	15.90m	1.5m	1.5m	SW	3.90m	13.90m			Limestone			
11c	146	15.90m	17.40m	1.5m	1.5m	SW	3.90m	Dry			Limestone			
12c	146	17.40m	18.90m	1.5m	1.5m	SW	3.90m	16.60m			Limestone			
13c	146	18.90m	20.40m	1.5m	1.5m	SW	3.90m	Dry			Limestone			
14c	146	20.40m	21.90m	1.5m	1.5m	SW	3.90m	19.80m			Limestone			
15c	146	21.90m	23.40m	1.5m	1.3m	SW	3.90m	19.80m			Limestone			
16c	146	23.40m	24.90m	1.5m	1.5m	SW	3.90m	Dry			Limestone			

WATER DEPTHS (m bgl)

a.m. 3.10m	p.m.	19.60m	struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

Lost flush 12.70m, limestone in at 12.70m
Digging water after + before run, Chasing flush water down
PM Water depth - 19.60m AM water depth - 3.10m

weather Dry Overcast

driller Josh Chapman
assistant driller Mike Cob, Lewis Murphy

landrover VK60 CUK

rig P20

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**J.C**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**M.C**	**BOREHOLE No.**	**K36**
		ASST. DRILLER:	**L.M**	**HAMMER ID:**	
DATE:	**4.02.2020**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**P20**

START OF SHIFT	06:45	**START ON SITE**	7:20 AM	**TIME**			**REMARKS**
END OF SHIFT	6:45 PM	**FINISH ON SITE**	5:45 PM	**FROM**	**TO**	**HOURS**	
SHIFT HOURS	12:00	**SITE HOURS**	10:25			00:00	am water depth 23.10m
CORE BOXES USED	0	No.				00:00	Whitby mustone in at 33.70m
FLUSH MEDIA						00:00	
FINAL CAT SCAN						00:00	
INSPECTION PIT			Hrs			00:00	
STANDPIPE REGION	None	No.				00:00	

GROUNDWATER								
HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
NA								

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m) FROM	DEPTH (m) TO	DRILLED	RECOVERED	CASING SIZE (mm)	CASING DEPTH (m)	WATER DEPTH (m)	STANDARD PENETRATION TEST SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)	CORE BOX No.	STRATA DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	DRILLING PARAMETERS ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE
		17	C	T6-146	24.90M	26.40M	1.5m	0.8m	SW	3.90m	3.10m															Limestone					
		18	C	T6-146	26.40m	27.90m	1.5m	0.5m	sw	3.90m	9.80m															Limestone					
		19	C	T6-146	27.90m	29.40m	1.5m	1.5m	sw	3.90m	9.70m															Limestone					
		20	C	T6-146	29.40m	30.90m	1.5m	1.5m	sw	3.90m	9.90m															Limestone					
		21	C	T6-146	30.90m	32.40m	1.5m	1.5m	sw	3.90m	0.30m															Limestone					
		22	C	T6-146	32.40m	33.90m	1.5m	1.5m	sw	3.90m	9.90m															Limestone into Whitby mudstone					
		22	C	T6-146	33.90m	34.80m	0.9m	0.9m	sw	3.90m	9.80m															Whitby Mudstone					

GEOTECHNICAL ENGINEERING LIMITED

DRILLERS DAILY REPORT

CLIENT:	**MJCA**	**DRILLER:**	**J.C**	**CONTRACT No.**	**35673**
SITE:	**Peterborough**	**ASST. DRILLER:**	**M.C**	**BOREHOLE No.**	**K36**
		ASST. DRILLER:	**L.M**	**HAMMER ID:**	**N/A**
DATE:	**5.02.2020**	**METHOD:**	**Geotechnical Pioneer Rig**	**RIG No.**	**p20**

START OF SHIFT	6:45 AM	**START ON SITE**	7:25 AM			
END OF SHIFT	6:30 PM	**FINISH ON SITE**	5:45 PM			
SHIFT HOURS	11:45	**SITE HOURS**	10:20			
CORE BOXES USED	0	No.				
FLUSH MEDIA						
FINAL CAT SCAN						
INSPECTION PIT				Hrs		
STANDPIPE REGION	None	No.				

TIME			REMARKS	GROUNDWATER								
FROM	**TO**	**HOURS**		HOLE DRY?	DEPTH STRUCK (m)	CASING DEPTH (m)	AFTER 5 MINS	AFTER 10 MIINS	AFTER 15 MINS	AFTER 20 MINS	BEFORE PULLING CASING	AFTER PULLING CASING
		00:00	Am water depth 26.80m									
		00:00	Bottom of hole 34.55m									
		00:00	Install backfill and pull casing									
		00:00	2 mixes of grout 3:1 mix	NA								
		00:00	Geosock on slotted pipe									
		00:00	21m slotted pipe and 14m plain pipe used									

DRILLING AND SAMPLING RECORD

DATE	TIME	SAMPLE NO.	SAMPLE TYPE	SAMPLER SIZE (mm)	DEPTH (m)		DRILLED	RECOVERED	CASING		WATER DEPTH (m)	STANDARD PENETRATION TEST											CORE BOX No.	STRATA		DRILLING PARAMETERS				
					FROM	TO			SIZE (mm)	DEPTH (m)		SEATING 1	SEATING 2	DRIVE 1	DRIVE 2	DRIVE 3	DRIVE 4	PEN 1 (mm)	PEN 2 (mm)	PEN 3 (mm)	PEN 4 (mm)	PEN 5 (mm)	PEN 6 (mm)		DEPTH (m)	DESCRIPTION/ REMARKS/DRILLING INFORMATION	ROTATION	FLUSH PRESSURE	FLUSH RETURN (%)	WEIGHT ON BIT	BIT TYPE

GEOTECHNICAL ENGINEERING LTD

DRILLERS DAILY REPORT

CONTRACT No.	**35673**
BOREHOLE No.	**K36**

BACKFILL/INSTALLATION			
DEPTH FROM (m)	DEPTH TO (m)	MATERIAL	PIPE(S)/INSTRUMENT
34.55m	33.90m	gravel	plain
33.90m	12.90m	gravel	slotted
12.90m	11.90m	gravel	plain
11.90m	11.40m	bentonite	plain
11.40m	0.00m	grout	plain

RESPONSE ZONE/SEAL	No. USED	
Washed sand		25kg bags
Gravel	25	25kg bags
Bentonite pellets	1	25kg bags
Bentonite powder	2	25kg bags
Cement	2	25kg bags
Ballast	2	25kg bags
Glass media		25kg bags
Tarmacadam		25kg bags
COVER		
Helmet	1	
Stopcock		
Traffic rated		
Manhole		
Padlocks		
WELL HEAD		
Push on cap	1	
Gas valve	1	

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 13-1-20 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET BOREHOLE K37

TIME AND PRODUCTION RECORD

from	5.00	rig move	1 no.	hr	dynamic sampling	1.10 m	hr
to	18.30	rig up	1 no.	hr	core drilling	9.10 m	hr
hrs	11.5 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				3.5 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	.90 m
							ballast	25kg bags			after ~~am~~/pm	3.21 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1x	128	1.20	2.30	1.10	1.10			1.00				GL		
		FLUSH CASING				SW	2.30							
2c	146	2.30	3.80	1.50	1.50			1.83						
		FLUSH CASING				SW	2.60							
3c	146	3.80	5.40	1.60	1.60			1.75						
4c	146	5.40	7.00	1.60	1.55			2.37						
5c	146	7.00	8.50	1.50	1.50			2.42						
6c	146	8.50	10.00	1.50	.80			2.54						
	146	10.00	10.00	0	.80									
7c	146	10.00	11.40	1.40	1.50			3.21						

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

YARD 5-6 AM
DRIVE TO SITE 6 - 9 AM
SET UP RIG + AWAIT ASSISTANT (INDUCTION) 9-10 AM

weather DRY	drille[redacted]	landrover	rig P18
	assi[redacted]		

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 14-1-20

CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K37

TIME AND PRODUCTION RECORD

from	7.00	rig move	no.	hr	dynamic sampling	m	hr
to	18.00	rig up	no.	hr	core drilling	114.0 m	hr
hrs	11 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				1.40 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m) 1.0	1.5	3.0	CASING (m) 1.0	1.5	3.0	RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
							washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	3.55 m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	test drive	strata description	installation / backfilling	depth (m bgl)	installation description
8C	146	11.40	12.80	1.40	1.50	SW	2.60	3.42				GL		
9C	146	12.80	14.10	1.30	1.30			13.95						
10C	146	14.10	15.60	1.50	1.50			15.35						
11C	146	15.60	17.10	1.50	1.60			16.90						
12C	146	17.10	18.70	1.60	1.50			18.50						
13C	146	18.70	20.20	1.50	1.55			20.43						
14C	146	20.20	21.70	1.60	1.55			21.58						
15C	146	21.70	22.70	1.00	1.05									
		FLUSH CASING				SW	21.10							

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5 13.95	10 13.95	15 13.95 20	
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

LOST FLUSH AT 13.80 MONITOR WATER AT 15.35, 15.35, 15.35
16.90, 16.90, 16.90, 18.50, 18.50, 18.50, 20.43, 20.71, 20.74
TOTAL 1H 15m 146 STUCK AT 22.70 CASED OVER WITH SW
TO 21.10 (2H 30)

weather DRY / RAIN

drill [redacted]

ass [redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 15.1.20 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K37

TIME AND PRODUCTION RECORD

from	7.00	rig move	no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling	4 m	hr
hrs	10.15 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				.45 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after ~~am~~/pm	3.84 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
		FLUSH	CASING			SW	23.00					GL		
16C	146	22.70	23.70	1.00	.60			3.68						
17C	146	23.70	25.30	1.60	.80			3.63						
18C	146	25.30	26.70	1.40	1.35			3.84						

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5 3.68	10 3.85	15 4.04	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

FLUSH CASING + PULL 146 BARREL 3H
BREAK DOWN 146 BARREL 1H
MONITOR WATER 3.63 3.75. 2.5m TOTAL MONITOR WATER

weather DRY

driller [redacted]
assist

landrover

rig

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 16-1-20

CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE K37

TIME AND PRODUCTION RECORD

from	7.00	rig move	no.	hr	dynamic sampling	m	hr
to	17.30	rig up	no.	hr	core drilling	8.90 m	hr
hrs	10.5 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				c45 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	9 25kg bags	helmet		push on cap	1 no.
HDPE	2		6			6	gravel	25kg bags	stopcock		gas valve	1 no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	16.52 m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
19c	146	26.70	28.20	1.50	.30	5W	23.m	3.37				GL		GL PLAIN
	146	28.20	28.20	0	NR			3.40						
20c	146	28.20	29.70	1.50	1.25			5.48						
21c	146	29.70	31.20	1.50	1.20			4.80						
22c	146	31.20	32.40	1.20	1.60			5.20						14.10 SLOTTED
23c	146	32.40	34.00	1.60	1.60			5.15						
24c	146	34.00	35.50	1.50	.65			4.40						
25c	146	35.50	35.60	.10	1.15			4.60						
											WASHED SAND 24.60			
														34.10 PLAIN
														35.40

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

INSTAL 1.45 M
CASING STILL AT 23.00m

weather DRY

driller [redacted]

assis [redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 17.1.20 CONTRACT No. 35673

SITE ANGLIAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE K37

TIME AND PRODUCTION RECORD

from	7.00	rig move	no.	hr	dynamic sampling	m	hr
to	17.00	rig up	no.	hr	core drilling	m	hr
hrs	hr	rig down	1 no.	hr	CFA	m	hr
transport to and from site				3 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	12 25kg bags	helmet	1	push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	1 25kg bags	traffic rated			no.
Triloc							bentonite powder	2 25kg bags	manhole		WATER LEVELS	
19mm							cement	2 25kg bags	padlocks		before am/pm	m
							ballast	2 25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
											GROUT TO GL	GL		PLAIN
											BENTONITE PELLETS 12.60			
														14.10 SLOTTED
											WASHED SAND 13.10			
														34.10 PLAIN
														35.40 BASE

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

FINNISH INSTALL + PULL 23m OF CASING 2H
GROUT HOLE FROM 12.60 TO GL 2H
RESET RIG + FREE UP CASING 1H
PLEASE REFER TO 16.1.20 K37 LOGS FOR INSTALL DETAILS (BEGINNING)

weather DRY	driller [redacted]	landrover	rig P18
	assis [redacted]		

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Clay.																						
0.80	Limestone gravels cobbles.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1225			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	1.10	0.80	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1225		CAT Scanned: Yes
1225		Permit Completed: Yes
1215	0025	Track rig to position.
1240	0030	Inspection pit: Hand dug 1.00m x 0.50m x 0.50m
1310	0030	Lunch.
1340	0035	Power signal in pit wait to re locate BH position and scan position.
1415	0025	Inspection pit: Hand dug 0.80m x 0.50m x 0.50m

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/12/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_1/19
Sheet	1 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1225			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	1.10	0.80	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1440	0040	Power signal in pit wait to re locate BH position.Move some kit.
1520	0050	Inspection pit: Hand dug 1.10m x 0.50m x 0.50m
1610	0030	Set up rig move rest of kit.
1640	0020	Tidy secure rig.
1700	0030	Drive to accommodation.
		General; Water seeping in all pitsat 0.75m.
		General; SHIFT. S DOWNER. 05.00HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/12/2019	**Day**	Monday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	KCW_1/19
Sheet	2 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1225			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	1.10	0.80	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH. 05.00HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/12/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_1/19
Sheet	3 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.10	Limestone.	1	C		1.10	2.60			1.50														0.90
			RC		1.10	2.60		0018	1.50	95	brown											0.00	0.90
		2	C		2.60	2.90			0.30														1.20
2.50	Stiff clay.		RC		2.60	2.90		0009	0.30	95	grey											2.60	1.20
		3	C		2.90	4.10			1.00														1.20
			RC		2.90	4.10		0013	1.00	95	grey											2.60	1.20
		4	C		4.10	5.60			1.50														1.30
			RC		4.10	5.60		0017	1.50	85	grey											2.60	1.30
		5	C		5.60	7.10			1.50														1.50
			RC		5.60	7.10		0015	1.50	90	grey											2.60	1.50
			RC		7.10	8.60		0015	0.00	85	grey											2.60	1.20
		6	C		7.10	8.60			1.50														1.40
			RC		7.10	8.60		0003	1.50	85	grey											2.60	1.40
			RC		8.60	10.10		0015	1.40	85	grey											2.60	1.40
		7	C		8.60	10.10			1.40														1.40
			RC		10.10	11.60		0018	1.50	85	grey											2.60	1.40
		8	C		10.10	11.60			1.50														1.40
		9	C		11.60	13.10			1.50														1.70

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.10	0.90	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	13.10	3.00	2.60

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	1.10	2.60					S			
RC	146.30	1.10	13.10	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0030	Drive to site.
0715	0150	Open up wait on water.
0905	0025	Drill ops core.
0930	0025	Wait on water.
0955	0015	Drill ops case and set up to core.
1010	0025	Wait on water.
1035	0605	Drill ops core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	10/12/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_1/19
Sheet	4 of 7	**Completed**	Y

AGS

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GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		11.60	13.10		0015	1.50	80	grey											2.60	1.70

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.10	0.90	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	13.10	3.00	2.60

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1630	0030	Tidy secure rig.
1700	0030	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	10/12/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_1/19
Sheet	5 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
14.50	Limestone.	10	C		13.10	14.60			1.50														0.60
			RC		13.10	14.60		0012	1.50	80	grey											2.00	0.60
		11	C		14.60	16.10			1.50														2.00
			RC		14.60	16.10		0010	1.50	70	brown											2.60	2.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	13.10	0.60	2.60

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1700	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	13.10	16.10	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0030	Drive to site.
0715	0200	Open up set up drill ops core.
0915	0020	Wait on BH instruction.
0935	0015	Monitor water at clients instruction. Lost flush at 15.60m.
0950	0030	Client instructs to stop monitoring after 15 mins. Water at 15.60m. Collect backfill.
1020	0120	Backfill mixand pump grout to BH. Pull casing.
1145	0135	Prepare to move track rig to compound.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	Project No	35673
Date	11/12/2019	Day	Wednesday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	KCW_1/19
Sheet	6 of 7	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	13.10	0.60	2.60
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1700	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	16.10	15.20
Grout	15.20	0.50
Arisings	0.50	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1315	0315	Return to GEL.
		General; 250L grout. 3:1ratio. 2x bentonite powder 1 x cement 1 x pellets. Used.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.00HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	11/12/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_1/19
Sheet	7 of 7	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf.	1	L		1.20	2.70	128	0011	1.50													0.00	Dry
		3	L		2.70	3.70	128	0005	0.00													0.00	Dry
		2	L		2.70	3.70	128	0010	0.00													0.00	Dry
0.30	Sandy clay gravels.	4	C		2.70	4.20			1.50														0.00
			RC		2.70	4.20		0015	1.50	95	grey											2.70	0.00
		5	C		4.20	5.70			1.50														1.50
0.80	Firm clay.		RC		4.20	5.70		0015	1.50	95	grey											2.70	1.50
		6	C		5.70	7.20			1.50														1.30
			RC		5.70	7.20		0015	1.50	95	grey											2.70	1.30
2.00	Very stiff clay.	7	C		7.20	8.10			0.90														1.80
			RC		7.20	8.10		0011	0.90	95	grey											2.70	1.80
		8	C		8.10	8.70			0.40														2.00
			RC		8.10	8.70		0007	0.40	95	grey											2.70	2.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	8.70	2.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	8.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0940	0105	Move kit track rig.
1045	0040	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1125	0010	Set up rig.
1135	0055	Wait on dumper to move rest of kit and tanks.
1230	0050	Drill ops sample.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	05/12/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_2/19
Sheet	1 of 5	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	8.70	2.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1320	0010	Wait on water.
1330	0015	Drill ops case.
1345	0015	Wait on water.
1400	0245	Drill ops core.
1645	0015	Tidy secure fig.
1700	0030	Return to accommodation.
		General; SHIFT. S DOWNER 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	05/12/2019	**Day**	Thursday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	KCW_2/19
Sheet	2 of 5	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	8.70	2.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT J SMITH 06.45HRS TO17.30HRS.
		General; SHIFT. T MAY 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	05/12/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_2/19
Sheet	3 of 5	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
8.70	Stiff clay.	9	C		8.70	10.20			1.50														1.30
			RC		8.70	10.20		0020	1.50	95	grey											2.70	1.30
		10	C		10.20	11.70			1.50														2.00
13.20	Fractured limestone.		RC		10.20	11.70		0016	1.50	95	grey											2.70	2.00
		11	C		11.70	13.20			1.50														2.30
			RC		11.70	13.20		0005	1.50	95	grey											2.70	2.30
			RC		11.70	13.20		0016	0.00	95	grey											2.70	2.20
		12	C		13.20	14.70			1.50														2.50
			RC		13.20	14.70		0012	1.50	90	brown											2.70	2.50

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	8.70	1.30	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1715	14.70	2.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	8.70	14.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0110	Open up wait on water.
0840	0350	Drill ops core.
1230	0010	Wait on BH instruction.
1240	0135	Dumper in use PH. Track rig to compound then secure area. Secure site.
1415	0300	Return to GEL.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Showers	**Project No**	35673
Date	06/12/2019	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_2/19
Sheet	4 of 5	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	14.70	1.40	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1220	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	14.70	13.20
Grout	13.20	0.50
Arisings	0.50	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0315	Drive to site.
0815	0130	Wait on access to rigs.
0945	0025	Track rig to position and set up.
1010	0140	Backfill BH Mix and pump grout. Pull casing.
1150	0025	Prepare to move.
		General; 250L of grout. 3:1. 2 x bentonite pellets 2 x powder 1 x cement used.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	09/12/2019	**Day**	Monday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	KCW_2/19
Sheet	5 of 5	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf topsoil.																						
0.30	Clay.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0645	0020	Drive to site.
0705	0425	Sign in open up un load steel move heras concrete cover in.
1130	0040	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1210	0125	Set up heras around position track rig to compound and load for return to GEL.
1335	0425	Return to GEL.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	29/11/2019	**Day**	Friday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 3/19
Sheet	1 of 6	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. S DOWNER. 06.45HRS TO 18.00HRS.
		General; SHIFT. J SMITH 06.45HRS TO 18.00HRS.
		General; SHIFT. J SELBY 06.45HRS TO 18.00HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	29/11/2019	**Day**	Friday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 3/19
Sheet	2 of 6	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	1.20	Dry	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0400	Drive to site.
0900	0815	Sign in standing rig repairs at GEL. Assist PH on P18.
1715	0030	Drive to accommodation.
		General; SHIFT. S DOWNER. 05.00HRS TO 17.45HRS
		General; SHUFT. J SMITH. 05.00HRS TO 17.45HRS
		General; SHIFT. T MAY 05.00HRS TO 17.45HRS

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	02/12/2019	**Day**	Monday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 3/19
Sheet	3 of 6	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.20	Stiff clay.	1	L		1.20	2.70	128	0016	1.50													0.00	Dry
		2	C		2.70	4.20			1.50														0.60
			RC		2.70	4.20		0016	1.50	80	brown											2.70	0.60
5.20	Fractured limestone.	3	C		4.20	5.70			1.50														3.80
			RC		4.20	5.70		0013	1.50	0	No return											2.70	3.80
		4	C		5.70	7.20			1.50														3.80
			RC		5.70	7.20		0012	1.50	0	No return											2.70	3.80
		5	C		7.20	8.70			1.50														6.40
			RC		7.20	8.70		0012	1.50	0	No return											2.70	6.40
		6	C		8.70	10.20			1.50														6.30
			RC		8.70	10.20		0012	1.50	0	No return											2.70	6.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	10.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0150	Sign in un losd rig track to position set up rig and kit pump water to tanks.
0900	0040	Drill ops sample and case.
0940	0025	Wait on water.
1005	0115	Drill ops and set up to core and core.
1120	0010	Await BH instruction.
1130	0015	Drill ops core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	03/12/2019	**Day**	Tuesday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 3/19
Sheet	4 of 6	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1145	0025	Await BH instruction.
1250	0015	Drill ops core.
1305	0025	Wait on water.
1330	0015	Drill ops core.
1345	0040	Wait on BH instruction and water.
1425	0135	Mix and pump grout to BH.
1600	0015	Tidy site secure site and rig.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	03/12/2019	**Day**	Tuesday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 3/19
Sheet	5 of 6	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	1.20	Dry	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	10.20	5.20
Grout	5.20	0.50
Arisings	0.50	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1615	0100	Assist PH on P18.
1715	0030	Return to accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.45HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.45HRS.
		General; SHIFT. T MAY. 06.45HRS TO 17.45HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	03/12/2019	**Day**	Tuesday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 3/19
Sheet	6 of 6	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf.	1	L		1.20	2.20	128	0015	1.00													0.00	Dry
		2	C		2.20	3.70			1.50														1.20
			RC		2.20	3.70		0014	1.50	80	brown											2.20	1.20
0.10	Clay with some gravels.	3	C		3.70	4.80			1.10														1.50
			RC		3.70	4.80		0012	1.10	80	brown											2.20	1.50
		4	C		4.80	5.20			0.40														1.40
1.00	Clay.		RC		4.80	5.20		0007	0.40	80	brown											2.20	1.40
		5	C		5.20	6.70			1.50														1.40
			RC		5.20	6.70		0011	1.50	50	brown											2.20	1.40
1.20	Sandy clay.	6	C		6.70	8.20			1.50														6.20
			RC		6.70	8.20		0012	1.50	0	No return											2.20	6.20
		7	C		8.20	9.70			1.50														6.20
5.20	Fractured limestone.		RC		8.20	9.70		0011	1.50	0	No return											2.20	6.20

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	5.20	Dry	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.20								
C	168.00	1.20	2.20					S			
RC	146.30	2.20	9.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0645	0025	Drive to site.
0710	0345	Prepare to move track rig walk all kit etc to position. Tracked dumper un available.
1055	0035	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1130	0010	Set up rig.
1140	0325	Drill ops sample case set upto core and core.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	Project No	35673
Date	04/12/2019	Day	Wednesday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	KCW_4/19
Sheet	1 of 4	Completed	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	5.20	Dry	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1505	0035	Collect backfill materials.
1540	0020	Backfill BH to 5.20m with bentonite pellets.
1600	0100	Not enough time to grout BH. Tidy and secure site and rig. Assist PH on P18.
1700	0030	Drive to accommodation.
		General; LOST FLUSH AT 6.70M.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	04/12/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_4/19
Sheet	2 of 4	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	5.20	Dry	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. T MAY. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	04/12/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_4/19
Sheet	3 of 4	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	5.20	Dry	2.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
0935	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	9.70	5.20
Grout	5.20	0.50
Arisings	0.50	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0230	Mix and pump grout prepare to move.
		General; 150L grout 3:1 ratio. 4 x bentonite pellets 1 x powder 1 x cement used.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	05/12/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_4/19
Sheet	4 of 4	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
1.20	Sandy clay.	1	L		1.20	2.70	128	0020	1.50													0.00	Dry
		2	C		2.70	4.20			1.50														1.20
			RC		2.70	4.20		0003	1.50	90	brown											2.70	1.20
5.00	Fractured limestone.		RC		2.70	4.20		0015	0.00	90	brown											2.70	1.30
		3	C		4.20	5.70			1.35														1.40
			RC		4.20	5.70		0015	1.35	80	brown											2.70	1.40
		4	C		5.70	7.20			1.50														1.30
			RC		5.70	7.20		0016	1.50	85	brown											2.70	1.30

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	7.20	1.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	7.20	T6-146	Rigid	120.00	PCD		.	Water	Yes

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500		CAT Scanned: Yes
0500		Permit Completed: Yes
0500	0335	Drive to site.
0835	0010	Induction.
0840	0035	Wait for others and client.
0915	0100	Walk to first position and client induction.
1015	0030	Wait to re position BH due to service picked up with cat.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	18/11/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	1 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	7.20	1.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1045	0025	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1110	0115	Track rig to position and move kit. Set up.Un able to get van to position. Soft ground.
1225	0025	Drill ops sample.
1250	0030	Wait on water.
1320	0020	Drill ops case.
1340	0025	Wait on water.
1405	0235	Drill ops case core.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	18/11/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	2 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	7.20	1.50	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1640	0025	Tidy pack away secure rig heras round position.
1705	0025	Drive to accommodation.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Fine	**Project No**	35673
Date	18/11/2019	**Day**	Monday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	3 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
7.20	Fractured limestone with sand bands.	5	C		7.20	8.70			1.50														4.10
			RC		7.20	8.70		0015	1.50	90	brown											2.70	4.10
		6	C		8.70	10.20			1.50														3.00
			RC		8.70	10.20		0015	1.50	90	brown											2.70	3.00
		7	C		10.20	11.70			1.50														1.40
			RC		10.20	11.70		0015	1.50	90	brown											2.70	1.40
		8	C		11.70	13.20			1.50														1.40
			RC		11.70	13.20		0013	1.50	90	brown											2.70	1.40
		9	C		13.20	14.70			1.50														1.90
			RC		13.20	14.70		0013	1.50	90	brown											2.70	1.90
		10	C		14.70	16.20			1.40														2.20
			RC		14.70	16.20		0015	1.40	80	brown											2.70	2.20
		11	C		16.20	17.40			1.20														3.00
			RC		16.20	17.40		0014	1.20	80	brown											2.70	3.00
		12	C		17.40	18.90			1.50														4.00
			RC		17.40	18.90		0015	1.50	0	No return											2.70	4.00
		13	C		18.90	19.20			0.30														9.00
			RC		18.90	19.20		0009	0.30	0	No return											2.70	9.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	7.20	4.10	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	19.20	8.60	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	7.20	19.20	Geobore S (146)	Rigid	102.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0040	Sign in set up.
0800	0515	Drill ops core.
1315	0100	Wait on water pump to IBC lunch.
1415	0030	Drill ops core.
1445	0215	Wait on water problenms withb2 x Honda pump assist P Hetherington. Tidy pack secure
1700	0035	Return to accommodation.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	19/11/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	4 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	7.20	4.10	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	19.20	8.60	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. JAMIE SMITH. 07.00HRS TO 17.30HRS.
		General; SHIFT D JONES. 06.45HRS TO ? TRAVELLING TO GEL.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	19/11/2019	**Day**	Tuesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	5 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
19.20	Fractured limestone.	14	C		19.20	20.70			1.50														7.60
			RC		19.20	20.70		0015	1.50	0	No return											2.70	7.60
		15	C		20.70	22.20			1.50														7.40
26.20	Clay.		RC		20.70	22.20		0012	1.50	0	No return											2.70	7.40
		16	C		22.20	23.70			1.50														7.60
			RC		22.20	23.70		0011	1.50	0	No return											2.70	7.60
		17	C		23.70	25.20			1.50														7.60
			RC		23.70	25.20		0012	1.50	0	No return											2.70	7.60
		18	C		25.20	26.70			1.50														7.40
			RC		25.20	26.70		0015	1.50	0	No return											2.70	7.40

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	19.20	7.60	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	26.70	7.40	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	19.20	26.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0025	Drive to site.
0710	0055	Wait on others sign in.
0805	0515	Wait on water. Assist P Hetherington case barrel.
1320	0020	Drill ops core.
1340	0035	Wait on water.
1415	0200	Drill ops core.
1615	0015	Assist P Hetherington with core barrel.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	20/11/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	6 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	19.20	7.60	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	26.70	7.40	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1630	0030	Tidy pack away secure rig and position.
1700	0030	Return to accommodation.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	20/11/2019	**Day**	Wednesday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	7 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		26.70	27.80		0015	1.10	0	No return											2.70	8.00
		19	C		26.70	27.80			1.10														8.00

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	26.70	8.00	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	26.70	7.60	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	26.70	27.80	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0030	Wait on others sign in open up set up.
0810	0110	Await BH instruction.
0920	0050	Drill ops core.
1010	0105	Await BH instruction.
1115	0035	Collect grout materials.
1150	0355	Mix and pump grout pull casing. (450L grout 2:1 ratio. 3x bags cement 6 x bentonite powder.)

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details		**CSCS No**	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	21/11/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	8 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	26.70	8.00	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	26.70	7.60	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1545	0115	Await instruction re grout. Tidy pack away secure site and rig.
1700	0030	Returnbto accommodation.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	21/11/2019	**Day**	Thursday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	9 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	21.70	7.00	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1930	3.00	3.00	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0030	Wait for others sign in load backfill materials.
0750	0325	Backfill BH with bentonite pellets to 17.50m mix and pump 300L grout.
1115	0015	Wait insruction re grout.
1130	0105	Bentonite pellets to 14.50m then mix and pump grout to 3.0M.
1235	0235	Assist P Hetheington with grouting. Move all steel off position track rig to compound.
1530	0400	Return to GEL.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Drizzle	**Project No**	35673
Date	22/11/2019	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	10 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	21.70	7.00	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1930	3.00	3.00	0.00

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Grout	14.20	3.00
Grout	1.20	0.50
Arisings	0.50	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. S DOWNER 06.45HRS TO 19.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 19.30HRS.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Drizzle	**Project No**	35673
Date	22/11/2019	**Day**	Friday
Rig type	Comacchio 305	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	11 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500	3.20	3.00	0.00
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1055	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Grout	26.70	21.70
Bentonite Pellets	21.70	17.10
Cement/Bentonite	17.10	14.50

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500	0330	Drive to site.
0830	0045	Move 2 x rigs to compound track P20 to site.
0915	0020	Finish backfilling BH.
		General; 10 X Bentonite pellets 6 x bentonite powder 3 x cement used.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	25/11/2019	**Day**	Monday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	KCW_5/19
Sheet	12 of 12	**Completed**	Y

AGS

Produced by KeyLogbook

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 18/11/19 CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE KCW 6/19

TIME AND PRODUCTION RECORD

from	5.00	rig move	1 no.	hr	dynamic sampling	4.5 m	hr
to	18.15	rig up	1 no.	hr	core drilling	6.95	hr
hrs	13.5 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				3 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
INDUCTIONS				hr	undisturbed sampling	no	hr
SITE WALKOVER				1.5 hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push-on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/pm	m
							ballast	25kg bags			after ~~am~~/pm 8.00	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
1x	128	1.20	1.05	.45	.45	SW	1.60				0 - 1.20 CLAY	GL		
2c	146	1.65	2.55	.90	.90						1.20 - 1.65 SANDS			
3c	146	2.55	4.05	1.50	1.50						1.65 - 5.20 SAND/CLAY			
4c	146	4.05	5.55	1.50	1.35						5.20 - 8.55 LIMESTONE			
5c	146	5.55	7.05	1.50	1.46									
6c	146	7.05	8.55	1.50	1.50									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at 1.05		settled at 1.05
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

AWAITING WATER 1.50 H
ERECTING HERAS FENCING .30 MIN

weather DRY

dril[redacted]
ass[redacted]

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 19/11/19 CONTRACT No. 35673

SITE AUGEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE KCW6/19

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	18.00	rig up	no.	hr	core drilling	7.55	hr
hrs	10.75	rig down	no.	hr	CFA	m	hr
transport to and from site				.45 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
DAILY BRIEF				.50 hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							bentonite powder	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	8.05 m
							ballast	25kg bags			after ~~am~~/pm	7.22 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
7c	146	8.55	10.05	1.50	1.50						8.55 - 15.00 LIMESTONE	GL		
8c	146	10.05	11.55	1.50	1.50						15.00 - SANDS			
9c	146	11.55	13.05	1.50	1.50									
10c	146	13.05	14.05	1.50	1.50									
11c	146	14.05	16.05	1.50	1.00									
12c	146	16.05	17.55	1.50	0									
SEE REMARKS														

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

AWAITING WATER 2.05
BARREL + RODS STUCK AT 17.55M / IN PROCESS OF CASING TO DEPTH
13.25 - 16.30 TRYING TO FREE BARREL / FLUSH CASING

weather DRY

driller [redacted]
assist

landrover rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 20-11-19 CONTRACT No. 35673

SITE ANGLEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE KCW6/19

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	17.15	rig up	no.	hr	core drilling	m	hr
hrs	10 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				30 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
DAILY BRIEF				39 hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		~~push on cap~~	no.
HDPE							gravel	25kg bags	~~stopcock~~		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							~~bentonite powder~~	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before am/~~pm~~	7.28 m
							ballast	25kg bags			after ~~am~~/pm	7.62 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive					strata description	installation / backfilling	depth (m bgl)	installation description
12C	146	17.55	17.55	0	1.00	SW	17.00								LIMESTONE	GL		
SEE	REMARKS																	

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

8.15 - 14.10 FLUSH CASING
2 HOURS AWAITING WATER
14.10 - 16.30 PULLING DRILL STRING / STRIPPING 146 BARREL

weather DRY

drille [redacted]
assis

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA DATE 20/11/19 CONTRACT No. 35673

SITE ANGLEAN PLC PETERBOROUGH SHEET 1/1 BOREHOLE KCW6/19

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	~~10.45~~ m	hr
to	17.15	rig up	no.	hr	core drilling	10.45 m	hr
hrs	10.00 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				.45 hr	HSFA	m	hr
awaiting access/instructions				hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		~~push on cap~~	no.
HDPE							gravel	25kg bags	~~stopcock~~		gas valve	no.
UPVC							bentonite pellets	25kg bags	traffic rated			no.
Triloc							~~bentonite powder~~	25kg bags	manhole		WATER LEVELS	
19mm							cement	25kg bags	padlocks		before ~~am~~/pm	10.42 m
							ballast	25kg bags			after ~~am~~/pm	18.85 m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
13c	146	17.55	18.70	1.15	1.50	SW	17.00					GL		
14c	146	18.70	20.30	1.60	1.50									
15c	146	20.30	21.80	1.50	1.50									
16c	146	21.80	23.35	1.55	1.50									
17c	146	23.35	24.90	1.55	1.50									
18c	146	24.90	26.50	1.60	1.50									
19c	146	26.50	28.00	1.50	1.50									

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing			after pulling casing		

REMARKS

8.00 - 9.25 STANDING AWAITING 146 BARREL
11.30 - 11.45 AWAITING WATER
15.35 - 16.00 PACKING UP / SETTING UP READY FOR INSTALL

weather DRY

drille [redacted]
assis

landrover

rig P18

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 22·11·19

CONTRACT No. 35763

SITE AUGEAN PLC PETERBOROUGH

SHEET 1/1

BOREHOLE KCW 6/19

TIME AND PRODUCTION RECORD

from	7.15	rig move	no.	hr	dynamic sampling	m	hr
to	19·15	rig up	no.	hr	core drilling	m	hr
hrs	12 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				35 hr	HSFA	m	hr
awaiting access/instructions				2·5 hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m)			CASING (m)			RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
	1.0	1.5	3.0	1.0	1.5	3.0	washed sand	25kg bags	helmet		push on cap	no.
HDPE							gravel	25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	20 25kg bags	traffic rated			no.
Triloc							bentonite powder	3 25kg bags	manhole		WATER LEVELS	
19mm							cement	2 25kg bags	padlocks		before am/~~pm~~	18·60 m
							ballast	25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	depth (m bgl) to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	penetration test test drive	strata description	installation / backfilling	depth (m bgl)	installation description
												GL		
														BENTONITE PELLETS *
													7.40m	
														CEMENT BENTONITE GROUT
													14·50	
														BENTONITE PELLETS
													28m	

WATER DEPTHS (m bgl)

a.m.	p.m.		struck at	settled at
after striking	5	10	15	20
sample taken at			before water flush	
before pulling casing			after pulling casing	

REMARKS

* TOPPED UP BENTONITE PELLETS ON MONDAY 25·11·19
AWAITING CONFIRMATION OF BACKFILL REQUIRED FROM CLIENT
PUMPED APPROX 1000LTRS OF GROUT

weather DRY	drille[redacted]	landrover	rig P18
	assis[redacted]		

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.60	Soft clay spoil.	1	B		0.20	0.40																	
		2	B		0.60	0.80																	
		3	B		1.00	1.20																	
1.20	Soft clay with bands of limestone	4	L		1.20	2.20	128	0008	1.00													0.00	Dry
		5	C		2.20	3.50			1.20														Dry
			RC		2.20	3.50		0020	1.20	95	grey											2.20	Dry
2.20	Very stiff clay.	6	C		3.50	5.00			1.50														1.62
			RC		3.50	5.00		0025	1.50	95	grey											2.20	1.62
		7	C		5.00	6.50			1.50														1.85
11.50	sandstone/limestone.		RC		5.00	6.50		0035	1.50	95	grey											2.20	1.85
		8	C		6.50	8.00			1.50														1.82
			RC		6.50	8.00		0035	1.50	95	grey											2.20	1.82
		9	C		8.00	9.50			1.50														1.71
			RC		8.00	9.50		0035	1.50	95	grey											2.20	1.71
		10	C		9.50	11.00			1.50														2.60
			RC		9.50	11.00		0025	1.50	95	grey											2.20	2.60
		11	C		11.00	12.50			1.50														1.78
			RC		11.00	12.50		0020	1.50	40	grey											2.20	1.78

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1830	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	0.00	2.20					S			
DS	128.00	1.20	2.20								
RC	146.30	2.20	12.50	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0500		CAT Scanned: Yes
0500		Permit Completed: Yes
0500	0030	Dayworks: Lading equipment on van.
0530	0315	Dayworks: Mob to site.
0845	0015	Standing: Toolbox talk
0900	0100	Dayworks: Installing bund Moving rig and equipment to borehole position.
1000	0045	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m

SPT I.D. Number		Calibration Date	
SPT Rod Type		SPT Energy Ratio	
Drilling Crew Details			CSCS No
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Sunny	Project No	35673..
Date	25/02/2020	Day	Tuesday
Rig type		Borehole Number	
Inclination		Orientation	kcw_7/19
Sheet	1 of 2	Completed	Y

AGS

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GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0500			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	12.50	11.00
Grout	11.00	0.50
Arisings	0.50	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1045	0415	Dayworks: Drilling.
1500	0030	Standing: Waiting for backfill instructions (Client)
1530	0100	Dayworks: Grouting borehole, pulled casing.
1630	0045	Dayworks: Pack up, Secured site, sign out.
		General; Work hours DW. 05.00am to 18.30pm.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Sunny	**Project No**	35673..
Date	25/02/2020	**Day**	Tuesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	kcw_7/19
Sheet	2 of 2	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.50	Soft clay with top soil.	1	L		1.20	1.80	128	0008	0.60													0.00	Dry
			RC		1.80	3.00		0015	1.20	95	grey											1.80	Dry
		2	C		1.80	3.00			1.20														Dry
1.20	Stiff clay.	3	C		3.00	4.30			1.30														0.98
			RC		3.00	4.30		0020	1.30	80	grey											2.20	0.98
			RC		4.30	5.80		0025	1.50	85	grey											2.20	1.21
15.50	Limestone/sandstone.	4	C		4.30	5.80			1.50														1.21
			RC		5.80	7.30		0025	1.50	80	grey											2.20	1.64
		5	C		5.80	7.30			1.50														1.64
		6	C		7.30	8.80			1.50														1.92
			RC		7.30	8.80		0025	1.50	80	grey											2.20	1.92
		7	C		8.80	10.30			1.50														0.83
			RC		8.80	10.30		0025	1.50	85	grey											2.20	0.83
			RC		10.30	11.80		0025	1.50	90	grey											2.20	0.88
		8	C		10.30	11.80			1.50														0.88
			RC		11.80	13.30		0025	1.50	80	grey											2.20	0.88
		9	C		11.80	13.30			1.50														0.88
			RC		13.30	14.80		0025	1.50	80	grey											2.20	1.36

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	0.00	2.20					S			
DS	128.00	1.20	1.80								
RC	146.30	1.80	16.30	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0645	0030	Dayworks: Mob to site.
0715	0015	Standing: Toolbox talk
0730	0130	Dayworks: Moving rig and equipment to borehole location.
0900	0030	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
0930	0030	Standing: Waiting for water

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Sunny	**Project No**	35673..
Date	26/02/2020	**Day**	Wednesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	kcw_8/19
Sheet	1 of 3	**Completed**	Y

AGS

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GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
		10	C		13.30	14.80			1.50														1.36
		11	C		14.80	16.30			1.50														1.21
			RC		14.80	16.30		0025	1.50	70	grey											2.20	1.21

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1000	0300	Dayworks: Drilling.
1300	0100	Lunch.
		General; Lost flush at around 15.50m
1400	0145	Dayworks: Finished drill ops.
1545	0015	Standing: Waiting for Client's backfill instructions.
1600	0100	Dayworks: Grouting borehole.
1700	0045	Loading core secured site sign out.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Sunny	**Project No**	35673..
Date	26/02/2020	**Day**	Wednesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	kcw_8/19
Sheet	2 of 3	**Completed**	Y

AGS

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GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1830	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	16.30	15.00
Grout	15.00	0.30
Arisings	0.30	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1745	0045	Dayworks: Left site arrived at accommodation.
1840		General: Working hours DW 06.45am to 18.30pm.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Sunny	**Project No**	35673..
Date	26/02/2020	**Day**	Wednesday
Rig type		**Borehole Number**	
Inclination		**Orientation**	kcw_8/19
Sheet	3 of 3	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.00	Turf topsoil.	1	L		1.20	2.70	128	0010	1.50													0.00	Dry
			RC		2.70	4.20		0016	1.35	95	brown											2.70	1.00
		2	C		2.70	4.20			1.35														1.00
0.20	Soft clayoccasional gravels.																						
1.20	Stiff clay.																						
2.70	Stiff boulder clay.																						

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1045			
Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1730	4.20	1.30	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
DS	128.00	1.20	2.70								
C	168.00	1.20	2.70					S			
RC	146.30	2.70	4.20	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1045	0020	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
1105	0015	Await instruction re metal object in side of pit wall at 0.80m.
1120	0020	Backfill pit and move location 3.00m. Dig pit.
1140	0220	Track and set move kit and set up.
1400	0220	Drill ops sample case core.
1620	0040	Tidy pack away erect heras.
1700	0030	Return to accommodation.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	23/01/2020	Day	Thursday
Rig type	Comacchio 305	Borehole Number	
Inclination		Orientation	BH KCW 9/19
Sheet	1 of 4	Completed	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
1045			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1730	4.20	1.30	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. S DOWNER. 06.45HRS TO 17.30HRS.
		General; SHIFT. J SMITH. 06.45HRS TO 17.30HRS.
		General; SHIFT. J CHAPMAN. 06.45HRS TO 17.30HRS.
		General; SHIFT L MURPHY. 06.45HRS TO 17.30HRS.
		General; J CHAPMAN DRILLING.
1045		CAT Scanned: Yes
1045		Permit Completed: Yes

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	23/01/2020	**Day**	Thursday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination	**Orientation**	BH KCW 9/19	
Sheet	2 of 4	**Completed**	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details: No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Drilling Details: Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Standard Penetration Test: Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
4.20	Boulder clay.	3	C		4.20	5.70			1.50														1.40
			RC		4.20	5.70		0015	1.50	95	brown											2.70	1.40
		4	C		5.70	7.20			1.50														1.40
			RC		5.70	7.20		0016	1.50	95	brown											2.70	1.40
		5	C		7.20	8.70			1.50														1.40
			RC		7.20	8.70		0018	1.50	95	brown											2.70	1.40
		6	C		8.70	10.20			1.50														1.60
			RC		8.70	10.20		0018	1.50	90	brown											2.70	1.60
		7	C		10.20	11.70			1.50														2.80
			RC		10.20	11.70		0018	1.50	90	brown											2.70	2.80

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	4.20	1.40	2.70

Finish time (hhmm)	Hole (m)	Water (m)	Casing (m)
1745	11.70	3.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
RC	146.30	4.20	11.70	T6-146	Rigid	120.00	PCD		.	Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0035	Drive to site.
0720	0045	Sign in open up set up.
0805	0445	Drill ops core.
1250	0020	Wait on water pump to tanks.
1310	0120	Tidy secure site core to compound and un load. Load all steel and tools to man van.
1430	0315	Return to GEL and un load.
		General; SHIFT. S DOWNER. 06.45HRS TO 17.45HRS.

SPT I.D. Number	EQU003	Calibration Date	09/10/2017
SPT Rod Type	NWY	SPT Energy Ratio	.
Drilling Crew Details		CSCS No	
Support Operative	TBC		
Lead Driller	Simon Downer	4966940	
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	Project No	35673
Date	24/01/2020	Day	Friday
Rig type	Comacchio 305	Borehole Number	
Inclination	Orientation	BH KCW 9/19	
Sheet	3 of 4	Completed	N

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	4.20	1.40	2.70
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1745	11.70	3.00	2.70

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
		General; SHIFT. J SMITH. 06.45HRS TO 17.45HRS.
		General; SHIFT. J CHAPMAN. 06.45HRS TO 17.45HRS.
		General; SHIFT. L MURPHY. 06.45HRS TO 17 .45HRS
		General; J CHAMAN. DRILLING.

SPT I.D. Number	EQU003	**Calibration Date**	09/10/2017
SPT Rod Type	NWY	**SPT Energy Ratio**	.
Drilling Crew Details			**CSCS No**
Support Operative	TBC		
Lead Driller	Simon Downer		4966940
Site category	Yellow		
Project Engineer	MJCA		
Lead Driller's signature			

Project Title

Peterborough

Weather	Cloudy	**Project No**	35673
Date	24/01/2020	**Day**	Friday
Rig type	**Comacchio 305**	**Borehole Number**	
Inclination		**Orientation**	BH KCW 9/19
Sheet	4 of 4	**Completed**	N

AGS

Produced by KeyLogbook

Geotechnical Engineering Limited

DRILLER'S DAILY REPORT

CLIENT MJCA

DATE 28-01-2020

CONTRACT No. 35673

SITE Peterborough

SHEET 1 of 1

BOREHOLE KCW 9/19

TIME AND PRODUCTION RECORD

from	0645	rig move	no.	hr	dynamic sampling	m	hr
to	1800	rig up	no.	hr	core drilling	m	hr
hrs	11 1/4 hr	rig down	no.	hr	CFA	m	hr
transport to and from site				1 3/4 hr	HSFA	m	hr
awaiting access/instructions				1 hr	penetration testing	no	hr
				hr	undisturbed sampling	no	hr
				hr	installing	m	hr

PIEZOMETER / STANDPIPE RECORD

TYPE	SCREEN (m) 1.0	1.5	3.0	CASING (m) 1.0	1.5	3.0	RESPONSE ZONE/SEAL	No. USED	COVER TYPE		WELL HEAD	
							washed sand	/ 25kg bags	helmet		push on cap	no.
HDPE							gravel	/ 25kg bags	stopcock		gas valve	no.
UPVC							bentonite pellets	3 25kg bags	traffic rated			no.
Triloc							bentonite powder	2 25kg bags	manhole		WATER LEVELS	
19mm							cement	1 25kg bags	padlocks		before am/pm	m
							ballast	/ 25kg bags			after am/pm	m

DRILLING AND SAMPLING RECORD

sample no.	type	depth (m bgl) from	to	drilled (m)	recov'd (m)	casing size (mm)	casing depth (m bgl)	water depth (m bgl)	penetration test seating	test drive	strata description	installation / backfilling	depth (m bgl)	installation description
8c	146	11.70m	13.20m	1.5m	1.5m	SW	2.70m	3.00m			Stiff clay	GL	0.00m	
9c	146	13.20m	14.70m	1.5m	1.5m	SW	2.70m	2.90m			Stiff clay / weathered limestone			13.90m - 0.00m Grout
10c	146	14.70m	14.90m	0.2m	0.2m	SW	2.70m	2.80m			Weathered limestone			2 mixes
11c	146	14.90m	16.20m	1.3m	1.3m	SW	2.70m	2.90m			Limestone			1 bag Cement
														2 bags bentonite powder
0645-	0720-	Drive to site												
0720-	0810-	Open up, sign in												
0810-	0915-	Move kit to position, set up												
0915-	1040-	Rig Checks, O/O core												
1040-	1100-	Wait for Client decision												
1100-	1240-	O/O core												
1240-	1315-	Wait for client decision												
1315-	1415-	30 Minute Lunch, Load install to track Jumper											13.90m	- bentonite pellets x3 bags
1415-	1645-	back fill BH, Pull Casing, grout Mix 3:1 x 2 mixes											16.20m	
1645-	1800-	Pack up Secure fencing, Cores to Compound, drive to Hotel												

Grout

WATER DEPTHS (m bgl)

a.m. 3.00m	p.m.		struck at		settled at
after striking	5	10	15	20	
sample taken at			before water flush		
before pulling casing	15.70m		after pulling casing		

REMARKS

Limestone at 14.00m, Lost 80% flush 14.00m
AM water - 3.00m
PM water - 15.70m

weather: Dry Sunny

driller: Josh Chapman

assistant driller: Mike Cobb, Sam York

landrover: UX60 CUK

rig: P20

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
0.60	Topsoil into stiff clay.	1	L		1.20	2.20	128	0010	1.00													0.00	Dry
		2	C		2.20	3.70			1.50														Dry
			RC		2.20	3.70		0020	1.50	95	grey											2.20	Dry
2.20	Very stiff clay.		RC		3.70	5.20		0025	1.50	95	grey											2.20	0.86
		3	C		3.70	5.20			1.50														0.86
			RC		5.20	6.70		0030	1.50	95	grey											2.20	1.36
18.50	sands with bands of limestone.	4	C		5.20	6.70			1.50														1.36
			RC		6.70	8.20		0025	1.50	90	grey											2.20	1.63
		5	C		6.70	8.20			1.50														1.63
		6	C		8.20	9.70			1.50														1.58
			RC		8.20	9.70		0020	1.50	95	grey											2.20	1.58
		7	C		9.70	11.20			1.50														2.06
			RC		9.70	11.20		0025	1.50	85	grey											2.20	2.06
		8	C		11.20	12.70			1.50														1.68
			RC		11.20	12.70		0025	1.50	90	grey											2.20	1.68
		9	C		12.70	14.20			1.50														1.98
			RC		12.70	14.20		0025	1.50	90	grey											2.20	1.98
		10	C		14.20	15.70			1.50														2.11

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	19.70	3.21	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer
C	168.00	0.00	2.20					S			
DS	128.00	1.20	2.20								
RC	146.30	2.20	19.70	T6-146	Rigid	120.00	PCD			Water	No

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645		CAT Scanned: Yes
0645		Permit Completed: Yes
0645	0045	Dayworks: Mob to site.
0730	0015	Standing: Toolbox talk
0745	0130	Dayworks: Moving rig and equipment to borehole location.
0915	0030	Inspection pit: Hand dug 1.20m x 0.50m x 0.50m
0945	0700	Dayworks: Drilling.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Fine	**Project No**	35673..
Date	27/02/2020	**Day**	Thursday
Rig type		**Borehole Number**	
Inclination		**Orientation**	KCW/10/19
Sheet	1 of 3	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)
			RC		14.20	15.70		0020	1.50	90	grey											2.20	2.11
		11	C		15.70	17.20			1.50														2.06
			RC		15.70	17.20		0035	1.50	90	grey											2.20	2.06
		12	C		17.20	18.20			1.00														2.28
			RC		17.20	18.20		0020	1.00	90	grey											2.20	2.28
			RC		18.20	19.70		0015	1.00	70	grey											2.20	3.13
		13	C		18.20	19.70			1.00														3.13

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645			
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1800	19.70	3.21	2.20

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
1645	0015	Standing: Waiting for Client's instructions
1700	0030	Dayworks: Pack away secured site signed out.
1730	0030	Dayworks: Arrived back at accommodation.
		General; Client instructed to backfill from 19.7m
		General; DW working hours 06.45am to 18.00pm

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Fine	**Project No**	35673..
Date	27/02/2020	**Day**	Thursday
Rig type		**Borehole Number**	
Inclination	**Orientation**	KCW/10/19	
Sheet	2 of 3	**Completed**	Y

AGS

Produced by KeyLogbook

GEOTECHNICAL ENGINEERING LTD on behalf of MJCA Rotary Drilling Log

Depth of Stratum Top (m)	Driller's Stratum Description	Sample / Hole / Test Details						Drilling Details				Standard Penetration Test											
		No	Type	Insitu test	From (m)	To (m)	Liner Dia (mm)	Core run time (hhmm)	Total core Recovery (m)	Flush Return %	Flush Colour	Self Weight Pen (mm)	75 mm	150 mm	Seating Pen (mm)	75 mm	150 mm	225 mm	300 mm	Main Pen (mm)	N value	Casing Depth (m)	Water/ flush level (m)

Shift details

Start time (hhmm)	Hole (m)	Water (m)	Casing (m)
0645	19.70	3.46	2.20
Finish time (hhmm)	**Hole (m)**	**Water (m)**	**Casing (m)**
1300	0.00		

Drilling Equipment Details

Casing (C) Open Hole (RO) Coring (RC)	Dia. (mm)	From (m)	To (m)	Barrel	Liner Type	Core Dia (mm)	Bit Type	Casing Type	Bit serial No	Flush	Polymer

Ground Water Record

Time of strike	Depth Struck (m)	Casing (m)	Inflow	5 min	10 min	15 min	20 min	Depth Sealed (m)

Backfill (m)

Type	From (m)	To (m)
Bentonite Pellets	19.70	18.00
Grout	18.00	0.30
Arisings	0.30	0.00

Time from	Duration (hhmm)	Remarks or details of any additional testing information, Dayworks
0645	0045	Dayworks: Mob to site.
0730	0015	Standing: Toolbox talk
0745	0115	Dayworks: Backfilling borehole/grouting.
0900	0130	Dayworks: Loading equipment on van and loading rig (demobbing)
1030	0230	Dayworks: Mob back to yard.

SPT I.D. Number		**Calibration Date**	
SPT Rod Type		**SPT Energy Ratio**	
Drilling Crew Details			**CSCS No**
Support Operative	.		
Lead Driller	Danny Williams		5608864
Site category	Yellow		
Project Engineer	cameron davidson		
Lead Driller's signature			

Project Title

peterborough..

Weather	Showers	**Project No**	35673..
Date	28/02/2020	**Day**	Friday
Rig type		**Borehole Number**	
Inclination		**Orientation**	KCW/10/19
Sheet	3 of 3	**Completed**	Y

AGS

Produced by KeyLogbook

APPENDIX E

PERFORMANCE INFORMATION FOR THE CONSTRUCTION PRODUCTS USED FOR THE MONITORING FACILITIES

Duroscreen™

Applications

- Ground water monitoring
- Contaminated soil monitoring
- Landfill gas recovery
- Landfill leachate extraction

Features

- HDPE black pipe manufactured to DIN 8074/75
- Available slotted or perforated
- Resistant to aggressive chemicals
- High strength, tough and durable
- Flush threaded joints
- Slot sizes – 0.5, 1.0, 2.0 mm
- Lengths – 1.0, 2.0, 3.0 m

	Series 17/SDR 17.6/PN6			Series 11/SDR11/PN10		
Outside Diameter (OD) mm	Wall Thickness mm	Inside Diameter mm	Weight kg/m	Wall Thickness mm	Inside Diameter (ID) mm	Weight kg/m
63	Not available	Not available	Not available	5.8	51.4	1.05
90	5.1	79.8	1.39	8.2	73.6	2.12
110	6.3	97.4	2.08	10.0	90.0	3.14
125	7.1	110.8	2.66	11.4	102.2	4.08
140	8.0	124.0	3.34	12.8	114.4	5.11
160	9.1	141.8	4.35	14.6	130.8	6.67
180	10.2	159.6	5.48	16.4	147.2	8.42
200	11.4	177.2	6.79	18.2	163.6	10.40
225	12.8	199.4	8.55	20.5	184.0	13.10
250	14.2	221.6	10.60	22.8	204.4	16.20
280	15.9	248.2	13.20	25.5	229.0	20.30
315	17.9	279.2	16.70	28.7	257.6	25.70
355	20.1	314.8	21.20	32.3	290.4	32.60
400	22.7	354.6	26.90	36.4	327.2	41.40
450	25.5	399.0	34.00	40.9	368.2	52.40
500	28.3	443.4	41.90	45.4	409.2	64.60
560	31.7	496.6	52.50	50.8	458.4	81.10
630	35.7	588.8	66.50	57.2	515.6	102.50

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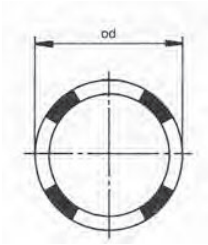
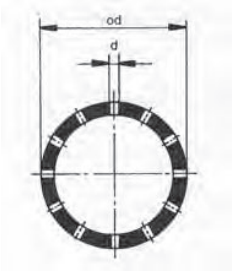
Specifications may change without prior notice

DuroScreen™

Fully Slotted		
OD mm	No. Rows	
63-90	2	
110 - 140	3	
160 - 225	4	
250-280	5	
315 - 355	6	
400 - 450	8	

Available slot sizes 2, 3, 4, 6mm; Standard axial slot spacing 15mm

Fully Perforated Pipe		
OD mm	No. Rows	
63-90	6-7	
110 - 140	8-12	
160 - 225	12-18	
250-280	18-24	
315 - 355	24-30	
400 - 450	30	

d = Standard perforation 12mm; Standard axial hole spacing 30mm

Open Area Rating of Screens according to Slot Dimension (Based on pipe I.D.)

OD mm	Rows	Slot 0.5 mm	Slot 1 mm	Slot 1.5 mm	Slot 2 mm	Slot 3 mm
63	2	2.0%	4.0%	6.1%	8.1%	12.1%
90	2	1.7%	3.3%	5.0%	6.6%	9.9%
110	3	2.3%	4.6%	6.9%	9.3%	13.9%
125	3	2.1%	4.3%	6.4%	8.6%	12.8%
140	3	2.0%	4.0%	6.0%	8.0%	12.0%
160	4	2.4%	4.8%	7.2%	9.5%	14.3%
180	4	2.2%	4.5%	6.7%	9.0%	13.4%
200	4	2.1%	4.2%	6.4%	8.5%	12.7%
225	4	2.0%	4.0%	5.9%	7.9%	11.9%
250	5	2.2%	4.5%	6.7%	8.9%	13.4%
280	5	2.0%	4.0%	6.0%	8.0%	11.9%
315	6	2.2%	4.4%	6.7%	8.9%	13.3%
355	6	2.1%	4.1%	6.2%	8.2%	12.4%
400	8	2.5%	5.1%	7.6%	10.2%	15.3%
450	8	2.3%	4.5%	6.8%	9.1%	13.6%

Material

Property	Standard	Unit	Value PE80
Density	ISO 1183	g/cm	0.94
Melt Flow Index (190/5)	ISO 1133	g/10min	0.9
Tensile stress at yield	ISO 527	MPa	20
Elongation at yield	ISO 527	%	10
Elongation at break	ISO 527	%	Minimum 350
Impact strength (notched)	ISO 179	kJ/m^2	12
Modules of elasticity	ISO 527	MPa	750

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05/2019 V1.5

GeoFilter

GeoFilters control the ingress of fines and eliminates the need for additional filter material within the borehole.

They are made up of a woven synthetic filter material that covers the outside of slotted or perforated pipe and an outer protective cover which is secured either end by adhesive or non-adhesive fixing.

Geonet

Geonet is a high tensile EVA sleeve which protects the GeoFilter during transport and installation.

- High tensile strength
- High abrasion resistance
- Range of sizes from 19-400mm

Georap

A woven geotextile which provides filtration down to 150 microns, suitable for fine soils

- Pore size ranges from 150 - 250 microns
- Diameters from 19 to 400 mm

Geosock

A knitted polyester filter sock which provides filtration down to 300 microns suitable for medium soils.

- 300 or 450 micron pore size
- Diameters from 50 to 400 mm

Applications

- Groundwater monitoring wells
- Landfill gas monitoring wells
- Dewatering wells

Features

- Easy to install
- Filter to suit soil conditions
- Drill smaller holes

Georap			
	Standard	**GR150**	**GR250**
Pore size 90% finer than (microns)	EN ISO 12956	180	270
Tensile strength (kN/m) MD CD	EN 10319	12 12	22 21
CBR puncture resistance (N)	EN ISO 12236	1800	2800
Water permeability (x 10-3) m/s	EN ISO 11058	18	20
Material	100% Polypropylene		
Effect of UV light	All are UV stabilized		

Geosock			
	Standard	**GS300 (up to 63 mm OD)**	**GS450 (90 to 400mm OD)**
Pore size 90% finer than (microns)	EN ISO 12956	300	450
Tensile strength (kN/m)	EN 10319	12	22
Puncture resistance (N)	ASTM D6241-04	1000	1000
Water permeability (x 10-3) m/s	EN ISO 11058	28	30
Material	100% Polyester		

The figures quoted are the mean of several tests

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05/2019 V1.3

Bentonite Powder

Bentonite Powder is a high-quality premium grade powder produced to OCMA standard. It is specially formulated to provide rapid development of viscosity and gel strength for drilling and civil engineering applications.

When mixed with water Bentonite Powder swells to many times its volume and rapidly forms a thixotropic gel.

Applications

- Borehole sealing
- Landfill gas well sealing
- Grouting
- Isolating instrumentation and sampling

Specifications	
Physical Appearance	Pale coloured powder
Moisture Content	12% ± 2%
Specific Gravity	2.4 – 2.6
Bulk Density	800 – 1000kg/m^3
Dry Screen Analysis	Min 75% < 75 micron

Features

- Easy to mix and use
- High gel strength
- Rapid build up of viscosity
- Suitable for use immediately after mixing

Storage

- Must be kept dry and free from moisture

Packaging

- 25kg paper bags

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Specifications may change without prior notice

05/2019 V1.2

Mikolit B

Mikolit® is a sealing pellet which requires no mixing or pumping. It is a patented clay-based pellet with very low dust content.

Mikolit B is a high grade bentonite pellet manufactured from a mix of activated calcium bentonites to provide a high swelling capacity of 180-200%.

All Mikolit pellets have excellent sinking qualities and are dust free and easy to use.

Applications

- Borehole sealing
- Isolating instrumentation and sampling zones

Specifications	
Pellet size	8mm (D) 7-12mm(L)
Processing time	None
Sinking speed in water	21m/min
Saturated density	1.70-1.80 t/m³
Bulk density	1.0 t/m³
Delayed swelling time	12 minutes
Swelling capacity	180-200%
Swelling pressure	12-15 kN/m²
Permeability	$<10^{-12}$ m/s

Features

- Pre-formed pellets
- 180-200% swelling capacity
- Suitable for use in sea water
- Delayed swelling
- No grout loss
- No grouting/mixing machines required
- Environmentally friendly
- Dust free
- Low permeability
- Simple & easy to use

Shelf Life

- Unlimited if unopened & kept in a dry location

Packaging

- 25kg waterproof bags*
- 42 bags per Europallet (disposable)

* 500 and 1000kg 'big bags' also available.

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Specifications may change without prior notice

Quantity Needed (kg/m)

Pipe Diameter (mm)	Borehole Diameter (mm)								
	100	125	150	200	250	300	400	500	600
0	9	13	19	34	54	77	137	215	309
50	6	11	17	32	51	75	135	212	307
100		5	11	26	45	69	129	206	300
125			6	21	40	64	124	201	295
160				12	32	55	115	193	287
200					19	43	103	180	175
250						24	84	161	255
315							52	129	224
400								77	172
500									94

APPENDIX F

PHOTOGRAPHIC LOG OF THE WORKS

Photograph 1. Slotted pipe with Geosock

Photograph 2. Close up of slotted high density polyethylene (HDPE) pipe

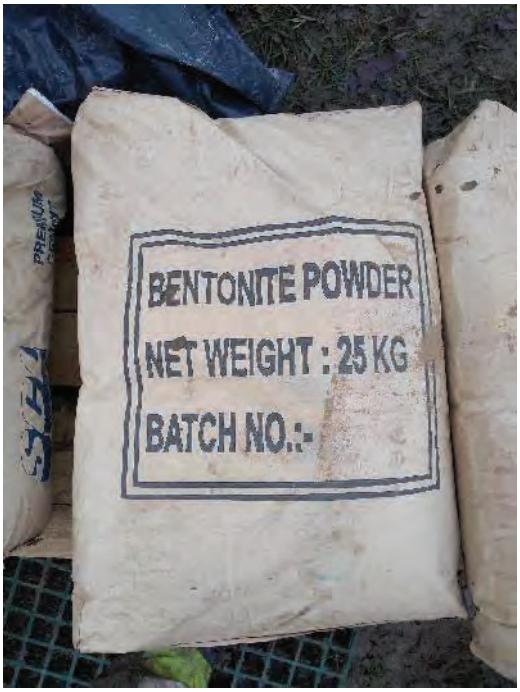
Photograph 3. End cap on plain HDPE pipe (sump)

Photograph 4. Gravel filter media

Photograph 5. Bentonite pellets supplied

Photograph 6. Cement for grout mix

Photograph 7. Bentonite powder for grout mix



Photograph 8. Drill rig on position at borehole K36

Photograph 9. Borehole K31 headworks and top cap with gas tap

Photograph 10. Borehole K31 headworks with fence

APPENDIX G

SITE DIARY FORMS AND INSTALLATION RECORDS

MJCA
Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Groundwater level (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
25/11/19	KCW 6/19	28m	17.0		N/A	N/A	N/A	N/A	28m
25/11/19	KCW 5/19	27.8m	2.7		N/A	N/A	N/A	N/A	27.8m

Monitoring borehole installation

Date	Borehole reference	Geotextile wrap checked	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
25/11/19	KCW 6/19	N/A	N/A	N/A	N/A	N/A	Pellets hydrated with water + grout mixed with bentonite	N/A
25/11/19	KCW 5/19	N/A	N/A	N/A	N/A	N/A	powder + cement 2:1 ratio.	
							A/A	N/A

General notes:

Signed (CQA Inspec [redacted]

Date: 25/11/19

MJCA Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	18/11/19 - 25/11/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	6"
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW6/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		scanned by GEL engineers
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)	✓	✓	Backfilled with pellets + grout
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Signed (CQA Inspector):

[redacted]

Date: 22/11/19

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Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	18/11/19 – 25/11/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	6"
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW/5/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		Scanned by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)			Backfilled with pellets + grout
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Signed (CQA Inspector):

[redacted]

Date: 25/11/19

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Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Groundwater level (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
2/12/19	k32	27.75m	12.0m		26.75m	5.75m ~~27.45~~	27.45	35x25kg	Pellets to 4.25m grout to 4.25m
28/11/19	k25	28.20m	7.2m		27.00m	6.00m ~~28.00m~~	28.0	21x25kg	Pellets to 5.00m grout to 4.50m

Monitoring borehole installation

Date	Borehole reference	Geotextile wrap checked	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
2/12/19	k32	Yes	Yes	bung & gas tap	Plain ø 2x2x3m slotted 7x3m	Yes	pellets hydrated with clean water grout mixed 3:1	raised headworks
28/11/19	k25	Yes	Yes	bung & gas tap	Plain 1m x 2x3m slotted 7x3m	Yes	pellets hydrated with clean water. grout mixed 3:1	raised headworks

General notes:

Signed (CQA Inspector): [redacted]

Date: 02/12/19

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Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	25/11/19 - 2/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HEATHERLINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	6"
H&S Plan/RAMS	YES

Checklist

Borehole reference: 432 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		scanned by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	✓	✓	63mmOD slott pipe. slott ap 1mm spacing 15mm + geosock wrap. 63mmOD plain pipe
Gravel (size/type)	✓	✓	Washed gravel 2-6mm
Bentonite (size/type)	✓	✓	Bentonite pellets + powder
End cap	✓	✓	
Top cap/valve	✓	✓	bung + gas trap
Headworks	✓	✓	raised headworks

General notes

Signed (CQA Inspector):

[redacted]

Date: 2/12/19

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Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	25/11 - 28/11/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	6"
H&S Plan/RAMS	YES

Checklist

Borehole reference: k25 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		scanned by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	✓	✓	63mm OD slotted + plain pipe. Slot aperture 1mm spacing 15mm + geosock wrap
Gravel (size/type)	✓	✓	washed gravel 2-5mm
Bentonite (size/type)	✓	✓	pellets + powder
End cap	✓	✓	
Top cap/valve	✓	✓	bung + gas trap
Headworks	✓	✓	raised headworks

General notes

Signed (CQA Inspector): [redacted]

Date: 28/11/19

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Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Groundwater level (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
03/12/19	KCW 3/19	10.20	2.70		N/A	N/A	N/A	N/A	10.20
05/12/19	KCW 4/19	9.70	2.20		N/A	N/A	N/A	N/A	9.70
06/12/19	KCW 2/19	14.70	2.70		N/A	N/A	N/A	N/A	14.70
06/12/19	K31	32.50	13.0		30.50	9.5 + 32.10m	32.10	23x25kg	8.2m pellets, 75m grout

Monitoring borehole installation

Date	Borehole reference	Geotextile wrap checked	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
03/12/19	KCW 3/19	N/A	N/A	N/A	N/A	N/A	pellets hydrated with clean water grout 3:1 mix	N/A
05/12/19	KCW 4/19	N/A	N/A	N/A	N/A	N/A	pellets with clean water grout 3:1 mix	N/A
06/12/19	KCW 2/19	N/A	N/A	N/A	N/A	N/A	pellets with clean water grout 3:1 mix	N/A
06/12/19	K31	Yes	Yes	bung + gas tap	Plain 1x2m + 4x3m slotted 7x3m	Yes	pellets with clean water grout 3:1 mix	raised headworks

General notes:

Signed (CQA Inspector): [redacted]

Date: 06/12/19

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	~~03/12/19~~ 29/11/19 - 03/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW 3/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		scanned by GEL engineer
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)	✓	✓	Backfilled with grout + pellets
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Signed (CQA Inspector):

[redacted] Date: 03/12/19

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	~~05/12/19~~ 04/12/19 - 05/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW 4/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		scanned by GEL engineer
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)			Backfilled with pellets + grout
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Signed (CQA Inspector):

[redacted]

Date: 05/12/19

Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	~~06/12/19~~ 05/12/19 - 06/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW 2/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	Y	
Services cleared	Y		scanned by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)	Y	Y	Backfilled with grout + pellets
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Signed (CQA Inspector):

[redacted]

Date: 06/12/19

Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	~~06/12/19~~ 02/12/19 – 06/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: K31 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	Y	
Services cleared	Y		~~cle~~ scanned by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	Y	Yes	63mm OD slotted pipe + plain pipe slot ap. 1mm, spacing 15mm
Gravel (size/type)	Y	Y	washed gravel 2-5mm
Bentonite (size/type)	Y	Y	pellets + powder
End cap	Y	Y	
Top cap/valve	Y	Y	bung + gas tap
Headworks	Y	Y	raised headworks

General notes

Signed (CQA Inspector):

[redacted]

Date: 06/12/19

MJCA
Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Groundwater level (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
11/12/19	KCW 1/19	16.10	2.6		N/A	N/A	N/A	N/A	16.10
12/12/19	K30	35.75	2.6		33.25	12.25 +34.75	34.75	21 x 25kg	11.10m pellets, 10.55m grout

Monitoring borehole installation

Date	Borehole reference	Geotextile wrap checked	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
11/12/19	KCW 1/19	N/A	N/A	N/A	N/A	N/A	pellets with clean water grout mixed 3:1	N/A
12/12/19	K30	Yes	Yes	bunge gas bag	Plain 1x1.5m + 6x3m + 1x1.5m slotted 7x3m	Yes	pellets with clean water grout mixed 2:1	raised headworks

General notes:

Signed (CQA Inspector) [redacted] Date: 12/12/19

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF
Project reference	AU/KCW/JRC/2936/01
Date	~~12/12/19~~ 09/12/19 - 12/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: 430 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		scanned by GEL engineer
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	✓	✓	63 OD slotted + plain pipe. slotted up 1mm, spacing 15mm + geosock wrap
Gravel (size/type)	✓	✓	2-5mm washed gravel
Bentonite (size/type)	✓	✓	pellets + powder
End cap	✓	✓	
Top cap/valve	✓	✓	bung + gas tap
Headworks	✓		rising headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 12/12/19

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	~~11/12/19~~ 09/12/19 – 11/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW1/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		Scanned by GEL engineer
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)			Backfilled with pellets + grout
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Backfilled with pellets from 16.10 to 15.20 (top of LST) and with grout (3:1 mix) to 0.5mbgl

Signed (CQA Inspector):

[redacted]

Date: 11/12/19

MJCA
Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Groundwater level (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
19/12/19	K29	~~35.75~~ 37.25	2.5m		34.50	13.~~34~~.35.40	~~[illegible]~~ 35.40 ~~34.50~~	20 x 25kg	~~[illegible]~~ 12.60 pellets, 11.90 grout
20/12/19	K27	36.70	2.7m		34.00	13.0m e 35.50	35.5	20 x 25kg	12.0m pellets, 11.50m grout

Monitoring borehole installation

Date	Borehole reference	Geotextile wrap checked	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
19/12/19	K29	Yes	Yes	bung + gas tap	plain 1mx1 + 5x3m slotted 7x3m	Yes	pellets with clean water grout 3:1 mix	rigid headworks
20/12/19	K27	Yes	Yes	bung + gas tap	plain 1x1.5m + 5x3m slotted 7x3m	Yes	pellets with clean water grout 3:1 mix	rigid headworks

General notes:

Signed (CQA Inspector): [redacted]

Date: 20/12/19

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Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF
Project reference	AU/KCW/JRC/2936/01
Date	~~19/12/19~~ 13/12/19 - 19/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: 429 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		scanned by GEL engineer
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	✓	✓	63 OD slotted + plain pipe slot gp 1mm, spacing 15m + geosock wrap
Gravel (size/type)	✓	—	2-5mm washed gravel
Bentonite (size/type)	✓	✓	pellets + granule/powder
End cap	✓	✓	
Top cap/valve	✓	✓	bung + gas tap
Headworks	✓		raised headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 19/12/19

MJCA Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	~~20/12/19~~ 16/12/19 – 20/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	

Checklist

Borehole reference: K27 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	✓	✓	
Services cleared	✓		Scanned by GEL engineer
Hand dug inspection pit	✓		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	✓	✓	63mm UPVC slotted + plain pipe. slot aplmm, spacing 15mm + geosock wrap
Gravel (size/type)	✓	✓	2-5mm washed gravel
Bentonite (size/type)	✓	✓	pellets + granules/powder
End cap	✓	✓	
Top cap/valve	✓	✓	bung + gas tap
Headworks	✓		mixed headworks

General notes

Signed (CQA Inspector): [redacted]

Date: 20/12/19

MJCA
Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
09/01/20	h28	38.5m	2.40	36.15	14.15 × 38.25	38.25	20 × 25kg	13.15m pellets, 12.65m grout
09/01/20	h24	30.8m	2.70	28.7m	7.7m × 30.8	30.8m	22 × 25kg	6.7m pellets, 6.2m grout
14/01/20	h25	34.2m	2.70	32.2m	13.2m × 34.2	34.2m	20 × 25kg	12.2m pellets, 11.70m grout
17/01/20	h37	35.60	23.0	34.10	14.10 × 35.40	35.40	21 × 25kg	13.10m pellets, 12.60m grout
23/01/20	h22	35.8m	31.70	34.80	19.80 × 35.80	35.80	25 × 25kg	18.80m pellets, 18.30m grout

Monitoring borehole installation

Date	Borehole reference	Geowrap	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
09/01/20	h28	YES	YES	bung & gas tap	5×3m plain + 2.1m, 7×3m + 1m slotted	YES	Pellets with clean water, grout 3:1 mix	raised headworks
09/01/20	h24	YES	YES	bung & gas tap	3×3m + 2.1m plain, 5×3m slotted	YES	Pellets with clean water, grout 3:1 mix	raised headworks
14/01/20	h23	YES	YES	bung & gas tap	5×3m + 2m plain, 6×3m + 1m slotted	YES	Pellets with clean water, grout 3:1 mix	Raised headworks
17/01/20	h37	YES	YES	bung & gas tap	5×3m + 1.3m plain, 6×3m + 2m slotted	YES	Pellets with clean water, grout 3:1 mix	Raised headworks
23/01/20	h22	YES	YES	bung & gas tap	7×3m + 1m plain, 6×3m + 1m slotted	YES	Pellets with clean water, grout 3:1 mix	Raised headworks

General notes:

Signed (CQA supervisor): [redacted]

Date: 23/01/20

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Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	East Northants Resource Management facility Extension
Project reference	AU/KCW/JRC/2936/01
Date	20/12/19
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	PAUL HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: H28 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	Y	
Services cleared	Y		Scanned by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			
Gravel (size/type)			
Bentonite (size/type)			
End cap			
Top cap/valve			
Headworks			

General notes

To be drilled in Jan 2020.

Signed (CQA Inspector):

[redacted]

Date: 20/12/19

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Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	6/01/2020 – 9/01/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: K28 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	Y	
Services cleared	Y		Scanned by GEL engineer
Hand dug inspection pit	Y		to 12m
Pipe (slot aperture/pipe diameter/geowrap)	Y	Y/N	63mm OD slotted pipe + plain pipe slott cp. 1mm, spacing 15mm
Gravel (size/type)	Y	Y/N	washed gravel 2-5mm
Bentonite (size/type)	Y/N	Y/N	Pellets + powder
End cap	Y/N	Y/N	
Top cap/valve	Y/N	Y/N	Bung + gas tap
Headworks	Y/N	Y/N	Raised headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 09/01/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	06/01/20 - 09/01/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: 424 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y/N		
Services cleared	Y/N		Scanned by GEL engineer
Hand dug inspection pit	Y/N	Y/N	dug to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	Y/N	Y/N	63mm OD slotted HDPE pipe slot aperture 1mm spacing 15mm
Gravel (size/type)	Y/N	Y/N	washed gravel 2-5mm
Bentonite (size/type)	Y/N	Y/N	Pellets + powder
End cap	Y/N	Y/N	
Top cap/valve	Y/N	Y/N	Buy + gas tap
Headworks	Y/N	Y/N	Raised headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 09/01/20

MJCA Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	13/01/20 - 14/01/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	S. DOWNER
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: 423 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Yes		
Services cleared	Yes		
Hand dug inspection pit	Yes		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	Yes	Yes	63mm OD slotted + plain pipe slotted = 0.1m, spacing 15mm
Gravel (size/type)	Yes	Yes	2-5mm washed gravel
Bentonite (size/type)	Yes	Yes	Pellets + Powder
End cap	Yes	Yes	
Top cap/valve	Yes	Yes	Bung + screw top
Headworks	Yes	Yes	Painted headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 14/01/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	10/01/20 - 17/01/20
Weather	
CQA Inspector	M. LEEDI
Drilling contractor	GEL
Lead driller	P. HEATHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: A37 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		Scanned by GEL engineer
Hand dug inspection pit	✓	Y/N	to 12m
Pipe (slot aperture/pipe diameter/geowrap)	Y/N	Y/N	63mm OD slott pipe + plain pipe slott cap 1mm spacing 15mm
Gravel (size/type)	Y/N	Y/N	2-5mm washed gravel
Bentonite (size/type)	Y/N	Y/N	Pellets + powder
End cap	Y/N	Y/N	
Top cap/valve	Y/N	Y/N	Bung + gas tap
Headworks	Y/N	Y/N	Daniel headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 17/01/20

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Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	15/01/20 - 23/01/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	J. Chapman (Supervised by S. BROWNER)
Drilling rig /method	Rotary (cont)
Borehole/casing diameter	
H&S Plan/RAMS	V21

Checklist

Borehole reference: 422 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	Y	
Services cleared	Y		Scanned by GEC engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	Y	Y/N	63mm OD slotted pipe + plain pipe slot a.p. [illegible] spacing [illegible]
Gravel (size/type)	Y	Y	washed gravel [illegible]
Bentonite (size/type)	Y	Y	Pellets + powder
End cap	Y	Y	
Top cap/valve	Y	Y	bung + [illegible]
Headworks	Y	Y	Partial headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 23/01/20

Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
28/01/20	h26	38.20	2.7m	36.85	15.0m = 37.25	37.25m	25 x 25kg	14.0m pellets, 15.50m grout
29/01/20	hCW9/19	16.20	2.7m	N/A	N/A	N/A	N/A	16.20

Monitoring borehole installation

Date	Borehole reference	Geowrap	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
28/01/20	h26	Yes	Yes	End cap + gas tap	7x3m + 2x1m slotted 5x3m + 1x1m + 0.4m plain	Yes	Pellets with clean water, grout 3:1 mix	Raised headworks
29/01/20	hCW9/19	N/A	N/A	N/A	N/A	N/A	Pellets with clean water, grout 3:1 mix	

General notes:

Signed (CQA supervisor): [redacted]

Date: 29/01/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	20/01/20 - 28/01/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	D. WILLIAMS / P. HETHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	6"
H&S Plan/RAMS	YES

Checklist

Borehole reference: A26 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		cleared by GEL utilities clearance personnel
Hand dug inspection pit	Y		to 12m
Pipe (slot aperture/pipe diameter/geowrap)	Y	Y	63mm OD slotted pipe + plain pipe slot up 1m, spacing 15mm
Gravel (size/type)	Y	Y	washed 2-5mm gravel
Bentonite (size/type)	Y	Y	Pellets + powder
End cap	Y	Y	
Top cap/valve	Y	Y	End cap + gas tap
Headworks	Y	Y	Raised headworks.

General notes

Signed (CQA Inspector):

[redacted] Date: 28/01/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	23/01/20 – 29/01/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	J. Chapman
Drilling rig /method	Rotary Coring
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: KCW 9/a GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		Cleared by GEL engineer.
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)			N/A
Gravel (size/type)			N/A
Bentonite (size/type)			Pellets + Powder
End cap			N/A
Top cap/valve			N/A
Headworks			N/A

General notes

Borehole backfilled with pellets to 13.9mbgl, grout mixed 3:1 with bentonite powder + cement to base of pit at 1.2mbgl.

Signed (CQA Inspector):

[redacted] Date: 29/01/20

Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
25/02/20	KCW7/19	12.50m	2.2m	N/A	N/A	N/A	N/A	12.50m
26/02/20	KCW8/19	16.30m	2.2m	N/A	N/A	N/A	N/A	16.30m
28/02/20	KCW10/19	19.70m	2.2m	N/A	N/A	N/A	N/A	19.70m
03/03/20	K34	33.50m	27.60m	32.5m	33.35m + 14.75m	33.35m	25x25kg	14.60m pellets, 13.40m grout
12/03/20	K33	34.20	19.	33.70m	34.20 + 17.70	34.20	18x25kg	16.60m pellets, 16m grout

Monitoring borehole installation

Date	Borehole reference	Geowrap	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
25/02/20	KCW7/19	N/A	N/A	N/A	N/A	N/A	Pellets with clear water. Grout 3:1 mix	N/A
26/02/20	KCW8/19	N/A	N/A	N/A	N/A	N/A	Pellets with clear water. Grout 3:1 mix	N/A
28/02/20	KCW10/19	N/A	N/A	N/A	N/A	N/A	Pellets with clear water. Grout 3:1 mix	N/A
03/03/20	K34	Yes	Yes	End Cap + gas valve	5x3m + 1x1m plain 6x3m slotted	Yes	Pellets with clear water. Grout 3:1 mix	Raised headworks
12/03/20	K33	Yes	Yes	End Cap + gas valve	5x3m slotted 6x3m + 1m 0.5m plain	Yes	Pellets with clean water. Grout 3:1 mix	Raised headworks

General notes:

Note: BH K33 is blocked at 18.70mbgl. Suspected grout in gravel pack/slotted pipe. BH to be abandoned and re-drilled.

Signed (CQA supervisor): [redacted]

Date: 12/03/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	25/02/20
Weather	
CQA Inspector	R. White
Drilling contractor	GEL
Lead driller	D. WILLIAMS
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: KCW 7/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	Y	
Services cleared	Y		cleared by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	N/A		
Gravel (size/type)	N/A		
Bentonite (size/type)	Y	Y	Pellets + Powder
End cap	N/A		
Top cap/valve	N/A		
Headworks	N/A		

General notes

Signed (CQA Inspector):

[redacted] Date: 25/02/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	25/02/20
Weather	
CQA Inspector	R. White
Drilling contractor	GEL
Lead driller	D. Williams
Drilling rig /method	Rotary Coring
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: KCW 8/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		cleared by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	N/A		
Gravel (size/type)	N/A		
Bentonite (size/type)	Y		Pellets + Powder
End cap	N/A		
Top cap/valve	N/A		
Headworks	N/A		

General notes

Signed (CQA Inspector):

[redacted] Date: 25/02/20

Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	27/02/20 – 28/02/20
Weather	
CQA Inspector	R. White
Drilling contractor	GEL
Lead driller	D. Williams
Drilling rig /method	Rotary Coring
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: KCW10/19 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		
Services cleared	Y		cleared by GEL engineer
Hand dug inspection pit	Y		to 12m
Pipe (slot aperture/pipe diameter/geowrap)	N/A		
Gravel (size/type)	N/A		
Bentonite (size/type)	Y		Pellets + Powder
End cap	N/A		
Top cap/valve	N/A		
Headworks	N/A		

General notes

Signed (CQA Inspector):

[redacted] Date: 27/02/20

Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	25/02/20 - 03/03/20
Weather	
CQA Inspector	R. White / M. Creed
Drilling contractor	GEL
Lead driller	P. HETHERINGTON
Drilling rig /method	Rotary Coring
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: 434 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Yes		
Services cleared	Yes		cleared by GEL engineer
Hand dug inspection pit	Yes		to 12m
Pipe (slot aperture/pipe diameter/geowrap)	Yes	Yes	63mm OD slotted pipe + plain pipe slot cp 1mm, spacing 15mm
Gravel (size/type)	Yes	Yes	Washed 2-3mm
Bentonite (size/type)	Yes	Yes	Pellets + Powder
End cap	Yes	Yes	
Top cap/valve	Yes	Yes	Bung + gas trap
Headworks	Yes	Yes	Raised headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 03/03/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	06/02/20 - 12/03/20
Weather	
CQA Inspector	M. Leeds
Drilling contractor	GEL
Lead driller	J. CHAPMAN
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	YES

Checklist

Borehole reference: 433 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y	N	
Services cleared	Y		cleared by GEL engineer
Hand dug inspection pit	Y		dug to 1.2m.
Pipe (slot aperture/pipe diameter/geowrap)	Y	Y	63mm OD slotted + plain HDPE pipe slot cp 1mm, spacing 15mm
Gravel (size/type)	Y	Y	Washed 2-5mm
Bentonite (size/type)	Yes	Yes	Pellets + Powder
End cap	Yes	Yes	
Top cap/valve	Yes	Yes	End cap with gas trap
Headworks	Yes	Yes	Metal headworks

General notes

Borehole blocked at 18.70mbgl during install. To be cleaned out and re-drilled.

Signed (CQA Inspector): [redacted]

Date: 12/03/20

MJCA
Technical advisers on environmental issues

Summary table for the CQA borehole drilling and monitoring borehole installation

Borehole drilling record

Date	Borehole reference	Depth to the base of the borehole (mbgl)	Depth of the drilling casing (mbgl)	Depth to the base of the slotted pipe (mbgl)	Depth to the base of the plain pipe (mbgl)	Depth to the base of the gravel (mbgl)	Mass of gravel added (kg)	Depth to the base of the bentonite (mbgl)
05/02/20	436	34.80m	3.90	33.90	34.55 - 12.90m	34.80		11.90m pellets, 11.40m grout
14/02/20	435	28.10m	19.2	N/A	N/A	N/A	N/A	25.2m
24/02/20	435A	34.10	24.2	33.10	34.10 - 12.10	34.10	30 x 25kg	11.0m pellets, 10.5m grout

Monitoring borehole installation

Date	Borehole reference	Geowrap	End cap fittings	Details of the top cap/gas valve	Number of sections of pipe	Pipe fittings checked	Details of the hydration of bentonite	Details of the cover/headworks
05/02/20	436	Yes	Yes	Cap with bung	4x3m plain & 0.75m 7x3m slotted	Yes	Pellets with clean water grout 3:1 mix	Paved headworks
14/02/20	435	N/A	N/A	N/A	N/A	N/A	Pellets - clean water grout 3:1 mix	N/A
24/02/20	435A	Yes	Yes	Cap with bung	4x3mm 2x plain 7x3m slotted	Yes	Pellets with clean water grout 3:1 mix	Paved headworks

General notes:

435 Backfilled with pellets to top of aquifer and sealed to ground level, cover hatched - 10m drill cuttings abandoned - waste - bole.

Signed (CQA supervisor): [redacted]

Date: 24/02/20

Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	[illegible] Management Facility Extension
Project reference	AU/KCW/JRC/2936/01
Date	30/01/20 - 05/02/20
Weather	
CQA Inspector	M. [illegible]
Drilling contractor	GEL
Lead driller	Josh Chapman
Drilling rig /method	Rotary core
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: A36 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Yes		
Services cleared	Yes		cleared by GEL engineer
Hand dug inspection pit	Yes		to 1.0m
Pipe (slot aperture/pipe diameter/geowrap)	Yes	Yes	63mm OD solid pipe + slot pipe slot ap 1mm spacing 1mm
Gravel (size/type)	Yes	Yes	washed gravel 2-5mm
Bentonite (size/type)	Yes	Yes	Pellets + powder
End cap	Yes	Yes	
Top cap/valve	Yes	Yes	End cap + gas tap
Headworks	Yes	Yes	Raised headworks

General notes

Signed (CQA Inspector):

[redacted] Date: 05/02/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	30/01/20 - 14/02/20
Weather	
CQA Inspector	M. LEEN
Drilling contractor	GEL
Lead driller	Paul Hetherington
Drilling rig /method	Rotary (cont)
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: K35 GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Yes	Yes	
Services cleared	Yes	✓	scanned by GEL engineer
Hand dug inspection pit	Yes	✓	to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	N/A		N/A
Gravel (size/type)	N/A		N/A
Bentonite (size/type)			pellets + gravel
End cap	N/A	N/A	N/A
Top cap/valve	N/A		N/A
Headworks	N/A		N/A

General notes

Cone barrel stuck + not recovered. Barrel plus rods left 25.2m bgl to 12m (top of rods in 12m barrel). Backfilled with pellets to top of aquifer and gravel to 1.5m below ground level to approx 1m bgl

Signed (CQA Inspector):

[redacted] Date: 14/02/20

MJCA
Technical advisers on environmental issues

Site diary CQA borehole drilling and installation

Site	ENRMF Extension
Project reference	AU/KCW/JRC/2936/01
Date	14/02/20 - 24/02/20
Weather	
CQA Inspector	M. LEEDS
Drilling contractor	GEL
Lead driller	P. HETHERINGTON
Drilling rig /method	ROTARY CORING
Borehole/casing diameter	
H&S Plan/RAMS	Yes

Checklist

Borehole reference: h35A GPS coordinates: _____

Pre-borehole drilling and installation checking of the materials and location details	Check (Y/N)	Photographic log (Y/N)	Details with regard to consistency with the specification set out in the agreed CQA Plan
Confirm the location is consistent with the CQA plan	Y		Re-drill located c. 5m west of h35.
Services cleared	Y		cleared by GEL engineer
Hand dug inspection pit	Y		to 1.2m
Pipe (slot aperture/pipe diameter/geowrap)	Y		63mm ø slotted + plain pipe, 1mm slot ap. + 15mm slot spacing
Gravel (size/type)	Y	Y	2-5mm washed gravel
Bentonite (size/type)	Y	Y	pellets + powder
End cap	Y	Y	
Top cap/valve	Y	Y	End cap + gas tap
Headworks	Y	Y	Raised headworks

General notes

Signed (CQA Inspector):

[redacted]

Date: 24/02/20

APPENDIX H

LABORATORY CERTIFICATES FOR THE DETERMINATION OF THE HYDRAULIC CONDUCTIVITY OF UNDISTURBED CORE SAMPLES

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	KW1/19
Sample Ref.:	KCW3
Depth (m):	14.35-14.49
Sample Type:	C

Description:
Very stiff brownish grey mottled yellowish brown silty CLAY with frequent coal fragments.

SPECIMEN DETAILS

Depth within original sample	0.03m
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	102.09	100.73
Height	*mm*	105.21	103.81
Water Content	*%*	8.3	8.7
Bulk Density	*Mg/m³*	2.39	2.50
Dry Density	*Mg/m³*	2.21	2.30

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		1.00	1.00

CONSOLIDATION STAGE

Effective pressure	*kPa*	144
Volume change	*mL*	34.4

PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

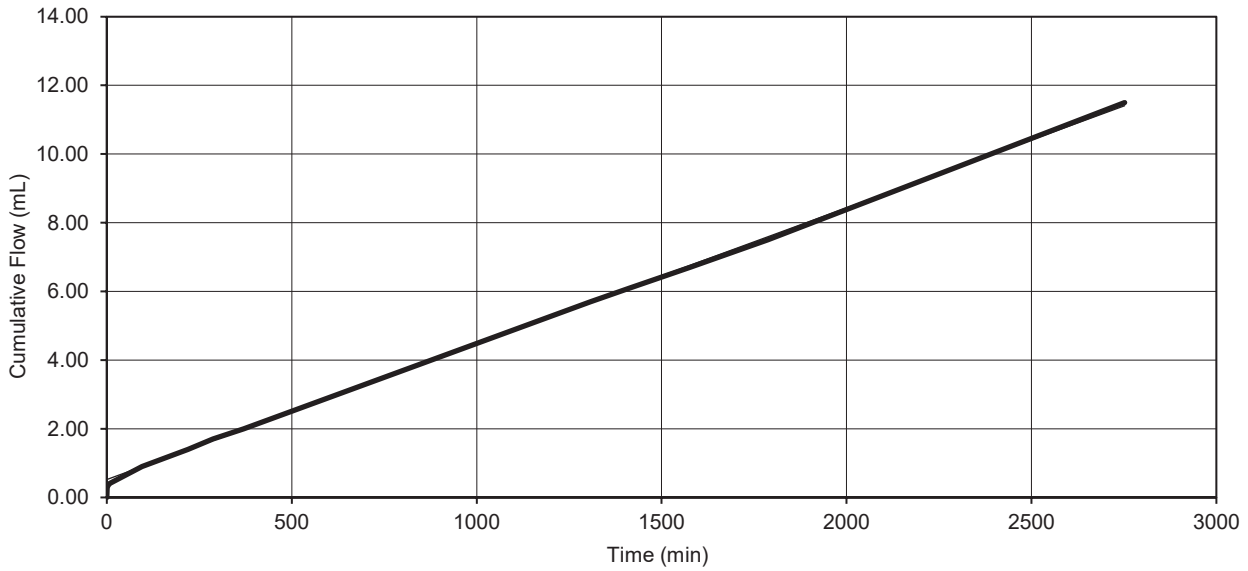
Pressure difference across specimen	*kPa*	21
Hydraulic gradient		20.2
Mean effective stress	*kPa*	133.7

TEST DURATIONS

Saturation	*days*	2
Consolidation	*days*	3
Flow	*days*	2

Coefficient of Permeability

k_v at 20 °C = 4.1×10^{-10} m/s



Checked and Approved by [redacted]

Project Number:

GEO / 30451

Project Name:

ENRMF POTENTIAL LANDFILL EXTENSION SITE INVESTIGATION
AU/KCW/JRC

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K23
Sample Ref.:	KCW8
Depth (m):	12.55-12.78
Sample Type:	C

Description:
Very stiff brown gravelly slightly sandy CLAY. Gravel is fine to coarse. Sand is fine to medium.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.13	99.82
Height	*mm*	99.78	98.49
Water Content	*%*	14.2	15.3
Bulk Density	*Mg/m³*	2.15	2.26
Dry Density	*Mg/m³*	1.88	1.96

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.51	0.96

CONSOLIDATION STAGE

Effective pressure	*kPa*	250
Volume change	*mL*	31.1

PERMEABILITY STAGE

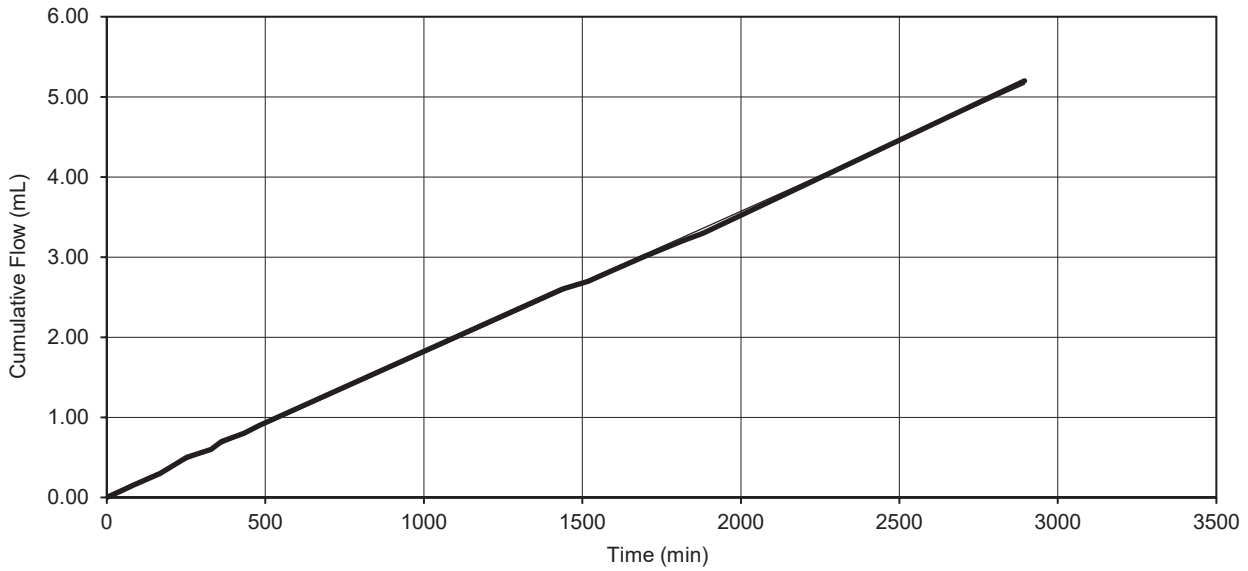
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.3
Mean effective stress	*kPa*	240.2

TEST DURATIONS

Saturation	*days*	5
Consolidation	*days*	2
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 1.9×10^{-10} m/s



[redacted]

Project Number:

GEO / 30848

Project Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K26
Sample Ref.:	KCW7
Depth (m):	14.31-14.50
Sample Type:	C

Description:
Very stiff light brown and yellowish brown slightly sandy slightly gravelly CLAY. Sand is fine. Gravel is fine, iron rich ore/nodule 5mm diameter.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	100.52	99.25
Height	*mm*	101.40	100.12
Water Content	*%*	14.2	15.0
Bulk Density	*Mg/m³*	2.19	2.30
Dry Density	*Mg/m³*	1.92	2.00

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.21	0.96

CONSOLIDATION STAGE

Effective pressure	*kPa*	290
Volume change	*mL*	30.6

PERMEABILITY STAGE

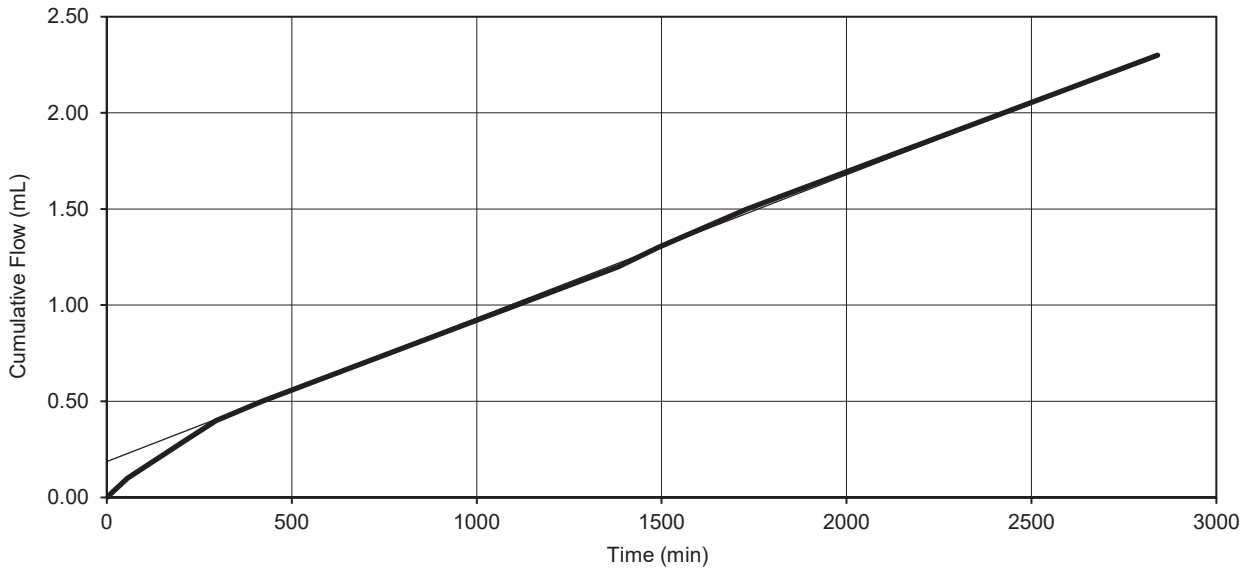
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.4
Mean effective stress	*kPa*	280

TEST DURATIONS

Saturation	*days*	5
Consolidation	*days*	2
Flow	*days*	2

Coefficient of Permeability
k_v at 20 °C = 7.9×10^{-11} m/s



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Project Number:

GEO / 30848

roject Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K28
Sample Ref.:	KCW5
Depth (m):	12.20-12.42
Sample Type:	C

Description:
Stiff dark brown CLAY becoming very weak SILTSTONE.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	104.32	103.66
Height	*mm*	102.35	101.70
Water Content	*%*	15.1	14.9
Bulk Density	*Mg/m³*	2.10	2.13
Dry Density	*Mg/m³*	1.82	1.86

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.88	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	245
Volume change	*mL*	16.5

PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

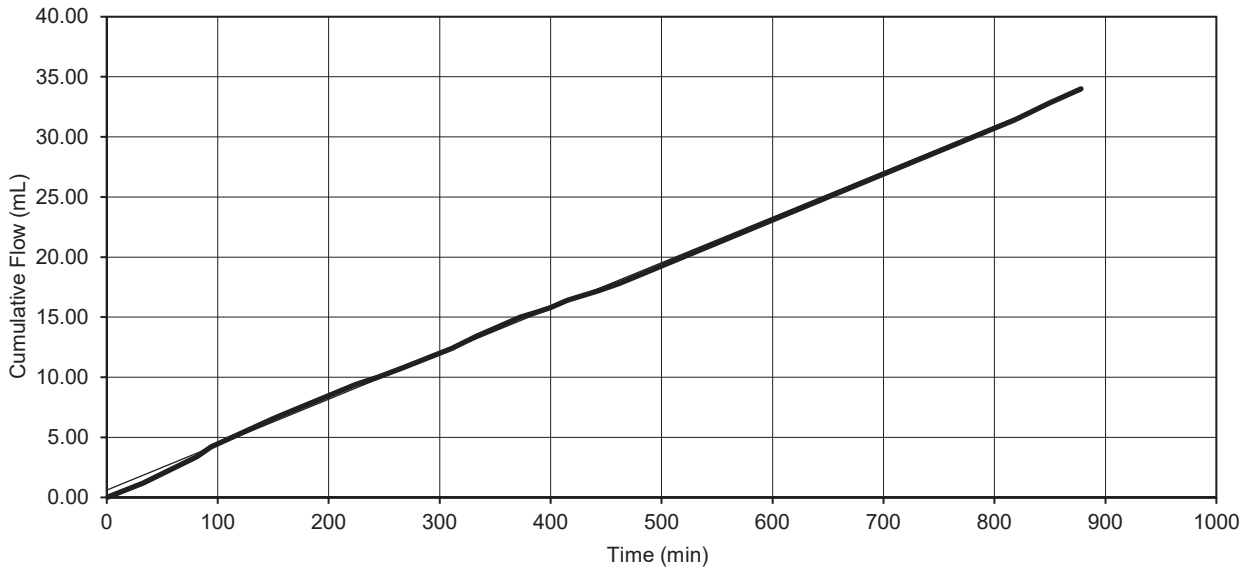
Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.1
Mean effective stress	*kPa*	235

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability

k_v at 20 °C = 3.7×10^{-9} m/s



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Project Number:

GEO / 30848

Project Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K28
Sample Ref.:	KCW6
Depth (m):	12.88-13.04
Sample Type:	C

Description:
Hard light brown mottled yellowish brown and dark brown SILTSTONE / fine SANDSTONE. The sample had a near vertical fissure through the whole sample.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample was prpeared using a rock saw to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	104.64	104.14
Height	*mm*	88.35	87.92
Water Content	*%*	9.7	9.8
Bulk Density	*Mg/m³*	2.18	2.21
Dry Density	*Mg/m³*	1.98	2.01

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.83	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	260
Volume change	*mL*	11.0

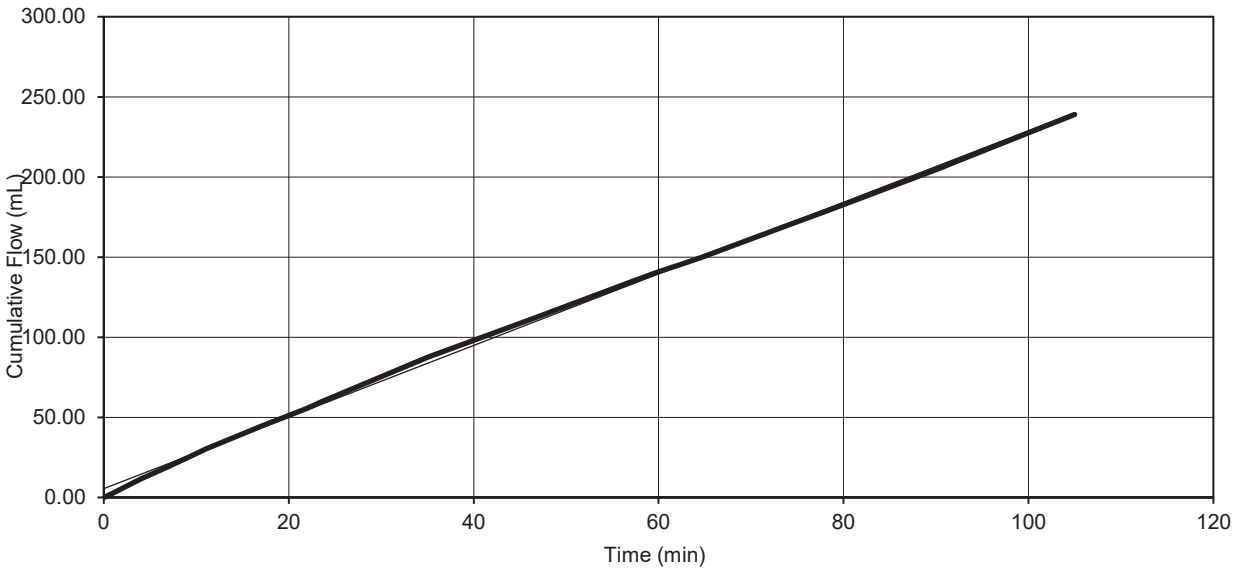
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	17
Hydraulic gradient		19.7
Mean effective stress	*kPa*	251.5

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	1

Coefficient of Permeability
k_v at 20 °C = 2.2×10^{-7} m/s



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Project Number:

GEO / 30848

Project Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K34
Sample Ref.:	KCW10
Depth (m):	12.57-12.70
Sample Type:	C

Description:
Stiff dark grey slightly gravelly CLAY. Gravel is fine to medium.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.25	100.92
Height	*mm*	100.35	100.03
Water Content	*%*	17.3	17.2
Bulk Density	*Mg/m³*	2.17	2.19
Dry Density	*Mg/m³*	1.85	1.87

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.53	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	255
Volume change	*mL*	7.9

PERMEABILITY STAGE

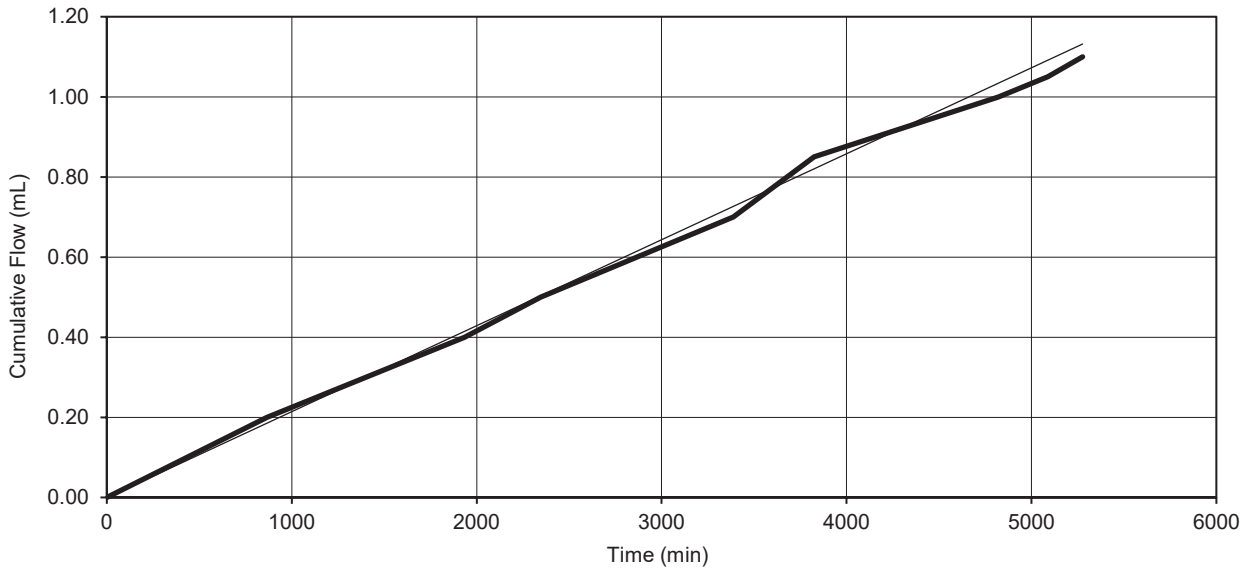
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.1
Mean effective stress	*kPa*	245.15

TEST DURATIONS

Saturation	*days*	5
Consolidation	*days*	1
Flow	*days*	4

Coefficient of Permeability
k_v at 20 °C = 2.2×10^{-11} m/s



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Project Number:

GEO / 30848

roject Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K37
Sample Ref.:	KCW9
Depth (m):	12.62-12.82
Sample Type:	C

Description:
Very stiff light brown slightly sandy CLAY becoming hard yellowish brown SILTSTONE. Sand is fine.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	100.54	99.45
Height	*mm*	103.22	102.10
Water Content	*%*	8.3	9.7
Bulk Density	*Mg/m³*	2.27	2.37
Dry Density	*Mg/m³*	2.09	2.16

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.62	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	255
Volume change	*mL*	26.7

PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

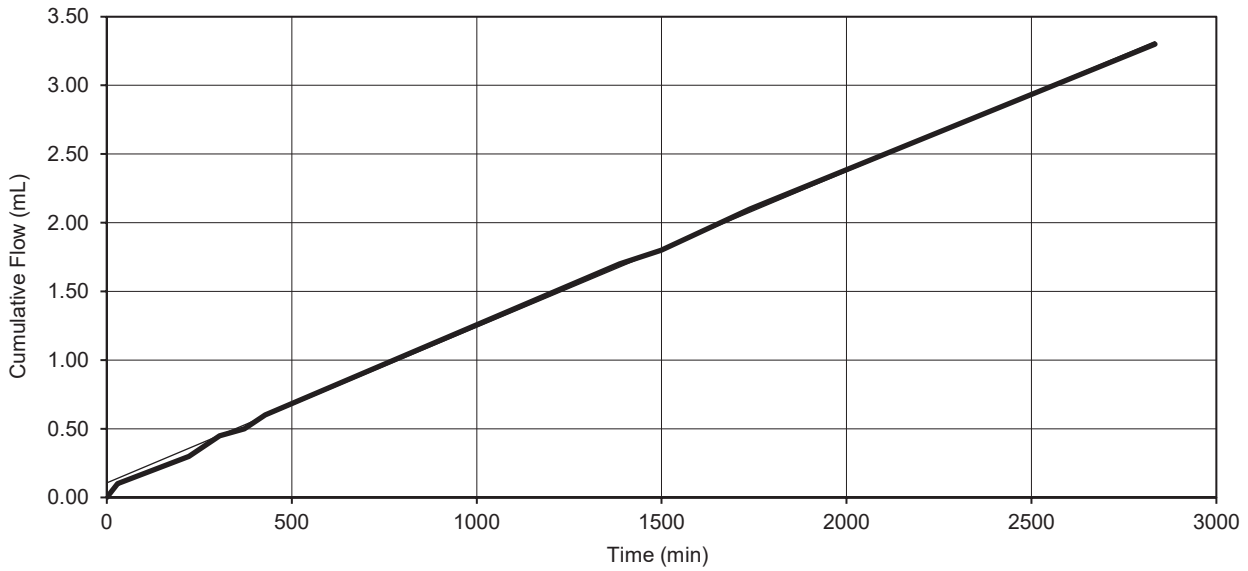
Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.0
Mean effective stress	*kPa*	245

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	1
Flow	*days*	2

Coefficient of Permeability

k_v at 20 °C = 1.2×10^{-10} m/s



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Project Number:

GEO / 30848

Project Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

GEOLABS

UKAS TESTING 1982

BS1377 : Part 6 : Clause 6 :1990

Determination of Permeability in a Triaxial Cell

Borehole Ref.:	KCW7/19
Sample Ref.:	KCW11
Depth (m):	11.20-11.40
Sample Type:	C

Description:
Very weak light greyish brown SILTSTONE.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	101.92	101.39
Height	*mm*	101.34	100.81
Water Content	*%*	10.7	11.5
Bulk Density	*Mg/m³*	2.24	2.30
Dry Density	*Mg/m³*	2.03	2.06

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.60	0.97

CONSOLIDATION STAGE

Effective pressure	*kPa*	225
Volume change	*mL*	12.9

PERMEABILITY STAGE

Measured under constant head conditions in a triaxial cell

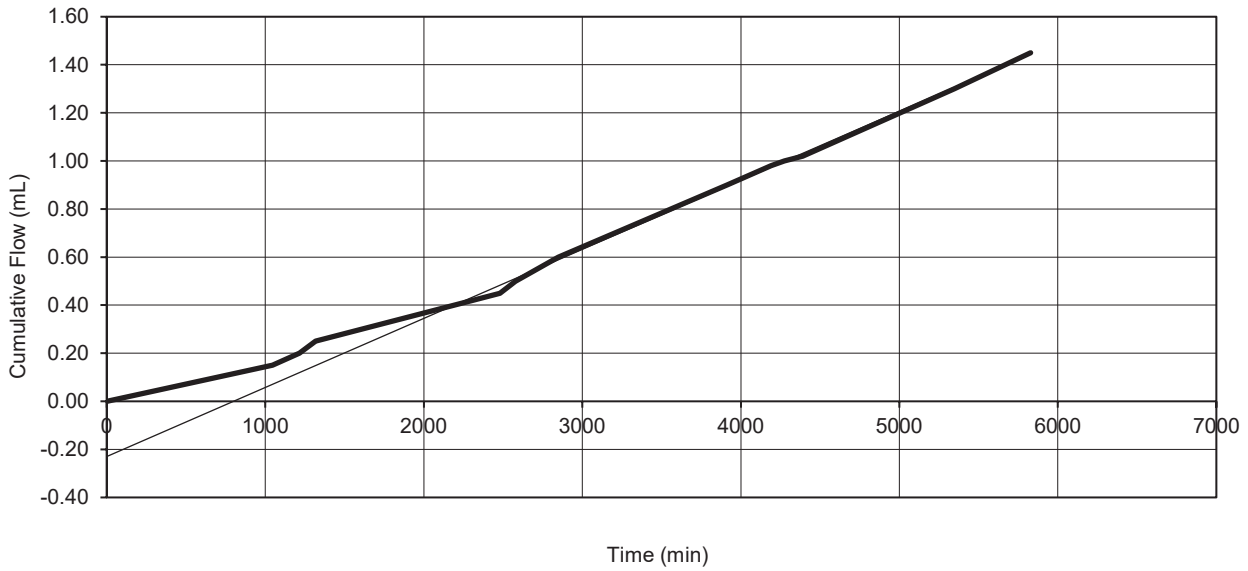
Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.2
Mean effective stress	*kPa*	215

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	2
Flow	*days*	4

Coefficient of Permeability

k_v at 20 °C = 2.9×10^{-11} m/s



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Project Number:

GEO / 30848

Project Name:

ENRMF Potential Landfill Extension Site Investigation
AU/KCW/JRC/2936/01

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Determination of Permeability in a Triaxial Cell

Borehole Ref.:	KCW8/19
Sample Ref.:	KCW12
Depth (m):	15.00-15.20
Sample Type:	C

Description:
Very stiff brown mottled light brown and white gravelly CLAY. Gravel is fine to medium.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	100.67	100.48
Height	*mm*	101.27	101.08
Water Content	*%*	13.8	15.1
Bulk Density	*Mg/m³*	2.19	2.23
Dry Density	*Mg/m³*	1.93	1.94

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.00	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	302
Volume change	*mL*	4.5

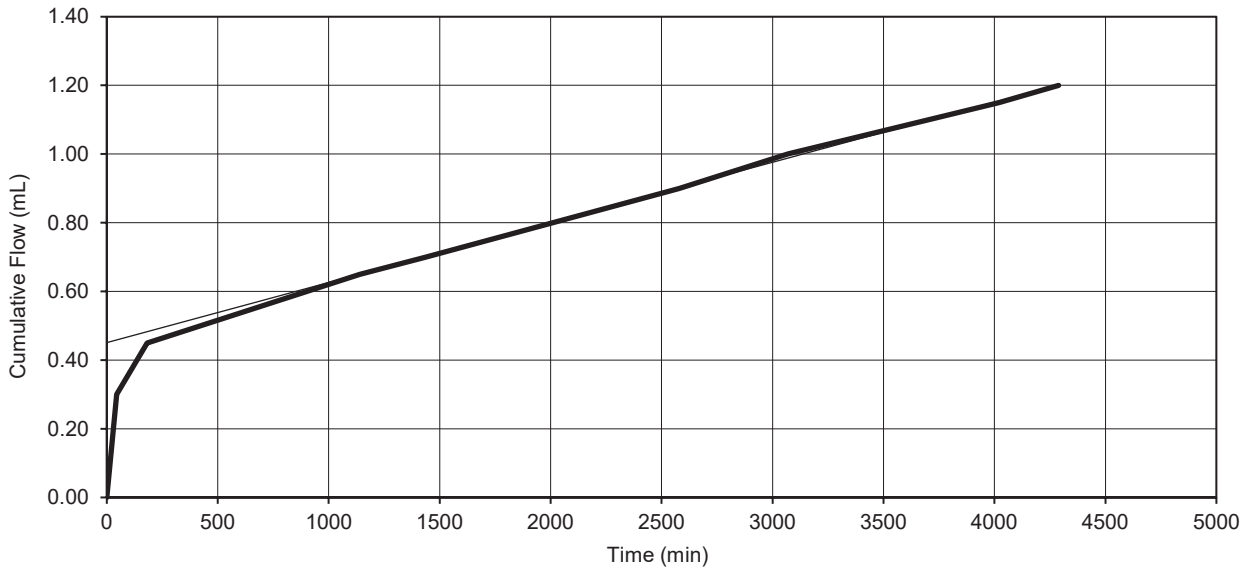
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.1
Mean effective stress	*kPa*	292.05

TEST DURATIONS

Saturation	*days*	5
Consolidation	*days*	2
Flow	*days*	3

Coefficient of Permeability
k_v at 20 °C = 1.8×10^{-11} m/s



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Determination of Permeability in a Triaxial Cell

Borehole Ref.:	KCW10/19
Sample Ref.:	KCW13
Depth (m):	13.80-14.00
Sample Type:	C

Description:
Stiff dark brown slightly gravelly CLAY. Gravel is fine to medium.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	104.00	103.66
Height	*mm*	100.79	100.46
Water Content	*%*	16.3	15.7
Bulk Density	*Mg/m³*	2.15	2.16
Dry Density	*Mg/m³*	1.85	1.87

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.74	0.98

CONSOLIDATION STAGE

Effective pressure	*kPa*	280
Volume change	*mL*	8.4

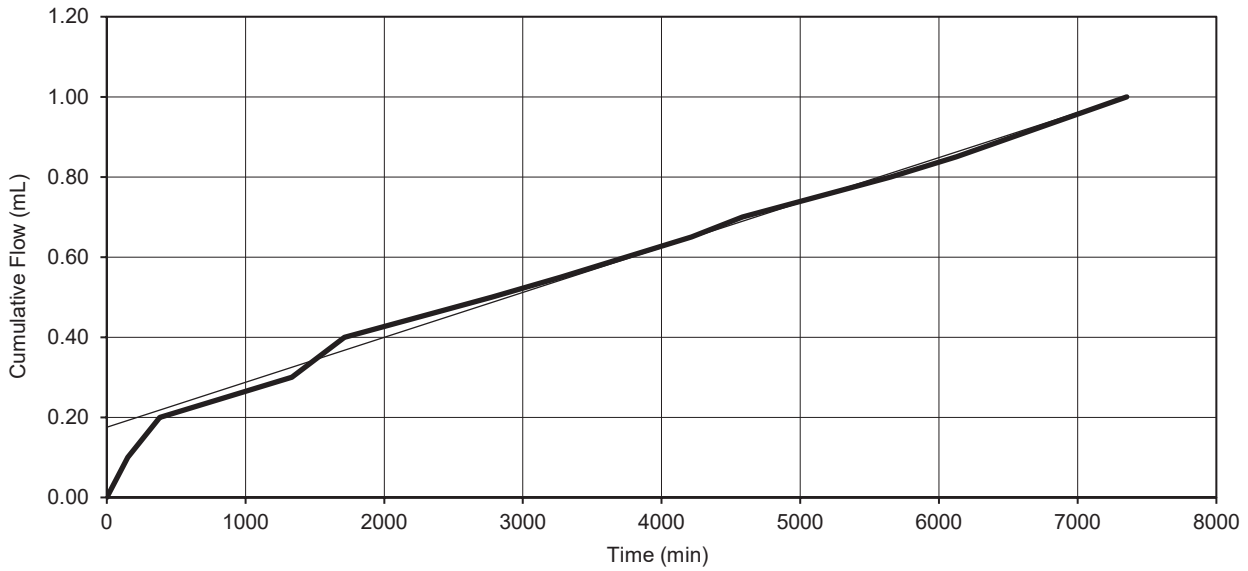
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.3
Mean effective stress	*kPa*	270

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	5

Coefficient of Permeability
k_v at 20 °C = 1.1×10^{-11} m/s



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Determination of Permeability in a Triaxial Cell

Borehole Ref.:	KCW10/19
Sample Ref.:	KCW14
Depth (m):	17.60-17.80
Sample Type:	C

Description:
Very stiff dark brown gravelly slightly sandy CLAY. Gravel and sand are fine to medium.

SPECIMEN DETAILS

Depth within original sample	n/a
Orientation within original	n/a
Specimen preparation	Sample prepared using a soil lathe to reduce its diameter to a more suitable size for the Triaxial Permeability apparatus.

TEST DETAILS

Cell Preparation: Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	104.62	104.42
Height	*mm*	101.48	101.29
Water Content	*%*	13.6	14.2
Bulk Density	*Mg/m³*	2.19	2.21
Dry Density	*Mg/m³*	1.92	1.94

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.35	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	355
Volume change	*mL*	4.9

PERMEABILITY STAGE

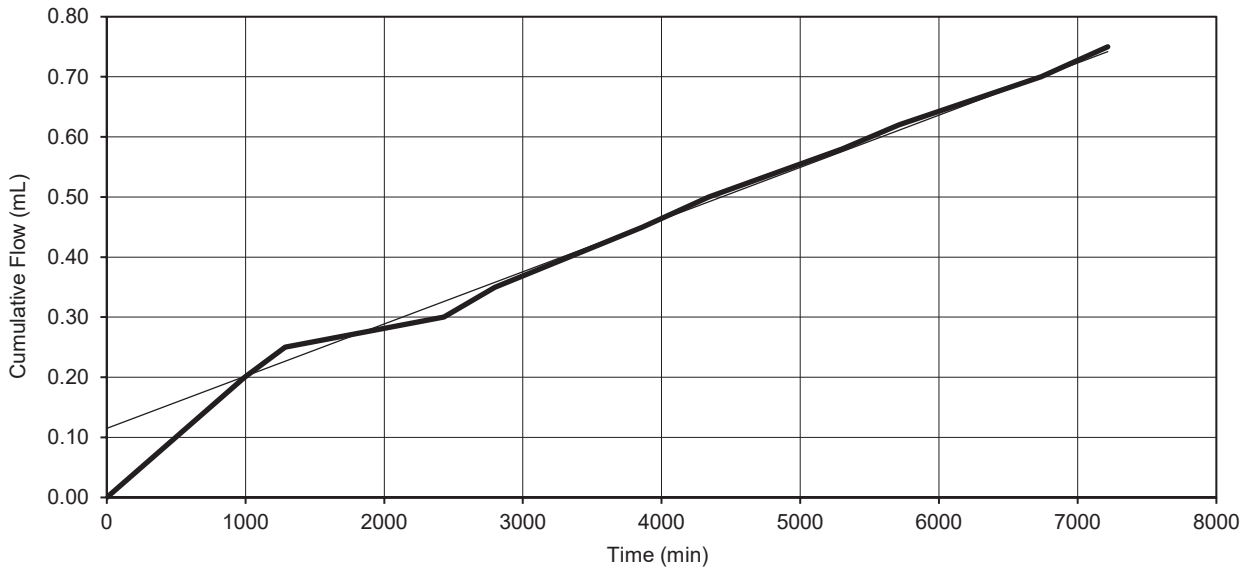
Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.1
Mean effective stress	*kPa*	345

TEST DURATIONS

Saturation	*days*	4
Consolidation	*days*	2
Flow	*days*	5

Coefficient of Permeability
k_v at 20 °C = 8.4×10^{-12} m/s



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Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K29
Sample Ref.:	KCW2
Depth (m):	12.29-12.54
Sample Type:	C

Description:
Very stiff greyish brown CLAY with occasional iron rich nodules.

SPECIMEN DETAILS

Depth within original sample	0.06m
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	105.28	105.18
Height	*mm*	92.72	92.63
Water Content	*%*	8.5	9.4
Bulk Density	*Mg/m³*	2.37	2.39
Dry Density	*Mg/m³*	2.18	2.19

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.91	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	124
Volume change	*mL*	2.3

PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

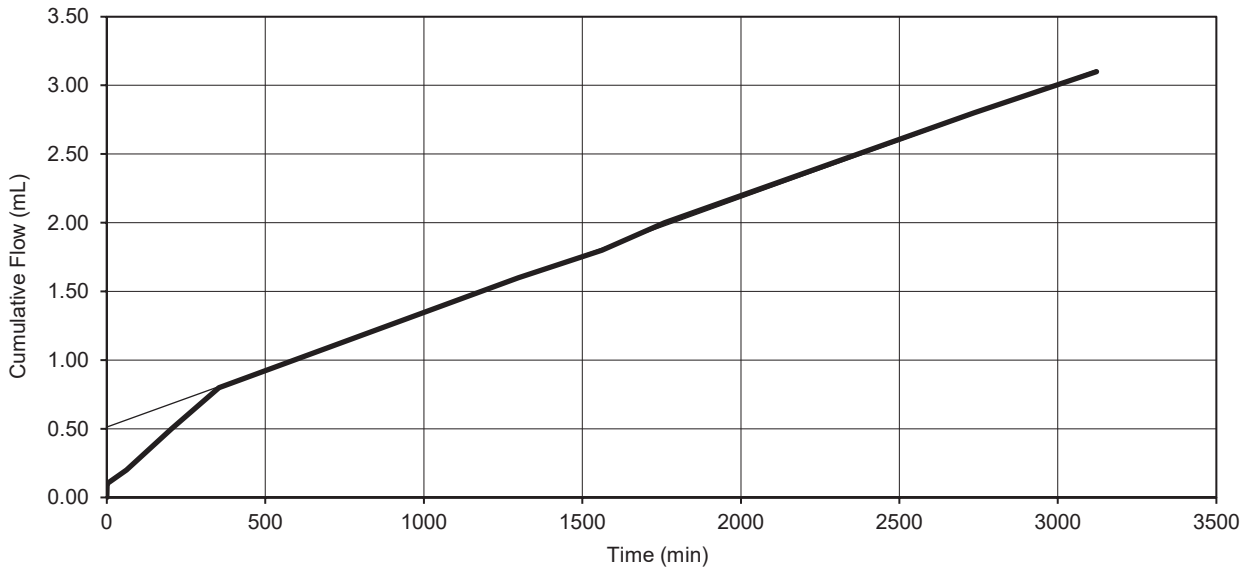
Pressure difference across specimen	*kPa*	18
Hydraulic gradient		20.0
Mean effective stress	*kPa*	114.9

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	2
Flow	*days*	3

Coefficient of Permeability

k_v at 20 °C = 8.0×10^{-11} m/s



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Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K29
Sample Ref.:	KCW4
Depth (m):	13.02-13.30
Sample Type:	C

Description:
Very stiff fissured yellowish brown silty CLAY.

SPECIMEN DETAILS

Depth within original sample	0.16m
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	102.36	102.27
Height	*mm*	105.12	105.03
Water Content	*%*	24.5	24.5
Bulk Density	*Mg/m³*	2.06	2.06
Dry Density	*Mg/m³*	1.65	1.66

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.91	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	132
Volume change	*mL*	2.2

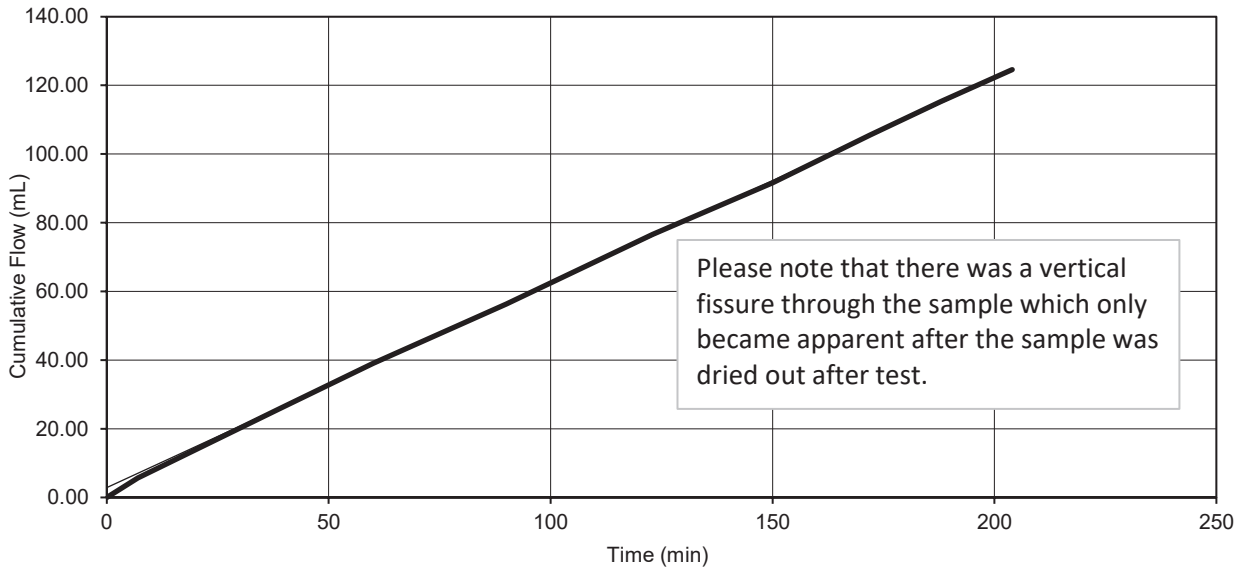
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	21
Hydraulic gradient		20.0
Mean effective stress	*kPa*	121.7

TEST DURATIONS

Saturation	*days*	2
Consolidation	*days*	1
Flow	*days*	1

Coefficient of Permeability
k_v at 20 °C = 6.1×10^{-8} m/s



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Determination of Permeability in a Triaxial Cell

Borehole Ref.:	K31	Description:
Sample Ref.:	KCW1	Very stiff brownish grey silty CLAY.
Depth (m):	8.76-9.00	
Sample Type:	C	

SPECIMEN DETAILS

Depth within original sample	0.04m
Orientation within original	Vertical
Specimen preparation	Undisturbed

TEST DETAILS

Cell Preparation — Performed in accordance with Clause 3.5

		INITIAL	FINAL
Diameter	*mm*	102.49	102.21
Height	*mm*	102.14	101.86
Water Content	*%*	10.0	10.4
Bulk Density	*Mg/m³*	2.37	2.40
Dry Density	*Mg/m³*	2.15	2.17

SATURATION STAGE

Saturation initially by constant moisture content, followed by back-pressure assistance.

Pore pressure coefficient ('B' value)		0.76	0.95

CONSOLIDATION STAGE

Effective pressure	*kPa*	88
Volume change	*mL*	6.9

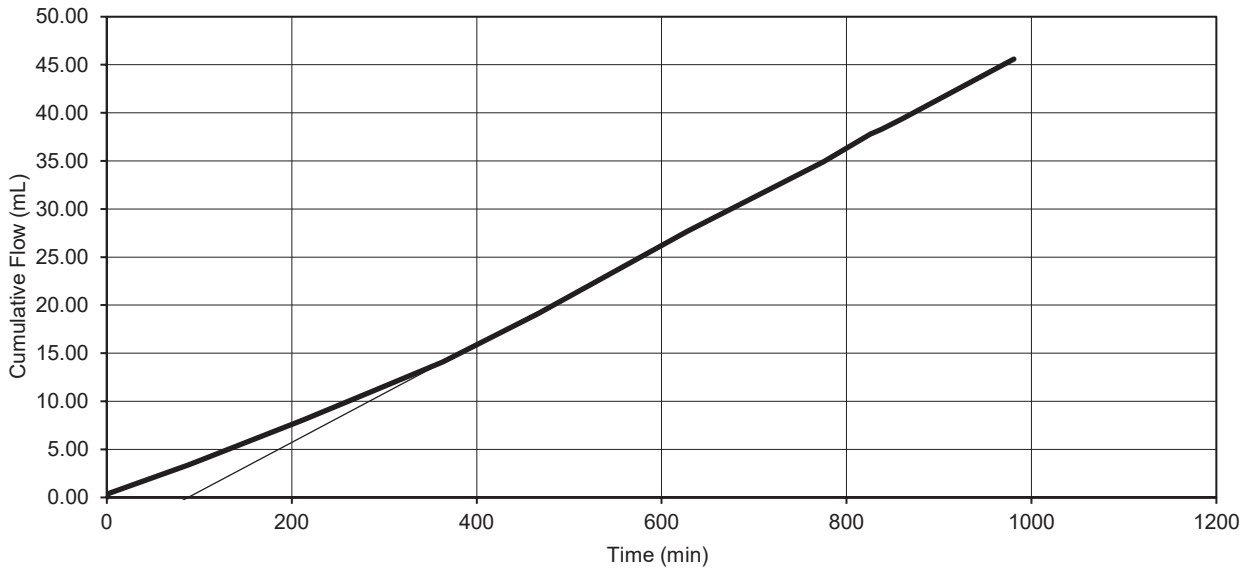
PERMEABILITY STAGE — Measured under constant head conditions in a triaxial cell

Pressure difference across specimen	*kPa*	20
Hydraulic gradient		20.0
Mean effective stress	*kPa*	78

TEST DURATIONS

Saturation	*days*	3
Consolidation	*days*	1
Flow	*days*	1

Coefficient of Permeability
k_v at 20 °C = 5.2×10^{-9} m/s



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