

9.2 Preliminary Phase 2 Ground Condition Assessment



Riverside & Woodbank Estate, Balloch

Preliminary Phase 2 Ground Condition
Assessment

On behalf of: Flamingo Land Ltd



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Summary

This report presents the findings of a Preliminary Phase 2 Ground Condition Assessment for the proposed development of the site at Riverside and Woodbank, Balloch.

Site Description

The Site, which measures approximately 18 hectares, is situated at the southern end of Loch Lomond. The Site can be split into two distinct areas, Riverside in the east and Woodbank in the west.

The larger eastern area (Riverside) is an irregular shape and is bounded to the north by the Lomond Shores centre and the bank of the Loch itself. To the east is the River Leven (the Maid of the Loch Slipway, including pontoons) and to the south is primarily housing. The majority of the Riverside area is occupied by woodland and walking paths. Two INEOS oil pipelines run through the site from west to east and two fenced valve compounds are present.

The smaller western area (Woodbank) is accessed via a track from Old Luss Road. The majority of the site area comprises two relatively flat lying open fields, however, in the west is an area dominated by woodland and the ruins of an old hotel and outbuildings. The western part of Woodbank features some steep slopes.

The Riverside Site has a varied history. There is no record of heavy industrial land uses within the Riverside site, however, multiple small quarries were active, particularly in the northern and western areas. The eastern area (beside the slipway) was dominated by railway infrastructure from Balloch Station in the south to Balloch Pier in the north. A dye works was located immediately offsite to the south, however, this area is currently occupied by housing.

The majority of the Woodbank site remained undeveloped from 1864 until present. The exception to this being the hotel and outbuildings present within the sloping woodland area in the west of the Woodbank site. On later mapping the hotel was labelled as Hamilton House. The hotel building was destroyed in a fire in 1995. The majority of the building was ruined, however, the façade remains standing. The various outbuildings are in a state of severe disrepair.

Ground Investigation

A preliminary ground investigation which comprised the drilling of shallow boreholes at 57 locations has been undertaken. Samples of soil were collected for geotechnical and environmental analysis and monitoring standpipes were installed for gas and groundwater analysis.

The objectives of the investigation were to record the shallow ground conditions including gas and groundwater. Where ground conditions are likely to present constraints to certain types of development, these will be described. The report will discuss where further investigations will be required in order to enable foundation design and remediation (if required).

Results of the Ground Investigation

Geotechnical Ground Conditions

Ground conditions across the undeveloped areas of the site comprised natural drift deposits with alluvium (soft, sandy, clayey peat) primarily to the east of Pier Road, glaciofluvial deposits (sands and gravels with silt and clay) and till (gravelly sandy clay). Made ground of >1.0m thickness was almost entirely restricted to the eastern part of the site where former railway lines ran. Made ground varied from cohesive to granular with common inclusions such as ash, glass, pottery and brick. Soft ground conditions associated with Peat / Alluvium were also typically restricted to the eastern part of the site.



Due to the depth of poor ground (Made Ground, Alluvium and Peat), the area to the east of Pier Road will not be suitable for traditional pad or strip foundations and will therefore require some form of ground treatment such as localised excavation and replacement, the use of vibro columns or piled foundations. The exceptions to this would be very lightly loaded (i.e. timber or timber and canvas) structures which would cause very little compression of the ground and are relatively tolerant of a degree of settlement in the event of ground movement.

Any proposed road construction will need to take cognisance of the peat deposits and may require either the excavation of peat or the use of a piled load transfer blanket.

Across the majority of the site, where Till deposits and Glaciofluvial deposits are present, it may be possible to adopt shallow spread foundations for relatively lightly loaded structures where the underlying material is proved to be at least medium dense or medium strength.

However, depending on the nature of the specific structures, consideration may need to be given to ground improvement such as vibro concrete columns, and for heavier and/or more sensitive structures, or where the strata is low strength or relative density is very loose or loose, then a piled foundation solution is likely to be required. This is likely to apply to structures such as the swimming pool complex and hotels.

Contamination

A detailed risk assessment of contamination in soils cannot be carried out until the nature of the proposed uses have been confirmed. However, for this preliminary assessment, contaminants have been highlighted as 'elevated' if they exceeded guideline values for soils in residential gardens.

Soils containing elevated contaminants were primarily restricted to the area to the east of Pier Road and to the North of Ben Lomond Way. The primary contaminant of concern was lead, however, elevated arsenic and hexavalent chromium were also encountered. More detailed assessment of the potential risks posed by contaminants will be undertaken when the development plan has been refined. However, it is likely that some remedial measures will be required in the eastern area. These may be limited to the delineation and removal of 'hotspots' and / the placement of capping material above the contaminated soils to generate a barrier and thus limiting exposure.

Gas

The dataset indicates that the area east of Pier Road and north of Ben Lomond Way will be classified as CS2 as a result of concentrations of carbon dioxide and methane in exceedance of trigger values. The design of buildings in these areas may require the inclusion of gas protection measures. The results for the remainder of the site indicate that it would be classified as CS1 and no gas protection measures will be required.

Groundwater

The results of the analysis of groundwater samples have confirmed the presence of slightly elevated concentrations of heavy metals in some of the boreholes. The concentrations encountered are considered unlikely to have significant negative impact on the sensitive receptors (Loch Lomond and River Leven), however, a further round of borehole sampling and the collection of surface water samples with testing is recommended to strengthen this conclusion.

The summary contains an overview of the key findings and conclusions. However, no reliance should be placed on any part of the summary until the whole of the report has been read.



1 Introduction

1.1 Preamble

- 1.1.1 Peter Brett Associates LLP (PBA) has been commissioned by Flamingo Land (the Client) to prepare a Preliminary Phase 2 Ground Condition Assessment for the proposed tourist park development at Riverside and Woodbank, Balloch.
- 1.1.2 Previous investigations have been undertaken at the site, and PBA has reviewed complete or partial copies of the following salient reports:
 - Engineering Review, West Riverside, Balloch, Aecom, 2015;
 - West Riverside, Loch Lomond Shores, Phase 1 Geo-Environmental Desk Study, Aecom 2015;
 - Lomond Shores, Stage 2 Site Investigation Report, URS Report Fer 44762681/GLRP0533 Issue 2.
- 1.1.3 It should be noted that none of the above listed reports included the Woodbank site, however, Woodbank was visible on historical mapping included within the Phase 1 Report.
- 1.1.4 Whilst PBA has taken cognisance of the contents of the reports listed above, the content of previous work will not be repeated here.
- 1.1.5 The reports listed above concern investigations undertaken when the site was being promoted for a different end use and with a different site boundary. Furthermore, since the previous investigations and assessments were carried out, there have been considerable developments in relevant guidance and best practice of assessing ground conditions, together with revisions to the assessment methodology and criteria for assessing the risks from land contamination and hazardous ground gases.
- 1.1.6 The objective of this study is to present an assessment of ground conditions based on a review of previous assessments and the results of a preliminary intrusive site investigation carried out in February 2017.
- 1.1.7 This study has been undertaken to assess the ground conditions at the Site, and thereby to identify potential geoenvironmental and geotechnical hazards and constraints with respect to the proposed end use.
- 1.1.8 At the time of writing this report, the proposed layout of the site (Masterplan) has yet to be finalised. It is anticipated that the findings of this investigation will be used to inform the next phase of master planning.
- 1.1.9 The development will include some very distinct structures and building types ranging from the demanding (such as an indoor leisure complex with a swimming pool and an outdoor monorail) to the simple (such as woodland paths, glamping accommodation and lodges). Clearly the different structures proposed will have very different foundation requirements. The various different land uses will also require different environmental risk assessments (more detailed description in **Section 2**, below).
- 1.1.10 Once a revised masterplan has been drawn up, additional phases of investigations will be required to establish ground conditions in more detail around the areas where the requirement is more complex (i.e. at large / heavily loaded buildings or monorail column footings). Likewise, additional intrusive investigation may be required at any areas where potentially significant contamination is encountered.



1.1.11 The assessment has been carried out in general accordance with "established procedures" using current UK best practice and guidance as given in British Standard 10175 (BS 10175, 2013), Contaminated Land Report 11 (EA, 2004) and NHBC Standards Chapter 4.1 (NHBC, 2016a) with regard to land contamination, and DCLG (2014) with regard to land stability.

1.2 Scope of Work

- 1.2.1 In summary the scope of work undertaken for this study comprised:
 - A review of the previous investigations and assessments, together with readily available geological, hydrogeological and aquifer vulnerability maps, and historical Ordnance Survey maps.
 - A preliminary intrusive investigation, designed to achieve site wide coverage. The investigation comprised:
 - Fifty-Seven (57) shallow boreholes were advanced across the site at the locations shown on Figure 1 (N.B. the actual total number of boreholes advanced was 73, as the presence of obstructions in the shallow soils meant that A, B and C were required at certain locations),
 - o Boreholes were logged and in situ testing, primarily in the form of SPTs was undertaken at all locations.
 - Samples were recovered from all boreholes for geotechnical and environmental analysis,
 - o Environmental monitoring standpipes were installed in 36 no of the boreholes to enable gas and groundwater monitoring,
 - Ground gas concentrations and flow rates were measured in the boreholes on 6 occasions over at least 12 weeks.
 - o Samples of groundwater were recovered from boreholes and sent to an accredited laboratory for environmental analysis.
 - A preliminary assessment of geological hazards and ground stability risks was undertaken to identify potential risks arising from loose or weak soils, cavities and other potentially adverse foundation conditions constraints.
 - A preliminary quantitative contamination risk assessment has been carried out utilising a
 Conceptual Site Model to identify 'source-pathway-receptor' linkages and data obtained
 from the site investigation to assess the potential risks and hazards, if any, associated
 with existing contamination in the ground.
- 1.2.2 Following the preliminary assessment, this report will recommend areas of the site where additional investigation would be beneficial.
- 1.2.3 It is anticipated that aspects of the masterplan will be revised or confirmed, partially based on the outcomes of the present study. Detailed foundation assessments will then be undertaken at the locations of the proposed structures that require them. I.e. the more detailed investigations and revisions of layout / design will be undertaken as concurrent, iterative processes.

1.3 Limitations

- 1.3.1 Unless stated otherwise, information from the previous ground investigation and assessment has not been included in this report and, where referenced, the report presenting this information should be read in conjunction with this report. PBA has not been involved in the supervision and technical direction of the previous investigations undertaken at the Site and accepts no responsible for the accuracy and completeness of the data.
- 1.3.2 Guidance on the context of this report and any general limitations or constraints on its content and usage are given in a separate guidance note included after the text of this report.



1.3.3 Additional investigations including flood risk, ecology and archaeology are being undertaken at the site and will not be covered in detail in this report.



2 The Site

2.1 Site Location

- 2.1.1 The Site is located at the northern extent of the town of Balloch, at the southern end of Loch Lomond approximately centred at Ordnance Survey Grid Reference 238666, 682128. The boundary of the Site is shown on a Plan presented as **Figure 1**.
- 2.1.2 The Site which measures approximately 18 hectares can be split into two distinct areas, Riverside in the east and Woodbank in the west.
- 2.1.3 The larger eastern area (Riverside) is an irregular shape and is bounded to the north by the Lomond Shores centre and the bank of the Loch itself. To the east is the River Leven (the Maid of the Loch Slipway, including pontoons) and to the south is primarily housing. The majority of the Riverside area is occupied by woodland and walking paths. Two INEOS oil pipelines run through the site from west to east and two fenced valve compounds are present.
- 2.1.4 The smaller western area (Woodbank) is accessed via a track from Old Luss Road. The majority of the site area comprises two relatively flat lying open fields, however, in the west is an area dominated by woodland and the ruins of an old hotel and outbuildings.
- 2.1.5 The Site in general is relatively flat lying. However, in the eastern area, ground levels fall away towards the River Leven. The Ineos oil pipelines run from west to east through the northern part of the site and for the most part are situated within a cutting. Woodland areas are hummocky, with level variations in the region of 2 3m. Other mounds and hollows at the site may be related to the superficial quarrying of sands and gravels. The western part of the Woodbank site includes some steeply sloping ground which is thought to be a natural feature, possibly due to the effects of glacial movement. The above features (with the exception of the Woodbank site) are shown on a topographical survey undertaken in 2017.

2.2 Summary of Site History

- 2.2.1 This summary is based on information from historical Ordnance Survey (OS) maps which were included within the 2015 Aecom Phase 1 report. An appraisal of the Site history was included within that report. A brief summary of the salient features is presented here.
- 2.2.2 The Riverside Site has a varied history. There is no record of heavy industrial land uses within the Riverside site, however, multiple small quarries were active, particularly in the northern and western areas. The eastern area (beside the slipway) was dominated by railway infrastructure from Balloch Station in the south to Balloch Pier in the north. A dye works was located immediately offsite to the south, however, this area is currently occupied by housing.
- 2.2.3 The majority of the Woodbank site remained undeveloped from 1864 until present. The exception to this being the hotel and outbuildings present within the sloping woodland area in the west of the Woodbank site. On later mapping the hotel was labelled as Hamilton House. The hotel building was destroyed in a fire in 1995. The majority of the building was ruined, however, the façade remains standing. The various outbuildings are in a state of severe disrepair.

2.3 Current Site Use

- 2.3.1 The eastern part of the Woodbank area is occupied by two relatively flat lying fields which have been used for grazing. The western part of the Woodbank area is more heavily vegetated with woodland and rhododendrons. The western area includes the various ruined buildings formerly
- 2.3.2 associated with the hotel. In the north west, is a small hill, possibly a drumlin (a hill moulded by glacial action).



- 2.3.3 The majority of the Riverside site is covered by woodland with paths, however, more open areas are also present throughout the site.
- 2.3.4 There is evidence of re-profiling throughout the Riverside site area. This is likely to have been associated with the small quarries in the area, the Lomond Shores development and the Ineos pipelines. Cuttings and embankments representing variations of between 2 and 5 metres in height are present and recorded on the topographical survey issued on 31/05/17 by L&M Survey Services for PBA.
- 2.3.5 Two fenced off compounds are present in the north of the site, along the route of the Ineos pipeline. These are assumed to be valve works.
- 2.3.6 The Aecom report from 2015 noted the presence of two stands of Japanese Knotweed within the Riverside site area. The Woodbank area was not included in that investigation. The presence of invasive / notifiable species will be covered during ecological survey works and are outside of the scope of this investigation.
- 2.3.7 The layout of the Site is shown on the plans included as **Figures 1 4**.

2.4 Proposed Development

- 2.4.1 A Masterplan for the proposed development is being developed. In general, the project relates to the erection and operation of a tourism and leisure led mixed use development with associated infrastructure on the two linked sites (Woodbank and Riverside) to the north west of Balloch.
- 2.4.2 The development will likely include new accommodation buildings, pods and glamping facilities, woodland paths, picnic areas, a central 'hub' including swimming pool, sports facilities and other attractions.
- 2.4.3 Development of the Woodbank House area will include proposals for the redevelopment of the remains of Woodbank House, (a listed building) and attendant structures, together with additional holiday lodge-style accommodation in the grounds.
- 2.4.4 Access to the proposed development will be from the existing road network including the A82, the A811 Stirling Road, the Old Luss Road, Ben Lomond Way, Pier Road and Balloch Road.
- 2.4.5 A Masterplan is currently being prepared with the layout evolving through an assessment of the site constraints (including the conclusions of this report). Early drafts of the Masterplan are still considered to provide a useful context for the findings of the present report as the draft shows the site split into zones and is indicative of the types of structures and density of development that is proposed.
- 2.4.6 Depending on the proposed structures, the foundation requirements will vary from robust and potentially complex (e.g. the swimming pool, elevated monorail footings) to very simple and undemanding (e.g. lodges and glamping pods, forest paths).
- 2.4.7 The assessments presented in **Sections 3, 4** and **5** of this report relate to the geotechnical properties (and implications for foundation design) for the various superficial geological.
- 2.4.8 Conditions encountered across the site as well as soil environmental and ground gassing assessments.
- 2.4.9 In order to make the assessments more useful to the masterplan revision phase, these constraints / ground conditions have been summarised on **Figures 1 4**.



3 Ground Conditions, Hydrogeology and Hydrology

3.1 Geology

Published Superficial Geology

- 3.1.1 The 1:50 000 scale geological map of the area, Sheet 30W and part of 29E (Scotland) Drift "Greenock" (British Geological Survey, 1989) indicates the presence of some superficial deposits overlying the solid geology within the Site boundary. The superficial deposits comprise three main types:
 - Raised Marine Deposits Clay, silt, sand and gravel. Formed in shallow seas with mainly siliciclastic sediments. This is indicated to be present adjacent to and following the southern shoreline of the loch.
 - Glaciofluvial Sand and Gravel gravel, sand and silt formed in cold periods with Ice Age
 glaciers scouring the landscape and depositing moraines of till with outwash sand and
 gravel deposits. These deposits are indicated to be present across the greater part of the
 Woodbank and Riverside sites.
 - Till (Diamicton) these deposits were formed in cold periods with Ice Age glaciers scouring the landscape and depositing moraines of till with outwash sand and gravel deposits. These deposits are indicated to be potentially present along the western part of the Woodbank site.
- 3.1.2 In addition, the British Geological Survey (BGS) mapping also shows areas of man-made deposits (Made Ground) being present and these are annotated by the BGS as being "deposited on original ground surface". These occur in two locations, being; in a narrow strip along the banks of the River Leven (Slipway) to the east of Pier Road (along the alignment of the former railway line); and in an area of ground to the North of Balloch Road and extending beneath Clairnish.
- 3.1.3 Furthermore, infilled ground (annotated as being Man-made deposits filling former opencast excavation) is marked as a parcel of land to the east of Old Luss Road and northwest of Ben Lomond Way, however this is believed to be outside of the Site boundary.
- 3.1.4 The Geology of Britain viewer on the BGS website indicates that there are also deposits of Alluvium present at the Site, described as clay, silt, sand and gravel, and shown as a ribbon extending from the shore of Loch Lomond, adjacent to the River Leven and along the alignment of the former railway line, predominantly to the east of Piers Road. These deposits may be present beneath any made ground.

Published Solid Geology

3.1.5 The 1:50 000 scale geological map of the area, Sheet 30W and part of 29E (Scotland) - Solid "Greenock" (BGS, 1990) indicates that the site is entirely underlain by the Teith Sandstone Formation of the Devonian Period.

Information on Solid Geology from the BGS and Previous Investigations

3.1.6 There are a number of BGS Borehole records available within the boundary of the Riverside site, and the deepest of these undertaken in 1998 for Balloch Footbridge (adjacent to the northern boundary of the Site) indicates that depth to bedrock is in excess of 35m at that location.



- 3.1.7 The Phase 1 Geo-Environmental Assessment (Aecom, May 2015) summarises the ground conditions indicated by previous ground investigations carried out at the Riverside site and identifies the presence of Made Ground and 'Organic Soils' overlying 'Fluvio/Upper Glacial Deposits', 'Glacial Till' with Bedrock (sandstone) encountered at depths of between 51m below ground level (m bgl) and 69m bgl. It is considered that the descriptor 'Organic Soils' could represent Alluvium.
- 3.1.8 There are no BGS borehole records from within the Woodbank site area. The closest BGS records relate to a string of shallow (generally <5m) boreholes drilled along the A82, to the west of the Woodbank site boundary. The boreholes typically reached depths of around 4.0mbgl and described 'Soft, friable or dense clayey SAND with cobbles' to around 1.5mbgl followed by 'Hard or Stiff sandy clay with boulders'
- 3.1.9 Two of the boreholes to the north / west of Woodbank (close to Stoneymollan Road / Roundabout) encountered sandstone bedrock at 5m 6.5mbgl.
- 3.1.10 The historical boreholes indicate that the depth to bedrock may be highly variable within the area of the Riverside / Woodbank sites. Sandstone was encountered at a depth of 52.65m at Balloch Station (southern end of Riverside), whilst in close proximity to the roundabout at the southern tip of Woodbank site sandstone was recorded at 5.0m.

2017 Ground Investigation

- 3.1.11 The ground conditions on the Site were investigated by Phoenix Drilling Ltd in January 2017 to provide information for the proposed sale of the Site.
- 3.1.12 Phoenix Drilling were instructed to complete 57 window sample boreholes to depths of up to 5m below ground level (mbgl). However, as a result of frequent obstructions which prevented drilling progress, several attempts were made at achieving depth at many of the boreholes. The additional boreholes were given the suffixes A, B, C etc. As a result, the total number of boreholes attempted was 73. Borehole locations are shown on **Figure 1**. The borehole logs are presented in **Appendix A**.
- 3.1.13 Geotechnical testing comprised the following:
 - Standard Penetration Test (SPTs) testing undertaken in situ during the drilling of the boreholes and used to give an understanding of the bearing pressure of the strata.
 - Particle Size Distributions (PSD) laboratory test to determine the make-up of soils in terms of relative proportions of particle size which determines the classification (i.e. silt, clay, sand, gravel).
 - Moisture Content laboratory test, the results of which influence the understanding of soil mechanics, bearing capacity and settlement.
 - Plasticity laboratory test carried out on clays.
 - pH and sulphate content the results of these laboratory tests are used to determine
 whether ground conditions will be aggressive to concrete and produce recommendations
 for the concrete mix required.
- 3.1.14 The following section summarises the ground conditions encountered in the boreholes which are also summarised on **Figures 1 4**.

3.2 Made Ground

3.2.1 Made Ground was encountered in forty-six out of seventy-three window sample boreholes, either from the ground surface or below a relatively thin layer of topsoil, to depths of between 0.15m bgl



and 3.5m bgl. With the exception of WS07 on the Woodbank Site, Made Ground thicknesses in excess of 1m were encountered predominantly to the east of Pier Road (as shown on **Figures 2**, **3 and 4**), where a former railway line used to cross the site on embankment (as shown on the historical maps presented in the 2015 Phase 1 report).

- 3.2.2 The borehole descriptions of the Made Ground indicate that it varies in composition from being a predominantly cohesive deposit comprising very soft gravelly sandy clay, to more typically a granular deposit, being a very loose to loose sand and gravel or organic silty gravelly sand. Each deposit contains varying quantities of cobbles, ash, glass fragments, pottery and brick fragments.
- 3.2.3 Uncorrected Standard Penetration Test (SPT) N values were recorded in a range of between 0 and 9, indicating that the granular Made Ground has a relative density of very loose and loose. Using an f1 factor (empirical correlation) of 4.5 (Stroud, 1989) would suggest an undrained shear strength for the cohesive Made Ground of between <5kPa and 40kPa. The SPT test results are included on the borehole logs included in **Appendix A**.
- 3.2.4 The laboratory testing indicates a variable moisture content range for the Made Ground of between 20% and 40%., with the higher moisture contents recorded within material described as Ash Fill.
- 3.2.5 A programme of geochemical laboratory testing was carried out on selected soil and groundwater samples to determine the concentrations of a range of commonly occurring potential contaminants as part of the investigation. In addition, monitoring wells installed in selected boreholes were monitored on a single occasion to provide a preliminary determination of concentrations of potentially hazardous ground gases. The results of the chemical analysis and gas monitoring are discussed in Section 5.
- 3.2.6 The results of the geotechnical laboratory analysis are included in **Appendix B**.

3.3 Alluvium

- 3.3.1 Material considered to represent Alluvium was encountered in fourteen of the seventy-three window sample boreholes, at depths between 0.2m bgl and 5.0m bgl. The Alluvium was only encountered in the eastern part of the Site, between Pier Road and the River Leven.
- 3.3.2 The Alluvium was typically described as very soft and soft peaty sandy Clay, but it is noted that beds (full thickness not proven but up to at least 2.85m) of very soft and soft sandy clayey Peat were encountered, as shown on **Figures 2 and 3** within the middle part of the site area east of Pier Road. The Alluvium is also occasionally encountered as a very loose and loose silty Sand.
- 3.3.3 An additional window sample borehole containing 2.5m thickness of peaty Sand overlying sandy Peat was encountered at WS16 located off site between Riverside and Woodbank.
- 3.3.4 Uncorrected SPT N values were recorded in a range of between 0 and 17. Using an f1 factor (empirical correlation) of 4.5 (Stroud, 1989) would suggest an undrained shear strength for the cohesive Alluvium of between <5kPa and 75kPa. The SPT N values indicate that the granular Alluvium has a typical relative density of very loose to loose.
- 3.3.5 The laboratory testing indicates moisture contents between 13% and 256% with measured values of liquid limit between 28% and 133% and plastic limit between 15% and 56%. Corresponding values of plasticity index range between 12% and 77% indicating the Alluvium to be variably of low to extremely high plasticity. The moisture contents above 100% and the extremely high plasticity relate to Peat samples encountered within the deposit.

3.4 Till (Diamicton)

3.4.1 Material considered to represent Till was encountered in five of the seventy-three window sample boreholes, all located in the western part of the Woodbank Site (see **Figure 3**). The Till was encountered at depths of between 0.1m bgl and 1.7m bgl, and was typically described as a firm



to stiff gravelly sandy Clay. The gravel was recorded as being flat to elongated subangular to rounded igneous rock and other lithologies. Some high value SPTs were recorded in the deposit which are considered to represent larger gravel /boulder elements present.

- 3.4.2 Uncorrected SPT N values recorded within the clay horizons were recorded in a range of between 26 and 47, which using an f1 factor (empirical correlation) of 4.5 (Stroud, 1989) would suggest an undrained shear strength for the Till of between about 100kPa and 200kPa. Measured values of undrained shear strength of clay samples within the Till, as determined by laboratory triaxial testing of two 71.49mm and 82.53mm diameter specimens are 57kPa and 113kPa indicating firm to stiff consistency. It is considered that these lower values may not be wholly representative of insitu conditions as they may have been subject to sample disturbance.
- 3.4.3 The laboratory testing indicates moisture contents between 11% and 26%, with measured values of liquid limit between 27% and 34% and plastic limit between 15% and 18%. Corresponding values of plasticity index range between 12% and 16% indicating the Till to be of low plasticity.

3.5 Glaciofluvial Deposits

- 3.5.1 Material considered to represent Glaciofluvial deposits was encountered in fifty-one out of seventy-three window sample boreholes, at depths from existing ground surface to 4.8m bgl. These deposits were typically encountered in the western part of the Riverside site and the eastern part of the Woodbank site (as shown on **Figure 3**). These deposits were typically described as medium dense Sand and Gravel, silty gravelly Sand and silty Sand, but also occasionally as gravelly sandy Clay. The gravel inclusions are described generally as elongated, sub angular to sub rounded, fine to coarse of quartz, sandstone, igneous rock and other lithologies.
- 3.5.2 Uncorrected SPT N values in the granular parts of this strata indicate a range between 0 and >50 indicating that the material has a highly variable relative density of between very loose to very dense, and it is considered that the higher values recorded may represent larger gravel/ boulder elements present within this deposit.
- 3.5.3 The laboratory testing indicates moisture contents for the glaciofluvial deposits of between 6% and 31%, with greater moisture contents encountered in the more cohesive parts of this deposit.

3.6 Groundwater

3.6.1 The 2015 Phase 1 report indicated that earlier ground investigations at the site identified groundwater strikes in the 'majority of exploratory locations' and that 'groundwater at the site was in general hydraulic continuity with the River Leven at the level between 7.54m Above Ordnance Datum (AOD) and 8.89mAOD.

During this phase of investigation, groundwater was only encountered during drilling in fourteen of the seventy-three window sample boreholes, at variable depths of between 0.8mbgl and 3.7mbgl, predominantly located in the Made Ground, Alluvium and glaciofluvial deposits in the east of the Site. It is noted that the surface datum level of each of the boreholes was not recorded and as such the relative level of groundwater during this phase of investigation cannot be determined. In subsequent monitoring visits, around 13 of the 36 installed boreholes remained dry.

3.6.2 The groundwater encountered is considered to be perched water, existing in pockets of more permeable strata (such as sands and gravels), restricted by lower permeability deposits (such as clays), rather than a continuous shallow groundwater body.

3.7 Hydrogeology

3.7.1 The Phase 1 Report (Aecom 2015) states that groundwater in superficial deposits beneath the site is likely to be of moderate to high potential productivity.



- 3.7.2 The Phase 1 Report states that the Lower Devonian (Strathmore) bedrock aquifer is of High Productivity and has an overall classification of 'Good'.
- 3.7.3 The Phase 1 Report states that there are no known abstraction boreholes within 1km of the site.

3.8 Hydrology

- 3.8.1 The nearest surface water features to the site are Loch Lomond which is situated immediately to the north and the River Leven which is situated immediately to the east and enters the Loch adjacent to the north eastern point of the site.
- 3.8.2 The Phase 1 Report states that the River Leven has a SEPA status of Poor for ecology and Pass for chemistry. The pressures on the river resulting in these classifications include morphological modifications (water collection, dams, weird etc) and point source pollutants.
- 3.8.3 Likewise, the Phase 1 Report states that Loch Lomond has a SEPA status of Poor for ecology and Pass for chemistry. The status is a result of both diffuse and point sources of pollution, morphological alterations and recreational activities.
- 3.8.4 Information on discharge consents is summarised in the Phase 1 Report which includes a Landmark Envirocheck report.
- 3.8.5 A flood risk assessment is currently being undertaken.

3.9 Other Potential Geological Hazards / Constraints

- 3.9.1 **Radon** is a naturally occurring radioactive gas and emanates from geological formations to varying degrees, depending on the type, porosity and permeability. An assessment of potential for radon gas to be present is given in the Aecom Phase 1 report (2015) and indicates that the site is in the lowest category for potential radon risk. As such, no further assessment of radon or radon specific remedial measures will be required.
- 3.9.2 **Mining** based on the conclusions of the 2015 Phase 1 report and the Coal Authority website, the site is not considered to be in an area where coal mining has occurred.



4 Geotechnical Considerations and Ground Stability Assessment

4.1 Introduction

- 4.1.1 This section of the report presents comments on the ground conditions in relation to a conceptual Masterplan.
- 4.1.2 For the proposed development, the principal geotechnical considerations will be the strength and compressibility of the founding soils and hence, the foundation requirements for the proposed structures.
- 4.1.3 As the layout and design details of the proposed structures have yet to be finalised, this report will discuss the geotechnical properties at the site in general terms.

4.2 Site Preparation

4.2.1 It is assumed that the proposed development will largely be constructed at grade on the existing ground profile. It is anticipated however that local regrading of the existing ground levels and excavation of trenches and ditches will be required associated with the construction of the site infrastructure.

4.3 Excavations and Groundwater Control

- 4.3.1 Construction activities such as trenches for drainage and utilities, will require excavations. Due to the potential shallow depth below ground of the water table in the area (within 1.0m below ground level in places) excavations may encounter groundwater during development works. The expected permeability of the near surface soils on the Site is expected to vary depending on the presence of cohesive or granular materials. Allowance should therefore be made for controlling inflows of any groundwater. Should groundwater be encountered it will be required to be pumped out until the excavation is backfilled. Deep excavations that are required to be open for any length of time will need to consider the potential for groundwater entry and use appropriate techniques to ensure the excavations remain dry and stable for the required duration.
- 4.3.2 For any structures that are proposed to be below ground and the associated groundwater table, consideration will need to be given to appropriate design and construction measures to prevent and/or control groundwater ingress.
- 4.3.3 The predominantly granular nature of the ground conditions at the site mean that it is unlikely that trenches and areas of open cut will remain open unsupported for even short durations, and this is especially the case below the groundwater table. Where excavations are above the groundwater table, the sides may need to be battered back to a safe slope angle or restrained by full face support such as shoring or trench sheeting. Where excavations are below the groundwater table the sides will require full face support such as shoring or trench sheeting.

4.4 Slope Stability

4.4.1 The proposed development may require the reuse of near surface soils as an engineered fill, if site levels are required to be amended, and this may result in the development of both cut and filled slopes. Any slopes proposed for the development will need to be adequately designed based on the nature of the material likely to be present, to ensure the slopes remain stable during the term required (i.e. temporary or permanent). It is likely that slopes formed from the predominantly granular material present at the site will be at risk of surface erosion and local shallow surface failures of the side slopes and therefore it is likely that measures will be required to protect the surface of the slopes in the short, medium and long term.



4.5 Pavements

- 4.5.1 Pavements carried on a suitable depth of capping/sub-base should prove adequate provided the exposed deposits are compacted by a heavy smooth wheeled roller and any soft/loose or degradable materials removed and replaced with compacted granular fill. Similarly, any remains of walls, foundations or exposed pieces of demolition materials present within the made ground would need to be removed to prevent any development or concentrations of stress in the pavement.
- 4.5.2 Road construction on areas where Peat has been identified can however suffer from significant settlement and any roads proposed that cross areas underlain by Peat may need to consider either excavation of the Peat and replacement with engineered fill or the formation of a piled load transfer blanket with the road construction layers formed on top of the load transfer blanket.
- 4.5.3 Strengthening of peat may be carried out in discrete columns or by mass strengthening of a larger zone. Typically, the strengthening with discrete columns achieves more controlled mixing and containment of materials whilst mass strengthening may enable a greater production rate to be achieved. The strengthened peat should be surcharged immediately after mixing for a period of time to allow it to consolidate and improve the strength gain. Additional ground investigation, compaction testing with the addition of different binders and field trials would need to be carried out in order to verify if this option is viable for the Site.
- 4.5.4 Peat does not provide adequate lateral confinement for the use of vibro-stone columns to improve soil bearing properties, however it is possible that vibro-concrete columns (VCCs) could be used subject to confirmation of this by specialist contractors.

4.6 Below Ground Infrastructure

4.6.1 Where peat is present consideration will need to be given to all buried services that are sensitive to settlement and movement such as surface water drains or foul sewers. Typically, services sensitive to settlement will be placed in corridors where the Peat is excavated and replaced by engineered fill. Alternatively, consideration can be given to support of services on piled foundations. Ground improvement using soil mixing or VCCs could be considered.

4.7 Foundations

- 4.7.1 For the proposed development, the principal consideration will be the strength and compressibility of the founding soils, and hence, the foundation requirements for the proposed structures. The appropriate foundation solution will depend not only on ground conditions, but also on the building geometry, structural loading, load distribution and the limiting criteria for movement or settlement of the various structures.
- 4.7.2 It is unlikely that traditional shallow spread foundations will be suitable in the areas of the Site where deeper Made Ground (>1.5m 2.0m thick) and Alluvium are present due to their variability, typically very low strength, and loose relative density resulting in unacceptably high magnitudes of total and differential settlements.
- 4.7.3 Where the Made Ground and Alluvium deposits are typically less than about 1.5m to 2.0m thick, and very lightly loaded structures that are relatively insensitive to settlement are proposed, deep strip or trench fill foundations could be taken through these deposits to found on more competent strata below (assuming competent strata is present). Alternatively, the Made Ground or Alluvium deposits could be excavated and replaced with engineered fill and a ground bearing raft used.
- 4.7.4 Where the Made Ground or Alluvium is greater than 1.5m to 2.0m thick, it may be uneconomical to adopt a traditional pad or deep strip foundation solution, and therefore consideration should be given to Vibrated Concrete Columns (VCC's) or a piled foundation solution.
- 4.7.5 Across the majority of the site, where Till deposits and Glaciofluvial deposits are present, it may be possible to adopt shallow spread foundations for relatively lightly loaded structures where the



underlying material is proved to be at least medium dense or medium strength. However, depending on the nature of the specific structures, consideration may need to be given to ground improvement such as vibro stone or vibro concrete columns, and for heavier and/or more sensitive structures, or where the strata is low strength or relative density is very loose or loose, then a piled foundation solution is likely to be required.

- 4.7.6 Careful consideration will need to be given to potential differential settlement developing between parts of the same building founded on different types of soil such as cohesive Till and granular Glaciofluvial deposits. The design of the proposed structures will need to consider both total and differential settlement, both beneath the whole structure and between individual foundations.
- 4.7.7 For any structures founded within areas of peat, there will be significant risk of differential movement between buildings and external pavement areas. Careful consideration will need to be given to mitigating the effects of differential movement, particularly at building thresholds or utility connections.

4.8 Piled Foundations

4.8.1 Piled foundations are likely to be required where strip or pad foundation depth becomes excessively deep, where the size of the foundation becomes excessively large, or where the magnitude of predicted settlements for pad or strip footings is unacceptable. It is therefore anticipated that medium and heavily loaded structures or structures that are sensitive to total and/or differential settlements such as the pool and leisure facility, hostel and hotel will require piled foundations.

4.9 Floor Slabs

- 4.9.1 The Made Ground and Alluvium, and other areas where the strata is identified as being of low strength or very loose/loose relative density, are unlikely to provide adequate support to floor slabs. As such, it is recommended that suspended ground floor slabs with suitable void are constructed in these areas.
- 4.9.2 It is anticipated that ground bearing floor slabs can be used on any engineered fill placed or on the Till and Glaciofluvial deposits (except where described as above), subject to loadings and serviceability requirements.

4.10 Design of Buried Concrete

4.10.1 The measured pH values and concentrations of water soluble sulphate measured on samples of soils recovered as part of the ground investigation are summarised in Table 4.1 below.

Table 4.1 Results of pH and Water Soluble Sulphate Analysis

| No. of Results | pH Range | Water Soluble Sulphate (mg/l) Range |
|----------------|-----------|-------------------------------------|
| 38 | 5.2 – 8.0 | <12 - 108 |

- 4.10.2 The values provided above correspond to Design Sulphate Class DS1 conditions as defined by BRE (2017).
- 4.10.3 It is assumed that the groundwater conditions at the Site are mobile and therefore It is considered that the Aggressive Chemical Environment Concrete (ACEC) class for the site is AC2z.



Belowground Structures

- 4.10.4 Utilities including the INEOS High Pressure Oil Pipeline and other gas apparatus are known to be present below the surface of the site. Known utilities (and where available, standoff zones) are included on **Figures 1 4**.
- 4.10.5 A belowground void was encountered during hand digging at borehole WS 40. It was later suggested that this void relates to a redundant 18" culvert at approximately 2m depth. The direction and extent of this feature is not known and may require further investigation with an excavator. This feature is not included on service plans which have been reviewed (and are included on **Figures 1 − 4**) which suggests that it is not Scottish Water plant.
- 4.10.6 The eastern area of the site is known to have had extensive rail lines running north / south. The extent to which these rail lines have been removed or simply buried is not known.



5 Assessment of Soil and Groundwater Contamination and Ground Gases

5.1 Risk Assessment Strategy

- 5.1.1 The assessment of risks associated with contaminated land are based on the use of a Conceptual Site Model to identify 'source-pathway-receptor' linkages.
- 5.1.2 A significant risk can only exist if a Source (contamination capable of causing harm) is present together with a Receptor (sensitive to harm by the contaminant) and a Pathway (a mechanism through which the contaminant Source can reach and affect the sensitive Receptor).
- 5.1.3 The magnitude of the risk from a given source of contamination is determined by the sensitivity of the receptor and the likelihood of the receptor being exposed to the contaminant.
- 5.1.4 Potential receptors include humans (development workers and future site users), future buildings and structures and the water environment.
- 5.1.5 A quantitative risk assessment of the potential risks posed by contaminant sources requires an understanding of the nature of the proposed development. Since the Masterplan for the Riverside and Woodbank developments is being refined at the time of writing this preliminary investigation report, a generic quantitative risk assessment will be used. In this preliminary investigation report, soil contamination will be described as elevated when concentrations exceed the most conservative assessment criteria (which relate to residential garden soils).
- 5.1.6 Once the development layout has been refined, a more detailed assessment of the results can be undertaken. Further investigation may also be required in certain areas. The more detailed risk assessment will be carried out to determine whether any remedial measures are required.

5.2 Preliminary Conceptual Site Model

5.2.1 Although the layout and detailed development plans have yet to be finalised, a preliminary conceptual site model, setting out potential Sources, Pathways and Receptors is included here to assist with the assessment of potentially significant of contamination.

5.3 Potential Sources

- 5.3.1 The majority of the site has remained undeveloped. The main exceptions to this are the area of railway land in the east, the small superficial quarries (potentially backfilled with material of unknown origin) and the buildings associated with the hotel at the Woodbank area. These areas are considered the main potential sources of onsite contamination.
- 5.3.2 The offsite dye works represents a further potential source of contamination.
- 5.3.3 Made Ground and Peat can be a source of ground gases resulting from microbial decay.
- 5.3.4 Potential sources of contamination are presented Table 5.1 below.



Table 5.1 Summary of Potential Sources of Contamination

| Source | Comment |
|-------------------------|---|
| On-Site | |
| Railway land | Railway land is often a source of contamination from the material used as ballast (including clinker and ashy material) as well as operational leaks and spills. |
| Made Ground | Made Ground or fill material of unknown origin can be a source of a range of contaminants including organic and inorganic compounds. Asbestos may be present within demolition rubble. If organic material is present, microbial decay can generate ground gases. |
| Peat / Organic Soils | Microbial decay can generate ground gases |
| Off-Site | |
| Dye-works | Potential for waste material from the adjacent historical dye works being deposited on site. The dye works may have affected groundwater, subsequently migrating below the Site. |

5.4 Potential Receptors

- 5.4.1 Potential receptors will include development and maintenance workers, future users, surface and groundwater and proposed buildings and structures.
- 5.4.2 Table 5.2 below summarises the sensitivity of potential receptors assuming no mitigation measures are in place.

Table 5.2 Summary of Sensitivity of Potential Receptors

| Receptor | Sensitivity | Comment |
|----------------------------|-------------|---|
| Site Workers | High | Ground workers and construction workers are likely to come into direct contact with soils, albeit for a short period of time. As the potential risk is to human health, the sensitivity is considered to be high. |
| Future Site Users | High | Future users include employees, day visitors and residential tourists who will have variable exposure scenarios to the potential contaminants. |
| | | However, since the potential risks are to human health, the sensitivity is considered to be high. |
| Ground Water Resources | Moderate | Groundwater is currently considered to be of poor quality, albeit with a target of continuous improvement. |
| Surface Water Resources | Moderate | The site is immediately adjacent to the River Leven and Loch Lomond. The River Leven is considered to be of poor quality, albeit with a target of continuous improvement. |
| Built Environment | Moderate | Proposed buildings are potentially at risk from aggressive ground conditions caused by low pH or high sulphate and from the build-up of gases in confined spaces. |



5.5 Potential Pathways

5.5.1 Table 5.3 below summarises potential pathways via which receptors could be affected by contamination and ground gases.

Table 5.3 Potential Exposure Pathways

| Pathway | Comment | |
|--|---|--|
| Direct contact with skin, ingestion or inhalation of soils or soil derived dust | Construction and maintenance work will take place in the presence of exposed, potentially contaminated surface soils. Workers may be exposed to direct contact with contaminated soils. | |
| | Future site users may be exposed to potentially contaminated surface soils whilst working at or visiting the site. | |
| Migration of gasses and accumulation in confined spaces | Ground gasses can migrate and accumulate in confined spaces with the potential to cause asphyxiation (CO ₂ and CH ₄) or explosion (CH ₄) | |
| Migration of mobile contamination to surface water receptors | Mobile soil contamination can migrate with shallow groundwater flow, potentially impacting surface water receptors. | |
| Migration of mobile contamination to groundwater receptors | Mobile soil contamination can migrate vertically, potentially impacting surface water receptors. | |

5.6 Scope and Objectives of Contamination Investigation

- 5.6.1 One of the objectives of this preliminary investigation was to determine the presence of contamination sources within the soils and ground water and in the form of ground gasses.
- 5.6.2 Soil samples were recovered from 57 locations across the site. Analysis of soil samples was undertaken with the objective of quantifying the presence or absence of contamination in soil samples representative of conditions on site.
- 5.6.3 In summary, samples were tested for the following suite of potential contaminants (No. of samples shown in brackets):
 - Metals: arsenic, cadmium chromium (III & VI), copper, lead, mercury, nickel, selenium, zinc, beryllium, boron and vanadium (63 samples),
 - pH (63 samples),
 - Petroleum hydrocarbons with carbon banding (63 samples)
 - Polycyclic Aromatic Hydrocarbons (PAHs): USEPA 16 species (23 samples)
 - Asbestos (63 samples)
- 5.6.4 Environmental monitoring wells were installed in 36 of the boreholes to enable gas monitoring, groundwater levels monitoring and groundwater sampling.
- 5.6.5 Gas monitoring has been undertaken on six occasions over 12 weeks.



- 5.6.6 Groundwater samples were recovered from 15 wells for the following laboratory analysis:
 - Metals: arsenic, cadmium chromium (III & VI), copper, lead, mercury, nickel, selenium, zinc, beryllium, boron and vanadium (15 samples),
 - pH and hardness (CaCO3) (15 samples),
 - Petroleum hydrocarbons with carbon banding (6 samples), and
 - Polycyclic Aromatic Hydrocarbons (PAHs): USEPA 16 species (13 samples).

5.7 Confirmed Soil Contamination – Woodbank

- 5.7.1 Despite the presence of Made Ground near the existing / ruined buildings, no potentially significant contamination has been encountered in soil samples recovered from the Woodbank site area.
- 5.7.2 It should be noted that no investigations have been undertaken from within the building footprints.
- 5.7.3 Given that the main hotel building was destroyed by fire, the potential exists for limited contamination to exist in soils within the building footprint. In particular, polycyclic aromatic hydrocarbons (PAHs) are often associated with combustion. If asbestos containing materials were present in any of the structures on site, the potential exists for asbestos to be present in structures or rubble that currently remain on site.
- 5.7.4 At the time of writing, it is unknown whether an attempt will be made to retain some or all of the existing buildings / remnants of buildings for inclusion within the proposed development. Depending on the outcome of these proposals, additional ground investigation locations are likely to be required within the existing / ruined building footprints.

5.8 Confirmed Soil Contamination – Riverside

- 5.8.1 No significant contamination was encountered within soil samples recovered from the natural soils to the west of Pier Road or South of Ben Lomond Way.
- 5.8.2 Elevated concentrations of heavy metals (lead and less frequently, arsenic and hexavalent chromium) were encountered within Made Ground soils to the east of Pier Road and North of Ben Lomond Way. These are likely to be associated with the former railway land and activities and potentially linked to the offsite dye works.
- 5.8.3 Concentrations of lead ranged from a maximum of 5,100mg/kg (in WS47) to a minimum of 5.1mg/kg. The average concentration of lead was 268mg/kg. The most conservative assessment criteria for lead is 200mg/kg which is the Category 4 Screening Value (C4SL) for soils in a residential garden scenario. Fourteen soil samples contained concentrations of lead above the C4SL of 200mg/kg. The 14 locations, together with the lead concentrations are included on **Figure 4**.
- 5.8.4 With the exception of WS46 (which is in close proximity to Pier Road), all of the potentially elevated concentrations of lead were located in Made Ground to the East of Pier Road and north of Ben Lomond Way.
- 5.8.5 A single soil sample contained a concentration of arsenic that was above the threshold for residential garden soil (65mg/kg arsenic in WS38). This location is indicated on **Figure 4**.
- 5.8.6 A single soil sample contained a concentration of hexavalent chromium that was above the threshold for residential garden soil (8mg/kg hexavalent chromium in WS49). This location is indicated on **Figure 4**. The elevated chromium concentrations correspond approximately with an area that driller noted some green colouration in soils during the site investigation.



- 5.8.7 No asbestos was encountered in any of the 63 samples analysed from Riverside and Woodbank.
- 5.8.8 A summary table including all chemical analysis results, with exceedances highlighted is included in **Appendix C**.

5.9 Assessment of Ground Gases

- 5.9.1 At the time of writing this preliminary report, ground gasses have been measured in 36 boreholes on 6 occasions. The results are included in **Appendix D**.
- 5.9.2 Using the approach recommended in CL:AIRE (2012) and endorsed in BS 8485 (2015), the Woodbank Site and the area of the Riverside site to the west of Pier Road and south of Ben Lomond Way may be classified as Characteristic Situation 1 as defined in BS 8485 (2015). This Situation is representative of ground with a very low potential for gas generation. For Characteristic Situation 1, BS 8485 (2015) advises that no special gas protection measures are required.
- 5.9.3 Within the areas to the east of Pier Road and the north of Ben Lomond Way the site is classified as CS2 for gas. This is due to the carbon dioxide (CO₂) and methane (CH₄) being recorded at concentrations above the trigger values of 5% and 1% respectively during the monitoring even though flow rates remained low.
- 5.9.4 As expected, the elevated concentrations of ground gases correspond with Made Ground and Peaty soils.
- 5.9.5 Depending on the nature of the structures proposed for this area, there may be a requirement to incorporate gas protection measures. The appropriate gas protection measures are dependent on the proposed building design and end use, however, typically gas protection measures comprise a combination of barrier (e.g. concrete slab, gas resistant membrane) and a ventilation layer (e.g. a void space).

5.10 Assessment of Groundwater

- 5.10.1 Samples of groundwater were collected from 15 boreholes and tested for the potential contaminants listed at 5.6.6, above. The results are included in **Appendix E**.
- 5.10.2 Concentrations of potential contaminants in the groundwater samples were assessed against appropriate threshold criteria.
- 5.10.3 The surface water quality of Loch Lomond and the River Leven are the primary receptors for consideration in this assessment due to the potential for groundwater below the site to migrate into the Loch. Therefore, the most appropriate assessment criteria selected were typically Environmental Quality Standards (EQS) for freshwater. EQS are designed to be used in assessing water quality within surface water bodies after dilution has occurred. As such, they are considered to be highly conservative thresholds for comparison with samples of shallow groundwater.
- 5.10.4 The potential risk to groundwater is considered a lower priority. This investigation has confirmed that shallow groundwater is not present consistently across the site. Rather, perched groundwater is present discontinuously across the site in natural superficial deposits and made ground. Given that there are no known groundwater abstractions within 1km of the site, and the fact that the depth to the bedrock aquifer is in the region of 50m (in the north / east of the site, perhaps shallower in the south / west) no specific assessment of the risk to groundwater as a resource has been undertaken.
- 5.10.5 The Tier 2 assessment reported in this preliminary site investigation report is based on a direct comparison of concentrations of potential contaminants measured in samples of groundwater recovered from within soil or made ground.



5.10.6 No exceedances were observed for the majority of the potential contaminants tested. The exceptions were: chromium, copper, lead, nickel, zinc, fluoranthene, and benzo(g,h,i)perylene. Each of these potential contaminants were recorded at concentrations above the most conservative surface water quality criteria and each of which will be discussed below.

Chromium

The groundwater sample from borehole WS40 contained a concentration of $6.1\mu g/l$ in exceedance of the long term mean EQS of $4.7\mu g/l$, although well below the short term (95 percentile) of 32 $\mu g/l$. WS40 was advanced into made ground and soil samples were analysed for potential contaminants. Chromium was not found to be elevated with respect to the human health criteria in soil samples from this borehole.

Copper

Concentrations of copper exceeded the EQS of $1\mu g/l$ in ten out of the fifteen samples, including samples from boreholes within made ground and within natural soils. The maximum recorded concentration was $5.8\mu g/l$. However, it should be noted that the EQS is based on the bioavailable fraction of the dissolved copper present within the surface water receptor following dilution and is therefore considered to be a conservative threshold for comparison.

Nickel

The maximum concentration of nickel recorded was 12 μ g/l. Concentrations of nickel exceeded the annual average EQS of 4μ g/l in ten out of the fifteen samples, including samples from boreholes within made ground and within natural soils. None of the concentrations were elevated compared to the Maximum Acceptable Concentration (MAC) of 34 μ g/l. The MAC applies to dissolved nickel, whilst the EQS for annual average applies to bioavailable nickel.

Lead

The concentrations of lead exceeded the freshwater annual average EQS of $1.2\mu g/l$ in four samples. None of the samples exceeded the MAC of $14 \mu g/l$.

Zinc

Concentrations of zinc exceeded the EQS of $11.9\mu g/l$ in nine out of the fifteen samples, including samples from boreholes within made ground and within natural soils. However, it should be noted that the EQS is based on the bioavailable fraction of the dissolved zinc and is therefore considered to be a conservative threshold for comparison.

PAHs

Benzo(a)pyrene (BaP) can be considered as a marker for the other PAHs. None of the samples tested contained concentrations of BaP that were above the laboratory limit of detection (LOD) of 0.01 μ g/l. The EQS for the Annual Average is 0.00017 μ g/l (below the LOD used in this analysis) but the maximum allowable concentration is 0.27 μ g/l.

5.11 Summary of Groundwater Assessment

Samples of groundwater from across the site recorded concentrations of heavy metals that were, in some cases, elevated by comparison to the most conservative assessment criteria typically Annual Average (AA) EQS. However, with the exception of zinc and copper (which do not have a Maximum Allowable Concentration EQS), none of the samples were elevated by comparison to the less conservative Maximum Allowable Concentration (MAC) EQS.



The EQS for both copper and zinc are based on bioavailable concentrations, whereas the laboratory results are for the dissolved metals regardless of bioavailability. The actual bioavailable proportion would inevitably be lower than the total amount measured.

EQS thresholds are designed to be protective of the freshwater environment and are therefore intended to be applied at a compliance point within the surface water, after dilution has occurred, or to direct discharges. Therefore, it is highly conservative to compare these thresholds to samples of ground water recovered from boreholes within made ground or natural soils.

Both the River Leven and Loch Lomond are categorised as 'poor' for ecology and 'pass' for quality by SEPA due to physical modification and heavy recreational use. As such, despite their proximity, these receptors are considered to be of only moderate sensitivity.

It is considered highly unlikely that groundwater from the site is causing significant pollution of Loch Lomond or the River Leven as a result of the marginal concentrations of contamination encountered here. Contaminants have been recorded at relatively low concentrations and are likely to exhibit relatively low mobility through soil pores. The rate of flux of shallow perched groundwater from below the site into Loch Lomond is likely to be low. Furthermore, if contaminated groundwater from the site did reach the river or loch, the effect of dilution from such a large body of water would be highly effective.



6 Summary of Constraints and Recommendations

6.1 Summary

- 6.1.1 This investigation has established the characteristics of shallow soils at the site including geotechnical and contamination status.
- 6.1.2 It is anticipated that the constraints discussed below will be taken into consideration as the next iteration of masterplan for the site is produced.
- 6.1.3 As the Masterplan evolves, more detailed geotechnical investigations will be required in certain areas.
- 6.1.4 The contamination encountered will be assessed in more detail in the context of the proposed end use, with further assessment and delineation likely to be required.
- 6.1.5 Following the next phase of geotechnical investigation, recommendations for foundation solutions, soil remediation and gas protection measures for the various structures and areas of the site will be made.

6.2 Geotechnical Conclusions

- 6.2.1 Perched shallow groundwater may be encountered within excavations to form foundations or service trenches. An allowance should be made for pumping groundwater from excavations.
- 6.2.2 Road design will require to take cognisance of the presence of peat, made ground and soft ground conditions in the east. Localised excavation and replacement with competent material or the formation of a piled load transfer blanket may be required.
- 6.2.3 If buried services that are sensitive to settlement (e.g. sewers) are required within the eastern area, it may be necessary to avoid areas of peat, excavate and replace peat or, use ground improvement techniques.

6.3 Foundations

- 6.3.1 Shallow spread foundations are unlikely to be suitable within the eastern area where deeper Made Ground, Alluvium and Peat are present.
- 6.3.2 Where Made Ground, Alluvium and / or peat are greater than 1.5 2.0m thick, it may be most economical to consider vibrated concrete columns (VCC) or a piled foundation solution.
- 6.3.3 The Till and Glaciofluvial deposits present across the majority of the site may be suitable for shallow spread foundations for relatively lightly loaded structures. Heavier structures, or those with particularly low tolerance for settlement may require ground improvement (e.g. VCC) or piled foundations.
- 6.3.4 In summary, piled foundations are considered likely to be required for heavily loaded structures such as the swimming pool, leisure facility, hotel and hostel. For areas where strata have been identified as low strength, suspended floor slabs incorporating below slab voids are recommended.
- 6.3.5 Structures such as glamping (wood and canvas tents), pods, picnic areas and woodland paths may be suitable for the eastern area without ground improvement, as these are very lightweight and unlikely to be sensitive to a degree of settlement. Note that contamination and gas will need to be considered (see **Section 6.4**, below).



6.4 Contamination / Ground Gas Conclusions

- 6.4.1 No elevated contamination was encountered in soils at the Woodbank site, however, no investigations were undertaken within the footprints of the existing / ruined buildings. In particular, the footprint of the building destroyed by fire may represent a potential localised source of contamination.
- 6.4.2 Potentially elevated concentrations of lead were encountered in samples of Made Ground in the east of the Riverside site, as well as individual examples of elevated hexavalent chromium and arsenic.
- 6.4.3 No elevated ground gases have been detected to date across the majority of the site, which can be designated as CS1 (requires no special gas protection measures).
- 6.4.4 Methane and carbon dioxide were detected at concentrations slightly above the trigger concentrations to the east of Pier Road and north of Ben Lomond Way which will be designated as CS2. Depending on the nature of structures and / or buildings proposed it these areas, it will be necessary to consider the need to incorporate ground gas protection measures.
- 6.4.5 Concentrations of some heavy metals were recorded in borehole samples of groundwater were elevated compared to the most conservative EQS thresholds. However, the effect of the presence of marginally elevated contamination within perched groundwater below the site is considered unlikely to significantly impact surface water quality in Loch Lomond and no known groundwater abstractions exist within 1km of the site.

6.5 Contamination / Ground Gas Recommendations

- 6.5.1 Limited additional trial pitting and sampling is recommended around the areas of WS46, WS47 and WS49, in order to better understand and delineate the elevated concentrations of contamination encountered.
- 6.5.2 Depending on the development proposals for the areas where contamination was encountered, additional site investigation is likely to be required to delineate contamination and form a remedial strategy.
- 6.5.3 The remedial strategy is likely to comprise localised excavations of contaminated material and the replacement with clean fill / capping material or hardstanding. This will be confirmed after the proposed end use of these areas is known and a more thorough risk assessment has been carried out.
- 6.5.4 Depending on the proposals for the existing derelict buildings at Woodbank, additional investigation is likely to be required within these footprints for potential contaminants of concern including asbestos and PAHs.
- 6.5.5 Marginally elevated concentrations of heavy metals were encountered in samples of groundwater recovered from boreholes. The results of testing for PAHs were inconclusive. A further round of groundwater sampling and analysis is recommended, along with the collection and analysis of surface water samples from the Loch and the River Leven.
- 6.5.6 Construction and ground workers should take cognisance of the presence of contamination as reported here. Method statements, risk assessments and PPE will be required to mitigate potential risks.
- 6.5.7 Where new buried potable water pipes are proposed, UK Water Industry Research (UKWIR) compliant testing of soils will be required to determine the acceptable water pipe material.



6.6 Geotechnical / Foundation Recommendations

- 6.6.1 Heavy structures will need specific site investigations to determine the most effective and economical foundation solutions.
- 6.6.2 Where piled foundations are likely to be required, site investigation will focus on determining the depth to competent strata, noting that the depth to bedrock may vary considerably from reported depths of around 50m in the north and east, to reported depths of around 5m just off site to the south east.
- 6.6.3 Buried concrete structures should conform to Design Sulphate Class DS1 an Aggressive Chemical Environment Concrete Class (ACEC) AC2z.



Essential Guidance for Report Readers

This report has been prepared within an agreed timeframe and to an agreed budget that will necessarily apply some constraints on its content and usage. The remarks below are presented to assist the reader in understanding the context of this report and any general limitations or constraints. If there are any specific limitations and constraints, they are described in the report text.

The opinions and recommendations expressed in this report are based on statute, guidance, and best practice current at the time of its publication. Peter Brett Associates LLP (PBA) does not accept any liability whatsoever for the consequences of any future legislative changes or the release of subsequent guidance documentation, etc. Such changes may render some of the opinions and advice in this report inappropriate or incorrect and the report should be returned to us and reassessed if required for re-use after one year from date of publication. Following delivery of the report PBA has no obligation to advise the Client or any other party of such changes or their repercussions.

Some of the conclusions in this report may be based on third party data. No guarantee can be given for the accuracy or completeness of any of the third party data used. Historical maps and aerial photographs provide a "snap shot" in time about conditions or activities at the site and cannot be relied upon as indicators of any events or activities that may have taken place at other times.

The conclusions and recommendations made in this report and the opinions expressed are based on the information reviewed and/or the ground conditions encountered in exploratory holes and the results of any field or laboratory testing undertaken. There may be ground conditions at the site that have not been disclosed by the information reviewed or by the investigative work undertaken. Such undisclosed conditions cannot be taken into account in any analysis and reporting.

This report has been written for the sole use of the Client stated at the front of the report in relation to a specific development or scheme. The conclusions and recommendations presented herein are only relevant to the scheme or the phase of project under consideration. This report shall not be relied upon or transferred to any other party without the express written authorisation of PBA. Any such party relies upon the report at its own risk.

The interpretation carried out in this report is based on scientific and engineering appraisal carried out by suitably experienced and qualified technical consultants based on the scope of our engagement. We have not taken into account the perceptions of, for example, banks, insurers, other funders, lay people, etc. unless the report has been prepared specifically for that purpose. Advice from other specialists may be required such as the legal, planning and architecture professions, whether specifically recommended in our report or not.

Public or legal consultations or enquiries, or consultation with any Regulatory Bodies (such as the Scottish Environment Protection Agency or Local Authority) have taken place only as part of this work where specifically stated.



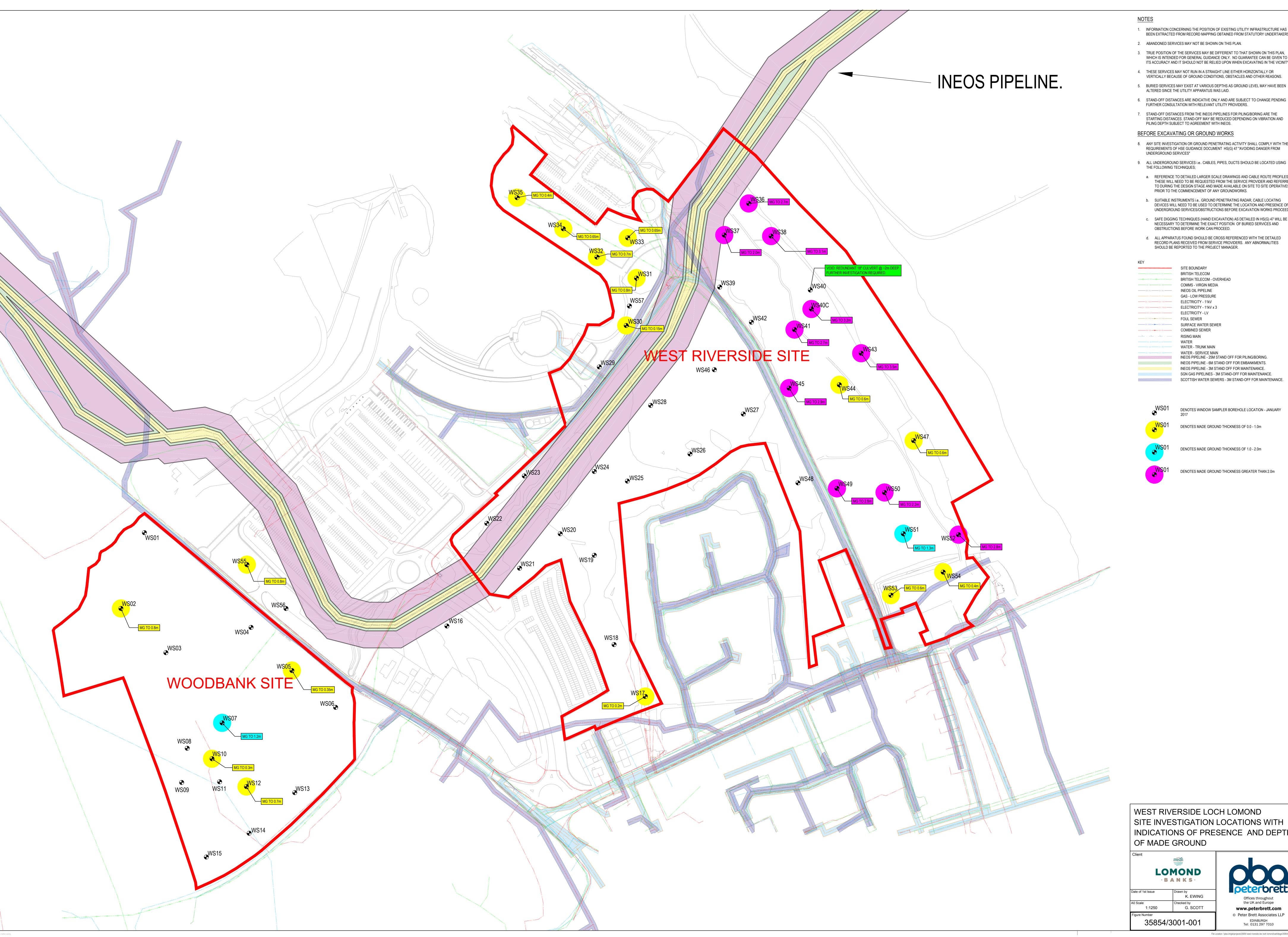
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Figures

- 1. Site Investigation Locations with Indicators of Presence and Depth of Made Ground
- 2. Site Investigation Locations where Peat was Encountered
- 3. Composite Plan of Shallow Ground Conditions Showing Approximate Distribution of Peat, Alluvium, Glaciofluvial Deposits and Till
- 4. Site Investigation Locations where Soil Contamination was Encountered and ground Gas Characteristic Situations (CS1 and CS2)



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 - 7. STAND-OFF DISTANCES FROM THE INEOS PIPELINES FOR PILING/BORING ARE THE

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- 8. ANY SITE INVESTIGATION OR GROUND PENETRATING ACTIVITY SHALL COMPLY WITH THE REQUIREMENTS OF HSE GUIDANCE DOCUMENT HS(G) 47 "AVOIDING DANGER FROM UNDERGROUND SERVICES"
- 9. ALL UNDERGROUND SERVICES i.e., CABLES, PIPES, DUCTS SHOULD BE LOCATED USING THE FOLLOWING TECHNIQUES;
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- b. SUITABLE INSTRUMENTS i.e.. GROUND PENETRATING RADAR, CABLE LOCATING DEVICES WILL NEED TO BE USED TO DETERMINE THE LOCATION AND PRESENCE OF UNDERGROUND SERVICES/OBSTRUCTIONS BEFORE EXCAVATION WORKS PROCEED.
- c. SAFE DIGGING TECHNIQUES (HAND EXCAVATION) AS DETAILED IN HS(G) 47 WILL BE NECESSARY TO DETERMINE THE EXACT POSITION OF BURIED SERVICES AND OBSTRUCTIONS BEFORE WORK CAN PROCEED.
- d. ALL APPARATUS FOUND SHOULD BE CROSS REFERENCED WITH THE DETAILED RECORD PLANS RECEIVED FROM SERVICE PROVIDERS. ANY ABNORMALITIES







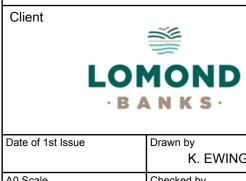


DENOTES MADE GROUND THICKNESS OF 0.0 - 1.0m

DENOTES MADE GROUND THICKNESS OF 1.0 - 2.0m

DENOTES MADE GROUND THICKNESS GREATER THAN 2.0m

WEST RIVERSIDE LOCH LOMOND SITE INVESTIGATION LOCATIONS WITH INDICATIONS OF PRESENCE AND DEPTH OF MADE GROUND



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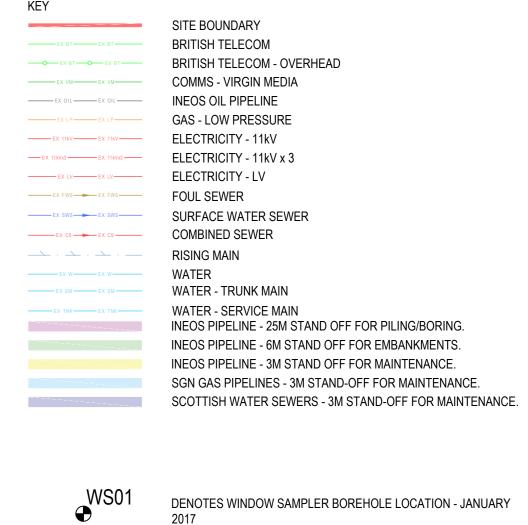
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- d. ALL APPARATUS FOUND SHOULD BE CROSS REFERENCED WITH THE DETAILED

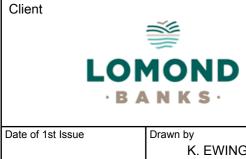
RECORD PLANS RECEIVED FROM SERVICE PROVIDERS. ANY ABNORMALITIES SHOULD BE REPORTED TO THE PROJECT MANAGER.



DENOTES LOCATION WHERE PEAT WAS ENCOUNTERED

WEST RIVERSIDE LOCH LOMOND

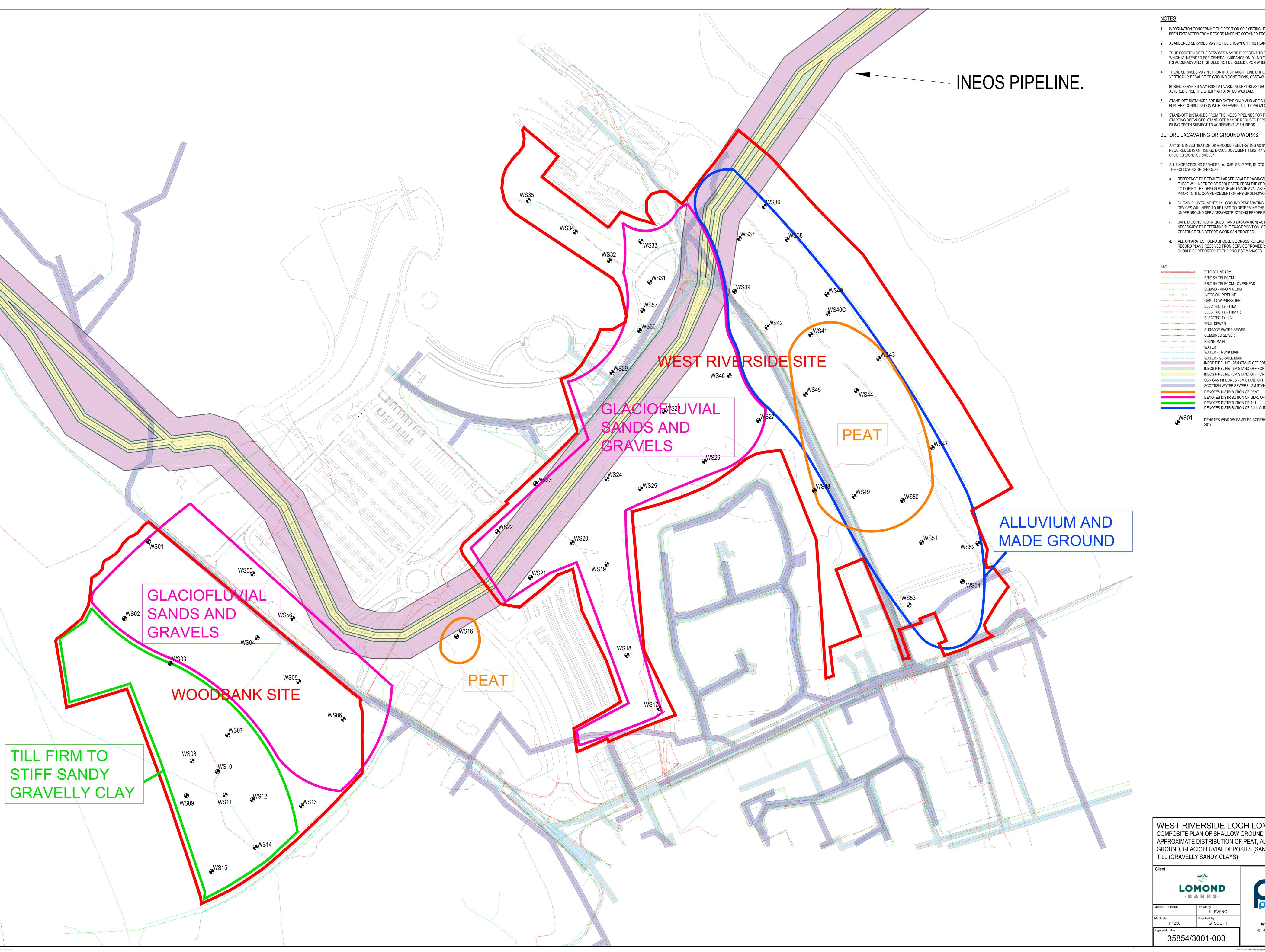
SITE INVESTIGATION LOCATIONS WHERE PEAT WAS ENCOUNTERED



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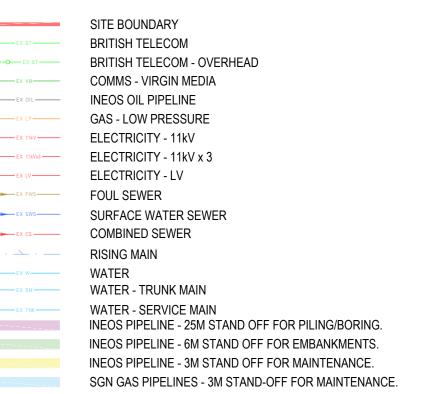


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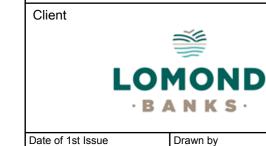


DENOTES WINDOW SAMPLER BOREHOLE LOCATION - JANUARY

DENOTES DISTRIBUTION OF GLACIOFLUVIAL SANDS AND GRAVELS

DENOTES DISTRIBUTION OF TILL
DENOTES DISTRIBUTION OF ALLUVIUM AND MADE GROUND

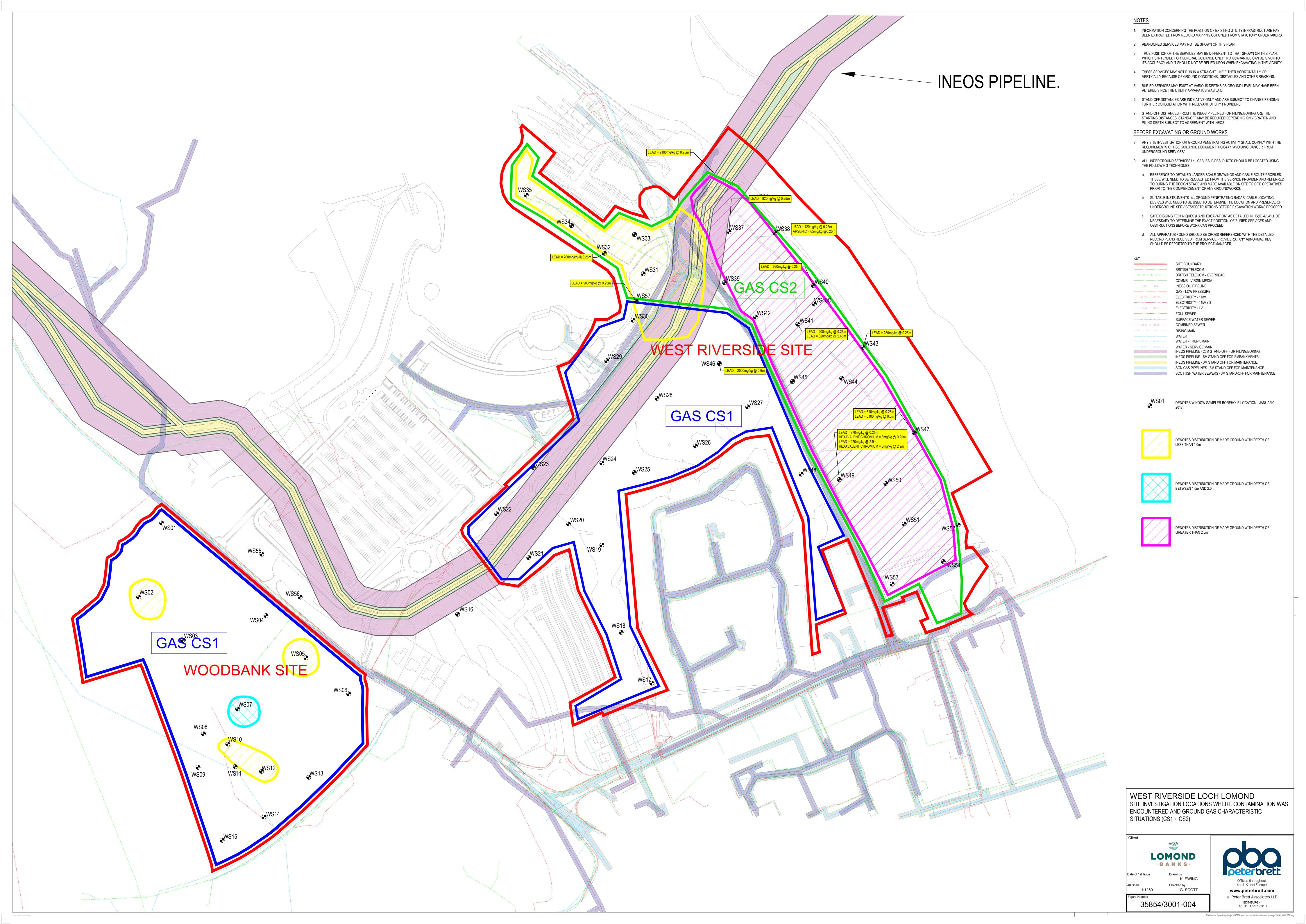
WEST RIVERSIDE LOCH LOMOND APPROXIMATE DISTRIBUTION OF PEAT, ALLUVIUM, MADE GROUND, GLACIOFLUVIAL DEPOSITS (SANDS AND GRAVELS) AND



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Appendix A Borehole Logs

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| Printe | | 55 | IIIIai | | | | 1 | WES ⁻ | ΓRIVE | RSID | E, B | ALLOC | CH | | | | "V | 4 | Sheet 1 | l of 1 | l |
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| | ᆔ | Sample Depth | l a | Sample | s and T Result | | Casing Depth | | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Ballodmy8 | ackfill Depth |
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| 20 | 5/2 017 | | | - | | | | | | 0.10 | | TOPSOIL. Clay fill, br | icks. (MAI | DE GROUI | ND) | | | | | | | | 0.20 |
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| | | 1.20 | T | T=29 4.5 | <u> </u> | | | | | | Br - su | own grave bangular i | elly very sa o rounded | andy CLAY I of igneous | with low pl s rock and | lasticity. G other litho | ravel is fla logies. | t to elonga | ted | | | | |
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| Printed: 13/06/2017 16:33:53 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | - - - | | | | | | | | | | | | | |
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| ix Drilling Ltd | ‡ De | escripti | ion al a | based o t 2.6 m o | n driller: depth. | s records | S. | | | Da | ırt | OIII. | | | Inspecti | ion Pit to v Sample | er to 2 | 1.20m 2.60m | DOIGHOR | . INU. | WSC |)2B | |
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| | 50 I | Sample Depth | e | | ples | Res | l Tests sult | i | _Cas | | Lev (mO | - 1 | Dep | th | | | | | | Des | scription | n of S | Strata | | | | | | Legend | Water Depth | Symbol | ackfill Depth |
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| rilling.co.uk Tel: 015 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| ian, EH54 8AY E-r | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| vingston, West Loth | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Industrial Estate, Li | 2-4 | | Flust | | | | | | nisellir | | | | ter Ac | | | Ohmanla | | | d-water | | 0.1.0 | | Diam | | To De | epth | Jio | ocatio | n. | E 2381: | 21.6 | |
| airn Road, Deans | Retu | irns | Type | ! | <u>Γο De</u> | eptn | From | | To | me(hr | <u> </u> | rom | 1 | To | | Struck | RO | <u>se 10</u> | ime(m | ins | Cut Off | - | 125 | Borin 3.1 | $\overline{}$ | Casing 3.15 | Le | evel: | | N 6818 - Vertical | 88.4 | |
| ∄# | ‡ De | narks: escripti refusa | ion t |) ase 3.1 | d or 5 m | n drill dept | lers red | cords | S. | | 1 | | | Equi Dart | uipmei t | nt: | 1 | | <u> </u> | | Metho Inspec Windo | ction | | | 1. 3. | .20m .50m | Вс | orehol | e No: | WS |)3 | |
| :33:53 Pho | | | | | | | | | | | | | | | | | | | | | | | | | | | C | ontrad | et No: | 2304 | 1 | |
| d: 13/06/2017 16 | Chl | oriller KG k & App | | St | inato /IM | | | | | | | | В | OF | REI | HOL Scal | | | COF | RD | | | | | | | | | Fred | Part Fig. No | _ _). | |
| Printec | | SG ' | | Fi | inal | | | | | | | ١ | WE | ST | ΓRI\ | /ERS | SID | E, B | ALL(| ОС | Н | | | | | | | U | ħ | Sheet | 1 of ' | 1 |

| SS | Sample | s | amples ar | d Tests | Casing | | Level | | | | | | | | | | | рr | Water | | ackfill |
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| | 0.25 | B, J, | | | | | | - | elonga | ated suba | angular fi | ne of vario | ous litholog | gies. (TOF | SOIL) | | AND. | | | | |
| | 0.50 | J, T, | V | | | | | - | Gravel rock. | l is flat to | elongate | ed subanç | evelly to ver gular fine to | o medium | of sandsto | one and igr | neous | ٥٠٠ | | | |
| | 1.00 | B, J, | T V | | | | | _ | | | | | | | | | | | | | 1.00 |
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| npul Ret | | Flush Type | To Depth | | hiselling To 1 | l l | | ter Adde | | ruck F | Ground Rose To 1 | -water ime(mins) | Cut Off | Diam | To D Boring | epth Casing | Locatio | n: | E 2382 | 16.7 | |
| Deans | | .,,,, | . J Doptii | 1.5 | | | 1 | Ţ' | | | | | 23.011 | 125 | 5.00 | 5.00 | | | N 6819 | | |
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| ling Lt | escript | ion ba | ased on dr | illers record | ds. | | | Da | | | | | | ion Pit to v Sample | | 1.20m 5.00m | | | | | |
| ix Dril | | | | | | | | | | | | | | | | | | | WS |)4 | |
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| .54 F | | | | | | | | | | | | | | | | | Contra | ct No: | 2304 | 1 | |
| 16:33 | Driller | Τ, | Originator | | | | | | יחריי | | DEC | | | | | | Contra | OL INU. | | T | |
| /2017 | KG | | MM | | | | | RO | | OLE Scale 1 | | ORD | , | | | | El 1 | d'a | Part Fig. No |). | |
| 13/06 | Jr 0 ^ | _ | Ctat. :- | | | | | | | 20010 | | | | | | | 3 | NE TO | | | |
| Printed: 13/06/2017 16;33:54 Phoenix Drilling Ltd. 2 Nairn Road. Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 다 3 표 표 표 표 표 표 표 표 표 표 표 표 표 표 표 표 표 표 | nk & App SG | ' | Status Final | | | | 1 | WES | T RIVE | ERSIF | DE. BA | ALLOC | СН | | | | | 1 | | | |
| 4 | | | | | | | | | _ | | , =- | | | | | | ' | , - | Sheet | 1 of 1 | |

| Progress | 8 | Sample Depth | Type | | and Tests Result | Casin | - I | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | ackfill Depth |
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| 7/: 20° | 2 17 | 0.25 0.50 | B, J, J, T, | | | | | - | 0.10 0.25 0.35 | Bi el # | Black ash. | nic silty clar ubangular f (MADE Gl slightly gra subangular | ROUND) | | | | | / . | | | | 0.20 |
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| | | 2.00 2.00 | SPT: B, T | =20 <u>3.5/5</u> | 5.5.5 | | | | 2.45 | ⊢G | ravel is fla | nse greyish t to elongat and igneous | ted suban | ghtly silty m gular to su | nedium to brounded | coarse SA fine to me | ND and Gl dium of | ļ | | | | |
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| co.uk Tel: (| | | | | | | | | - | | | | | | | | | | | | | |
| nixdrilling.c | | | | | | | | | | | | | | | | | | | | | | |
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| Y E-mail: | | | | | | | | | | | | | | | | | | | | | | |
| n, EH54 8A | | | | | | | | | - | | | | | | | | | | | | | |
| Vest Lothia | | | | | | | | | | | | | | | | | | | | | | |
| ivingston, \ | | | | | | | | | - | | | | | | | | | | | | | |
| al Estate, L | | | | | | | | | | | | | | | | | | | | | | |
| Printed: 13/06/2017 16:33:54 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | etui | | Flush Type | To De | oth From | Chiselling To | Time(hr) | | ter Adde | ed To | Struck | Ground Rose To | d-water Fime(mins | Cut Off | Diam 125 | To E Boring 2.90 | Depth Casing 2.90 | Location | | E 23820 N 6818 | | |
| n Road, De | | | | | | | | | | | | | | | | | | Level: | | - | 00.0 | |
| td, 2 Nair | | narks: | | | | | | | | luipm | ent: | | | Method | : : | | 1.00 | Orientation Borehole | | Vertical | | |
| * Drilling L | | | | | drillers reco 1.2 and 2.9 i | |) depth. | | Da | art | | | | | ion Pit to v Sample | | 1.20m 2.90m | | | WSO |)5 | |
| 54 Phoen | | | | | | | | | | | | | | | | | | | | 000 | | |
| 17 16:33: | | oriller KG | (| Originato MM | r | | | | BC | RE | EHOLI | E REC | CORD | <u> </u> | | | | Contract | No: | 2304 Part | | |
| d: 13/06/20 | Chk | « & App | | Status | | | | | | | Scale | 1:50 | | | | | | | | Fig. No |) . | |
| Printec | ; | SG | | Final | | | | ١ | WES | TR | IVERS | SIDE, B | ALLOC | CH | | | | 408 | 1 | Sheet | 1 of 1 | |

| 3 | 5 | Sample Depth | Type | mples ar | nd Tests esult | Casin Depti | - | Level (mOD) | Depth | | | Des | scription | of Strata | | | | Legend | Water Depth | 9 | ckfill Depth |
|--|------|--------------------|---------------|-----------------|-------------------|------------------|--------|----------------|------------|----------------------------|-------------------------------|-----------------------|--------------------|-------------|----------------|-----------------------------|-----------|--------------|----------------|--------|-----------------|
| 3 20 | /2 | | | | | | | | 0.10 | #TOPSOI | | | | | | | | <u> </u> | | | 0.20 |
| 20 | 117 | 0.25 | B, J, 1 | , V | | | | | 0.40 | Soft brown | organic ver | y sandy CL | AY. | | | | | <u></u> | | Ħ | |
| | | 0.50 | J, T, \ | , | | | | | | Soft to firm of sandsto | light brown | slightly gra | avelly sand | ly CLAY. (| Gravel is fl | at subangı | ular fine | • | | | 0.50 |
| | | | | | | | | | _ | | | | | | | | | | | | |
| | | 1.00 | В, Ј, Т | , V | | | | | 1.10 | | | | | | | | | • | | | |
| | | 1.20 | SPT= | 10 2.2/2.3. | 3.2 | 1.20 | | | - | Medium de | ense brown subangular | silty gravell | y fine to m | edium SA | ND. Grave | el is cubic t k and othe | to r | ×o × | | 199 | |
| | | | T | | | | | | - | lithologies. | | | | , , | , | | | × ° | | | |
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| | | 2.20 | | 14 4.4/4.3.4 | <u>4.3</u> | 2.20 | | | - | lenses. Gr | ense to dens avel is cubic | to elongate | ed subang | ular fine o | f various li | ithologies. | iine siit | xo . | | | |
| | | | Т | | | | | | - | | | | | | | | | × · · · | | | |
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| ſ | ress | Sample | | | ıples an | d Tests | Casin | g | Level | . | | | | | | -101 : | | | | puí | Water | | nckfill |
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| 56 Phoenix Drilling Ltd, | # D | narks: escripti ⊺refusa | ion t al at | ase 2.2 | d on dri m depth | llers recor 1. | rds. | | | Eq Da | uipm rt | ent: | | | | : ion Pit to v Sample | | 1.20m 2.20m | Borehol | | WS | | |
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| | Progress | Sample Depth | Type | Sampl | | d Tests sult | Casir Dept | -1 | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | log | ckfill Depth |
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| | | 0.25 | B, J, T J, T | | | | | | | - So | oft to firm I | ight brown nses. Grav | to brown s | sandy very elongated | gravelly C subangu | CLAY with I lar to subre | low plastici ounded fine | ty and e to | | | | |
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| Printed: 13/06/2017 16:33:57 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | ۱۱۸ | SG App | F | inal | | | | • | WES | ST R | IVERS | IDE, B | ALLOC | СН | | | | | 1 | Shoot | 1 of 4 | |
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| | ㅠ . | Sample Depth | (a) | amples a | nd Tests esult | Casin Deptl | - | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | 00 | ckfill Depth |
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| 9 | o c | Sample | ; | am | ples an | d Tests | Casir | ıg | Level | | | | | | | | | | | pu | Water | | ickfill |
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| Ftd. | De | narks: escripti | ion ba | ase | d on dri | llers recor | ds. | | | Eq Da | uipm ırt | ent: | | | | ion Pit to | | 1.20m | Borehol | e No: | | | |
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| 7 16:3 | | Oriller | T | | inator | | | | | RC |)P= | HOI | F RF | CORD |) | | | | , | , | Part | | |
| 3/2017 | | RB | | Ν | ИM | | | | | טט | /1 \L | | = 1:50 | | • | | | | A M | 1/2 | Fig. No |) . | |
| 13/06 | Cr, | L O A · | \perp | C. | otus | | | | | | | | - | | | | | | | J. | | | |
| Printed: 13/06/2017 16:33:58 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | unk | k & App SG | | F i | atus i nal | | | | , | WFS | ΤR | IVFR9 | IDF R | ALLOC | Н | | | | | | | | |
| Pri | | | | | | | | | , | 0 | | | , D | | | | | | 'V | • | Sheet ' | 1 of 1 | |

| S S | Sample | | | nples and | d Tests | Casin | g | Level | | | | | | | | | | | pu | Water | Bac | kfill |
|---|-----------------|--------------|------|---------------------|-----------|------------------|---------|--------------|-------------|------------------|--|--|--------------------------------------|---------------------------|---------------------------|----------------------------|---------------------------|------------------|--|--------------------------|--------|-------|
| Progress | Depth | Type | ; | Res | sult | Depti | - 1 | (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Depth | Symbol | Depth |
| 2/2 2017 | 0.25 | B, . | J, T | | | | | | - - | Gr su lith | reyish bro bangular nologies. (| wn silty gra fine to coa MADE GF | avelly medi rse of sand ROUND) | um sand a Istone, sha | nd gravel le, brick fr | . Gravel is agments a | flat to cubi ind other | c | | | | 0.20 |
| | 1.00 | В, . | J, T | | | | | | 0.70 | SA | edium der AND. Grav ad other lit | ∕el is elong | se light bro pated subar | wn to brow ngular fine | n slightly to mediun | silty very g n of sands | ravelly me tone, igned | dium ous rock | ρ | | | |
| | 1.20 | SP'T | T=1 | 5 <u>2.3/3.3.4.</u> | <u>5</u> | 1.20 | | | - - - | | | | | | | | | | ρ | | | |
| | 2.00 2.20 | B SP T | T=2 | 3 <u>4.4/6.5.6.</u> | <u>6</u> | 2.20 | | | - - - | | | | | | | | | | | | | |
| | 2.80 | B SP | Т= | <u>50/</u> | | 3.00 | | | 3.00 | | | | EN | D OF BOF | REHOLE | | | | | | | 3.00 |
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| Ret | | Flus Type | | To Depth | From | Chiselling To | Time(hr | Wa) From | ter Adde | ed o | Struck | | d-water Time(mins | Cut Off | Diam | To D Boring | Depth Casing | Locatio | n: | E 2382 | 11.5 | |
| Road, Dean | | | | | | | | | | | | | | | 125 | 3.00 | 3.00 | Level: | | N 6817 - | 39.1 | |
| Nairn | | | | | | | | | | | | | | | | | | Orienta | tion: | Vertical | | |
| Rer | marks: | | | | | | | • | Eq Da | uipm rt | ent: | • | | Method Inspect | : ion Pit to | | 1.20m | Boreho | le No: | | | |
| Joenix Drilling | T refusa | al ar | nd n | o recove | ry at SPT | at 3.0 m | depth. | | | - | | | | Windov | v Sample | erto (| 3.00m | | | WS ² | 12 | |
| :58 PI | | | | | | | | | | | | | | | | | | Contra | ct No: | 2304 | 1 | |
| 7 16:33 | Driller | \top | | iginator | | | | | ₽∩ | PE | :HOI | F RF | CORD | <u> </u> | | | | Contra | CL INU. | 230 ² Part | † | |
| Printed: 13/06/2017 16:33:58 Phoenix Drilling Ltd. 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | RB ik & App SG | | S | MM Status | | | | | | 'I XL | | e 1:50 | | | | | | | The state of the s | Fig. No |). | |
| Printec | SG | | F | inal | | | | 1 | WES | TR | IVERS | SIDE, B | ALLOC | CH | | | | 4 | 1/7 | Sheet | 1 of 1 | |

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| Progress | S | ample. Depth | Samples and | d Tests | _Casing Depth | Level (mOD |) Depth | | | De | scription | of Strata | | | | Legend | Water Depth | log | ckfill Depth |
|--|-----------|--------------------|---------------------------------------|--------------------------------|------------------|---------------|-----------|------------------------|---|------------------------------|--------------|------------------------|------------------------|------------------------|---------------------|----------|-------------------|--------|-----------------|
| 3/2 201 | 2 17 | | B, J, T, V | | | | 0.10 | medium | n organic gra of various lith | ologies. | | | | | | <u> </u> | | 1.11.1 | 0.20 |
| | | | J, T, V B, J, T, V | | | | - | CLAY with sandston | m light browr th intermediat e and other li | te plasticity ithologies. | . Gravel is | flat suban | gular fine t | o medium | of | | | | |
| | | 1.20 | SPT=10 2.2/2.3.3. T | <u>2</u> | 1.20 | | - | | | | | | | | | <u> </u> | | | |
| | | 2.20 | B, T SPT=14 <u>4.4/4.3.4.</u> T | <u>3</u> | 2.20 | | 2.20 | Medium | dense brown | silty gravel | ly fine to m | edium SA | ND. Grave | l is cubic t | 0 | × · | | | |
| | | 2.60 | B SPT= 7.15/15.5 | 0 | 2.70 | | 2.70 | elongate lithologie | d subangular | fine to coar | rse of sand | stone, igr | neous rock | and other | | × | | | 2.70 |
| | | | | | | | 3.00_ | | | EN | D OF BOF | REHOLE | | | | | | | 3.00 |
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| Vest Lothian | | | | | | | - | | | | | | | | | | | | |
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| eans Indus | etur | | Flush Type To Depth | Ch From | iselling To Tin | me(hr) Fro | ater Adde | o Struc | | d-water Time(mins | Cut Off | Diam 125 | To D Boring 3.00 | epth Casing 2.70 | Location | | E 23826 N 6817 | | |
| n Road, D | | | | | | | | | | | | | | | Level: | | - | | |
| td, 2 Nair | | arks: | | | | | | uipment: | | | Method | | | | Orientat Borehol | | Vertical | | |
| Printed: 13/06/2017 16:33:59 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY | De: PT | scriptio refusa | on based on dril Il and no recove | llers records ry at 2.7 m o | s. depth. | | Da | π | | | | ion Pit to v Sample | | l.20m 3.00m | | | WS1 | 3 | |
| :33:59 P | | | | | | | | | | | | | | | Contrac | t No: | 2304 | ļ | |
| 13/06/2017 16 | F | iller RB | Originator MM | | | | ВО | | LE RE(ale 1:50 | CORD |) | | | | | | Part Fig. No |). | |
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| Progress | 5 | Sample Depth | Samples and | | Casing Depth | Level (mOD) | Depth | | | De | scription o | of Strata | | | | Legend | Water Depth | 8 | ckfill Depth |
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| 3/2 20 | 2 17 | | B, J, T, V J, T, V | | | | 0.10 | to coarse o | organic gra f sandstone wn silty grav sandstone a | , igneous r | ock and oth | her litholo | gies. | | | \$ · | | | 0.20 |
| | | 1.00 | B, J, T, V SPT=33 4.6/6.9.9. | 9 | 1.20 | | - | medium of | sandstone a | and igneou | s rock. | | | | | × • × • × • × • × • × • × • × • × • × • | | | |
| | | 1.20 | T | _ | 1.25 | | 1.65 - | Dense grey elongated s lithologies. | <i>i</i> ish brown s subangular t | silty sandy t | fine to med | lium GRA dstone, ig | VEL. Grave | el is flat to and other | | ×0 | T | 0 | |
| | | | B, T SPT=41 <u>10.10/9.1</u> T | <u>0.11.11</u> | 2.20 | | | ilulologies. | | | | | | | | | | | |
| | | | B SPT= <u>10.12/50</u> | | 3.00 | | 3.00 | Light brown subangular No recover | n to brown s fine to coar y for SPT. | se of igned | y medum S bus rock an D OF BOR | nd other lit | avel is flat t thologies. | o elongate | | × | | | 3.00 3.15 |
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| drilling.co.uk | | | | | | | - | | | | | | | | | | | | |
| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | - | | | | | | | | | | | | |
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| othian, EH54 | | | | | | | - | | | | | | | | | | | | |
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| l Estate, Livin | | | | | | | - | | | | | | | | | | | | |
| Industria | etur | | Flush Type To Depth | | selling To Tim | Wane(hr) Fron | ater Adde | d Struck | Ground Rose To | d-water Time(mins | Cut Off | Diam | To D | epth Casing | Location |] n: | E 2382 ² | 14.5 | |
| ad, Deans | otui | 110 | Туре То Верш | Trom | | ic(iii) | | 1.50 | 1.50 | 20 | out on | 125 | 3.15 | 3.00 | Level: | | N 68168 - | | |
| Nairn Ro | | | | | | | | | | | | | | | Orientat | ion: | Vertical | | |
| g Ltd, 21 # 33 | De | arks: scription | on based on dril | lers records. | · ,, | <u> </u> | Eq. Da | uipment: rt | 1 | I | | on Pit to | | I.20m | Borehol | e No: | | | |
| hoenix Drillin | ۲۱ | retusa | al and no recove | ry at 3 m dep | otn. | | | | | | VVIIIQOW | v Sample | ज्ञा () | 3.15m | | | WS1 | 4 | |
| 33:59 F | | | | | | | | | | | | | | | Contrac | t No: | 2304 | ļ. | |
| Printed: 13/06/2017 16:33:59 Phoenix Drilling Ltd. 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY | ı | riller RB | Originator MM | | | | ВО | REHOL Scal | E RE(e 1:50 | CORD |) | | | | | | Part Fig. No |). | |
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| Progress | Sa | mple, | Type | | - | d Tests sult | Casin | | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | ackfill Depth |
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| 3/2 201 | 7 | | |) J, T, ' | | <u> </u> | Вора | | | 0.10 | | TOPSOIL. | organic slig | ghtly gravel medium of | lly sandy C | CLAY with | roots. Grav | vel is flat to | , | <u> </u> | | Š | |
| | 0 | | | Γ, V | | | | | | 0.60 | | | | velly slightli | | | | | | <u></u> | | 0.0 | 0.50 |
| | | | | J, T, ' T=29 | V) <u>2.4/6.7.7</u> | <u>.9</u> | 1.20 | | | - | - | oabago | | 000.00 | a. 140101.10, | .90000 | 50K G. G. | ioi iii iioiog | | | | | |
| | 1 | .50 | T B | | | | | | | 1.70 | | | | | | | | | | | | | 1.70 |
| | 1 | .70 | SP | Τ= | 50/ | | 1.70 | | | _ | | | | EN | ID OF BOF | REHOLE | | | | | | | |
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| 8AY E-m | | | | | | | | | | | | | | | | | | | | | | | |
| an, EH54 | | | | | | | | | | - | | | | | | | | | | | | | |
| Vest Lothi | | | | | | | | | | | - | | | | | | | | | | | | |
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| Industrial | eturn | | Flus Typ | | To Depth | From | Chiselling To | Time(hr | Wa) From | ter Add | ed To | Struck | Ground Rose To | d-water Time(mins | Cut Off | Diam | To E | Depth Casing | Location | n: | E 23816 | 6.8 | |
| ad, Deans | | | ,,, | | | | | | | | - | | 333.3 | 2,3330 | | 125 | 1.70 | 1.70 | Level: | | N 68166 | | |
| Nairn Ro | | | | | | | | | | | | | | | | | | | Orienta | tion: | Vertical | | |
| Hing Ltd, 2 | ema Desc PT re | criptio | on al a | base | d on dr | llers recor ery at at 1.7 | ds. ' m depth | _ | | Ec Da | luipm art | ent: | | | | : ion Pit to v Sample | | 1.20m 1.70m | Borehol | e No: | | | |
| hoenix Dri | | | | | | | | | | | | | | | | | | | | | WS1 | 5 | |
| 34:00 PF | | | | | | | | | | | | | | | | | | | Contrac | ct No: | 2304 | <u> </u> | |
| 3/2017 16: | Dril R | | | | inator /IM | | | | | ВС | RE | | E RE(| CORD |) | | | | all a | d'a | Part Fig. No | ı. | |
| Printed: 13/06/2017 16:34:00 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | Chk 8 | k App G | + | St F i | atus i nal | | | | , | W/ES | TP | | | ALLOC | ` | | | | | | | | |
| Prin | | | | | | | | | , | vv 🗅 S | ıK | IVERS | יוט⊏, מ | MLLUC |) I | | | | " | ľ | Sheet | of 1 | |

| Progress | Sample Depth | I q | | | nd Tests esult | Casin Depti | ~ | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Balloquis | ckfill Depth |
|---|---------------------------|----------|--------------------|------------------------|------------------------------|------------------|--------|----------------|-------------------|-------------|-----------------------|----------------------------|---|------------------------------|-----------------------------|------------------------|-------------------|-------------------|--|------------------|------------|-----------------|
| 8/2 201 | 7 0.25 0.50 | B, | J, T, ^v | V | | | | | 0.30 | eloı | t brown c | ubangular | ghtly grave fine to coa o dark grey I coal trace | rse of vario | us litholog | jies. (TOP: | SOIL). | | | | | 0.20 |
| | 1.00 | B, | | 2.2/1.1. | <u>1.1</u> | 1.20 | | | - - | ign | eous rock | k, coal frag | ments and | other litho | logies. | ngulai iine | or sarios | orie, | | | | |
| | 1.80 | J, | | | | | | | 1.50 ⁻ | Ext | remely so | oft grey to | black claye | ey sandy Pl | EAT with b | orown sand | dy clay lens | ses. | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | | | |
| | 2.00 2.00 | SF B, | PT=0 T | 0.0/0.0. | <u>0.0</u> | 2.00 | | | - - - | | | | | | | | | | 77 7 7 77 77 7 | | | |
| | 3.00 3.00 | SF B, | T=13 T | 2.2/2.3. | <u>3.5</u> | 3.00 | | | 2.80 | Me with | dium den n sandy s | se light br ilt lenses. | own sligthl | y silty grav | elly to very | y gravelly r | medium S/ | AND | | | | |
| | 4.00 | | ν= | <u>50/</u> | | 4.00 | | | 4.00 | | | | EN | ID OF BOF | REHOLE | | | | | | | 4.00 |
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| og.co.uk Tel: 0 | | | | | | | | | - - - | - | | | | | | | | | | | | |
| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | - - - | - | | | | | | | | | | | | |
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| thian, EH54 8A | | | | | | | | | - - - | - | | | | | | | | | | | | |
| gston, West Lot | | | | | | | | | - - - | | | | | | | | | | | | | |
| al Estate, Living | | | | | | | | | - | | | | | | | | | | | | | |
| Deans Industri | turns | Flus | | To Depth | | Chiselling To | Time(h | | iter Adde | ed o | Struck | Ground Rose To | d-water Time(mins | Cut Off | Diam 125 | To E Boring 4.00 | Depth Casing 4.00 | Location | | E 2384 N 6819 | | |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY | | | | | | | | | | | | | | | | | | Level: Orienta | | - Vertical | | |
| 97 tq | | tion | | | illers recor ery at at 4. | | ٦. | | Eq Da | uipme rt | ent: | | | Method Inspecti Windov | : ion Pit to v Sample | erto 4 | 1.20m 4.00m | Borehol | ie No: | WS1 | 16 | |
| 3:34:01 Phoe | | | | | | | | | | | | | | | | | | Contrac | ct No: | 2304 | 1 | |
| 13/06/2017 16 | Driller KG hk & App | n | 1 | jinator ∕IM atus | | | | | ВО | RE | | E RE(1:50 | CORE |) | | | | | | Part Fig. No |) . | |
| Printed: | SG | ۲ | F | inal | | | | , | WES | T RI | VERS | IDE, B | ALLO | CH | | | | | N. | Sheet | 1 of 1 | |

| Progress | Sa | ample. Depth | Samples an | d Tests | Casing Depth | | Level mOD) | Depth | Description of Strata Water Depth | Backfill | |
|--|-----------|-----------------|-------------------------------------|----------|--------------|--------|---------------|------------------|---|----------|-----|
| 14 <i>)</i> 201 | 0 | .00 | B, J, T, V B SPT=18 4.4/4.5.4 | <u>5</u> | 1.20 | | | 0.05 / 0.20 1.20 | #TOPSOIL. #Ash fill (MADE GROUND) Dark brown very organic silty gravelly medium to coarse SAND with low cobble content and rootlets. Gravel is elongated subangular to subrounded fine to medium of sandstone and other lithologies. Cobbles are elongated subangular of sandstone. Light brown silty slightly gravelly medium SAND with low cobble content. Gravel is flat to elongated angular to subangular sandstone and other lithologies. Cobbles are elongated subangular of sandstone. Medium dense light yellowish brown slightly silty medium SAND and GRAVEL. | | |
| Printed: 13/06/2017 16:34:01 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 교육 및 고기 문 및 및 및 고기 문 및 기계 및 | | F | - - Iush | Chic | selling | | I Water | 1.60 | END OF BOREHOLE END OF BOREHOLE To Death | 1.6 | 35_ |
| Nairn Road, Deans In | eturn | | Type To Depth | | | me(hr) | From | | | | |
| 01 Phoenix Drilling Ltd, 2 | | criptio | on based on dri ruction at 1.6 m | | | • | | Eqi Dai | Window Sampler to 1.65m WS1 | | |
| 3/06/2017 16:34: | Dril K | G | Originator MM | | | | | ВО | PREHOLE RECORD Scale 1:50 Contract No: 2304 Part Fig. No. | | |
| Printed: 1 | Shk 8 | & App G | Status Final | | | | ٧ | WES ⁻ | T RIVERSIDE, BALLOCH | 1 of 1 | |

| Progress | 55.60 | Sample Depth | Type | Samp | | d Tests | | asing epth | | Level (mOD) | Depth | 1 | | | Des | scription | of Strata | | | | Legend | Water Depth | Ballodmy8 | ackfill Depth |
|------------------------|----------|------------------------------|---------------|--------------------|-----------------|-----------------------|---------|---------------|-------|----------------|---------|------------------|--|---|---|---|---------------------------------------|------------------------------------|--------------------------------------|------------------------|--------|------------------------------------|-----------|------------------|
| 14. 20 | /2 17 | | B, J | T, V | 110 | Jun | | -γu1 | | | 0.20 | | #TOPSOIL. Dark brown o content. Gravisandstone and sandstone sandsto | rganic silt el is elong d other lith d igneous | y gravelly ated suba nologies. C rock. | medium to ngular to s Cobbles are | coarse S. subrounde e flat suba | AND with itd fine to mangular to s | medium co nedium of subrounder | obble d of | ×0 | | 0 0 | - |
| | | 1.00 1.20 | B SPT T | =14 | 2.3/3.3.4 | .4 | 1 | 1.20 | | | 1.20 | - N | Medium dens GRAVEL. Gra gneous rock | avel is elor | ngated sub | oangular to | vn slightly subround | silty mediu ded fine to | ım SAND a coarse of | and quartz, | × | | | |
| | | 2.00 2.00 | SPT B, T | =22 | 3.4/5.5.6 | <u>.6</u> | 2 | 2.00 | | | | | | | | | | | | | | | | |
| | | 3.00 3.00 | SPT B, T | =43 | 11.11/12 | .14.8.9 | 3 | 3.00 | | | 3.45 | - | | | ENI | D OF BOR | PEHOLE | | | | b | | | 3.10 |
| | | | | | | | | | | | | | | | LIV | D OF BOIL | ALI IOLL | | | | | | | |
| 06 41 1448 | | | | | | | | | | | | | | | | | | | | | | | | |
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| an, EH54 8AY E-m | | | | | | | | | | | | | | | | | | | | | | | | |
| ngston, West Lothia | | | | | | | | | | | | - - - - | | | | | | | | | | | | |
| idustrial Estate, Livi | | | Flush | | | Т | Chisell | ing | | I Wa | ter Ado | led | | Ground | -water | | | То Е | Depth | I | | | | |
| lairn Road, Deans Ir | etur | | Type | To | Depth | | То | | me(hr | | | То | Struck | Rose To | | Cut Off | Diam 125 | Boring 3.45 | Casing 3.10 | Locatio Level: Orienta | | E 2386: N 6818 - Vertical | | |
| 늴# | De | arks: escripti el obst | ion b | ased on a | on dri 3.1 m | llers recor depth. | rds. | | | 1 | E D | quipm art | ment: | | | Method Inspecti Windov | : on Pit to v Sample | | l 1.20m 3.45m | Boreho | le No: | WS1 | 8 | |
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| : 13/06/2017 16 | ı | oriller KG | | Origii M Sta | M | | | | | | ВС | ORE | Scale | | ORD | | | | | | | Part Fig. No |). | |
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| <u>_</u> | Sample Depth | Type | | d Tests sult | | sing epth | | Level (mOD) | Depth | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | ackfi De |
|------------|-----------------|---------------|----------------------|-----------------|---------------|--------------|--------|----------------|------------------|---------|--|----------------------|-------------------|-------------------|----------------|-------|----------|----------|--------------------|--------|-------------|
| 4/2)17 | 0.25 | B, J, T, | V | | | | | | 0.30 - | | brown orgar ar fine of vari greyish brow subangular | | | | | | is | | | | |
| | 1.00 | В | | | | | | | 1.00 | | | EN | D OF BOF | REHOLE | | | | <u> </u> | | | 1. |
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| Retu | | Flush Type | Γο Depth | From | Chisell To | ing Tin | ne(hr) | | ter Added | | Ground Rose To | d-water Time(mins | Cut Off | Diam | To D Boring | Depth | Location | | E 23859 N 68199 | | _ |
| | | | | | | | | | | | | | | | | | Level: | | - Vertical | 97.0 | |
| | narks: | n at 1.0 | m denti | <u> </u> | | | | | Equ Dan | ipment: | | | Method Inspect | l: tion Pit to | | 1.00m | Borehole | | v Ci tical | | |
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| | Orillor | 0- | ingto: | ı | | | | | | | | | | | | | Contract | No: | 2304 | | _ |
| | Oriller KG | 1 | ginator MM | | | | | | BOI | | _E RE(| CORD |) | | | | | | Part Fig. No |). | |
| Chl | k & App SG | F | atus i nal | | | | | , | WEST | RIVER | SIDE, B | BALLOC | Н | | | | | (12 | Sheet 7 | | |

| ſ | ess | Sample | | ample | es and | d Tests | Casir | ıg | Level | | | | | | | | | | | pui | Water | | nckfill |
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| | Progress | Depth | ו ט ו | | Res | sult | Dept | | (mOD) | ⊔epth | | | | De | scription | ot Strata | | | | Legend | Depth | Symbol | Depth |
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| | | | | | | | | | - | 0.30 | #: | SAND and | GRAVEL. | = | | | | | | 6. h | | | |
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| | | 1.20 | SPT: | =18 2.3 | 3/4.4.5. | 5 | 1.20 | | | 1.10 | - M | edium der | nse brown t | to greyish t bangular to | orown silty | fine to m | edium SAN | ND and GF | RAVEL. | 0. 1. t | | | |
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| Indus | Det | | Flush | Tor |)enth | | Chiselling | Timo/h- | Wat | ter Add | | Struck | Ground | d-water Time(mins | Cut O" | Diam | To D | Depth | Locatio | n: | <u> </u> | | |
| eans | ret | urns | Type | 10 L | Depth | From | То | Time(hr |) From | | To | Struck | RUSE 10 | , iiie(mins | , Cul Off | 125 | Boring 2.00 | Casing 2.00 | 1 | | | | |
| oad, D | | | | | | | | | | | | | | | | | | | Level: | | - | | |
| irn Rc | | | | | | | | | | | | | | | | | | | Orienta | ition: | Vertical | | |
| 2 Na | Por | narks: | | <u> </u> | | | | | | F | uinm | ent. | | | Method | | | | Boreho | | v ci ucal | | |
| ng Ltd, | # D | escrint | ion ba | sed o | n dril | lers recor | rds. | | | Da | quipm art | CIIL. | | | Inspect | : ion Pit to v Sample | er to | 1.20m 2.00m | boreno | IC INO: | | | |
| Drillin | ⊔ar | rel obs | ıructio | on at 2 | u.υ m. | ueptn. | | | | | | | | | v v ii iuUV | • oampit | .ı. (U 2 | 00111 | | | WS1 | 19A | |
| oenix | | | | | | | | | | | | | | | | | | | | | | , . | |
| 3 Ph | | | | | | | | | | | | | | | | | | | | | | | |
| 3:34:0, | | | | | | | | | | | | | | | | | | | Contra | ct No: | 2304 | 1 | |
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| /06/20 | | | | | | | | | | | | Scale | 1:50 | | | | | | 2 | R. | Fig. No |) . | |
| 3d: 13, | Ch | ık & App | | Statu | s I | | | | | | | | | | | | | | 3 | (LE | | | |
| Printed: 13/06/2017 16:34:03 Phoenix Drilling Ltd. 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | 55 | | | " | | | | 1 | WES | TR | IVERS | SIDE, B | ALLOC | H | | | | "\ | 1, | Sheet | 1 of 1 | |
| | | | - 1 | | | | | | | | | | | | | | | | 1 | | | | |

| Soft dark brown organic gravelly sandy clay with roots. Gravel is flat to elongated subangular to subangular fine of various lithologies. (TOPSOIL) 1.00 B 1.20 SPT =11 3.2/2.3.3.3 1.20 Medium dense light greyish brown slightly silty medium SAND and GRAVEL. Gravel is elongated subangular to subrounded fine to coarse of quartz, gneous rock and other lithologies. Medium dense light greyish brown slightly silty medium SAND and GRAVEL. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Soft dark brown organic gravelly sandy clay with roots. Gravel is flat to elongated subangular to subrounded subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Medium dense light greyish brown slightly silty medium SAND and GRAVEL. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Soft dark brown organic gravelly sandy clay with roots. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Soft dark brown organic gravelly sandy clay with roots. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Soft dark brown organic gravelly sandy clay with roots. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Soft dark brown organic gravelly sandy clay with roots. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. Soft dark brown organic gravely and other lithologies. | Progress | s | ample Depth | Type | amples ar | nd Tests esult | Casin Depth | 1 1 | Level (mOD) | Depth | ו | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | ackfill Depth |
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| 1.00 B 1.20 SPT=11 3.2/2.3.3.3 T 1.20 Medium dense light greyish brown slightly silty medium SAND and GRAVEL. Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. 2.00 SPT=12 2.2/3.3.2.4 B, T 2.90 B END OF BOREHOLE | 13/: 201 | 2 | 0.25 | | Γ, V | | | | | 0.45 | - su | oft dark br ubangular f | own organ ine of vario | ic gravelly ous litholog | sandy clay jies. (TOPS | y with root SOIL) | s. Gravel is | s flat to elo | ngated | | | 1 1 1 1 | 0.20 |
| 1.00 SPT=11 1.20.2.8.2.8.2. 1.20 | | | | | | | | | | 0.45 | | own silty rubrounded | nedium SA fine to coa | ND and G rse of qua | RAVEL. G rtz, igneou | Fravel is el s rock and | ongated su | ubangular t ologies. | to | . b. ' | | | 0.50 |
| T Gravel is elongated subangular to subrounded fine to coarse of quartz, igneous rock and other lithologies. 2.00 SPT=12 22/3.3.2.4 B, T 2.90 B END OF BOREHOLE | | | | | 44.0.0/0.0 | | 4.00 | | | 1.20 | | | | | | | | | | 0, 0, | | | |
| 2.00 SPT=12 2.2/3.3.2.4 2.00 | | | 1.20 | T T | :11 <u>3.2/2.3.</u> | <u>3.3</u> | 1.20 | | | | - G | ravel is eld | ngated sul | oangular to | n slightly s subround | ilty mediu led fine to | m SAND a coarse of | ind GRAVE quartz, ign | EL. leous | 0. 0. | | | |
| 2.90 B END OF BOREHOLE | | | 2 00 | SPT= | -12 2.2/3.3.2 | 2.4 | 2.00 | | | | | | | | | | | | | p t | | 9 | |
| 2.90 B END OF BOREHOLE | | | 2.00 | B, T | | | 2.00 | | | | - | | | | | | | | | b t | | | |
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| 1 | | | 2.90 | В | | | | | | | - | | | EN | D OF BOF | REHOLE | | | | | | | |
| Remarks: Remarks Flush Type To Death Flown To Interim From To Struck Rose To Interim Remarks Location Level: - Vertical | | | | | | | | | | | | | | | | | | | | | | | |
| Return Type To Depth From To Struck Rose To Investmin Cut Off Diam Solid Contract No. 2.9 m depth Depth Contract No. 2.9 m depth Dep | | | | | | | | | | | } | | | | | | | | | | | | |
| Returns Type. To Death From To Timeshy). From To Struck Rose to Innocenses. Cut off Dam Boring Casing. Location: E 23861.6 N 682021.0 Level: Orientation: Vertical Barrel obstruction at 2.9 m depth. Equipment: Dart Method: Inspection Pit to 1.20m Window Sampler to 2.50m WS20 Contract No: 230.4 Part Fig. No. Part Fig. No. Part Fig. No. | | | | | | | | | | | | | | | | | | | | | | | |
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| Returns Type To Depth From To Translers Flush From To Struck Rose to Insciences Cut Off To Depth From No Re2021.0 Remarks: Barrel obstruction at 2.9 m depth. Differ Kg | 506 4114 | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: Barrel lobstruction at 2.9 m depth. Boundary Boundar | Tel: 01 | | | | | | | | | | - | | | | | | | | | | | | |
| Returns Type to Depth From To Time(m) From To Struck Rose To Time(mins) Cut Off Diam Boring Casing Location: E 238561.6 N 682021.0 Level: - Orientation: Vertical Barrel obstruction at 2.9 m depth. Diffiliar Chik A App Status Status Status Struck Rose To Time(mins) Cut Off Diam Diam Rose To Time(mins) Cut Off Diam Rose To Time(mins) Cut Off Diam Rose To Time(mins) Cut Off Diam Rose To Time(m | ling.co.uk | | | | | | | | | | - | | | | | | | | | | | | |
| Returns Type To Depth From To Struck Rose To Time(thr) From To Struck Rose To Time(mins) Cut Off 125 2.90 2.90 Remarks: Barriel obstruction at 2.9 m depth. Borehole No: Diffler KG MMM BOREHOLE RECORD Scale 1:50 BOREHOLE RECORD Scale 1:50 WEST RIVERSIDE, BALLOCH | oenixdril | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: Barrel obstruction at 2.9 m depth. Barrel obstruction at 2.9 m depth. Dark Da | : info@pt | | | | | | | | | |] | | | | | | | | | | | | |
| Returns Type To Depth From To Time(tr) From To Struck Rose To Time(mins Out Off 125 2.90 2.90 Location: E 238561.6 N 682021.0 Level: - Orientation: Vertical Barrel obstruction at 2.9 m depth. Dillier KG MM BOREHOLE RECORD Scale 1:50 Status Shape Status S | / E-mail | | | | | | | | | | | | | | | | | | | | | | |
| Plush Plus | H54 8A | | | | | | | | | | | | | | | | | | | | | | |
| Part | Lothian, E | | | | | | | | | | - | | | | | | | | | | | | |
| Returns Type To Depth From To Struck Rose To Time(mins Cut Off Diam To Depth No Reacount N | on, West | | | | | | | | | | - | | | | | | | | | | | | |
| Flush Type To Depth From To Time(thr) From To Struck Rose To Time(mins) Cut Off 125 2.90 2.90 Level: - Orientation: Vertical | Livingsto | | | | | | | | | | | | | | | | | | | | | | |
| Flush Chiselling Water Added Ground-water To Depth From To Struck Rose To Time(mins Cut Off Diam Boring Casing Location: E 238561.6 N 682021.0 | al Estate, | | | | | | | | | | | | | | | | | | | | | | |
| Remarks: Barrel obstruction at 2.9 m depth. Dart Diller Remarks Dart | s Industri | etur | | | To Depth | | | Time(hr | | | | Struck | | | Cut Off | Diam | | | Locatio | n: | E 23856 | 61.6 | |
| Remarks: Barrel obstruction at 2.9 m depth. Dart Dart | ad, Dean | | | | | | | | | | | | | | | 125 | 2.90 | 2.90 | Level: | | N 68202 - | 21.0 | |
| Remarks: Barrel obstruction at 2.9 m depth. Equipment: Dart Method: Inspection Pit to Window Sampler to 1.20m 2.90m WS20 Contract No: 2304 Driller KG MM Scale 1:50 Dart Borehole No: Contract No: 2304 Part Fig. No. | Nairn Ro | | | | | | | | | | | | | | | | | | | tion: | Vertical | | |
| WS20 Contract No: 2304 Part Fig. No. Chk & App Status SG Final WS20 WS20 Contract No: 2304 Part Fig. No. | Ba Ltd, 2 | | | ructio | n at 2.9 n | n depth. | | | ' | E O | quipm art | ent: | | | Inspecti | ion Pit to | er to | 1.20m 2.90m | Borehol | e No: | | | |
| Contract No: 2304 Driller KG Originator MM BOREHOLE RECORD Scale 1:50 Part Fig. No. WEST RIVERSIDE, BALLOCH | enix Drilli | | | | | | | | | | | | | | | - wpic | 4 | | | | WS2 | 20 | |
| Driller KG Originator KG MM BOREHOLE RECORD Scale 1:50 Chk & App Status SG Final WEST RIVERSIDE, BALLOCH | 03 Phoe | | | | | | | | | | | | | | | | | | Combin | nt NI= : | 220 | | |
| Scale 1:50 Scale 1:50 Fig. No. WEST RIVERSIDE, BALLOCH | 17 16:34: | | | | | | | | | BC | ORE | HOLI | E REC | CORD |) | | | | Contrac | ct No: | | • | |
| SG Final WEST RIVERSIDE, BALLOCH | 13/06/20 | | | | | | | | | | | | | | | | | | | | Fig. No |). | |
| Sheet 1 of 1 | Printed: | nk S | & App SG | | Final | | | | , | WES | ST R | IVERS | IDE, B | ALLOC | Н | | | | | J. | Sheet ' | 1 of 1 | |

| 100 20 100 | <u>5</u> | Sample Depth | <u> </u> | amples | s and Resu | | Casir Dept | -1 | Level (mOD) | Depth | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | nckfill Depth |
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| Solution | 017 | 0.25 | B, J, | T, V | | | | | | | Brown slig | ghtly organic | c silty gravel lar to subro | lly medium unded fine | to coarse of sandst | e SAND wit one and ot | th rootlets. ther litholog | Gravel gies. | жо . • | | 0 0 | 0.20 |
| Solution Flush F | | | | =10 <u>1.2/</u> | / <u>2.2.3.3</u> | | | | | 1.00 | to coarse | SAND. Grav | vel is elonga | wn slightly ated suban | silty grave gular to si | elly to very ubrounded | gravelly m | nedium edium of | ρ | | | |
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| Solution | | | | | | | | | | 5 00 | lithologies | ed subangui s. | iai to subio | unaea ime | to mediui | II OI Salius | ione and c | ou lei | ٥ | | | 5.00 |
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| WEST RIVERSIDE, BALLOCH Sheet 1 of | Cri | O A : | \perp | Ctct | } | | | | | | | - | | | | | | 3 | | _ | | |
| 5 '∀' Sheet 1 of | | | ' | Final | i | | | | , | WES | TRIVER | SIDF F | 341100 | ЭН | | | | 3) | | | | |
| | | | | | | | | | | 0 | | .J.J., L | | | | | | '' | • | Sheet | 1 of 1 | |

| Progress | Sample Depth | e | amples an | d Tests | Casin Depti | ັ | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | 9 | ockfill Depth |
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| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | - - - - | | | | | | | | | | | | | |
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| g Ltd, | ‡ De | narks: escripti | on ba | sed on dr | illers recor | ds. | | | Eq Da | quipme art | ent: | | | Method | ion Pit to | | 1.20m | Borehole | e No: | | | |
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| 3/06/2 | | | | | | | | | | | Scale | 1:50 | | | | | | 3 | | Fig. No |). | |
| Printed: 13/06/2017 16:34:05 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | Chl | c & App SG | | Status Final | | | | , | WES | T PI | \/ED9 | IDE P | ALLOC | `H | | | | | (12 | | | |
| Prin | | | | | | | | ' | v v 🗀 S | , i (%) | IV ERS | יוטב, ם | ALLUC | <i>)</i> | | | | " | ľ | Sheet ' | 1 of 1 | |

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| BLtd. | marks: Descript | ion b | ase | d on dri | llers reco | rds. | | | Da | luipm irt | ient: | | | Method Inspect | l: ion Pit to v Sample | ar to | 1.20m 3.10m | Boreho | ie No: | | | |
| Printed: 13/06/2017 16:34:05 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | i refusa | aı an | a n | o recove | ry at 3.1 r | п aepth. | | | | | | | | v v II IUOV | w Оантріє | ਗ (| o. IUIII | | | WS2 | 24 | |
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| Progress | Sample Depth | ē | Samples | s and Resu | | Casi | -1 | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Pod | nckfill Depth |
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| 15/2 201 | 0.25 | | , T, V | | | | | | 0.50 | Gra | avel is flat | t to elonga | nic gravelly ated subang ngular of ig | gular fine o | figneous i | rock and c | content and other litholo | d roots. ogies. | | | a | 0.20 |
| | 1.00 | B, T SP1 T | - =15 <u>4.4/</u> | <u>4.4.3.4</u> | | 1.20 | 0 | | 1.15 | elor and Mer SAI | ngatéd si I other litl dium der ND. Grav | ubangular hologies. nse light br | rown to gree o elongated ne and other | yish brown | coarse of | sandston | e, igneous | rock | b. b. | | | 0.30 |
| | 2.00 2.00 | SP1 B, T | =11 <u>2.2/</u> | 2.3.3.3 | | 2.00 |) | | 2.10 - - | Med med fine | dium den dium to d to coars | nse to dens coarse SAI se of igneo | se light bro ND. Gravel us rock, sa | wn to grey is flat to el ndstone, q | ish brown ongated s uartz and | slightly sil ubangular other litho | ty gravelly to subroui ologies. | nded | ρ | | | |
| | 3.00 3.00 | SP1 B, T | =17 <u>2.3/</u> | <u>4.4.4.5</u> | | 3.00 | | | - - - - | | | | | | | | | | | | | |
| | 4.00 4.00 | SP1 B, T | =31 <u>5.6/</u> | 6.8.8.9 | | 4.00 | 0 | | - | | | | | | | | | | ٥ | | | |
| | | | | | | | | - | 4.45 - | | | | EN | ID OF BOF | REHOLE | | | | • | | | 4.45 |
| 06 41 1448 | | | | | | | | | - - - | - | | | | | | | | | | | | |
| .co.uk Tel: 015 | | | | | | | | | - - | - | | | | | | | | | | | | |
| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | - | - | | | | | | | | | | | | |
| | | | | | | | | | - - - | - | | | | | | | | | | | | |
| thian, EH54 8A` | | | | | | | | | - | - | | | | | | | | | | | | |
| igston, West Lo | | | | | | | | | - | - | | | | | | | | | | | | |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY | | | | | | | | | - - - | - | | | | | | | | | | | | |
| snpul st | turns | Flush Type | | epth | From | Chiselling To | Time(h | | iter Adde | ed To | Struck | | d-water Time(mins | Cut Off | Diam | Boring | Depth Casing | Location | 1 n: | <u> </u> | 1 | |
| ad, Dear | | | | | | | | | | | | | | | 125 | 4.45 | 4.00 | Level: | | | | |
| lairn Ro | | | | | | | | | | | | | | | | | | Orienta | tion: | - Vertical | | |
| E Ke | marks: rrel refu | ısal a | it 4.0 m | depth | 1. | | | <u> </u> | Eq Da | uipme rt | ent: | | | | L : ion Pit to v Sample | | 1.20m 1.45m | Borehol | e No: | WS2 | 24A | |
| 06 Phoeni | | | | | | | | | | | | | | | | | | | | 000 | | |
| 16:34:(| Driller | Т | Originate | or | | | | | RO | DE | HOU | F DE | CORD | <u> </u> | | | | Contrac | t No: | 2304 Part | } | |
| I: 13/06/2017 | KG | p | MM Status | | | | | | DO. | /INE | | E KEV e 1:50 | | , | | | | Was a series | The state of the s | Fig. No |). | |
| Printeo | SG ' | | Final | | | | | , | WES | T RI | VERS | SIDE, B | BALLOC | CH | | | | 4 | 7 | Sheet | 1 of 1 | |

| Progress | Sample Depth | e e | amples | s and Resi | | Cas De | ٦ | Leve (mOE | Depti | h | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | nckfill Depth |
|---|---------------------|------------------|------------------------------|---------------|----------|-----------------|-----------|--------------|-----------|-----------------|--------------------------------------|---|---|---|---------------------------------|----------------------|-------------------------------|--|---|------------------|------------|------------------|
| 15/2 2017 | 0.25 | B, J, | T, V | | | | | | 0.50 | - 0 | Fravel is fla | t to elonga | ic gravelly ted subang ngular of ig | ular fine o | figneous i | rock and c | ontent and i other litholo | roots. gies. | | | | 0.20 |
| | 1.00 | B, T SPT T | =13 <u>1.2/</u> | 3.3.4.3 | | 1.: | 20 | | | - L G - s | oose to me GRAVEL. G andstone, | edium dens iravel is eld igneous ro | se orangey ongated sul ck and othe | brown silty bangular to er lithologie | y clayey m o subround es. | edium to ded fine to | coarse SAN coarse of | ND and | 0.0.0 | | | 0.30 |
| | 2.00 | SPT | =22 <u>5.5/</u> | 5.6.5.6 | | 2.0 | 00 | | 2.00 | - N - iç | | | rown to gree elongated ne and othe | | | | | | ×0 | | | |
| | 2.00 | B, T | | | | | | | | - g | ravelly fine | to mediun | n SAND. G edium of igr | ravel is fla | t to elonga | ated subar | ngular to | , | | | | |
| | 3.00 | SPT B, T | =15 <u>3.4/</u> | 3.4.3.5 | | 3.0 | 00 | | | | | | | | | | | | | | | |
| | 4.00 4.00 | SPT B, T | =26 <u>2.3/</u> | 4.5.7.1 | <u>0</u> | 4.0 | 00 | | 4.45 | | | | | | | | | | | | ₩ ₩ | 4.00 |
| | | | | | | | | | 4.40 | - | | | EN | D OF BOF | REHOLE | | | | <u> </u> | | ×××× | 4.40 |
| 506 41 1448 | | | | | | | | | | - | | | | | | | | | | | | |
| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | - | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY | | | | | | | | | | - | | | | | | | | | | | | |
| ngston, West Lo | | | | | | | | | | - | | | | | | | | | | | | |
| trial Estate, Livi | | | | | | | | | | | | | | | | | | | | | | |
| inpul Re | | Flush Type | To De | epth | From | Chisellir To | g Time | | Vater Add | ded To | Struck | | d-water Time(mins | Cut Off | Diam | Boring | Depth | Locatio | | E 2386 | | |
| ad, Dea | | | | | | | | | | | | | | | 125 | 4.45 | 4.00 | Level: | | N 6820 - | /9.8 | |
| lairn Ro | | | | | | | | | | | | | | | | | | Orienta | tion: | - Vertical | | |
| Drilling Ltd, 2 N | marks: rrel refu | ısal a | 4.0 m | depth | า. | <u> </u> | 1 | | | quipn | nent: | <u> </u> | l | | : ion Pit to v Sample | | 1.20m 4.45m | Boreho | le No: | WS2 |)5 | |
| Printed: 13/06/2017 16:34:06 Phoenix Drilling Ltd, | | | | | | | | | | | | | | | | | | Contro | ot No: | | | |
| 7 16:34 | Driller | 1 | Originate | or | | | | | R(|)RF | -HOI | F RF | CORD |) | | | | Contrac | LI NO: | 230 ⁴ | t | |
| ed: 13/06/201 | KG nk & App SG |)) | MM Status Final | | | | | | | | Scale | 1:50 | | | | | | The same of the sa | San | Fig. No |) . | |
| Print | | | | | | | | | WES | šΓF | RIVERS | SIDE, B | ALLOC | .H | | | | " | 1, | Sheet | 1 of 1 | |

| | <u> </u> | Sample Depth | e | | es and | d Tests | | sing epth | | Level (mOD) | Depth | ו | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | ackfill Depth |
|---|--------------|----------------------|---------------------------|------------------------|------------------|-------------------|-----------|--------------|-------|----------------|---------|-----------------|--|---------------------------------------|---|---|---------------------------------------|--|--|-------------------|--|-------------------------------------|--------|------------------|
| 16 20 | 5/2)17 | 0.25 | | , T, V | | | | | | | 0.20 | | TOPSOIL. Orangey bro GRAVEL wit ubrounded | wn to grey h brown s fine to me | rish brown andy clay lo dium of sai | silty clayey enses. Gra ndstone, ig | / medium avel is elor neous roo | to coarse s ngated sub ck and othe | SAND and cangular to er lithologie | es. | | | | 0.20 |
| | | | B SP [*] T | Γ =24 <u>3.</u> | <u>4/5.7.6.</u> | <u>3</u> | 1 | .20 | | | 1.20 | M - wi to | ledium den vith brown s medium o | se greyish andy clay f sandston | lenses. Gra le, igneous | y clayey me avel is elor rock and c | ngated sub other lithol | coarse SAI bangular to logies. | ND and GF o subround | RAVEL led fine | | | | 1.70 |
| Printed: 13/06/2017 16:34:07 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | Flusi | | | | Chisell | ina | | ■ Wa | ter Add | | | Ground | J-water | | | Тог | Depth | | | | | |
| Road, Deans | <u>ketu</u> | irns | Туре | 101 | Depth | From | <u>To</u> | | me(hr |) From | 1 | To | Struck | Rose Io | Time(mins | Cut Off | Diam 125 | Boring 1.70 | Casing 1.70 | Locatio | | E 23870 N 6821 ⁻ - | | |
| td, 2 Nairn | | narks: | | | | | | | | | E | quipm | nent: | | | Method | <u> </u> | | | Orienta Boreho | | Vertical | | |
| 77 Phoenix Drilling Lt | : De Barr | escripti el refus | ion t isal a | pased o | on dril n dep | lers recor th. | rds. | | | | Di | art | | | | Inspecti Windov | ion Pit to v Sample | er to | 1.20m 1.70m | | | WS2 | | |
| 16/2017 16:34:C | | Oriller KG | T | Origina MN | | | | | | | BC | DRE | EHOLI Scale | | CORD |) | | | | Contra | ct No: | Part Fig. No | | |
| Printed: 13/0 | Chł | k & App SG |) | Statu Fina | ıs al | | | | | , | WES | STR | RIVERS | IDE, B | ALLOC | CH | | | | ¥, | A STATE OF THE STA | Sheet - | 1 of 1 | I |

| Progress | | Sample Depth | Type | | | nd Tests esult | Casir Dept | | Level (mOD) | Depti | 1 | | | De | scription | of Strata | | | | Legend | Water Depth | 9 | nckfill Depth |
|---|----------|-----------------|--|-------|----------------------|-------------------|------------------|---------|----------------|----------|--------------|--|-----------------------------|-----------------------------|-----------------------------|---------------------------|-------------------------|--------------------------|------------|--------|------------------|--------|------------------|
| 14, 20 | /2 17 | 0.25 | | J, T, | V | | | | | 0.20 | - ro | TOPSOIL. Park brown potlets. Gra chologies. | slightly org vel is elon | ganic silty f gated suba | ine to med angular fine | dium SAN e of quartz | D and GRA , sandston | AVEL with le and othe | | 0.0. | | | |
| | | 1.00 1.20 | B SF T | PT=22 | 3.4/5.5 | <u>.5.7</u> | 1.20 | | | 1.00 | N | ledium den Gravel is eld | se brown tongated sul | to greyish l bangular fi | brown silty ine of quart | sandy fine tz, sandste | e to mediu | m GRAVE ner litholog | L. ies. | | | | |
| | | 1.75 | SF | Υ= | 50/ | | 1.75 | | | 1.75 | - | | | EN | ID OF BOF | REHOLE | | | | ••• | | | 1.75 |
| | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | - | | | | | | | | | | | | |
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| I: 01506 41 1448 | | | | | | | | | | | | | | | | | | | | | | | |
| illing.co.uk Te | | | | | | | | | | | | | | | | | | | | | | | |
| nfo@phoenixdı | | | | | | | | | | | | | | | | | | | | | | | |
| 8AY E-mail: i | | | | | | | | | | | | | | | | | | | | | | | |
| . Lothian, EH54 | | | | | | | | | | | - | | | | | | | | | | | | |
| vingston, West | | | | | | | | | | | | | | | | | | | | | | | |
| ustrial Estate, L | | | | | | | | | | | - | | | | | | | | | | | | |
| ad, Deans Indu | etur | | Flus Typ | | To Dept | | Chiselling To | Time(hi | | iter Add | To | Struck | | d-water Time(mins | Cut Off | Diam 125 | To D Boring 1.75 | Casing 1.75 | Location | | E 2387 N 6821 | | |
| Vairn Ro | | | | | | | | | | | | | | | | | | | Orientat | tion: | Vertical | | |
| Ltd, 21 | De | arks: | ion | base | d on d | rillers reco | rds. | | | E | quipm art | nent: | I | ı | Method Inspecti | ion Pit to | | 1.20m | Borehol | e No: | | | |
| Phoenix Drilling | PT | refusa | cription based on drillers records. efusal and no recovery at 1.75 m depth. | | | | | | | | | | | | Windov | v Sample | er to | 1.75m | | | WS2 | 27 | |
| 34:08 | _ | | | | | | | | | | | | | | | | | | Contrac | t No: | 2304 | 1 | |
| Printed: 13/06/2017 16:34:08 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | ŀ | Oriller KG | | ľ | inator //M | | | | | ВС | ORE | EHOLI Scale | E RE(| CORE |) | | | | | | Part Fig. No |). | |
| Printed: | ۱۱۲ | SG | ' | F | atus i nal | | | | 1 | WES | STR | RIVERS | IDE, B | ALLOC | CH | | | | | | Sheet | 1 of 1 | |

| Progress | Sa | ample, epth | Type | ample | s and Res | Tests | Casir Dept | -1 | Level (mOD) | Depth | 1 | | | De | scription | of Strata | | | | Legend | Water Depth | Ballodmy8 | ckfill Depth |
|--|--------|----------------|---------------|-----------------------------|--------------|-----------|------------------|--------|----------------|----------|-------------------|--|--|--|--|---|--------------------------------------|--|--|--|------------------|-----------|-----------------|
| 16/2 201 | 2 7 |).25 | B, J, | T, V | | | | | | 0.70 | So - ar lit | oft dark brond roots. Ghologies. C | own organi ravel is flat Cobbles are | c gravelly to elongate flat subro | very clayey ted subang ounded up | y sand with gular fine o to 13 cm o | h medium of igneous of igneous | cobble cor rock and o rock. (TOI | ntent other PSOIL) | | | | |
| | 1. | .00 | В | | | | | | | 1.10 | | rangey bro RAVEL with subrounder | | | | | | | | b . t | | | |
| | 1. | .20 | SPT= T | =18 <u>3.3</u> | /3.4.5.6 | | 1.20 | | | 1.60 | - ig | ledium den ravel is elc neous rock | and other | prown sitt pangular to lithologies | y clayey mo subround s. | led fine to | medium o | f sandston | o. e, | | | | |
| | 1. | .80 | SPT= | <u>50/</u> | | | 1.80 | ' | | 1.80 | # | Stiff boulde | er CLAY. | EN | D OF BOF | REHOLE | | | | × | | | 1.80 |
| Printed: 13/06/2017 16:34:08 Phoenix Drilling Ltd, 2 Naim Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | | | | | | | | | | | | | | |
| Re Re | turn | | Flush Type | To D | epth | From | Chiselling To | Time(h | | iter Add | To | Struck | Ground Rose To | Fime(mins | Cut Off | Diam 125 | Boring 1.80 | Casing 1.80 | Locatio | | E 2386 N 6821 | | |
| Road, E | | | | | | | | | | | | | | | | | | | Level: | | - | | |
| 2 Nairn | | | | | | | | | | | | | | | N | | | | Orienta | | Vertical | | |
| Na Phoenix Drilling Ltd. | emai | | I and | no re | cover | yat 1.8 m | n depth. | | | Da | quipm art | ient: | | | | : ion Pit to v Sample | | 1.20m 1.80m | Boreho | | WS2 | | |
| 16:34:0 | Dril | ller | | Originat | tor | | | | | DC |)Dr | EHOLI | | | ` | | | | Contra | ct No: | 2304 | 1 | |
| rinted: 13/06/2017 O | hk & | & App | | MM Status Fina | 3 | | | | , | | | | 1:50 | | | | | | Washington . | The state of the s | Part Fig. No | | |
| Printed: 13/06/2 | hk & | & App G | | Status Fina | Î | | | | 1 | WES | ST R | | | ALLOC | ж | | | | Service of the servic | No. | | | No. t 1 of 1 |

| Progress | | Sample Depth | Type | | and Tests Result | Casing Depth | | Level (mOD) | Depth | | | | De | scription (| of Strata | | | | Legend | Water Depth | <u> </u> | nckfill Depth |
|--|-----------|-------------------------------|--------------|--|---------------------|--------------|----------------|----------------|----------------------------|-------------|-------------|------------|-----------------------|---------------------|---------------------------------|------|------------------------|-----------------|--------|-------------------|----------|------------------|
| 16/ 201 | /2 | | F | | | | | | 0.70 - - 1.10 - - | #(| | ose to med | lium SAND m SAND + | | EL. | | | | | | | |
| Printed: 13/06/2017 16:34:08 Phoenix Drilling Ltd, 2 Naim Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | F | SP1 | | | 1.20 | | | 1.70 - | | Stiff bould | Ground | d-water | D OF BOR | | Тоб | Depth | | k - * | | | 1.70 |
| 3 Phoenix Drilling Ltd, 2 Nairn Road, Deans Ir 公事知 | em De: | arks: | Type on b | ased on o | drillers record | ds. | <u>Fime(hr</u> | r) From | | uipm irt | Struck ent: | Rose To | Time(mins | Method: Inspecti | Diam 125 : :on Pit to v Sample | 1.70 | 1.70 1.20m 1.70m | Level: Orientat | ion: | - Vertical | 28A | |
| Printed: 13/06/2017 16:34:08 | ŀ | riller KG : & App SG | | Originator MM Status Final | | | | , | | | Scale | 1:50 | CORD | | | | | Contrac | t No: | Part Fig. No |). | |

| Progress | S | ample Depth | Type | mples an Re | d Tests sult | Casin Deptl | -1 | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Pa | ckfill Depth |
|---|---------|----------------|----------------|------------------------|-----------------|------------------|--------|----------------|----------------------------|---------------------|------------------------------------|---|--|------------------------------|---------------------------|------------------------------|-------------------------------|--------------------|---|-----------------|--------|-----------------|
| 10/ 201 | 2 17 |).25 | В, Ј, Т | -, V | | | | | _0.05_/ - - 0.60 | | OPSOIL. wn slight angular t | ly silty ver o subroun | y gravelly n ded fine to | nedium to coarse of | coarse SA sandstone | ND. Grave and other | el is elonga r lithologies | ated s. | ×0 | | | 0.20 |
| | | | | | | | | | 1.00 | Ligh | nt brown | silty fine to | o medium S | SAND with | pockets o | f organic r | matter. | | × . | | | |
| | | | B SPT= T | 12 <u>2.2/3.3.3</u> | <u>3</u> | | | | | Med SAN san | dium der ND. Grav dstone a | se light br el is elong nd other li | rown slightly gated subar thologies. | y silty grav ngular to si | elly to ver ubrounded | y gravelly i I fine to me | medium to edium of | coarse | × × × × × × × × | | | |
| | 4 | 2.00 | SPT= B, T | 14 <u>2.2/3.3.3</u> | <u>.5</u> | 1.00 | | | | | | | | | | | | | × · · · · · · · · · · · · · · · · · · · | | | |
| | | 3.00 3.00 | SPT= B, T | 22 <u>3.3/3.5.6</u> | <u>.8</u> | 2.00 | | | 3.00 | Med Gra lithd | dium der vel is elc blogies. | se light br ongated su | own slightl bangular to | y silty med o subround | ium to coa led fine of | arse SANE sandstone | and GRA e and other | VEL. | x x x x x x x x x x x x x x x x x x x | | | 3.30 |
| | | | | | | | | | 3.60 | | | | EN | D OF BOF | REHOLE | | | | | | | 3.60 |
| | | | | | | | | | - - - | | | | | | | | | | | | | |
| 111448 | | | | | | | | | - - | | | | | | | | | | | | | |
| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | - | | | | | | | | | | | | | |
| ixdrilling.co.ul | | | | | | | | | - | | | | | | | | | | | | | |
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| Lothian, EH5 | | | | | | | | | - - - | | | | | | | | | | | | | |
| ıgston, West | | | | | | | | | - | | | | | | | | | | | | | |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY | | | | | | | | | - - - | | | | | | | | | | | | | |
| i Industrik | eturr | | Flush Type | To Depth | | Chiselling To | Time(h | | iter Adde | | Struck | Groun | d-water Time(mins | Cut Off | Diam | To I | Depth Casing | Location | n: | E 23862 | 22.4 | |
| 1, Deans | uull | 13 | , ype | io Depin | riull | IU | mie(ii | ., FION | | | Juuck | 1103€ 10 | ,e(IIIIIS | , Out OII | 125 | 3.60 | 3.60 | | | N 6821 | | |
| airn Road | | | | | | | | | | | | | | | | | | Level: Oriental | tion: | - Vertical | | |
| Ltd, 2 Ng | | ırks: | on ha | od or d-: | llers recor | rde | | | Eq: Dai | uipme | nt: | | | Method | : ion Pit to | | 1.20m | Borehol | | . 5. 11001 | | |
| Printed: 13/06/2017 16:34:09 Phoenix Drilling Ltd, | arre | obst | ructio | n at 3.6 m | depth. | ius. | | | Dai | | | | | | v Sample | | 3.60m | | | WS2 | 29 | |
| 3:34:09 | | | | | ı | | | | | | | | | | | | | Contrac | ct No: | 2304 | ŀ | |
| 13/06/2017 16 | K | ller G | | riginator MM | | | | | ВО | REI | | E RE(1:50 | CORD |) | | | | | | Part Fig. No |). | |
| Printed: | | & App G | | Status Final | | | | , | WES ⁻ | TRI | VERS | IDE, B | ALLOC | :Н | | | | | Mr. | Sheet | 1 of 1 | |

| | Progress | Sample Depth | Type | | and Tests Result | Casir Dept | · 1 1 | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | Depth |
|---|--------------|--------------------------------|---------------|------------------------------|---------------------|---------------|---------|----------------|----------|---------------------------|--|---|---|--|--|-------------------------------------|----------------------------|------------------|--|--------------------|--------|-------|
| 2 | 10/2 2017 | 0.25 | B, J, | T, V | | | | | 0.15 | # H Bro elo lith | Hardcore (own slight ongated su ologies. C | MADE GF y organic ubangular Cobbles ar | ROUND) silty very sa to subroun re subangu | andy GRA\ ded fine to lar elongate | VEL with lo coarse of ed of sand | ow cobble f sandstone dstone. | content. Gr e and other | ravel is | | | 0 0 | 0.20 |
| | | 1.00 1.20 1.20 | B SPT T | =49 <u>8.11/</u> | <u>12.13.13.11</u> | 1.20 | | | 1.20 | | | | ry sandy C nd other lit | | el is subar | ngular to su | ubrounded | of . | | | | |
| | | | | | | | | | 2.00 | | | | FN | ID OF BOR | REHOLE | | | | | | | 2.00 |
| | | | | | | | | | | | | | | .5 6. 56. | | | | | | | | |
| | | | | | | | | | - - | | | | | | | | | | | | | |
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| ad, Deans In | Retu | | Type | To De | pth From | То | Time(hr | | | Го | Struck | | Time(mins | Cut Off | Diam 125 | Boring 2.00 | Casing 2.00 | Location Level: | | E 23866 N 68223 | | |
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| rilling Ltd, 2 | # De | narks: escripti rel obst | ion ba | ased on on at 2.0 | drillers reco | ords. | | | Da | juipme irt | ent: | | | Method Inspecti Windov | : ion Pit to v Sample | er to 2 | 1.20m 2.00m | Borehole | e No: | Mea | 00 | |
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| 7 16:34:10 | | Driller | T . | Originato | r | | | | BC |)RF | HOLI | F RF | CORD | <u> </u> | | | | Contract | t No: | 2304 Part | | |
| Printed: 13/06/2017 16;34:10 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | Ch | KG k & App | | MM Status Final | | | | | | / I \L | | 1:50 | | | | | | To the second | The state of the s | Fig. No |). | |
| Printec | | SG ' | | Final | | | | ١ | WES | TRI | VERS | IDE, B | ALLOC | CH | | | | 40) | h | Sheet ' | 1 of 1 | |

| = | Sample Depth | Samples and | | Casing Depth | | Level (mOD) | Depth | | | Des | scription o | of Strata | | | | Legend | Water Depth | 8 | ckfill Deptl |
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| lem De Dbs | narks: escription truction | on based on dril at 0.6 m depth | lers records. | | | • | Equ Dar | uipment: rt | | | Method: Inspecti | on Pit to | (|).60m | Borehole | | WS3 | 1 | |
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| Γ | SSS | Sample | Sa | mples an | d Tests | Casin | a | Level | | | | | | | | | | | pu | Water | Ba | ackfill |
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| Progress | Sa | ample, Depth | Samp | les and | I Tests | Casing Depth | | Level (mOD) | Depth | 1 | | | De | scription | of Strata | | | | Legend | Water Depth | - Io | nckfill Depth |
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| airn Road, Deans Indt | eturr | | Flush Type To | Depth | From | Chiselling To T | ime(hr | | ter Adde | ed To | Struck | | d-water Time(mins | Cut Off | Diam | To E Boring | Depth Casing | Location Level: Orienta | | E 23860 N 68232 - Vertical | | |
| 1 Phoenix Drilling Ltd, 2 h | Des | urks: cription | on based n at 0.9 m | on dril depth. | lers record | ds. | | 1 | Eqi Dai | quipn art | ment: | | ı | Method Inspecti | : ion Pit to | (|).90m | Borehol | | WS3 | | |
| /06/2017 16:34:11 | | ller G | Origir MI | | | | | | ВО | DRE | EHOLE Scale | | CORE |) | | | | Contrac | ct No: | 2304 Part Fig. No | | |
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| o o o o o | 5 | Sample Depth | Type | Samples | s and Resu | | Casing Depth | 1 | Level (mOD) | Depth | n | | | De | escription | of Strata | | | | Legend | Water Depth | 00 | ackfill Depth |
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| Progress | Sample | Samples and | | sing | Level (mOD) | Depth | | | Des | scription (| of Strata | | | | Legend | Water Depth | 0 | ckfill |
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| Ret | | Flush Type To Depth | Chiselli From To | ng Time(h | | ater Adde | | Ground- Rose To | water ime(mins) | Cut Off | Diam | To D Boring | epth Casing | Location | | E 23856 | | |
| | | | | | | | | | | | | | | Level: | | N 68236 - Vertical | 01.2 | |
| Rer # D | narks: escripti | on based on dril | lers records. | | 1 | Eq. Da | uipment: rt | | | Method: Inspecti | : on Pit to | (|).65m | Borehol | | . o. tioal | | |
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| Drograce | ee line | Sample Depth | Sa | mples an Re | d Tests sult | Casing Depth | | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | 00 | ckfill Depth |
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| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | 1.50 = | | | | EN | D OF BOF | REHOLE | | | | D. • • | | | 1.50 |
| Road, Deans Industri | etu | | Flush Type | To Depth | From | Chiselling To | Time(hr | | iter Adde | ed To | Struck 1.00 | Ground Rose To 0.80 | d-water Time(mins 20 | Cut Off | Diam 125 | To I Boring 1.50 | Depth Casing 1.25 | Level: | | E 23851 N 68239 - | | |
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| Γ | SS | Sample | San | nples an | d Tests | Casin | _ | Level | | | | | | | | | | | ٦ | Water | Ва | ackfill |
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| 2 | 24/2 017 | | | | | | | | _0.05_/ _0.15_# | # 1 | Turf. TOPSOIL. | | | | | | | / | | | \bowtie | |
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| ٦ | | riller | Orio | ginator | | | | | | | | | 2000 | ` | | | | | | | | |
| 1 | | KG | | MM | | | | | RO | KE | | | CORD |) | | | | - M | de | Part | | |
| N V | | | | | | | | | | | Scale | 1:50 | | | | | | EX | 13 | Fig. No | | |
| | <u> </u> | . 0 . | +- | 4-4 | | | | | | | | | | | | | | \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\ | 13 | | | |
| G | Chk | & App SG | S | tatus inal | | | | _ | | | n /== ^ | = | | | | | | | 10- | | | |
| [| | | - | | | | | ' | WES | ΙR | IVERS | IDE, B | ALLOC | Ж | | | | "V | " | Sheet 1 | l of 1 | |
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| | 50 I | Sample Depth | Type | | nd Tests esult | Casin Depti | | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | 00 | ckfill Depth |
|--|------------|------------------------------|----------------------|------------------------|------------------------------|------------------|--------|----------------|----------------------------|--------------|--|--|--|---|---|---|-----------------------------------|--------------------|--------|--------------------|----|-----------------|
| 10 20 | 0/2)17 | 0.25 | B, J, 1 | -, V | | | | | . 0.05 - - - - | | ropsoil ose dark on ose dark on ose dark on ose dark ose dare dark ose dare dark ose dare dark ose | grey to bro otlets, glas fine to coa | ownish grey ss fragmen rse of sand | r, slightly o ts and darl stone and | organic silt k grey ash other litho | y gravelly . Gravel is logies. (M | medium to elongated ADE GRO | coarse UND) | | | | 0.20 |
| | | 1.00 1.20 | B SPT= T | 6 <u>1.2/2.1.</u> | <u>1.2</u> | | | | - - - | - | | | | | | | | | | | | |
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| I: 01506 411448 | | | | | | | | | - - - | - | | | | | | | | | | | | |
| E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | - - - - | - | | | | | | | | | | | | |
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| n, West Lothian, EH54 | | | | | | | | | - - - - | - | | | | | | | | | | | | |
| ıstrial Estate, Livingsto | | | | | | | | | - - - - | - | | | | | | | | | | | | |
| d, Deans Indu | Retu | | Flush Type | To Depti | n From | Chiselling To | Time(h | | ter Adde | ed Fo | Struck | Groun Rose To | d-water Time(mins | Cut Off | Diam 125 | To E Boring 3.20 | Casing 3.00 | Location | | E 23872 N 68242 | | |
| 2 Nairn Roa | 200 | norko: | | | | | | | Fa | uinm | ant: | | | Mothod | | | | Level: Orientat | | - Vertical | | |
| 크# | E De | narks: escripti refusa | ion bas | sed on di no recov | rillers reco ery at 3.2 i | rds. m depth. | | | Eq Da | uipme irt | eril. | | | Method Inspecti Windov | : ion Pit to v Sample | er to | 1.20m 3.20m | Borehol | e IVO: | WS3 | 36 | |
| 017 16:34:13 | | Oriller KG | 0 | riginator MM | | | | | BC | RE | | | CORD |) | | | | Contrac | t No: | 2304 Part | | |
| Printed: 13/06/2 | | k & App SG | | Status Final | | | | , | WES | T RI | | e 1:50 SIDE, B | BALLOC | Ж | | | | | | Fig. No | | |

| 9 | SS | Sample | S | amı | oles and | d Tests | Casin | | Level | | | | | | | | | | | рL | Water | | ackfill |
|---|------|----------------------|---------------|------|--------------------|-------------|-----------------|----------|-------|---------------------------------|----------------|--|--|--|--|---|---|---|--|-------------|-------------------------|--------|---------|
| 200 | 5 I | Depth | Type | | Res | | Depth | 1 1 | (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Depth | Symbol | Depth |
| 20 | 0/2 | 0.25 1.00 1.20 | B, J, | | , 1.1/1.1.1. | 1 | | | | 0.50 - 0.50 - - - - | Da as an | TOPSOIL. ark grey to h. Gravel d brick fra ose brown ey ash. Gi nologies a | b black, silt is elongate agments. (I nish grey, ravel is elo nd brick fr | y gravelly n ed subangu MADE GRO slightly orga ngated sub agments. (f | nedium to ilar fine to DUND) anic silty vo angular fir WADE GRO | coarse sa coarse of ery sandy ne to coars OUND) | nd and dai sandstone gravel with se of sands | rk grey to b other lithour rootlets a stone, slate | plack blogies and dark e, other | | | | 0.25 |
| | | 2.00 2.20 | B, T SPT: | =8 | 1.0/1.2.2. | <u>3</u> | | | | 2.00 | Lo su | ose light t bangular | orown silty fine of igne | clayey fine ous rock a | to mediun nd sandsto | n SAND. (one. | Gravel is el | ongated | | | | | |
| | | | | | | | | | | 2.70 | Lig | ght brown | silty grave | lly fine to m | nedium SA | ND. Grav | el is elonga | ated subar | ngular | | Ā Ā | | |
| - | | 3.00 | SPT: | - | 50/ | | + | | | 3.00 | πin | e or quart | z, sandsto | | D OF BOF | | | | | • • • • | * | | 3.00 |
| Printed: 13/06/2017 16:34:14 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | | | | | | | | | | | | | | |
| lpul su | Retu | | Flush Type | T | o Depth | From | hiselling To | Time(hr) | | ter Adde | ed Fo | Struck | Rose To | d-water Time(mins | Cut Off | Diam | Boring | Casing | Location | | E 2387 | | |
| Nairn Road, Dear | | | | | | | | | | | | 2.90 | 2.75 | 20 | | 125 | 3.00 | 3.00 | Level: Orientat | | N 6823 - Vertical | 54.2 | |
| :14 Phoenix Drilling Ltd, 2 | | narks: escripti | on ba | ised | d on dril | lers record | ls. | | | Eq Da | uipmo | ent: | | | | : ion Pit to v Sample | | I.20m 3.00m | Borehol | | WS3 | | |
| 13/06/2017 16:34: | | Oriller KG | | N | nator IM | | | | | BC | RE | | E RE(| CORD |) | | | | Contrac | I NO: | Part Fig. No | | |
| Printed: | CNK | c & App SG | | Fi | atus nal | | | | ١ | WES | TR | IVERS | SIDE, B | ALLOC | Н | | | | | | Sheet | 1 of 1 | I |

| Progress | Sample Depth | (1) | Sam | | d Tests sult | Casin Dept | | Level (mOD) | Depth | | | | De | escription | of Strata | | | | Legend | Water Depth | log | ckfill Depth |
|---|----------------------|---------------------|------|------------|-----------------|------------------|--------|----------------|------------------------------|------------|---|--|--|---|---|--|---|---------------------|--|-----------------|--------|-----------------|
| 21/2 2017 | 1.00 | B, J | | | | | | | _0.05_/ - - - - | # Lo | TOPSOIL. Dose dark Darse sand JUDE GRO | grey to bro I and grave fine to coa DUND) | ownish grey el with root rse of sand | y, slightly o lets and da dstone, oth | organic silt ark grey as er lithologi | y clayey g h. Gravel i es and brid | ravelly mee s elongate ck fragmer | dium to | | | ПП | 0.25 |
| | 2.00 2.00 | Т | -=n | 0.0/1.0.1 | | | | | - - - - | | | | | | | | | | | | | |
| | 3.00 3.00 3.30 | SP1 B, T J, T | | 1.1/0.1.0 | 1 | | | | 3.10 - - - - | - Ve | ery soft ligi | ht brown o | rganic silty | sandy CL | AY with ro | otlets. | | | | • | | |
| | 4.00 4.00 | SP1 B, T | =0 | 0.0/0.0.0 | <u>o</u> | | | | 4.60 | | an and line | | illa Francis | madium C | AND and | | | | | ‡ | | 4.50 |
| 1448 | 5.00 | В | | | | | | | 5.00 | el | ery soft ligi ongated si | nt brown s ubangular | ilty fine to fine to coa EN | rse of quar | rtz, sandst | GRAVEL. (one and ot | Gravei is her litholog | gies. | | | | 5.00 |
| Printed: 13/06/2017 16:34:14 Phoenix Drilling Ltd. 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tei: 01506 411448 | | | | | | | | | | | | | | | | | | | | | | |
| s Industrial Est | | Flush Type | | o Depth | From | Chiselling To | Time(h | | ter Adde | ed To | Struck | | d-water Time(mins | Cut Off | Diam | To E | Depth Casing | Location | n: | E 23879 | 96.8 | |
| Road, Dear | | | | | | | | | | | 3.70 | 3.60 | 20 | | 125 | 4.00 | 4.00 | Level: | | N 6823 | 53.0 | |
| Rer # D | marks: escripti | ion b | ase | d on dri | llers recor | ds. | | | Eq Da | uipm rt | ent: | | | | l: tion Pit to w Sample | | 1.20m 5.00m | Orientat Borehol | | Vertical | | |
| Phoenix Drilli | | | | | | | | | | | | | | 77111001 | Jampie | | | | | WS3 | 38 | |
| 16:34:14 | Driller | | Orig | inator | | | | | P.O | | | | ^^D | <u> </u> | | | | Contrac | t No: | 2304 | 1 | |
| d: 13/06/2017 | KG |)) | Sta | 1M atus | | | | | BO | rKE | | E KE(e 1:50 | CORE | , | | | | | A STATE OF THE PARTY OF THE PAR | Part Fig. No |). | |
| Printe | SG | | Fi | nal | | | | • | WES | TR | IVERS | SIDE, B | ALLO | CH | | | | 40 | 7, | Sheet | 1 of 1 | |

| | ᡖ | Sample Depth | Type | amples | and T | | Casin Depth | | Level (mOD) | Depth | 1 | | | De | scription (| of Strata | | | | Legend | Water Depth | Balloquikg | Depth |
|---|--------------|--------------------|---------------|------------------------|-----------|------------|-----------------|----------|----------------|-----------|--------------|-----------|------------|--|-------------------------------|---|----------------|----------------|----------|--------|-----------------|------------|-------|
| | 16/2 2017 | | В, Ј, | T, V | | | | | | 0.50 | - | | | ic gravelly fine of igne clayey med to subround | | | | | | , | | | |
| | | 1.00 1.20 | B SPT T | =31 <u>3.4/5</u> | 5.6.10.10 | <u>D</u> | 1.20 | | | 1.20 | Me | edium den | se to dens | se greyish b ravel is elo igneous ro | orown to br | rown silty o bangular t er litholog | clavev med | dium to coa | arse | | | | 1.65 |
| Printed: 13/06/2017 16:34:15 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tei: 01506 411448 | Retu | | Flush | To De | | C. From | hiselling To | Time(hr) | | ter Adddd | | Struck | | d-water Time(mins | | Diam | To C Boring | Depth Casing | Location | | E 2387 | 30.5 | |
| Road, Dean | | | | | | | | | | | | | | | | 125 | 1.65 | 1.50 | Level: | | N 6822 - | 96.2 | |
| 2 Nairn | Do~ | Jarko. | | | | | | | | E | nuin~ | ent: | | | Mathad | | | | Orientat | | Vertical | | |
| 15 Phoenix Drilling Ltd, | | narks: el refu: | sal a | 1.5 m | depth. | | | | | Da | quipm art | દાાા. | | | Method: Inspecti Window | : ion Pit to v Sample | er to 1 | 1.20m 1.65m | Borehold | | WS3 | | |
| /06/2017 16:34: | | Oriller KG | | Originato MM | or | | | | | BC | RE | | E RE(| CORD |) | | | | Contrac | t No: | Part Fig. No | | |
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| ſ | CD | Sample Depth | Sa | mples ar | d Tests sult | Casing Depth | 1 | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | 00 | nckfill Depth |
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| 1 | 6/2 | -opui | Ļ | 110 | | Jopan | | | | # | Sandy TO | PSOII | | | | | | | \/// | 6.41 | <u>Ā</u> | 20pu1 |
| 2 | 6/2 017 | | | | | | | | 0.50 | | | | AND + GRA | AVEL. | | | | | | | | |
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| JS Indu | Retu | | Flush Type | To Depth | | To To | Time(hı | | iter Adde | ed To | Struck | | d-water Time(mins | Cut Off | Diam | Boring | Depth Casing | Location | 1: | | | |
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| Road | | | | | | | | | | | | | | | | | | Level: | | - | | |
| Nairn | | | | | | | | | | | | | | | | | | Orienta | ion: | Vertical | | |
| Ltd, 2 | | narks: | on had | sed on dr | llers records | <u> </u> | | - | Eq | uipm rt | ent: | | | Method Inspect | ion Pit to | | 1.20m | Borehol | e No: | | | |
| dilling | SPT | refusa | al and | no recove | ery at 1.40 m | n depth. | | | | | | | | Windov | v Sample | er to | 1.40m | | | 14400 | | |
| ΠX | | | | | | | | | | | | | | | | | | | | WS3 | 9A | |
| Phoe | | | | | | | | | | | | | | | | | | | | | | |
| 34:15 | | | | | | | | | | | | | | | | | | Contrac | t No: | 2304 | ļ | |
| 7 16:3 | | Oriller | 0 | riginator | | | | | BC |)RF | HOL | E RF | CORD |) | | | | | 1 | Part | | |
| 16/201 | | KG | | MM | | | | | | . _ | | 1:50 | . J. \D | | | | | W. | 1 | Fig. No |). | |
| 13/0 | Chl | k & App SG | | Status | | | | | | | | | | | | | | - Y | Se la | | | |
| Printed: 13/06/2017 16:34:15 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | SG | | Final | | | | • | WES | TR | IVERS | IDE, B | ALLOC | CH | | | | 40 | <i>)</i> | Sheet | 1 of 1 | |
| <u>"</u> | | | | | | | | | | | | | | | | | | | | SIICCI | ı Uı I | |

| Progress | Sample Depth | Samples and | | - 1 | Level (mOD) | Depth | | | Des | scription | of Strata | | | | Legend | Water Depth | 8 | ckfill Dept |
|--------------|---------------------|------------------------------|----------------------|-------------|----------------|------------|---|---|--|--|---|--|--|--|---|--------------------|----------------------|----------------|
| 20/2 2017 | | B, J, T, V | Suit Dep | 7(1) | | 0.60 | # Turf. Brownish gr cobble conte subangular f fragments. (| ey, slightly o ent, rootlets, fine to coars Cobbles elor | organic sili grass fra se of sand ngated sul | ty gravelly gments an stone, othe bangular c | medium to ad dark greer lithologi of sandston | to coarse s ey ash. Gra es and brid ne. (MADE | and with lo avel is elon k and pott GROUND | w gated ery | 3 | | \(\tilde{\omega} \) | 0.60 |
| | | | | | | 0.60 | subangular i fragments. C | ine to coars Cobbles elor | e or sand: ngated sul ENI | stone, other stone | er Innologi fr sandsto REHOLE | es and brid | M and potition of the control of the | ery)) | | | | 0.66 |
| Reti | | Flush Type To Depth | Chisellin From To | g Time(h | | ater Adde | | Ground- Rose To Ti | water ime(mins) | Cut Off | Diam | To D Boring | epth Casing | Location | | E 23884 N 68229 | | |
| | | | | | | | | | | | | | | Level: Orientat | | - Vertical | ,L.J | |
| | narks: escripti | on based on dril | lers records. | | | Equ Dar | uipment: t | | | Method Inspecti | : ion Pit to | (|).60m | Borehol | | | | |
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| | Oriller | Originator | | | | RO | REHOLI | E DEC | , \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ | <u> </u> | | | | Contrac | t No: | 2304 Part | • | |
| | KG k & App SG | MM Status Final | | | | | Scale | 1:50 | | | | | | A CONTRACTOR OF THE PARTY OF TH | See | Part Fig. No | | |
| | 33 | Filial | | | , | WES | T RIVERS | IDE, BA | ALLOC | H | | | | U | h | Sheet 1 | of 1 | |

| ſ | ress | Sample | | mples and | d Tests | Casing | | Level | 5 | | | | _ | | | | | | pue | Water | Ba | ckfill |
|---|------------|---------------|--------------|------------------------|-------------|-----------------|--------------|-------|-----------------|----------|-------------|-------------------|-----------------------|--------------|------------|----------------|-----------------|----------|-------------|--------------------|-----------|--------|
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| Printed: 13/06/2017 16:34:17 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | | | | | | | | | Orientat | | Vertical | | |
| td, | err De | narks: escription | on bas | sed on dril | lers record | S. | | | Eq Da | uipm rt | ent: | | | Method Inspect | l: ion Pit to | (| 0.50m | Borehole | e No: | | | |
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| Progress | Sample | e | | nples an | d Tests | Casir | g | Level (mOD) | Danth | | | | Da | escription | of Strata | | | | Legend | Water | Backfill o |
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| 23/2 2017 | 0.25 | В | | | | | | | 0.10 | | OPSOIL. Sand and | gravel fill. | (MADE GF | ROUND) | | | | | | | 0.20 |
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| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail | | | | | | | | | - - - - | | | | | | | | | | | | |
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| 道# D | escript | tion ple | base betw | ed on dri een 3.0 | llers recor and 4.0 m | ds. depth. | | | Da | rt | | | | Inspect | ion Pit to w Sample | er to | 1.20m 6.00m | | | WS4 | |
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| 16:34: | Driller | \top | Oriç | ginator | | | | | | יםרי | <u> </u> | | | <u> </u> | | | | Contra | ct No: | 2304 | + | \dashv |
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| Progress | S | ample. Depth | Samples | s and Tests Result | Casing Depth | Level (mOD) | Depth | | | Des | scription | of Strata | | | | Legend | Water Depth | Balloquiks | Depth |
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| 16/ 201 | /2 17 | 0.25 | B, J, T, V | | | | 0.35 | Soft dark bro elongated su lithologies. (| own organi ubangular t | c clayey ve | ery gravelly ded fine to | y sand with medium o | h roots. Gra of igneous | avel is flat rock and o | to other | | | | |
| | | 1.00 | B B SPT=42 11. T | 12/10.11.9.12 | 1.20 | | | Dense brow flat subangu other litholog | n clayey sa ular to subr | andy mediu ounded fin | ım to coars ne to coars | se GRAVE e of sands | EL. Gravel i stone, igned | s elongate ous rock a | ed and nd | | | | |
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| Bans Inc | etur | | Flush Type To De | | Chiselling To Time | | iter Adde | | Ground Rose To | rime(mins) | Cut Off | Diam 125 | Boring 1.65 | epth Casing 1.40 | Location | | E 2387 N 6822 | | |
| Road, D. | | | | | | | | | | | | | | | Level: | | - | | |
| Nairn F | | | | | | | | | | | | | | | Orienta | tion: | Vertical | | |
| 4:18 Phoenix Drilling Ltd, 2 贸力 | | arks: Il refus | sal at 1.4 m | depth. | | | Equ Dar | uipment: rt | | | Method Inspect Windov | : ion Pit to v Sample | er to | .20m .65m | Borehol | | WS ² | | |
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| Progress | Sa | ample_ Depth | Sa | mples an Re | d Tests sult | Casing Depth | | Level (mOD) | Depth | | | | De | scription (| of Strata | | | | Legend | Water Depth | 00 | ackfill Depth |
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| Printed: 13/06/2017 16:34:19 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | 1 | | SPT= | 50/ | | 1.60 | | I Wa | 1.60 | | | Groun | EN di-water | D OF BOR | REHOLE | | Depth | | b | | | 1.60 |
| Itd, 2 Nairn Road, Deans Ir | ema | ırks: | Type | To Depth | From | To To | Fime(hr | | ı T | uipm | Struck ent: | | Time(mins | Method: Inspecti | Diam 125 : ion Pit to v Sample | 1.60 | Casing 1.60 | Level: Orientat Borehol | ion: | E 23882 N 68207 - Vertical | | |
| :34:19 Phoenix Drillir ত্ | - 1 F | eiusa | i and i | io recove | ery at 1.60 i | ш чертп. | | | | | | | | VVIII GOW | Сатре | to | | Contrac | et No: | WS4 | | |
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| SS | Cample | | San | nple | s and | d Tes | ts | C: | asino | , | TL | evel | | | | | | | | | | | | | | | | g | Water | | Backfill |
|----------------------------|---|-------------|---------|-----------|-------------------|-----------|----------------|-------------|-------|--------|-----|------|-----|---------------------|----------------------------------|--|-----------------------------------|--------------------------------------|---|--------------------------------|---|---|--------------------------------|------------------------------|--------------------------------|-----------------------|------------------|----------|----------------|--------|----------|
| Progress | Sample Depth | - | lype | • | | sult | | | epth | 1 | (n | nOD) | De | pth | | | | | [| Des | cription | of Strata | а | | | | | Legend | Water Depth | Symbol | Dep |
| 21/2 2017 | | В | , J, T, | |)/1.0.0. | 0 | | | 1.20 | | | | 0.1 | | #To Ver gra Gra brio | OPSOIL y loose velly me velly is el k fragm | dark gedium ongati eents. (| grey to to coa ed sub (MADI | browni arse san bangula E GROI | ish g nd w ar fin UNE | grey, slig ith rootle le to med D) | htly organ ts, glass t lium of sa | nic silty fragme andstor | y grave ents a ne, oth | elly to vond dark ner litho | ery grey logies | ash. ; and | | | | 0.2 |
| | 2.00 | T | | |)/0.1.0. | | | | 2.00 | | | | | | | | | | | | | | | | | | | | _ | | |
| | 3.00 | SIB | PT=2 | 0.0 | 0/1.0.1. | <u>o</u> | | ; | 3.00 | | | | 3.8 | - - - 50 - | Ver | y soft da | ark bro | own to | o brown | san | dy claye | y PEAT w | ith roc | otlets. | | | | <u> </u> | | | |
| | 4.00 | S | PT= | <u>50</u> | , | | | 1 | 4.00 | | | | 4.0 | 00 | | | | | | |) OF BO | REHOLE | | | | | | 1/ 1/ | <u> </u> | | 4.0 |
| Retu | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Retu | | Flu Ty | | То Е | Depth | Froi | | hisel To | | Time(h | hr) | Wa | | Added To | 1 | Struck | Ros | е То | | ins) | Cut Off | Diam | | oring | epth | 9_ | ocatio | | E 2388 | | |
| | | | | | | | | | | | | | | | | 2.60 | 2. | 60 | 20 | | | 125 | 4 | .00 | 4.00 | | evel: | | N 6822 | 22.4 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | over. Orienta | ition: | - Vertica | I | |
| # De No r | narks: escripti recover refusa | ion ry f | or SF | PT a | on dril at 3.0 | lers real | ecord 1.0 m | ds. dep | th. | | | | | Equip Dart | <u>I</u> ome | nt: | 1 | | | | Method Inspec Windo | L d: tion Pit t w Samp | o ler to | | .20m I.00m | В | Soreho | le No: | WS | 43 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | C | Contra | ct No: | 230 | 4 | |
| | Oriller KG | | | gina | | | | | | | | | E | BOF | REI | | E F e 1:5 | | COR | RD | | | | | | 707 | | | Part Fig. N | | |
| Ren # De No i SPT | k & App SG | ر | F | ina | s I | | | | | | | , | WE | EST | RI | VERS | SIDE | Ξ, Β. | ALLC | <u></u> | H | | | | | | | N. C. | Sheet | 1 of | 1 |

| Progress | Sample | Samples an | | 1 1 | Level (mOD) | Depth | | | Des | scription (| of Strata | | | | Legend | Water | Ba | ckfill |
|--------------|--------------------|------------------------|--------------------|--------------|----------------|------------------|--|---|---------------------|--|----------------|----------------------------------|---------------------------------------|--------------------|----------|--------------------|------|--------|
| 21/2 2017 | Depth 0.25 | Re: | sult Dep | oth | | 0.10 | # TOPSOIL. | grey, slightl | | | | to gravelly | / medium to | 0 ar fine | ě | Depth | ×₩ | Dept |
| 21/2 2017 | 0.25 | B J | | | | 0.60 | # TOPSOIL. Loose dark coarse sand to coarse of | grey, slightl with rootlet sandstone, | | silty slightt cgrey ash logies and D OF BOR | | to gravelly selongated ments. (M | v medium ti v subangula ADE GRO | o par fine UND) | | | | 0.60 |
| Retu | | Flush Type To Depth | Chiselling From To | g Time(hr | | iter Adder | | Ground- Rose To | -water ime(mins) | Cut Off | Diam | To D Boring | Pepth Casing | Location | | E 23887 N 68218 | | |
| | | | | | | | | | | | | | | Level: Orientat | | - Vertical | | |
| | narks: escripti | on based on dri | lers records. | | | Equ Dar | uipment: t | | | Method: Inspecti | : on Pit to | C | 0.60m | Borehole | | WS4 | | |
| | Oriller KG | Originator MM | | | | ВО | REHOLI Scale | E REC | ORD | | | | | Contrac | t No: | Part Fig. No | | |
| Chl | « & App SG | Status Final | | | , | WES ⁻ | T RIVERS | IDE, BA | ALLOC | :H | | | | No. | A Samuel | Sheet 1 | of 1 | |

| Progress | Sample | e_ | | nples an | d Tests | Casin | g | Level (mOD) | Denth | | | De | scription | of Strata | | | | Legend | Water | | ckfill |
|--------------|----------------------|----|----------------------|-------------------------|-------------|------------------|----------|----------------|-------------|--|--|---|---|--|--|---|------------------------------------|--------|-----------------|------------|--------|
| Proç | Depth | | Туре | Re | sult | Depth | 1 | (0) | 20ptii | | | | | | | | | Leg | Depth | Symbol | Depth |
| 17/2 2017 | 0.25 | В | 3, J, T, | V | | | | | - - - | subangul | ganic silty cla ar fine to me s. (MADE Gl | edium of sar | ly medium ndstone, ot | sand. Gra her litholo | avel is flat t gies and b | o elongate rick and til | d e | | | | 0.20 |
| | 1.00 1.20 1.30 | B | 3 SPT=1 , T, V | 1.1/1.0.0 | .0 | 1.20 | | | 1.20 | Very loos | e to loose da ash. Gravel and tile fra | ark grey to g | grey, silty g | ravelly me | edium to co | oarse SAN | D with | | | | |
| | 2.00 | s | | 1.1/0.0.1 | <u>o</u> | 2.00 | | | - | lithologies | asir. Glavei | gments. (M | ADE GRO | UND) | coarse or | sai iusioi ie | , ou lei | | | | |
| | | | | | | | | | 2.90 | | F-14-1 | | | | ND 10 | | | | | | |
| | 3.00 | S | | 2.1/0.1.0 | <u>.1</u> | 3.00 | | | 3.15 | Very loos elongated Very loos peaty and quartz, sa | e light brow d angular to se e brown silty I sandy clay andstone and | rn silty claye subangular / clayey gra bands. Gra d other litho | ey fine to m fine of qua velly fine to vel is elono logies. | edium SA irtz, sands o medium gated sub | ND and G stone and c very sandy angular fin | RAVEL. G hther litholo GRAVEL e to mediu | ravel is ogies. with m of | 0 0 0 | | | |
| | 4.00 4.00 | | SPT=0 3, T | 0.0/0.0.0 | .0 | 4.00 | | | - - - | | | | | | | | | | | | |
| 1 | | | | | | | | | 4.45 - | Soft to fire | m greyish br | own peaty s | sandy CLA | Υ. | | | | | | | |
| | 5.00 | SB | | 0.0/0.0.0 | <u>.0</u> | 5.00 | | | 5.00 | Very soft | to firm grey | sandy claye | y PEAT wi | th shell fra | agments. | | | | | | |
| | 6.00 | В | | | | | | | 6.00 | | | | | | | | | V VV | | | 6.00 |
| Renn | | | | | | | | | | | | | | | | | | | | | |
| Retu | | | ush /pe | To Depth | From | Chiselling To | Time(hr) | | ter Added | | | nd-water Time(mins | Cut Off | Diam 125 | Boring 6.00 | Casing 6.00 | Locatio | | E 2388 | | |
| | | | | | | | | | | | | | | 123 | 0.00 | 0.00 | Level: | | N 6821 - | 83.5 | |
| | | | | | | | | | | | | | | | | | Orienta | | Vertical | | |
| | narks: recover | | for SI | PT at 1.2 | 2 , 3.0 and | 5.0 m de | pth. | | Equ Dar | uipment: t | | | | l: ion Pit to v Sample | | 1.20m 6.00m | Boreho | le No: | WS4 | 15 | |
| | Driller | | 05 | ginator | ı | | | | | | | | | | | | Contra | ct No: | 2304 | 1 | |
| Ch | KG | 0 | S | ginator MM Status | | | | | ВО | REHO Sc | LE RE ale 1:50 | CORE |) | | | | Was a | | Part Fig. No |) . | |
| | k & App SG | | F | inal | | | | ' | WEST | ΓRIVEF | RSIDE, E | BALLO | CH | | | | 4 | J. | Sheet | 1 of 1 | |

| | ᡖ | Sample Depth | Type | Samples a | nd Tests esult | Casing Depth | | evel iOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Balloquiks | nckfill Depth |
|---|--------------|-----------------|---------------|------------------|-------------------|------------------|----------|--------------|---------|-------------|---------------------------|---------------------------|----------------------------|-----------------------------|-------------------------|---------------------------|----------------------------|--------------------|--|-------------------|------------|------------------|
| ļ | 16/2 2017 | 0.25 | <u>Б</u> , Ј, | T. V | | | | | 0.40 | Sc | oft dark bro | own organi ibangular i | ic clayey ve to subroun | ery gravelly ded fine to | y sand with medium o | h roots. Gr of igneous | avel is flat rock and o | to ther | | | | |
| | | 0.20 | 2, 0, | ., . | | | | - | 0.40 | - Br | own clave | y sandy m | edium to c | oarse GRA | VEL. Gra | vel is elono | gated and f rock and of | flat | | | | |
| | | 1.00 1.20 | B SPT | >50 6.8/10. | <u>14.17.21</u> | 1.20 | | - | 1.20 | | | | | | | | ly medium | | · • · · · · · · · · · · · · · · · · · · | | | |
| | | | _ | | | | | - | 1.65 | - Gr igr | avel is eld neous rock | ngated su and other | rlithologies | subround s. ID OF BOF | | medium o | f sandston | e, | | | | 1.65 |
| | | | | | | | | | - | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | - | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | |
| 148 | | | | | | | | | - | | | | | | | | | | | | | |
| 01506 4114 | | | | | | | | | | | | | | | | | | | | | | |
| .co.uk Tel: | | | | | | | | | _ | | | | | | | | | | | | | |
| oenixdrilling | | | | | | | | | | | | | | | | | | | | | | |
| ail: info@ph | | | | | | | | | - | | | | | | | | | | | | | |
| 8AY E-ma | | | | | | | | | | | | | | | | | | | | | | |
| hian, EH54 | | | | | | | | | - | | | | | | | | | | | | | |
| n, West Lot | | | | | | | | | | | | | | | | | | | | | | |
| e, Livingstor | | | | | | | | | - | | | | | | | | | | | | | |
| Printed: 13/06/2017 16:34:21 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | | | | | | | | | | | | | |
| Deans Indu | Retu | | Flush Type | To Dept | | Chiselling To | Time(hr) | Wat From | ter Add | ed To | Struck | | d-water Time(mins | Cut Off | Diam 125 | To E Boring 1.65 | Casing 1.20 | Locatio | | E 23873 N 6822 | | |
| n Road, [| | | | | | | | | | | | | | | | | | Level: | | - | | |
| td, 2 Nair | | narks: | | | | | | | | quipm | ent: | | | Method | <u> </u> | | | Orienta Borehol | | Vertical | | |
| x Drilling Li | Barr | el refu | sal a | t 1.35 m c | epth. | | | | Da | art | | | | | ion Pit to v Sample | | 1.20m 1.65m | | | WS4 | 6 | |
| 21 Phoeni. | | | | | | | | | | | | | | | | | | | | 000 | | |
| 17 16:34:2 | | Oriller KG | Τ | Originator MM | | | | | BC | RE | HOLI | E REC | CORD | <u> </u> | | | | Contrac | t No: | 2304 Part | <u> </u> | \dashv |
| 1: 13/06/20 | Chl | k & App | + | Status | - | | | | | | | 1:50 | | | | | | | The state of the s | Fig. No |). | |
| Printed | | SG ' | | Final | | | | ١ | WES | TR | IVERS | IDE, B | ALLOC | CH | | | | 40 | 7 | Sheet | 1 of 1 | |

| Progress | Sample | ו ט ו | | asing | Level (mOD) | Depth | | | Desc | cription o | of Strata | | | | Legend | Water Depth | 0 | ckfill Dept |
|--------------|--------------------------------|--|------------------|-----------|----------------|------------|---|----------------------------|-------------------|------------------------|-----------------|-----------------------|------------|--------------------|----------|--------------------------|------|----------------|
| 23/2 2017 | Depth 0.25 | B, J, T, V | sult D | Depth | | 0.10 | # TOPSOIL. Soft dark bro Gravel is fla rock, other li | own organic to elongate | clayey ver | y gravelly | / sand with | h roots and | dark grey | ash. eous | <u> </u> | - | u/(G | Бер |
| | | J | | | | 0.60 | Gravel is fla rock, other li | to eloñgate thologies ar | | ilair to subgements. (| | fine to med ROUND) | ium of ign | eous | | | | 0.6 |
| Retu | | Flush Type To Depth | Chise From To | | | ater Adde | | Ground- Rose To Ti | water me(mins) | Cut Off | Diam | To D Boring | epth | Location | | E 23895 N 68212 | | |
| | | | | | | | | | | | | | | Level: Orientat | | - Vertical | .5.0 | |
| Ren | narks: | 0.6 for potentia | Chromium cor | ntaminati | on. | Eq. Dar | uipment: t | | | Method: Inspecti | : ion Pit to | (|).60m | Borehole | | | | |
| | , , | | | | | | | | | | | | | | | WS4 | 7 | |
| | | | | | | | | | | | | | | | | | | |
| Stop | Oriller | Originator | | | | 5.0 | DELLO | | 2000 | | | | | Contrac | t No: | 2304 | | |
| Stop | Driller KG k & App SG | Originator MM Status Final | | | | | REHOL Scale | 1:50 | | | | | | Contrac | t No: | 2304 Part Fig. No. | | |

| Progress | Samp | le | Samples a | nd Tests esult | Casing Depth | | _evel mOD) [| Depth | Description of Strata | Legend | Water Depth | Symbol | ackfill Depth |
|---|----------------------|---------|---|-------------------|-----------------|---------|-----------------|-----------------------------|---|--|-------------------------------------|----------------------------|------------------|
| 20/2 201 | 0.25 | | , J, T, V | | | | | 0.10 0.20 - - - | #Turf. #TOPSOIL. Very loose dark grey, slightly organic silty clayey gravelly medium to coarse sand with rootlets and dark grey ash. Gravel is elongated subangular fine to coarse of sandstone, other lithologies and brick fragments. (MADE GROUND) | | | S S S S S S S S S S | 0.25 |
| | 1.00 1.20 2.00 | SI | PT=2 <u>1.1/0.1.</u> PT=8 <u>2.1/1.2</u> . | | | | _ | - 1.65 - - | Very soft to soft dark grey to brownish grey, slightly organic slightly gravelly very sandy clay dark grey ash traces. Gravel is elongated subangular fine to coarse of sandstone and other lithologies. (MADE GROUND) | | | | |
| | 2.90 | B J. | T. V | | | | | 2.80 | Soft dark brown to brown sandy clayey PEAT with rootlets. | <u> </u> | | | |
| | 2.90 3.00 | SI B | .T, V PT=10 <u>3.2/2.2.</u> | <u>3.3</u> | | | | 3.60 | Light greyish brown organic peaty silty sandy CLAY with rootlets. | 7 7 7 7 7 7 | | | |
| | 4.00 | SI B | PT= 50/ | | | | | 4.00 | END OF BOREHOLE | | | - | 4.00 |
| 06 41 1448 | | | | | | | | - | | | | | |
| rilling.co.uk Tel: 015 | | | | | | | | - - - - | | | | | |
| Printed: 13/06/2017 16:34:22 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | - | | | | | |
| ian, EH54 8AY E-r | | | | | | | | - - - | | | | | |
| vingston, West Loth | | | | | | | | - - - | | | | | |
| idustrial Estate, Liv | | Flu | rsh | l c | hiselling | | Wate | - er Adde | Ground-water Size To Depth | | | | |
| irn Road, Deans Ir | eturns | Ту | | | | ime(hr) | From | T | Struck Rose To Time(mins) Cut Off Diam Boring Casing 125 3.00 3.00 Level: | | E 23887 N 68207 - Vertical | | |
| x Drilling Ltd, 2 Na | emarks Descrip | | based on d | rillers record | S. | | | Eqi Dai | pment: Method: Boreho | | WS4 | .9 | |
| 3:34:22 Phoeni | | | | | | | | | Contra | ct No: | 2304 | | |
| d: 13/06/2017 16 | Driller KG | р | Originator MM Status | | | | | ВО | REHOLE RECORD Scale 1:50 | The state of the s | Part Fig. No | | |
| Printer | SG | | Final | | | | ٧ | VES | RIVERSIDE, BALLOCH | 1/1 | Sheet 1 | of 1 | |

| SS | Ca | nla | Sar | nples ar | nd Tests | Casing | | Level | | | | | | | | | | | <u>p</u> | Water | | ackfill |
|--------------------|----------------|-----|------------------|-----------------|--------------|------------------|----------|-------|---------------------------|------------|---|--|---|---|---|---|--|-----------------------|----------|-----------------|--------|---------|
| Progress | Samp Dep | | Туре | | esult | Casing | 1 10 | (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Depth | Symbol | Depth |
| 20/ 201 | 2 7 0.25 | + | <u></u> | V | | | | | \ 0.05 . \ 0.15 . - | # Lo co to | Turf. TOPSOIL. ose dark of arse sand coarse of ROUND) | grey, sligh I with rooth sandstone | ntly organic ets and dar e, other litho | silty slight k grey ash ologies and | ly gravelly . Gravel is I brick and | to gravelly elongated pottery fra | / medium t I subangul agments. (| to ar fine MADE | | | | 0.25 |
| | 1.00 | | B SPT=3 T | 0.0/1.1.0 | <u>).1</u> | | | | - - - | | | | | | | | | | | | | |
| | 2.00 | 0 1 | SPT=4 B, T | 1.1/0.1.: | 1 <u>.2</u> | | | | 2.20 | Ve fin | ery loose li e to medii | ight brown um SAND | to greyish with some | brown pea | ity silty cla ravel is ele | yey to very | r clayey gra ıbangular i | avelly fine to | × | | | |
| | 3.00 | 0 ; | <u>SPT=</u> B | <u>50/</u> | | | | | 3.10 | co | arse of qu | uartz, sand | stone and o | D OF BOR | | | | | × | | | 3.00 |
| | | | | | | | | | - - - | _ | | | | | | | | | | | | |
| | | | | | | | | | - | | | | | | | | | | | | | |
| 11506 41 1448 | | | | | | | | | - - - | - | | | | | | | | | | | | |
| lling.co.uk Tel: 0 | | | | | | | | | - - - | | | | | | | | | | | | | |
| info@phoenixdri | | | | | | | | | - - - | | | | | | | | | | | | | |
| 54 8AY E-mail: | | | | | | | | | - - - | | | | | | | | | | | | | |
| Vest Lothian, EH | | | | | | | | | - - - | - | | | | | | | | | | | | |
| ate, Livingston, W | | | | | | | | | - - - - | | | | | | | | | | | | | |
| strial Esta | | | | | | | | | - | | | | | | | | | | | | | |
| sinpul st | eturns | | lush ype | To Depth | | Chiselling To | Time(hr) | | ter Adde | ed To | Struck | | d-water Time(mins | Cut Off | Diam | Boring | epth Casing | Location | | E 2389 | | |
| rn Road, Dear | | | | | | | | | | | | | | | 125 | 3.00 | 3.00 | Level: | | N 6820 - | 67.1 | |
| 1, 2 Nai | emarks | s: | | | | | | | Fo | uipm | ent· | | | Method | : | | | Orientati Borehole | | Vertical | | |
| - | | | on bas | ed on dr | illers recor | rds | | | Da | | | | | Inspecti | ion Pit to v Sample | | 1.20m 3.10m | 20,01016 | . 110. | WS | 50 | |
| 1:22 P | | | | | | | | | | | | | | | | | | Contract | t No | 2304 | 1 | |
| 3/06/2017 16:34 | Driller KG | r | | iginator MM | | | | | BC | RE | | E RE(| CORD |) | | | | Shinac | | Part Fig. No | | |
| Printed: 13 | chk & A SG | фр | F | Status Final | | | | ١ | WES | TR | IVERS | SIDE, B | ALLOC | Н | | | | | (SE | Sheet | 1 of 1 | |

| gress | Sample | Samples ar | | Casing | Level (mOD) | Depth | | | Des | scription | of Strata | | | | gend | Water | Ba | ckfill |
|-------------------|--------------------------|------------------------|----------------|-------------------|----------------|---------------------------|---|--|---|---|--|--|-----------------------------------|--------------------|---------|-------------------------|------|--------|
| SSappord 21/22017 | Depth | Φ | | Depth Depth | Level (mOD) | Depth 0.05 / 0.30 - 0.70 | #TOPSOIL. Loose dark (gravel with o sandstone, o #Sand + gra | grey to black lark grey as other litholog avel. (MADE | k, slightly o h. Gravel i gies, brick GROUNI | organic sili is elongate fragment D) | ty slightly ed subang s and slag | medium to gular fine to g. (MADE G | coarse sa coarse of SROUND) | and and | Pregend | Depth | 20 | O.70 |
| | | | | | | | | | | | | | | | | | | |
| Retu | | Flush Type To Depth | | elling To Time | | tter Adde | | Ground- Rose To | -water ime(mins) | Cut Off | Diam | To D Boring | epth Casing | Location Level: | | E 23894 N 68202 | | |
| | narks: escripti | on based on dr | llers records. | | | Equ Dai | uipment: t | | | Method: Inspecti | : on Pit to | C |).70m | Borehol | e No: | WS5 | | |
| | Oriller KG k & App | Originator MM | | | | ВО | REHOLI Scale | E REC : 1:50 | ORD | | | | | Contrac | t No: | 2304 Part Fig. No | | |
| 511 | k & App SG | Status Final | | | 1 | WES ⁻ | T RIVERS | IDE, BA | ALLOC | Н | | | | 1 | 1 | Sheet 1 | of 1 | |

| Progress | Sample | Samples ar | | Casing | | Level (mOD) | Depth | | | De | scription | of Strata | | | | Legend | Water | 8 | ckfill |
|--------------|--------------------------------|-------------------------------------|----------------|----------|--------|----------------|------------------|---------------------|---------------------------------|-----------|-----------|-----------------|--------|--------|----------|--|-----------------|--------|--------|
| 21/2 2017 | Depth | ed A | esult | Depth | | | 0.30 | | IL. IADE GROL gravel. (MA | JD) | | | | | | <u> </u> | Depth | | Depth |
| | | | | | | | 0.75 | | | FN | ID OF BOF | REHOLF | | | | | | | 0.75 |
| | | ··lush | T Chi | iselling | | I Wa | tter Adde | d I | Groun | id-water | | | I To E | Depth | | | | | |
| Retu | | Type To Depth | From | To Ti | ime(hr | | | | Rose To | Time(mins | Cut Off | Diam | Boring | Casing | Location | 1: | | | |
| | | | | | | | | | | | | | | | Level: | | - | | |
| | | | | | | | | | | | | | | | Orientat | ion: ' | Vertical | | |
| | narks: | on based on dr | illere recorde | | | 1 | Equ Dar | l uipment: rt | l | ı | Method | : ion Pit to | |).75m | Borehol | e No: | | | |
| # U(| esunpul | on based on di | mers records | • | | | Jai | | | | opcot | | | | | | WS5 | | _ |
| | Driller | Origin -4-: | Г | | | | | | | | | | | | Contrac | t No: | 2304 | | |
| | Oriller KG k & App SG | Originator MM Status Final | | | | | | | ale 1:50 | | | | | | No. | The state of the s | Part Fig. No |). | |
| | 3G | rinal | | | | 1 | WES ⁻ | TRIVER | SIDE, E | BALLOC | CH | | | | 40 | 7, | Sheet 1 | l of 1 | |

| ess | Sam | ple | | mple | s and | Tests | Casin | 11 1 | Level | _ | | | | | | | | | | pu | Water | Ba | ckfill |
|--|---------------|-----------------------------------|-----------|-------------------------|-----------------|------------|-----------|----------|-------|-------------|------------------|--|--|---|--|--|--|---|--------------|--|-----------------|--------|--------|
| Progress | Dep | | Туре | | Resu | ılt | Depth | -1 10 | (mOD) | ⊔epth | | | | De | scription | of Strata | | | | Legend | Depth | Symbol | Depth |
| 22/: 201 | 1.00 | 0 | В | | | | | | | 0.30 | Lo | TOPSOIL. ose dark avel with o ndstone, o ght brown avel. Grav nologies a | grey to bla dark grey a other litholo to brown s vel is elong nd brick ar | ck, slightly ash. Gravel ogies, brick slightly orga ated subar nd tile fragr | organic sil is elongat fragments anic silty sl ngular fine ments. (MA | ty slightly ed subang s and slag ightly med to coarse ADE GRO | medium to gular fine to g. (MADE of dium to coa of sandsto UND) | o coarse sa coarse o coarse o ROUND) irse sand ne, other | and and f | | | 0 0 | 0.20 |
| | 1.20 1.20 | 0 | SPT≕ T | 9 2.2 | 2.2.2.3 | | 1.20 | | | 1.30 | Ve Gr lith | ery soft bro avel is elo nologies. | own silty sa ongated su | andy grave bangular fi | lly CLAY w ne to coars | vith low pla se of sand | asticity and Istone, qua | sandy ba rtz and otl | nds. ner | | | | |
| | 2.00 | 0 | SPT≕ | 5 <u>0.0</u> | <u>/1.3.0.1</u> | | 2.00 | | | - - - | _ | | | | | | | | | | Ā | | |
| | 3.00 | | В | | | | | Ш | | 3.00 | | | | | D OF BOF | | | | | | | | 3.00 |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tei: 01506 411448 | | | | | | | | | | | | | | | | | | | | | | | |
| dustrial | | F | lush | | | CI | hiselling | | Wa | ter Adde | ed I | | Groun | d-water | | | То [| Depth | I | | | | |
| Reans Ir | turns | | ype | To D | epth | From | | Time(hr) | | | Го | Struck 2.20 | | Time(mins 20 | Cut Off | Diam 125 | Boring 3.00 | Casing 3.00 | Locatio | n: | | | |
| Road, D | | | | | | | | | | | | | | | | | | | Level: | | - | | |
| Vairn F | | | | | | | | | | | | | | | | | | | Orienta | tion: | Vertical | | |
| | mark | | n bar | ed o | n drilla | ers record | <u> </u> | | · | Eq | uipme ert | ent: | 1 | 1 | Method Inspect | : ion Pit to | , , | 1.20m | Boreho | le No: | | | |
| .≝l Ot | struct | tion | at 3.0 | om d | epth. | ers record | | | | | | | | | Windov | v Sample | er to (| 3.00m | | | WS! | 51B | |
| 5:34:24 | | | | | | | | | | | | | | | | | | | Contra | ct No: | 2304 | 1 | |
| 1: 13/06/2017 16 | Driller KG | | | riginat MM Status | . | | | | | ВС | RE | | E RE(e 1:50 | CORD |) | | | | Was a series | A STATE OF THE PARTY OF THE PAR | Part Fig. No | Э. | |
| Printed | SG | s & App Status SG Final | | | | | | | | WES | TR | IVERS | SIDE, B | ALLOC | CH | | | | 4 | 1 | Sheet | 1 of 1 | |

| Progress | Sample Depth | Samples and | Ousii | (m(| vel DD) Depth | | | Desci | ription o | of Strata | | | | Legend | Water Depth | 20 | ckfill Dept |
|--------------------------|---------------------------------|---------------------------------------|-------------------------------------|----------|------------------------------|---------------------------|---|---------------------------------------|--|--------------------------|---|--|-------------------------------|--|--------------------------|------|----------------|
| <u>a</u> 22/2 2017 | | B, J, T, V J, T, V | | | 0.05 0.35 0.50 0.75 | Light brow fine to med | c grey, slightly d dark grey as other litholog n silty gravelly lium of quartz h fill. (MADE (| fine to med , sandstone GROUND) | y gravelly s flat to el ck and po dium sand and othe | d. Gravel er litholog | n to coarse subangula ments. (M. is elongat iies. (MADI | sand with r fine to co ADE GRO ed subang E GROUN | arse of UND) ular D) | | | Ġ. | 0.75 |
| | | | | | - | | | | | | | | | | | | |
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| Reti | | Flush Type To Depth | Chiselling From To | Time(hr) | Water Adde | ed Struck | Ground- Rose To Ti | water me(mins) C | Cut Off | Diam | To D Boring | epth Casing | Location | | E 23900 | | |
| | | | | | | | | | | | | | Level: Orientat | | N 68202 - Vertical | 20.1 | |
| | narks: escripti struction | on based on dri n at 0.75 m (drill | lers records. er records "metal" |). | Eq Da | uipment: art | | N II | Method: nspection | on Pit to | (|).75m | Borehol | | WS5 | 2 | |
| | Oriller | Originator | | | | NDEL : 0: | E DEC | 000 | | | | | Contrac | | 2304 | | |
| | KG k & App SG | MM | | | BC |)REHOL Sca | LE REC le 1:50 | UKD | | | | | | The state of the s | Part Fig. No | | |
| | SG | Final | | | WES | T RIVER | SIDE, BA | LLOCH | ł | | | | 4 | <i>h</i> | Sheet 1 | of 1 | |

| Progress | Sample | | | nples an | d Tests | Casin | g | Level (mOD) | Denth | | | | D. | scription | of Strata | | | | Legend | Water | Back | kfill |
|--|---------------------------------|--------------|--------------|---------------------------------------|--------------|------------|--------|----------------|------------------------------|-----------------|--|--|--|---|--|-----------------------------|---|--|--|-----------------|------------|-------|
| Prog | Depth | T | - | Re | sult | Depth | 1 | (יווטט) | · | | | | | oonpuon | oi oiiald | | | | Leg | Depth | Symbol | epth |
| 22/2 2017 | , | | | | | | | | 0.05 | | Turf. _ight brow | n loose sa | nd and ara | avel. (MAD | E GROUN | ND) | | | | | | 0.20 |
| | 1.00 | B SF T | PT=0 | 1.1/0.0.0 | <u>o</u> | 1.20 | | | - 0.35 | Ve me ler | ery loose of edium to onsess. Grav | dark grey to coarse sand | black, slight d with root | ghtly organ lets and da I subangula fragments. | ic silty slig ork grey as ar fine to c | ghtly grave sh, some b | lly to grave rown claye andstone, | elly ey sandy other | | | 0 0 | 0.50 |
| | 2.00 2.00 | SF B, | T=0 T | 1.0/0.0.0 | <u>0</u> | 2.00 | | | - - - - | | | | | | | | | | | | | |
| | 3.00 | SF B | T=3 | 0.0/1.0.1 | 1 | 3.00 | | | 2.80 | Ve SA sa | ery loose t AND. Grav ndstone, i | o medium vel is elong igneous ro | dense light ated subar ck and othe | t brown to ngular to si er lithologie | brown silt ubrounded es. | y clayey gr d fine to me | avelly med edium of | lium | | Ā | | 3.40 |
| | 4.00 4.00 | SF B, | T=9 T | 1.1/2.2.2 | <u>3</u> | 4.00 | | | - - - 4.45 - | | | | | | | | | | | | | 4.45 |
| | | | | | | | | | - | | | | EN | ID OF BOF | REHOLE | | | | | | | |
| I: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | - - - - - | | | | | | | | | | | | | |
| AY E-mail: info@phoenixd | | | | | | | | | - - - - | | | | | | | | | | | | | |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail | | | | | | | | | - - - - - | | | | | | | | | | | | | |
| dustrial Estate, Livingsto | | Flus | ·h | | | Chiselling | | l Wa | - - - - ter Adde | | | Group | d-water | | | Tot | lonth | | | | | |
| Ret | | Тур | | To Depth | From | | Time(h | | | ō | Struck 2.70 | | Time(mins | Cut Off | Diam 125 | Boring 4.45 | Casing 4.00 | Locatio | n: | | | |
| ad, De | | | | | | | | | | | | | | | | | | Level: | | _ | | |
| irn Ro | | | | | | | | | | | | | | | | | | Orienta | tion· | Vertical | | |
| 2 Na | marks: | | | | | | | | Fa | uipme | ent: | | | Method | | | | Boreho | | v Ci tiCal | | |
| 크#D | escripti | truc | base tion | ed on dri at 4.0 m | llers record | ds. | | | Da | rt | on. | | | Inspect | ion Pit to v Sample | er to | 1.20m 4.45m | | | WS | | |
| 6:34:2 | Driller | _ | Orio | ninator | | | | | | _ | | _ | | | | | | Contra | ct No: | 2304 | 1 | |
| ed: 13/06/2017 1 | Driller KG nk & App SG | 0 | S | ginator MM tatus inal | | | | | | | Scale | 1:50 | CORE | | | | | A STATE OF THE PARTY OF THE PAR | The state of the s | Part Fig. No |) . | |
| Print | - | | - | | | | | \ | WES | ΙR | IVERS | SIDE, B | ALLOC | JH . | | | | " | 1, | Sheet | 1 of 1 | |

| Progress | Sa | ample Depth | Samples an | d Tests | Casing Depth | Leve (mOD | Depth | h | | Des | scription (| of Strata | | | | Legend | Water Depth | 9 | ckfill Depth |
|--|-----------|------------------|--------------------------------------|---------------|--------------|--------------|-----------|---------------|--|---|--|---|--|--|----------|--|-------------------------------------|--------|-----------------|
| 22/ 201 | '2 7 |).25 | B, J, T, V | | | | 0.10 | | # Turf. Dark grey to brown, o cobble content, rootlet coarse of sandstone, celongated subangular Medium dense brown is elongated subangul | rganic silty s and dark ther litholog of igneous silty gravell ar fine to co | clayey gra grey ash. (gies and b rock and b ly to very g parse of qu | velly med Gravel is e rick fragm rick fragn ravelly fin artz, sand | ium to coa elongated s nents. Cobl nents. (MA e to mediu Istone and | rse sand w subangular oles are fla DE GROU m SAND. (other lithol | | | | | 0.20 |
| | | | B SPT=29 <u>6.6/7.7.7</u> T | 8 | 1.20 | | 1.65 | | | | | | | | | × · · · × · · × · · × · · × · · × | | | 1.50 1.65 |
| Printed: 13/06/2017 16:34:25 Phoenix Drilling Ltd, 2 Naim Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 41 1448 교육 및 기계 | | | | | | | | 5 | | EN | D OF BOR | REHOLE | | | | xp*.* | | | 1.65 |
| Industrial Estate, | | | Flush | | selling | | Vater Add | | | d-water | 0.40% | Diam | | Depth | Location |). | E 23893 | 80.5 | |
| airn Road, Deans | eturn | 18 | Type To Depth | From | To Tir | ne(hr) Fro | om - | <u>To</u> | Struck Rose To | Time(mins) | Cut Off | 125 | 1.65 | 1.50 | Level: | | E 23693 N 68195 - Vertical | | |
| 5 Phoenix Drilling Ltd, 2 N: 88 # 38 | Des | urks: criptio | on based on dri truction at 1.5 n | lers records. | | | Ec Da | Equip Oart | ment: | | Method: Inspecti Window | : on Pit to v Sample | er to | 1.20m 1.65m | Borehol | e No: | WS5 | | |
| 06/2017 16:34:25 | Dri K | | Originator MM | | | | BC | OR | EHOLE REG | CORD |) | | | | Contrac | t No: | Part Fig. No | | |
| Printed: 13/ | Chk 8 | & App G | Status Final | | | | WES | ST | RIVERSIDE, B | ALLOC | Н | | | | 3 | A STATE OF THE PARTY OF THE PAR | Sheet 1 | l of 1 | |

| ſ | ress | Sample | | mples and | d Tests | Casing | | Level | Donth | | | | Do | aarintian | of Ctroto | | | | pua | Water | Ba | ckfill |
|---|--------------|---------------------|---------|------------------------|-------------|-----------|----------|---------|----------|------------|-----------------------|-------------|-------------|-------------------|------------------|--------|--------|----------|----------|----------|------|--------|
| | ш. | Depth | Туре | Res | sult | Depth | | (mOD) | | | | | De | scription | or Strata | | | | Legend | Depth | (v) | Depth |
| 2 | 22/2 2017 | | | | | | | | 0.10 | # | Turf. Topsoil fill | bricks lard | ge cobbles. | . (MADE G | ROUND) | | | | | | | |
| | | | | | | | | | 0.60 | | | | , | , | , | | | | | | | |
| ŀ | | | | | | | | | 0.60 | | | | EN | D OF BOF | REHOLE | | | | ***** | | *** | 0.65 |
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| al Est | | | | | | | | | - | | | | | | | | | | | | | |
| Printed: 13/06/2017 16:34:26 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | Flush | | | hiselling | <u> </u> | | ter Adde | | | Ground | | | Diam | | Depth | 10" | | | | |
| eans l | Retu | ırns | Type | To Depth | From | To To | Γime(h | r) From | 1 T | 0 | Struck | Rose To | Time(mins | Cut Off | Diam | Boring | Casing | Location | | | | |
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| ٦ Ltd, | # De | narks: escriptio | on ba | sed on dril | lers record | S. | | | Eq Da | uipm rt | ent: | | | Method Inspect | l: ion Pit to | (| 0.65m | Borehole | e No: | | | |
| Jrilling | Obs | truction | n at 0. | 65 m dept | h. | | | | | | | | | | | | | | | WS5 | 3 N | |
| enix [| | | | | | | | | | | | | | | | | | | | v v 33 | υA | |
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| 17 16: | | Oriller KG | С | riginator MM | | | | | ВО | RE | HOLI | E REC | CORD |) | _ | | | | ارار | Part | | |
| 6/201 | | NG | | IVIIVI | | | | | _ | | Scale | | | | | | | AST TO | 1 | Fig. No | | |
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| rinted | | SG | | Final | | | | , | WES | TR | IVERS | IDE, B | ALLOC | CH | | | | 40 |) | Shoot 4 | of 4 | |
| п. | | | - 1 | | | | | | | | | | | | | | | ı ₹ | | Sheet 1 | OI I | |

| Progress | 000 | Sample Depth | Type | mples ar | nd Tests | Casing | -1 | Level (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Water Depth | Symbol | ackfill Depth |
|---|------------|--------------------|---------------|-------------------|------------|------------------|--------|----------------|---------|------------|---------------------------|---------------------------|-----------------------------|------------------------------|------------------------|----------------|-----------------|-----------------------|----------|----------------|--------|------------------|
| 22/ 201 | /2 | _opui | F | | | Вора | | | | # | Hardcore. | (MADE G | ROUND) | | | | | | <u> </u> | • | | |
| 201 | | 0.50 | | | | | | | 0.40 | Gı | revish brov | vn silty cla | vev mediur | m to coarse | e SAND a | nd GRAVE | EL. Gravel | is flat to | | | | 0.20 |
| | | 0.50 | J, T | | | | | | 0.80 | | | | fine to coar | | | h cond con | di i banda i | | | | | |
| | | 1.00 | В | | | | | | - | is | elongated her litholog | subangula | gravelly CL ar fine to m | edium of s | andstone, | , quartz, ig | neous rock | and | | | | |
| | | 1.20 1.20 | SPT= | 7 4.3/2.2. | <u>1.2</u> | 1.20 | | | | | | | | | | | | | | | | |
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| | | 2.00 2.00 | SPT= B, T | 3 <u>1.2/1.1.</u> | 1.3 | 2.00 | | | - | | | | | | | | | | | | | |
| | | | ŕ | | | | | | 2.40 | Me | edium den | se light br | own to bro | wn very sil | ty clayey r | nedium SA | AND and | | <u></u> | | | |
| | | | | | | | | | | - GI sa | RAVEL. G andstone, i | ravel is elo gneous ro | ongated sub ck and othe | bangular to er lithologie | subround s. | ded fine to | medium o | f | | | | |
| | | 3.00 | SPT= | 21 6.5/5.5. | <u>5.6</u> | 3.00 | | | - | | | | | | | | | | | Ţ | | 3.00 |
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| strial Es | | | | | | | | | | | | | | | | | | | | | | |
| snpul si | etur | | Flush Type | To Depth | | Chiselling To | Time(h | | ter Add | ed To | Struck | | d-water Time(mins | Cut Off | Diam | To D Boring | Depth Casing | Location | 1: | E 23898 | 38.8 | |
| i, Dean | | | | | | | | | | | 3.20 | | | | 125 | 3.45 | 3.00 | | | N 6819 | 78.3 | |
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| , 2 Naii | em | arks: | | | | | | | Fr | quipm | ent· | | | Method | | | | Orientati Borehole | | Vertical | | |
| ling Ltd | De arre | scripti el obst | ructio | n at 3.0 n | | | | | Da | art | ont. | | | Inspecti | ion Pit to v Sample | | 1.20m 3.45m | POLETION | . INU. | | | |
| E Li | | | | | to 2.0 m d | epth. | | | | | | | | | | | | | | WS5 | 54 | |
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| 017 16 | | riller KG | 0 | riginator MM | | | | | BC | RE | | | CORD |) | | | | M == | مل | Part | | |
| 13/06/2 | . · | . 0. 4 | | 04-4 | | | | | | | Scale | 1:50 | | | | | | 3 | | Fig. No |). | |
| Printed: 13/06/2017 16:34:26 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | : & App SG | | Status Final | | | | • | WES | TR | IVERS | IDE, B | ALLOC | Н | | | | | | CL = 1 | 1 | |
| | | | | | | | | | | | | | | | | | | '* | | Sheet | ı ot 1 | |

| | <u>_</u> | Sample Depth | Sampl | es and Tests Result | Casing Depth | Level (mOD) | Depth | Description of Strata Wate | ō | ackfill Depth |
|---|------------------------------|--------------------------------|------------------------|--------------------------------|--------------------|----------------|------------------|--|-----------|------------------|
| 2 | 3/2 017 | 0.25 | B, J, T, V | | | | 0.20 | #TOPSOIL. Soft dark brown organic gravelly sandy CLAY with roots. Gravel is flat to elongated subangular medium of various lithologies. | | |
| | | | В | | | | 0.80 | Light brown very silty fine SAND with silt lenses . | | |
| | | 1.20 | SPT=17 <u>2</u> T | <u>6/5.5.2.5</u> | | | 1.80 | Firm dark brown organic gravelly very sandy CLAY. Gravel is flat to elongated subangular medium of igneous rock and other lithologies. | | 1.80 |
| | | | | | | | 1.00 | END OF BOREHOLE | **** | 1.80 |
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| Deans Indu | Retu | | Flush Type To | Depth From | Chiselling To Time | | ter Adde | Struck Rose To Time(mins Cut Off Diam Boring Casing 125 1.80 1.80 Location: | 1 | |
| Nairn Road, | | | | | | | | Level: - Orientation: Vertice | al | |
| Drilling Ltd, 2 | ‡ De | narks: escripti rel obst | on based ruction at | on drillers re 1.8 m depth. | cords. | | Eqi Dai | pment: Method: Inspection Pit to 1.20m Window Sampler to 1.80m WS | S55 | |
| 27 Phoenix | | | | | | | | | | |
| /2017 16:34: | Driller Originator KG MM | | | | | | ВО | Contract No: 230 REHOLE RECORD Scale 1:50 Contract No: 230 Part Fig. | | |
| Printed: 13/06/2017 16:34:27 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | Chk & App Status SG Final WI | | | | | , | WES ⁻ | RIVERSIDE, BALLOCH | et 1 of 1 | |

| ſ | <u>_</u> | Sample Depth | Samples an | d Tests | Casing Depth | | Level (mOD) | Depth | | | | De | scription o | of Strata | | | | Legend | Water Depth | 00 | nckfill Depth |
|---|------------------------------------|---------------------|-----------------|---------------|--------------|------------------------|------------------------|---|-------------|------------|----------|-----------|---------------------|------------|----------------|----------------|----------|----------------|----------------|------|------------------|
| 2 | B/2 017 | | <u> </u> | | | | | 0.20 | | TOPSOIL. | n CLAV | | | | | | | | | 1111 | 0.20 |
| | | | | | | | | | #1 | Dark brow | n CLAY. | | | | | | | - x - | | 0 0 | 0.50 |
| | | | | | | | | 0.80 | # 5 | Silty SANE |) | | | | | | | × · · | | | |
| | | | | | | | | 1.15 | | Dark brow | | | | | | | | : × | | | |
| | | | | | | | | 1.50 | #1 | Jaik brow | II CLAY. | | | | | | | | | 0 0 | 1.50 |
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| ngston, | | | | | | | | - | | | | | | | | | | | | | |
| te, Livir | | | | | | | | | | | | | | | | | | | | | |
| al Esta | | | | | | | | | 1 | | | | | | | | | | | | |
| Printed: 13/06/2017 16:34:27 Phoenix Drilling Ltd, 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | D-: | | Flush | | niselling | ing - " | | ter Adde | | 041 | | d-water | 0.40" | Diam | To D | epth | Location | n: | | | |
| Deans | Retu | ums 1 | Type To Depth | From | To T | Time(hr | r) From | ' | Го | Struck | Kose Io | Time(mins | Cut Off | 125 | Boring 1.50 | Casing 1.50 | | | | | |
| Road, | | | | | | | | | | | | | | | | | Level: | | - | | |
| Nairn | | | | | | | | | | | | | | | | | Orientat | ion: | Vertical | | |
| g Ltd, 2 | # De | narks: escriptio | on based on dri | llers records | S. | | | Eq Da | uipm art | ent: | | | Method: Inspecti | ion Pit to | or to | 1.20m | Borehole | e No: | | | |
| Drillin | Barrel obstruction at 1.5 m depth. | | | | | | | | | vvindov | v Sample | ertO ′ | 1.50m | | | WS5 | 5A | | | | |
| hoenix | | | | | | | | | | | | | | | | | | - | | | |
| 4:27 F | | | | | | | | | | | | | | Contrac | t No: | 2304 | <u> </u> | | | | |
| 17 16:3 | Driller Originator KG MM | | | | BC | BOREHOLE RECORD | | | | | | | ا رز | Part | • | | | | | | |
| /06/201 | | | | | - | - | | 1:50 | | | | | | F | | Fig. No |). | | | | |
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| Prin | WE WE | | | | | vv ES | EST RIVERSIDE, BALLOCH | | | | | SI | | Sheet 1 | of 1 | | | | | | |

| Progress | Sample Depth | (n) | and Tests Result | Casing Depth | Level (mOD) | Depth | | | De | scription | of Strata | | | | Legend | Water Depth | 9 | ckfill Depth |
|---|------------------------------|-------------------------------|------------------|---------------------|-------------------|-----------|-------------------------------|-----------------------------|-----------------------------|----------------------------|--------------------------|------------------------|------------------------|----------------|-----------------|----------------|-----------|-----------------|
| 8/2 2017 | | | | | | 0.20 | #TOPSOIL | | | | | | | | | | T. I T. T | 0.20 |
| | 0.25 | B, J, T, V | | | | - | Very loose I is fine to me | ight brown edium of sa | fine silty ci ndstone. | iayey siigh | tiy graveliy | / SAND WI | in rootlets. | Gravel | × . | | | 0.50 |
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| | 1.20 | Т | | | | 1.60 | | | | | | | | | × | | | |
| | | | | | | | Very soft to | firm brown | silty sandy | y laminated | CLAY. | | | | | | | |
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| | | | | | | - | Loose brow subangular | n silty claye to subroun | ey fine to m ded fine to | nedium SA medium c | ND and G of quartz, i | RAVEL. G gneous roo | ravel is k and othe | er | 0 | | | |
| | | | | | | - | lithologies | | | | | | | | 0 | ₹ | | |
| | 3.00 | SPT=7 2.4/2 | 2.1.2.2 | 3.00 | | | | | | | | | | | 0 | * | | |
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| Dean | | | | | | | 3.00 | 2.90 | 20 | | 125 | 5.00 | 5.00 | | | | | |
| Road, | | | | | | | | | | | | | | Level: | | - | | |
| airn R | | | | | | | | | | | | | | Orienta | tion: | Vertical | | |
| Z Rer | narks: | | | | | Ear | uipment: | | | Method | | | <u> </u> | Borehol | | | | |
| ng Ltc | escript | ion based on ry for SPT at | drillers record | S. | | Dai | | | | Inspect | ion Pit to v Sample | | 1.20m 5.00m | | | | | |
| Line | er samı | ple between | 1.2 and 2.0 m | depth and | between 2.0 | | | | | | | | | | | WS | 56 | |
| and | d 3.0 m depth. | | | | | | | | | | | | | | | | | |
| 88 P | | | | | | | | | | | | | | | | | | |
| 6:34:2 | Driller Originator | | | | | | | | | | | | Contrac | ct No: | 2304 | 1 | | |
| 017 1 | Driller Originator KG MM | | | | ВО | REHOL | | CORE |) | | | | - M- | de | Part | | | |
| 106/20 | | | | | Scale | 1:50 | | | | | | 3 | K. | Fig. No | О. | | | |
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| Print | SG FINAL V | | | | WES ⁻ | TRIVERS | SIDE, B | ALLOC | CH | | | | "V | 1, | Sheet | 1 of 1 | | |
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| es SS | Sample | 7I | | ples and | d Tests | Casin | al I | Level | | | | | | | | | | | pu | Water | Ba | ckfill |
|--|---|----------|----------|------------|----------|-----------------|-----------------------------|-------|----------|-----------|---|--------------------------------------|--|--|---------------------------|------------------------------|------------------------|-------------------|--------|----------------|--------|--------|
| Progress | Depth | Φ | ; | Res | sult | Depth | - 10 | (mOD) | Depth | | | | De | scription | of Strata | | | | Legend | Depth | Symbol | Depth |
| 24/2 2017 | 0.25 | | J, T, ' | V | | | | | 0.30 | Da | t to elonga | organic ve ated suban e SAND + | ry silty clay gular fine o GRAVEL. | ey slightly of various l | gravelly s ithologies. | and with ro | ootlets. Gr _) | avel is | 5 | <u>*</u> | | 0.20 |
| | 1.00 | В | | | | | | | 0.80 | So sul | ft to firm s bangular | silty sandy fine of sand | gravelly Cl dstone, qua | AY with sartz, igneo | andy band us rock an | ls. Gravel i d other lith | s elongate ologies. | ed | -0. | Ţ | | |
| | 1.20 | SP | T=0 | 0.0/0.0.0. | <u>0</u> | 1.20 | | | - | cla | y lenses. | Gravel is e | own to brow elongated s ck and othe | ubangular | to subrou | ly medium Inded fine f | SAND wit o medium | h sandy ı of | | | | |
| | 2.00 2.00 | SP B, | T=1 T | 1.0/0.1.0. | 0 | 2.00 | | | 2.00 | co | ntent. Gra | vel is suba | wn silty ver angular to s e rounded | ubrounde | d of quartz | z. ianeous i | ock and c | ther | 0.00 | | | 2.60 |
| | 3.00 | В | | | | | | | 3.00 | | | | = 1 | D OF BOF | 25,101,5 | | | | 0 0 | | | 3.00 |
| 2 Nairn Road, Deans Industrial Estate, Livingston, West Lothian, EH54 8AY E-mail: info@phoenixdrilling.co.uk Tel: 01506 411448 | | | | | | | | | | | | | | | | | | | | | | |
| Ret | | Flus | | Γο Depth | From | hiselling To | Time(hr) | | ter Adde | d To | Struck | | d-water Fime(mins | Cut Off | Diam | To E Boring | epth Casing | Locatio | n: | | | |
| d, Dean | | | | | | | | | | 7 | 0.80 | 0.50 | 20 | | 125 | 3.00 | 2.60 | المسم ا | | | | |
| irn Roa | | | | | | | | | | | | | | | | | | Level: Orienta | tion: | - \/ortical | | |
| 2 Na | marko: | | | | | | | | E~ | uinm | ant: | | | Mothod | | | | | | Vertical | | |
| Ing Ltd. We D | Remarks: # Description based on drillers records. No recovery for SPT at 1.2 m depth. Installed up to 2.6 m (sand and gravel blowing up casing) | | | | Eq Da | uipme rt | ent: | | | Inspect | Method: Inspection Pit to 1.20m Window Sampler to 3.00m | | | | ie No: | WS | | | | | | |
| 6:34:2 | Driller | _ | Orio | ginator | | | | | | | | | | | | | | Contra | ct No: | 2304 | 1 | |
| KG MM I | | | | | | | BOREHOLE RECORD Scale 1:50 | | | | | | A STATE OF THE PARTY OF THE PAR | The state of the s | Part Fig. No |). | | | | | | |
| Print | WEST RIVERSIDE, BALLOCH | | | | | | | | " | 1, | Sheet | 1 of 1 | | | | | | | | | | |

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Appendix B Geotechnical Test Results

LABORATORY TEST CERTIFICATE



10 Queenslie Point Queenslie Industrial Estate 120 Stepps Road

Glasgow G33 3NQ

Tel: 0141 774 4032 Fax: 0141 774 3552

email: info@mattest.org Website: www.mattest.org

Certificate No: 17/334 - 01

To: Stephen Glover

Client : Phoenix Drilling Limited

2 Nairn Road

Deans Industrial Estate

Livingston EH54 8AY

Dear Sirs,

LABORATORY TESTING OF SOIL

Introduction

We refer to samples taken from Riverside, Balloch and delivered to our laboratory on 20th March 2017.

Material & Source

Sample Reference : See Report Plates

Sampled By : Client

Sampling Certificate : Not Supplied

Location : See Report Plates

Description : See Page 2 to Page 5

Date Sampled : Not Supplied

Date Tested : 20th March 2017 Onwards

Source : Riverside, Balloch

Test Results;

As Detailed On Page 2 to Page 34 inclusive

Comments:

Opinions and interpretations expressed herein are outside the scope of UKAS accreditation. This report should not be reproduced except in full without the written approval of the laboratory. All remaining samples for this project will be disposed of 28 days after issue of this test certificate.

Remarks;

| Approved for Issue | | |
|------------------------|------|------------|
| | Date | 20/04/2017 |
| T McLelland (Director) | | |



Issue No. 01 Page 1 of 34



| BOREHOLE | SAMPLE | DEPTH (m) | SAMPLE DESCRIPTION |
|----------|--------|--------------|--|
| WS1 | В | 0.25 | Brown gravelly sandy CLAY. Gravel is fine to coarse. |
| WS1 | В | 1.00 | Brown clayey silty fine to coarse SAND and GRAVEL. |
| WS2 | В | 1.00 | Brown very gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS2B | В | 2.00 | Brown very gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS3 | В | 1.00 | Brown very gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS4 | В | 1.00 | Brown fine to coarse SAND and GRAVEL. |
| WS4 | В | 4.00 | Brown gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS5 | В | 1.00 | Mottled brown gravelly sandy CLAY. Gravel is fine to coarse. |
| WS5 | В | 2.80 | Mottled brown slightly gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS6 | В | 1.00 | Brown silty slightly sandy CLAY. |
| WS7 | В | 0.25 | Brown fine to coarse SAND and GRAVEL. |
| WS8 | В | 1.00 | Brown gravelly sandy CLAY. Gravel is fine to coarse. |
| WS8 | U | 1.20-1.65 | Mottled brown gravelly very sandy CLAY. Gravel is fine to medium. |
| WS8 | В | 2.00 | Mottled brown gravelly very sandy CLAY. Gravel is fine to medium. |
| WS9 | В | 1.00 | Brown gravelly sandy CLAY. Gravel is fine to coarse. |
| WS10 | В | 1.00 | Greyish brown slightly gravelly sandy CLAY with root fibres. Gravel is fine to medium. |
| WS11 | В | 0.25 | Brown sandy CLAY. |
| WS11 | В | 2.00 | Mottled brown very sandy very gravelly CLAY. Gravel is fine to coarse. |
| WS11 | U | 2.20-2.50 | Brown gravelly sandy CLAY. Gravel is fine to coarse. |
| WS12 | В | 1.00 | Brown fine to coarse SAND and GRAVEL. |
| WS13 | В | 0.25 | Brown very gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS13 | В | 1.00 | Brown gravelly sandy CLAY with root fibres. Gravel is fine to coarse. |
| WS14 | В | 1.00 | Brown slightly clayey fine to coarse SAND and GRAVEL. |
| WS15 | В | 1.00 | Brown very gravelly sandy CLAY. Gravel is fine to coarse. |



| BOREHOLE | SAMPLE | DEPTH (m) | SAMPLE DESCRIPTION | | | | |
|----------|-------------|--------------|---|--|--|--|--|
| WS16 | В | 1.00 | Dark brown PEAT (Von Post Classification - H4) | | | | |
| WS16 | В | 2.00 | Dark brown PEAT (Von Post Classification - H2) | | | | |
| WS17 | В | 1.00 | Brown gravelly fine to coarse SAND with cobbles. Gravel is fine to coarse. | | | | |
| WS18 | В | 1.00 | rown fine to coarse SAND and GRAVEL. | | | | |
| WS20 | В | 0.25 | Dark brown fine to coarse SAND and GRAVEL with root fibres. | | | | |
| WS21 | В | 1.00 | Brown fine to coarse SAND and GRAVEL with root fibres. | | | | |
| WS21 | В | 4.00 | Light brown slightly gravelly very sandy silty CLAY. Gravel is fine to coarse. | | | | |
| WS22 | В | 4.00 | Light brown very clayey very silty slightly gravelly fine to coarse SAND. Gravel is fine to medium. | | | | |
| WS23 | В | 1.00 | Brown slightly gravelly fine to coarse SAND. Gravel is fine to medium. | | | | |
| WS24 | В | 1.00 | Brown fine to coarse SAND and fine to medium GRAVEL. | | | | |
| WS24A | В | 2.00 | Brown fine to coarse SAND and fine to medium GRAVEL. | | | | |
| WS25 | В | 1.00 | Brown fine to coarse SAND and GRAVEL with root fibres. | | | | |
| WS26 | В | 1.00 | Brown fine to coarse SAND and GRAVEL. | | | | |
| WS29 | В | 1.00 | Brown fine to coarse SAND with pockets of organic matter. | | | | |
| WS30 | В | 1.00 | Brown clayey very sandy fine to coarse GRAVEL with cobbles. | | | | |
| WS32 | В | 0.90 | Dark brown / grey fine to coarse SAND and GRAVEL. | | | | |
| WS35 | В | 1.00 | Dark brown fine to coarse SAND and GRAVEL with pockets of sandy clay. | | | | |
| WS36 | В | 0.25 | Dark brown fine to coarse SAND and GRAVEL with pockets of sandy clay. | | | | |
| WS36 | В | 2.00 | Dark grey ASH FILL. | | | | |
| WS37 | В | 1.00 | Brown fine to coarse SAND and GRAVEL. | | | | |
| WS37 | WS37 B 2.00 | | Dark brown clayey silty fine to coarse SAND and GRAVEL. | | | | |
| WS38 | WS38 B 0.25 | | Grey fine to coarse SAND and GRAVEL / ASH FILL. | | | | |
| WS38 | В | 3.00 | Dark grey slightly clayey fine to coarse ASH FILL. | | | | |
| WS39 | В | 1.00 | Brown fine to coarse SAND and GRAVEL. | | | | |



| BOREHOLE | SAMPLE | DEPTH (m) | SAMPLE DESCRIPTION |
|----------|-------------|--------------|---|
| WS40C | В | 1.00 | Black fine to coarse SAND and GRAVEL / ASH FILL. |
| WS40C | В | 5.00 | Dark grey slightly gravelly silty fine to coarse SAND. Gravel is fine to medium. |
| WS41 | В | 1.00 | Black fine to coarse SAND / ASH FILL. |
| WS41 | В | 3.00 | Black very clayey PEAT (Von Post Classification - H2) |
| WS43 | В | 1.00 | Black ASH FILL. |
| WS43 | В | 4.00 | Black PEAT (Von Post Classification - H3) |
| WS45 | В | 1.00 | Dark brown slightly clayey fine to coarse SAND and GRAVEL. |
| WS45 | В | 4.00 | Mottled brown very gravelly very sandy CLAY with black staining. Gravel is fine to coarse. |
| WS45 | В | 5.00 | Dark brown / black ver clayey PEAT (Von Post Classification - H3) |
| WS47 | В | 0.25 | Dark grey fine to coarse SAND and GRAVEL / ASH FILL. |
| WS49 | В | 1.00 | Dark grey very clayey fine to coarse SAND and GRAVEL / ASH FILL. |
| WS49 | В | 2.00 | Dark grey very clayey fine to coarse SAND and GRAVEL / ASH FILL. |
| WS49 | В | 3.00 | Black PEAT (Von Post Classification - H2) |
| WS50 | В | 0.25 | Black fine to coarse SAND and GRAVEL / ASH FILL. |
| WS50 | В | 3.00 | Dark grey gravelly sandy CLAY. Gravel is fine to coarse. |
| WS51B | В | 1.00 | Brown very gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS51B | В | 3.00 | Brown very sandy very gravelly CLAY. Gravel is fine to coarse. |
| WS52 | В | 0.25 | Brown fine to coarse SAND and GRAVEL with cobbles. |
| WS53 | В | 0.25 | Dark brown very gravelly very sandy CLAY with root fibres. Gravel is fine to coarse. |
| WS54 | В | 1.00 | Brown gravelly sandy CLAY. Gravel is fine to coarse. |
| WS54 | В | 3.00 | Greyish brown very gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS55 | WS55 B 0.25 | | Dark brown gravelly very sandy CLAY. Gravel is fine to coarse. |
| WS56 | В | 0.25 | Brown sandy CLAY with root fibres. |
| WS56 | В | 1.00 | Light brown slightly gravelly fine to coarse SAND with root fibres. Gravel is fine to medium. |



| BOREHOLE | SAMPLE | DEPTH (m) | SAMPLE DESCRIPTION |
|----------|--------|--------------|---|
| WS57 | В | | Brown slightly gravelly sandy CLAY. Gravel is fine to coarse. |
| | | | |
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| BOREHOLE | SAMPLE | DEPTH (m) | MOISTURE CONTENT (%) |
|----------|--------|--------------|----------------------------|
| WS1 | В | 0.25 | 26 |
| WS1 | В | 1.00 | 11 |
| WS2 | В | 1.00 | 13 |
| WS2B | В | 2.00 | 26 |
| WS3 | В | 1.00 | 24 |
| WS4 | В | 1.00 | 6.8 |
| WS4 | В | 4.00 | 21 |
| WS5 | В | 1.00 | 30 |
| WS6 | В | 1.00 | 25 |
| WS8 | В | 1.00 | 16 |
| WS8 | U | 1.20 | 11 |
| WS8 | В | 2.00 | 12 |
| WS9 | В | 1.00 | 13 |
| WS10 | В | 1.00 | 30 |
| WS11 | В | 0.25 | 30 |
| WS11 | В | 2.00 | 15 |
| WS12 | В | 1.00 | 9.2 |
| WS13 | В | 0.25 | 32 |
| WS13 | В | 1.00 | 28 |
| WS15 | В | 1.00 | 14 |
| WS16 | В | 1.00 | 35 |
| WS16 | В | 2.00 | 211 |
| WS17 | В | 1.00 | 9.9 |

Tested in accordance with BS 1377: Part 2: 1990: Clause 3

SUMMARY OF MOISTURE CONTENT TEST RESULTS



| BOREHOLE | SAMPLE | DEPTH (m) | MOISTURE CONTENT (%) |
|----------|--------|--------------|----------------------------|
| WS18 | В | 1.00 | 6.8 |
| WS20 | В | 0.25 | 23 |
| WS21 | В | 1.00 | 9.0 |
| WS22 | В | 4.00 | 9.2 |
| WS23 | В | 1.00 | 18 |
| WS24 | В | 1.00 | 7.0 |
| WS24A | В | 2.00 | 5.6 |
| WS25 | В | 1.00 | 9.1 |
| WS26 | В | 1.00 | 9.1 |
| WS29 | В | 1.00 | 10 |
| WS30 | В | 1.00 | 10 |
| WS32 | В | 0.90 | 9.1 |
| WS36 | В | 2.00 | 32 |
| WS37 | В | 2.00 | 13 |
| WS38 | В | 3.00 | 40 |
| WS40C | В | 5.00 | 22 |
| WS41 | В | 3.00 | 195 |
| WS43 | В | 4.00 | 125 |
| WS45 | В | 4.00 | 31 |
| WS45 | В | 5.00 | 102 |
| WS49 | В | 1.00 | 22 |
| WS49 | В | 2.00 | 20 |
| WS49 | В | 3.00 | 256 |

Tested in accordance with BS 1377: Part 2: 1990: Clause 3

SUMMARY OF MOISTURE CONTENT TEST RESULTS

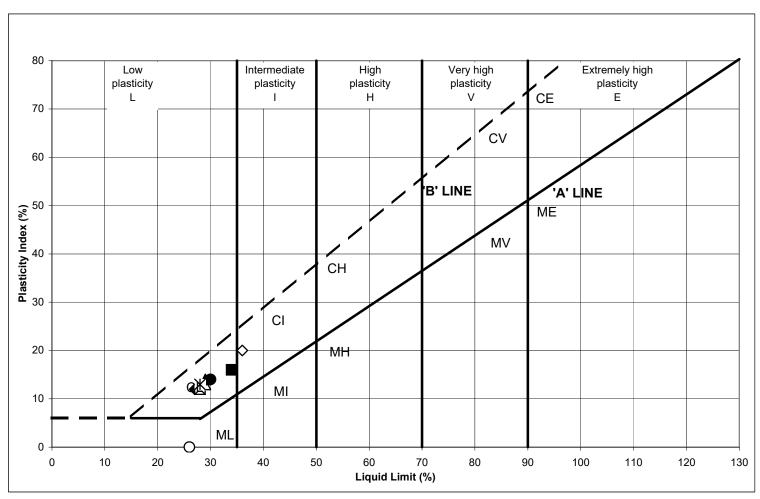


| BOREHOLE | SAMPLE | DEPTH (m) | MOISTURE CONTENT (%) |
|----------|--------|--------------|----------------------------|
| WS50 | В | 3.00 | 27 |
| WS51B | В | 3.00 | 17 |
| WS54 | В | 1.00 | 13 |
| WS54 | В | 3.00 | 14 |
| WS55 | В | 0.25 | 25 |
| WS56 | В | 1.00 | 18 |
| | | | |

Tested in accordance with BS 1377: Part 2: 1990: Clause 3

SUMMARY OF MOISTURE CONTENT TEST RESULTS



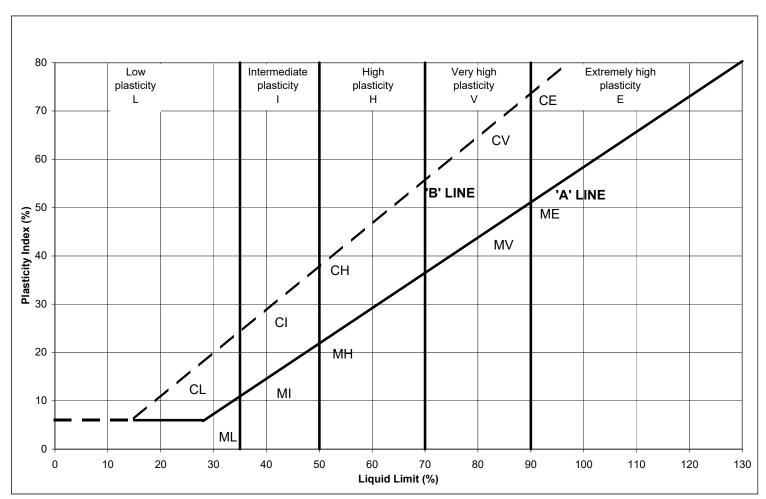


| Symbol | Borehole | Sample | Depth | Moisture Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | % Passing 0.425mm Sieve | Remarks |
|------------|----------|--------|-------|----------------------------|---------------------|----------------------|-------------------------|-------------------------------|-----------------------------------|
| | WS2B | В | 2.00 | 26 | 34 | 18 | 16 | 61 | Clay with low plasticity |
| • | WS8 | U | 1.30 | 11 | 27 | 15 | 12 | 66 | Clay with low plasticity |
| A | WS8 | В | 2.00 | 12 | 29 | 15 | 14 | 74 | Clay with low plasticity |
| • | WS9 | В | 1.00 | 13 | 30 | 16 | 14 | 58 | Clay with low plasticity |
| | WS11 | В | 2.00 | 15 | 28 | 16 | 12 | 42 | Clay with low plasticity |
| \Diamond | WS13 | В | 1.00 | 28 | 36 | 16 | 20 | 91 | Clay with intermediate plasticity |
| Δ | WS15 | В | 1.00 | 14 | 29 | 16 | 13 | 61 | Clay with low plasticity |
| 0 | WS49 | В | 2.00 | 20 | 26 | Non Plastic | Non Plastic | 27 | |
| × | WS51B | В | 3.00 | 17 | 28 | 16 | 12 | 59 | Clay with low plasticity |
| Ж | WS54 | В | 1.00 | 13 | 28 | 15 | 13 | 62 | Clay with low plasticity |

All samples were tested in accordance with BS 1377 : Part 2 : 1990 Clause 4.3, 5.3 and 5.4. All samples were washed on a 0.425mm test sieve prior to test.

SUMMARY OF ATTERBERG LIMITS TEST RESULTS





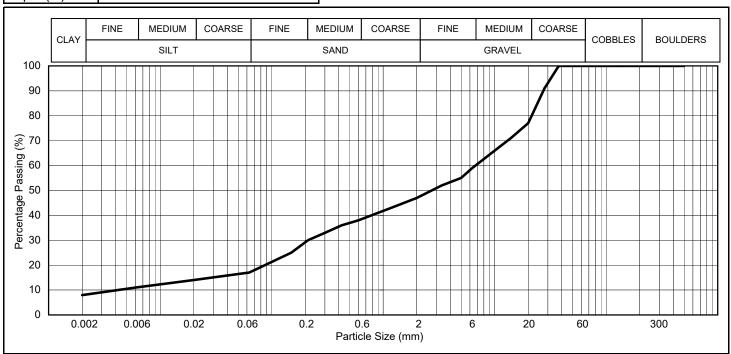
| Symbol | Borehole | Sample | Depth | Moisture Content (%) | Liquid Limit (%) | Plastic Limit (%) | Plasticity Index (%) | % Passing 0.425mm Sieve | Remarks |
|----------|----------|--------|-------|----------------------------|---------------------|----------------------|-------------------------|-------------------------------|--|
| | WS45 | В | 5.00 | 102 | 133 | 56 | 77 | - | Unable to plot on chart due to material type |
| • | | | | | | | | | |
| A | | | | | | | | | |
| • | | | | | | | | | |
| | | | | | | | | | |
| ♦ | | | | | | | | | |
| Δ | | | | | | | | | |
| 0 | | | | | | | | | |
| × | | | | | | | | | |
| Ж | | | | | | | | | |

All samples were tested in accordance with BS 1377 : Part 2 : 1990 Clause 4.3, 5.3 and 5.4. All samples were tested in their natural state.

SUMMARY OF ATTERBERG LIMITS TEST RESULTS



| Borehole | WS1 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |

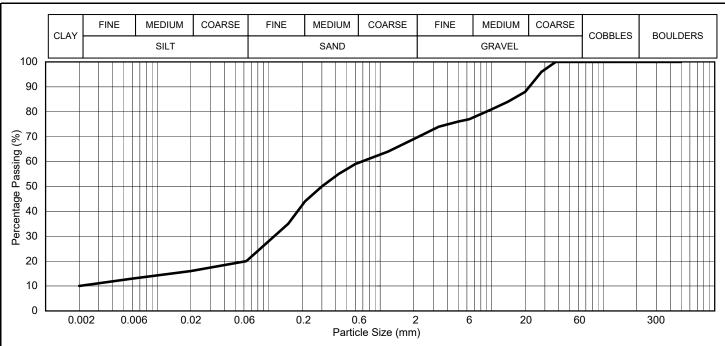


| | SIEVING | | | | S | EDIMENT | ATION | |
|--------------------|--------------------|---------|---------------------|--|------------|-----------|---------------|----------------|
| Ciava Ciava (mana) | Percentage Passing | • | ication | Particle Size (mm) Percen | | |) 4 | Di (0/) |
| Sieve Size (mm) | (%) | Lower % | plicable Upper % | | e Size (mn | 1) | ercentage | Passing (%) |
| 500.0 | 100 | • | - | | 0.020 | | 1 | 4 |
| 300.0 | 100 | - | - | | 0.006 | | 1 | 1 |
| 125.0 | 100 | - | - | | 0.002 | | (| 3 |
| 90.0 | 100 | - | - | | | • | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | Grading classification proves the material has met the relevant grad | | | | |
| 28.0 | 91 | - | - | requirements only. Further testing may be required to assess | | | | o assess |
| 20.0 | 77 | • | - | compliance with SHW. | | | | |
| 14.0 | 71 | • | - | | | | | |
| 10.0 | 66 | • | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 59 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 55 | • | - | CLAI | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 52 | • | - | 8 | 9 | 30 | 53 | 0 |
| 2.00 | 47 | • | - | | | | | |
| 1.18 | 43 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5) |
| 0.600 | 38 | - | - | D10 D60 | | | | |
| 0.425 | 36 | • | - | Specific Specific | | | Specification | |
| 0.300 | 33 | - | - | | - | | - | |
| 0.212 | 30 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 25 | - | - | | | | | |
| 0.063 | 17 | - | - | | | | | |

Remarks



| Borehole | WS3 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |

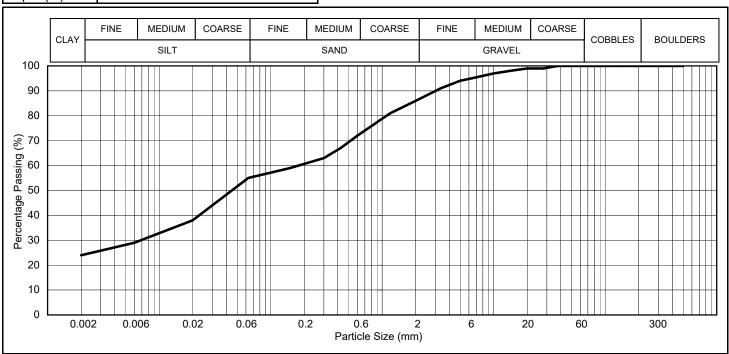


| | SIEVING | | | | S | SEDIMENT | ATION | | |
|-----------------|--------------------|---------|----------|---|------------|-----------|------------|---------------|--|
| | Percentage Passing | Specif | | | | | | | |
| Sieve Size (mm) | (%) | Not Ap | plicable | Particl | e Size (mn | n) F | Percentage | Passing (%) | |
| | (70) | Lower % | Upper % | | | | | | |
| 500.0 | 100 | • | - | | 0.020 | | 1 | 6 | |
| 300.0 | 100 | • | - | | 0.006 | | 1 | 3 | |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 0 | |
| 90.0 | 100 | - | - | | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) | |
| 63.0 | 100 | - | - | | | | | | |
| 50.0 | 100 | - | - | | | - | | | |
| 37.5 | 100 | - | - | Grading classification proves the material has met the relevant grading | | | | | |
| 28.0 | 96 | - | - | requirements only. Further testing may be required to assess | | | | | |
| 20.0 | 88 | - | - | compliance with SHW. | | | | | |
| 14.0 | 84 | - | - | | | | | | |
| 10.0 | 81 | - | - | | PERC | ENTAGE S | SOIL TYPE | S | |
| 6.30 | 77 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES | |
| 5.00 | 76 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES | |
| 3.35 | 74 | - | - | 10 | 10 | 49 | 31 | 0 | |
| 2.00 | 69 | - | - | | | | | | |
| 1.18 | 64 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | E 6/1 NOTE 5) | |
| 0.600 | 59 | - | - | D10 D60 | | | | | |
| 0.425 | 55 | - | - | Specificat | | | | Specification | |
| 0.300 | 50 | • | - | | - | | - | | |
| 0.212 | 44 | - | - | UNIFORM | IITY COEF | FICIENT | - | - | |
| 0.150 | 35 | - | - | | | | | | |
| 0.063 | 20 | - | - | | | | | | |

Remarks



| Borehole | WS4 |
|-----------|------|
| Sample | В |
| Depth (m) | 4.00 |

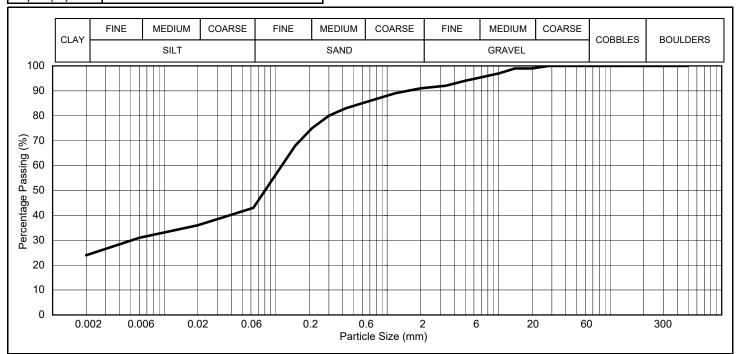


| | SIEVING | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|----------|--|------------|-----------|---------------|-----------------------|
| | Percentage Passing | Specif | ication | | | | | |
| Sieve Size (mm) | (%) | Not Ap | plicable | Particle | e Size (mn | າ) F | Percentage | Passing (%) |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | • | - | | 0.020 | | 3 | 8 |
| 300.0 | 100 | • | - | | 0.006 | | 2 | 9 |
| 125.0 | 100 | • | - | | 0.002 | | 2 | 4 |
| 90.0 | 100 | • | - | | | | | |
| 75.0 | 100 | • | - | GRAD | DING CLAS | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | • | - | | | | | |
| 50.0 | 100 | • | - | | | - | | |
| 37.5 | 100 | • | • | Grading classification proves the material has met the relevant grad | | | | |
| 28.0 | 99 | • | • | requirements only. Further testing may be required to assess | | | | |
| 20.0 | 99 | • | • | compliance with SHW. | | | | |
| 14.0 | 98 | • | • | | | | | |
| 10.0 | 97 | • | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 95 | • | • | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 94 | • | • | CLAI | SILT T | SAND | GRAVEL | COBBLES |
| 3.35 | 91 | • | • | 24 | 31 | 31 | 14 | 0 |
| 2.00 | 86 | • | • | | | | | |
| 1.18 | 81 | • | • | UNIFORM | ITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5) |
| 0.600 | 72 | • | • | D10 D60 | | | | |
| 0.425 | 67 | • | - | Specific | | | Specification | |
| 0.300 | 63 | - | - | | - | | - | |
| 0.212 | 61 | - | - | UNIFORM | ITY COEF | FICIENT | - | - |
| 0.150 | 59 | - | - | | | | | |
| 0.063 | 55 | - | - | | | | | |

Remarks



| Borehole | WS5 |
|-----------|------|
| Sample | В |
| Depth (m) | 2.80 |

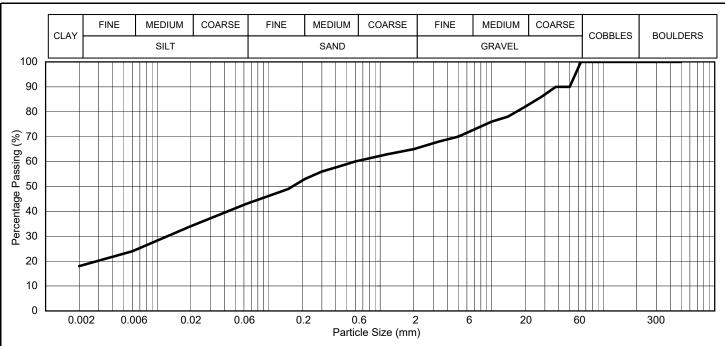


| | SIEVING | | | | S | EDIMENT | ATION | |
|-------------------|--------------------|---------|---------------------|---|-------------|-----------|---------------|----------------|
| Ciava Ciaa (mama) | Percentage Passing | | ication | Particle Size (mm) Percentage Passir | | | Dessing (0/) | |
| Sieve Size (mm) | (%) | Lower % | plicable Upper % | | e Size (min | 1) - | rercentage | Passing (%) |
| 500.0 | 100 | - | - | 0.020 36 | | | | 36 |
| 300.0 | 100 | - | - | | 0.006 | | 3 | 31 |
| 125.0 | 100 | - | - | | 0.002 | | 2 | 24 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW ' | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | Grading classification proves the material has met the relevant gradi | | | | |
| 28.0 | 100 | - | - | requirements only. Further testing may be required to assess | | | | o assess |
| 20.0 | 99 | - | - | compliance v | WITH SHVV. | | | |
| 14.0 | 99 | - | - | | | | | |
| 10.0 | 97 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 95 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 94 | - | - | CLAI | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 92 | • | - | 24 | 19 | 48 | 9 | 0 |
| 2.00 | 91 | • | - | | | | | |
| 1.18 | 89 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5) |
| 0.600 | 85 | • | - | D10 D60 | | | | |
| 0.425 | 83 | - | - | Specifica | | | Specification | |
| 0.300 | 80 | - | - | | - | | - | |
| 0.212 | 75 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 68 | - | - | | | | | |
| 0.063 | 43 | - | - | | | | | |

Remarks



| Borehole | WS9 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |



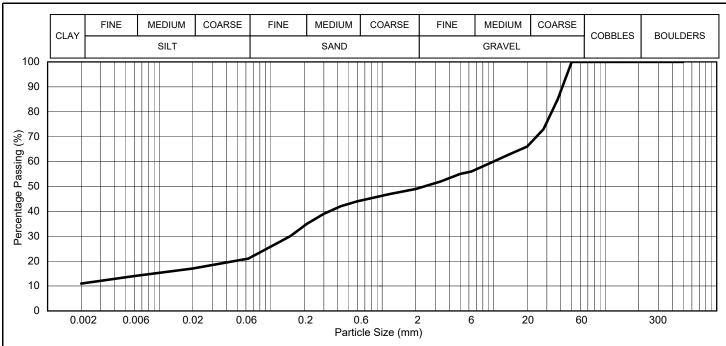
| Sieve Size (mm) | | | | | | | | | | |
|--|-----------------|--------------------|---------|---------|----------------------|------------|-----------|-----------|----------------|--|
| Not Applicable Lower % Upper % Particle Size (mm) Percentage Passing (% Size (mm) Size (| | SIEVING | | | | | SEDIMENT | ATION | | |
| Not Applicable Lower % Upper % Particle Size (IIIII) Percentage Passing (% Lower % Upper % Sould provide the provided passing (% Sould passing (% Sould provided passing (% Sould passing | | Percentage Passing | | | | | | | | |
| Solution Solution | Sieve Size (mm) | | | | Particl | e Size (mn | n) F | , | | |
| 300.0 | | (70) | Lower % | Upper % | | | | | | |
| 125.0 | 500.0 | 100 | • | - | | 0.020 | | 3 | 4 | |
| 90.0 100 GRADING CLASSIFICATION (SHW TABLE 6/2) 63.0 100 | 300.0 | 100 | • | - | | 0.006 | | | | |
| Total | 125.0 | 100 | • | - | | 0.002 | | 1 | 8 | |
| 100 | 90.0 | 100 | • | - | | | | | | |
| Solid | 75.0 | 100 | • | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) | |
| 37.5 90 - Grading classification proves the material has met the relevant grade requirements only. Further testing may be required to assess compliance with SHW. 14.0 78 - | 63.0 | 100 | • | - | | | | | | |
| 28.0 86 - | 50.0 | 90 | • | - | | | - | | | |
| 20.0 82 - | 37.5 | 90 | • | - | · | | | | | |
| 14.0 | 28.0 | 86 | • | - | | | | | | |
| 10.0 76 - - PERCENTAGE SOIL TYPES 6.30 72 - - CLAY SILT T SAND GRAVEL COBBLE 5.00 70 - - - 18 25 22 35 0 2.00 65 - - - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOT O.600 60 - - D10 D60 Specificat | 20.0 | 82 | • | - | compliance with SHW. | | | | | |
| 6.30 72 - - CLAY SILT F SAND GRAVEL COBBLE 5.00 70 - - - 18 25 22 35 0 3.35 68 - - 18 25 22 35 0 2.00 65 - - - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOT OLD) 1.18 63 - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOT OLD) D60 Specificated 0.425 58 - - - D10 D60 Specificated | 14.0 | 78 | • | - | | | | | | |
| 5.00 70 - - CLAY SILT # SAND GRAVEL COBBLE 3.35 68 - - 18 25 22 35 0 2.00 65 - | 10.0 | 76 | • | - | | PERC | ENTAGE S | SOIL TYPE | S | |
| 5.00 70 - | 6.30 | 72 | • | - | CLAV | QII T T | SVND | CDAVE | CORRI ES | |
| 2.00 65 - - 1.18 63 - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOT 0.600 0.600 60 - - - D10 D60 Specificat 0.425 58 - - - Specificat | 5.00 | 70 | • | - | CLAI | SILI T | SAND | GRAVEL | COBBLES | |
| 1.18 63 - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOT 0.600 0.600 60 - - - D10 D60 0.425 58 - - - Specificat | 3.35 | 68 | • | - | 18 | 25 | 22 | 35 | 0 | |
| 0.600 60 - - D10 D60 Specificate 0.425 58 - <td>2.00</td> <td>65</td> <td>•</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> | 2.00 | 65 | • | - | | | | | | |
| 0.425 58 D10 D60 Specificat | 1.18 | 63 | • | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | _E 6/1 NOTE 5) | |
| 0.425 58 Specificat | 0.600 | 60 | • | - | , , | | | | | |
| 0.300 56 | 0.425 | 58 | - | - | Specific | | | | Specification | |
| | 0.300 | 56 | • | - | | _ | | - | | |
| 0.212 53 - UNIFORMITY COEFFICIENT | 0.212 | 53 | • | - | UNIFORM | IITY COEF | FICIENT | - | - | |
| 0.150 49 | 0.150 | 49 | - | - | | | | | | |
| 0.063 43 | 0.063 | 43 | • | - | | | | | | |

Remarks

T Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS11 |
|-----------|------|
| Sample | В |
| Depth (m) | 2.00 |



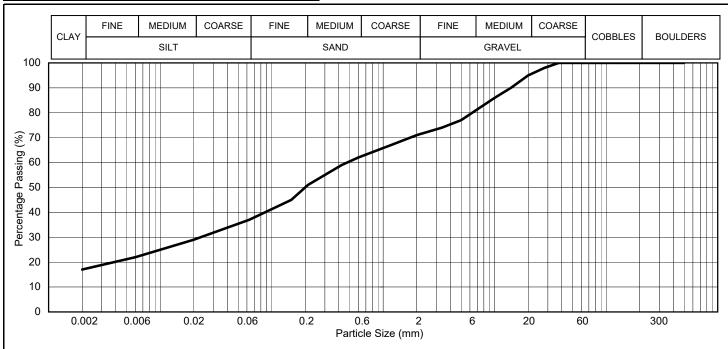
| SIEVING | | | | SEDIMENTATION | | | | |
|-----------------|--------------------|--------|----------|--|------------|-----------|---------------|----------------------|
| | | Specif | ication | | | | | |
| Sieve Size (mm) | Percentage Passing | Not Ap | plicable | Particle Size (mm) | | n) F | Percentage | Passing (%) |
| , | (%) | | Upper % | | • | , | · · | 3 () |
| 500.0 | 100 | - | - | | 0.020 | | 1 | 7 |
| 300.0 | 100 | - | - | | 0.006 | | 1 | 4 |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 1 |
| 90.0 | 100 | - | - | | | • | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 85 | - | - | | | | | e relevant grading |
| 28.0 | 73 | - | - | requirements only. Further testing may be required to assess | | | | |
| 20.0 | 66 | - | - | compliance v | with SHVV. | | | |
| 14.0 | 63 | - | - | | | | | |
| 10.0 | 60 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 56 | • | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 55 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 52 | - | - | 11 | 10 | 28 | 51 | 0 |
| 2.00 | 49 | - | - | | | | | |
| 1.18 | 47 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5 |
| 0.600 | 44 | - | - | i i | | | | |
| 0.425 | 42 | - | - | D10 D60 Spec | | | Specification | |
| 0.300 | 39 | • | - | | | | | |
| 0.212 | 35 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 30 | - | - | | | | | |
| 0.063 | 21 | - | - | | | | | |

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS13 |
|-----------|------|
| Sample | В |
| Depth (m) | 0.25 |

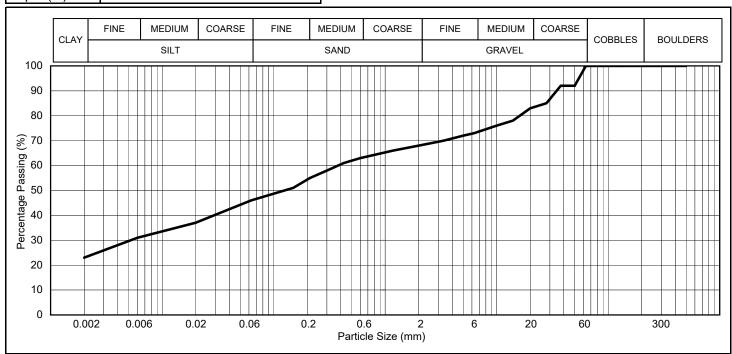


| SIEVING | | | | | | EDIMENT | ATION | |
|-----------------------------|--------------------|----------------|---------|--------------------|-------------|---------------|----------------------|--------------------|
| Specification Specification | | | | | | | ATION | |
| Ciava Ciaa (mama) | Percentage Passing | Not Applicable | | Particle Size (mm) | | ۰ ۱ |)t | Deceing (0/) |
| Sieve Size (mm) | (%) | | | | e Size (min | 1) F | Percentage Passing (| |
| 500.0 | | Lower % | Upper % | | 2 222 | | | |
| 500.0 | 100 | | - | | 0.020 | | | .9 |
| 300.0 | 100 | - | - | | 0.006 | | | 2 |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 7 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | | - | GRAI | DING CLAS | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | | | | | e relevant grading |
| 28.0 | 98 | - | - | | • | r testing may | be required to | assess |
| 20.0 | 95 | • | - | compliance \ | with SHW. | | | |
| 14.0 | 90 | • | - | | | | | |
| 10.0 | 86 | - | - | | PERC | ENTAGE : | SOIL TYPE | S |
| 6.30 | 80 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 77 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 74 | - | - | 17 | 20 | 34 | 29 | 0 |
| 2.00 | 71 | - | - | | | | | |
| 1.18 | 67 | • | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | _E 6/1 NOTE 5) |
| 0.600 | 62 | - | - | D10 D60 | | | | |
| 0.425 | 59 | - | - | Specifi | | | | Specification |
| 0.300 | 55 | - | - | | | | | |
| 0.212 | 51 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 45 | - | - | | | | | |
| 0.063 | 37 | - | - | | | | | |

Remarks



| Borehole | WS15 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |



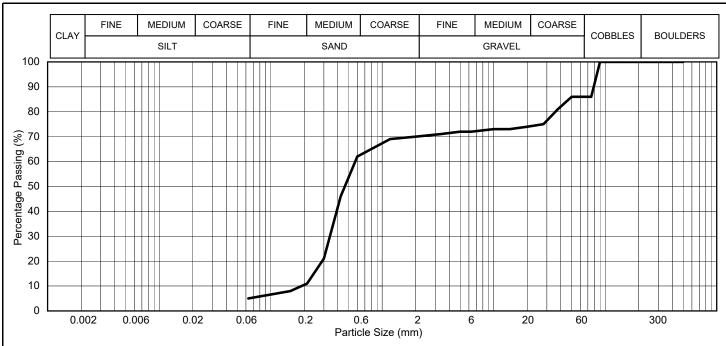
| SIEVING | | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|---------------------|-------------------------------|------------|---------------|----------------|-----------------------|
| Sieve Size (mm) | Percentage Passing | • | ication plicable | Particle Size (mm) Percentage | | | | Passing (%) |
| 0.000 0.20 () | (%) | Lower % | | | 0 0.20 (| ' ' | or our mage | . accing (70) |
| 500.0 | 100 | - | - | | 0.020 | | 3 | 7 |
| 300.0 | 100 | - | - | | 0.006 | | 3 | 1 |
| 125.0 | 100 | - | - | | 0.002 | | 2 | 3 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW ' | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 92 | - | - | | | - | | |
| 37.5 | 92 | - | - | | | | | e relevant grading |
| 28.0 | 85 | - | - | | , | r testing may | be required to | assess |
| 20.0 | 83 | • | - | compliance v | WITH SHVV. | | | |
| 14.0 | 78 | • | - | | | | | |
| 10.0 | 76 | • | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 73 | • | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 72 | • | - | CLAI | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 70 | • | - | 23 | 23 | 22 | 32 | 0 |
| 2.00 | 68 | • | - | | | | | |
| 1.18 | 66 | • | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5) |
| 0.600 | 63 | • | - | D10 D60 | | | | |
| 0.425 | 61 | - | - | Speci | | | Specification | |
| 0.300 | 58 | - | - | | | | | |
| 0.212 | 55 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 51 | - | - | | | | | |
| 0.063 | 46 | - | - | | | | | |

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS17 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |



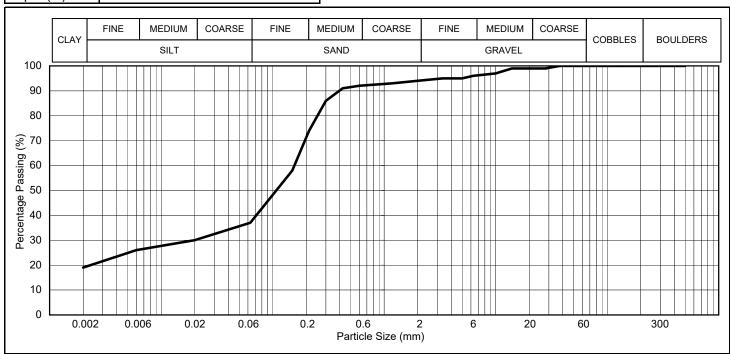
| Sieve Size (mm) Percentage Passing (%) Not Applicable Lower % Upper % Upper % Particle Size (mm) Percentage Passing (%) | | | | | • | | | | |
|--|-----------------|--------------------|---------|---------|--------------|------------|-----------|---------------|----------------|
| Not Applicable Lower % Upper % | SIEVING | | | | | S | SEDIMENT | ATION | |
| Composition | | Percentage Passing | | | | | | | |
| Cower % Opper % Oppe | Sieve Size (mm) | | NOL AP | | | e Size (mn | n) F | Percentage | Passing (%) |
| 300.0 | | (70) | Lower % | Upper % | | | | | |
| 125.0 | 500.0 | 100 | • | - | | 0.020 | | | |
| 90.0 | 300.0 | 100 | - | - | | 0.006 | | | |
| 75.0 | 125.0 | 100 | - | - | | 0.002 | | | |
| 63.0 | 90.0 | 100 | - | - | | | | | |
| Solid Soli | 75.0 | 86 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 37.5 | 63.0 | 86 | - | - | | | | | |
| 28.0 75 | 50.0 | 86 | - | - | | | - | | |
| 20.0 | 37.5 | 81 | - | - | | | | | |
| 14.0 | 28.0 | 75 | - | - | | | | | |
| 10.0 | 20.0 | 74 | - | - | compliance v | WITH SHVV. | | | |
| 6.30 72 - - CLAY SILT F SAND GRAVEL COBBLES 5.00 72 - <t< td=""><td>14.0</td><td>73</td><td>-</td><td>-</td><td></td><td></td><td></td><td></td><td></td></t<> | 14.0 | 73 | - | - | | | | | |
| Solution Signature Signa | 10.0 | 73 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 1.18 | 6.30 | 72 | - | - | CLAV | CILTI | SVND | CDAVE | CORRI ES |
| 2.00 70 - - 1.18 69 - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 90.0000) 0.600 62 - - D10 D60 Specification 1.0000 0.425 46 - | 5.00 | 72 | - | - | CLAI | SILI T | SAND | GRAVEL | COBBLES |
| 1.18 69 - - UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NOTE 5) 0.600 62 - - D10 D60 Specification 0.300 21 - - - - - - Specification 0.212 11 - - UNIFORMITY COEFFICIENT - - - - 0.150 8 - | 3.35 | 71 | - | - | 1 | 5 | 65 | 16 | 14 |
| 0.600 62 - - D10 D60 Specification 0.300 21 -< | 2.00 | 70 | - | - | | | | | |
| 0.425 46 - - D10 D60 Specification 0.300 21 -< | 1.18 | 69 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | _E 6/1 NOTE 5) |
| 0.425 46 - - Specification 0.300 21 - - - - 0.212 11 - - UNIFORMITY COEFFICIENT - - 0.150 8 - - - - - | 0.600 | 62 | - | - | D40 D60 | | | | |
| 0.212 11 UNIFORMITY COEFFICIENT 0.150 8 | 0.425 | | - | - | Spec | | | Specification | |
| 0.150 8 | 0.300 | 21 | - | - | | | | | |
| | 0.212 | 11 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.063 5 | 0.150 | | - | - | | | | | |
| | 0.063 | 5 | - | - | | | | | |

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS21 |
|-----------|------|
| Sample | В |
| Depth (m) | 4.00 |

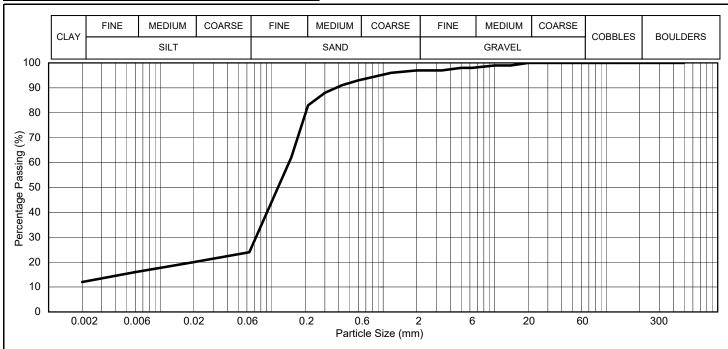


| SIEVING | | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|----------|--------------|------------|---------------|------------------------|--------------------|
| | Percentage Passing | Specif | ication | | | | | |
| Sieve Size (mm) | (%) | | plicable | Particl | e Size (mn | າ) F | Percentage Passing (%) | |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | - | - | | 0.020 | | 3 | 0 |
| 300.0 | 100 | - | - | | 0.006 | | 2 | 6 |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 9 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLAS | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | | | | | e relevant grading |
| 28.0 | 99 | - | - | | • | r testing may | be required to | assess |
| 20.0 | 99 | - | - | compliance v | VITN SHVV. | | | |
| 14.0 | 99 | - | - | | | | | |
| 10.0 | 97 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 96 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 95 | • | - | CLAI | SIL1 T | SAND | GRAVEL | COBBLLS |
| 3.35 | 95 | - | - | 19 | 18 | 57 | 6 | 0 |
| 2.00 | 94 | - | - | | | | | |
| 1.18 | 93 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | E 6/1 NOTE 5) |
| 0.600 | 92 | - | - | D10 D60 | | | | |
| 0.425 | 91 | - | - | Spec | | | Specification | |
| 0.300 | 86 | - | - | | | - | | |
| 0.212 | 74 | - | - | UNIFORM | ITY COEF | FICIENT | - | - |
| 0.150 | 58 | - | - | | | | | |
| 0.063 | 37 | - | - | | | | | |

Remarks



| Borehole | WS22 |
|-----------|------|
| Sample | В |
| Depth (m) | 4.00 |

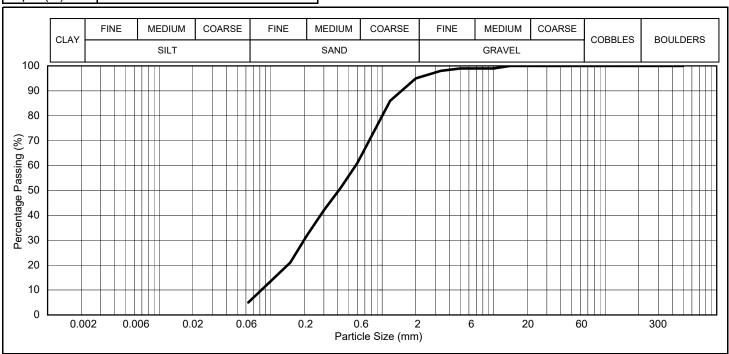


| CIEVINO | | | | I | | CDIMENIT | ATION | |
|-----------------|--------------------|----------------|---------|--|-----------------|---------------|-----------------|--------------------|
| | SIEVING | | | | | EDIMENT | ATION | |
| | Percentage Passing | Specif | | | | , _ | | |
| Sieve Size (mm) | (%) | Not Applicable | | Particle Size (mm) | | n) F | Percentage | Passing (%) |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | - | - | | 0.020 | | 2 | .0 |
| 300.0 | 100 | - | • | | 0.006 | | 1 | 6 |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 2 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | - | - |
| 50.0 | 100 | - | - | 1 | | - | | |
| 37.5 | 100 | - | - | Grading clas | sification prov | ves the mater | rial has met th | e relevant grading |
| 28.0 | 100 | - | - | requirements only. Further testing may be required to assess | | | | |
| 20.0 | 100 | - | - | compliance v | with SHW. | | | |
| 14.0 | 99 | - | • | | | | | |
| 10.0 | 99 | - | - | | PERC | ENTAGE : | SOIL TYPE | S |
| 6.30 | 98 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 98 | - | - | CLAT | SILI + | SAND | GRAVEL | COBBLES |
| 3.35 | 97 | - | - | 12 | 12 | 73 | 3 | 0 |
| 2.00 | 97 | - | - | | - | | | |
| 1.18 | 96 | - | - | UNIFORMITY COEFFICIENT (SHW TABLE 6/1 NO | | | | |
| 0.600 | 93 | - | - | D10 D60 | | | | |
| 0.425 | 91 | - | - | Specific | | | | Specification |
| 0.300 | 88 | - | - | | | | | |
| 0.212 | 83 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 62 | - | - | | | | | |
| 0.063 | 24 | - | - | | | | | |

Remarks



| Borehole | WS23 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |

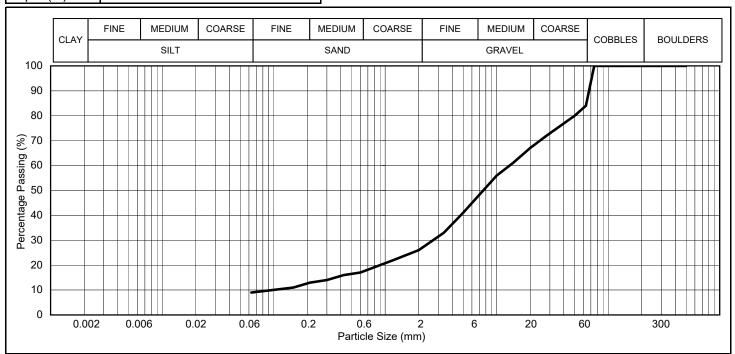


| SIEVING | | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|----------|----------------|--------------------|---------------|------------------------|--------------------|
| | Percentage Passing | Specif | ication | | | | | |
| Sieve Size (mm) | (%) | Not Ap | plicable | Particl | Particle Size (mm) | | Percentage Passing (%) | |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | - | - | | 0.020 | | | |
| 300.0 | 100 | - | - | | 0.006 | | | |
| 125.0 | 100 | - | - | | 0.002 | | | |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW ' | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | | | | | e relevant grading |
| 28.0 | 100 | - | - | | | r testing may | be required to | o assess |
| 20.0 | 100 | - | - | compliance v | with SHW. | | | |
| 14.0 | 100 | - | - | | | | | |
| 10.0 | 99 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 99 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 99 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 98 | - | - | 1 | 5 | 90 | 5 | 0 |
| 2.00 | 95 | - | - | | | | | |
| 1.18 | 86 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5) |
| 0.600 | 61 | - | - | D40 D00 | | | | |
| 0.425 | 51 | - | - | D10 D60 Specif | | | Specification | |
| 0.300 | 42 | - | - | | | - | | |
| 0.212 | 32 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 21 | - | - | | | | | |
| 0.063 | 5 | - | - | | | | | |

Remarks



| Borehole | WS30 |
|-----------|------|
| Sample | В |
| Depth (m) | 1.00 |



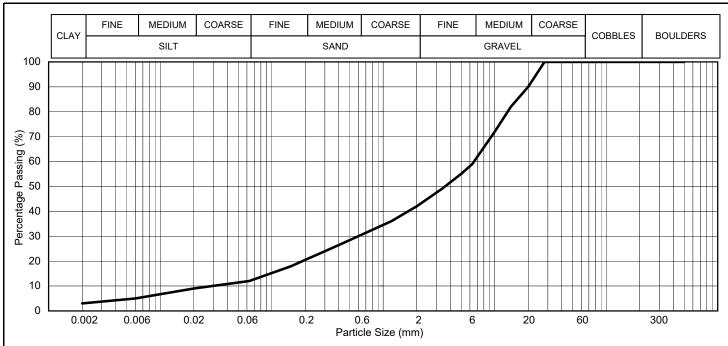
| SIEVING | | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|----------|--------------------|-----------|---------------|----------------|--------------------|
| | Percentage Passing | Specif | ication | | | | | |
| Sieve Size (mm) | (%) | Not Ap | plicable | Particle Size (mm) | | າ) F | Percentage | Passing (%) |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | - | - | | 0.020 | | | |
| 300.0 | 100 | - | - | | 0.006 | | | |
| 125.0 | 100 | - | - | | 0.002 | | | |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 84 | - | - | | | | | |
| 50.0 | 80 | - | - | | | - | | |
| 37.5 | 76 | - | - | | | | | e relevant grading |
| 28.0 | 72 | - | - | | , | r testing may | be required to | assess |
| 20.0 | 67 | - | - | compliance v | vith SHW. | | | |
| 14.0 | 61 | - | - | | | | | |
| 10.0 | 56 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 46 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 41 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 33 | - | - | 1 | 9 | 17 | 58 | 16 |
| 2.00 | 26 | - | - | | | | | |
| 1.18 | 22 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | E 6/1 NOTE 5) |
| 0.600 | 17 | - | - | D. | 10 | D | 60 | |
| 0.425 | 16 | - | - | D10 | | U | 00 | Specification |
| 0.300 | 14 | - | - | - | | | - | |
| 0.212 | 13 | - | - | UNIFORM | ITY COEF | FICIENT | - | - |
| 0.150 | 11 | - | - | | | | | |
| 0.063 | 9 | - | - | | | | | |

Remarks

Ŧ Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS37 |
|-----------|------|
| Sample | В |
| Depth (m) | 2.00 |



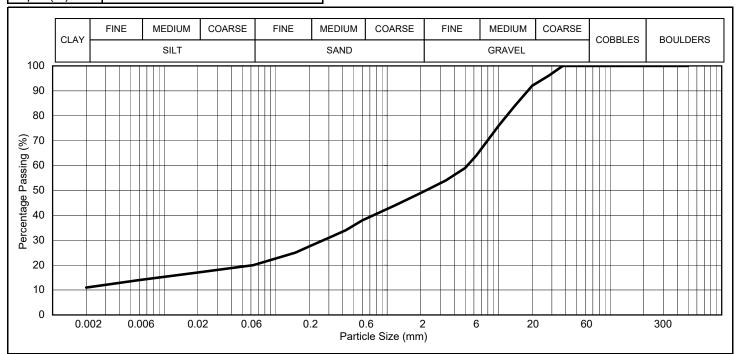
| | SIEVING | | | SEDIMENTATION | | | | |
|-----------------|--------------------|---------|----------|---------------|------------|---------------|----------------|--------------------|
| | Percentage Passing | | ication | | | | | |
| Sieve Size (mm) | (%) | Νοι Αρ | plicable | Particl | e Size (mn | n) F | Percentage | Passing (%) |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | - | - | | 0.020 | | (| 9 |
| 300.0 | 100 | - | - | | 0.006 | | | 5 |
| 125.0 | 100 | - | - | | 0.002 | | ; | 3 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | | | | | e relevant grading |
| 28.0 | 100 | - | - | | • | r testing may | be required to | assess |
| 20.0 | 90 | - | - | compliance v | with SHW. | | | |
| 14.0 | 82 | - | - | | | | | |
| 10.0 | 72 | - | - | | PERC | ENTAGE : | SOIL TYPE | S |
| 6.30 | 59 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 55 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 49 | - | - | 3 | 9 | 30 | 58 | 0 |
| 2.00 | 42 | - | - | | | | | |
| 1.18 | 36 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | _E 6/1 NOTE 5) |
| 0.600 | 30 | - | - | | | | | |
| 0.425 | 27 | - | - | - D10 D60 | | טסי | Specification | |
| 0.300 | 24 | - | - | | | | - | |
| 0.212 | 21 | - | - | UNIFORM | IITY COEF | FICIENT | - | - |
| 0.150 | 18 | - | - | | | | | |
| 0.063 | 12 | - | - | | | | | |
| | | | | _ | | | | |

Remarks

T Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS38 |
|-----------|------|
| Sample | В |
| Depth (m) | 3.00 |

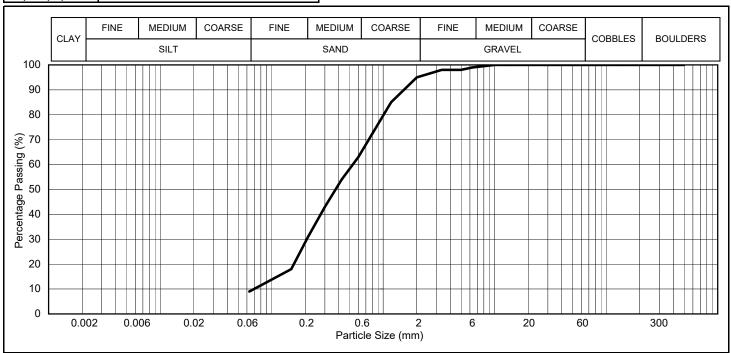


| SIEVING | | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|----------|--------------------|-----------|---------------|----------------|--------------------|
| | Percentage Passing | Specif | | | | | | |
| Sieve Size (mm) | (%) | | plicable | Particle Size (mm) | | n) F | Percentage | Passing (%) |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | • | - | | 0.020 | | 1 | 7 |
| 300.0 | 100 | • | - | | 0.006 | | 1 | 4 |
| 125.0 | 100 | • | - | | 0.002 | | 1 | 1 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | - | - | | | | | e relevant grading |
| 28.0 | 96 | - | - | | , | r testing may | be required to | assess |
| 20.0 | 92 | - | - | compliance v | vith SHW. | | | |
| 14.0 | 84 | - | - | | | | | |
| 10.0 | 76 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 64 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 59 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 54 | - | - | 11 | 9 | 29 | 51 | 0 |
| 2.00 | 49 | - | - | | | | | |
| 1.18 | 44 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | E 6/1 NOTE 5) |
| 0.600 | 38 | - | - | i i | | | | - |
| 0.425 | 34 | - | - | - D10 D60 | | | 00 | Specification |
| 0.300 | 31 | - | - | - | | | - | |
| 0.212 | 28 | - | - | UNIFORM | ITY COEF | FICIENT | - | - |
| 0.150 | 25 | - | - | | | | | |
| 0.063 | 20 | - | - | | | | | |

Remarks



| Borehole | WS40C |
|-----------|-------|
| Sample | В |
| Depth (m) | 5.00 |

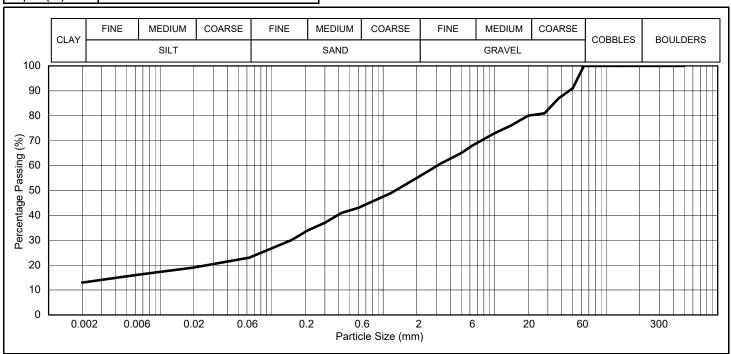


| SIEVING | | | | | S | EDIMENT | ATION | |
|-----------------|--------------------|---------|---------------------|------------------------------|-------------|---------------|----------------|-----------------------|
| Sieve Size (mm) | Percentage Passing | | ication plicable | Particle Size (mm) | | | Percentage | Passing (%) |
| , | (%) | Lower % | | | , | | J | 3 () |
| 500.0 | 100 | - | - | | 0.020 | | | |
| 300.0 | 100 | - | - | | 0.006 | | | |
| 125.0 | 100 | - | - | | 0.002 | | | |
| 90.0 | 100 | • | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) |
| 63.0 | 100 | • | - | | | _ | | |
| 50.0 | 100 | - | - | | | - | | |
| 37.5 | 100 | • | - | J | | | | e relevant grading |
| 28.0 | 100 | - | - | requirements compliance v | • | r testing may | be required to | assess |
| 20.0 | 100 | - | - | compliance v | WILLI SHVV. | | | |
| 14.0 | 100 | - | - | | | | | |
| 10.0 | 100 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 99 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 98 | • | - | CLAI | JILI T | SAND | GRAVEL | COBBLLS |
| 3.35 | 98 | • | - | 1 | 9 | 86 | 5 | 0 |
| 2.00 | 95 | • | - | | | | | |
| 1.18 | 85 | • | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | LE 6/1 NOTE 5) |
| 0.600 | 63 | - | - | D10 D60 | | | | |
| 0.425 | 54 | - | - | טויט | | | Specifica | |
| 0.300 | 43 | - | - | | | - | | |
| 0.212 | 31 | - | - | UNIFORM | IITY COEF | FICIENT | • | - |
| 0.150 | 18 | - | - | | | | | |
| 0.063 | 9 | - | - | | | | | |

Remarks



| Borehole | WS45 |
|-----------|------|
| Sample | В |
| Depth (m) | 4.00 |



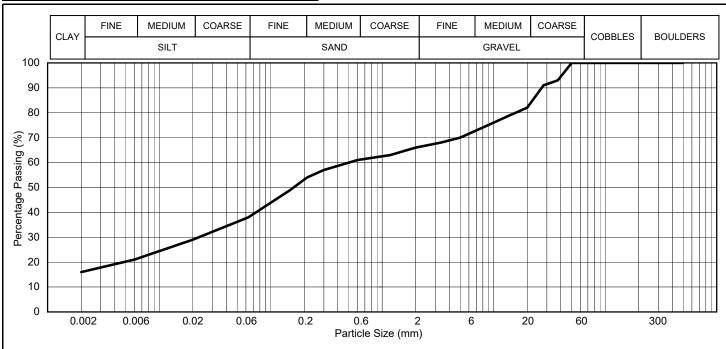
| SIEVING | | | | SEDIMENTATION | | | | |
|-----------------|--------------------|---------|----------|---------------|------------|---------------|----------------|--------------------|
| | Percentage Passing | Specif | ication | | | | | |
| Sieve Size (mm) | (%) | | plicable | Particl | e Size (mn | າ) F | Percentage | Passing (%) |
| | (70) | Lower % | Upper % | | | | | |
| 500.0 | 100 | - | - | | 0.020 | | 1 | 9 |
| 300.0 | 100 | - | - | | 0.006 | | 1 | 6 |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 3 |
| 90.0 | 100 | - | - | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLAS | SSIFICATI | ON (SHW : | TABLE 6/2) |
| 63.0 | 100 | - | - | | | | | |
| 50.0 | 91 | - | - | | | - | | |
| 37.5 | 87 | - | - | | | | | e relevant grading |
| 28.0 | 81 | - | - | | • | r testing may | be required to | assess |
| 20.0 | 80 | - | - | compliance v | vith SHW. | | | |
| 14.0 | 76 | - | - | | | | | |
| 10.0 | 73 | - | - | | PERC | ENTAGE S | SOIL TYPE | S |
| 6.30 | 68 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES |
| 5.00 | 65 | - | - | CLAI | SILI T | SAND | GRAVEL | COBBLES |
| 3.35 | 61 | - | - | 13 | 10 | 32 | 45 | 0 |
| 2.00 | 55 | - | - | | | | | |
| 1.18 | 49 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | E 6/1 NOTE 5) |
| 0.600 | 43 | - | - | D. | 10 | D | 60 | |
| 0.425 | 41 | - | - | - D10 | | | 00 | Specification |
| 0.300 | 37 | - | - | - | | | - | |
| 0.212 | 34 | - | - | UNIFORM | ITY COEF | FICIENT | - | - |
| 0.150 | 30 | - | - | | | | | |
| 0.063 | 23 | - | - | | | | | |

Remarks

T Where a sedimentation test was not carried out, this figure represents total fines, i.e., particles of diameter less than 63 microns Sample does not meet minimum mass requirement for material type



| Borehole | WS51B |
|-----------|-------|
| Sample | В |
| Depth (m) | 3.00 |

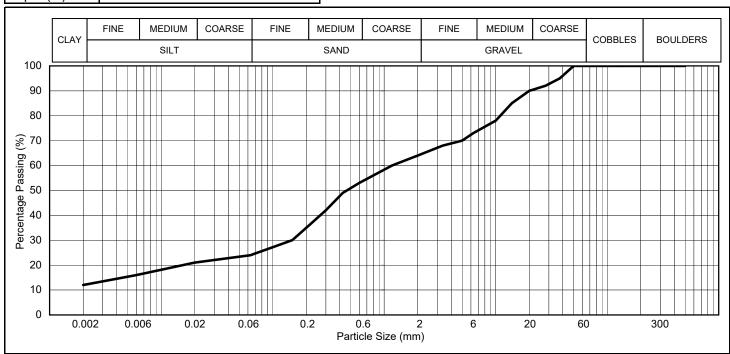


| SIEVING | | | | | S | SEDIMENT | ATION | | |
|-----------------|--------------------|----------------|---------|---|-----------|-----------|----------------------|----------------|--|
| | Percentage Passing | Specif | | | | | | | |
| Sieve Size (mm) | (%) | Not Applicable | | Particle Size (mm) | | n) F | Percentage Passing (| | |
| | (70) | Lower % | Upper % | | | | | | |
| 500.0 | 100 | • | - | 0.020 29 | | | | | |
| 300.0 | 100 | • | - | | 0.006 | | 2 | :1 | |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 6 | |
| 90.0 | 100 | - | - | | | | | | |
| 75.0 | 100 | - | - | GRADING CLASSIFICATION (SHW TABLE 6/2) | | | | TABLE 6/2) | |
| 63.0 | 100 | - | - | | | | | | |
| 50.0 | 100 | - | - | ¬ | | | | | |
| 37.5 | 93 | - | - | Grading classification proves the material has met the relevant grading | | | | | |
| 28.0 | 91 | - | - | requirements only. Further testing may be required to assess | | | | | |
| 20.0 | 82 | - | - | compliance with SHW. | | | | | |
| 14.0 | 79 | - | - | | | | | | |
| 10.0 | 76 | - | - | | PERC | ENTAGE S | SOIL TYPE | S | |
| 6.30 | 72 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES | |
| 5.00 | 70 | - | - | CLAT | SILI + | SAND | GRAVEL | COBBLES | |
| 3.35 | 68 | - | - | 16 | 22 | 28 | 34 | 0 | |
| 2.00 | 66 | - | - | | - | - | | | |
| 1.18 | 63 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | _E 6/1 NOTE 5) | |
| 0.600 | 61 | - | - | D10 D60 | | | | | |
| 0.425 | 59 | - | - | | | | | Specification | |
| 0.300 | 57 | - | - | | | | | | |
| 0.212 | 54 | - | - | UNIFORMITY COEFFICIENT - | | | - | | |
| 0.150 | 49 | - | - | | | | | | |
| 0.063 | 38 | - | - | 1 | | | | | |

Remarks



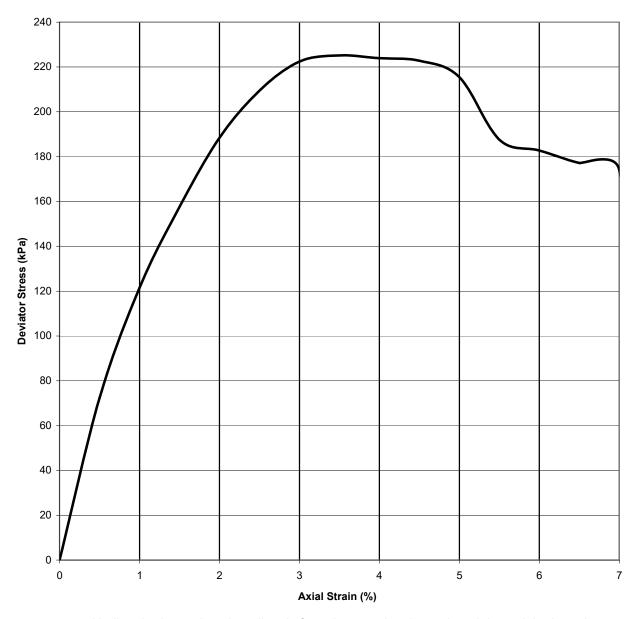
| Borehole | WS54 |
|-----------|------|
| Sample | В |
| Depth (m) | 3.00 |



| SIEVING | | | | | S | EDIMENT | ATION | | |
|-----------------|--------------------|---------|----------|---|------------|-------------------|-----------|---------------|--|
| | Percentage Passing | Specif | ication | | | | | | |
| Sieve Size (mm) | | Not Ap | plicable | Particl | e Size (mn | n) Percentage Pas | | Passing (%) | |
| | (%) | Lower % | Upper % | | | | | | |
| 500.0 | 100 | - | - | 0.020 | | | | 21 | |
| 300.0 | 100 | - | - | | 0.006 | | 1 | 6 | |
| 125.0 | 100 | - | - | | 0.002 | | 1 | 2 | |
| 90.0 | 100 | - | - | | | | | | |
| 75.0 | 100 | - | - | GRAI | DING CLA | SSIFICATI | ON (SHW | TABLE 6/2) | |
| 63.0 | 100 | - | - | | | | | | |
| 50.0 | 100 | - | - | 7 | | | | | |
| 37.5 | 95 | - | - | Grading classification proves the material has met the relevant gradin | | | | | |
| 28.0 | 92 | - | - | requirements only. Further testing may be required to assess compliance with SHW. | | | | | |
| 20.0 | 90 | - | - | | | | | | |
| 14.0 | 85 | - | - | | | | | | |
| 10.0 | 78 | - | - | | PERC | ENTAGE S | SOIL TYPE | S | |
| 6.30 | 73 | - | - | CLAY | SILT Ŧ | SAND | GRAVEL | COBBLES | |
| 5.00 | 70 | - | - | CLAT | SILI T | SAND | GRAVEL | COBBLES | |
| 3.35 | 68 | - | - | 12 | 12 | 40 | 36 | 0 | |
| 2.00 | 64 | - | - | | | | | | |
| 1.18 | 60 | - | - | UNIFORM | IITY COEF | FICIENT (| SHW TABI | E 6/1 NOTE 5) | |
| 0.600 | 53 | - | - | D10 D60 | | | | | |
| 0.425 | 49 | - | - | | | | | Specification | |
| 0.300 | 42 | - | - | - | | | - | | |
| 0.212 | 36 | - | - | UNIFORMITY COEFFICIENT - | | - | | | |
| 0.150 | 30 | - | - | | | | | | |
| 0.063 | 24 | - | - | | | | | | |

Remarks





—— Undisturbed sample, taken directly from the sample tube and retaining axial orientation

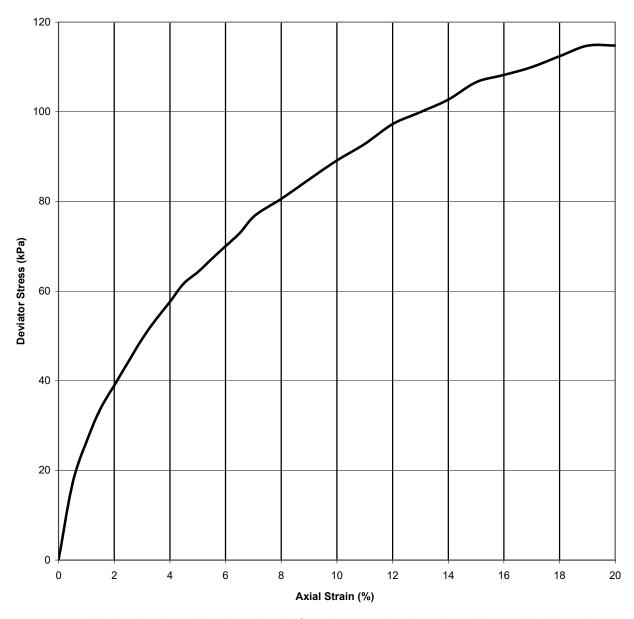
| Failure Conditions | | | | | |
|---------------------------|-------|--------------|--|--|--|
| Cell pressure | (kPa) | 25 | | | |
| Membrane correction | (kPa) | 0.2 | | | |
| Strain at failure | (%) | 3.5 | | | |
| Failure Type | | Intermediate | | | |
| Corrected deviator stress | (kPa) | 225 | | | |
| Undrained shear strength | (kPa) | 113 | | | |

| Initial Conditions | | | | | Borehole | WS8 |
|--------------------|-----------|------------------|------|-------------------|--------------|------|
| Sample length | 169.09 mm | Rate of strain | 2.0 | %/min | Dorenole | VV30 |
| Sample diameter | 82.53 mm | Bulk Density | 2.25 | Mg/m ³ | Sample | U |
| Membrane type | Latex | Dry Density | 2.02 | Mg/m ³ | Depth (m) | 1.40 |
| Membrane thickness | 0.2 mm | Moisture Content | 12 | % | Deptil (III) | 1.40 |

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

Tested in accordance with BS 1377: Part 7:8.0:1990





—— Undisturbed sample, taken directly from the sample tube and retaining axial orientation

| Failure Conditions | | | | | |
|---------------------------|-------|--------------|--|--|--|
| Cell pressure | (kPa) | 50 | | | |
| Membrane correction | (kPa) | 1.0 | | | |
| Strain at failure | (%) | 20.0 | | | |
| Failure Type | | Intermediate | | | |
| Corrected deviator stress | (kPa) | 115 | | | |
| Undrained shear strength | (kPa) | 57 | | | |

| Initial Conditions | | | | Borehole | WS11 | |
|--------------------|-----------|------------------|------|-------------------|--------------|------|
| Sample length | 140.62 mm | Rate of strain | 2.0 | %/min | Dorellole | WSII |
| Sample diameter | 71.49 mm | Bulk Density | 2.32 | Mg/m ³ | Sample | U |
| Membrane type | Latex | Dry Density | 2.07 | Mg/m ³ | Depth (m) | 2.20 |
| Membrane thickness | 0.2 mm | Moisture Content | 12 | % | Deptil (III) | 2.20 |

DETERMINATION OF UNDRAINED SHEAR STRENGTH IN TRIAXIAL COMPRESSION

Tested in accordance with BS 1377: Part 7:8.0:1990



| BOREHOLE | SAMPLE | DEPTH (m) | SPECIMEN § ORIENTATION | PREPARATION METHOD * | BS TEST METHODS * | SAMPLE PASSING 2mm SIEVE (%) | TOTAL SULPHATE (% SO3) | 2:1 WATER SOLUBLE SULPHATE (g/l SO3) | pH VALUE |
|----------|--------|--------------|------------------------|-------------------------|----------------------|---------------------------------------|------------------------------|---|-------------|
| WS1 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 87 | - | 0.01 | 5.8 |
| WS2 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 60 | - | 0.01 | 7.3 |
| WS3 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 69 | - | 0.01 | 5.7 |
| WS4 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 31 | - | 0.01 | 6.2 |
| WS5 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 75 | - | <0.01 | 6.4 |
| WS6 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 97 | - | 0.01 | 6.0 |
| WS7 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 31 | - | <0.01 | 6.6 |
| WS8 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 76 | - | <0.01 | 8.0 |
| WS10 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 85 | - | <0.01 | 6.7 |
| WS13 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 71 | - | 0.01 | 5.6 |
| WS14 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 44 | - | <0.01 | 6.3 |
| WS15 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 68 | - | 0.01 | 6.3 |
| WS16 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 57 | - | 0.04 | 6.8 |
| WS20 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 65 | - | <0.01 | 5.2 |
| WS21 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 62 | - | <0.01 | 6.7 |
| WS23 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 95 | - | <0.01 | 5.8 |
| WS24 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 39 | - | <0.01 | 6.0 |

All tests performed on fraction of sample passing 2mm sieve NOTE: To convert sulphate results from ${\rm SO_3}$ to ${\rm SO_4}$ multiply by 1.2

| § Specir | nen orientation : |
|----------|---|
| N/A | Not applicable due to preparation method and/or sample type |
| V | Cut vertically from undisturbed sample |
| Н | Cut horizontally from undisturbed sample |

| * Tested in | d in accordance with the following clauses | | | | | | | | | | |
|-------------|--|-----|---------------------------------|--|--|--|--|--|--|--|--|
| of BS 137 | 77: Part 3: 1990: | | | | | | | | | | |
| 5.2 | Acid extract method | 9.4 | Preparation of pH test specimen | | | | | | | | |
| 5.3 | Water extract method | 9.5 | Determination of the pH value | | | | | | | | |
| 5.5 | Gravimetric method of analysis | | | | | | | | | | |

SUMMARY OF SULPHATE & pH TEST RESULTS



| BOREHOLE | SAMPLE | DEPTH (m) | SPECIMEN § ORIENTATION | PREPARATION METHOD * | BS TEST METHODS * | SAMPLE PASSING 2mm SIEVE (%) | TOTAL SULPHATE (% SO3) | 2:1 WATER SOLUBLE SULPHATE (g/l SO3) | pH VALUE |
|----------|--------|--------------|------------------------|-------------------------|----------------------|---------------------------------------|------------------------|---|-------------|
| WS25 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 20 | - | <0.01 | 6.7 |
| WS29 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 96 | - | 0.01 | 6.2 |
| WS32 | В | 0.90 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 58 | - | 0.01 | 8.0 |
| WS35 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 75 | - | 0.09 | 7.8 |
| WS36 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 44 | - | 0.02 | 6.6 |
| WS37 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 44 | - | 0.02 | 6.6 |
| WS38 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 34 | - | 0.01 | 6.5 |
| WS39 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 14 | - | <0.01 | 6.6 |
| WS40C | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 43 | - | 0.01 | 6.7 |
| WS41 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 50 | - | <0.01 | 6.5 |
| WS43 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 31 | - | 0.02 | 6.6 |
| WS45 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 33 | - | 0.01 | 7.0 |
| WS47 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 38 | - | <0.01 | 6.6 |
| WS49 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 55 | - | 0.02 | 6.5 |
| WS50 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 50 | - | 0.04 | 6.6 |
| WS51B | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 54 | - | 0.01 | 7.1 |
| WS52 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 75 | - | <0.01 | 6.5 |

All tests performed on fraction of sample passing 2mm sieve NOTE: To convert sulphate results from ${\rm SO_3}$ to ${\rm SO_4}$ multiply by 1.2

| § Specime | en orientation : |
|-----------|---|
| N/A | Not applicable due to preparation method and/or sample type |
| V | Cut vertically from undisturbed sample |
| Н | Cut horizontally from undisturbed sample |

| | ested in accordance with the following clauses of BS 1377: Part 3: 1990: | | | | | | | | | | | |
|-----------|---|-----|---------------------------------|--|--|--|--|--|--|--|--|--|
| 01 03 137 | 7. Part 5. 1990. | | | | | | | | | | | |
| 5.2 | Acid extract method | 9.4 | Preparation of pH test specimen | | | | | | | | | |
| 5.3 | Water extract method | 9.5 | Determination of the pH value | | | | | | | | | |
| 5.5 | Gravimetric method of analysis | | | | | | | | | | | |

SUMMARY OF SULPHATE & pH TEST RESULTS



| BOREHOLE | SAMPLE | DEPTH (m) | SPECIMEN § ORIENTATION | PREPARATION METHOD * | BS TEST METHODS * | SAMPLE PASSING 2mm SIEVE (%) | TOTAL SULPHATE (% SO3) | 2:1 WATER SOLUBLE SULPHATE (g/I SO3) | рН |
|----------|--------|--------------|------------------------|-------------------------|----------------------|---------------------------------------|------------------------------|---|-----|
| WS53 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 42 | - | 0.01 | 7.4 |
| WS55 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 78 | - | 0.04 | 6.6 |
| WS56 | В | 0.25 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 99 | - | 0.03 | 6.9 |
| WS57 | В | 1.00 | N/A | 5.3 / 9.4 | 5.5 / 9.5 | 97 | - | <0.01 | 6.5 |
| | | | | | | | | | |
| | | | | | | | | | |

All tests performed on fraction of sample passing 2mm sieve NOTE: To convert sulphate results from ${\rm SO_3}$ to ${\rm SO_4}$ multiply by 1.2

| § | Specime | n orientation : |
|---|---------|---|
| | N/A | Not applicable due to preparation method and/or sample type |
| | V | Cut vertically from undisturbed sample |
| | Н | Cut horizontally from undisturbed sample |

| * Tested in | d in accordance with the following clauses | | | | | | | | | | |
|-------------|--|-----|---------------------------------|--|--|--|--|--|--|--|--|
| of BS 137 | 77: Part 3: 1990: | | | | | | | | | | |
| 5.2 | Acid extract method | 9.4 | Preparation of pH test specimen | | | | | | | | |
| 5.3 | Water extract method | 9.5 | Determination of the pH value | | | | | | | | |
| 5.5 | Gravimetric method of analysis | | | | | | | | | | |

SUMMARY OF SULPHATE & pH TEST RESULTS



Appendix C Environmental Laboratory Results

WEST RIVERSIDE AND WOODBANK TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE HUMAN HEALTH ASSESSMENT CRITERIA

| | | | | Strata | T | 1 | 1 | 1 | 1 | ı | ı | 1 | ı | 1 | Г | ı | 1 | 1 | 1 | | 1 | | 1 | T | 1 | ı | | |
|------------------------------|------------|------|----------------|------------|------------|------|------------|------------|------|------------|------------|------|------------|------|------|------------|------|------|------------|------------|------------|------|------|------------|------------|------------|------------|------------|
| SOM 2.5% | ſ | Ass | sessment Crite | | WS17 | WS18 | WS19 | WS20 | WS24 | WS27 | WS29 | WS30 | WS36 | WS56 | WS7 | WS10 | WS11 | WS12 | WS06 | WS13 | WS14 | WS15 | WS01 | WS02 | WS02 | WS03 | WS04 | WS05 |
| | | RwHP | RwoHP | Commercial | | | | | | | | | | | | | | | | | | | | | | | | |
| Analyte | Units | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Stones BG 2.6/3.0 | % | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture content at 30 C | % | - | - | - | 17 | 6.5 | 13 | 15 | 12 | 8.4 | 7.2 | 8.1 | 18 | 9.1 | 7.4 | 15 | 18 | 7.8 | 29 | 25 | 21 | 20 | 30 | 20 | 16 | 18 | 11 | 29 |
| Arsenic* | mg/kg | 37 | 40 | 640 | 6.9 | 4.5 | 6.9 | 5.6 | 5.5 | 4.4 | 3.9 | 3.8 | 36 | 7.1 | 4 | 3.9 | 10 | 4 | 6.9 | 5.4 | 5.9 | 8.3 | 5.7 | 6.2 | 5.6 | 4.2 | 4 | 6.3 |
| Cadmium | mg/kg | 11 | 85 | 190 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.3 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Chromium Trivalent | mg/kg | 910 | 910 | 8600 | 14 | 31 | 16 | 15 | 13 | 17 | 14 | 19 | 74 | 22 | 22 | 18 | 21 | 13 | 25 | 21 | 20 | 23 | 29 | 24 | 36 | 17 | 21 | 26 |
| Chromium Hexavalant* | mg/kg | 6 | 6 | 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 11 | 1 |
| Copper | mg/kg | 2400 | 7100 | 68000 | 19 | 11 | 19 | 18 | 22 | 19 | 21 | 7.4 | 120 | 29 | 18 | 32 | 9.5 | 20 | 21 | 17 | 20 | 12 | 21 | 27 | 20 | 11 | 16 | 21 |
| Lead* | mg/kg | 200 | 310 | 2300 | 47 | 15 | 67 | 60 | 12 | 24 | 9.3 | 11 | 2100 | 21 | 31 | 83 | 37 | 60 | 39 | 34 | 94 | 38 | 53 | 84 | 100 | 26 | 21 | 36 |
| Mercury | mg/kg | 40 | 56 | 1100 | 0.12 | 0.05 | 0.78 | 0.1 | 0.05 | 0.05 | 0.05 | 0.05 | 0.12 | 0.05 | 0.18 | 0.06 | 0.05 | 0.16 | 0.11 | 0.11 | 0.24 | 0.13 | 0.11 | 0.11 | 0.2 | 0.05 | 0.07 | 0.1 |
| Nickel | mg/kg | 130 | 180 | 980 | 17 | 26 | 13 | 13 | 14 | 17 | 16 | 18 | 55 | 25 | 24 | 32 | 15 | 15 | 22 | 18 | 19 | 20 | 19 | 22 | 30 | 15 | 18 | 23 |
| Selenium | mg/kg | 250 | 430 | 12000 | 0.7 | 0.9 | 1 | 0.7 | 0.5 | 0.5 | 0.5 | 0.9 | 0.7 | 0.7 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 |
| Zinc | mg/kg | 3700 | 40000 | 730000 | 39 | 71 | 47 | 44 | 28 | 47 | 33 | 40 | 100 | 45 | 41 | 70 | 32 | 74 | 60 | 51 | 64 | 48 | 60 | 91 | 77 | 36 | 46 | 57 |
| Beryllium | mg/kg | 1.7 | 1.7 | 12 | | | | | | | | | | | | | | | | | | | - | | | | | |
| Boron | mg/kg | 290 | 11000 | 240000 | | | | | | | | | | | | | | | | | | | - | | | | | |
| Vanadium | mg/kg | 410 | 1200 | 9000 | 0.4 | 0.0 | 0.5 | 0.4 | 0.2 | 0.0 | 0.4 | 0.3 | 2.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.5 | 0.5 | 0.4 | 0.3 | 0.6 | 0.2 | 0.0 | 0.0 | 0.0 | 0.4 |
| Cyanide (Total) | mg/kg % | - | - | - | 0.4 3.8 | 0.2 | 0.5 4.7 | 0.4 3.7 | 1.1 | 0.3 2.2 | 0.1 0.5 | 1.1 | 3.6 6.7 | 0.3 | 0.2 | 0.3 5.9 | 0.3 | 0.2 | 0.5 3.9 | 0.5 3.3 | 0.4 3.1 | 2.2 | 4.9 | 0.3 2.5 | 0.2 2.1 | 0.3 1.5 | 0.3 1.7 | 0.4 3.7 |
| Organic matter Phenol. Total | ma/ka | 200 | 690 | 690 | 3.0 | 0.6 | 4.7 | 3.1 | 1.1 | 2.2 | 0.5 | 1.1 | 0.7 | 0.6 | 0.6 | 5.9 | 1.1 | 0.6 | 3.9 | 3.3 | 3.1 | 2.2 | 4.9 | 2.5 | 2.1 | 1.5 | 1.7 | 3.1 |
| Sulphate (Total) as SO4 | mg/kg | 200 | | | 38 | 59 | 10 | 11 | 12 | 11 | 11 | 35 | 23 | 12 | 19 | 12 | 12 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Sulphate (Total) as 504 | pH Units | - | - | - | 5.9 | 7.4 | 5.4 | 5.5 | 6.3 | 6.2 | 6.6 | 6 | 7.9 | 6.8 | 7.8 | 7.3 | 6.9 | 7.5 | 5.4 | 5.6 | 5.6 | 5.7 | 6.7 | 5.6 | 5.7 | 5.9 | 6 | 5.9 |
| >C10 to C12 Aromatic | mg/kg | 180 | 590 | 28000 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C10 to C12 Aromatic | mg/kg | 330 | 2300 | 37000 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C12 to C10 Aromatic | mg/kg | 540 | 1900 | 28000 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 13 | 10 | 10 | 17 | 10 | 14 | 18 | 23 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C21 TO C35 Aromatic | mg/kg | 1500 | 1900 | 28000 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 13 | 10 | 10 | .,, | 10 | 17 | 10 | 25 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C35 to C44 Aromatic | mg/kg | 1500 | 1900 | 28000 | 10 | 10 | 15 | 14 | 10 | 10 | 13 | 10 | 18 | 10 | 10 | 18 | 10 | 14 | 24 | 37 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| Total Aromatic C5-C35 | ma/ka | - | - | - | | | | | | | | | | | | | | 1 | | | | | | | | | | |
| TPH Ali/Aro | mg/kg | - | - | _ | | | | | | | | | | | | | | | | | | | | | | | | |
| EPH (C10-C40) | mg/kg | - | - | - | 10 | 10 | 84 | 81 | 10 | 90 | 54 | 10 | 110 | 10 | 10 | 110 | 10 | 92 | 130 | 190 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| naphthalene | mg/kg | 5.6 | 5.6 | 460 | 0.03 | | <u> </u> | <u> </u> | | - 00 | 0.03 | 0.03 | 0.03 | | | | | | .00 | | | | | | | | | |
| acenaphthylene | mg/kg | 420 | 4600 | 97000 | 0.03 | | | | | | 0.03 | 0.03 | 0.03 | | | | | | | | | | | | | | | |
| acenaphthene | mg/kg | 510 | 4700 | 97000 | 0.03 | | | | | | 0.03 | 0.03 | 0.03 | | | | | | | | | | | | | | | |
| fluorene | mg/kg | 400 | 3800 | 68000 | 0.03 | | | | | | 0.03 | 0.03 | 0.03 | | | | | | | | | | | | | | | |
| phenanthrene | mg/kg | 220 | 1500 | 22000 | 0.03 | | | | | | 0.03 | 0.03 | 0.07 | | | | | | | | | | | | | | | |
| anthracene | mg/kg | 5400 | 35000 | 540000 | 0.03 | | | | | | 0.03 | 0.03 | 0.03 | | | | | | | | | | | | | | | |
| fluoranthene | mg/kg | 560 | 1600 | 23000 | 0.05 | | | | | | 0.03 | 0.03 | 0.12 | | | | | | | | | | | | | | | |
| pyrene | mg/kg | 1200 | 3800 | 54000 | 0.04 | | | | | | 0.03 | 0.03 | 0.14 | | | | | | | | | | | | | | | |
| benzo(a)anthracene | mg/kg | 11 | 14 | 170 | 0.03 | | | | | | 0.03 | 0.03 | 0.06 | | | | | | | | | | | | | | | |
| chrysene | mg/kg | 22 | 31 | 350 | 0.03 | | | | | | 0.03 | 0.03 | 0.07 | | | | | | | | | | | | | | | |
| benzo(b)fluoranthene | mg/kg | 3.3 | 4 | 44 | 0.03 | | | | | | 0.03 | 0.03 | 0.07 | | | | | | | | | | | | | | | |
| benzo(k)fluoranthene | mg/kg | 93 | 110 | 1200 | 0.03 | | | | | | 0.03 | 0.03 | 0.03 | | | | | | | | | | | | | | | |
| benzo(a)pyrene* | mg/kg | 2.7 | 3.2 | 35 | 0.03 | | | | | | 0.03 | 0.03 | 0.05 | | | | | | | | | | | ļ | | | | |
| benzo(g,h,i)perylene | mg/kg | 340 | 360 | 4000 | 0.03 | | | | | | 0.03 | 0.03 | 0.05 | | | | | | | | | | | ļ | | | | |
| dibenzo(ah)anthracene | mg/kg | 0.28 | 0.32 | 3.6 | 0.03 | | | | | | 0.03 | 0.03 | 0.03 | 1 | | | 1 | | | | 1 | | | | | | | \perp |
| indeno(1,2,3-c,d)pyrene | mg/kg | 36 | 46 | 510 | 0.03 | | | | | | 0.03 | 0.03 | 0.04 | 1 | | | 1 | | | | 1 | | | | | | | \perp |
| Total PAH | mg/kg | - | - | - | 0.1 | | | | | | 0.1 | 0.1 | 0.69 | | | | 1 | | | | | | | ļ | ļ | | | |
| PCB (as Aroclors) | mg/kg | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | |
| Asbestos | TEXT | - | - | - | N | N | N | N | Ν | N | N | N | N | N | N | N | N | N | Ν | N | N | N | N | N | N | N | N | N |

Asbestos TEXT - - - N N N LQM/CIEH S4ULs Copyright Land Quality Management Limited Reproduced with Permission; Publication Number S4UL3202. All Rights Reserved * Category 4 Screening Value @ 6% SOM Version 5.1



^{**} Land Use Scenarios: RwHP = residential with homegrown produce, RwoHP = Residential without homegrown produce

WEST RIVERSIDE AND WOODBANK TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE HUMAN HEALTH ASSESSMENT CRITERIA

| | | | | Strata | 1 | 1 | ı | 1 | I | 1 | 1 | 1 | 1 | 1 | ı | I | 1 | 1 | 1 | | ı | 1 | | ſ | ı | 1 | | 1 |
|-----------------------------|----------------|------|----------------|------------|------|------|------|------|------|------|--|------|----------|------|------|------|------|------|--|------|------|----------|------------|------|------|------|------------|--|
| SOM 2.5% | Ī | Ass | sessment Crite | | WS08 | WS08 | WS09 | WS16 | WS16 | WS21 | WS22 | WS23 | WS25 | WS26 | WS28 | WS31 | WS32 | WS33 | WS34 | WS35 | WS37 | WS38 | WS38 | WS39 | WS40 | WS41 | WS41 | WS41 |
| Analyte | Units | RwHP | RwoHP | Commercial | | | | | | | | | | | | | | | | | | | | | | | | |
| Stones BG 2.6/3.0 | % | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | |
| Moisture content at 30 C | % | - | - | - | 24 | 13 | 19 | 23 | 72 | 5.6 | 8.2 | 14 | 21 | 13 | 17 | 15 | 11 | 24 | 12 | 19 | 19 | 26 | 24 | 10 | 18 | 24 | 63 | 55 |
| Arsenic* | mg/kg | 37 | 40 | 640 | 8.9 | 5.9 | 9.1 | 5.1 | 1.4 | 4 | 3.2 | 2.8 | 4.5 | 1.7 | 7 | 5.3 | 5.5 | 6.3 | 5.4 | 8.3 | 9.7 | 65 | 3.9 | 5.6 | 6.2 | 14 | 15 | 9.1 |
| Cadmium | mg/kg | 11 | 85 | 190 | 0.3 | 0.1 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | 0.3 | 0.3 | 0.2 | 0.1 | 0.1 | 0.5 | 0.3 | 0.3 | 0.4 |
| Chromium Trivalent | mg/kg | 910 | 910 | 8600 | 25 | 30 | 27 | 16 | 3 | 16 | 15 | 11 | 18 | 13 | 19 | 20 | 25 | 21 | 22 | 45 | 17 | 34 | 22 | 18 | 26 | 21 | 28 | 34 |
| Chromium Hexavalant* | mg/kg | 6 | 6 | 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Copper | mg/kg | 2400 | 7100 | 68000 | 36 | 20 | 34 | 19 | 6.4 | 24 | 14 | 22 | 24 | 5.8 | 19 | 24 | 34 | 20 | 23 | 32 | 130 | 130 | 22 | 12 | 93 | 300 | 250 | 29 |
| Lead* | mg/kg | 200 | 310 | 2300 | 170 | 13 | 93 | 36 | 15 | 19 | 12 | 5.7 | 51 | 13 | 62 | 34 | 260 | 50 | 42 | 50 | 920 | 420 | 13 | 18 | 660 | 200 | 320 | 96 |
| Mercury | mg/kg | 40 | 56 | 1100 | 0.56 | 0.05 | 0.31 | 0.07 | 0.05 | 0.05 | 0.19 | 0.05 | 0.16 | 0.05 | 0.05 | 0.05 | 0.1 | 0.06 | 0.08 | 0.09 | 0.29 | 0.09 | 0.05 | 0.05 | 0.12 | 0.63 | 0.82 | 0.05 |
| Nickel | mg/kg | 130 | 180 | 980 | 31 | 29 | 29 | 15 | 3.4 | 18 | 14 | 13 | 19 | 10 | 17 | 19 | 23 | 17 | 22 | 49 | 50 | 77 | 22 | 15 | 30 | 52 | 61 | 27 |
| Selenium | mg/kg | 250 | 430 | 12000 | 0.8 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.5 | 0.6 | 1.7 | 1.1 | 1 |
| Zinc | mg/kg | 3700 | 40000 | 730000 | 110 | 55 | 100 | 49 | 16 | 48 | 34 | 29 | 64 | 31 | 39 | 53 | 72 | 55 | 60 | 81 | 98 | 87 | 40 | 39 | 340 | 89 | 92 | 100 |
| Beryllium | mg/kg | 1.7 | 1.7 | 12 | | | | | | | | | | | | | | | | | | <u> </u> | | | | | | |
| Boron | mg/kg | 290 | 11000 | 240000 | | | | | | | | | | | | | | | | | | | | | | | | |
| Vanadium | ma/ka | 410 | 1200 | 9000 | | | | | | | | | | | | | | | | | | | | | | | | |
| Cyanide (Total) | mg/kg | - | - | - | 0.4 | 0.1 | 0.3 | 0.3 | 0.3 | 0.1 | 0.2 | 0.1 | 0.2 | 0.2 | 0.4 | 0.2 | 0.2 | 0.4 | 0.2 | 0.3 | 3.2 | 2.3 | 0.1 | 0.3 | 0.6 | 1.5 | 0.9 | 0.9 |
| Organic matter | % | - | - | - | 4.9 | 0.5 | 3.3 | 3 | 25 | 0.7 | 3.5 | 0.4 | 6.6 | 1.4 | 3.8 | 2.8 | 1.9 | 3.5 | 1.2 | 3.6 | 6.9 | 11 | 0.3 | 1.5 | 3.6 | 9.9 | 8.2 | 7.4 |
| Phenol, Total | mg/kg | 200 | 690 | 690 | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulphate (Total) as SO4 | % | - | - | - | 12 | 10 | 10 | 10 | 37 | 12 | 17 | 10 | 25 | 15 | 10 | 73 | 11 | 13 | 14 | 18 | 16 | 25 | 10 | 10 | 17 | 19 | 27 | 88 |
| pH | pH Units | - | - | - | 5.8 | 6.4 | 6.4 | 6.2 | 5.8 | 6 | 6.2 | 6.3 | 6.4 | 5.7 | 5.4 | 7.5 | 7.5 | 6.5 | 7.5 | 6.2 | 7.4 | 6.4 | 6.3 | 5.2 | 7.4 | 7.8 | 7 | 5.4 |
| >C10 to C12 Aromatic | mg/kg | 180 | 590 | 28000 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C12 to C16 Aromatic | mg/kg | 330 | 2300 | 37000 | 10 | 10 | 10 | 10 | 24 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C16 to C21 Aromatic | mg/kg | 540 | 1900 | 28000 | 10 | 10 | 10 | 10 | 47 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 15 | 25 | 14 | 10 |
| >C21 TO C35 Aromatic | mg/kg | 1500 | 1900 | 28000 | | | | | | | | | | | | | | | | | | | | | | | | |
| >C35 to C44 Aromatic | mg/kg | 1500 | 1900 | 28000 | 10 | 10 | 10 | 10 | 77 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 20 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 74 | 29 | 10 | 26 |
| Total Aromatic C5-C35 | mg/kg | - | - | - | | | | | | | | | | | | | | | | | | | | | | | | |
| TPH Ali/Aro | mg/kg | | - | - | | | | | | | | | | | | | | | | | | | | | | | | |
| EPH (C10-C40) | mg/kg | - | - | - | 10 | 10 | 10 | 10 | 530 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 75 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 270 | 210 | 54 | 150 |
| naphthalene | mg/kg | 5.6 | 5.6 | 460 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.19 | | | | 0.03 | 0.03 | 0.03 | | 0.03 | 0.03 | | |
| acenaphthylene | mg/kg | 420 | 4600 | 97000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.03 | | | | 0.03 | 0.03 | 0.03 | | 0.04 | 0.03 | | |
| acenaphthene | mg/kg | 510 | 4700 | 97000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.15 | | | | 0.03 | 0.03 | 0.03 | | 0.03 | 0.03 | | |
| fluorene | mg/kg | 400 | 3800 | 68000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.13 | | | | 0.03 | 0.03 | 0.03 | | 0.03 | 0.03 | | |
| phenanthrene | mg/kg | 220 | 1500 | 22000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.66 | | | | 0.06 | 0.03 | 0.03 | | 0.5 | 0.12 | | |
| anthracene | mg/kg | 5400 | 35000 | 540000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.14 | | | | 0.03 | 0.03 | 0.03 | | 0.13 | 0.09 | | |
| fluoranthene | mg/kg | 560 | 1600 | 23000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.51 | | | | 0.09 | 0.03 | 0.03 | | 1 | 0.14 | | |
| pyrene | mg/kg | 1200 | 3800 | 54000 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.48 | | | | 0.09 | 0.03 | 0.03 | | 0.92 | 0.14 | | |
| benzo(a)anthracene | mg/kg | 11 | 14 | 170 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.17 | | | | 0.05 | 0.03 | 0.03 | | 0.49 | 0.05 | | |
| chrysene | mg/kg | 22 | 31 | 350 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.19 | | | | 0.06 | 0.03 | 0.03 | | 0.5 | 0.09 | | |
| benzo(b)fluoranthene | mg/kg | 3.3 | 4 | 44 | 0.03 | | | 0.03 | 0.03 | | | | | | | 0.03 | 0.17 | | | | 0.06 | 0.03 | 0.03 | | 0.61 | 0.03 | | |
| benzo(k)fluoranthene | mg/kg | 93 | 110 | 1200 | 0.03 | 1 | | 0.03 | 0.03 | 1 | 1 | 1 | | 1 | - | 0.03 | 0.07 | 1 | 1 | - | 0.03 | 0.03 | 0.03 | | 0.23 | 0.03 | | |
| benzo(a)pyrene* | mg/kg | 2.7 | 3.2 | 35 | 0.03 | 1 | | 0.03 | 0.03 | 1 | 1 | 1 | | 1 | - | 0.03 | 0.14 | 1 | 1 | - | 0.04 | 0.03 | 0.03 | | 0.42 | 0.03 | | |
| benzo(g,h,i)perylene | mg/kg | 340 | 360 | 4000 | 0.03 | | | 0.03 | 0.03 | | + | | ļ | - | | 0.03 | 0.09 | | - | | 0.03 | 0.03 | 0.03 | | 0.33 | 0.03 | | |
| dibenzo(ah)anthracene | mg/kg | 0.28 | 0.32 | 3.6 | 0.03 | 1 | | 0.03 | 0.03 | 1 | 1 | 1 | | 1 | - | 0.03 | 0.03 | 1 | 1 | - | 0.03 | 0.03 | 0.03 | | 0.08 | 0.03 | | |
| indeno(1,2,3-c,d)pyrene | mg/kg | 36 | 46 | 510 | 0.03 | 1 | | 0.03 | 0.03 | 1 | 1 | 1 | | 1 | - | 0.03 | 0.08 | 1 | 1 | - | 0.03 | 0.03 | 0.03 | | 0.3 | 0.03 | | |
| Total PAH PCB (as Aroclors) | mg/kg ma/ka | - | - | - | 0.1 | | | 0.1 | 0.1 | - | | - | 1 | - | | 0.1 | 3.2 | | | | 0.46 | 0.1 | 0.1 | | 5.6 | 0.64 | | |
| | 3 3 | - | - | - | | 1.4 | F.1 | A.I | | k. | N1 | k. | N.I | | , | | N.I | N.I. | N1 | h 1 | N 1 | h 1 | N 1 | 14 | F.1 | A 1 | . . | . |
| Asbestos | TEXT | - | - | - | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N | N |

Asbestos | 1 EX1 | - | - | LOM/CIEH S4ULs Copyright Land Quality Management Limited Reproduced with Permission; Publication * Category 4 Screening Value @ 6% SOM



^{**} Land Use Scenarios: RwHP = residential with homegrown produce, RwoHP = Residential without homeç

WEST RIVERSIDE AND WOODBANK

TABLE SUMMARISING SOIL RESULTS AND HIGHLIGHTING EXCEEDANCES ABOVE HUMAN HEALTH ASSESSMENT CRITERIA

| | _ | | | Strata | | | | | | | | | | | | | | | |
|--------------------------|----------|------|---------------|------------|------|------|------|------|------|------|------|------|------|------|------|---|------|------|------|
| SOM 2.5% | | Ass | essment Crite | ria** | WS43 | WS44 | WS45 | WS45 | WS46 | WS47 | WS47 | WS49 | WS49 | WS50 | WS51 | WS52 | WS53 | WS54 | WS57 |
| Analyte | Units | RwHP | RwoHP | Commercial | | | | | | | | | | | | | | | |
| Stones BG 2.6/3.0 | % | - | - | - | | | | | | | | | | | | | | | |
| Moisture content at 30 C | % | - | _ | _ | 32 | 23 | 28 | 24 | 14 | 26 | | 17 | 73 | 19 | 11 | 9.2 | 13 | 9.2 | 16 |
| Arsenic* | ma/ka | 37 | 40 | 640 | 13 | 7.9 | 9.9 | 4.6 | 24 | 6.8 | 20 | 20 | 11 | 10 | 4.4 | 3.9 | 6.4 | 4.2 | 5.7 |
| Cadmium | mg/kg | 11 | 85 | 190 | 0.3 | 0.2 | 0.3 | 0.1 | 0.6 | 0.2 | 0.4 | 0.3 | 0.1 | 0.2 | 0.1 | 0.7 | 0.1 | 0.1 | 0.4 |
| Chromium Trivalent | mg/kg | 910 | 910 | 8600 | 14 | 10 | 21 | 17 | 41 | 15 | 820 | 150 | 19 | 32 | 21 | 16 | 20 | 20 | 23 |
| Chromium Hexavalant* | mg/kg | 6 | 6 | 33 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 8 | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| Copper | mg/kg | 2400 | 7100 | 68000 | 170 | 380 | 83 | 15 | 210 | 74 | 170 | 170 | 150 | 120 | 33 | 1600 | 48 | 30 | 48 |
| Lead* | mg/kg | 200 | 310 | 2300 | 250 | 66 | 120 | 32 | 2000 | 510 | 5100 | 970 | 270 | 140 | 27 | 130 | 88 | 10 | 500 |
| Mercury | mg/kg | 40 | 56 | 1100 | 0.22 | 0.08 | 0.11 | 0.05 | 0.25 | 0.13 | 0.14 | 0.14 | 0.05 | 0.13 | 0.05 | 0.15 | 0.09 | 0.05 | 0.2 |
| Nickel | mg/kg | 130 | 180 | 980 | 46 | 19 | 31 | 14 | 65 | 33 | 62 | 69 | 110 | 47 | 15 | 15 | 20 | 20 | 15 |
| Selenium | mg/kg | 250 | 430 | 12000 | 0.8 | 2.5 | 0.9 | 0.5 | 1.1 | 0.5 | 0.5 | 0.6 | 0.5 | 0.6 | 0.8 | 0.5 | 0.5 | 0.5 | 0.5 |
| Zinc | ma/ka | 3700 | 40000 | 730000 | 130 | 59 | 62 | 36 | 180 | 62 | 150 | 120 | 79 | 92 | 38 | 110 | 71 | 39 | 650 |
| Bervllium | mg/kg | 1.7 | 1.7 | 12 | 100 | - 00 | - 02 | - 00 | 100 | - 02 | 100 | 120 | 7.5 | - 52 | - 00 | 110 | , , | - 00 | 000 |
| Boron | mg/kg | 290 | 11000 | 240000 | | | | | | | | | | | | | | | |
| Vanadium | ma/ka | 410 | 1200 | 9000 | | | | | | | | | | | | | | | |
| Cyanide (Total) | mg/kg | - | - | - | 0.4 | 0.5 | 0.8 | 0.4 | 3.5 | 12 | 120 | 18 | 4.3 | 0.9 | 0.3 | 0.1 | 0.2 | 0.1 | 0.6 |
| Organic matter | grg | _ | _ | - | 12 | 9.4 | 7.9 | 3.1 | 8.7 | > 25 | 8.9 | 9.1 | 4.3 | 5.5 | 2.6 | 0.4 | 2.3 | 0.2 | 2.3 |
| Phenol. Total | mg/kg | 200 | 690 | 690 | | | | | | | | | | | | • | | | |
| Sulphate (Total) as SO4 | % | - | - | - | 160 | 820 | 16 | 20 | 39 | 28 | 37 | 15 | 390 | 23 | 86 | 10 | 43 | 10 | 10 |
| pH | pH Units | - | - | - | 6.4 | 10.8 | 5.5 | 5.7 | 6.8 | 5.8 | 7 | 6.1 | 6.1 | 7.1 | 8.8 | 7.7 | 7.7 | 8.3 | 6.5 |
| >C10 to C12 Aromatic | mg/kg | 180 | 590 | 28000 | 10 | 10.0 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C12 to C16 Aromatic | mg/kg | 330 | 2300 | 37000 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 10 | 11 | 10 | 10 | 10 | 10 | 10 | 10 |
| >C16 to C21 Aromatic | mg/kg | 540 | 1900 | 28000 | 18 | 10 | 10 | 10 | 10 | 27 | 10 | 12 | 41 | 30 | 10 | 10 | 13 | 10 | 17 |
| >C21 TO C35 Aromatic | mg/kg | 1500 | 1900 | 28000 | | | | | | | | | | - 00 | | | | | ., |
| >C35 to C44 Aromatic | mg/kg | 1500 | 1900 | 28000 | 26 | 10 | 10 | 10 | 10 | 40 | 10 | 20 | 110 | 33 | 10 | 10 | 24 | 10 | 58 |
| Total Aromatic C5-C35 | mg/kg | - | - | - | | | | | | | | | | - 00 | | | | | - 55 |
| TPH Ali/Aro | mg/kg | - | _ | - | | | | | | | | | | | | | | | |
| EPH (C10-C40) | mg/kg | - | - | - | 170 | 10 | 10 | 10 | 10 | 270 | 10 | 94 | 1500 | 290 | 10 | 10 | 120 | 10 | 260 |
| naphthalene | mg/kg | 5.6 | 5.6 | 460 | 0.03 | 0.03 | 10 | 0.03 | 10 | 0.03 | 10 | 0.03 | 1000 | 0.03 | 0.03 | 0.03 | 0.03 | 10 | 200 |
| acenaphthylene | mg/kg | 420 | 4600 | 97000 | 0.03 | 0.03 | | 0.03 | | 0.03 | | 0.03 | | 0.03 | 0.03 | 0.03 | 0.03 | | |
| acenaphthene | ma/ka | 510 | 4700 | 97000 | 0.03 | 0.03 | | 0.03 | | 0.03 | | 0.03 | | 0.03 | 0.03 | 0.03 | 0.03 | | |
| fluorene | mg/kg | 400 | 3800 | 68000 | 0.03 | 0.03 | | 0.03 | | 0.03 | | 0.03 | | 0.03 | 0.03 | 0.03 | 0.03 | | |
| phenanthrene | mg/kg | 220 | 1500 | 22000 | 0.09 | 0.04 | | 0.03 | | 0.2 | | 0.05 | | 0.14 | 0.08 | 0.03 | 0.26 | | |
| anthracene | mg/kg | 5400 | 35000 | 540000 | 0.09 | 0.04 | | 0.03 | | 0.13 | | 0.06 | | 0.06 | 0.04 | 0.03 | 0.08 | | |
| fluoranthene | mg/kg | 560 | 1600 | 23000 | 0.09 | 0.04 | | 0.03 | | 0.31 | | 0.07 | | 0.18 | 0.11 | 0.03 | 0.58 | | |
| pyrene | ma/ka | 1200 | 3800 | 54000 | 0.07 | 0.04 | | 0.03 | | 0.29 | | 0.06 | | 0.17 | 0.11 | 0.03 | 0.56 | | |
| benzo(a)anthracene | mg/kg | 11 | 14 | 170 | 0.03 | 0.03 | | 0.03 | | 0.13 | | 0.03 | | 0.08 | 0.06 | 0.03 | 0.28 | | |
| chrysene | ma/ka | 22 | 31 | 350 | 0.03 | 0.03 | | 0.03 | | 0.15 | | 0.03 | | 0.09 | 0.06 | 0.03 | 0.29 | | |
| benzo(b)fluoranthene | mg/kg | 3.3 | 4 | 44 | 0.03 | 0.03 | | 0.03 | | 0.15 | | 0.06 | | 0.09 | 0.07 | 0.03 | 0.43 | | |
| benzo(k)fluoranthene | mg/kg | 93 | 110 | 1200 | 0.03 | 0.03 | | 0.03 | | 0.06 | | 0.03 | | 0.04 | 0.03 | 0.03 | 0.16 | | |
| benzo(a)pyrene* | mg/kg | 2.7 | 3.2 | 35 | 0.03 | 0.03 | | 0.03 | | 0.1 | | 0.03 | | 0.06 | 0.05 | 0.03 | 0.34 | | |
| benzo(q,h,i)perylene | mg/kg | 340 | 360 | 4000 | 0.03 | 0.03 | | 0.03 | | 0.08 | İ | 0.03 | | 0.05 | 0.05 | 0.03 | 0.26 | | |
| dibenzo(ah)anthracene | ma/ka | 0.28 | 0.32 | 3.6 | 0.03 | 0.03 | | 0.03 | | 0.03 | İ | 0.03 | | 0.03 | 0.03 | 0.03 | 0.06 | | |
| indeno(1,2,3-c,d)pyrene | mg/kg | 36 | 46 | 510 | 0.03 | 0.03 | | 0.03 | | 0.07 | | 0.03 | | 0.05 | 0.04 | 0.03 | 0.21 | | |
| Total PAH | mg/kg | - | - | - | 0.34 | 0.16 | | 0.1 | | 1.7 | İ | 0.3 | | 1 | 0.64 | 0.1 | 3.5 | | |
| PCB (as Aroclors) | mg/kg | - | - | - | | | | | | | | | | | | | | | |
| Asbestos | TEXT | _ | - | - | N | N | N | N | N | N | | N | N | N | N | N | N | N | N |
| | / . 1 | | | | | | | | | | | | | | | | | | |



^{**} Land Use Scenarios: RwHP = residential with homegrown produce, RwoHP = Residential without homeg



Appendix D Ground Gas Data (Pending)

| Date | Borehole | Atmospheric | | Gas Co | mpositio | n | Differential | Flow | Depth | Remarks |
|----------|----------|-------------|--------|--------|----------|-------|--------------|--------|-------|---------|
| | No. | Pressure | CH4 | CO2 | O2 | H2S | Pressure | | of | |
| | | | | | | | | | Water | |
| | | (mBar) | (%vol) | (%vol) | (%vol) | (ppm) | (Pa) | (l/hr) | (m) | |
| 19/04/17 | WS1 | 1032 | 0.0 | 4.1 | 14.1 | 0.0 | 0.00 | 0.00 | 1.03 | |
| 19/04/17 | WS2B | 1031 | 0.0 | 0.6 | 19.9 | 0.1 | 0.00 | 0.00 | 1.74 | |
| 19/04/17 | WS3 | 1031 | 0.0 | 0.2 | 20.4 | 0.0 | 0.00 | 0.00 | 1.31 | |
| 19/04/17 | WS4 | 1033 | 0.0 | 2.1 | 17.8 | 0.1 | 0.00 | 0.00 | 3.79 | |
| 19/04/17 | WS6 | 1037 | 0.0 | 3.1 | 16.1 | 0.0 | 0.00 | 0.00 | 2.02 | |
| 19/04/17 | WS7 | 1031 | 0.0 | 0.7 | 19.7 | 0.0 | 0.00 | 0.00 | Dry | |
| 19/04/17 | WS8 | 1026 | 0.1 | 1.4 | 20.2 | 0.0 | 0.00 | 0.00 | 1.67 | |
| 19/04/17 | WS10 | 1029 | 0.2 | 3.1 | 16.8 | 0.0 | 0.00 | 0.00 | 1.68 | |
| 19/04/17 | WS11 | 1030 | 0.0 | 2.7 | 17.1 | 0.1 | 0.00 | 0.00 | Dry | |
| 19/04/17 | WS12 | 1029 | 0.1 | 0.5 | 20.1 | 0.1 | 0.00 | 0.00 | Dry | |
| 19/04/17 | WS14 | 1030 | 0.0 | 4.4 | 14.3 | 0.0 | 0.00 | 0.00 | 2.04 | |
| 20/04/17 | WS15 | 1029 | 0.0 | 0.5 | 20.5 | 0.0 | 0.00 | 0.00 | 2.32 | |
| 21/04/17 | WS16 | 1028 | 0.1 | 4.2 | 14.7 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS18 | 1029 | 0.1 | 0.4 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS20 | 1028 | 0.0 | 0.6 | 19.7 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS21 | 1028 | 0.0 | 0.0 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS22 | 1029 | 0.1 | 1.1 | 19.0 | 0.0 | 0.00 | 0.00 | 0.84 | |
| 20/04/17 | WS23 | 1029 | 0.0 | 0.4 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS24 | 1031 | 0.0 | 0.8 | 19.9 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS25 | 1031 | 0.0 | 1.1 | 19.4 | 0.1 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS26 | 1029 | 0.0 | 0.6 | 19.7 | 0.0 | 0.00 | 0.00 | Dry | |
| 20/04/17 | WS29 | 1032 | 0.0 | 0.2 | 20.4 | 0.0 | 0.00 | 0.00 | 1.96 | |
| 20/04/17 | WS30 | 1033 | 0.0 | 0.8 | 19.7 | 0.0 | 0.00 | 0.00 | 2.29 | |
| 20/04/17 | WS35 | 1032 | 1.1 | 2.4 | 15.6 | 0.0 | 0.00 | 0.30 | 0.79 | |
| 20/04/17 | WS36 | 1031 | 0.0 | 1.3 | 19.0 | 0.0 | 0.00 | 0.00 | 2.10 | |
| 20/04/17 | WS37 | 1032 | 0.0 | 1.2 | 18.9 | 0.0 | 0.00 | 0.00 | 2.15 | |
| 21/04/17 | WS38 | 1033 | 0.00 | 0.60 | 20.30 | 0.00 | 0.00 | 0.00 | 3.01 | |
| 21/04/17 | WS40C | 1032 | 0.00 | 0.80 | 19.90 | 0.00 | 0.00 | 0.00 | 2.71 | |
| 21/04/17 | WS41 | 1032 | 0.00 | 1.10 | 19.40 | 0.00 | 0.00 | 0.00 | 2.82 | |
| 21/04/17 | WS43 | 1032 | 0.00 | 2.10 | 17.30 | 0.00 | 0.00 | 0.00 | 2.49 | |
| 21/04/17 | WS49 | 1032 | 0.00 | 4.80 | 13.30 | 0.00 | 0.00 | 0.00 | 1.71 | |
| 21/04/17 | WS50 | 1033 | 0.00 | 1.50 | 19.10 | 0.00 | 0.00 | 0.00 | 2.24 | |
| 21/04/17 | WS51B | 1034 | 0.00 | 1.30 | 17.40 | 0.00 | 0.00 | 0.10 | 2.03 | |
| 21/04/17 | WS52A | 1032 | 0.00 | 1.20 | 19.20 | 0.10 | 0.00 | 0.00 | 2.61 | |
| 21/04/17 | WS53 | 1033 | 0.10 | 0.80 | 17.20 | 0.00 | 0.00 | 0.00 | Dry | |
| 21/04/17 | WS54 | 1029 | 0.10 | 3.70 | 9.90 | 0.00 | 0.00 | 0.00 | Dry | |
| | | | | | | | | | ik di | |

Contract No. RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig. No.

2304

| Date | Borehole | Atmospheric | | Gas Co | mpositio | n | Differential | Flow | Depth | Remarks |
|----------|----------|-------------|--------|--------|----------|-------|--------------|--------|-------|---------|
| | No. | Pressure | CH4 | CO2 | O2 | H2S | Pressure | | of | |
| | | | | | | | | | Water | |
| | | (mBar) | (%vol) | (%vol) | (%vol) | (ppm) | (Pa) | (l/hr) | (m) | |
| 26/04/17 | WS1 | 1014 | 0.0 | 3.7 | 14.8 | 0.0 | 0.00 | 0.00 | 0.98 | |
| 26/04/17 | WS2B | 1014 | 0.0 | 0.4 | 19.1 | 0.2 | 0.00 | 0.00 | 1.60 | |
| 26/04/17 | WS3 | 1015 | 0.0 | 0.5 | 19.1 | 0.0 | 0.00 | 0.00 | 1.40 | |
| 26/04/17 | WS4 | 1014 | 0.0 | 1.8 | 18.5 | 0.1 | 0.00 | 0.00 | 3.50 | |
| 26/04/17 | WS6 | 1015 | 0.0 | 2.4 | 15.8 | 0.0 | 0.00 | 0.00 | 2.20 | |
| 26/04/17 | WS7 | 1016 | 0.0 | 1.2 | 19.4 | 0.1 | 0.00 | 0.00 | Dry | |
| 26/04/17 | WS8 | 1015 | 0.1 | 1.1 | 20.8 | 0.0 | 0.00 | 0.00 | 1.76 | |
| 26/04/17 | WS10 | 1016 | 0.1 | 2.8 | 17.5 | 0.0 | 0.00 | 0.00 | 1.55 | |
| 26/04/17 | WS11 | 1013 | 0.0 | 2.1 | 16.5 | 0.2 | 0.00 | 0.00 | Dry | |
| 26/04/17 | WS12 | 1014 | 0.0 | 0.6 | 19.1 | 0.1 | 0.00 | 0.00 | Dry | |
| 26/04/17 | WS14 | 1014 | 0.0 | 4.1 | 12.6 | 0.0 | 0.00 | 0.00 | 2.12 | |
| 27/04/17 | WS15 | 998 | 0.0 | 0.3 | 19.1 | 0.1 | 0.00 | 0.00 | 2.44 | |
| 27/04/17 | WS16 | 998 | 0.1 | 3.5 | 15.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS18 | 996 | 0.1 | 0.6 | 20.9 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS20 | 997 | 0.0 | 0.4 | 20.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS21 | 995 | 0.0 | 0.0 | 19.5 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS22 | 997 | 0.2 | 0.9 | 19.7 | 0.0 | 0.00 | 0.00 | 0.80 | |
| 27/04/17 | WS23 | 997 | 0.0 | 0.6 | 19.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS24 | 998 | 0.0 | 0.5 | 21.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS25 | 996 | 0.0 | 0.8 | 19.1 | 0.1 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS26 | 994 | 0.0 | 0.4 | 19.5 | 0.0 | 0.00 | 0.00 | Dry | |
| 27/04/17 | WS29 | 996 | 0.0 | 0.3 | 20.0 | 0.0 | 0.00 | 0.00 | 1.86 | |
| 27/04/17 | WS30 | 996 | 0.0 | 0.9 | 19.1 | 0.1 | 0.00 | 0.00 | 2.14 | |
| 27/04/17 | WS35 | 998 | 0.8 | 2.1 | 15.1 | 0.0 | 0.00 | 0.30 | 0.89 | |
| 27/04/17 | WS36 | 997 | 0.0 | 1.9 | 19.8 | 0.0 | 0.00 | 0.00 | 2.04 | |
| 27/04/17 | WS37 | 994 | 0.0 | 1.4 | 18.5 | 0.0 | 0.00 | 0.00 | 2.00 | |
| 28/04/17 | WS38 | 1004 | 0.00 | 0.80 | 21.00 | 0.00 | 0.00 | 0.00 | 2.91 | |
| 28/04/17 | WS40C | 1002 | 0.00 | 1.20 | 20.80 | 0.00 | 0.00 | 0.00 | 2.88 | |
| 28/04/17 | WS41 | 1005 | 0.00 | 1.00 | 20.60 | 0.00 | 0.00 | 0.00 | 3.11 | |
| 28/04/17 | WS43 | 1004 | 0.00 | 2.30 | 17.90 | 0.00 | 0.00 | 0.00 | 2.33 | |
| 28/04/17 | WS49 | 1003 | 0.00 | 4.20 | 14.50 | 0.00 | 0.00 | 0.00 | 1.81 | |
| 28/04/17 | WS50 | 1003 | 0.00 | 1.30 | 18.00 | 0.00 | 0.00 | 0.00 | 2.05 | |
| 28/04/17 | WS51B | 1002 | 0.00 | 1.80 | 16.20 | 0.00 | 0.00 | 0.10 | 1.89 | |
| 28/04/17 | WS52A | 1004 | 0.00 | 1.40 | 18.30 | 0.20 | 0.00 | 0.00 | 2.51 | |
| 28/04/17 | WS53 | 1006 | 0.20 | 0.90 | 16.50 | 0.00 | 0.00 | 0.00 | Dry | |
| 28/04/17 | WS54 | 1004 | 0.10 | 3.80 | 11.60 | 0.00 | 0.00 | 0.00 | Dry | |
| | | | | | | | | | ik di | |

Contract No. RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig. No.

2304

| Date | Borehole | Atmospheric | | Gas Co | mpositio | n | Differential | Flow | Depth | Remarks |
|----------|----------|-------------|--------|--------|----------|-------|--------------|--------|-------|-----------------|
| | No. | Pressure | CH4 | CO2 | O2 | H2S | Pressure | | of | |
| | | | | | | | | | Water | |
| | | (mBar) | (%vol) | (%vol) | (%vol) | (ppm) | (Pa) | (l/hr) | (m) | |
| 17/05/17 | WS1 | 1004 | 0.0 | 3.8 | 15.2 | 0.0 | 0.00 | 0.00 | 1.07 | |
| 17/05/17 | WS2B | 1007 | 0.0 | 0.6 | 20.1 | 0.0 | 0.00 | 0.00 | 1.30 | |
| 17/05/17 | WS3 | 1006 | 0.0 | 0.7 | 20.1 | 0.0 | 0.00 | 0.00 | 1.80 | No plastic |
| 17/05/17 | WS4 | 1004 | 0.0 | 1.8 | 19.1 | 0.0 | 0.00 | 0.00 | 3.20 | |
| | WS5 | | | | | | | | | Unable to locat |
| 17/05/17 | WS6 | 1006 | 0 | 2.8 | 18.5 | 0.0 | 0.00 | 0.00 | 2.10 | |
| 17/05/17 | WS7 | 1007 | 0 | 1.2 | 15.8 | 0.0 | 0.00 | 0.00 | Dry | |
| 17/05/17 | WS8 | 1008 | 0.10 | 1.1 | 19.4 | 0.0 | 0.00 | 0.00 | 1.65 | |
| 17/05/17 | WS10 | 1004 | 0.10 | 2.9 | 17.4 | 0.0 | 0.00 | 0.00 | 1.70 | |
| 17/05/17 | WS11 | 1006 | 0 | 3.0 | 16.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 17/05/17 | WS12 | 1006 | 0.10 | 0.6 | 20.4 | 0.0 | 0.00 | 0.00 | Dry | |
| | WS13 | | | | | | | | , | Unable to locat |
| 17/05/17 | WS14 | 1006 | 0 | 4.0 | 13.2 | 0.0 | 0.00 | 0.00 | 1.90 | |
| 17/05/17 | WS15 | 1007 | 0 | 0.6 | 19.4 | 0.0 | 0.00 | 0.00 | 1.30 | |
| 17/05/17 | WS16 | 1006 | 0.10 | 3.6 | 15.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 17/05/17 | WS18 | 1019 | 0 | 0.8 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS20 | 1021 | 0 | 0.6 | 20.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS21 | 1020 | 0 | 0.1 | 20.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS22 | 1020 | 0.10 | 0.9 | 19.4 | 0.0 | 0.00 | 0.00 | 1.10 | |
| 18/05/17 | WS23 | 1019 | 0 | 0.6 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS24 | 1021 | 0 | 0.5 | 21.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS25 | 1020 | 0 | 0.8 | 19.4 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS26 | 1014 | 0 | 0.7 | 15.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS29 | 1008 | 0.10 | 0.9 | 20.0 | 0.0 | 0.00 | 0.00 | 1.80 | |
| 19/05/17 | WS30 | 1016 | 0.10 | 1.1 | 19.5 | 0.0 | 0.00 | 0.00 | 1.76 | |
| 19/05/17 | WS35 | 1017 | 0.20 | 2.6 | 16.2 | 0.0 | 0.00 | 0.00 | 0.80 | |
| 19/05/17 | WS36 | 1009 | 0.20 | 1.6 | 19.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS37 | 1010 | 0 | 1.2 | 18.0 | 0.0 | 0.00 | 0.00 | 2.35 | |
| 18/05/17 | WS38 | 1019 | 0.20 | 0.90 | 20.10 | 0.0 | 0.00 | 0.00 | 2.05 | |
| 18/05/17 | WS40C | 1020 | 0.10 | 1.40 | 19.30 | 0.0 | 0.00 | 0.00 | 2.84 | |
| 18/05/17 | WS41 | 1020 | 0.10 | 2.30 | 18.50 | 0.0 | 0.00 | 0.00 | 2.50 | |
| 19/05/17 | WS43 | 1014 | 0.10 | 1.10 | 19.80 | 0.0 | 0.00 | 0.00 | 2.83 | |
| 19/05/17 | WS45 | 1017 | 0.10 | 1.70 | 18.40 | 0.0 | 0.11 | 0.00 | 2.44 | |
| 18/05/17 | WS49 | 1019 | 0 | 5.10 | 16.50 | 0.0 | 0.00 | 0.00 | 1.82 | |
| 18/05/17 | WS50 | 1018 | 0 | 1.40 | 15.50 | 0.0 | 0.00 | 0.00 | 2.40 | |
| 19/05/17 | WS51B | 1015 | 0 | 1.30 | 17.90 | 0.0 | 0.00 | 0.10 | 2.15 | |
| 19/05/17 | WS52A | 1016 | 0 | 1.20 | 19.80 | 0.0 | 0.00 | 0.00 | 2.70 | |
| 19/05/17 | WS53 | 1014 | 0.1 | 2.40 | 15.10 | 0.0 | 0.00 | 0.00 | Dry | |
| 19/05/17 | WS54 | 1014 | 0.1 | 3.60 | 12.50 | 0.0 | 0.00 | 0.00 | Dry | |
| 18/05/17 | WS56 | 1006 | 0.2 | 0.60 | 11.40 | 0.0 | 0.00 | 0.00 | Dry | |
| 10/03/17 | WS57 | 1021 | 0.1 | 0.00 | 11.40 | 0.0 | 0.00 | 0.00 | ыу | Unable to locat |
| | VV 331 | <u> </u> | | | | | | | | Unable to locat |

Contract No. RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig. No.

2304

| Date | Borehole | Atmospheric | | Gas Co | mpositio | n | Differential | Flow | Depth | Remarks |
|----------|----------|-------------|--------|--------|----------|-------|--------------|--------|-------|-----------------|
| | No. | Pressure | CH4 | CO2 | O2 | H2S | Pressure | | of | |
| | | | | | | | | | Water | |
| | | (mBar) | (%vol) | (%vol) | (%vol) | (ppm) | (Pa) | (l/hr) | (m) | |
| 30/05/17 | WS1 | 1007 | 0.0 | 3.9 | 16.5 | 0.0 | 0.00 | 0.00 | 1.09 | |
| 30/05/17 | WS2B | 1006 | 0.0 | 0.8 | 19.2 | 0.0 | 0.00 | 0.00 | 1.88 | |
| 30/05/17 | WS3 | 1004 | 0.0 | 0.8 | 20.1 | 0.0 | 0.00 | 0.00 | 2.26 | No plastic |
| 30/05/17 | WS4 | 1008 | 0.0 | 1.6 | 19.7 | 0.0 | 0.00 | 0.00 | 4.96 | |
| | WS5 | | | | | | | | | Unable to locat |
| 30/05/17 | WS6 | 1006 | 0.0 | 3.0 | 16.6 | 0.0 | 0.00 | 0.00 | 1.97 | |
| 30/05/17 | WS7 | 1007 | 0.0 | 1.1 | 19.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 30/05/17 | WS8 | 1008 | 0.0 | 1.8 | 19.0 | 0.0 | 0.00 | 0.00 | 1.62 | |
| 30/05/17 | WS10 | 1006 | 0.1 | 3.3 | 16.6 | 0.0 | 0.00 | 0.00 | 1.72 | |
| 30/05/17 | WS11 | 1007 | 0.0 | 3.1 | 16.9 | 0.0 | 0.00 | 0.00 | Dry | |
| 30/05/17 | WS12 | 1007 | 0.1 | 0.9 | 19.6 | 0.0 | 0.00 | 0.00 | Dry | |
| | WS13 | | | | | | | | | Unable to locat |
| 30/05/17 | WS14 | 1006 | 0.0 | 3.9 | 14.8 | 0.0 | 0.00 | 0.00 | 1.97 | |
| 30/05/17 | WS15 | 1008 | 0.0 | 0.7 | 20.1 | 0.0 | 0.00 | 0.00 | 1.27 | |
| 30/05/17 | WS16 | 1006 | 0.2 | 3.8 | 15.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS18 | 1021 | 0.0 | 0.8 | 19.5 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS20 | 1020 | 0.0 | 0.9 | 19.4 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS21 | 1019 | 0.0 | 0.1 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS22 | 1021 | 0.0 | 1.0 | 18.8 | 0.0 | 0.00 | 0.00 | 1.18 | |
| 31/05/17 | WS23 | 1019 | 0.0 | 0.6 | 20.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS24 | 1021 | 0.0 | 0.5 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS25 | 1021 | 0.0 | 0.8 | 19.6 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS26 | 1016 | 0.0 | 0.9 | 19.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 30/05/17 | WS29 | 1009 | 0.1 | 0.9 | 20.0 | 0.0 | 0.00 | 0.00 | 1.98 | |
| 01/06/17 | WS30 | 1017 | 0.0 | 1.1 | 19.5 | 0.0 | 0.00 | 0.00 | 1.81 | |
| 01/06/17 | WS35 | 1016 | 0.0 | 3.5 | 17.5 | 0.0 | 0.00 | 0.00 | 0.89 | |
| 31/05/17 | WS36 | 1010 | 0.0 | 0.7 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 30/05/17 | WS37 | 1011 | 0.0 | 0.8 | 19.9 | 0.0 | 0.00 | 0.00 | 2.39 | |
| 31/05/17 | WS38 | 1020 | 0.20 | 0.90 | 20.10 | 0.0 | 0.00 | 0.00 | 2.08 | |
| 31/05/17 | WS40C | 1019 | 0.10 | 1.60 | 19.30 | 0.0 | 0.00 | 0.00 | 2.89 | |
| 31/05/17 | WS41 | 1020 | 0.10 | 4.50 | 13.50 | 0.0 | 0.00 | 0.00 | 2.51 | |
| 01/06/17 | WS43 | 1015 | 0.10 | 1.10 | 19.80 | 0.0 | 0.00 | 0.00 | 2.98 | |
| 01/06/17 | WS45 | 1016 | 0.00 | 1.70 | 19.40 | 0.0 | 0.11 | 0.00 | 2.59 | |
| 31/05/17 | WS49 | 1020 | 0.00 | 5.10 | 14.70 | 0.0 | 0.00 | 0.00 | 1.83 | |
| 31/05/17 | WS50 | 1018 | 0.00 | 1.40 | 14.50 | 0.0 | 0.00 | 0.00 | 2.43 | |
| 01/06/17 | WS51B | 1014 | 0.00 | 1.10 | 17.60 | 0.0 | 0.00 | 0.10 | 2.16 | |
| 01/06/17 | WS52A | 1014 | 0.00 | 0.90 | 19.50 | 0.0 | 0.00 | 0.00 | 2.73 | |
| 01/06/17 | WS53 | 1014 | 0.10 | 2.40 | 15.70 | 0.0 | 0.00 | 0.00 | Dry | |
| 01/06/17 | WS54 | 1004 | 0.00 | 3.30 | 10.20 | 0.0 | 0.00 | 0.00 | Dry | |
| | | | 0.10 | 0.70 | 20.50 | 0.0 | 0.00 | 0.00 | Dry | |
| 31/05/17 | WS56 | 1022 | 0.10 | 0.70 | 20.00 | 0.0 | 0.00 | 0.00 | Diy | |

Contract No.

RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig. No.

2304

| Date | Borehole | Atmospheric | | Gas Co | mpositio | n | Differential | Flow | Depth | Remarks |
|----------|----------|-------------|--------|--------|----------|-------|--------------|--------|-------|-----------------|
| | No. | Pressure | CH4 | CO2 | O2 | H2S | Pressure | | of | |
| | | | | | | | | | Water | |
| | | (mBar) | (%vol) | (%vol) | (%vol) | (ppm) | (Pa) | (l/hr) | (m) | |
| 07/06/17 | WS1 | 1005 | 0.0 | 3.8 | 16.5 | 0.0 | 0.00 | 0.00 | 1.04 | |
| 07/06/17 | WS2B | 1004 | 0.0 | 0.8 | 19.2 | 0.0 | 0.00 | 0.00 | 1.82 | |
| 07/06/17 | WS3 | 1003 | 0.0 | 0.8 | 20.1 | 0.0 | 0.00 | 0.00 | 2.22 | No plastic |
| 07/06/17 | WS4 | 1007 | 0.0 | 1.6 | 19.7 | 0.0 | 0.00 | 0.00 | 4.92 | |
| | WS5 | | | | | | | | | Unable to locat |
| 07/06/17 | WS6 | 1007 | 0.0 | 3.2 | 16.4 | 0.0 | 0.00 | 0.00 | 1.95 | |
| 07/06/17 | WS7 | 1007 | 0.0 | 1.1 | 19.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 07/06/17 | WS8 | 1006 | 0.0 | 1.7 | 18.8 | 0.0 | 0.00 | 0.00 | 1.57 | |
| 07/06/17 | WS10 | 1005 | 0.1 | 3.4 | 16.4 | 0.0 | 0.00 | 0.00 | 1.69 | |
| 07/06/17 | WS11 | 1006 | 0.0 | 3.0 | 16.9 | 0.0 | 0.00 | 0.00 | Dry | |
| 07/06/17 | WS12 | 1006 | 0.1 | 0.8 | 19.4 | 0.0 | 0.00 | 0.00 | Dry | |
| | WS13 | | | | | | | | | Unable to locat |
| 07/06/17 | WS14 | 1005 | 0.0 | 3.9 | 14.7 | 0.0 | 0.00 | 0.00 | 1.94 | |
| 08/06/17 | WS15 | 1007 | 0.0 | 0.8 | 20.1 | 0.0 | 0.00 | 0.00 | 1.24 | |
| 08/06/17 | WS16 | 1005 | 0.2 | 3.8 | 15.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS18 | 1021 | 0.0 | 0.8 | 19.5 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS20 | 1020 | 0.0 | 0.9 | 19.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS21 | 1020 | 0.0 | 0.1 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS22 | 1019 | 0.0 | 0.9 | 18.7 | 0.0 | 0.00 | 0.00 | 1.16 | |
| 08/06/17 | WS23 | 1019 | 0.0 | 0.6 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS24 | 1020 | 0.0 | 0.5 | 20.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS25 | 1020 | 0.0 | 0.9 | 19.5 | 0.0 | 0.00 | 0.00 | Dry | |
| 08/06/17 | WS26 | 1014 | 0.0 | 0.8 | 19.3 | 0.0 | 0.00 | 0.00 | Dry | |
| 09/06/17 | WS29 | 1007 | 0.1 | 0.9 | 20 | 0.0 | 0.00 | 0.00 | 1.92 | |
| 09/06/17 | WS30 | 1015 | 0.0 | 1.1 | 19.5 | 0.0 | 0.00 | 0.00 | 1.78 | |
| 09/06/17 | WS35 | 1014 | 0.0 | 3.4 | 17.4 | 0.0 | 0.00 | 0.00 | 0.86 | |
| 09/06/17 | WS36 | 1009 | 0.0 | 0.7 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 07/06/17 | WS37 | 1009 | 0.0 | 0.8 | 19.9 | 0.0 | 0.00 | 0.00 | 2.35 | |
| 07/06/17 | WS38 | 1019 | 0.20 | 0.90 | 20.1 | 0.0 | 0.00 | 0.00 | 2.06 | |
| 08/06/17 | WS40C | 1019 | 0.10 | 1.70 | 19.2 | 0.0 | 0.00 | 0.00 | 2.85 | |
| 08/06/17 | WS41 | 1020 | 0.10 | 4.50 | 13.5 | 0.0 | 0.00 | 0.00 | 2.49 | |
| 08/06/17 | WS43 | 1012 | 0.10 | 1.10 | 19.8 | 0.0 | 0.00 | 0.00 | 2.95 | |
| 08/06/17 | WS45 | 1014 | 0.00 | 1.70 | 19.3 | 0.0 | 0.11 | 0.00 | 2.54 | |
| 08/06/17 | WS49 | 1018 | 0.00 | 5.10 | 14.6 | 0.0 | 0.00 | 0.00 | 1.80 | |
| 08/06/17 | WS50 | 1019 | 0.00 | 1.30 | 14.4 | 0.0 | 0.00 | 0.00 | 2.40 | |
| 09/06/17 | WS51B | 1019 | 0.00 | 0.90 | 17.2 | 0.0 | 0.00 | 0.10 | 2.14 | |
| 09/06/17 | WS52A | 1012 | 0.00 | 0.90 | 19.3 | 0.0 | 0.00 | 0.00 | 2.70 | |
| 09/06/17 | WS53 | 1012 | 0.10 | 2.30 | 15.6 | 0.0 | 0.00 | 0.00 | Dry | _ |
| 08/06/17 | WS54 | 1003 | 0.00 | 3.30 | 10.2 | 0.0 | 0.00 | 0.00 | Dry | |
| | | | 0.10 | 0.70 | 20.3 | 0.0 | 0.00 | 0.00 | Dry | 1 |
| 09/06/17 | WS56 | 1020 | 0.10 | 0.70 | 20.0 | 0.0 | 0.00 | 0.00 | L Diy | |

Contract No.

RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig. No.

2304

| Date | Borehole | Atmospheric | | Gas Co | mpositio | n | Differential | Flow | Depth | Remarks |
|----------|----------|-------------|----------|--------|----------|-------|--------------|--------|-------|--------------------|
| | No. | Pressure | CH4 | CO2 | O2 | H2S | Pressure | | of | |
| | | | | | | | | | Water | |
| | | (mBar) | (%vol) | (%vol) | (%vol) | (ppm) | (Pa) | (l/hr) | (m) | |
| 21/06/17 | WS1 | 1003 | 0.0 | 3.7 | 16.4 | 0.0 | 0.00 | 0.00 | 1.02 | |
| 21/06/17 | WS2B | 1001 | 0.0 | 0.8 | 19.1 | 0.0 | 0.00 | 0.00 | 1.80 | |
| 21/06/17 | WS3 | 1001 | 0.0 | 0.7 | 20.0 | 0.0 | 0.00 | 0.00 | 2.20 | No plastic |
| 21/06/17 | WS4 | 1005 | 0.0 | 1.5 | 19.6 | 0.0 | 0.00 | 0.00 | 4.90 | |
| | WS5 | | | | | | | | | Unable to locate |
| 21/06/17 | WS6 | 1005 | 0.0 | 3.1 | 16.3 | 0.0 | 0.00 | 0.00 | 1.94 | |
| 21/06/17 | WS7 | 1005 | 0.0 | 1.0 | 19.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 21/06/17 | WS8 | 1003 | 0.0 | 1.6 | 18.6 | 0.0 | 0.00 | 0.00 | 1.55 | |
| 21/06/17 | WS10 | 1004 | 0.1 | 3.3 | 16.3 | 0.0 | 0.00 | 0.00 | 1.65 | |
| 21/06/17 | WS11 | 1004 | 0.0 | 3.0 | 16.7 | 0.0 | 0.00 | 0.00 | Dry | |
| 21/06/17 | WS12 | 1005 | 0.1 | 0.7 | 19.3 | 0.0 | 0.00 | 0.00 | Dry | |
| | WS13 | | | | | | | | , | Unable to locate |
| 21/06/17 | WS14 | 1003 | 0.0 | 3.8 | 14.6 | 0.0 | 0.00 | 0.00 | 1.92 | |
| 22/06/17 | WS15 | 1005 | 0.0 | 0.8 | 20.0 | 0.0 | 0.00 | 0.00 | 1.22 | |
| 22/06/17 | WS16 | 1003 | 0.2 | 3.7 | 15.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS18 | 1019 | 0.0 | 0.7 | 19.4 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS20 | 1018 | 0.0 | 0.8 | 19.4 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS21 | 1018 | 0.0 | 0.1 | 20.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS22 | 1017 | 0.0 | 0.8 | 18.6 | 0.0 | 0.00 | 0.00 | 1.14 | |
| 22/06/17 | WS23 | 1017 | 0.0 | 0.5 | 20.0 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS24 | 1018 | 0.0 | 0.5 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS25 | 1018 | 0.0 | 0.8 | 19.4 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS26 | 1012 | 0.0 | 0.8 | 19.2 | 0.0 | 0.00 | 0.00 | Dry | |
| 23/06/17 | WS29 | 1005 | 0.1 | 0.8 | 20 | 0.0 | 0.00 | 0.00 | 1.90 | |
| 23/06/17 | WS30 | 1005 | 0.0 | 1.2 | 19.4 | 0.0 | 0.00 | 0.00 | 1.76 | |
| 23/06/17 | WS35 | 1012 | 0.0 | 3.3 | 17.3 | 0.0 | 0.00 | 0.00 | 0.84 | |
| 23/06/17 | WS36 | 1007 | 0.0 | 0.6 | 20.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS37 | 10017 | 0.0 | 0.7 | 19.9 | 0.0 | 0.00 | 0.00 | 2.33 | |
| 22/06/17 | WS38 | 1018 | 0.20 | 0.80 | 20.1 | 0.0 | 0.00 | 0.00 | 2.04 | |
| 21/06/17 | WS40C | 1018 | 0.10 | 1.60 | 19.1 | 0.0 | 0.00 | 0.00 | 2.80 | |
| 21/06/17 | WS41 | 1018 | 0.10 | 4.30 | 13.4 | 0.0 | 0.00 | 0.00 | 2.45 | |
| 22/06/17 | WS43 | 1018 | 0.10 | 1.10 | 19.8 | 0.0 | 0.00 | 0.00 | 2.93 | |
| 22/06/17 | WS45 | 1013 | 0.00 | 1.60 | 19.2 | 0.0 | 0.11 | 0.00 | 2.50 | |
| 22/06/17 | WS49 | 1016 | 0.00 | 5.10 | 14.3 | 0.0 | 0.00 | 0.00 | 1.78 | |
| 23/06/17 | WS50 | 1017 | 0.00 | 1.20 | 14.3 | 0.0 | 0.00 | 0.00 | 2.38 | |
| 23/06/17 | WS51B | 1017 | 0.00 | 0.80 | 17.1 | 0.0 | 0.00 | 0.10 | 2.12 | |
| 23/06/17 | WS52A | 1010 | 0.00 | 0.80 | 19.2 | 0.0 | 0.00 | 0.00 | 2.68 | |
| 23/06/17 | WS53 | 1010 | 0.10 | 2.20 | 15.5 | 0.0 | 0.00 | 0.00 | Dry | |
| 23/06/17 | WS54 | 1002 | 0.00 | 3.10 | 10.1 | 0.0 | 0.00 | 0.00 | Dry | |
| 22/06/17 | WS56 | 1018 | 0.10 | 0.60 | 20.2 | 0.0 | 0.00 | 0.00 | Dry | |
| | WS57 | .515 | 0.10 | 0.00 | 20.2 | 0.0 | 0.00 | 0.00 | Diy | Unable to locate |
| | | I | <u> </u> | | | | | | | C. Idolo to locate |

Contract No.

RESULTS OF GAS AND WATER LEVEL MONITORING IN STANDPIPES

Fig. No.

2304



Appendix E Groundwater Results



Certificate Number 17-09386

08-Sep-17

Client Peter Brett Associates LLP

Exchange Place 3 Semple Street Edinburgh EH3 8BL

Our Reference 17-09386

Client Reference (not supplied)

Order No (not supplied)

Contract Title Balloch

Description 15 Water samples.

Date Received 04-Sep-17

Date Started 04-Sep-17

Date Completed 08-Sep-17

Test Procedures Identified by prefix DETSn (details on request).

Notes Opinions and interpretations are outside the laboratory's scope of ISO 17025 accreditation. This certificate is issued in accordance with the accreditation requirements of the United Kingdom Accreditation Service. The results reported herein relate only to the material supplied to the laboratory. This certificate shall not be reproduced except in full, without the prior written approval of the laboratory.

Approved By

Adam Fenwick Contracts Manager





Summary of Chemical Analysis Water Samples

Our Ref 17-09386
Client Ref
Contract Title Balloch

| Lab No | 1225048 | 1225049 | 1225050 | 1225051 | 1225052 | 1225053 |
|---------------|----------|----------|----------|----------|----------|----------|
| Sample ID | WS1 | WS2A | WS3 | WS08 | WS22 | WS29 |
| Depth | | | | | | |
| Other ID | | | | | | |
| Sample Type | WATER | WATER | WATER | WATER | WATER | WATER |
| Sampling Date | 30/05/17 | 30/05/17 | 30/05/17 | 30/05/17 | 31/05/17 | 30/05/17 |
| Sampling Time | n/s | n/s | n/s | n/s | n/s | n/s |

| | | Julipi | ing rime[| n/s | n/s | n/s | n/s | n/s | n/s |
|-------------------------|-------------|--------|-----------|--------|--------|--------|--------|--------|--------|
| Test | Method | LOD | Units | | | | | | |
| Metals | | | | | | | | | |
| Arsenic, Dissolved | DETSC 2306 | 0.16 | ug/l | 0.42 | 0.56 | 0.42 | 0.60 | 0.22 | 0.21 |
| Cadmium, Dissolved | DETSC 2306 | 0.03 | ug/l | < 0.03 | < 0.03 | < 0.03 | < 0.03 | < 0.03 | 0.03 |
| Chromium, Dissolved | DETSC 2306 | 0.25 | ug/l | < 0.25 | < 0.25 | 0.47 | < 0.25 | < 0.25 | < 0.25 |
| Chromium, Hexavalent | DETSC 2203 | 7 | ug/l | | | | | | |
| Copper, Dissolved | DETSC 2306 | 0.4 | ug/l | 0.5 | 1.4 | 0.7 | 0.9 | 5.8 | 2.1 |
| Lead, Dissolved | DETSC 2306 | 0.09 | ug/l | < 0.09 | < 0.09 | < 0.09 | < 0.09 | 0.14 | < 0.09 |
| Mercury, Dissolved | DETSC 2306 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Nickel, Dissolved | DETSC 2306 | 0.5 | ug/l | 0.8 | 3.0 | 0.9 | 1.4 | 9.5 | 12 |
| Selenium, Dissolved | DETSC 2306 | 0.25 | ug/l | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 | < 0.25 |
| Zinc, Dissolved | DETSC 2306 | 1.3 | ug/l | 9.4 | 4.6 | 5.0 | 8.2 | 35 | 9.7 |
| Inorganics | | | | | | | | | |
| рН | DETSC 2008 | | | 6.5 | 7.4 | 7.2 | 7.0 | 6.4 | 6.4 |
| Hardness | DETSC 2303 | 0.1 | mg/l | 61.9 | 299 | 178 | 79.2 | 23.9 | 23.7 |
| Petroleum Hydrocarbons | | | | | | | | | |
| EPH (C10-C12) | DETSC 3311 | 10 | ug/l | | | | | | |
| EPH (C12-C16) | DETSC 3311 | 10 | ug/l | | | | | | |
| EPH (C16-C21) | DETSC 3311 | 10 | ug/l | | | | | | |
| EPH (C21-C28) | DETSC 3311 | 10 | ug/l | | | | | | |
| EPH (C28-C35) | DETSC 3311 | 10 | ug/l | | | | | | |
| EPH (C35-C40) | DETSC 3311 | 10 | ug/l | | | | | | |
| EPH (C10-C40) | DETSC 3311 | 10 | ug/l | | | | | | |
| PAHs | | | • | | | | | | |
| Naphthalene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Acenaphthylene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Acenaphthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Fluorene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Phenanthrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | 0.03 | | |
| Anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | 0.06 | | |
| Pyrene | DETSC 3304 | 0.01 | ug/l | 0.06 | 0.03 | 0.07 | 0.28 | | |
| Benzo(a)anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Chrysene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Benzo(b)fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Benzo(k)fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Benzo(a)pyrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Indeno(1,2,3-c,d)pyrene | DETSC 3304* | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Dibenzo(a,h)anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| Benzo(g,h,i)perylene | DETSC 3304* | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | | |
| PAH Total | DETSC 3304 | 0.04 | ug/l | 0.06 | < 0.04 | 0.07 | 0.38 | | |



Summary of Chemical Analysis Water Samples

Our Ref 17-09386
Client Ref
Contract Title Balloch

| Lab No | 1225054 | 1225055 | 1225056 | 1225057 | 1225058 | 1225059 |
|---------------|----------|----------|----------|----------|----------|----------|
| Sample ID | WS37 | WS38 | WS40 | WS41 | WS43 | WS45 |
| Depth | | | | | | |
| Other ID | | | | | | |
| Sample Type | WATER | WATER | WATER | WATER | WATER | WATER |
| Sampling Date | 30/05/17 | 31/05/17 | 31/05/17 | 31/05/17 | 01/06/17 | 01/06/17 |
| Sampling Time | n/s | n/s | n/s | n/s | n/s | n/s |

| | | Janipi | mg rime[| n/s | n/s | n/s | n/s | n/s | n/s |
|-------------------------|-------------|--------|----------|--------|--------|--------|--------|--------|--------|
| Test | Method | LOD | Units | | | | | | |
| Metals | | | | | | | | | |
| Arsenic, Dissolved | DETSC 2306 | 0.16 | ug/l | 0.39 | 0.37 | 1.6 | 1.1 | 4.5 | 0.61 |
| Cadmium, Dissolved | DETSC 2306 | 0.03 | ug/l | < 0.03 | < 0.03 | 0.04 | 0.11 | < 0.03 | < 0.03 |
| Chromium, Dissolved | DETSC 2306 | 0.25 | ug/l | 0.42 | 0.45 | 6.1 | 0.31 | 0.57 | 0.32 |
| Chromium, Hexavalent | DETSC 2203 | 7 | ug/l | | | | | < 7.0 | < 7.0 |
| Copper, Dissolved | DETSC 2306 | 0.4 | ug/l | 2.6 | 2.5 | 4.5 | 1.8 | 1.3 | 0.8 |
| Lead, Dissolved | DETSC 2306 | 0.09 | ug/l | 0.23 | 0.42 | 4.8 | 1.9 | 32 | 4.0 |
| Mercury, Dissolved | DETSC 2306 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Nickel, Dissolved | DETSC 2306 | 0.5 | ug/l | 2.9 | 6.1 | 6.1 | 11 | 8.9 | 7.6 |
| Selenium, Dissolved | DETSC 2306 | 0.25 | ug/l | 0.75 | < 0.25 | 0.78 | < 0.25 | < 0.25 | < 0.25 |
| Zinc, Dissolved | DETSC 2306 | 1.3 | ug/l | 17 | 37 | 32 | 230 | 62 | 20 |
| Inorganics | | | | | | | | | |
| рН | DETSC 2008 | | | 6.8 | 6.8 | 6.7 | 6.4 | 7.0 | 6.9 |
| Hardness | DETSC 2303 | 0.1 | mg/l | 185 | 112 | 136 | 124 | 172 | 183 |
| Petroleum Hydrocarbons | | | | | | | | | |
| EPH (C10-C12) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| EPH (C12-C16) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| EPH (C16-C21) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| EPH (C21-C28) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| EPH (C28-C35) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| EPH (C35-C40) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| EPH (C10-C40) | DETSC 3311 | 10 | ug/l | < 10 | | < 10 | | < 10 | < 10 |
| PAHs | | | • | | | | | | |
| Naphthalene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthylene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluorene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Phenanthrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | 0.01 | 0.02 | < 0.01 | < 0.01 | < 0.01 |
| Pyrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | 0.14 | 0.07 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Chrysene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(b)fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(k)fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)pyrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Indeno(1,2,3-c,d)pyrene | DETSC 3304* | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Dibenzo(a,h)anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| Benzo(g,h,i)perylene | DETSC 3304* | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 | < 0.01 |
| PAH Total | DETSC 3304 | 0.04 | ug/l | < 0.04 | 0.15 | 0.08 | < 0.04 | < 0.04 | < 0.04 |



Summary of Chemical Analysis Water Samples

Our Ref 17-09386
Client Ref
Contract Title Balloch

| Lab No | 1225060 | 1225061 | 1225062 |
|---------------|----------|----------|----------|
| Sample ID | WS49 | WS51B | WS56 |
| Depth | | | |
| Other ID | | | |
| Sample Type | WATER | WATER | WATER |
| Sampling Date | 31/05/17 | 01/06/17 | 31/05/17 |
| Sampling Time | n/s | n/s | n/s |

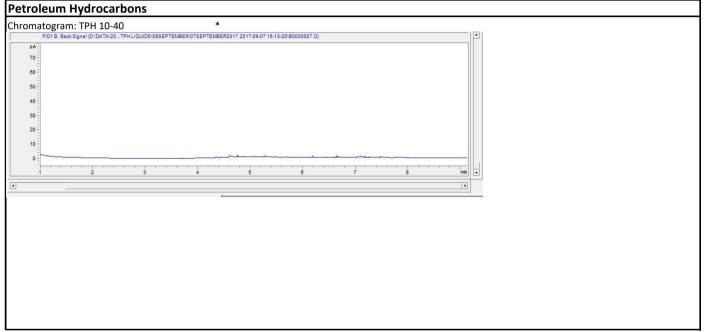
| Test | Method | LOD | Units | | | |
|-------------------------|-------------|------|-------|--------|--------|--------|
| Metals | | | | | | |
| Arsenic, Dissolved | DETSC 2306 | 0.16 | ug/l | 0.83 | 1.8 | 1.3 |
| Cadmium, Dissolved | DETSC 2306 | 0.03 | ug/l | < 0.03 | < 0.03 | < 0.03 |
| Chromium, Dissolved | DETSC 2306 | 0.25 | ug/l | 0.40 | 0.83 | 0.86 |
| Chromium, Hexavalent | DETSC 2203 | 7 | ug/l | < 7.0 | < 7.0 | |
| Copper, Dissolved | DETSC 2306 | 0.4 | ug/l | 2.8 | 0.6 | 1.5 |
| Lead, Dissolved | DETSC 2306 | 0.09 | ug/l | 0.43 | 0.49 | 0.52 |
| Mercury, Dissolved | DETSC 2306 | 0.01 | ug/l | 0.01 | < 0.01 | < 0.01 |
| Nickel, Dissolved | DETSC 2306 | 0.5 | ug/l | 8.4 | 4.8 | 5.7 |
| Selenium, Dissolved | DETSC 2306 | 0.25 | ug/l | 2.7 | 1.8 | 0.92 |
| Zinc, Dissolved | DETSC 2306 | 1.3 | ug/l | 64 | 10 | 57 |
| Inorganics | | | | | | |
| рН | DETSC 2008 | | | 6.4 | 6.6 | 6.8 |
| Hardness | DETSC 2303 | 0.1 | mg/l | 175 | 139 | 221 |
| Petroleum Hydrocarbons | | | | | · | |
| EPH (C10-C12) | DETSC 3311 | 10 | ug/l | < 10 | < 10 | |
| EPH (C12-C16) | DETSC 3311 | 10 | ug/l | < 10 | 34 | |
| EPH (C16-C21) | DETSC 3311 | 10 | ug/l | < 10 | 80 | |
| EPH (C21-C28) | DETSC 3311 | 10 | ug/l | < 10 | 32 | |
| EPH (C28-C35) | DETSC 3311 | 10 | ug/l | < 10 | < 10 | |
| EPH (C35-C40) | DETSC 3311 | 10 | ug/l | < 10 | < 10 | |
| EPH (C10-C40) | DETSC 3311 | 10 | ug/l | < 10 | 120 | |
| PAHs | | | • | | | |
| Naphthalene | DETSC 3304 | 0.01 | ug/l | < 0.01 | 0.14 | 0.02 |
| Acenaphthylene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Acenaphthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | 0.06 |
| Fluorene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Phenanthrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | 0.04 |
| Anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | 0.35 |
| Pyrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | 2.1 |
| Benzo(a)anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Chrysene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Benzo(b)fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Benzo(k)fluoranthene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Benzo(a)pyrene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Indeno(1,2,3-c,d)pyrene | DETSC 3304* | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Dibenzo(a,h)anthracene | DETSC 3304 | 0.01 | ug/l | < 0.01 | < 0.01 | < 0.01 |
| Benzo(g,h,i)perylene | DETSC 3304* | 0.01 | ug/l | < 0.01 | < 0.01 | 0.16 |
| PAH Total | DETSC 3304 | 0.04 | ug/l | < 0.04 | 0.14 | 2.8 |



Our Ref 17-09386 Client Ref Contract Title Balloch

Lab No 1225054
Sample ID WS37
Depth
Other ID
Sample Type WATER
Sampling Date 30/05/2017
Sampling Time

Test Method LOD Units
Petroleum Hydrocarbons

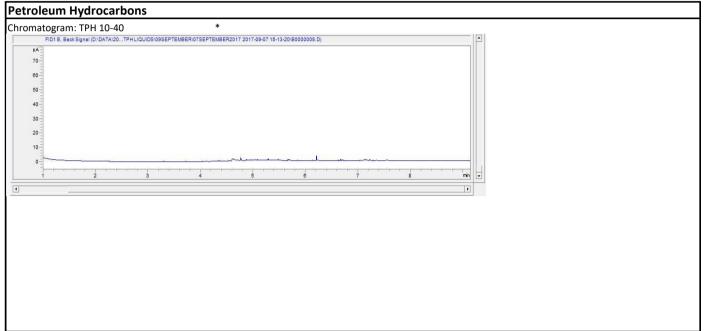




Our Ref 17-09386 Client Ref Contract Title Balloch

Lab No 1225056
Sample ID WS40
Depth
Other ID
Sample Type WATER
Sampling Date 31/05/2017
Sampling Time

Test Method LOD Units





Our Ref 17-09386 Client Ref Contract Title Balloch

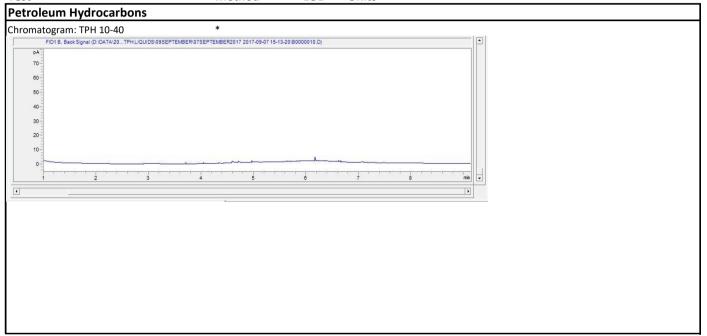
Lab No
Sample ID
WS43
Depth
Other ID
Sample Type
Sampling Date
Sampling Time



Our Ref 17-09386 Client Ref Contract Title Balloch

Lab No
Sample ID
WS45
Depth
Other ID
Sample Type
Sampling Date
Sampling Time

Test Method LOD Units





Our Ref 17-09386 Client Ref Contract Title Balloch

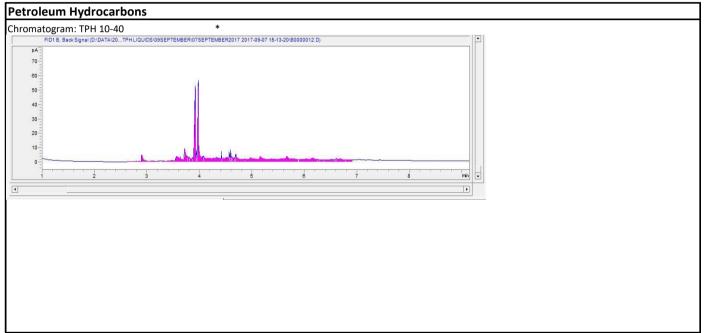
Lab No
Sample ID
WS49
Depth
Other ID
Sample Type
Sampling Date
Sampling Time



Our Ref 17-09386 Client Ref Contract Title Balloch

Lab No
Sample ID
WS51B
Depth
Other ID
Sample Type
Sampling Date
Sampling Time

Test Method LOD Units





Information in Support of the Analytical Results

Our Ref 17-09386

Client Ref

Contract Balloch

Containers Received & Deviating Samples

| | | Date | • | | Inappropriate container for |
|---------|-------------|----------|----------------------------|--|-----------------------------|
| Lab No | Sample ID | Sampled | Containers Received | Holding time exceeded for tests | tests |
| 1225048 | WS1 WATER | 30/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days) | |
| 1225049 | WS2A WATER | 30/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days) | |
| 1225050 | WS3 WATER | 30/05/17 | GB 1L, GV | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days) | |
| 1225051 | WS08 WATER | 30/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days) | |
| 1225052 | WS22 WATER | 31/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days) | |
| 1225053 | WS29 WATER | 30/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days) | |
| 1225054 | WS37 WATER | 30/05/17 | GB 1L, GV, PB 1L | Chromium (14 days), Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days), EPH (14 days) | |
| 1225055 | WS38 WATER | 31/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days) | |
| 1225056 | WS40 WATER | 31/05/17 | GB 1L, GV, PB 1L | Chromium (14 days), Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days), EPH (14 days) | |
| 1225057 | WS41 WATER | 31/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days) | |
| 1225058 | WS43 WATER | 01/06/17 | GB 1L, GV, PB 1L | Chromium (14 days), Chromium, Hexavalent (4 days), Hardness (7 days), Kone (30 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days), EPH (14 days) | |
| 1225059 | WS45 WATER | 01/06/17 | GB 1L, GV, PB 1L | Chromium (14 days), Chromium, Hexavalent (4 days), Hardness (7 days), Kone (30 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days), EPH (14 days) | |
| 1225060 | WS49 WATER | 31/05/17 | GB 1L, GV, PB 1L | Chromium (14 days), Chromium, Hexavalent (4 days), Hardness (7 days), Kone (30 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days), EPH (14 days) | |
| 1225061 | WS51B WATER | 01/06/17 | GB 1L, GV, PB 1L | Chromium (14 days), Chromium, Hexavalent (4 days), Hardness (7 days), Kone (30 days), pH/Cond/TDS (7 days), Metals (Soluble) ICPMS (30 days), Naphthalene (14 days), PAH MS (14 days), EPH (14 days) | |



Information in Support of the Analytical Results

Our Ref 17-09386

Client Ref

Contract Balloch

| commune | Danoch | | | | |
|---------|------------|----------|------------------|---|--|
| 1225062 | WS56 WATER | 31/05/17 | GB 1L, GV, PB 1L | Hardness (7 days), pH/Cond/TDS (7 days), Metals | |
| | | | | (Soluble) ICPMS (30 days), Naphthalene (14 days), | |
| | | | | PAH MS (14 days) | |

Key: G-Glass P-Plastic B-Bottle V-Vial

DETS cannot be held responsible for the integrity of samples received whereby the laboratory did not undertake the sampling. In this instance samples received may be deviating. Deviating Sample criteria are based on British and International standards and laboratory trials in conjunction with the UKAS note 'Guidance on Deviating Samples'. All samples received are listed above. However, those samples that have additional comments in relation to hold time, inappropriate containers etc are deviating due to the reasons stated. This means that the analysis is accredited where applicable, but results may be compromised due to sample deviations. If no sampled date (soils) or date+time (waters) has been supplied then samples are deviating. However, if you are able to supply a sampled date (and time for waters) this will prevent samples being reported as deviating where specific hold times are not exceeded and where the container supplied is suitable.

Disposal

From the issue date of this test certificate, samples will be held for the following times prior to disposal :Soils - 1 month, Liquids - 2 weeks, Asbestos (test portion) - 6 months

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All of our work, from the engineering of landmark buildings and critical infrastructure to the spatial planning and economic evidence in support of development, is evidence based and informed by a deep understanding of what it takes to deliver construction.

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