

Uig Harbour Redevelopment

Best Practicable Environmental Option (BPEO)
Assessment

The Highland Council

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Quality information

Prepared by

Redacted

Checked by

Verified by

Approved by

Redacted
Associate Director

Redacted
Senior Technician

Redacted
Principal Engineer

Redacted
Regional Director

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Prepared for:

The Highland Council
Glenurquhart Road,
Inverness,
IV3 5NX

Prepared by:

Redacted
Associate Director
Redacted
Redacted

AECOM Infrastructure & Environment UK Limited
7th Floor, Aurora
120 Bothwell Street
Glasgow G2 7JS
United Kingdom

T: +44 141 248 0300
aecom.com

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1. Introduction

1.1 Introduction to this Report

- 1.1.1 This report presents the results of the Best Practicable Environmental Option (BPEO) assessment prepared by AECOM on behalf of The Highland Council (hereafter referred to as the 'Applicant') for the dredging and dredge disposal associated with the Uig Harbour Redevelopment (hereafter referred to as the 'Proposed Development'). This report accompanies a marine licence application to Marine Scotland (MS) for capital dredging and opening a new sea disposal site in the vicinity of Uig Bay for the disposal of the dredged material.
- 1.1.2 The purpose of the BPEO assessment is to identify the disposal option that provides the most environmental benefit or least environmental damage. This assessment considers the alternative options available against a range of criteria including technical feasibility, environmental impact and cost.

1.2 Background to the Proposed Development

- 1.2.1 Uig Harbour is located in Uig Bay in the north east of the Isle of Skye. It forms part of the 'Skye Triangle' (along with Tarbert and Lochmaddy), providing lifeline ferry services for communities in the Western Isles. The Pier at Uig Harbour, named King Edward Pier, serves the CalMac ferry route to the isles of Harris and North Uist. The Pier is under the control of Highland Harbours which is run by the Applicant, whilst the ferry service operations are controlled by CalMac Ferries Ltd. (CFL).
- 1.2.2 Increasing demand and aging tonnage has led the ferry operator to commission new, larger ferry vessels for a number of its routes. The 'Skye Triangle' has been identified by the operator as a priority and the procurement of a new vessel for this route has commenced. A number of upgrades are required to Uig Harbour to accommodate the new, larger vessel, including a capital dredge at the berth and along the approach way. Maintenance dredges will also be required in the future.

1.3 Environmental Impact Assessment

- 1.3.1 In view of the nature, size and location of the Proposed Development, an Environmental Impact Assessment (EIA) has been carried out by AECOM to assess the onshore and offshore elements of the Proposed Development. The EIA Report will be submitted as part of the marine licence application together with this BPEO assessment.

1.4 Other Supporting Information

- 1.4.1 The following supporting information will also accompany the application:
- Site Characterisation Report;
 - Environmental Impact Assessment Report
 - Pre-Application Consultation Report;

1.5 Structure of the Report

1.5.1 This report has the following structure:

1. Introduction
2. Dredging Requirements
3. Available Disposal Options
4. Assessment of the Disposal Options
5. Identification of the BPEO

2. Dredging Requirements

2.1 Dredging

- 2.1.1 Uig Harbour was last dredged in 2015. This was classed as a 'maintenance dredge' to ensure that the operation of the harbour is maintained'. The volume of dredge was less than 5000m³ and therefore was deemed acceptable by Marine Scotland for beach nourishment.
- 2.1.2 The proposed 'Capital Dredge' is required due to the increased draft of the proposed new vessel of 0.5m depth and to increase resilience of the route for use by a range of vessels (up to and including the draft depth of the MV Isle of Lewis). The proposed dredge volume would be 30,792m³. This volume would provide sufficient depth for the harbour for all intended vessels provided by CFL to serve Uig. Following the Capital Dredge, maintenance dredging will be required to maintain the depth in the navigable areas. The anticipated maintenance dredging will be undertaken at 5 yearly intervals.

2.2 Dredge Sediment characteristics

- 2.2.1 The material to be dredged was sampled and analysed. This was undertaken during the ground investigation undertaken by Holequest Ltd and included in document No. THC/UHRG1/1117/FACT (attached in Appendix A) and the sampling undertaken by Aspect Surveys (attached in Appendix B). The finding from the ground investigation identified that the material contains elevated levels of some metals as discussed further below.
- 2.2.2 Geo-chemical testing was undertaken on nine samples from the superficial deposits at three locations in order to determine the suitability for disposal of any dredged material at sea:
- BH DS01 at 0.3m, 1.5m and 3.0m BSBL.
 - DS02 (seabed sample) at 0.1m, 0.5m and 0.8m BSBL.
 - BH1 at 0.0m, 0.5m and 2.0m BSBL.
- 2.2.3 The results are compared to the Marine Scotland Action Levels, as published in the Pre-Disposal Sampling Guidance Version 1 (2017). This comparison can be observed in Table 1, reproduced below.

Table 1: Summary of Pre Disposal Sampling Test

Contaminant	Action Level 1 (mg/kg dry weight)	Action Level 2 (mg/kg dry weight)	Maximum recorded concentration (mg/kg)	Number of exceedances (AL1-AL2)
Arsenic	20	70	9	0-0
Cadmium	0.4	4	0.3	0-0
Chromium	50	370	490	9-4
Copper	30	300	97	8-0
Mercury	0.25	1.5	0.35	1-0
Nickel	30	150	260	9-8
Lead	50	400	7.6	0-0
Zinc	130	600	120	0-0
Tributyl tin	0.1	0.5	22	1-1
Polychlorinated Biphenyls	0.02	0.18	0.0092	0-0

- 2.2.4 The exact location of areas to be dredged remains unconfirmed. The samples taken from the existing pier should therefore be used for a preliminary assessment only, with further sampling required at a future date once the dredge area is defined.
- 2.2.5 There are recorded concentrations of five substances which exceed the relevant Action Level 1 (AL1) concentrations. Three of these substances also exceed the Action Level 2 (AL2) concentrations. Three Chromium concentrations above the AL2 threshold value were recorded in the 3 samples from the 'Seabed' sampling location (DS02) and the one in the 1.5m BSBL sample at the BH DS1 location. Elevated Nickel concentrations above the AL2 threshold were observed in samples from all three locations. The 1.5m sample from BH DS1 exceed the AL1 concentrations of 8 PAH's, concentrations over double the action level are recorded for Dibenzo(ah)anthracene, Furoanthene and Pyrene. The PAH (total) value for this sample is well below the AL1 concentration.
- 2.2.6 For the Post glacial Deposits in the Foreshore Area
- 2.2.6.1 The trial pits encountered very soft / very loose material at the surface, underlain by variable deposits of sands, gravels, silts and clays including shell debris and organic material. Borehole BH07 encountered possibly organic clay, dense to very dense sand and gravel and gravel overlying stiff to very stiff clay. Most of the CPTs were terminated at shallow depth due to obstructions, however they also encountered variable deposits of variable consistencies.
- 2.2.6.2 Laboratory classification testing of the organic silt indicates that recorded moisture contents range from 24% to 50%. The finer fraction recovered from the more cohesive materials generally classifies as silts (occasionally clays) of high plasticity (plasticity index ranging from 17 to 33, average 23). Particle size distribution analysis indicates the material to be slightly clayey to clayey slightly sandy slightly gravelly silt.
- 2.2.7 Glacial Till Deposits in the Pier Area
- 2.2.7.1 The superficial deposits around the existing pier comprised variable deposits of sands, gravels, silts and clays down to depths of between 6.4m and 9.6m below seabed level. Below this were generally stiff to very stiff (locally firm) clay with bands of sand and /or gravel, with cobbles and boulders, proved to a maximum depth of 36.5m below seabed level (-40.94m CD).
- 2.2.7.2 Laboratory classification testing indicates that recorded moisture contents range from 10% to 32%. The finer fraction recovered from the more cohesive materials generally classifies as clays of low to intermediate plasticity (plasticity index ranging from 7 to 35, average 18). Particle size distribution analysis indicated the glacial till materials to contain varying proportions of finer and coarser materials but to primarily comprise silty / clayey slightly sandy GRAVEL or slightly sandy slightly gravelly to gravelly CLAY (based also on the classification tests).

3. Available Disposal Options

3.1 Overview

- 3.1.1 A range of disposal options have been considered in this BPEO assessment including the following and detailed in the following sections:

- Option 1 – Land Reclamation on Site
- Option 2 – Construction Material Offsite
- Option 3 – Beach Recharge
- Option 4 – Sea Disposal at Existing Disposal Site
- Option 5 – Sea Disposal at New Sea Disposal Site
- Option 6 – Landfill

3.2 Option 1 – Land Reclamation on Site

- 3.2.1 The Proposed Development includes the expansion of the current marshalling area by land reclamation. A proportion of the dredged material could be used as infilling material for the land reclamation, if appropriately prepared to a suitable specification. To reuse the material, further working of the material would be required. The material would first be landed from the dredger. The dredged arisings must then be placed onshore and moved to an appropriate space to be dried and classified, then additional material added to ensure the dredge material is compliant with specification for infill and/or treatment for contamination then relocated to be deposited in the reclaim.
- 3.2.2 Transportation of the material to a space for drying out would generate an increase in traffic for moving the 30,792m³ of dredging. If the assumption is they were moved by 40t trucks and is adopted, this would generate circa 1,400 vehicle movements for moving to the processing site and additional 1,400 movements to the reclaim area. This would total approximately 2,800 vehicle movements.

3.3 Option 2 – Construction Material Offsite

- 3.3.1 Dredged material can be suitable for use as construction material offsite. Given the high content of certain metals identified in the ground investigation and sampling undertaken in 2017 of the sediment in Uig (see section 2.2), the material would require treatment prior to further use as a construction material. The material would have to be landed and transported to an appropriate site for treatment, then transported to a storage site and finally further transported to the site for its specific use. This option is similar to option 1 except it moves the process to a remote site from this locality (potentially - Duiskey Landfill Site, Kinlochell, near Fort William - 137 miles away from Uig by road). The potential triple or quadruple handling of the material and processing would create significant cost.

3.4 Option 3 – Beach Recharge

- 3.4.1 Should there be a requirement for beach recharge this option considered whether the dredged material could be used for this purpose. This would require Marine Scotland's approval and could only be suitable for small amounts (<5000m³). The methodology would require; sampling of the proposed recharge area to consider the suitability of the receiving material, and then monitoring of the area identified for disposal and its adjacent parts for sediment transportation and 'drift' for a period before and after recharge of a minimum of 2 years. It is understood that the existing foreshore has a relatively low amenity to the local community and is tidally flooded. A detailed methodology for undertaking this work was not identified at this stage as it was considered that the time required to undertake an assessment and associated monitoring is not compatible with the project programme and costs.

3.5 Option 4 – Sea Disposal at an Existing Disposal Site

- 3.5.1 There is an existing disposal site at Loch Broom adjacent to Ullapool Harbour as shown in Figure 1. It is understood the site was used for the disposal of dredged material for Ullapool Harbour Redevelopment in 2015. The distance to the site from Uig is approximately 75 nautical miles. This distance would mean that the dredging operation would require additional time as the hopper for the dredger would need to travel to the disposal site. Additional hoppers would be required.
- 3.5.2 The disposal site at Ullapool would need to be tested and assessed for chemical suitability and compatibility with the known characteristics, including high metal content, of the dredge material expected from Uig Bay. The consideration of cost/programme impact due to the distance and the mobilisation of additional equipment and timescale would extend the programme due to travel time to the disposal site, it is estimated this would add 2-4 weeks to the dredging activity programme. Cost associated with this task would increase by 100-200% when compared to disposal at a new local site to Uig.

3.5.3

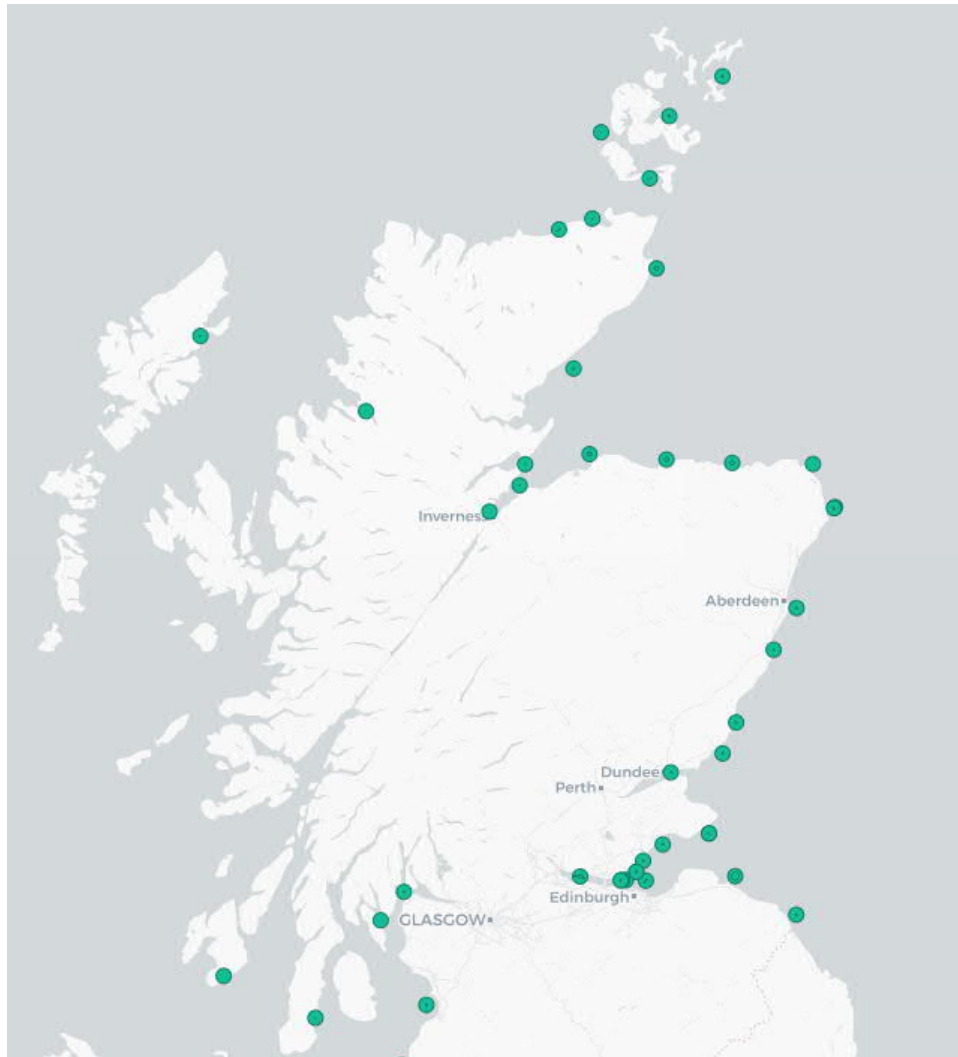


Figure 1. Existing, open, marine disposal sites (source – Extract from Marine Scotland Maps NMPI)

3.6 Option 5 – Sea Disposal at a New Disposal Site

- 3.6.1 Given the significant distance to existing sea disposal sites, this BPEO assessment also considered the potential of opening a new disposal site within Uig Bay. This option offers an opportunity for efficient materials handling as dredge material will be collected straight into the barge hopper and disposed of without any additional processing.

The high metal content expected within the dredge sediments is likely to be at least partially, as a result of naturally occurring geological process ‘BGS, Information on Land Quality in Scotland, R&D Technical Report P293’. These characteristics are therefore likely to be relatively widespread within Uig Bay. Disposing of dredged materials locally, would

therefore minimise the risk of distributing contamination to areas which are currently unaffected.

- 3.6.2 A Site Characterisation Study including a survey programme to identify physical, chemical and biological characteristics of an agreed search area within Uig Bay would be required in order to identify a suitable disposal site. Appropriate disposal licencing would then be required to be agreed with Marine Scotland.

3.7 Option 6 – Landfill

- 3.7.1 The dredged material would be landed and transported by road to Duisky Landfill Site, Kinlocheil, near Fort William. This site was identified but has not been confirmed to be suitable to accept the waste. The cost associated with road transport of the dredge arisings would be in excess of £2.5m with the considered volume for road transport. Space on land would be required to process the material for road transport. The material would need to be landed and dried prior to transport.

4. Assessment of Disposal Options

4.1 Summary of Available Options

- 4.1.1 As part of the assessment, an indicative high-level cost of each option along with consideration of the practicalities of physically undertaking of each option was considered in developing the BPEO. The chemical composition of the dredged arising considered is summarised in section 2.2 of this report and is provided from the ground investigation undertaken by Holequest Ltd in document No. THC/UHRG1/1117/FACT. The results of the sampling testing are included in Appendix A with further dredge sampling which was also undertaken by Aspect Surveys and results are included in Appendix B.

4.2 Option 1 – Land Reclamation on Site

Strategic Considerations

- 4.2.1 The handling of the dredge material onshore will present specific operational challenges, as the material will be saturated, difficult to handle (till dried) and will have an odour issue dependent upon wind direction and amount of organic bed material recovered. The dredged material would need to be; landed, transported, classified, separated, treated/improved, tested and then transported to the reclamation.
- 4.2.2 As part of the ground investigation, testing was undertaken to find the composition of the samples, the material was found to contain concentrations of certain metals specifically, chromium and nickel which are believed to be naturally occurring. The level of chromium and nickel in some samples exceeded the level 2 actions used by Marine Scotland for Dredged Material Assessment. Liaison with Marine Scotland and the Applicant regarding the possibility of reuse of the material took place. Marine Scotland's Redacted indicated that the observed high levels of metals in the area are likely naturally occurring. This is acknowledged in 'BGS, Information on Land Quality in Scotland, R&D Technical Report P293'

Environmental Considerations

- 4.2.3 The odour from the dredged material (see below) may cause discomfort to those in proximity of the site compound, which is proposed to be adjacent to the existing terminal building, local businesses and residential property.

The landing of the dredged material could impact on the existing harbour activity which would include the Harbour and ferry operation, as well as the local community. The estimated dredge volume of circa 30,792m³ would require approximately 1,400 vehicle movements on the pier for tippers to take it to the compound, this additional traffic could be expected to have a detrimental effect on the local community and road, road users, with increase noise, emissions and road safety.

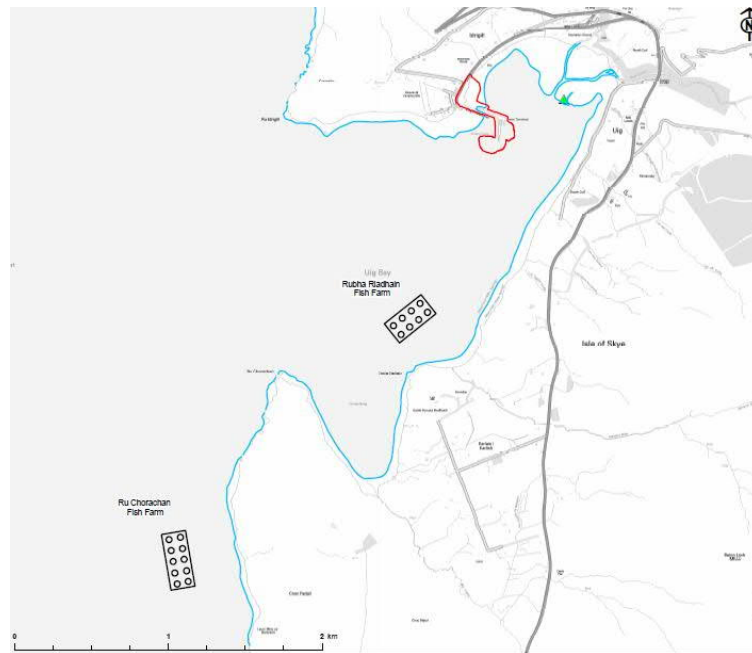


Figure 2. Location of fish farms in relation to proposed development

Aesthetically, the storage of dredged arisings on land, initially in the form of a slurry then once processed, arisings will be in a dried form, would be visually intrusive. In addition arisings may result in potential odour issues particularly when in slurry form. In dried form, dust may also be a problem.

Available mitigation options for the above would be to install hoarding and covers as appropriate. Management of the run-off from the drying process would require additional surface drainage management. Traffic management measures would also be adopted to manage the additional traffic, but limited measures could be used to reduce the impact of this option on odour and handling.

During the drying process airborne dust would require standard dust suppression measures for the arisings.

Cost Considerations

- 4.2.4 The cost for handling the dredge material, classification, treatment and reuse would be £1.5 this considers that 50% of the material would be unsuitable for the reclaim material and this would need to be transported to landfill and disposed. The cost considerations are for the practical undertaking of the work.

4.3 Option 2 – Construction Material Offsite

Strategic Considerations

- 4.3.1 As discussed within Option 1, the handling of the dredge material onshore will present specific challenges, as the material will be saturated, difficult to handle until it has been dried and may present an odour issue; dependent upon wind direction and amount of organic bed material recovered. The dredged material would need to be; landed, transported, classified, separated, treated/improved, tested and then transported to the reclamation. The licensing for 'disposal' on land would need acceptance from SEPA.
- 4.3.2 As part of the ground investigation, testing was undertaken to find the composition of the samples, the material was found to contain naturally occurring high metals. The level of chromium and Nickel in some samples exceeded the level 2 actions levels used by Marine Scotland for Dredged Material Assessment. Treatment of the material would be required to ensure all levels are below Action Level 1. Currently the samples also show elevated levels of copper that exceed the Level 1 actions level used by Marine Scotland for Dredged Material Assessment. Landfill tax and waste management certification would be required to ensure proper processing and disposal.

Environmental Considerations

- 4.3.3 The handling of the dredged material would increase the risk to health and safety, with the increased traffic cause by the movement of the material, potential dust from drying and processing and also the work of processing the arisings. The material would be transported by road to a site for processing and treat the dredging to remove or reduce the levels of the metals in the soil so it can be used in alternative locations and organic matter, also specific processing for the purpose of the reuse of the material. The risks to the public in this option are reduced when compared to option 1 however, the whole process would occur at the nearest landfill site which, is approximately 137 miles away.
- 4.3.4 The material once treated could be suitable for a different application but the transportation of the material will again be required to the location where it is required. The distance the material would have to travel and the processing that would be required may be impractical.

Cost Considerations

- 4.3.5 The key cost would be the transportation of the sediment. It is estimated from experience and consideration of the transport costs and distance to the landfill site that the cost of this option would be in excess of £2m. The cost considerations are for the practical undertaking of the work.

4.4 Option 3 – Beach Recharge

Strategic Considerations

- 4.4.1 The dredging could be dispersed from the hopper at high tide on the foreshore using a splitter hopper adjacent to the works to the north and east of the proposed marshalling area. This would minimise any requirement for road transport. At low tide tracked “back actor” excavator could be used to spread the arisings to form the beach nourishment, a deposition depth of of 600mm has been assumed, which would require significant foreshore area to disperse the material.
- 4.4.2 The potential was identified for sediment movement from beach recharge location(s) back towards the dredge area around the berth as a result of natural coastal processes, which may lead to the requirement for a more frequent maintenance dredging regime.
- 4.4.3 This option would require beach monitoring pre- and post- disposal in order to understand natural beach recharge rates and existing rates of coastal weathering etc. No monitoring has been undertaken to date. The period of monitoring may vary but would likely include two years of monitoring pre-disposal and 1 year after disposal. These fall outwith the timescales of the project for the pre-disposal surveys.
- 4.4.4 Dredge disposal licence(s) would be required from Marine Scotland for this option.
- 4.4.5 Disposal in the beach location would also increase the siltation rate of the fisherman’s berth.

Environmental Considerations

- 4.4.6 Beach recharge was initially considered as a viable option where the dredge volume was <5000m³. However as the volume of dredge material now expected is significantly more than 5000m³ following our original consultation with Marine Scotland (5th July 2017) acknowledged concern that should the dredge volume be >5000m³ they would have difficulty in them accepting the volume. From our discussion large volumes of beach recharge in this area was not acceptable.
- 4.4.7 Noise generated as a result of vehicle movements and from sediment handling machinery on the foreshore would impact the local community. It has also been assumed that this option does not offer sufficient capacity for the disposal of the full volume of dredge sediment expected. As a result the remainder of dredge materials would also require disposal through one of the other method options discussed above also therefore incurring additional environmental effects associated with this additional disposal method.

Cost Considerations

- 4.4.8 The cost associated with this option would be comparable with disposal at a new sea disposal site. It is considered possible that disposal of up to approximately 5000m³ could be accommodated by this option in Uig Bay. As a result other forms of disposal would be also required.
- 4.4.9 For this exercise it is assumed that some may be used if suitable in the backfill of the infill are of 50% of the total dredged volume and the remaining is taken to landfill. This is estimated from experience and the above considerations to be £1.2m. The cost considerations are for the practical undertaking of the work.

4.5 Option 4 – Sea Disposal at Existing Disposal Site

Strategic Considerations

- 4.5.1 The existing disposal site closest to Uig is at Loch Broom at Ullapool. This is approximately 75 nautical miles away from the dredging area. Using a site at this distance from the Proposed Development would increase the cost and time required, meaning additional hoppers, tugs and equipment would likely be required. This option would also require further assessment of the characteristics of the existing disposal site at Ullapool to establish its suitability to accept dredge sediments from Uig. An assessment of the suitability of the site would be required prior to disposal and a licence from Marine Scotland for disposal at the site.

Dredge disposal at the existing site at Ullapool would require significant transit times for the dredge hopper(s) between Uig and Ullapool. As a result the capital dredge programme could be expected to be subject to greater influence by weather conditions than other options under consideration.

Environmental Considerations

- 4.5.2 The disposal site in Loch Broom at Ullapool lies within the Wester Ross Marine Protected Area (MPA) designated for burrowed mud and circalittoral muddy sand communities. All three species of seapen found in Scottish coastal waters are present within this MPA, including substantial numbers of the nationally scarce tall seapen (Marine Scotland et al 2014)¹. Whilst this disposal site is listed as an open site, It is considered that disposal of the quantity of dredge materials to be generated by the Proposed Development could result in significant effects on the benthic habitats for which this MPA is designated.

- 4.5.3 The distance between Uig and the disposal site at Ullapool would also result in higher vessel emissions when compared to more local disposal options, with result effects on air quality.

Cost Considerations

- 4.5.4 The cost associated would be approximately £1m. This is estimated considering the distance the disposal site is from Uig bay, the extended time for dredging required with extra equipment and risk of weather delays is more prominent as the duration of the dredge would possibly extended. The cost considerations are for the practical undertaking of the work.

¹ Marine Scotland, JNCC, SNH and The Scottish Government (2014): Wester Ross Marine Protected Area: Amazing marine biodiversity in a glacial landscape.

4.6 Option 5 – Sea Disposal at New Sea Disposal Site within Uig Bay.

Strategic Considerations

- 4.6.1 This option offers the opportunity for efficient materials handling, when compared with other options and could therefore be expected to have the least impact on the receiving environment in terms of operational impact and handling.
- 4.6.2 A marine disposal licence will need to be obtained. The marine licence application will be required to include an assessment of the proposed site for suitability for the dredge disposal. Licence determination is expected to take up to 16 weeks, although it has been acknowledged in discussion with Marine Scotland that application consideration timescale may be extended as a reflection of the potential complexity of the application.
- 4.6.3 In obtaining a licence for a new sea disposal site for dredge arisings in close proximity to the Proposed Development, this would streamline and minimise subsequent potential effects as a result of future maintenance dredging.

Environmental Considerations

- 4.6.4 Consideration of potential for sediment dispersion impacts affecting the two identified fish farms in Uig would need further assessment. This option has minimal impact on public health. The elevated metal content in the samples would need to be assessed with the sampling from the disposal site. It is assumed at this stage the material is suitable when considering the proximity to the dredge site.

A benthic survey and assessment would need to be undertaken to understand the characteristics of existing benthic communities within Uig Bay and to ensure any effects as a result of sediment deposition could be minimised.

Cost Considerations

- 4.6.5 The cost associated with the dredging and disposal at the new site and disposal at Sea is estimated at £550k. The cost considerations are for the practical undertaking of the work.

4.7 Option 6 – Landfill

Strategic Considerations

- 4.7.1 The considerations associated with disposing of dredged deposits to landfill are similar to those discussed in Option 1 and 2. The transportation is a key consideration and the cost of landfill tax would be substantial.
- 4.7.2 Due to the substantial cost associated with this option (as discussed below) and duration of programme required to transport this volume by road and the associated time requirements of having to land the arising and dry the material prior to transport. This option should be dismissed. The landfill site at Lochaber and the one identified above at Duisk are a significant distance by road. The cost associated with moving the dredging and processing at Uig was considered unfeasible.

Environmental Considerations

- 4.7.3 As discussed above the handling of the dredged arisings and traffic movements, noise, air quality and amenity disturbance would discount this option.

Cost Considerations

- 4.7.4 The key cost would be the transportation of the sediment and a desktop exercise was undertaken to ascertain the most practicable landfill that could be used to treat, store and re-use the material and concluded it would be the Duiskey Landfill Site, Kinlocheil, near Fort William, approximately 137 miles away from the site. This would incur a significant cost, in excess of circa £2.5m more than disposal at a new disposal site. The cost considerations are for the practical undertaking of the work.

5. Waste Hierarchy

1. **Prevention** this is not possible as without dredging the 'lifeline' ferry service to Tarbert and Lochmaddy could not operate regularly.
2. **Re-use** of the material is discussed in this BPEO assessment, but it is not considered feasible as a result of the chemical composition of the sediments, and the required handling and processing of material that will be highly saturated. The high metal content, fine material as the level of preparation of the dredged material would be subject to thorough de-watering makes it unsuitable for re-use.
3. **Recycling** of the dredging has been assessed as part of the BPEO but is not suitable due to the makeup of the dredged material in the geotechnical report and water content. The following options are discussed:
 - a. Beach Recharge
 - b. Reclaim
 - c. Landfill and
 - d. Construction Material

All options were found unsuitable, predominantly due to the characteristics of the dredged material.

4. **Other Recovery** the limited use of the material and the significant cost of processing/remediation would not be viable.
5. **Disposal** for both onshore and offshore application have been assessed as part of the BPEO. The distance of the nearest landfill site would not be feasible due to the practical, economic and environmental cost associated with disposal to land.

6. Identification of the BPEO

6.1 BPEO Scoring Matrix

6.1.1 In considering the options, the key benefits and disadvantages of each option have been considered and an indicative scoring of Low/Moderate/High impact allocated as described below:

- **Cost** – This is an assessment from the cost estimates associated with each option. The options are compared with each other where high is the highest and the low present the lowest assumed cost.
- **Logistical difficulty** – This considers the handling and the movement of the arisings. The distance and number of times the arising are transferred and handles was considered. High is the most distance and times the material is transferred and handled.
- **Environmental impact** – this is an overall consideration for the natural environment that the option would have for the lifecycle of the options. The greater the impact this would be classed as high, when compared against all the other options.
- **Public Health Risk** – this considers the interaction of the options with human health. High describes the high risk to human public health when compared against the other options.
- **Duration** - is the estimated time to undertake the option. High is for high duration of the options
- **Technical Difficulty** – This considers the practical possibility of delivering these options within the context of the project This looks at the need for space and time to undertake the option and compares them against each other.

Table 2: A summary of the Assessment of the Best Practical Environmental Option

Options	Cost	Logistical Difficulty	Environmental Impact	Public Health risk	Duration	Technical Difficulty
1. Reuse for Land Reclamation	Moderate	Moderate	Low	High	High	High
2. Reuse for Offsite	High	High	Low	Moderate	Moderate	High
3. Beach Recharge	Low	Moderate	Moderate	Low	Moderate	High
4. Sea Disposal at Existing Site	Moderate	Low	High	Low	Low	Moderate
5. Sea disposal at New Site	Low	Low	Moderate	Low	Low	Low
6. Landfill	Very High	Moderate	Low	Low	Moderate	High

6.2 Discussion

- 6.2.1 The strategic considerations highlighted that the need for handling and transport of the dredged arisings is a key consideration particularly in consideration of onshore disposal options due to the volume of material required to be moved by road transport. The Need to process the arising on land is considered impractical either as a result of the extensive site space that would be required if processed locally, or as a result of the distance for the material to be transported for offsite disposal options. The effort to move the material would increase vehicular traffic increasing the risk to Health and Safety of the local community and road safety.
- 6.2.2 The assumed dredge method for the capital dredge is cutter suction dredging, which would place the arisings on a hopper. The subsequent landing of this material for processing with significant vehicular movements, as proposed in Option 1 would be both technically impractical and disruptive for the local community. The visual intrusion of storage, odour from drying, noise from moving vehicles, dust from arisings and the need to store this material with limited space mean this was discounted at an early stage. Uig is a small town and its connection made by the Lifeline ferry service to Tarbert and Lochmaddy makes it a tourist and visitor area and the operation to land the arisings would not be advantageous to the local community or visitors/tourists
- 6.2.3 A similar range of environmental considerations exist for Option 2, with the exception of the significant vehicular movements created as a result of landing the arising. The distance to the Duisk site would also increase the level of vehicle activity and the time required to dispose of dredge materials. .
- 6.2.4 The high metal content in samples collected limits the reuse of the material away from the locality of the works. Beach nourishment with dredged material has been undertaken in the past but the volume of such previous works was low and this option was considered likely to have a significant impact on the foreshore unsuitable for the volume of dredge arisings to be generated here. The long terms effects of beach recharge are difficult to measure but it is considered likely that the material would increase the siltation rate of the vessel berth area along the approachway used by the fisherman and commercial vessels directly adjacent to the area of disposal.
- 6.2.5 Beach recharge posed significant challenge with consenting due to the significant volume for the works. The volume of dredging would have meant a significant area of the foreshore would require to be used to spread the arisings to minimise impact. When this proposal was discussed with Marine Scotland it was noted that Marine Scotland would likely object to this approach due to the large volume discussed. Further consideration was the morphological and sedimentation process in the bay would likely increase the need for dredging of the harbour as the material 'drifts' and is transported onto the berths by swell, wave and current.
- 6.2.6 Due to the location of Uig, transportation both by road and sea to the existing disposal sites (both on and offshore) are significant for a project of this scale, increasing cost of the dredging and disposal part of this project, which would bring to question the viability of the project.
- 6.2.7 The need to keep the material local and minimise transportation provided the assessment with two meaningful options (3 & 5) Beach Recharge or New Disposal Site.
- 6.2.8 Option 3: Beach recharge was considered unlikely to offer sufficient capacity to accommodate the volume of dredge materials expected to be generated as a result of the Proposed Development.

- 6.2.9 The disposal at a new sea disposal site in proximity to Uig Bay would have impact on the sub-tidal habitats within Loch Snizort and Uig Bay which were mapped as part of the 1988 Skye Sealochs Marine Nature Conservation Review (MNCR) (JNCC, 2001). These include the habitats 'Seapens and burrowing mega fauna in circalittoral soft mud' and 'Kelp and red seaweed on sublittoral sediments'. 'Northern seafan and sponge communities' and 'Maerl beds' have also been previously recorded close to the Ascrib Islands. Whilst the burrowing megafauna in this biotope including seapens can tolerate smothering by fine sediments of up to approximately 30 cm depth, the sediment for disposal and quantity and depth of disposal required could be expected to result in localised habitat loss.
- 6.2.10 Careful consideration would need to be taken in identifying a specific site for a new disposal site, in order to minimise impact on local benthic communities. Notwithstanding this potential effect, it was considered that the particular characteristics of the local geology, including the naturally occurring elevated metal content expected within the dredge materials, should be most compatible for disposal in the local area, where the receiving environment could be expected to be similar. The minimal handling of sea disposal at the new disposal site is a most favourable as the arisings are neither landed or travelled a significant distance for disposal.
- 6.2.11 Option 5: Sea disposal in a new disposal location within the local area was identified as the BPEO to be taken forward to further investigation.

Appendix A Holequest Ltd Geotechnical Sampling and Testing Extract

4:0 LABORATORY TESTING

A programme of laboratory testing, agreed with AECOM, was undertaken at the UKAS Accredited laboratories of PSL Ltd on behalf of Messrs Holequest Limited. The tests where appropriate were undertaken in accordance with British Standard 1377 "Methods of Tests for Soils for Civil Engineering Purposes" or as indicated otherwise. The various tests undertaken are as follows:-

- 1) NATURAL MOISTURE CONTENT
- 2) PARTICLE SIZE DISTRIBUTION BY WET SIEVE
- 3) PARTICLE SIZE DISTRIBUTION BY SEDIMENTATION (PIPETTE)
- 4) LIQUID & PLASTIC LIMITS
- 5) CONSOLIDATED DRAINED SHEARBOX
- 6) CONSOLIDATED UNDRAINED TRIAXIAL WITH MEASUREMENT OF POREWATER PRESSURE (MULTISATGE)
- 7) ONE DIMENSIONAL CONSOLIDATION

A programme of laboratory testing for contaminants, agreed with AECOM, was undertaken at the UKAS / MCERTS accredited laboratory of Scientific Analysis Laboratories Ltd, on behalf of Messrs Holequest Limited. The soil and water samples were tested for one or more of the following:-

- 1) BRE SD1 SUITE
- 2) MARINE SCOTLAND SUITE
- 3) WASTE ACCEPTANCE CRITERIA (UNKNOWN)
- 4) ARSENIC
- 5) BORON (WATER SOLUBLE)
- 6) CADMIUM
- 7) CHROMIUM (TOTAL)
- 8) COPPER
- 9) CYANIDE (TOTAL)
- 10) LEAD
- 11) MERCURY
- 12) NICKEL
- 13) pH
- 14) SELEMIUM
- 15) SULPHATE (ACID SOLUBLE AND 2:1 EXTRACT)
- 16) ZINC
- 17) ORGANIC MATTER CONTENT
- 18) PAH (EPA 16)
- 19) SVOC
- 20) VOC
- 21) TPH (ALIPHATIC / AROMATIC SPLIT)
- 22) ASBESTOS ID

The Geotechnical and Environmental Laboratory Test Results are summarised in Appendix IV.

Redacted

Redacted (Assistant Contracts Manager)
for HOLEQUEST LTD

Dated:- November 2017

Approved By:-

Redacted

Redacted (Technical Manager)
for HOLEQUEST LTD
&©ajb

Dated:- November 2017

APPENDIX IV

Laboratory Testing

ii) Environmental Testing

Concept Life Sciences

Certificate of Analysis

Report Number: 669675-2

Date of Report: 08-Aug-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17155

Customer Site Reference: UIG, Skye

Date Job Received at Concept: 19-Jul-2017

Date Analysis Started: 21-Jul-2017

Date Analysis Completed: 08-Aug-2017

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

Report checked
and authorised by :
Redacted
Customer Service Advisor

Issued by :
Redacted
Project Manager

Redacted

Concept Reference: 669675 Project Site: UIG, Skye Customer Reference: 17/035					
Sediment Metals Matrix Spike			Analysed as Sediment		
Concept Reference					669675 005
Customer Sample Reference					Matrix Spike
Determinand	Method	Test Sample	LOD	Units	
As Recovery	T750	AR	1	%	100
Cd Recovery	T750	AR	1	%	100
Cr Recovery	T750	AR	1	%	100
Cu Recovery	T750	AR	1	%	90
Ni Recovery	T750	AR	1	%	100
Pb Recovery	T750	AR	1	%	100
Zn Recovery	T750	AR	1	%	100



Concept Reference: 669675 Project Site: UIG, Skye Customer Reference: 17/035							
Sediment				Analysed as Sediment			
Marine Scotland Suite							
Concept Reference					669675 001	669675 002	669675 003
Customer Sample Reference					Seabed 0.1m	Seabed 0.5m	Seabed 0.8m
Determinand	Method	Test Sample	LOD	Units			
Arsenic	T740	AR	0.5	mg/kg	7.3	9.0	6.5
Cadmium	T740	AR	0.1	mg/kg	0.3	0.3	0.3
Chromium	T740	AR	0.5	mg/kg	380	410	490
Copper	T740	AR	0.5	mg/kg	41	25	37
Lead	T740	AR	0.5	mg/kg	6.4	3.5	4.8
Nickel	T740	AR	0.5	mg/kg	220	190	230
Zinc	T740	AR	1.0	mg/kg	100	77	100
Mercury	T355	AR	0.05	mg/kg	(13) 0.35	(13) <0.05	(13) <0.05
Moisture	T2	AR	0.1	%	20	21	15
PCB (Total Tri-Hepta)	T16	AR	0.05	µg/kg	(2) <0.50	<0.05	<0.05
Tributyl tin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01
PCB EC7 (Sum)	T85	AR	0.35	µg/kg	<0.35	<0.35	<0.35



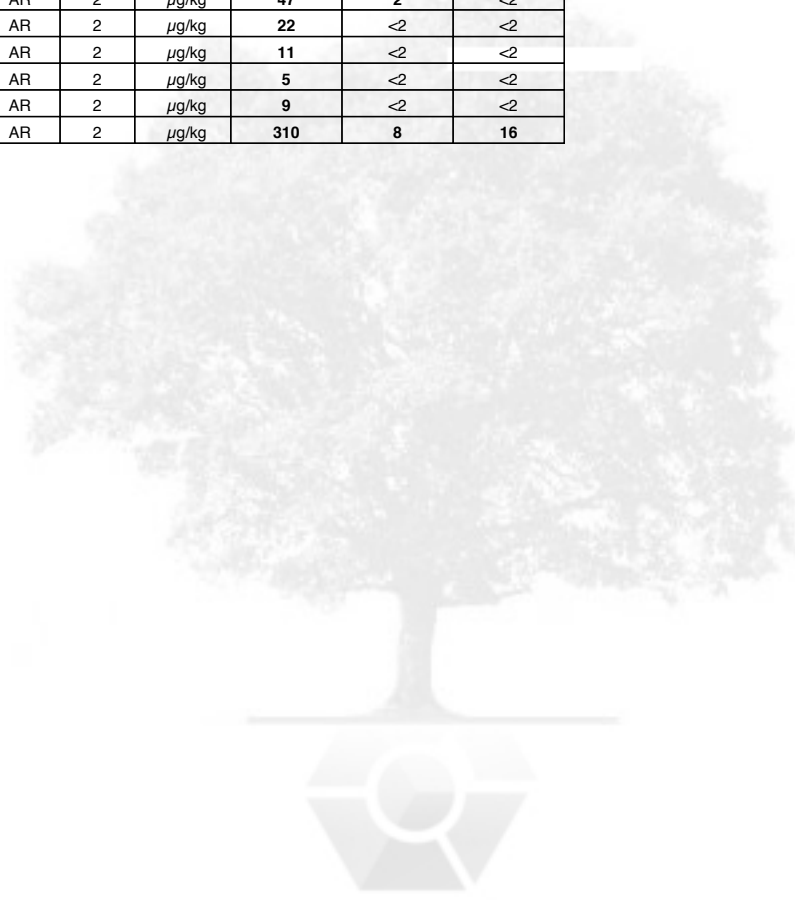
Concept Reference: 669675							
Project Site: UIG, Skye							
Customer Reference: 17/035							
Sediment		Analysed as Sediment					
Poly-Chlorinated Biphenyls (ICES 7)							
Concept Reference				669675 001	669675 002	669675 003	
Customer Sample Reference				Seabed 0.1m	Seabed 0.5m	Seabed 0.8m	
Determinand	Method	Test Sample	LOD	Units			
PCB BZ#28	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#52	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#101	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#118	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#153	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#138	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#180	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05



Concept Reference: 669675
Project Site: UIG, Skye
Customer Reference: 17/035

Sediment Analysed as Sediment
Total and Speciated USEPA16 PAH

Concept Reference					669675 001	669675 002	669675 003
Customer Sample Reference					Seabed 0.1m	Seabed 0.5m	Seabed 0.8m
Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T1	AR	2	µg/kg	24	6	11
Acenaphthylene	T1	AR	2	µg/kg	<2	<2	<2
Acenaphthene	T1	AR	2	µg/kg	3	<2	3
Fluorene	T1	AR	2	µg/kg	2	<2	2
Phenanthrene	T1	AR	2	µg/kg	15	<2	<2
Anthracene	T1	AR	2	µg/kg	6	<2	<2
Fluoranthene	T1	AR	2	µg/kg	56	<2	<2
Pyrene	T1	AR	2	µg/kg	48	<2	<2
Benzo(a)Anthracene	T1	AR	2	µg/kg	33	<2	<2
Chrysene	T1	AR	2	µg/kg	33	<2	<2
Benzo(b/k)Fluoranthene	T1	AR	2	µg/kg	47	2	<2
Benzo(a)Pyrene	T1	AR	2	µg/kg	22	<2	<2
Indeno(123-cd)Pyrene	T1	AR	2	µg/kg	11	<2	<2
Dibenzo(ah)Anthracene	T1	AR	2	µg/kg	5	<2	<2
Benzo(ghi)Perylene	T1	AR	2	µg/kg	9	<2	<2
PAH(total)	T1	AR	2	µg/kg	310	8	16



Index to symbols used in 669675-2

Value	Description
AR	As Received
2	LOD Raised Due to Matrix Interference
13	Results have been blank corrected.
N	Analysis is not UKAS accredited

Notes

The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T85	Calc
T740	ICP/MS (HF)
T16	GC/MS
T429	GC/MS (Recovery)
T1	GC/MS (HR)
T355	CVAFS
T750	ICP/MS (Recovery)
T2	Grav
T434	GC/MS (HR) (Recovery)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
PCB BZ#28 Recovery	T434	AR	1	%	N	004
PCB BZ#52 Recovery	T434	AR	1	%	N	004
PCB BZ#101 Recovery	T434	AR	1	%	N	004
PCB BZ#118 Recovery	T434	AR	1	%	N	004
PCB BZ#153 Recovery	T434	AR	1	%	N	004
PCB BZ#138 Recovery	T434	AR	1	%	N	004
PCB BZ#180 Recovery	T434	AR	1	%	N	004
Naphthalene Recovery	T429	AR	1	%	N	004
Acenaphthene Recovery	T429	AR	1	%	N	004
Phenanthrene Recovery	T429	AR	1	%	N	004
Chrysene Recovery	T429	AR	1	%	N	004
Benzo(a)Pyrene Recovery	T429	AR	1	%	N	004
Arsenic	T740	AR	0.5	mg/kg	N	001-003
Cadmium	T740	AR	0.1	mg/kg	N	001-003
Chromium	T740	AR	0.5	mg/kg	N	001-003
Copper	T740	AR	0.5	mg/kg	N	001-003
Lead	T740	AR	0.5	mg/kg	N	001-003
Nickel	T740	AR	0.5	mg/kg	N	001-003
Zinc	T740	AR	1.0	mg/kg	N	001-003
Mercury	T355	AR	0.05	mg/kg	N	001-003
Moisture	T2	AR	0.1	%	N	001-003
PCB (Total Tri-Hepta)	T16	AR	0.05	µg/kg	N	001-003
Tributyl tin	T16	AR	0.01	mg/kg	N	001-003
PCB EC7 (Sum)	T85	AR	0.35	µg/kg	N	001-003
PCB BZ#28	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#52	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#101	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#118	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#153	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#138	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#180	T1	AR	0.05	µg/kg	N	001-003
Naphthalene	T1	AR	2	µg/kg	N	001-003
Acenaphthylene	T1	AR	2	µg/kg	N	001-003
Acenaphthene	T1	AR	2	µg/kg	N	001-003
Fluorene	T1	AR	2	µg/kg	N	001-003
Phenanthrene	T1	AR	2	µg/kg	N	001-003
Anthracene	T1	AR	2	µg/kg	N	001-003
Fluoranthene	T1	AR	2	µg/kg	N	001-003
Pyrene	T1	AR	2	µg/kg	N	001-003

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Benzo(a)Anthracene	T1	AR	2	µg/kg	N	001-003
Chrysene	T1	AR	2	µg/kg	N	001-003
Benzo(b/k)Fluoranthene	T1	AR	2	µg/kg	N	001-003
Benzo(a)Pyrene	T1	AR	2	µg/kg	N	001-003
Indeno(123-cd)Pyrene	T1	AR	2	µg/kg	N	001-003
Dibenzo(ah)Anthracene	T1	AR	2	µg/kg	N	001-003
Benzo(ghi)Perylene	T1	AR	2	µg/kg	N	001-003
PAH(total)	T1	AR	2	µg/kg	N	001-003
As Recovery	T750	AR	1	%	N	005
Cd Recovery	T750	AR	1	%	N	005
Cr Recovery	T750	AR	1	%	N	005
Cu Recovery	T750	AR	1	%	N	005
Ni Recovery	T750	AR	1	%	N	005
Pb Recovery	T750	AR	1	%	N	005
Zn Recovery	T750	AR	1	%	N	005



Concept Life Sciences

Certificate of Analysis

Report Number: 675775-1

Date of Report: 23-Aug-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference:

Date Job Received at Concept: 25-Jul-2017

Date Analysis Started: 16-Aug-2017

Date Analysis Completed: 22-Aug-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

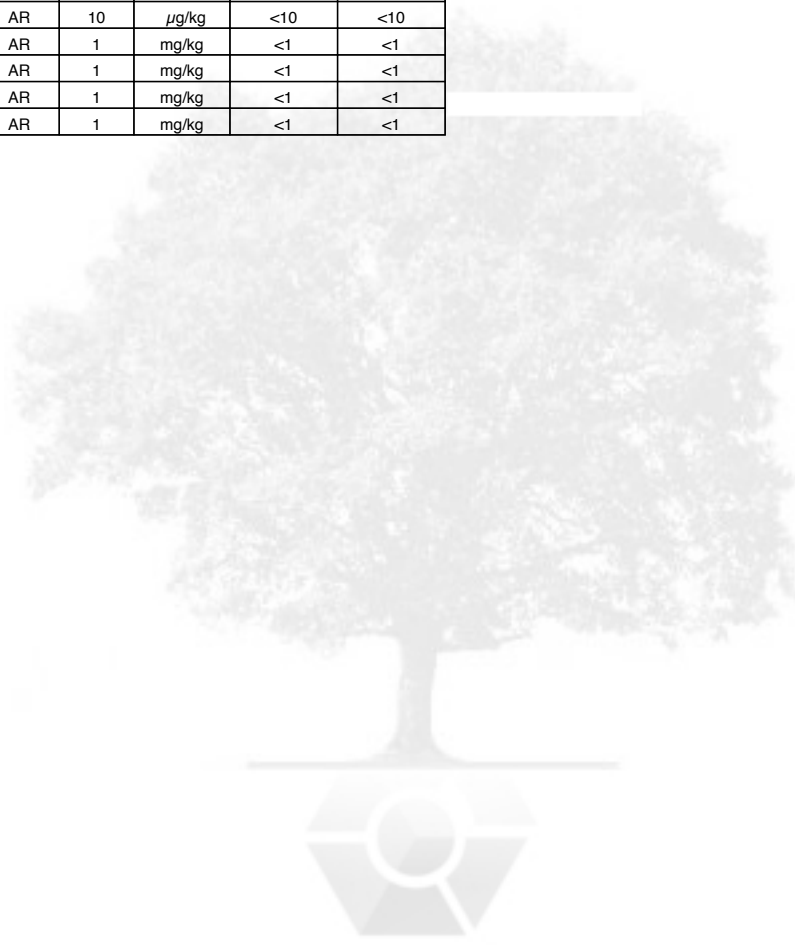
Report checked
and authorised by :
Redacted
Project Manager

Issued by :
Redacted
Project Manager

Redacted

Customer Reference:

Concept Reference					675775 003	675775 008
Customer Sample Reference					TP02 0.0M	TP04 0.0M
Date Sampled					20-JUL-2017	21-JUL-2017
Determinand	Method	Test Sample	LOD	Units		
TPH (C5-C6 aliphatic)	T54	AR	10	µg/kg	<10	<10
TPH (C6-C8 aliphatic)	T54	AR	10	µg/kg	<10	<10
TPH (C8-C10 aliphatic)	T54	AR	10	µg/kg	<10	<10
TPH (C10-C12 aliphatic)	T8	AR	1	mg/kg	<1	<1
TPH (C12-C16 aliphatic)	T8	AR	1	mg/kg	<1	<1
TPH (C16-C21 aliphatic)	T8	AR	1	mg/kg	<1	<1
TPH (C21-C35 aliphatic)	T8	AR	1	mg/kg	(13) <1	<1
TPH (C6-C7 aromatic)	T54	AR	10	µg/kg	<10	<10
TPH (C7-C8 aromatic)	T54	AR	10	µg/kg	<10	<10
TPH (C8-C10 aromatic)	T54	AR	10	µg/kg	<10	<10
TPH (C10-C12 aromatic)	T8	AR	1	mg/kg	<1	<1
TPH (C12-C16 aromatic)	T8	AR	1	mg/kg	<1	<1
TPH (C16-C21 aromatic)	T8	AR	1	mg/kg	<1	<1
TPH (C21-C35 aromatic)	T8	AR	1	mg/kg	<1	<1



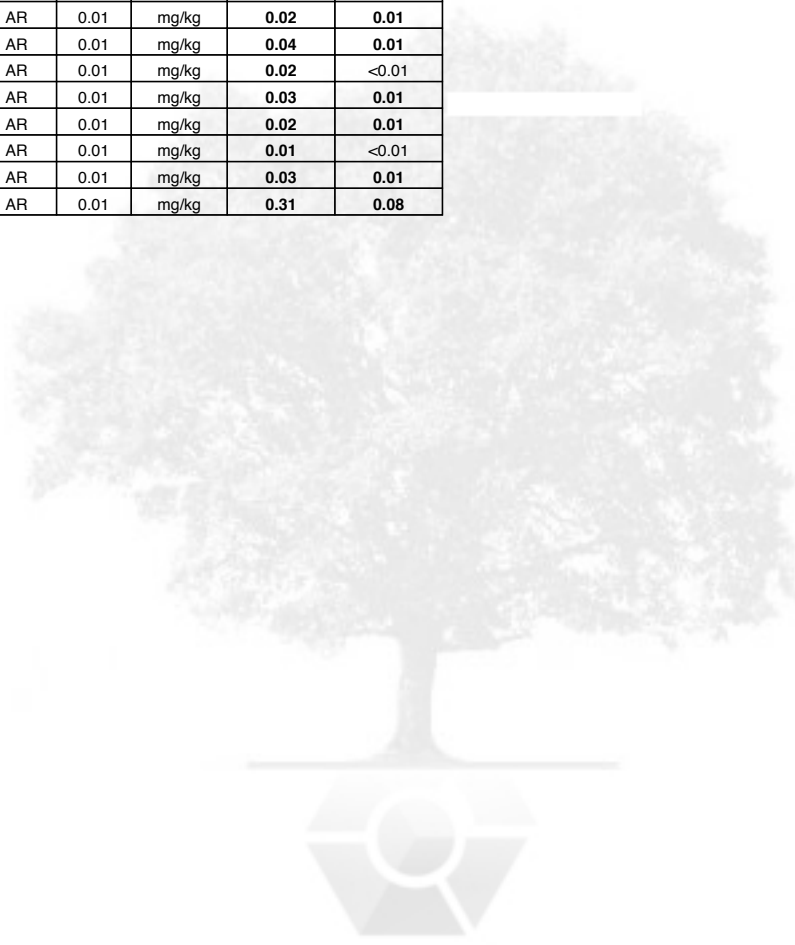
Concept Reference: 675775 Customer Reference: Soil Analysed as Soil Suite Requested						
Concept Reference				675775 003	675775 008	
Customer Sample Reference				TP02 0.0M	TP04 0.0M	
Date Sampled				20-JUL-2017	21-JUL-2017	
Determinand	Method	Test Sample	LOD	Units		
Arsenic	T82	A40	2	mg/kg	7	8
Cadmium	T82	A40	1	mg/kg	<1	<1
Chromium	T82	A40	1	mg/kg	52	71
Copper	T82	A40	1	mg/kg	55	43
Lead	T82	A40	3	mg/kg	10	19
Mercury	T82	A40	1	mg/kg	<1	<1
Nickel	T82	A40	1	mg/kg	140	170
Selenium	T82	A40	3	mg/kg	<3	<3
Zinc	T82	A40	1	mg/kg	95	130
pH	T7	A40			8.2	7.7
Asbestos ID	T27	AR			N.D.	N.D.
Organic Matter	T2	A40	0.1	%	1.9	3.8



Customer Reference:

Total and Speciated USEPA16 PAH (EK)

Concept Reference					675775 003	675775 008
Customer Sample Reference					TP02 0.0M	TP04 0.0M
Date Sampled					20-JUL-2017	21-JUL-2017
Determinand	Method	Test Sample	LOD	Units		
Naphthalene	T149	AR	0.01	mg/kg	0.01	0.01
Acenaphthylene	T149	AR	0.01	mg/kg	0.01	<0.01
Acenaphthene	T149	AR	0.01	mg/kg	<0.01	<0.01
Fluorene	T149	AR	0.01	mg/kg	<0.01	<0.01
Phenanthrene	T149	AR	0.01	mg/kg	0.01	<0.01
Anthracene	T149	AR	0.01	mg/kg	0.01	<0.01
Fluoranthene	T149	AR	0.01	mg/kg	0.04	0.01
Pyrene	T149	AR	0.01	mg/kg	0.04	0.01
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	(13) 0.02	(13) <0.01
Chrysene	T149	AR	0.01	mg/kg	0.02	0.01
Benzo(b)fluoranthene	T149	AR	0.01	mg/kg	0.04	0.01
Benzo(k)fluoranthene	T149	AR	0.01	mg/kg	0.02	<0.01
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	0.03	0.01
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	0.02	0.01
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	0.01	<0.01
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	0.03	0.01
PAH(total)	T149	AR	0.01	mg/kg	0.31	0.08




Customer Reference:

Concept Reference	675775 003	675775 008	675775 011
Customer Sample Reference	TP02 0.0M	TP04 0.0M	SVOC BLANK
Date Sampled	20-JUL-2017	21-JUL-2017	15-AUG-2017

2,4-Dichlorophenol	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Bis (2-chloroethoxy) methane	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2,4-Dichlorophenol	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
1,2,4-Trichlorobenzene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Naphthalene	T16	AR	0.1	mg/kg	0.2	<0.1	<0.1
4-Chloroaniline	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Hexachlorobutadiene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
4-Chloro-3-methylphenol	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2-Methylnaphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Hexachlorocyclopentadiene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2,4,6-Trichlorophenol	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2,4,5-Trichlorophenol	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2-Chloronaphthalene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2-Nitroaniline	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Dimethyl phthalate	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2,6-Dinitrotoluene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthylene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Acenaphthene	T16	AR	0.1	mg/kg	0.2	<0.1	<0.1
3-Nitroaniline	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Dibenzofuran	T16	AR	0.1	mg/kg	0.1	<0.1	<0.1
2,4-Dinitrotoluene	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1
2,4-Dinitrophenol	T16	AR	0.1	mg/kg	<0.1	<0.1	<0.1

Customer Reference:

Concept Reference	675775 003	675775 008
Customer Sample Reference	TP02 0.0M	TP04 0.0M
Date Sampled	20-JUL-2017	21-JUL-2017



Index to symbols used in 675775-1

Value	Description
AR	As Received
A40	Assisted dried < 40C
N.D.	Not Detected
13	Results have been blank corrected.
S	Analysis was subcontracted
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

SVOC, PAH and VOC - These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T7	Probe
T8	GC/FID
T149	GC/MS (SIR)
T27	PLM
T54	GC/MS (Headspace)
T2	Grav
T82	ICP/OES (Sim)
T16	GC/MS

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Phenol	T16	AR	0.1	mg/kg	U	003,008,011
Bis (2-chloroethyl) ether	T16	AR	0.1	mg/kg	U	003,008,011
2-Chlorophenol	T16	AR	0.1	mg/kg	U	003,008,011
1,3-Dichlorobenzene	T16	AR	0.1	mg/kg	U	003,008,011
1,4-Dichlorobenzene	T16	AR	0.1	mg/kg	U	003,008,011
1,2-Dichlorobenzene	T16	AR	0.1	mg/kg	U	003,008,011
Bis (2-chloroisopropyl) ether	T16	AR	0.1	mg/kg	U	003,008,011
2-methyl phenol	T16	AR	0.1	mg/kg	U	003,008,011
3/4-Methylphenol	T16	AR	0.1	mg/kg	U	003,008,011
Hexachloroethane	T16	AR	0.1	mg/kg	U	003,008,011
Nitrobenzene	T16	AR	0.1	mg/kg	U	003,008,011
Isophorone	T16	AR	0.1	mg/kg	U	003,008,011
2,4-Dimethylphenol	T16	AR	0.1	mg/kg	U	003,008,011
Bis (2-chloroethoxy) methane	T16	AR	0.1	mg/kg	U	003,008,011
2,4-Dichlorophenol	T16	AR	0.1	mg/kg	U	003,008,011
1,2,4-Trichlorobenzene	T16	AR	0.1	mg/kg	U	003,008,011
Naphthalene	T16	AR	0.1	mg/kg	U	003,008,011
4-Chloroaniline	T16	AR	0.1	mg/kg	U	003,008,011
Hexachlorobutadiene	T16	AR	0.1	mg/kg	U	003,008,011
4-Chloro-3-methylphenol	T16	AR	0.1	mg/kg	U	003,008,011
2-Methylnaphthalene	T16	AR	0.1	mg/kg	U	003,008,011
Hexachlorocyclopentadiene	T16	AR	0.1	mg/kg	U	003,008,011
2,4,6-Trichlorophenol	T16	AR	0.1	mg/kg	U	003,008,011
2,4,5-Trichlorophenol	T16	AR	0.1	mg/kg	U	003,008,011
2-Chloronaphthalene	T16	AR	0.1	mg/kg	U	003,008,011
2-Nitroaniline	T16	AR	0.1	mg/kg	U	003,008,011
Dimethyl phthalate	T16	AR	0.1	mg/kg	U	003,008,011
2,6-Dinitrotoluene	T16	AR	0.1	mg/kg	U	003,008,011
Acenaphthylene	T16	AR	0.1	mg/kg	U	003,008,011
Acenaphthene	T16	AR	0.1	mg/kg	U	003,008,011
3-Nitroaniline	T16	AR	0.1	mg/kg	U	003,008,011
Dibenzofuran	T16	AR	0.1	mg/kg	U	003,008,011
2,4-Dinitrophenol	T16	AR	0.1	mg/kg	N	003,008,011
2,4-Dinitrotoluene	T16	AR	0.1	mg/kg	U	003,008,011
2-Nitrophenol	T16	AR	0.1	mg/kg	U	003,008,011
Diethyl phthalate	T16	AR	0.1	mg/kg	U	003,008,011
Fluorene	T16	AR	0.1	mg/kg	U	003,008,011

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
4-Chlorophenyl phenylether	T16	AR	0.1	mg/kg	U	003,008,011
4-Nitroaniline	T16	AR	0.1	mg/kg	U	003,008,011
Azobenzene	T16	AR	0.1	mg/kg	U	003,008,011
4-Bromophenyl phenylether	T16	AR	0.1	mg/kg	U	003,008,011
Hexachlorobenzene	T16	AR	0.1	mg/kg	U	003,008,011
Pentachlorophenol	T16	AR	0.1	mg/kg	U	003,008,011
Phenanthrene	T16	AR	0.1	mg/kg	U	003,008,011
Anthracene	T16	AR	0.1	mg/kg	U	003,008,011
Carbazole	T16	AR	0.1	mg/kg	U	003,008,011
Di-n-butylphthalate	T16	AR	0.1	mg/kg	U	003,008,011
Fluoranthene	T16	AR	0.1	mg/kg	U	003,008,011
Pyrene	T16	AR	0.1	mg/kg	U	003,008,011
Butyl benzylphthalate	T16	AR	0.1	mg/kg	U	003,008,011
Benzo(a)Anthracene	T16	AR	0.1	mg/kg	U	003,008,011
4-Nitrophenol	T16	AR	0.1	mg/kg	N	003,008,011
Chrysene	T16	AR	0.1	mg/kg	U	003,008,011
Bis (2-ethylhexyl)phthalate	T16	AR	0.1	mg/kg	U	003,008,011
Di-n-octylphthalate	T16	AR	0.1	mg/kg	U	003,008,011
Benzo(b/k)Fluoranthene	T16	AR	0.1	mg/kg	U	003,008,011
Benzo(a)Pyrene	T16	AR	0.1	mg/kg	U	003,008,011
Indeno(123-cd)Pyrene	T16	AR	0.1	mg/kg	U	003,008,011
Dibenzo(ah)Anthracene	T16	AR	0.1	mg/kg	U	003,008,011
Benzo(ghi)Perylene	T16	AR	0.1	mg/kg	U	003,008,011
TPH (C5-C6 aliphatic)	T54	AR	10	µg/kg	N	003,008
TPH (C6-C8 aliphatic)	T54	AR	10	µg/kg	N	003,008
TPH (C8-C10 aliphatic)	T54	AR	10	µg/kg	N	003,008
TPH (C10-C12 aliphatic)	T8	AR	1	mg/kg	N	003,008
TPH (C12-C16 aliphatic)	T8	AR	1	mg/kg	N	003,008
TPH (C16-C21 aliphatic)	T8	AR	1	mg/kg	N	003,008
TPH (C21-C35 aliphatic)	T8	AR	1	mg/kg	N	003,008
TPH (C6-C7 aromatic)	T54	AR	10	µg/kg	N	003,008
TPH (C7-C8 aromatic)	T54	AR	10	µg/kg	N	003,008
TPH (C8-C10 aromatic)	T54	AR	10	µg/kg	N	003,008
TPH (C10-C12 aromatic)	T8	AR	1	mg/kg	N	003,008
TPH (C12-C16 aromatic)	T8	AR	1	mg/kg	N	003,008
TPH (C16-C21 aromatic)	T8	AR	1	mg/kg	N	003,008
TPH (C21-C35 aromatic)	T8	AR	1	mg/kg	N	003,008
Naphthalene	T149	AR	0.01	mg/kg	U	003,008
Acenaphthylene	T149	AR	0.01	mg/kg	U	003,008
Acenaphthene	T149	AR	0.01	mg/kg	U	003,008
Fluorene	T149	AR	0.01	mg/kg	U	003,008
Phenanthrene	T149	AR	0.01	mg/kg	U	003,008
Anthracene	T149	AR	0.01	mg/kg	U	003,008
Fluoranthene	T149	AR	0.01	mg/kg	U	003,008
Pyrene	T149	AR	0.01	mg/kg	U	003,008
Benzo(a)Anthracene	T149	AR	0.01	mg/kg	U	003,008
Chrysene	T149	AR	0.01	mg/kg	U	003,008
Benzo(b)fluoranthene	T149	AR	0.01	mg/kg	U	003,008
Benzo(k)fluoranthene	T149	AR	0.01	mg/kg	U	003,008
Benzo(a)Pyrene	T149	AR	0.01	mg/kg	U	003,008
Indeno(123-cd)Pyrene	T149	AR	0.01	mg/kg	U	003,008
Dibenzo(ah)Anthracene	T149	AR	0.01	mg/kg	U	003,008
Benzo(ghi)Perylene	T149	AR	0.01	mg/kg	U	003,008
PAH(total)	T149	AR	0.01	mg/kg	U	003,008
Arsenic	T82	A40	2	mg/kg	U	003,008
Cadmium	T82	A40	1	mg/kg	U	003,008
Chromium	T82	A40	1	mg/kg	U	003,008
Copper	T82	A40	1	mg/kg	U	003,008
Lead	T82	A40	3	mg/kg	U	003,008
Mercury	T82	A40	1	mg/kg	U	003,008
Nickel	T82	A40	1	mg/kg	U	003,008
Selenium	T82	A40	3	mg/kg	U	003,008
Zinc	T82	A40	1	mg/kg	U	003,008
pH	T7	A40			U	003,008
Asbestos ID	T27	AR			SU	003,008
Organic Matter	T2	A40	0.1	%	N	003,008
Dichlorodifluoromethane	T54	AR	5	µg/kg	U	003,008
Chloromethane	T54	AR	5	µg/kg	U	003,008
Vinyl chloride	T54	AR	5	µg/kg	U	003,008
Bromomethane	T54	AR	5	µg/kg	U	003,008

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chloroethane	T54	AR	5	µg/kg	U	003,008
Trichlorofluoromethane	T54	AR	5	µg/kg	U	003,008
1,1-Dichloroethylene	T54	AR	5	µg/kg	U	003,008
Dichloromethane	T54	AR	50	µg/kg	N	003,008
Trans-1,2-Dichloroethene	T54	AR	5	µg/kg	U	003,008
1,1-Dichloroethane	T54	AR	5	µg/kg	U	003,008
Cis-1,2-Dichloroethylene	T54	AR	5	µg/kg	U	003,008
2,2-Dichloropropane	T54	AR	5	µg/kg	U	003,008
Chloroform	T54	AR	5	µg/kg	U	003,008
Bromochloromethane	T54	AR	5	µg/kg	U	003,008
1,1,1-Trichloroethane	T54	AR	5	µg/kg	U	003,008
1,1-Dichloropropene	T54	AR	5	µg/kg	U	003,008
Carbon tetrachloride	T54	AR	5	µg/kg	U	003,008
1,2-Dichloroethane	T54	AR	5	µg/kg	U	003,008
Benzene	T54	AR	1	µg/kg	U	003,008
1,2-Dichloropropane	T54	AR	5	µg/kg	U	003,008
1,1,2-Trichloroethylene	T54	AR	5	µg/kg	U	003,008
Bromodichloromethane	T54	AR	5	µg/kg	U	003,008
Dibromomethane	T54	AR	5	µg/kg	U	003,008
Cis-1,3-Dichloropropene	T54	AR	5	µg/kg	U	003,008
Toluene	T54	AR	1	µg/kg	U	003,008
Trans-1,3-Dichloropropene	T54	AR	5	µg/kg	U	003,008
1,1,2-Trichloroethane	T54	AR	5	µg/kg	U	003,008
1,3-Dichloropropane	T54	AR	5	µg/kg	U	003,008
Tetrachloroethene	T54	AR	5	µg/kg	U	003,008
Chlorodibromomethane	T54	AR	5	µg/kg	U	003,008
1,2-dibromoethane	T54	AR	5	µg/kg	U	003,008
Chlorobenzene	T54	AR	5	µg/kg	U	003,008
1,1,1,2-Tetrachloroethane	T54	AR	5	µg/kg	U	003,008
EthylBenzene	T54	AR	1	µg/kg	U	003,008
M/P Xylene	T54	AR	1	µg/kg	U	003,008
O Xylene	T54	AR	1	µg/kg	U	003,008
Styrene	T54	AR	5	µg/kg	U	003,008
Bromoform	T54	AR	5	µg/kg	U	003,008
Isopropyl benzene	T54	AR	5	µg/kg	U	003,008
1,1,2,2-Tetrachloroethane	T54	AR	5	µg/kg	U	003,008
1,2,3-Trichloropropane	T54	AR	5	µg/kg	U	003,008
n-Propylbenzene	T54	AR	5	µg/kg	U	003,008
Bromobenzene	T54	AR	5	µg/kg	U	003,008
1,3,5-Trimethylbenzene	T54	AR	5	µg/kg	U	003,008
T-Butylbenzene	T54	AR	5	µg/kg	U	003,008
1,2,4-Trimethylbenzene	T54	AR	5	µg/kg	U	003,008
S-Butylbenzene	T54	AR	5	µg/kg	U	003,008
p-Isopropyltoluene	T54	AR	5	µg/kg	U	003,008
2-Chlorotoluene	T54	AR	5	µg/kg	U	003,008
4-Chlorotoluene	T54	AR	5	µg/kg	U	003,008
1,3-Dichlorobenzene	T54	AR	5	µg/kg	U	003,008
1,4-Dichlorobenzene	T54	AR	5	µg/kg	U	003,008
1,2-Dichlorobenzene	T54	AR	5	µg/kg	U	003,008

Concept Life Sciences

Certificate of Analysis

Report Number: 675785-1

Date of Report: 23-Aug-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference:

Date Job Received at Concept: 25-Jul-2017

Date Analysis Started: 16-Aug-2017

Date Analysis Completed: 22-Aug-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Redacted
Project Manager

Issued by :
Redacted Redacted
Project Manager

Waste Acceptance Criteria

Customer Sample Reference : TP01 0.0M

SAL Sample Reference : 675785 001

Test Portion Mass (g) : 175

Date Sampled : Deviating

Soil Summary					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
TPH C10-C40 (sum)	Calc	1	mg/kg	N	(100) <10	500.0		
BTEX (Sum)	Calc	0.0040	mg/kg	U	(13) <0.0040	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.030	1.0		
Total Organic Carbon	OX/IR	0.1	%	N	1.7	3.0	5.0	6.0
pH	Probe			U	8.2		>6.0	
Loss on Ignition	Grav	0.1	%	N	6.2			10.0

10:1 Leachate					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.024	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.0021	mg/kg	N	0.21	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.54	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	0.04	1.0	5.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	2.0	50.0	100.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0031	mg/kg	N	<0.0031	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.0021	mg/kg	N	<0.0021	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.052	mg/kg	N	0.48	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.045	0.4	10.0	40.0
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0052	mg/kg	N	0.0056	0.1	0.5	7.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.021	mg/kg	N	0.14	4.0	50.0	200.0
Chloride	Calc / Discrete Analyser	10	mg/kg	N	23000	800.0	15000.0	25000.0
Fluoride	Calc / Discrete Analyser	0.52	mg/kg	N	9.1	10.0	150.0	500.0
Sulphate	Calc / Discrete Analyser	5.2	mg/kg	N	1400	1000.0	20000.0	50000.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	290	500.0	800.0	1000.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Total Dissolved Solids	Calc	100	mg/kg	N	46000	4000.0	60000.0	100000.0

From: Criteria set by European Council Decision 2003/33/EC(2) pursuant to Directive 1999/31/EC(3) and implemented in Scotland by The Landfill (Scotland) Regulations 2003

The 2:1 moisture extract was not produced because the moisture content of the sample was greater than 200%. Therefore, the exact application of the two-step leaching test is precluded on technical grounds (ref: Section 5.2.4 BS EN 12457-3:2002). Results are derived from a single step leaching at L/S 10/1 as prescribed by the EA guidance. (Ref Section C4.1.1 Guidance on Sampling and Testing of Wastes to meet Landfill Waste Acceptance Procedures Version 1 April 2005, Environment Agency)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

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

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

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

Waste Acceptance Criteria

Customer Sample Reference : TP03 1.0M

SAL Sample Reference : 675785 002

Test Portion Mass (g) : 175

Date Sampled : Deviating

Soil Summary					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
PAH (Sum)	Calc	1.6	mg/kg	N	<1.6	100.0		
TPH C10-C40 (sum)	Calc	1	mg/kg	N	<1	500.0		
BTEX (Sum)	Calc	0.0040	mg/kg	U	(13) 0.020	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.030	1.0		
Total Organic Carbon	OX/IR	0.1	%	N	1.5	3.0	5.0	6.0
pH	Probe			U	8.8		>6.0	
Loss on Ignition	Grav	0.1	%	N	3.0			10.0

10:1 Leachate					Result	Inert Waste Landfill	Stable non reactive	Hazardous Waste Landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.043	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.11	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	0.04	1.0	5.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	2.0	50.0	100.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	<0.0020	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.050	mg/kg	N	<0.050	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	<0.010	0.4	10.0	40.0
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.020	0.1	0.5	7.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	<0.020	4.0	50.0	200.0
Chloride	Calc / Discrete Analyser	10	mg/kg	N	25	800.0	15000.0	25000.0
Fluoride	Calc / Discrete Analyser	0.50	mg/kg	N	0.50	10.0	150.0	500.0
Sulphate	Calc / Discrete Analyser	5.0	mg/kg	N	180	1000.0	20000.0	50000.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	16	500.0	800.0	1000.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Total Dissolved Solids	Calc	100	mg/kg	N	880	4000.0	60000.0	100000.0

From: Criteria set by European Council Decision 2003/33/EC(2) pursuant to Directive 1999/31/EC(3) and implemented in Scotland by The Landfill (Scotland) Regulations 2003
Note:- Sample failed to produce sufficient eluate within the specified time after vacuum filtration for 1 hour and centrifugation for 30 minutes. Therefore, the exact application of the two-step leaching test is precluded on technical grounds. (ref: Section 5.2.4 BS EN 12457-3:2002) Results are derived from a single step leaching at L/S 10/1 as prescribed by the EA guidance. (Ref Section C4.1.1 Guidance on Sampling and Testing of Wastes to meet Landfill Waste Acceptance Procedures Version 1 April 2005, Environment Agency)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

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

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

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

Index to symbols used in 675785-1

Value	Description
AR	As Received
2:1	Leachate to BS EN 12457-3 (2:1)
8:1	Leachate to BS EN 12457-3 (8:1)
A40	Assisted dried < 40C
100	LOD determined by sample aliquot used for analysis
13	Results have been blank corrected.
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

GC/MS Headspace - LOD raised as samples diluted due to poor internal standard recovery.
PAH soil - These samples have been analysed exceeding recommended holding times. It is possible therefore that the results provided may be compromised.
The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.



Concept Life Sciences

Certificate of Analysis

Report Number: 676021-1

Date of Report: 24-Aug-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Site Reference: UIG Harbour Redevelopment

Date Job Received at Concept: 15-Aug-2017

Date Analysis Started: 16-Aug-2017

Date Analysis Completed: 22-Aug-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Redacted
Customer Service Advisor

Issued by :
Redacted
Project Manager

Redacted

Customer Reference: 17/035

Soil	Analysed as Soil
Miscellaneous	

Concept Reference					676021 009	676021 010
Customer Sample Reference					BH6A 0.00M	BH6A 0.50M
Date Sampled					Deviating	Deviating
Determinand	Method	Test Sample	LOD	Units		
Organic Matter	T2	A40	0.1	%	3.0	3.2

<div>Concept Reference: 676021</div> <div>Project Site: UIG Harbour Redevelopment</div> <div>Customer Reference: 17/035</div>									
Soil					Analysed as Soil				
Soil Suite									
Concept Reference					676021 001	676021 002	676021 003	676021 004	676021 005
Customer Sample Reference					BH1 0.00M	BH1 5.80M	BH1 10.30M	BH8A 1.00M	BH8A 5.30M
Date Sampled					Deviating	Deviating	Deviating	Deviating	Deviating
Determinand	Method	Test Sample	LOD	Units					
Leach Prep (2:1)	T2	AR			Extracted	Extracted	Extracted	Extracted	Extracted
pH	T7	A40			8.9	9.0	8.6	9.1	8.1
(Acid Soluble) SO4	T192	AR	0.01	%	0.16	0.14	0.26	0.16	0.53
Sulphur (total)	T6	A40	0.01	%	0.09	0.19	0.34	0.14	1.7

Concept Reference: 676021									
Project Site: UIG Harbour Redevelopment									
Customer Reference: 17/035									
Soil					Analysed as Soil				
Soil Suite									
Concept Reference					676021 006	676021 007	676021 008	676021 009	
Customer Sample Reference					BH9 0.90M	BH9 3.80M	BH9 9.10M	BH6A 0.00M	
Date Sampled					Deviating	Deviating	Deviating	Deviating	
Determinand		Method	Test Sample	LOD	Units				
Leach Prep (2:1)		T2	AR			Extracted	Extracted	Extracted	Extracted
pH		T7	A40			8.9	7.9	8.1	9.3
(Acid Soluble) SO4		T192	AR	0.01	%	0.17	0.76	0.37	0.35
Sulphur (total)		T6	A40	0.01	%	0.18	1.7	0.48	0.77

Concept Reference: 676021									
Project Site: UIG Harbour Redevelopment									
Customer Reference: 17/035									
Leachate 2:1					Analysed as Water				
Suite A									
Concept Reference					676021 001	676021 002	676021 003	676021 004	676021 005
Customer Sample Reference					BH1 0.00M	BH1 5.80M	BH1 10.30M	BH8A 1.00M	BH8A 5.30M
Date Sampled					Deviating	Deviating	Deviating	Deviating	Deviating
Determinand	Method	Test Sample	LOD	Units					
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	<0.05	<0.05	0.43	<0.05	1.5
Chloride	T686	2:1	1	mg/l	920	1100	2400	1300	2200
Magnesium	T82	2:1	1	mg/l	24	35	210	28	170
Nitrate	T686	2:1	0.5	mg/l	<0.5	<0.5	<0.5	<0.5	1.7
Dissolved SO4(Total)	T285	2:1	10	ma/l	491	379	844	374	1397

Concept Reference: 676021									
Project Site: UIG Harbour Redevelopment									
Customer Reference: 17/035									
Leachate 2:1					Analysed as Water				
Suite A									
Concept Reference					676021 006	676021 007	676021 008	676021 009	
Customer Sample Reference					BH9 0.90M	BH9 3.80M	BH9 9.10M	BH6A 0.00M	
Date Sampled					Deviating	Deviating	Deviating	Deviating	
Determinand	Method	Test Sample	LOD	Units					
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	<0.05	3.2	2.2	2.1	
Chloride	T686	2:1	1	mg/l	2100	1900	570	2300	
Magnesium	T82	2:1	1	mg/l	44	160	220	5	
Nitrate	T686	2:1	0.5	mg/l	<0.5	<0.5	<0.5	<0.5	
Dissolved SO4(Total)	T285	2:1	10	mg/l	646	1900	1199	381	

Index to symbols used in 676021-1

Value	Description
AR	As Received
2:1	Leachate 2:1
A40	Assisted dried < 40C
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T7	Probe
T2	Grav
T686	Discrete Analyser
T6	ICP/OES
T82	ICP/OES (Sim)
T192	HCl Extraction/ICP/OES (TRL 447 T2)
T285	ICP/OES (SIM) (Filtered)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Organic Matter	T2	A40	0.1	%	N	009-010
Leach Prep (2:1)	T2	AR			N	001-009
pH	T7	A40			U	001-009
(Acid Soluble) SO ₄	T192	AR	0.01	%	N	001-009
Sulphur (total)	T6	A40	0.01	%	N	001-009
Ammonia expressed as NH ₄	T686	2:1	0.05	mg/l	U	001-009
Chloride	T686	2:1	1	mg/l	U	001-009
Magnesium	T82	2:1	1	mg/l	N	001-009
Nitrate	T686	2:1	0.5	mg/l	U	001-009
Dissolved SO ₄ (Total)	T285	2:1	10	mg/l	N	001-009

Concept Life Sciences

Certificate of Analysis

Report Number: Supplement to previous report number
677646-2

Date of Report: 18-Apr-2018

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17244

Customer Site Reference: UIG Harbour Redevelopment, Skye

Date Job Received at Concept: 22-Aug-2017

Date Analysis Started: 24-Aug-2017

Date Analysis Completed: 05-Sep-2017

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

Report checked
and authorised by :
Redacted
Site Manager

Issued by : Redacted
Redacted
Customer Service Advis

Concept Reference: 677646
Project Site: UIG Harbour Redevelopment, Skye
Customer Reference: 17/035

Sediment Analysed as Sediment
Metals Matrix Spike

Concept Reference					677646 001	677646 002	677646 003
Customer Sample Reference					BH1 0.00M	BH1 0.50-2.00M	BH1 2.00-3.50M
Date Sampled					18-AUG-2017	18-AUG-2017	18-AUG-2017
Determinand	Method	Test Sample	LOD	Units			
As Recovery	T750	AR	1	%	100	100	100
Cd Recovery	T750	AR	1	%	100	100	100
Cr Recovery	T750	AR	1	%	100	100	100
Cu Recovery	T750	AR	1	%	100	100	100
Ni Recovery	T750	AR	1	%	100	100	100
Pb Recovery	T750	AR	1	%	100	100	100
Zn Recovery	T750	AR	1	%	100	100	100



Customer Reference: 17/035

Analysed as Soil

PAH Matrix Spike

Concept Reference					677646 005
Customer Sample Reference					Matrix Spikes
Date Sampled					18-AUG-2017
Determinand	Method	Test Sample	LOD	Units	
Naphthalene Recovery	T429	AR	1	%	100
Acenaphthene Recovery	T429	AR	1	%	100
Phenanthrene Recovery	T429	AR	1	%	100
Chrysene Recovery	T429	AR	1	%	99
Benzo(a)Pyrene Recovery	T429	AR	1	%	90

PCB Matrix Spike

Concept Reference					677646 005
Customer Sample Reference					Matrix Spikes
Date Sampled					18-AUG-2017
Determinand	Method	Test Sample	LOD	Units	
PCB BZ#28 Recovery	T434	AR	1	%	98
PCB BZ#52 Recovery	T434	AR	1	%	98
PCB BZ#101 Recovery	T434	AR	1	%	92
PCB BZ#118 Recovery	T434	AR	1	%	94
PCB BZ#153 Recovery	T434	AR	1	%	100
PCB BZ#138 Recovery	T434	AR	1	%	96
PCB BZ#180 Recovery	T434	AR	1	%	100

Concept Reference: 677646

Project Site: UIG Harbour Redevelopment, Skye

Customer Reference: 17/035

Sediment

Analysed as Sediment

Marine Scotland Suite

Concept Reference					677646 001	677646 002	677646 003
Customer Sample Reference					BH1 0.00M	BH1 0.50-2.00M	BH1 2.00-3.50M
Date Sampled					18-AUG-2017	18-AUG-2017	18-AUG-2017
Determinand	Method	Test Sample	LOD	Units			
Arsenic	T740	AR	0.5	mg/kg	7.3	7.2	8.8
Cadmium	T740	AR	0.1	mg/kg	<0.1	<0.1	<0.1
Chromium	T740	AR	0.5	mg/kg	100	220	120
Copper	T740	AR	0.5	mg/kg	38	42	58
Lead	T740	AR	0.5	mg/kg	3.8	4.6	2.5
Mercury	T355	AR	0.05	mg/kg	(13) <0.05	(13) <0.05	(13) <0.05
Moisture	T2	AR	0.1	%	26	17	6.9
Nickel	T740	AR	0.5	mg/kg	140	240	210
PCB EC7 (Sum)	T85	AR	0.35	µg/kg	<0.35	<0.35	<0.35
PCB (Total Tri-Hepta)	T16	AR	0.05	µg/kg	<0.05	<0.05	<0.05
Tributyl tin	T16	AR	0.01	mg/kg	<0.01	0.02	<0.01
Zinc	T740	AR	1.0	mg/kg	77	96	78



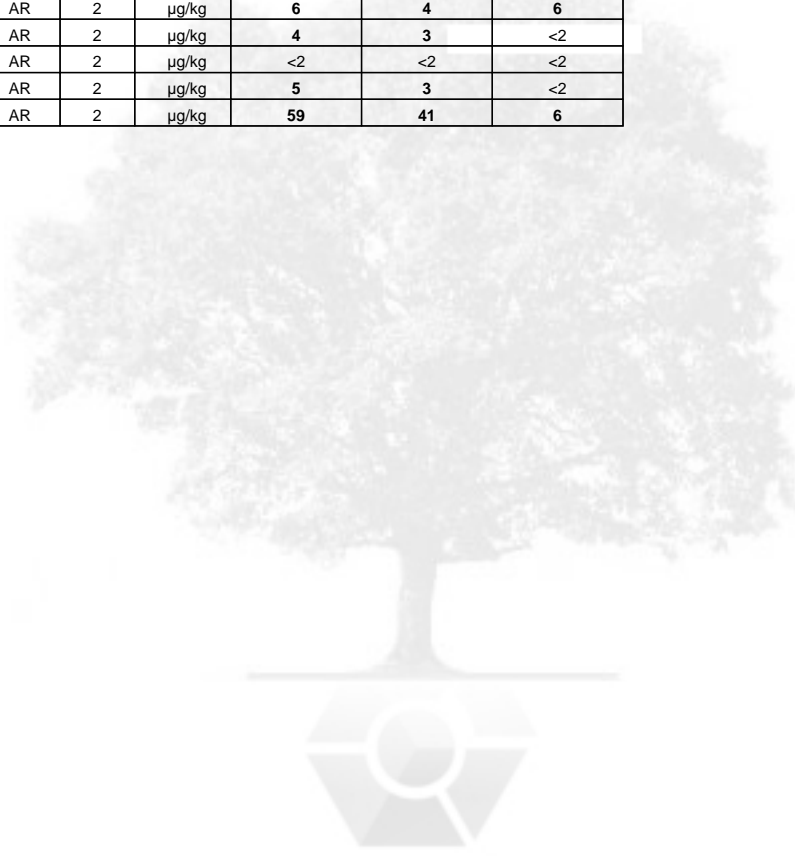
Concept Reference: 677646							
Project Site: UIG Harbour Redevelopment, Skye							
Customer Reference: 17/035							
Sediment		Analysed as Sediment					
Poly-Chlorinated Biphenyls (ICES 7)							
Concept Reference				677646 001	677646 002	677646 003	
Customer Sample Reference				BH1 0.00M	BH1 0.50-2.00M	BH1 2.00-3.50M	
Date Sampled				18-AUG-2017	18-AUG-2017	18-AUG-2017	
Determinand	Method	Test Sample	LOD	Units			
PCB BZ#28	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#52	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#101	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#118	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#153	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#138	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#180	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05



Concept Reference: 677646
Project Site: UIG Harbour Redevelopment, Skye
Customer Reference: 17/035

Sediment Analysed as Sediment
Total and Speciated USEPA16 PAH

Concept Reference					677646 001	677646 002	677646 003
Customer Sample Reference					BH1 0.00M	BH1 0.50-2.00M	BH1 2.00-3.50M
Date Sampled					18-AUG-2017	18-AUG-2017	18-AUG-2017
Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T1	AR	2	µg/kg	(13) <2	(13) <2	(13) <2
Acenaphthylene	T1	AR	2	µg/kg	<2	<2	<2
Acenaphthene	T1	AR	2	µg/kg	<2	<2	<2
Fluorene	T1	AR	2	µg/kg	<2	<2	<2
Phenanthrene	T1	AR	2	µg/kg	(13) 3	(13) 2	(13) <2
Anthracene	T1	AR	2	µg/kg	<2	<2	<2
Fluoranthene	T1	AR	2	µg/kg	(13) 9	(13) 6	(13) <2
Pyrene	T1	AR	2	µg/kg	(13) 11	(13) 6	(13) <2
Benzo(a)Anthracene	T1	AR	2	µg/kg	(13) 6	(13) 5	(13) <2
Chrysene	T1	AR	2	µg/kg	(13) 5	(13) 3	(13) <2
Benzo(b/k)Fluoranthene	T1	AR	2	µg/kg	10	9	<2
Benzo(a)Pyrene	T1	AR	2	µg/kg	6	4	6
Indeno(123-cd)Pyrene	T1	AR	2	µg/kg	4	3	<2
Dibenzo(ah)Anthracene	T1	AR	2	µg/kg	<2	<2	<2
Benzo(ghi)Perylene	T1	AR	2	µg/kg	5	3	<2
PAH(total)	T1	AR	2	µg/kg	59	41	6



Index to symbols used in Supplement to previous report number 677646-2

Value	Description
AR	As Received
13	Results have been blank corrected.
N	Analysis is not UKAS accredited

Notes

Supplemental report issued in order to amend sample 002 Tributyl tin result due to laboratory transcription error.

Method Index

Value	Description
T434	GC/MS (HR) (Recovery)
T1	GC/MS (HR)
T429	GC/MS (Recovery)
T16	GC/MS
T355	CVAFS
T2	Grav
T740	ICP/MS (HF)
T750	ICP/MS (Recovery)
T85	Calc

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
As Recovery	T750	AR	1	%	N	001-003
Cd Recovery	T750	AR	1	%	N	001-003
Cr Recovery	T750	AR	1	%	N	001-003
Cu Recovery	T750	AR	1	%	N	001-003
Ni Recovery	T750	AR	1	%	N	001-003
Pb Recovery	T750	AR	1	%	N	001-003
Zn Recovery	T750	AR	1	%	N	001-003
Naphthalene Recovery	T429	AR	1	%	N	005
Acenaphthene Recovery	T429	AR	1	%	N	005
Phenanthrene Recovery	T429	AR	1	%	N	005
Chrysene Recovery	T429	AR	1	%	N	005
Benzo(a)Pyrene Recovery	T429	AR	1	%	N	005
PCB BZ#28 Recovery	T434	AR	1	%	N	005
PCB BZ#52 Recovery	T434	AR	1	%	N	005
PCB BZ#101 Recovery	T434	AR	1	%	N	005
PCB BZ#118 Recovery	T434	AR	1	%	N	005
PCB BZ#153 Recovery	T434	AR	1	%	N	005
PCB BZ#138 Recovery	T434	AR	1	%	N	005
PCB BZ#180 Recovery	T434	AR	1	%	N	005
Arsenic	T740	AR	0.5	mg/kg	N	001-003
Cadmium	T740	AR	0.1	mg/kg	N	001-003
Chromium	T740	AR	0.5	mg/kg	N	001-003
Copper	T740	AR	0.5	mg/kg	N	001-003
Lead	T740	AR	0.5	mg/kg	N	001-003
Mercury	T355	AR	0.05	mg/kg	N	001-003
Moisture	T2	AR	0.1	%	N	001-003
Nickel	T740	AR	0.5	mg/kg	N	001-003
PCB EC7 (Sum)	T85	AR	0.35	µg/kg	N	001-003
PCB (Total Tri-Hepta)	T16	AR	0.05	µg/kg	N	001-003
Tributyl tin	T16	AR	0.01	mg/kg	N	001-003
Zinc	T740	AR	1.0	mg/kg	N	001-003
PCB BZ#28	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#52	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#101	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#118	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#153	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#138	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#180	T1	AR	0.05	µg/kg	N	001-003
Naphthalene	T1	AR	2	µg/kg	N	001-003
Acenaphthylene	T1	AR	2	µg/kg	N	001-003

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Acenaphthene	T1	AR	2	µg/kg	N	001-003
Fluorene	T1	AR	2	µg/kg	N	001-003
Phenanthrene	T1	AR	2	µg/kg	N	001-003
Anthracene	T1	AR	2	µg/kg	N	001-003
Fluoranthene	T1	AR	2	µg/kg	N	001-003
Pyrene	T1	AR	2	µg/kg	N	001-003
Benzo(a)Anthracene	T1	AR	2	µg/kg	N	001-003
Chrysene	T1	AR	2	µg/kg	N	001-003
Benzo(b/k)Fluoranthene	T1	AR	2	µg/kg	N	001-003
Benzo(a)Pyrene	T1	AR	2	µg/kg	N	001-003
Indeno(123-cd)Pyrene	T1	AR	2	µg/kg	N	001-003
Dibenzo(ah)Anthracene	T1	AR	2	µg/kg	N	001-003
Benzo(ghi)Perylene	T1	AR	2	µg/kg	N	001-003
PAH(total)	T1	AR	2	µg/kg	N	001-003



Concept Life Sciences

Certificate of Analysis

Report Number: 681125-2

Date of Report: 20-Sep-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17257

Customer Site Reference: UIG Harbour Redevelopment

Date Job Received at Concept: 07-Sep-2017

Date Analysis Started: 08-Sep-2017

Date Analysis Completed: 20-Sep-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Redacted
Customer Service Advisor

Issued by :
Redacted
Customer Service Advisor

Redacted

Concept Reference: 681125 Project Site: UIG Harbour Redevelopment Customer Reference: 17/035 Soil Soil Suite					
Concept Reference					681125 001
Customer Sample Reference					BH2 @0.0
Date Sampled					18-AUG-2017
Determinand	Method	Test Sample	LOD	Units	
Leach Prep (2:1)	T2	AR			Extracted
pH	T7	A40			8.1
(Acid Soluble) SO4	T192	AR	0.01	%	0.17
Sulphur (total)	T6	A40	0.01	%	0.18

Concept Reference: 681125 Project Site: UIG Harbour Redevelopment Customer Reference: 17/035 Leachate 2:1 Suite A					
Concept Reference					681125 001
Customer Sample Reference					BH2 @0.0
Date Sampled					18-AUG-2017
Determinand	Method	Test Sample	LOD	Units	
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	1.2
Chloride	T686	2:1	1	mg/l	2300
Magnesium	T82	2:1	1	mg/l	68
Nitrate	T686	2:1	0.5	mg/l	<0.5
Dissolved SO4(Total)	T285	2:1	10	mg/l	494

Index to symbols used in 681125-2

Value	Description
A40	Assisted dried < 40C
2:1	Leachate 2:1
AR	As Received
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Method Index

Value	Description
T7	Probe
T2	Grav
T82	ICP/OES (Sim)
T686	Discrete Analyser
T192	HCl Extraction/ICP/OES (TRL 447 T2)
T6	ICP/OES
T285	ICP/OES (SIM) (Filtered)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Leach Prep (2:1)	T2	AR			N	001
pH	T7	A40			U	001
(Acid Soluble) SO4	T192	AR	0.01	%	N	001
Sulphur (total)	T6	A40	0.01	%	N	001
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	U	001
Chloride	T686	2:1	1	mg/l	U	001
Magnesium	T82	2:1	1	mg/l	N	001
Nitrate	T686	2:1	0.5	mg/l	U	001
Dissolved SO4(Total)	T285	2:1	10	mg/l	N	001

Concept Life Sciences

Certificate of Analysis

Report Number: 681797-1

Date of Report: 20-Sep-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17266

Customer Site Reference: Uig Harbour, Redevelopment

Date Job Received at Concept: 11-Sep-2017

Date Analysis Started: 12-Sep-2017

Date Analysis Completed: 20-Sep-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Redacted
Project Manager

Issued by :
Redacted
Project Manager

Redacted

Concept Reference: 681797 Project Site: Uig Harbour, Redevelopment Customer Reference: 17/035						
Soil Soil Suite						
Concept Reference				681797 001	681797 002	
Customer Sample Reference				BH6A 7.50m	BH2 6.50m	
Date Sampled				Deviating	Deviating	
Determinand	Method	Test Sample	LOD	Units		
Leach Prep (2:1)	T2	AR			Extracted	Extracted
pH	T7	A40			8.5	9.0
(Acid Soluble) SO4	T192	AR	0.01	%	0.25	0.17
Sulphur (total)	T6	A40	0.01	%	0.55	0.54

Concept Reference: 681797 Project Site: Uig Harbour, Redevelopment Customer Reference: 17/035						
Leachate 2:1 Suite A						
Concept Reference				681797 001	681797 002	
Customer Sample Reference				BH6A 7.50m	BH2 6.50m	
Date Sampled				Deviating	Deviating	
Determinand	Method	Test Sample	LOD	Units		
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	0.16	0.46
Chloride	T686	2:1	1	mg/l	1900	1700
Magnesium	T82	2:1	1	mg/l	49	32
Nitrate	T686	2:1	0.5	mg/l	<0.5	<0.5
Dissolved SO4(Total)	T285	2:1	10	mg/l	549	436

Index to symbols used in 681797-1

Value	Description
A40	Assisted dried < 40C
2:1	Leachate 2:1
AR	As Received
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T2	Grav
T192	HCl Extraction/ICP/OES (TRL 447 T2)
T7	Probe
T6	ICP/OES
T285	ICP/OES (SIM) (Filtered)
T82	ICP/OES (Sim)
T686	Discrete Analyser

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Leach Prep (2:1)	T2	AR			N	001-002
pH	T7	A40			U	001-002
(Acid Soluble) SO4	T192	AR	0.01	%	N	001-002
Sulphur (total)	T6	A40	0.01	%	N	001-002
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	U	001-002

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Chloride	T686	2:1	1	mg/l	U	001-002
Magnesium	T82	2:1	1	mg/l	N	001-002
Nitrate	T686	2:1	0.5	mg/l	U	001-002
Dissolved SO4(Total)	T285	2:1	10	mg/l	N	001-002



Concept Life Sciences

Certificate of Analysis

Report Number: 683576-1

Date of Report: 28-Sep-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17285

Customer Site Reference: UIG Harbour Redevelopment

Date Job Received at Concept: 19-Sep-2017

Date Analysis Started: 20-Sep-2017

Date Analysis Completed: 28-Sep-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Redacted
Customer Service Advisor

Issued by :
Redacted
Customer Service Advis

Redacted

Concept Reference: 683576							
Project Site: UIG Harbour Redevelopment							
Customer Reference: 17/035							
Soil				Analysed as Soil			
Miscellaneous							
Concept Reference				683576 001	683576 004	683576 005	
Customer Sample Reference				BH3 4.50m	BH4 5.0m	BH5 4.5m	
Date Sampled				Deviating	Deviating	Deviating	
Determinand	Method	Test Sample	LOD	Units			
Organic Matter	T2	A40	0.1	%	2.6	5.0	7.6

Concept Reference: 683576 Project Site: UIG Harbour Redevelopment Customer Reference: 17/035 Soil Soil Suite							
Analysed as Soil							
Concept Reference				683576 002	683576 003		
Customer Sample Reference				BH3 7.50m	BH4 0.0m		
Date Sampled				Deviating	Deviating		
Determinand	Method	Test Sample	LOD	Units			
Leach Prep (2:1)	T2	AR			Extracted	Extracted	
pH	T7	A40			9.9	9.2	
(Acid Soluble) SO ₄	T192	AR	0.01	%	0.06	0.12	
Sulphur (total)	T6	A40	0.01	%	1.0	0.27	

Concept Reference: 683576 Project Site: UIG Harbour Redevelopment Customer Reference: 17/035 Leachate 2:1 Suite A							
Analysed as Water							
Concept Reference				683576 002	683576 003		
Customer Sample Reference				BH3 7.50m	BH4 0.0m		
Date Sampled				Deviating	Deviating		
Determinand	Method	Test Sample	LOD	Units			
Ammonia expressed as NH ₄	T686	2:1	0.05	mg/l	0.23	<0.05	
Chloride	T686	2:1	1	mg/l	180	580	
Magnesium	T82	2:1	1	mg/l	<1	4	
Nitrate	T686	2:1	0.5	mg/l	<0.5	<0.5	
Dissolved SO ₄ (Total)	T285	2:1	10	mg/l	159	245	

Index to symbols used in 683576-1

Value	Description
A40	Assisted dried < 40C
AR	As Received
2:1	Leachate 2:1
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T7	Probe
T285	ICP/OES (SIM) (Filtered)
T686	Discrete Analyser

T192	HCl Extraction/ICP/OES (TRL 447 T2)
T82	ICP/OES (Sim)
T2	Grav
T6	ICP/OES

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Organic Matter	T2	A40	0.1	%	N	001,004-005
Leach Prep (2:1)	T2	AR			N	002-003
pH	T7	A40			U	002-003
(Acid Soluble) SO ₄	T192	AR	0.01	%	N	002-003
Sulphur (total)	T6	A40	0.01	%	N	002-003
Ammonia expressed as NH ₄	T686	2:1	0.05	mg/l	U	002-003
Chloride	T686	2:1	1	mg/l	U	002-003
Magnesium	T82	2:1	1	mg/l	N	002-003
Nitrate	T686	2:1	0.5	mg/l	U	002-003
Dissolved SO ₄ (Total)	T285	2:1	10	mg/l	N	002-003



Concept Life Sciences

Certificate of Analysis

Report Number: 687648-2

Date of Report: 20-Oct-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17336

Customer Site Reference: UIG Harbour Redevelopment

Date Job Received at Concept: 06-Oct-2017

Date Analysis Started: 06-Oct-2017

Date Analysis Completed: 20-Oct-2017

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual

Report checked
and authorised by :
Redacted
Project Manager

Issued by :
Redacted
Project Manager

Redacted

Concept Reference: 687648							
Project Site: UIG Harbour Redevelopment							
Customer Reference: 17/035							
Sediment				Analysed as Sediment			
Marine Scotland Suite							
Concept Reference					687648 001	687648 002	687648 003
Customer Sample Reference					BH DS1 0.3m	BH DS1 1.50m	BH DS1 3.0m
Determinand	Method	Test Sample	LOD	Units			
Arsenic	T740	AR	0.5	mg/kg	8.1	6.4	7.0
Cadmium	T740	AR	0.1	mg/kg	0.2	0.2	0.2
Chromium	T740	AR	0.5	mg/kg	310	460	330
Copper	T740	AR	0.5	mg/kg	97	43	62
Lead	T740	AR	0.5	mg/kg	7.6	4.0	3.8
Nickel	T740	AR	0.5	mg/kg	210	260	250
Zinc	T740	AR	1.0	mg/kg	120	100	110
Mercury	T355	AR	0.05	mg/kg	(13) <0.05	(13) <0.05	(13) <0.05
Moisture	T2	AR	0.1	%	14	12	11
PCB EC7 (Sum)	T85	AR	0.35	µg/kg	3.53	<0.35	<0.35
PCB (Total Tri-Hepta)	T16	AR	0.05	µg/kg	9.2	<0.05	<0.05
Tributyl tin	T16	AR	0.01	mg/kg	<0.01	<0.01	<0.01

Concept Reference: 687648							
Project Site: UIG Harbour Redevelopment							
Customer Reference: 17/035							
Sediment		Analysed as Sediment					
Poly-Chlorinated Biphenyls (ICES 7)							
Concept Reference					687648 001	687648 002	687648 003
Customer Sample Reference					BH DS1 0.3m	BH DS1 1.50m	BH DS1 3.0m
Determinand	Method	Test Sample	LOD	Units			
PCB BZ#28	T1	AR	0.05	µg/kg	<0.05	<0.05	<0.05
PCB BZ#52	T1	AR	0.05	µg/kg	0.39	<0.05	<0.05
PCB BZ#101	T1	AR	0.05	µg/kg	0.91	<0.05	<0.05
PCB BZ#118	T1	AR	0.05	µg/kg	0.74	<0.05	<0.05
PCB BZ#153	T1	AR	0.05	µg/kg	0.54	<0.05	<0.05
PCB BZ#138	T1	AR	0.05	µg/kg	0.73	<0.05	<0.05
PCB BZ#180	T1	AR	0.05	µg/kg	0.22	<0.05	<0.05

Concept Reference: 687648							
Project Site: UIG Harbour Redevelopment							
Customer Reference: 17/035							
Sediment				Analysed as Sediment			
Total and Speciated USEPA16 PAH							
Concept Reference					687648 001	687648 002	687648 003
Customer Sample Reference					BH DS1 0.3m	BH DS1 1.50m	BH DS1 3.0m
Determinand	Method	Test Sample	LOD	Units			
Naphthalene	T1	AR	2	µg/kg	(13) <2	(13) 3	(13) <2
Acenaphthylene	T1	AR	2	µg/kg	5	34	4
Acenaphthene	T1	AR	2	µg/kg	2	7	<2
Fluorene	T1	AR	2	µg/kg	<2	7	8
Phenanthrene	T1	AR	2	µg/kg	(13) 21	(13) 98	(13) 28
Anthracene	T1	AR	2	µg/kg	11	37	8
Fluoranthene	T1	AR	2	µg/kg	67	340	25
Pyrene	T1	AR	2	µg/kg	62	310	19
Benzo(a)Anthracene	T1	AR	2	µg/kg	(13) 32	(13) 150	(13) 8
Chrysene	T1	AR	2	µg/kg	29	130	8
Benzo(b/k)Fluoranthene	T1	AR	2	µg/kg	65	280	12
Benzo(a)Pyrene	T1	AR	2	µg/kg	36	160	7
Indeno(123-cd)Pyrene	T1	AR	2	µg/kg	22	88	4
Dibenzo(ah)Anthracene	T1	AR	2	µg/kg	6	20	<2
Benzo(ghi)Perylene	T1	AR	2	µg/kg	26	110	4
PAH(total)	T1	AR	2	µg/kg	380	1800	140

Index to symbols used in 687648-2

Value	Description
AR	As Received
13	Results have been blank corrected.
N	Analysis is not UKAS accredited

Notes

PCB and ICP/MS analysis was carried out at Concept Life Sciences Manchester.
The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T16	GC/MS
T85	Calc
T355	CVAFS
T2	Grav
T1	GC/MS (HR)
T740	ICP/MS (HF)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Arsenic	T740	AR	0.5	mg/kg	N	001-003
Cadmium	T740	AR	0.1	mg/kg	N	001-003
Chromium	T740	AR	0.5	mg/kg	N	001-003
Copper	T740	AR	0.5	mg/kg	N	001-003
Lead	T740	AR	0.5	mg/kg	N	001-003
Nickel	T740	AR	0.5	mg/kg	N	001-003
Zinc	T740	AR	1.0	mg/kg	N	001-003
Mercury	T355	AR	0.05	mg/kg	N	001-003
Moisture	T2	AR	0.1	%	N	001-003
PCB EC7 (Sum)	T85	AR	0.35	µg/kg	N	001-003
PCB (Total Tri-Hepta)	T16	AR	0.05	µg/kg	N	001-003
Tributyl tin	T16	AR	0.01	mg/kg	N	001-003
PCB BZ#28	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#52	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#101	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#118	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#153	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#138	T1	AR	0.05	µg/kg	N	001-003
PCB BZ#180	T1	AR	0.05	µg/kg	N	001-003
Naphthalene	T1	AR	2	µg/kg	N	001-003
Acenaphthylene	T1	AR	2	µg/kg	N	001-003
Acenaphthene	T1	AR	2	µg/kg	N	001-003
Fluorene	T1	AR	2	µg/kg	N	001-003
Phenanthrene	T1	AR	2	µg/kg	N	001-003
Anthracene	T1	AR	2	µg/kg	N	001-003
Fluoranthene	T1	AR	2	µg/kg	N	001-003
Pyrene	T1	AR	2	µg/kg	N	001-003
Benzo(a)Anthracene	T1	AR	2	µg/kg	N	001-003
Chrysene	T1	AR	2	µg/kg	N	001-003
Benzo(b/k)Fluoranthene	T1	AR	2	µg/kg	N	001-003
Benzo(a)Pyrene	T1	AR	2	µg/kg	N	001-003
Indeno(123-cd)Pyrene	T1	AR	2	µg/kg	N	001-003
Dibenzo(ah)Anthracene	T1	AR	2	µg/kg	N	001-003
Benzo(ghi)Perylene	T1	AR	2	µg/kg	N	001-003
PAH(total)	T1	AR	2	µg/kg	N	001-003

Concept Life Sciences

Certificate of Analysis

Report Number: 689661-1

Date of Report: 23-Oct-2017

Customer: Holequest
Winston Road
Galashiels
TD1 2DA

Customer Contact: Redacted

Customer Job Reference: 17/035

Customer Purchase Order: 17354

Customer Site Reference: UIG Harbour Redevelopment

Date Job Received at Concept: 14-Oct-2017

Date Analysis Started: 17-Oct-2017

Date Analysis Completed: 23-Oct-2017

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

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

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

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

All results have been reviewed in accordance with Section 25 of the Concept Life Sciences, Analytical Services Quality Manual



1549

Report checked
and authorised by :
Redacted
Customer Service Advisor

Issued by :
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Customer Service Advis

Redacted

Concept Reference: 689661 Project Site: UIG Harbour Redevelopment Customer Reference: 17/035									
Leachate 2:1 Suite A					Analysed as Water				
Concept Reference					689661 001	689661 002	689661 003	689661 004	689661 005
Customer Sample Reference					BH DS1 0.00-1.50M	BH DS1 4.50-6.00M	BH DS1 6.00-7.50M	BH DS1 7.50-9.00M	BH7 0.00-1.00M
Date Sampled					Deviating	Deviating	Deviating	Deviating	Deviating
Determinand	Method	Test Sample	LOD	Units					
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	<0.05	0.10	0.54	1.0	<0.05
Chloride	T686	2:1	1	mg/l	580	1700	340	1100	120
Magnesium	T82	2:1	1	mg/l	10	81	2	29	86
Nitrate	T686	2:1	0.5	mg/l	<0.5	<0.5	<0.5	<0.5	<0.5
Dissolved SO4(Total)	T285	2:1	10	mg/l	305	1964	280	505	1922

Concept Reference: 689661 Project Site: UIG Harbour Redevelopment Customer Reference: 17/035					
Leachate 2:1 Suite A			Analysed as Water		
Concept Reference			689661 007		
Customer Sample Reference			BH7 8.50-10.00M		
Date Sampled			Deviating		
Determinand	Method	Test Sample	LOD	Units	
Ammonia expressed as NH4	T686	2:1	0.05	mg/l	<0.05
Chloride	T686	2:1	1	mg/l	29
Magnesium	T82	2:1	1	mg/l	<1
Nitrate	T686	2:1	0.5	mg/l	<0.5
Dissolved SO4(Total)	T285	2:1	10	mg/l	547

Index to symbols used in 689661-1

Value	Description
A40	Assisted dried < 40C
2:1	Leachate 2:1
AR	As Received
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

The date of sampling has not been provided and therefore the time from sampling to analysis is unknown. It is possible therefore that the results provided may be compromised.

Method Index

Value	Description
T2	Grav
T192	HCl Extraction/ICP/OES (TRL 447 T2)
T7	Probe
T686	Discrete Analyser
T6	ICP/OES
T285	ICP/OES (SIM) (Filtered)
T82	ICP/OES (Sim)

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Organic Matter	T2	A40	0.1	%	N	001-002,005-006,008-009
pH	T7	A40			U	001-005,007
(Acid Soluble) SO4	T192	AR	0.01	%	N	001-005,007
Sulphur (total)	T6	A40	0.01	%	N	001-005,007

Determinand	Method	Test Sample	LOD	Units	Symbol	Concept References
Ammonia expressed as NH ₄	T686	2:1	0.05	mg/l	U	001-005,007
Chloride	T686	2:1	1	mg/l	U	001-005,007
Magnesium	T82	2:1	1	mg/l	N	001-005,007
Nitrate	T686	2:1	0.5	mg/l	U	001-005,007
Dissolved SO ₄ (Total)	T285	2:1	10	mg/l	N	001-005,007



Appendix B Aspect Survey Vibro-Core Sampling and Testing Extract

5. CONDUCT OF VIBROCORE SAMPLING

The vibrocore apparatus used was a lightweight SDI Vibecore 4D system with 76mm aluminium extruded pipe being used to recover the core. The system does not rely on overall mass but the vibrational frequency of the equipment and liquefaction of surrounding sediments to enable effective penetration. It is therefore reliant on the moisture content in the sediment.

The portability and simplicity of this equipment facilitates rapid deployment at an alternate location should the previous location provide a poor return.

The aim was to collect 3 cores in total across the site, of up to 3m in length, from sample points indicated on Figure 1.

The vessel was manoeuvred to each of the locations in turn and secured to the existing pier in order to avoid swinging during the sampling operation.

All vibrocore locations were sampled on 2nd & 3rd April 2018 at the following locations:

VIBROCORE POINT	SAMPLED EASTING	SAMPLED NORTHING	CORE LENGTH
VB3_3	138657.3	863558.7	2.1m
VB4_1	138778.8	863341.6	1.0m
VB5_2	138711.6	863549.2	1.4m

6. EQUIPMENT USED FOR SAMPLING

A Speciality Devices Incorporated D-4 vibrocorer was used for all samples. A 76mm diameter, 3m long core was fitted for all sample attempts and each core tube was constructed of aluminium.

The sediment was pushed out of the core tube prior to sampling the cores and then sampled with care being taken not to sample material that had come into contact with the sample tube wall.



FIGURE 2 - SDI D-4 VIBROCORDER AND CORE ON DECK OF JOHANNA G

7. SAMPLE ANALYSIS

The laboratory analysis was carried out by SOCOTEC. The intention was that all vibrocore samples would be sub sampled at 0.5m intervals at the top middle and bottom of the length of the core and each sub sample analysed for Particle Size, Metals, WAC and Booster Biocides. The lab reporting is rendered with this report under separate cover:

A6542_Uig_Pre-disposal Sampling Results Form_MAR00025.xlsx

TEST REPORT



1252

Report No. EFS/184704 (Ver. 1)

SOCOTEC UK Limited Bretby (Marine)
Derwent House
Bretby Business Park
Ashby Road
Burton Upon Trent
Staffordshire
DE15 0YZ

Site: MAR00025

The 11 samples described in this report were registered for analysis by SOCOTEC UK Limited on 11-Apr-2018. This report supersedes any versions previously issued by the laboratory.

The analysis was completed by: 30-Apr-2018

Tests where the accreditation is set to N or No, and any individual data items marked with a * are not UKAS accredited. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

The following tables are contained in this report:

Table 1 Main Analysis Results (Pages 2 to 4)
Table of WAC Analysis Results (Pages 5 to 13)
Analytical and Deviating Sample Overview (Page 14)
Table of Additional Report Notes (Page 15)
Table of Method Descriptions (Page 16)
Table of Report Notes (Page 17)
Table of Sample Descriptions (Appendix A Page 1 of 1)

On behalf of
SOCOTEC UK Li
Redacted
Redacted
Operations Director
Energy & Waste Services

Redacted

Date of Issue: 30-Apr-2018

Tests marked '^' have been subcontracted to another laboratory.

Where samples have been flagged as deviant on the Analytical and Deviating Sample Overview, for any reason, the data may not be representative of the sample at the point of sampling and the validity of the data may be affected.

SOCOTEC UK Limited accepts no responsibility for any sampling not carried out by our personnel.

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)				Leaching Data	
					Weight of sample (kg)	0.292
Contact	Redacted				Moisture content @ 105°C (% of Wet Weight)	25.3
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	MAR00025				Volume of water required to carry out 2:1 stage (litres)	0.383
					Fraction of sample above 4 mm %	
Sample Description			Report No	Sample No	Issue Date	Fraction of non-crushable material %
A6542 - 4_1_1			s18_4704	CL/1900261	30-Apr-18	Volume to undertake analysis (2:1 Stage) (litres)
						Weight of Deionised water to carry out 8:1 stage (kg)
						1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.542\$	3	5	6
N	LOI450	Loss on Ignition (%)	3.7			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0802	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.049	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	28.51\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.82	100		
N	PHSOIL	pH (pH units)	8.6 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	10.36		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ⁰⁰		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ⁰⁰	7.5	8.9	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ⁰⁰	9590	2650					
U	ICPMSW	Arsenic	0.008	0.003	0.016	0.04	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.002	<0.002	<0.02	0.5	10	70
U	ICPMSW	Copper	0.003	0.002	0.006	0.02	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.101	0.163	0.202	1.55	0.5	10	30
U	ICPMSW	Nickel	0.002	0.001	0.004	0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.003	0.003	0.006	0.03	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.003	<0.002	<0.03	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	2910	661	5820	9609	800	15000	25000
U	ISEF	Fluoride	1	1.3	2	13	10	150	500
U	ICPWATVAR	Sulphate as SO4	590	183	1180	2373	1000	20000	50000
N	WSLM27	Total Dissolved Solids	7480	2060	14960	27827	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	8.6	16	17.2	150	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)				Leaching Data	
					Weight of sample (kg)	0.341
Contact	Redacted				Moisture content @ 105°C (% of Wet Weight)	24.5
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	MAR00025				Volume of water required to carry out 2:1 stage (litres)	0.334
					Fraction of sample above 4 mm %	
Sample Description			Report No	Sample No	Issue Date	Fraction of non-crushable material %
A6542 - 4_1_2			s18_4704	CL/1900262	30-Apr-18	Volume to undertake analysis (2:1 Stage) (litres)
						Weight of Deionised water to carry out 8:1 stage (kg)
						1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.426\$	3	5	6
N	LOI450	Loss on Ignition (%)	4			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0796	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.049	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	14.04\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.80	100		
N	PHSOIL	pH (pH units)	8.6 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	6.25		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ^{oo}		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ^{oo}	7.6	7.8	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ^{oo}	11400	1330					
U	ICPMSW	Arsenic	0.009	0.019	0.018	0.18	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.001	<0.002	<0.01	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.274	0.038	0.548	0.69	0.5	10	30
U	ICPMSW	Nickel	0.003	<0.001	0.006	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.005	0.003	0.01	0.03	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.001	<0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	0.005	<0.002	0.01	<0.02	4	50	200
U	KONENS	Chloride	3660	308	7320	7549	800	15000	25000
U	ISEF	Fluoride	1.1	0.7	2.2	8	10	150	500
U	ICPWATVAR	Sulphate as SO4	691	109	1382	1866	1000	20000	50000
N	WSLM27	Total Dissolved Solids	8900	1040	17800	20880	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	7.1	2.7	14.2	33	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)				Leaching Data	
					Weight of sample (kg)	0.271
Contact	Redacted				Moisture content @ 105°C (% of Wet Weight)	19.8
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	MAR00025				Volume of water required to carry out 2:1 stage (litres)	0.404
					Fraction of sample above 4 mm %	
Sample Description			Report No	Sample No	Issue Date	Fraction of non-crushable material %
A6542 - 4_1_3			s18_4704	CL/1900263	30-Apr-18	Volume to undertake analysis (2:1 Stage) (litres)
						Weight of Deionised water to carry out 8:1 stage (kg)
						1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.301\$	3	5	6
N	LOI450	Loss on Ignition (%)	3.6			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0745	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	<12.47\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.70	100		
N	PHSOIL	pH (pH units)	8.9 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	2.45		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ^{oo}		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ^{oo}	8.1	8.7	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ^{oo}	7620	992					
U	ICPMSW	Arsenic	0.022	0.031	0.044	0.3	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	0.001	<0.002	<0.01	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.039	0.01	0.078	0.14	0.5	10	30
U	ICPMSW	Nickel	0.003	0.001	0.006	0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.005	0.004	0.01	0.04	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.001	<0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	2320	217	4640	4974	800	15000	25000
U	ISEF	Fluoride	1.1	0.6	2.2	7	10	150	500
U	ICPWATVAR	Sulphate as SO4	394	127	788	1626	1000	20000	50000
N	WSLM27	Total Dissolved Solids	5940	774	11880	14628	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	3.9	1.9	7.8	22	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)	Leaching Data	
Contact	Redacted	Weight of sample (kg)	0.417
Site	MAR00025	Moisture content @ 105°C (% of Wet Weight)	57.5
		Equivalent Weight based on drying at 105°C (kg)	0.225
		Volume of water required to carry out 2:1 stage (litres)	0.258
		Fraction of sample above 4 mm %	
Sample Description	Report No	Sample No	Issue Date
A6542 - 3_3_1	s18_4704	CL/1900264	30-Apr-18
		Fraction of non-crushable material %	
		Volume to undertake analysis (2:1 Stage) (litres)	0.300
		Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	3.745\$	3	5	6
N	LOI450	Loss on Ignition (%)	11.7			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.1415	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.084	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	3550\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<5.4	100		
N	PHSOIL	pH (pH units)	7.9 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	1.87		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ^{oo}		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ^{oo}	8.7	8.6	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ^{oo}	7270	2970					
U	ICPMSW	Arsenic	0.081	0.004	0.162	0.14	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	0.001	<0.002	<0.01	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.138	0.059	0.276	0.7	0.5	10	30
U	ICPMSW	Nickel	0.008	<0.001	0.016	<0.02	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.009	0.003	0.018	0.04	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.003	<0.002	<0.03	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	2300	774	4600	9775	800	15000	25000
U	ISEF	Fluoride	1.8	1.4	3.6	15	10	150	500
U	ICPWATVAR	Sulphate as SO4	926	134	1852	2396	1000	20000	50000
N	WSLM27	Total Dissolved Solids	5670	2310	11340	27580	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	6.8	16	13.6	148	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING

BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)	Leaching Data	
Contact	Redacted	Weight of sample (kg)	0.278
Site	MAR00025	Moisture content @ 105°C (% of Wet Weight)	51.5
		Equivalent Weight based on drying at 105°C (kg)	0.225
		Volume of water required to carry out 2:1 stage (litres)	0.397
		Fraction of sample above 4 mm %	
Sample Description	Report No	Sample No	Issue Date
A6542 - 3_3_2	s18_4704	CL/1900265	30-Apr-18
		Fraction of non-crushable material %	
		Volume to undertake analysis (2:1 Stage) (litres)	0.300
		Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	3.263\$	3	5	6
N	LOI450	Loss on Ignition (%)	10.1			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.1238	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.07	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	1300\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<8.41	100		
N	PHSOIL	pH (pH units)	8.4 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	1.55		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ⁰⁰		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ⁰⁰	8.4	9.2	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ⁰⁰	9040	1530					
U	ICPMSW	Arsenic	0.004	0.005	0.008	0.05	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	0.004	<0.002	<0.04	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.18	0.08	0.36	0.93	0.5	10	30
U	ICPMSW	Nickel	<0.001	0.003	<0.002	<0.03	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.004	0.004	0.008	0.04	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.001	<0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	0.003	<0.004	<0.03	4	50	200
U	KONENS	Chloride	2880	363	5760	6986	800	15000	25000
U	ISEF	Fluoride	1.4	0.8	2.8	9	10	150	500
U	ICPWATVAR	Sulphate as SO4	242	352	484	3373	1000	20000	50000
N	WSLM27	Total Dissolved Solids	7050	1200	14100	19800	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	0.06	<0.1	<0.6	1		
N	WSLM13	Dissolved Organic Carbon	15	4.3	30	57	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)				Leaching Data		
					Weight of sample (kg)	0.288	
Contact	Redacted				Moisture content @ 105°C (% of Wet Weight)	22.0	
					Equivalent Weight based on drying at 105°C (kg)	0.225	
Site	MAR00025				Volume of water required to carry out 2:1 stage (litres)	0.387	
					Fraction of sample above 4 mm %		
Sample Description			Report No	Sample No	Issue Date	Fraction of non-crushable material %	
A6542 - 3_3_3			s18_4704	CL/1900266	30-Apr-18	Volume to undertake analysis (2:1 Stage) (litres)	
						Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.400\$	3	5	6
N	LOI450	Loss on Ignition (%)	3.4			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0764	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.042	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	17.18\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.74	100		
N	PHSOIL	pH (pH units)	9 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	4.81		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ^{oo}		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ^{oo}	8	9.4	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ^{oo}	22300	1200					
U	ICPMSW	Arsenic	0.018	0.155	0.036	1.37	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	0.001	<0.002	<0.01	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.064	0.036	0.128	0.4	0.5	10	30
U	ICPMSW	Nickel	<0.001	0.011	<0.002	<0.1	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	<0.001	0.004	<0.002	<0.04	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.002	<0.002	<0.02	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	8150	249	16300	13025	800	15000	25000
U	ISEF	Fluoride	1.1	1	2.2	10	10	150	500
U	ICPWATVAR	Sulphate as SO4	528	246	1056	2836	1000	20000	50000
N	WSLM27	Total Dissolved Solids	17400	935	34800	31303	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	11	5.4	22	61	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)	Leaching Data	
Contact	Redacted	Weight of sample (kg)	0.441
Site	MAR00025	Moisture content @ 105°C (% of Wet Weight)	40.6
		Equivalent Weight based on drying at 105°C (kg)	0.225
		Volume of water required to carry out 2:1 stage (litres)	0.234
		Fraction of sample above 4 mm %	
Sample Description	Report No	Sample No	Issue Date
A6542 - 5_2_1	s18_4704	CL/1900267	30-Apr-18
		Fraction of non-crushable material %	
		Volume to undertake analysis (2:1 Stage) (litres)	0.300
		Weight of Deionised water to carry out 8:1 stage (kg)	1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	2.182§	3	5	6
N	LOI450	Loss on Ignition (%)	9.4			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.1014	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.1576	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	212§	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<2.29	100		
N	PHSOIL	pH (pH units)	8.4 §		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	4.47		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ^{oo}		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ^{oo}	8.1	8	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ^{oo}	22200	1230					
U	ICPMSW	Arsenic	0.011	0.013	0.022	0.13	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	<0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	0.003	<0.002	<0.03	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.359	0.015	0.718	0.61	0.5	10	30
U	ICPMSW	Nickel	<0.001	<0.001	<0.002	<0.01	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.001	0.002	0.002	0.02	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.001	<0.002	<0.01	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	8350	274	16700	13508	800	15000	25000
U	ISEF	Fluoride	0.9	0.7	1.8	7	10	150	500
U	ICPWATVAR	Sulphate as SO4	499	89	998	1437	1000	20000	50000
N	WSLM27	Total Dissolved Solids	17300	959	34600	31378	4000	60000	100000
U	SFAP1	Phenol Index	0.16	<0.05	0.32	<0.6	1		
N	WSLM13	Dissolved Organic Carbon	17	3.5	34	53	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)				Leaching Data	
					Weight of sample (kg)	0.381
Contact	Redacted				Moisture content @ 105°C (% of Wet Weight)	34.8
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	MAR00025				Volume of water required to carry out 2:1 stage (litres)	0.294
					Fraction of sample above 4 mm %	
Sample Description			Report No	Sample No	Issue Date	Fraction of non-crushable material %
A6542 - 5_2_2			s18_4704	CL/1900268	30-Apr-18	Volume to undertake analysis (2:1 Stage) (litres)
						Weight of Deionised water to carry out 8:1 stage (kg)
						1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	1.648\$	3	5	6
N	LOI450	Loss on Ignition (%)	7.4			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0919	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.056	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	267\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	13.1	100		
N	PHSOIL	pH (pH units)	8.2 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	4.04		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ⁰⁰		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ⁰⁰	7.9	8.7	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ⁰⁰	17300	2380					
U	ICPMSW	Arsenic	0.018	0.007	0.036	0.08	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.001	<0.002	<0.01	0.5	10	70
U	ICPMSW	Copper	<0.001	<0.001	<0.002	<0.01	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.206	0.106	0.412	1.19	0.5	10	30
U	ICPMSW	Nickel	<0.001	0.003	<0.002	<0.03	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.004	0.005	0.008	0.05	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.002	<0.002	<0.02	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	6150	602	12300	13417	800	15000	25000
U	ISEF	Fluoride	1.1	1.4	2.2	14	10	150	500
U	ICPWATVAR	Sulphate as SO4	815	320	1630	3860	1000	20000	50000
N	WSLM27	Total Dissolved Solids	13500	1860	27000	34120	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	8	9.9	16	96	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

WASTE ACCEPTANCE CRITERIA TESTING BSEN 12457/3

Client	SOCOTEC UK Limited Bretby (Marine)				Leaching Data	
					Weight of sample (kg)	0.317
Contact	Redacted				Moisture content @ 105°C (% of Wet Weight)	29.6
					Equivalent Weight based on drying at 105°C (kg)	0.225
Site	MAR00025				Volume of water required to carry out 2:1 stage (litres)	0.358
					Fraction of sample above 4 mm %	
Sample Description			Report No	Sample No	Issue Date	Fraction of non-crushable material %
A6542 - 5_2_3			s18_4704	CL/1900269	30-Apr-18	Volume to undertake analysis (2:1 Stage) (litres)
						Weight of Deionised water to carry out 8:1 stage (kg)
						1.650

Note: The >4mm fraction is crushed using a disc mill

Accreditation	Method Code	Solid Waste Analysis (Dry Basis)	Concentration in Solid (Dry Weight Basis)	Landfill Waste Acceptance Criteria Limit Values		
				Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non-Hazardous Landfill	Hazardous Waste Landfill
N	WSLM59	Total Organic Carbon (% M/M)	0.755\$	3	5	6
N	LOI450	Loss on Ignition (%)	4.1			10
U	BTEXHSA	Sum of BTEX (mg/kg)	<0.0856	6		
U	PCBUSECD	Sum of 7 Congener PCB's (mg/kg)	<0.049	1		
N	TPHFIDUS	Mineral Oil (mg/kg)	15.06\$	500		
N	PAHMSUS	PAH Sum of 17 (mg/kg)	<1.93	100		
N	PHSOIL	pH (pH units)	8.8 \$		>6	
N	ANC	Acid Neutralisation Capacity (mol/kg) @pH 7	4.08		To be evaluated	To be evaluated

Accreditation	Method Code	Leachate Analysis	2:1 Leachate	8:1 Leachate	Calculated amount leached @ 2:1	Calculated cumulative amount leached @ 10:1	Landfill Waste Acceptance Criteria Limit Values for BSEN 12457/3 @ L/S 10 litre kg-1 mg/kg (dry weight)		
			mg/l except ^{oo}		mg/kg (dry weight)				
		U	WSLM3	pH (pH units) ^{oo}	8.6	9.1	Calculated data not UKAS Accredited		
U	WSLM2	Conductivity (µs/cm) ^{oo}	11100	1630					
U	ICPMSW	Arsenic	0.181	0.174	0.362	1.75	0.5	2	25
U	ICPWATVAR	Barium	<0.01	<0.01	<0.02	<0.1	20	100	300
U	ICPMSW	Cadmium	<0.0001	<0.0001	<0.0002	<0.001	0.04	1	5
U	ICPMSW	Chromium	<0.001	0.003	<0.002	<0.03	0.5	10	70
U	ICPMSW	Copper	<0.001	0.006	<0.002	<0.05	2	50	100
U	ICPMSW	Mercury	<0.0001	<0.0001	<0.0002	<0.001	0.01	0.2	2
U	ICPMSW	Molybdenum	0.522	0.183	1.044	2.28	0.5	10	30
U	ICPMSW	Nickel	0.006	0.027	0.012	0.24	0.4	10	40
U	ICPMSW	Lead	<0.001	<0.001	<0.002	<0.01	0.5	10	50
U	ICPMSW	Antimony	0.045	0.018	0.09	0.22	0.06	0.7	5
U	ICPMSW	Selenium	<0.001	0.005	<0.002	<0.04	0.1	0.5	7
U	ICPMSW	Zinc	<0.002	<0.002	<0.004	<0.02	4	50	200
U	KONENS	Chloride	3540	378	7080	7996	800	15000	25000
U	ISEF	Fluoride	0.8	0.7	1.6	7	10	150	500
U	ICPWATVAR	Sulphate as SO4	724	916	1448	8904	1000	20000	50000
N	WSLM27	Total Dissolved Solids	8640	1270	17280	22527	4000	60000	100000
U	SFAP1	Phenol Index	<0.05	<0.05	<0.1	<0.5	1		
N	WSLM13	Dissolved Organic Carbon	12	12	24	120	500	800	1000

Template Ver. 1

Landfill Waste Acceptance Criteria limit values correct as of 11th March 2009.

Tests where the accreditation is set to U are UKAS accredited, those where the accreditation is set to N are not UKAS accredited

Customer SOCOTEC UK Limited Bretby (Marine)
 Site MAR00025
 Report No S184704

Consignment No S73786
 Date Logged 11-Apr-2018
 In-House Report Due 25-Apr-2018

Please note the results for any subcontracted analysis (identified with a '^') is likely to take up to an additional five working days.

WSLM59	Total Organic Carbon	✓																		
TPHFIDUS	TPH by GC/FID (AR)	✓																		
	TPH Band (>C10-C40)	✓																		
TMSS	Tot.Moisture @ 105C	✓																		
PHSOIL	pH units (AR)	✓																		
PCBEC	PCB-7 Congeners Analysis	✓																		
PAHMSUS	PAH (17) by GC/MS	✓																		
LOI(%/MM)	L.O.I. % @ 450C																			
	Zinc (MS) Sediments	✓																		
ICPMSS	Nickel (MS) Sediments	✓																		
	Mercury (MS) Low Level Sediments																			
CustServ	Lead (MS) Sediments	✓																		
	Chromium (MS) Sediments	✓																		
CEN LeachBn	Cadmium (MS) Sediments	✓																		
	Arsenic (MS) Sediments	✓																		
BTEXHSA	Copper (MS) Sediment	✓																		
	Report B >63 µm																			
ANC	CEN Leac(P)2																			
	CEN Leac(P)1																			
MethodID	MTBE (µg/kg)	✓																		
	BTEX-HSA + MTBE analysis	✓																		
	Acid Neut. Capacity																			
	Sampled																			
ID Number	Description	02/04/18	A6542 - 4_1_1	02/04/18	A6542 - 4_1_2	02/04/18	A6542 - 4_1_3	03/04/18	A6542 - 3_3_1	03/04/18	A6542 - 3_3_2	03/04/18	A6542 - 3_3_3	03/04/18	A6542 - 5_2_1	03/04/18	A6542 - 5_2_2	03/04/18	A6542 - 5_2_3	03/04/18

Note: We will endeavour to prioritise samples to complete analysis within holding time; however any delay could result in samples becoming deviant whilst being processed in the laboratory.

If sampling dates are missing or matrices unclassified then results will not be ISO 17025 accredited. Please contact us as soon as possible to provide missing information in order to reinstate accreditation.

Deviating Sample Key

- A The sample was received in an inappropriate container for this analysis
- B The sample was received without the correct preservation for this analysis
- C Headspace present in the sample container
- D The sampling date was not supplied so holding time may be compromised - applicable to all analysis
- E Sample processing did not commence within the appropriate holding time
- F Sample processing did not commence within the appropriate handling time

Requested Analysis Key

- Analysis Required
- Analysis dependant upon trigger result - **Note: due date may be affected if triggered**
- No analysis scheduled
- Analysis Subcontracted - **Note: due date may vary**

Where individual results are flagged see report notes for status.

Additional Report Notes

Method Code	Sample ID	The following information should be taken into consideration when using the data contained within this report
BTEXHSA	CL1900261 TO CL1900269	The Primary process control data associated with this Test has not wholly met the requirements of the Laboratory Quality Management System QMS with one or more target analytes falling outside acceptable limits. However the remaining data gives the Laboratory confidence that the test has performed satisfactorily and that the validity of the data may not have been significantly affected. However in line with our QMS policy we have removed accreditation from the affected analytes (Ethylbenzene, M/P xylenes) . These circumstances should be taken into consideration when utilising the data”

Method Descriptions

Matrix	MethodID	Analysis Basis	Method Description
Soil	ANC	Oven Dried @ < 35°C	Quantitative digestion with Hydrochloric Acid back titration with 1M Sodium Hydroxide to pH 7
Soil	BTEXHSA	As Received	Determination of Benzene, Toluene, Ethyl benzene and Xylenes (BTEX) by Headspace GCFID
Soil	ICPMSS	Oven Dried @ < 35°C	Determination of Metals in Marine Sediments and Soil samples by aqua regia digestion followed by ICPMS detection
Soil	LOI(%MM)	Oven Dried @ < 35°C	Determination of loss on ignition for soil samples at specified temperature by gravimetry
Soil	PAHMSUS	As Received	Determination of Polycyclic Aromatic Hydrocarbons (PAH) by hexane/acetone extraction followed by GCMS detection
Soil	PCBECD	As Received	Determination of Polychlorinated Biphenyl (PCB) congeners/arocloris by hexane/acetone extraction followed by GCECD detection
Soil	PHSOIL	As Received	Determination of pH of 2.5:1 deionised water to soil extracts using pH probe.
Soil	TMSS	As Received	Determination of the Total Moisture content at 105°C by loss on oven drying gravimetric analysis (% based upon wet weight)
Soil	TPHFIDUS	As Received	Determination of hexane/acetone extractable Hydrocarbons in soil with GCFID detection.
Soil	WSLM59	Oven Dried @ < 35°C	Determination of Organic Carbon in soil using sulphurous Acid digestion followed by high temperature combustion and IR detection
Water	ICPMSW	As Received	Direct quantitative determination of Metals in water samples using ICPMS
Water	ICPWATVAR	As Received	Direct determination of Metals and Sulphate in water samples using ICPOES
Water	ISEF	As Received	Determination of Fluoride in water samples by Ion Selective Electrode (ISE)
Water	KONENS	As Received	Direct analysis using discrete colorimetric analysis
Water	SFAPI	As Received	Segmented flow analysis with colorimetric detection
Water	WSLM13	As Received	Instrumental analysis using acid/persulphate digestion and non-dispersive IR detection
Water	WSLM2	As Received	Determination of the Electrical Conductivity ($\mu\text{S}/\text{cm}$) by electrical conductivity probe.
Water	WSLM27	As Received	Gravimetric Determination
Water	WSLM3	As Received	Determination of the pH of water samples by pH probe

Where individual results are flagged see report notes for status.

Report Notes

Generic Notes

Soil/Solid Analysis

Unless stated otherwise,

- Results expressed as mg/kg have been calculated on the basis indicated in the Method Description table.
All results on MCERTS reports are reported on a 105°C dry weight basis with the exception of pH and conductivity.
- Sulphate analysis not conducted in accordance with BS1377
- Water Soluble Sulphate is on a 2:1 water:soil extract

Waters Analysis

Unless stated otherwise results are expressed as mg/l

Nil: Where "Nil" has been entered against Total Alkalinity or Total Acidity this indicates that a measurement was not required due to the inherent pH of the sample.

Oil analysis specific

Unless stated otherwise,

- Results are expressed as mg/kg
- SG is expressed as g/cm³ @ 15°C

Gas (Tedlar bag) Analysis

Unless stated otherwise, results are expressed as ug/l

Asbestos Analysis

CH Denotes Chrysotile

TR Denotes Tremolite

CR Denotes Crocidolite

AC Denotes Actinolite

AM Denotes Amosite

AN Denotes Anthophyllite

NAIIS No Asbestos Identified in Sample

NADIS No Asbestos Detected In Sample

Symbol Reference

^ Sub-contracted analysis.

\$\$ Unable to analyse due to the nature of the sample

¶ Samples submitted for this analyte were not preserved on site in accordance with laboratory protocols.

This may have resulted in deterioration of the sample(s) during transit to the laboratory.

Consequently the reported data may not represent the concentration of the target analyte present in the sample at the time of sampling

¥ Results for guidance only due to possible interference

& Blank corrected result

I.S Insufficient sample to complete requested analysis

I.S(g) Insufficient sample to re-analyse, results for guidance only

Intf Unable to analyse due to interferences

N.D Not determined

N.Det Not detected

N.F No Flow

NS Information Not Supplied

Req Analysis requested, see attached sheets for results

▮ Raised detection limit due to nature of the sample

* All accreditation has been removed by the laboratory for this result

‡ MCERTS accreditation has been removed for this result

§ accreditation has been removed for this result as it is a non-accredited matrix

Note: The Laboratory may only claim that data is accredited when all of the requirements of our Quality System have been met. Where these requirements have not been met the laboratory may elect to include the data in its final report and remove the accreditation from individual data items if it believes that the validity of the data has not been affected. If further details are required of the circumstances which have led to the removal of accreditation then please do not hesitate to contact the laboratory.

Sample Descriptions

Client : SOCOTEC UK Limited Bretby (Marine)

Site : MAR00025

Report Number : S18_4704

Note: major constituent in upper case

[illegible]

