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Baseline Environmental Site Investigation

First Milk, Pembroke Road, Merlin's
Bridge, Haverfordwest, SA61 1JN

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Executive Summary

Ramboll UK Limited (Ramboll) has been instructed by First Milk Limited (the “Client”) to prepare a Baseline Environmental Site Investigation for the Haverfordwest Creamery site (the “Site”) located at First Milk, Pembroke Road, Merlin’s Bridge, Haverfordwest, SA61 1JN. The investigation has been undertaken in connection an improvement condition within the latest issue of the Site’s Environmental Permit.

Within the latest issue of the Environmental Permit, Table S1.3 stipulates Improvement Programme requirements. *Improvement Condition 8 (IC8) requires the Operator to complete and submit for approval: a baseline report containing information necessary to determine the current state of soil and groundwater contamination, so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.*

Ramboll has undertaken a baseline environmental site investigation to address the above mentioned requirement, designed to target the priority potential contamination sources identified within the Site’s Environmental Risk Assessment. The investigation concentrated on shallow soil and groundwater (where present) and comprised drilling of sixteen boreholes to depths of up to 3.10m bgl. Soil samples were recovered from each of the exploratory locations and were analysed at an independent MCERTS accredited laboratory for a range of determinands associated with site activities. Ten of the boreholes were installed as groundwater monitoring wells; and a round of groundwater monitoring and sampling was carried out.

Ground conditions encountered during the investigation comprised Made Ground, typically as a brown clayey gravel with localised fragments of brick and concrete and suspected reworked natural material in several locations; over natural ground of Alluvium and Haverfordwest Mudstone Formation, encountered across the site recovered as weathered mudstone bedrock.

Groundwater was encountered, likely present as shallow discontinuous groundwater bodies formed directly over competent mudstone bedrock. However, it was determined that, if present, groundwater flow would be in an approximately northerly direction, towards nearby surface water features and in line with topography.

Chemical analysis undertaken on the soil and groundwater samples collected during the baseline environmental site investigation are presented within this report; and represent ‘baseline data’ on soil and groundwater for the site. The information contained within this report determines the current state of soil and groundwater contamination; and is considered sufficient to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.

Although not a requirement of the baseline data reporting, for context soil and groundwater analytical results have been screened against Generic Assessment Criteria (GAC) for human health in a commercial/industrial scenario. No elevated concentrations were detected.

When compared to screening criteria for the assessment of the water environment, a limited number of contaminants were identified as exceeding the screening criteria. Concentrations are not indicative of gross or widespread contamination.

1. Introduction

1.1 Brief

Ramboll UK Limited (Ramboll) has been instructed by First Milk Limited (the “Client”) to undertake an intrusive environmental site investigation for the purpose of environmental baseline data collection at First Milk, Pembroke Road, Merlin’s Bridge, Haverfordwest, SA61 1JN. A Site Location Plan is provided in Figure 1.

It is understood that the investigation is required in connection with a programme of improvements set out by Natural Resources Wales (NRW, the Regulator) in Environmental Permit EPR/XP3830UR, dated April 2022.

1.2 Background

The site operates under Environmental Permit Ref: EPR/XP3830UR, which was last issued by NRW in April 2022. The key operations regulated in this permit are the processing of milk to produce cheese and whey products, the effluent treatment process, and associated combustion processes. Some refrigeration activity is carried out within the installation to preserve food materials.

Within the latest issue of the Environmental Permit, Table S1.3 stipulates Improvement Programme requirements. *Improvement Condition 8 (IC8) requires the Operator to complete and submit for approval: a baseline report containing information necessary to determine the current state of soil and groundwater contamination, so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.*

1.3 Objectives

The intrusive investigation was designed to target the priority potential contamination sources identified within the Environmental Risk Assessment (ERA)¹; and concentrated on shallow soil and groundwater (where present).

The intrusive investigation is presented in this factual report, which includes the laboratory results tabulated to present baseline data for the site. For context, Ramboll has also compared the soil and groundwater analysis results against Generic Assessment Criteria (GAC) for commercial/industrial site use. The GAC are concentrations above which, a theoretical risk to receptors exists; however, if there are no pathways between the source (i.e. the elevated concentration) and receptor (human, and/or environmental), the actual risk may not be present.

1.4 Constraints and Limitations

This report has been prepared by Ramboll exclusively for the intended use by the Client in accordance with the agreement (proposal reference number 131025 Baseline Proposal, Haverfordwest), dated 17th March 2023, defining, among others, the purpose, the scope and the terms and conditions for the services. No other warranty, expressed or implied, is made as to the professional advice included in this report or in respect of any matters outside the agreed scope of the services or the purpose for which the report and the associated agreed scope were intended, or any other services provided by Ramboll.

In preparation of the report and performance of any other services, Ramboll has relied upon publicly available information, information provided by the client and information provided by

¹ Environmental Risk Assessment v2 2023.01.05.xls, produced by the Client.

third parties. Accordingly, the conclusions in this report are valid only to the extent that the information provided to Ramboll was accurate, complete and available to Ramboll within the reporting schedule.

Ramboll's services are not intended as legal advice, nor an exhaustive review of site conditions and/or compliance. This report and accompanying documents are initial and intended solely for the use and benefit of the Client for this purpose only and may not be used by or disclosed to, in whole or in part, any other person without the express written consent of Ramboll. Ramboll neither owes nor accepts any duty to any third party, unless formally agreed by Ramboll through that party entering into, at Ramboll's sole discretion, a written reliance agreement.

Unless otherwise stated in this report, the scope of services, assessment and conclusions made assume that the site will continue to be used for its current purpose and end-use without significant changes either on-site or off-site.

The ground investigation works were undertaken during a discrete period of time. The findings and conclusions presented in this report are accordingly factually limited by these circumstances and, unless stated otherwise in the report, are preliminary. The field investigations were restricted to a level of detail necessary to meet the stated objectives of the services. The results of any measurements taken may vary spatially or with time and further confirmatory measurements should be made after any significant period of time has elapsed since the sampling took place.

Overall, Ramboll was able to investigate the identified potential contaminant sources and it is considered that the exploratory holes provide an appropriate coverage across the accessible areas of the site.

2. Description of Site and Setting

The site location is at National Grid reference 194882, 214503 as shown in Figure 1; it comprises an irregular plot of land occupying an area of approximately 6 hectares (ha). The topography of the site and surrounding area slopes towards the north with the nearest surface watercourse being Merlin's Brook adjacent north from the site.

The site is understood, from publicly available historical mapping of the area, to have been occupied by largely undeveloped agricultural land until developed as a factory in the 1960s/1970s, which was expanded throughout the 2000s and 2010s. The site's Environmental Permit was applied for and determined in 2005, with notable additions to permitted processes in 2013 for an effluent treatment plant; and in 2019 for medium combustion plant.

Presently, the site is developed with buildings, hard surfacing and landscaping, with permeable surfacing occupying approximately 10% of the area of the site (primarily an undeveloped area in the east of the site).

According to the local geological map of the area (British Geological Survey (BGS) 1:50,000 scale), superficial deposits of Alluvium (clay, silt, sand and gravel) are present in the central northern portion of the site (approximately 10% of the site area); with the remainder of the site directly underlain by bedrock geology of the Portfield Formation and Haverford Mudstone Formation (mudstone). Furthermore, information from a 2002 ground investigation, provided by the Client within a Site Condition Report, has shown that the investigated portion of the site is underlain by approximately 2.0m of clay-based Made Ground over mudstone. In some of these investigation locations, shallow groundwater was encountered, perched upon the mudstone bedrock. According to available information on the BGS website, the Portfield Formation and

Haverford Mudstone Formation is classified by NRW as a Secondary B Aquifer, a lower permeability formation with potential to support small abstractions.

An ERA for the site, provided by the Client, details a large number of above ground storage tanks in use at the site. The ERA goes on to assess the main potential environmental receptor as Merlin's Brook, a surface water feature located adjacent off-site to the north.

The ERA defines six zones within the site, based on primary activities undertaken in different areas of the site; and identifies potential contamination sources within each zone.

The ground investigation was designed to assess the current soil and groundwater conditions at the site, based on the above description (incorporating the zones and potential sources of contamination identified in the ERA). The following sections describe the ground investigation strategy, and the results of laboratory chemical analysis and monitoring. Borehole locations are presented in Figure 2.

3. Ground Investigation

3.1 Design

The ground investigation was designed to determine the current state of soil and groundwater contamination, so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity. The ground investigation includes exploratory locations within each of the six zones identified in the ERA.

3.2 Ground Investigation Activities

The intrusive ground investigation was supervised by Ramboll, and was undertaken between 7th and 14th September 2023, with subsequent monitoring of groundwater undertaken on 19th September 2023. Factual records relating to the ground investigation are provided in Appendix 2.

The ground investigation was undertaken in general accordance with:

- BS 5930 Code of Practice for Ground Investigation²; and
- BS 10175 Investigation of Potentially Contaminated Sites – Code of Practice³.

The level of investigation designed for is considered by Ramboll to be Detailed with respect to BS 10175. The scope of the investigation was discussed with the Regulator on 12th May 2023, and was subsequently deemed suitable.

A summary of the scope of the investigation undertaken at the site is presented in Table 3.1. Exploratory locations are shown on Figure 2. Borehole logs (including monitoring well details) are provided in Appendix 2.

Table 3.1 Summary of Intrusive Works

Item	No.	Comments
Utilities Clearance Survey	Item	Prior to intrusive works a specialist service location contractor, Utility Detection Ltd, was contracted to locate below ground services and mark out drilling locations.
Window Sample Boreholes	16 No.	Rig type: Archway Competitor – Windowless Liner System Depth range: 0.85m to 3.10m

² British Standards (2015) Code of Practice for site Investigation BS5930:2015+A1:2020

³ British Standards (2017) Code of Practice for the Investigation of Potentially Contaminated sites. BS10175:2011 + A2:2017

Item	No.	Comments
Soil Sampling and Screening	31 No.	During the ground investigation, soil samples were recovered from each exploratory hole location and screened on-site using a hand-held photo-ionisation detector (PID) for the presence of volatile organic compounds.
Groundwater Sampling and Monitoring	9 No.	An oil/water interface probe was used to check for free-phase hydrocarbons and resting groundwater levels were monitored. <i>Note: Groundwater was not present in WS06 during monitoring, and there was insufficient sample volume available in WS02 for a full suite of analysis.</i>
Waste Characterisation for Disposal	Item	All soil and groundwater arisings along with general waste generated during the works were stored in dedicated drums during the investigation. A representative sample of the waste was submitted for chemical testing and was characterised for waste disposal purposes waste (i.e. hazardous or non-hazardous waste). Once characterised, the wastes (soil, water and general waste) were collected by Acorn Waste Management, who (under appropriate consignment notes) arranged for disposal to a suitably licenced facility.

3.3 Sample Location Rationale

The rationale for positioning the sampling locations is described in Table 3.2.

Table 3.2 Exploratory Hole Rationale

Exploratory Hole	Rationale
WS01	To determine the shallow soil conditions at the western end of the northern site boundary, within the milk intake and whey out loading yard, combined heat and power (CHP), and dispatch zone.
WS02	To determine the shallow soil and groundwater conditions in the west of the site, within the milk intake and whey out loading yard, CHP, and dispatch zone.
WS03	To determine the shallow soil conditions in the centre of the site, within the milk intake and whey out loading yard, CHP, and dispatch zone.
WS04	To determine the shallow soil and groundwater conditions in the central northern site boundary, between the milk intake and whey out loading yard, CHP, and dispatch zone and the Engineering zone.
WS05	To determine the shallow soil and groundwater conditions at the northern site boundary, in an area of anticipated superficial deposits of alluvium, between the production site and the effluent treatment plant. Adjacent to the Engineering zone.
WS06	To determine the shallow soil and groundwater conditions in the south-west of the site, in the vicinity of above ground oil storage tanks serving the CHP, within the milk intake and whey out loading yard, CHP, and dispatch zone.
WS07	To determine shallow soil conditions in the central south of the site, within the creamery production zone, and near vicinity of bunded storage area.
WS08	To determine shallow soil and groundwater conditions in the south of the site, within the chemical storage and water heat recovery zone.
WS09	To determine shallow soil and groundwater conditions adjacent to the vehicle wash-down, within the rear yard zone.
WS10	To determine shallow soil and groundwater conditions adjacent to the vehicle refuelling diesel tank, within the rear yard zone.
WS11	To determine shallow soil conditions within the chemical storage and water heat recovery zone.
WS12	To determine the shallow soil and groundwater conditions at the eastern end of the production site, within the rear yard zone.
WS13	To determine the shallow soil and groundwater conditions in the effluent treatment plant zone.
WS14	To determine the shallow soil conditions in the effluent treatment plant zone.
WS15	To determine the shallow soil conditions in the effluent treatment plant zone.
WS16	To determine the shallow soil and groundwater conditions in the effluent treatment plant zone.

3.4 Sampling and Monitoring

Details of the general sampling and monitoring methods utilised during the investigation are provided in Appendix 3. Project-specific details are summarised below.

Soil samples were recovered from each of the exploratory locations based at regular intervals and/or changes of strata, within the unsaturated zone. Soil samples were analysed at an independent MCERTS accredited laboratory for a range of determinands associated with site activities, including: pH, metals, cyanide, speciated phenols, water soluble sulphate, total organic carbon (TOC), speciated total petroleum hydrocarbons (TPH CWG), polycyclic aromatic hydrocarbons (PAHs) and asbestos (screen and identification or quantification).

Groundwater samples were recovered from nine locations using dedicated disposable bailers, to prevent cross contamination. Groundwater analysis included pH, metals, water soluble sulphate, ammoniacal nitrogen, dissolved organic carbon (DOC), hardness, cyanide, phenol, TPH CWG and PAHs. Groundwater was not present in WS06 during the monitoring visit; and there was insufficient sample volume available in WS02 for a full suite of analysis.

Monitoring of waters was undertaken at selected locations, details of which are summarised in Table 3.3.

Table 3.3 Monitoring Locations

Monitoring Wells				
Monitoring Position	Response Zone (m bgl)	Response Zone (m AOD)	Response Zone Strata	Monitoring Purpose
WS02	1.00 to 1.70	12.39 to 13.09	Weathered Mudstone	Groundwater
WS04	1.00 to 1.70	12.71 to 13.41	Weathered Mudstone	Groundwater
WS05	1.00 to 1.70	10.01 to 10.71	Weathered Mudstone	Groundwater
WS06	1.40 to 2.40	12.81 to 13.81	Weathered Mudstone	Groundwater
WS08	1.00 to 2.00	12.19 to 13.19	Weathered Mudstone	Groundwater
WS09	1.50 to 2.50	11.29 to 12.29	Weathered Mudstone	Groundwater
WS10	1.45 to 2.45	12.08 to 13.08	Weathered Mudstone	Groundwater
WS12	2.10 to 3.10	12.43 to 13.43	Weathered Mudstone	Groundwater
WS13	1.00 to 1.40	11.40 to 11.80	Weathered Mudstone	Groundwater
WS16	1.00 to 1.75	11.02 to 11.77	Weathered Mudstone	Groundwater

Table 3.4 summarises the analytical schedule for the samples tested together with the rationale for analysis.

Table 3.4 Analytical Strategy

Analytical Suite	Rationale	Number of Samples Tested	
		Soil	Ground water
Metals, inorganics (pH, cyanide, sulphate), and phenol.	Typically associated with commercial/industrial activity	31	8
Total Petroleum Hydrocarbons Carbon Working Group (TPH CWG) including BTEX	Typically associated with storage and use of fuels and oils	31	9
Polycyclic Aromatic Hydrocarbons (PAHs)	Typically associated with storage and use of fuels and oils	31	8

3.5 Field Observations

3.5.1 Ground Conditions

Ground conditions identified during the ground investigation are summarised in Table 3.5. A full lithological description is recorded on the logs, which are provided as Appendix 2.

Table 3.5 Ground Conditions Encountered

Stratum	Description	Depth to Base (m bgl)	Approximate Average Thickness (where encountered) (m)
Made Ground	Made Ground is present across the site, typically as a brown clayey gravel with localised fragments of brick and concrete. Suspected reworked natural material was recorded beneath Made Ground in three locations (WS06, WS09 and WS11), extending to a greater depth.	0.3-1.7 (suspected reworked natural material to 2.2)	1.0
Alluvium	Alluvium was encountered in three locations (WS03, WS05, and WS10) in the centre-north of the site, typically recorded as soft to stiff CLAY/SILT with a natural organic (alluvial) odour.	1.0-1.6, where present	0.8
Haverford Mudstone Formation	Natural ground was encountered across the site, typically as brown slightly sandy gravelly CLAY; over mudstone recovered as an angular and subangular fine to coarse GRAVEL. This is interpreted as weathered mudstone bedrock.	Proven to depths of 0.9-3.1	>1.0

Each drilling location terminated in impenetrable natural ground interpreted as weathered mudstone bedrock. Given that the site is set on a hillside, and appears to have been constructed using cut and fill earthwork techniques, suspected reworked natural material was recorded in several locations.

The ground conditions encountered across the site are generally comparable to the geology described in the British Geological Survey (BGS) map of the area.

Dark-brown and black staining with a moderate to strong 'whey-type' odour was recorded in WS02, within natural ground and groundwater. A similar odour was noted prior to drilling, associated with a nearby process.

3.5.2 Groundwater

The depth to resting groundwater level was recorded during the groundwater monitoring round. A summary of the groundwater levels and evidence for contamination observed is provided in Table 3.6.

Table 3.6 Groundwater Observations

Monitoring Well	Groundwater Encountered?	NAPL Encountered	Depth to Groundwater (m bgl)	Depth to Base (m bgl)	Groundwater Level (m AOD)	Inferred Aquifer Containing Groundwater ¹
WS02	Yes	None	1.38	1.55	12.71	Weathered Mudstone
WS04	Yes	None	0.98	1.85	13.43	Made Ground
WS05	Yes	None	0.76	1.68	10.95	Alluvium
WS06	No	NA	NA	NA	NA	NA
WS08	Yes	None	1.58	2.02	12.61	Weathered Mudstone
WS09	Yes	None	1.80	2.49	11.99	Weathered Mudstone
WS10	Yes	None	1.22	2.49	13.31	Alluvium
WS12	Yes	None	2.44	3.24	13.09	Weathered Mudstone
WS13	Yes	None	1.28	1.44	11.52	Weathered Mudstone
WS16	Yes	None	0.93	1.79	11.84	Weathered Mudstone

Notes: ¹ The inferred horizon has been identified by comparing the resting groundwater levels against the exploratory hole logs and monitoring well design.

NAPL – Non-aqueous phase liquid

Based on groundwater level monitoring data, and with consideration to the proximity of surface water features, and topography in the area of the site, the inferred groundwater flow direction is in an approximate north direction. However, the investigation suggests that shallow groundwater is not present beneath the site as a continuous aquifer, but as discontinuous groundwater bodies formed directly over competent mudstone bedrock.

4. Analytical Results (Baseline Data)

This section summarises the chemical analysis undertaken on the soil and groundwater samples collected during the baseline environmental site investigation by Ramboll in September 2023. The results represent 'baseline data' on soil and groundwater for the site.

4.1 Soil

A summary of the soil analytical results is presented in Table 4.1 on the following pages. The analytical certificates for soils are presented in full in Appendix 4.

Table 4.1 Soil Analysis Results (WS01 to WS06)

Contaminant	Unit	Sample Location and Depth (m)										
		WS01	WS02	WS02	WS03	WS03	WS04	WS04	WS05	WS05	WS06	WS06
		0.20	0.50	1.50	0.50	1.50	0.50	1.50	0.20	0.80	0.50	2.00
Inorganics and Phenols												
Arsenic	mg/kg	6.1	12.8	26.9	15	19.3	8.9	14.6	5.7	3.2	14.6	16.9
Beryllium	mg/kg	1.3	1.3	1.9	1	0.9	0.7	1	1.1	1.5	1.4	1.4
Boron (water soluble)	mg/kg	0.2	0.3	0.3	0.6	0.4	0.6	0.5	0.3	0.2	0.3	0.2
Cadmium	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Chromium (hexavalent)	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Chromium (trivalent)	mg/kg	30.9	38	41.1	39.4	44.6	34.1	36.6	92.3	42.2	40.6	40.4
Copper	mg/kg	25	28	32	28	18	31	23	31	20	27	26
Lead	mg/kg	10	16	19	29	18	29	32	25	18	63	25
Mercury	mg/kg	<0.1	0.2	0.2	<0.1	0.1	3.8	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	17.4	34.3	39.2	26.2	28.4	28.4	23.8	20.9	40.3	33	30.1
Selenium	mg/kg	<1	<1	<1	1	2	<1	2	<1	<1	<1	1
Vanadium	mg/kg	73	30	35	33	36	65	51	64	34	30	31
Zinc	mg/kg	99	81	97	66	68	122	68	99	104	85	85
Cyanide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphate	mg/l	3.1	16	64.7	56.6	104.5	89.2	15.8	13.6	5.2	92.9	5.8
pH	pH units	8.26	7.35	7.12	7.26	5.67	10.07	7.9	8.17	6.84	7.96	7.76
Phenols (screen)	mg/kg	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
PAHs												
Naphthalene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Acenaphthylene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Acenaphthene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Fluorene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Phenanthrene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	<0.03	<0.03	<0.03	<0.03	<0.03
Anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Fluoranthene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	0.32	<0.03	0.11	<0.03	<0.03	<0.03

Contaminant	Unit	Sample Location and Depth (m)										
		WS01	WS02	WS02	WS03	WS03	WS04	WS04	WS05	WS05	WS06	WS06
		0.20	0.50	1.50	0.50	1.50	0.50	1.50	0.20	0.80	0.50	2.00
Pyrene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	0.24	<0.03	0.09	<0.03	<0.03	<0.03
Benzo[a]anthracene	mg/kg	<0.06	<0.06	<0.06	<0.06	<0.06	0.22	<0.06	0.11	<0.06	<0.06	<0.06
Chrysene	mg/kg	0.05	<0.02	<0.02	<0.02	<0.02	0.22	<0.02	0.13	<0.02	<0.02	<0.02
Benzo[b]fluoranthene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	0.28	<0.05	0.16	<0.05	<0.05	<0.05
Benzo[k]fluoranthene	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	0.06	<0.02	<0.02	<0.02
Benzo[a]pyrene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	0.19	<0.04	0.13	<0.04	<0.04	<0.04
Indeno[1,2,3-cd]pyrene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	0.13	<0.04	0.1	<0.04	<0.04	<0.04
Dibenzo(ah)anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04	<0.04	<0.04
Benzo[g,h,i]perylene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	0.13	<0.04	0.13	<0.04	<0.04	<0.04
TPH CWG												
TPH aliphatic >C5-C6	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH aliphatic >C6-C8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH aliphatic >C8-C10	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1
TPH aliphatic >C10-C12	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TPH aliphatic >C12-C16	mg/kg	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
TPH aliphatic >C16-C21	mg/kg	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
TPH aliphatic >C21-C35	mg/kg	8	<7	<7	<7	<7	141	<7	37	<7	<7	<7
Total aliphatics C5-C35	mg/kg	<19	<19	<19	<19	<19	141	<19	37	<19	<19	<19
TPH aromatic >C5-C7	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH aromatic >C7-C8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH aromatic >C8-C10	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
TPH aromatic >C10-C12	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
TPH aromatic >C12-C16	mg/kg	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4
TPH aromatic >C16-C21	mg/kg	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7
TPH aromatic >C21-C35	mg/kg	97	<7	<7	<7	<7	75	<7	195	<7	<7	<7
Total aromatics C5-C35	mg/kg	97	<19	<19	<19	<19	75	<19	195	<19	<19	<19
BTEX and MTBE												
Benzene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

Contaminant	Unit	Sample Location and Depth (m)										
		WS01 0.20	WS02 0.50	WS02 1.50	WS03 0.50	WS03 1.50	WS04 0.50	WS04 1.50	WS05 0.20	WS05 0.80	WS06 0.50	WS06 2.00
Toluene	µg/kg	<5	11	<5	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylene-p and -m	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylene-o	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methyl tert-butyl ether	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5

Notes: '<' indicates less than laboratory method reporting limit

Table 4.1 (Cont.) Soil Analysis Results (WS07 to WS11)

Contaminant	Unit	Sample Location and Depth (m)										
		WS07	WS07	WS08	WS08	WS09	WS09	WS10	WS10	WS11	WS11	
		0.80	2.50	0.50	1.50	1.00	2.00	0.30	1.30	0.50	2.00	
Inorganics and Phenols												
Arsenic	mg/kg	16.5	9.6	15.8	11.9	13.3	14.8	14.5	10.1	13.6	15	
Beryllium	mg/kg	1.4	1.1	1.5	1.9	1.2	1.7	1.5	1	1.5	1.7	
Boron (water soluble)	mg/kg	0.1	0.2	0.2	0.2	<0.1	0.2	0.4	0.7	0.2	0.2	
Cadmium	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Chromium (hexavalent)	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Chromium (trivalent)	mg/kg	39.7	33.7	42	48.4	51.3	41.8	40.1	32.5	34.7	42.8	
Copper	mg/kg	24	18	24	27	12	24	54	16	22	26	
Lead	mg/kg	19	15	16	21	14	13	36	59	18	19	
Mercury	mg/kg	0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	
Nickel	mg/kg	31	30.3	29.9	37.3	21.5	40.8	31.8	16.1	27.5	37.5	
Selenium	mg/kg	2	<1	<1	<1	<1	<1	<1	<1	<1	<1	
Vanadium	mg/kg	31	29	30	37	34	34	36	45	29	35	
Zinc	mg/kg	81	74	78	102	47	100	150	46	71	96	
Cyanide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Sulphate	mg/l	<1.5	11.4	3.8	2.9	6.6	4.2	9.7	12.2	3.5	3.9	
pH	pH units	9.42	6.9	8.38	8.36	8.15	7.87	8.2	6.87	7.71	7.64	
Phenols (screen)	mg/kg	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
PAHs												
Naphthalene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Acenaphthylene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Acenaphthene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Fluorene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Phenanthrene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	<0.03	<0.03	<0.03	
Anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Fluoranthene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.21	0.1	<0.03	<0.03	
Pyrene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.4	0.07	<0.03	<0.03	

Contaminant	Unit	Sample Location and Depth (m)										
		WS07	WS07	WS08	WS08	WS09	WS09	WS10	WS10	WS11	WS11	
		0.80	2.50	0.50	1.50	1.00	2.00	0.30	1.30	0.50	2.00	
Benzo[a]anthracene	mg/kg	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.2	0.08	<0.06	<0.06	
Chrysene	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.37	0.07	<0.02	<0.02	
Benzo[b]fluoranthene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.22	0.07	<0.05	<0.05	
Benzo[k]fluoranthene	mg/kg	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.08	0.03	<0.02	<0.02	
Benzo[a]pyrene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.25	<0.04	<0.04	<0.04	
Indeno[1,2,3-cd]pyrene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.12	<0.04	<0.04	<0.04	
Dibenzo(ah)anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	<0.04	<0.04	
Benzo[g,h,i]perylene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.22	<0.04	<0.04	<0.04	
TPH CWG												
TPH aliphatic >C5-C6	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aliphatic >C6-C8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aliphatic >C8-C10	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aliphatic >C10-C12	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
TPH aliphatic >C12-C16	mg/kg	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	
TPH aliphatic >C16-C21	mg/kg	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	
TPH aliphatic >C21-C35	mg/kg	<7	<7	<7	<7	<7	<7	17	<7	<7	<7	
Total aliphatics C5-C35	mg/kg	<19	<19	<19	<19	<19	<19	<19	<19	<19	<19	
TPH aromatic >C5-C7	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aromatic >C7-C8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aromatic >C8-C10	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aromatic >C10-C12	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
TPH aromatic >C12-C16	mg/kg	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	
TPH aromatic >C16-C21	mg/kg	<7	<7	<7	<7	<7	<7	17	<7	<7	<7	
TPH aromatic >C21-C35	mg/kg	<7	<7	<7	<7	<7	<7	88	<7	<7	<7	
Total aromatics C5-C35	mg/kg	<19	<19	<19	<19	<19	<19	105	<19	<19	<19	
BTEX and MTBE												
Benzene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Toluene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	

Contaminant	Unit	Sample Location and Depth (m)										
		WS07	WS07	WS08	WS08	WS09	WS09	WS10	WS10	WS11	WS11	
		0.80	2.50	0.50	1.50	1.00	2.00	0.30	1.30	0.50	2.00	
Ethylbenzene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Xylene-p and -m	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Xylene-o	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5		
Methyl tert-butyl ether	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5		

Table 4.1 (Cont.) Soil Analysis Results (WS12 to WS16)

Contaminant	Unit	Sample Location and Depth (m)										
		WS12	WS12	WS12	WS13	WS13	WS14	WS14	WS15	WS16	WS16	
		0.30	1.00	2.00	0.50	0.80	0.50	1.20	0.50	0.30	1.00	
Inorganics and Phenols												
Arsenic	mg/kg	8.4	17.9	88.7	13.9	12.4	9.1	9.2	12.4	11.6	10.6	
Beryllium	mg/kg	1	1.3	1	1.7	1.5	1.8	1.6	1.9	1.9	1.7	
Boron (water soluble)	mg/kg	0.4	0.7	0.1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	
Cadmium	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
Chromium (hexavalent)	mg/kg	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	
Chromium (trivalent)	mg/kg	50.2	60.3	49.6	43.4	45	48.4	40.3	41.9	47.1	44.5	
Copper	mg/kg	40	25	16	24	25	23	27	32	24	25	
Lead	mg/kg	20	58	16	26	18	22	15	21	29	16	
Mercury	mg/kg	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.2	0.2	<0.1	<0.1	
Nickel	mg/kg	25.2	23.3	24.2	34.5	34.7	38.5	35.4	37.4	38.6	30.6	
Selenium	mg/kg	<1	3	<1	1	<1	<1	<1	1	<1	<1	
Vanadium	mg/kg	61	69	24	40	34	38	33	49	38	35	
Zinc	mg/kg	111	81	58	95	84	115	90	97	112	75	
Cyanide	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	
Sulphate	mg/l	97.8	31.3	12.5	14.9	17.8	16.4	13	21.6	12.8	20.7	
pH	pH units	8.56	7.63	7.34	7.57	7.99	6.83	6.27	6.86	8.23	6.84	
Phenols (screen)	mg/kg	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	
PAHs												
Naphthalene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Acenaphthylene	mg/kg	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Acenaphthene	mg/kg	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Fluorene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Phenanthrene	mg/kg	0.16	0.04	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Fluoranthene	mg/kg	0.28	0.09	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	
Pyrene	mg/kg	0.21	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	

Contaminant	Unit	Sample Location and Depth (m)										
		WS12	WS12	WS12	WS13	WS13	WS14	WS14	WS15	WS16	WS16	
		0.30	1.00	2.00	0.50	0.80	0.50	1.20	0.50	0.30	1.00	
Benzo[a]anthracene	mg/kg	0.17	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	
Chrysene	mg/kg	0.21	0.08	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Benzo[b]fluoranthene	mg/kg	0.22	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	
Benzo[k]fluoranthene	mg/kg	0.09	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	
Benzo[a]pyrene	mg/kg	0.14	0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Indeno[1,2,3-cd]pyrene	mg/kg	0.11	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Dibenzo(ah)anthracene	mg/kg	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
Benzo[g,h,i]perylene	mg/kg	0.11	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	
TPH CWG												
TPH aliphatic >C5-C6	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aliphatic >C6-C8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aliphatic >C8-C10	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aliphatic >C10-C12	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
TPH aliphatic >C12-C16	mg/kg	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	
TPH aliphatic >C16-C21	mg/kg	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	
TPH aliphatic >C21-C35	mg/kg	85	<7	<7	<7	<7	<7	<7	<7	<7	<7	
Total aliphatics C5-C35	mg/kg	85	<19	<19	<19	<19	<19	<19	<19	<19	<19	
TPH aromatic >C5-C7	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aromatic >C7-C8	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aromatic >C8-C10	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	
TPH aromatic >C10-C12	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	
TPH aromatic >C12-C16	mg/kg	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	
TPH aromatic >C16-C21	mg/kg	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	
TPH aromatic >C21-C35	mg/kg	49	<7	<7	<7	<7	<7	<7	<7	<7	<7	
Total aromatics C5-C35	mg/kg	49	<19	<19	<19	<19	<19	<19	<19	<19	<19	
BTEX and MTBE												
Benzene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Toluene	µg/kg	<5	<5	<5	<5	<5	10	<5	<5	<5	<5	

Contaminant	Unit	Sample Location and Depth (m)										
		WS12	WS12	WS12	WS13	WS13	WS14	WS14	WS15	WS16	WS16	
		0.30	1.00	2.00	0.50	0.80	0.50	1.20	0.50	0.30	1.00	
Ethylbenzene	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Xylene-p and -m	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Xylene-o	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	
Methyl tert-butyl ether	µg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	

4.1.1 Comparison of Soil Results Against Human Health Screening Criteria

Although not a requirement of the baseline data reporting, for context Ramboll has compared the analysis results against generic assessment criteria (GAC) calculated to establish potential risks to human health considering a commercial/industrial site use.

No elevated concentrations were detected.

The soil baseline data is summarised as follows:

- **Metals** were detected at low concentrations and none exceeded the respective GAC for commercial/industrial site use.
- **pH values** ranged from slightly acidic pH 5.67 (WS03, 1.50m) to slightly alkaline pH 9.42 (WS07, 0.80m) and 10.07 (WS04, 0.50m). Remaining pH values were between pH 6 and pH 9.
- **Total Sulphate** was detected at concentrations above the method reporting limit (MRL) in all samples submitted for analysis. The highest concentration of total sulphate detected was 104.5mg/l (WS03, 1.50m).
- **Total Cyanide** was not detected at concentrations above the MRL in any of the samples analysed.
- **Speciated Polycyclic Aromatic Hydrocarbons** (PAHs) were detected in seven analysed samples. Although PAHs have been detected, the concentrations are not elevated above human health screening criteria considering a commercial / industrial site use.
- **Total Petroleum Hydrocarbons** by Criteria Working Group Methodology (TPH CWG) speciated hydrocarbon bands were detected in five analysed samples. A maximum total TPH (C5-C35) of 232mg/kg was recorded in the sample from WS05 (0.20m). The BTEX compound, toluene was detected above the MRL in one soil sample (WS02, 0.50m). The TPH CWG concentrations detected are not elevated above human health screening criteria considering a commercial/industrial site use.

Ramboll's methodology for deriving GAC is based on the Contaminated Land Exposure Assessment (CLEA) approach. Ramboll has derived GAC for the interpretation of soil and groundwater chemical analyses. The GAC are threshold-based screening criteria below which a significant risk is not considered to be present. Contaminants at concentrations above the GAC do not infer an unacceptable risk; rather that further assessment would be required to more fully understand potential contamination risks. Given that no elevated concentrations were identified, no further assessment is required.

4.1.2 Asbestos

A fragment of suspected asbestos containing material (ACM) was identified in WS10 at a depth of approximately 0.30m (approx. 50x30x10mm). Laboratory analysis confirmed the material as asbestos containing, described by the laboratory as chrysotile containing asbestos cement.

Asbestos fibres (chrysotile and amosite) in soil were identified by the laboratory in one analysed sample (WS04, 0.50m). This material is identified in the borehole logs as Made Ground that contains fragments of construction/demolition type materials. The Made Ground in this location is overlain by an approximately 0.22m thick concrete slab.

4.2 Groundwater

A summary of the soil analytical results is presented in Table 4.2 on the following pages. The analytical certificates for soils are presented in full in Appendix 4.

Table 4.2 Groundwater Analysis Results

Contaminant	Unit	Sample Location								
		WS02	WS04	WS05	WS08	WS09	WS10	WS12	WS13	WS16
Inorganics and Phenols										
Arsenic	µg/l	NA	3.4	<0.9	<0.9	16.2	1.2	<0.9	<0.9	<0.9
Beryllium	µg/l	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	µg/l	NA	29	30	48	38	29	41	35	32
Cadmium	µg/l	NA	<0.03	<0.03	0.12	0.1	0.07	<0.03	<0.03	0.07
Chromium (hexavalent)	µg/l	NA	<6	<6	<6	<6	<2	<6	<6	<2
Chromium (trivalent)	µg/l	NA	1.8	<0.2	0.4	1.5	<0.2	<0.2	3.6	0.3
Copper	µg/l	NA	2	1	2	4	5	<1	2	2
Lead	µg/l	NA	<0.4	<0.4	0.5	1.3	<0.4	<0.4	<0.4	<0.4
Mercury	µg/l	NA	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel	µg/l	NA	1.9	4.2	4.1	190.7	16.1	5.5	4.1	17.7
Selenium	µg/l	NA	12.8	3.7	<1.2	42.8	<1.2	18.9	36.4	13.5
Vanadium	µg/l	NA	10	<0.6	<0.6	1.7	<0.6	<0.6	0.8	<0.6
Zinc	µg/l	NA	2.2	3	2.7	39.1	2.5	7.1	4.8	2.8
Cyanide	mg/l	NA	<0.20	<0.20	<0.20	<0.20	<0.01	<0.20	<0.20	<0.01
Sulphate	mg/l	NA	42.2	30.1	18.4	133	27.9	112.4	145.7	118.4
Ammoniacal Nitrogen as N	mg/l	NA	0.16	0.08	0.19	97.03	3.82	0.12	<0.03	0.3
pH	pH units	NA	8.07	7.53	7.76	7.60	7.50	7.33	8.03	7.20
Phenols	mg/l	3.13	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15
PAHs										
Naphthalene	µg/l	0.11	0.01	<0.01	<0.01	0.05	<0.1	<0.01	<0.01	<0.1
Acenaphthylene	µg/l	0.009	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Acenaphthene	µg/l	0.011	0.014	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Fluorene	µg/l	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenanthrene	µg/l	0.041	0.199	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Anthracene	µg/l	<0.005	0.078	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Contaminant	Unit	Sample Location								
		WS02	WS04	WS05	WS08	WS09	WS10	WS12	WS13	WS16
Fluoranthene	µg/l	0.058	1.41	<0.005	<0.005	<0.005	<0.005	0.041	<0.005	<0.005
Pyrene	µg/l	0.05	1.31	<0.005	<0.005	<0.005	<0.005	0.055	<0.005	<0.005
Benzo(a)anthracene	µg/l	0.008	0.881	<0.005	<0.005	0.03	<0.005	<0.005	<0.005	<0.005
Chrysene	µg/l	0.04	1.15	<0.005	<0.005	0.061	<0.005	<0.005	<0.005	<0.005
Benzo(b)fluoranthene	µg/l	0.087	2.84	<0.005	<0.005	0.063	<0.008	0.033	<0.005	<0.008
Benzo(k)fluoranthene	µg/l	<0.005	1.03	<0.005	<0.005	0.018	<0.008	0.016	<0.005	<0.008
Benzo(a)pyrene	µg/l	<0.002	1.74	<0.002	<0.002	<0.002	<0.005	0.025	<0.002	<0.005
Indeno(123cd)pyrene	µg/l	<0.005	1.56	<0.005	<0.005	<0.005	<0.005	0.021	<0.005	<0.005
Dibenzo(ah)anthracene	µg/l	<0.005	0.29	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(ghi)perylene	µg/l	<0.005	1.46	<0.005	<0.005	0.026	<0.005	<0.005	<0.005	<0.005
TPH CWG										
TPH aliphatic >C5-C6	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH aliphatic >C6-C8	µg/l	143	<10	<10	<10	<10	<10	<10	<10	<10
TPH aliphatic >C8-C10	µg/l	<10	<10	12	<10	<10	<10	<10	<10	<10
TPH aliphatic >C10-C12	µg/l	NA	<5	<5	<5	<5	<5	<5	<5	54
TPH aliphatic >C12-C16	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	360
TPH aliphatic >C16-C21	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	660
TPH aliphatic >C21-C35	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	120
Total aliphatics C5-C35	µg/l	NA	<10	12	<10	<10	<10	<10	<10	1194
TPH aromatic >C5-C7	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH aromatic >C7-C8	µg/l	462	<10	<10	<10	<10	<10	<10	<10	<10
TPH aromatic >C8-C10	µg/l	<10	<10	<10	<10	<10	<10	<10	<10	<10
TPH aromatic >C10-C12	µg/l	NA	<5	<5	<5	<5	<5	<5	<5	<5
TPH aromatic >C12-C16	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	130
TPH aromatic >C16-C21	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	250
TPH aromatic >C21-C35	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	<10
Total aromatics C5-C35	µg/l	NA	<10	<10	<10	<10	<10	<10	<10	380
Total aliphatics and aromatics C5-C35	µg/l	NA	<10	12	<10	<10	<10	<10	<10	1574

		Sample Location								
Contaminant	Unit	WS02	WS04	WS05	WS08	WS09	WS10	WS12	WS13	WS16
BTEX and MTBE										
Benzene	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5
Toluene	µg/l	462	<5	<5	<5	<5	<5	<5	<5	<5
Ethylbenzene	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylene-p and -m	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5
Xylene-o	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5
Methyl tert-butyl ether	µg/l	<5	<5	<5	<5	<5	<5	<5	<5	<5

Notes: '<' indicates less than laboratory method reporting limit

NA – Not applicable, insufficient sample volume for analysis

4.2.1 Comparison of Groundwater Results Against Human Health Screening Criteria

Although not a requirement of the baseline data reporting, for context the groundwater analytical results obtained during this investigation have been screened against the GAC for human health in a commercial/industrial scenario, via the vapour migration pathway.

No elevated concentrations were detected.

4.2.2 Comparison of Groundwater Results Against Water Environment Screening Criteria

Ramboll has compared the analysis results according to commonly accepted UK guidelines including country specific water regulations and the Environmental Quality Standards (EQS) defined in European legislation such as the Water Framework Directive (WFD) (2000/60/EC) considering the watercourse adjacent north of the site as a potential receptor.

For those determinands included in the analytical suite which do not have corresponding European screening criteria derived from the above sources, UK-specific GAC are utilised. Where these are not available reference is made to other international guidance.

The groundwater baseline data is summarised as follows:

- **Metals** were generally detected at low concentrations. However, nickel was detected in WS09 at a total dissolved concentration of 190.7µg/l. This concentration equates to a bioavailable concentration of 24.3µg/l when calculated using a metal bioavailability assessment tool (M-BAT), which exceeds the EQS of 4µg/l. Sources of nickel have not been identified in processes carried out at the site; therefore, this localised elevated concentration is likely to be associated with the presence of overlying Made Ground at this location.
- **pH values** were all close to neutral and ranged from pH 7.20 (WS16) to pH 8.07 (WS04).
- **Total Sulphate** was detected at concentrations above the method reporting limit in all samples submitted for analysis. The highest concentration of sulphate was 145.7mg/l in WS13. The maximum recorded concentration remains below the EQS of 400mg/l.
- **Total Cyanide** was not detected at concentrations above the MRL in any of the samples analysed.
- **Speciated Polycyclic Aromatic Hydrocarbons (PAHs)** were detected in four of the nine analysed samples. At least one PAH compound has exceeded the relevant EQS in boreholes WS02, WS04, and WS12, typically associated with the presence of Made Ground. The EQS values used are very conservative; and the concentrations detected are not indicative of gross or widespread contamination.
- **Total Petroleum Hydrocarbons** by Criteria Working Group Methodology (TPH CWG) were detected in three of the nine analysed samples (WS02, WS05, and WS16). In the absence of appropriate EQS, TPH concentrations have been compared to the drinking water standards (DWS). Where detected, TPH concentrations exceed the DWS, which is considered to be overly conservative given that groundwater beneath the site is not abstracted for potable supply.
- **Toluene** was detected in the groundwater sample from WS02 at a concentration of 462µg/l, which exceeds the relevant screening criteria of 74µg/l. Other BTEX compounds (benzene, ethylbenzene and xylene) were not detected above the method reporting limit in any groundwater samples. Toluene was detected at a low concentration in soil at this location. In

the absence of any sources of BTEX compounds within processes at the site, toluene in groundwater is likely associated with low concentrations of toluene present within Made Ground.

5. Conclusions

The site operates under Environmental Permit Ref: EPR/XP3830UR, which was last issued by NRW in April 2022. The key operations regulated in this permit are the processing of milk to produce cheese and whey products, the effluent treatment process, and associated combustion processes. Some refrigeration activity is carried out within the installation to preserve food materials.

Within the latest issue of the Environmental Permit, Table S1.3 stipulates Improvement Programme requirements. *Improvement Condition 8 (IC8) requires the Operator to complete and submit for approval: a baseline report containing information necessary to determine the current state of soil and groundwater contamination, so as to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.*

Ramboll has undertaken a baseline environmental site investigation to address the above mentioned requirement, designed to target the priority potential contamination sources identified within the ERA. The investigation concentrated on shallow soil and groundwater (where present).

The investigation comprised drilling of sixteen windowless liner system boreholes to depths of up to 3.10m bgl. Soil samples were recovered from each of the exploratory locations based at regular intervals and/or changes of strata; and were analysed at an independent MCERTS accredited laboratory for a range of determinands associated with site activities. Ten of the boreholes were installed as groundwater monitoring wells; and a round of groundwater monitoring was carried out, during which nine samples of groundwater were collected.

Ground conditions encountered during the investigation comprised Made Ground, present across the site, typically as a brown clayey gravel with localised fragments of brick and concrete. Suspected reworked natural material was also recorded beneath Made Ground in several locations. Natural ground of Alluvium was encountered in three locations in the centre-north of the site; over Haverfordwest Mudstone Formation, encountered across the site recovered as gravelly clay and gravel. All boreholes terminated in impenetrable natural ground interpreted as weathered mudstone bedrock.

Groundwater was encountered in nine of the ten monitoring wells, likely present as shallow discontinuous groundwater bodies formed directly over competent mudstone bedrock. However, it was determined that if present, groundwater flow would be in an approximately northerly direction, towards nearby surface water features and in line with topography of the site and surrounding area.

Chemical analysis undertaken on the soil and groundwater samples collected during the baseline environmental site investigation are presented within this report; and represent 'baseline data' on soil and groundwater for the site. The information contained within this report determines the current state of soil and groundwater contamination; and is considered sufficient to enable a quantified comparison to be made with the state of soil and groundwater contamination upon definitive cessation of activity.

Although not a requirement of the baseline data reporting, for context soil and groundwater analytical results have been screened against relevant GAC for human health in a commercial/industrial scenario. No elevated concentrations were detected.

When compared to screening criteria for the assessment of the water environment, nickel and some hydrocarbons were identified as exceeding the screening criteria in at least one location at

the site. Whilst a generic qualitative risk assessment does not form part of the scope of this assessment, concentrations of contaminants identified in groundwater beneath the site detected are not indicative of gross or widespread contamination.

Appendix 1

Figure 1: Site Layout Plan

Figure 2: Site Investigation Locations

Figure 3: Groundwater Contour Plot

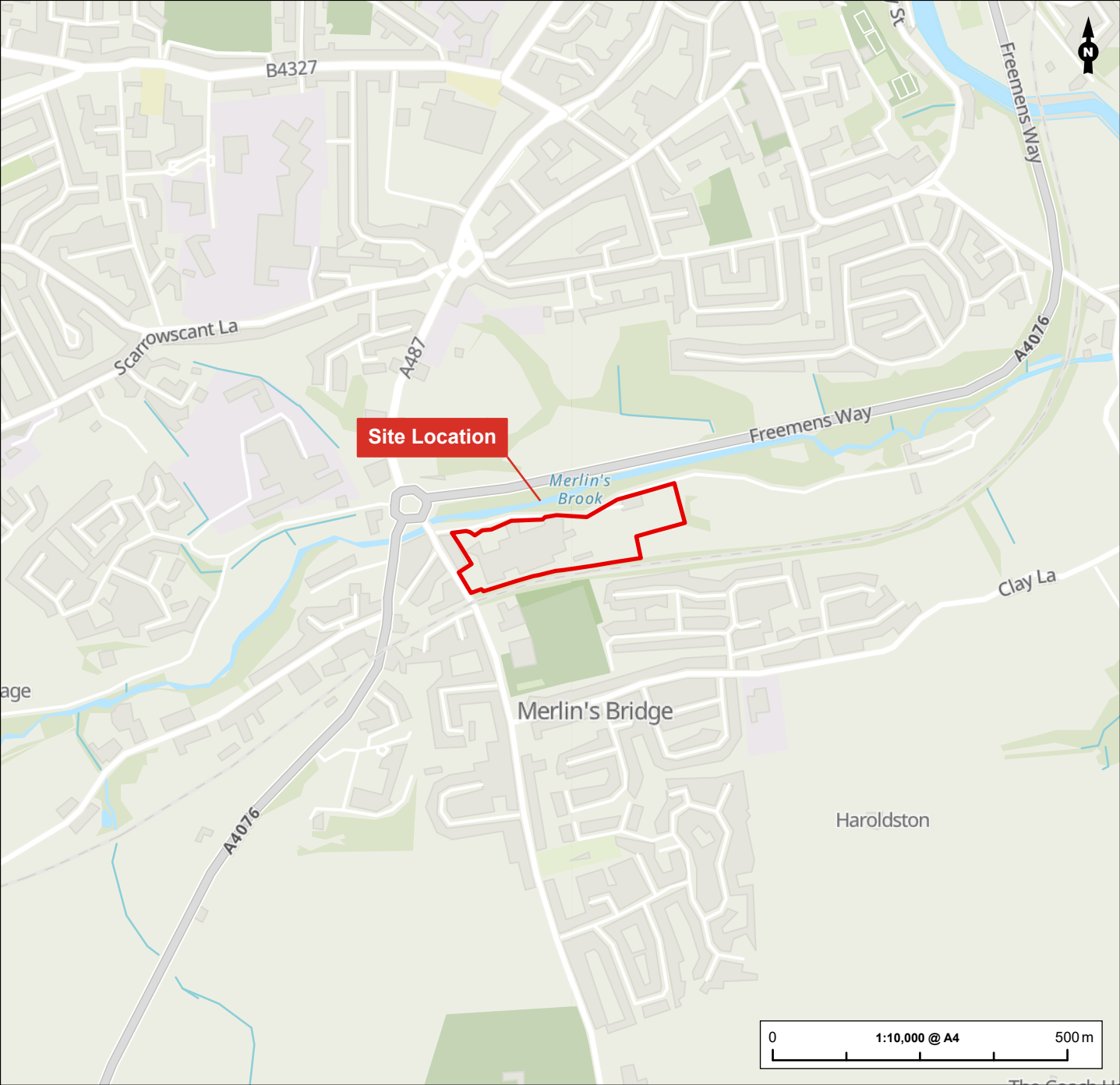
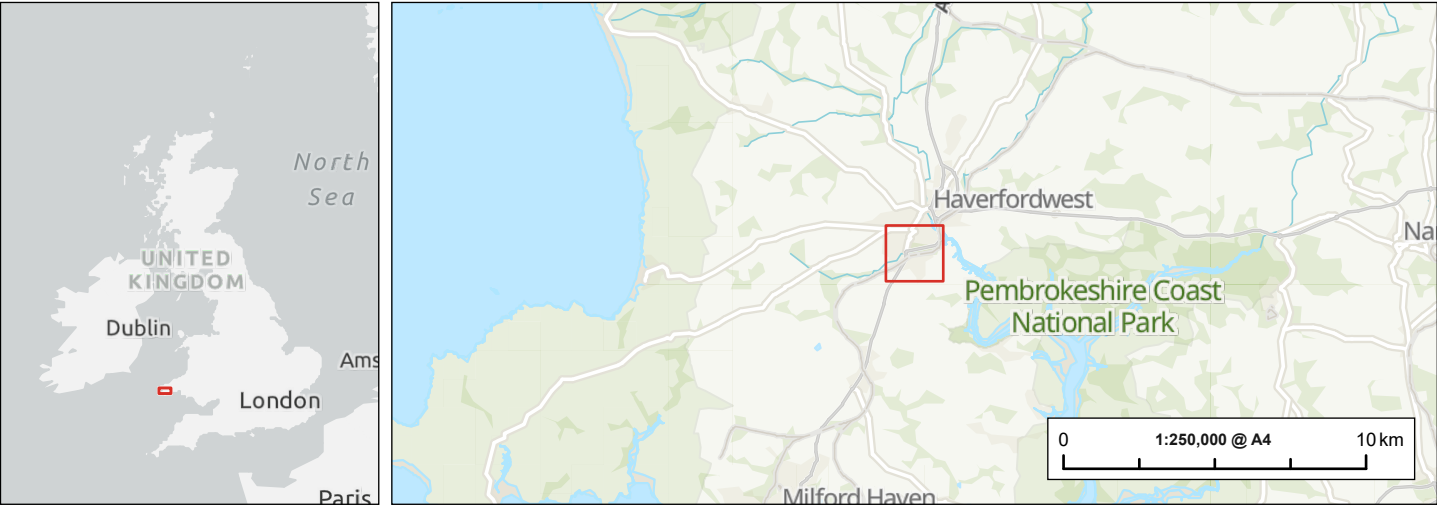


	Figure Title Site Location Plan	Project Name Baseline Investigation Pembrokeshire	Date October 2023	
	Client First Milk Limited	Project No./File ID 1620015885 / REH2023N01555	Prepared By CT	Figure No. 1
			Scale As Shown	Revision 1.0



Legend

Installation Boundary

Window Sample

Figure Title

Borehole Location Plan

Project Name

Baseline Investigation
Pembrokeshire

Project No./Filery ID

1620015885 / REH2023N01555

Date

October 2023

Figure No.

2

Revision

1.0

Prepared By

CT

Scale

1:1,500 @A3

Client

First Milk Limited

RAMBOLL



Legend

- Installation Boundary
- Groundwater Contour (mAOD)
- Window Sample

Figure Title
Groundwater Contour Plot

Project Name
Baseline Investigation
Pembrokeshire

Project No./Filery ID
1620015885 / REH2023N01555

Date October 2023	Figure No. 3	Revision 1.0
Prepared By CT	Scale 1:1,500 @A3	

Client
First Milk Limited

1620015885-RAM-MA-SS-00003_GroundwaterContour_01.pagx

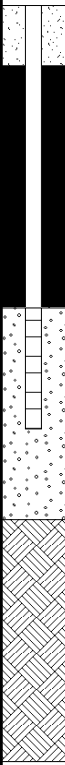
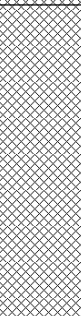
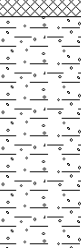
Appendix 2

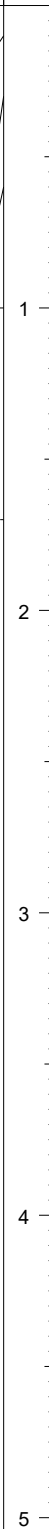
Factual Site Investigation Information

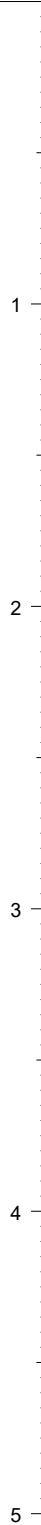
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Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194805.03 - 214534.18		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 12.44		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 14/09/2023 - 14/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.20	ES	PID=0	0.10	12.34		MADE GROUND: Asphalt. MG		1	
					0.30	12.14		MADE GROUND: Dense light grey sandy angular and subangular fine and medium gravel of limestone (subbase). MG			
					0.90	11.54		Recovered as light grey angular fine to coarse GRAVEL of mudstone. MST			
							End of borehole at 0.90 m			2	
										3	
										4	
										5	
Remarks Borehole terminated on suspected mudstone bedrock.											

RAMBOLL					Borehole Log			Borehole No. WS02 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194820.32 - 214482.75		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 14.09		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 14/09/2023 - 14/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.50	ES	PID=2	0.29	13.80		MADE GROUND: Concrete (cored). MG		1 2 3 4 5	
				PID=5	0.60	13.49		MADE GROUND: Dense light brown slightly clayey angular and subangular fine to coarse gravel of mixed lithology. MG			
		1.50	ES	PID=3	1.60	12.49		Firm dark brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse predominantly mudstone. Localised black staining and moderate to strong 'whey-type' odour. MST			
					1.70	12.39		Recovered as dense dark brown slightly sandy slightly clayey angular and subangular fine to coarse GRAVEL of mudstone. Moderate to strong 'whey-type' odour. MST			
End of borehole at 1.70 m											
Remarks Borehole terminated on suspected mudstone bedrock.											

RAMBOLL					Borehole Log			Borehole No. WS03 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194850.69 - 214520.44		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 14.86		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 13/09/2023 - 13/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.50	ES	PID=1	0.25	14.61		MADE GROUND: Concrete (cored). MG		1	
				PID=1	0.40	14.46		MADE GROUND: Dense grey slightly sandy angular fine to coarse gravel (subbase). MG			
		1.50	ES	PID=0	1.50	13.36		Soft brown locally mottled black and red slightly sandy slightly gravelly CLAY/SILT. Slight natural organic (alluvial) odour. ALV			
					1.80	13.06		Dense brown slightly sandy clayey angular and subangular fine to coarse GRAVEL of mudstone. MST			
								End of borehole at 1.80 m		2	
											3
											4
											5
Remarks Borehole terminated on suspected mudstone bedrock.											

RAMBOLL					Borehole Log			Borehole No. WS04 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194931.20 - 214550.85		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 14.41		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 13/09/2023 - 13/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.22			14.19		MADE GROUND: Concrete (cored). MG		1		
		0.50	ES	PID=2				MADE GROUND: Dense brown slightly sandy clayey gravel with many fragments of brick and concrete. MG			
		1.30		PID=2		13.11		Firm dark brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse predominantly mudstone. MST		2	
		1.50	ES	PID=0				Dense dark brown slightly sandy slightly clayey subangular and subrounded fine to coarse GRAVEL of mudstone. MST			
		2.10		PID=1		12.31					
	2.50				11.91	End of borehole at 2.50 m				3	
										4	
										5	
Remarks Borehole terminated on suspected mudstone bedrock.											

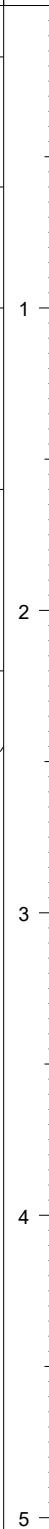
RAMBOLL					Borehole Log			Borehole No. WS05 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194982.91 - 214554.95		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 11.71		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 14/09/2023 - 14/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.20	ES	PID=1	0.10	11.61		MADE GROUND: Asphalt. MG			
					0.30	11.41		MADE GROUND: Dense grey and black slightly clayey sandy subangular and subrounded fine to coarse gravel of predominantly mudstone with rare fragments of concrete and brick. MG			
		0.50	ES		0.60	11.11		Stiff green-brown slightly gravelly CLAY with a slight natural-organic (alluvial) odour. ALV			
		0.80	ES					Firm light grey mottled green-brown slightly sandy CLAY. ALV			
					PID=1	1.00	10.71		Recovered as dense brown slightly sandy very clayey angular and subangular fine and medium GRAVEL of mudstone. MST		
				PID=0	1.70	10.01	End of borehole at 1.70 m				
Remarks Borehole terminated on suspected mudstone bedrock.											

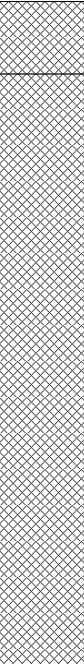
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Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194838.21 - 214446.90		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 15.21		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 13/09/2023 - 13/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.50	ES	PID=2	0.20	15.01		MADE GROUND: Concrete (cored). MG			
				PID=0				MADE GROUND: Firm brown slightly gravelly sandy clay. Sand os fine to coarse. MG			
								PID=0	Medium dense brown clayey very gravelly fine to coarse SAND. Gravel is angular and subangular fine and medium predominantly mudstone. Possible reworked natural material. RWN		
		2.00	ES	PID=0	2.20	13.01		Dense brown slightly clayey very sandy angular and subangular fine and medium GRAVEL of predominantly mudstone. MST			
				PID=0				End of borehole at 2.40 m			
Remarks Borehole terminated on suspected mudstone bedrock.											

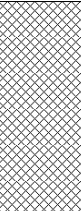
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Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194894.03 - 214462.29		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 15.25		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 13/09/2023 - 13/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.80	ES	PID=0	0.20	15.05		MADE GROUND: Concrete (cored). MG		1	
				PID=0	0.50	14.75		MADE GROUND: Dense grey slightly sandy angular fine to coarse gravel (subbase). MG			
								MADE GROUND: Soft brown slightly sandy slightly gravelly clay. MG			
		PID=0	1.00	14.25		Firm brown mottled light grey slightly sandy gravelly CLAY. Gravel is angular to subrounded fine to coarse predominantly mudstone. Possible reworked natural material. RWN					
		PID=13	1.80	13.45		Firm orange-brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse mudstone. MST					
		PID=3	2.00	13.25		Recovered as dense wet orange-brown slightly sandy clayey GRAVEL of angular and subangular fine to coarse mudstone. MST					
		2.50	ES	PID=0	3.00	12.25		End of borehole at 3.00 m		3	
											4
											5
Remarks Borehole terminated on suspected mudstone bedrock.											

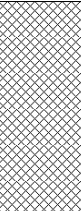
					Borehole Log			Borehole No. WS08 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194944.79 - 214482.46		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 14.19		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 12/09/2023 - 12/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.20	13.99		MADE GROUND: Concrete (cored). MG			
								MADE GROUND: Firm brown locally mottled grey slightly sandy slightly gravelly CLAY. Possible reworked natural material. RWN			
								Recovered as dense wet brown slightly sandy clayey subangular and subrounded fine and medium GRAVEL of mudstone. MST			
							End of borehole at 2.00 m				
					2.00	12.19					
Remarks Borehole terminated on suspected mudstone bedrock.											

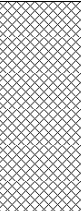
RAMBOLL					Borehole Log			Borehole No. WS09 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194973.51 - 214519.79		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 13.79		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 12/09/2023 - 12/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
					0.18	13.61		MDE GROUND: Concrete (cored). MG			
				PID=0					MADE GROUND: Soft brown locally mottled grey slightly sandy slightly gravelly clay. Possible reworked natural material, RWN		
		1.00	ES	PID=0							
				PID=1							
							1.70	12.09			Firm brown slightly sandy gravelly CLAY. Gravel is angular and subangular fine and medium mudstone. MST
		2.00	ES	PID=0						2	
					2.20	11.59		Recovered as dense wet orange-brown slightly sandy clayey angular and subangular fine and medium GRAVEL of mudstone. MST			
					2.50	11.29		End of borehole at 2.50 m			
Remarks Borehole terminated on suspected mudstone bedrock.											

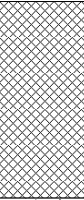
RAMBOLL					Borehole Log			Borehole No. WS10 Sheet 1 of 1				
Project Name:		Baseline Environmental Ground Investigation		Project No. 1620015885		Co-ords: 194991.85 - 214510.08		Hole Type WLS				
Location:		Haverfordwest, SA61 1JN				Level: 14.53		Scale 1:25				
Client:		First Milk Ltd				Dates: 12/09/2023 - 12/09/2023		Logged By RH				
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description				
		Depth (m)	Type	Results								
		0.30	ES	PID=1	0.17	14.36		MADE GROUND: Concrete (cored). MG				
		1.30	ES	PID=2	1.60	12.93		MADE GROUND: Firm brown slightly sandy gravelly clay with rare fragments of brick. MG				
								2.20		12.33		Suspected asbestos containing material (ACM). Asbestos cement sheet fragment. Approx. 50x30x10mm.
												2.45
								2.45		12.08		
		2.45	12.08		Stiff orange-brown mottled light grey slightly sandy slightly gravelly CLAY. MST							
2.45	12.08					Dense wet orange-brown slightly sandy clayey angular and subangular fine and medium GRAVEL of mudstone. MST						
		End of borehole at 2.45 m										
Remarks Borehole terminated on suspected mudstone bedrock.												

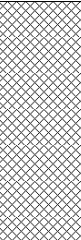
					Borehole Log			Borehole No. WS11 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 194972.53 - 214483.44		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 14.16		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 12/09/2023 - 12/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.50	ES	PID=0	0.24	13.92		MADE GROUND: Concrete (cored). MG		1	
				PID=0				MADE GROUND: Firm brown locally mottled grey slightly sandy slightly gravelly clay. Possible reworked natural material. MG			
				PID=0							
		2.00	ES	PID=0	2.20	11.96		Hard grey slightly sandy gravelly CLAY. Gravel is angular and subangular fine to coarse mudstone. MST		2	
				PID=0							
					2.90	11.26		End of borehole at 2.90 m		3	
										4	
										5	
Remarks Borehole terminated on suspected mudstone bedrock.											

					Borehole Log			Borehole No. WS12 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 195051.03 - 214529.07		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 15.53		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 12/09/2023 - 12/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30	ES	PID=1	0.70	14.83		MADE GROUND: Surface dressing of gravel over brown slightly sandy gravelly clay. Gravel is angular and subangular fine to coarse of mixed lithology with rare fragments of concrete and brick. MG		1	
		1.00	ES	PID=4				MADE GROUND: Firm dark brown slightly sandy gravelly clay with rare fragments of brick. MG			
				PID=2	1.50	14.03		Stiff orange-brown slightly sandy slightly gravelly CLAY. MST		2	
		2.00	ES	PID=1	2.10	13.43		Very stiff orange-brown mottled grey slightly sandy slightly gravelly CLAY. MST			
				PID=0	3.00	12.53		Recovered as damp dark grey slightly sandy angular and subangular fine to coarse GRAVEL of mudstone. MST		3	
			3.10	12.43	End of borehole at 3.10 m						
Remarks Borehole terminated on suspected mudstone bedrock.											

RAMBOLL				Borehole Log				Borehole No. WS13 Sheet 1 of 1		
Project Name: Baseline Environmental Ground Investigation				Project No. 1620015885		Co-ords: 195076.17 - 214582.08		Hole Type WLS		
Location: Haverfordwest, SA61 1JN				Level: 12.80		Scale 1:25		Logged By RH		
Client: First Milk Ltd				Dates: 11/09/2023 - 11/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description		
		Depth (m)	Type	Results						
		0.30	ES	PID=1				MADE GROUND: Surface dressing of gravel over brown clayey slightly sandy angular and subangular fine to coarse gravel of predominantly mudstone. MG	1	
		0.80	ES	PID=0	0.70	12.10		Firm brown slightly sandy slightly gravelly CLAY. MST		
					1.00	11.80		Recovered as damp dark grey angular and subangular fine to coarse GRAVEL of mudstone. MST		
					1.40	11.40	----- End of borehole at 1.40 m		5	
Remarks Borehole terminated on suspected mudstone bedrock.										

					Borehole Log			Borehole No. WS14 Sheet 1 of 1					
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 195133.11 - 214593.04		Hole Type WLS				
Location: Haverfordwest, SA61 1JN					Level: 12.77		Scale 1:25		Logged By RH				
Client: First Milk Ltd					Dates: 11/09/2023 - 11/09/2023								
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description					
		Depth (m)	Type	Results									
		0.50	ES	PID=0	0.70	12.07		MADE GROUND: Gravel surface dressing over brown clayey slightly sandy angular and subangular fine to coarse gravel of predominantly mudstone. MG		1			
		1.20	ES	PID=1	0.90	11.87					   	MADE GROUND: Stiff red-brown and grey-brown slightly sandy gravelly clay. Gravel is angular and subangular fine to coarse mudstone. MG Stiff friable orange-brown and light grey slightly sandy gravelly CLAY. Gravel is subangular fine and medium predominantly mudstone. MST Recovered as dark grey angular and subangular fine to coarse GRAVEL. MST End of borehole at 1.50 m	
					1.40	11.37							
					1.50	11.27							
Remarks Borehole terminated on suspected mudstone bedrock.													

					Borehole Log			Borehole No. WS15 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 195084.93 - 214547.33		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 12.73		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 11/09/2023 - 11/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.50	ES	PID=0	0.65	12.08		MADE GROUND: Gravel surface dressing over slightly sandy angular and subangular fine to coarse gravel of predominantly mudstone. MG	1 2 3 4 5		
					0.85	11.88		Recovered as angular and subangular fine to coarse GRAVEL of mudstone. MST			
		End of borehole at 0.85 m									
Remarks Borehole terminated on suspected mudstone bedrock.											

RAMBOLL					Borehole Log			Borehole No. WS16 Sheet 1 of 1			
Project Name: Baseline Environmental Ground Investigation					Project No. 1620015885		Co-ords: 195156.20 - 214586.02		Hole Type WLS		
Location: Haverfordwest, SA61 1JN					Level: 12.77		Scale 1:25		Logged By RH		
Client: First Milk Ltd					Dates: 11/09/2023 - 11/09/2023						
Well	Water Strikes	Samples and In Situ Testing			Depth (m)	Level (m)	Legend	Stratum Description			
		Depth (m)	Type	Results							
		0.30	ES	PID=0	0.80	11.97		MADE GROUND: Gravel surface dressing over brown clayey slightly sandy angular medium and coarse gravel of mudstone with rare subangular cobbles of mudstone. MG		1 2 3 4 5	
		1.00	ES	PID=0							
					PID=0	1.60	11.17		Very stiff orange-brown mottled light grey slightly sandy slightly gravelly CLAY. MST <i>Damp and light grey in colour. Locally soft.</i>		
					PID=0	1.75	11.02		Recovered as brown and dark brown angular and subangular fine to coarse GRAVEL of mudstone. MST End of borehole at 1.75 m		
Remarks Borehole terminated on suspected mudstone bedrock.											

Appendix 3 Field Methods

In the preparation of this report Ramboll has made reference to UK regulatory guidance and methodologies, including, but not limited to: Land Contamination: Risk Management⁴ (LCRM); BS5930:2015+A1:2020 Code of Practice for site Investigation⁵; and BS10175:2011 + A2:2017 Code of Practice for the Investigation of Potentially Contaminated Sites⁶.

Investigatory Locations

Investigatory locations were marked out and cleared by a specialist underground service clearance contractor before the start of intrusive works, in accordance with Ramboll's Health and Safety procedures. Supervision of drilling works was undertaken by a professional engineer, who logged the soil arisings, collected samples and completed in-situ testing;

Where boreholes were drilled, these were undertaken to facilitate the collection of shallow and deeper soil and groundwater samples. Selected boreholes were installed with monitoring wells for assessment of ground gas and, where present groundwater conditions .

Trial pits were excavated using a mechanical excavator to facilitate the collection of shallow soil samples and allow the assessment of ground conditions for environmental purposes;

Hand dug pits were dug, to facilitate the collection of shallow soil samples and allow the assessment of ground conditions for environmental purposes.

Sampling

Samples of various environmental media were collected in accordance with BS 10175 ³.

Samples and were stored within appropriate sample containers and forwarded to an independent analytical laboratory. Samples were placed in containers supplied by the laboratory appropriate to the type of analysis being undertaken and stored in cool boxes with ice packs. All samples were dispatched accompanied by chain of custody documentation. The laboratory selected to perform the analysis is accredited by UKAS to ISO 17025. Internal quality assurance checks are carried out by the laboratory data prior to the laboratory certificates being issued.

Each of the monitoring/sampling wells that were constructed were developed on completion. Prior to sampling, the depth to the resting groundwater level (where present) and base of the monitoring wells were measured using an electronic interface probe, wells were then purged before samples were taken.

Testing

Where soil samples were tested on site for volatile organic compounds (VOCs), testing was completed using a photo-ionisation detector (PID). Each sample was placed into a sealed plastic bag and agitated. The PID was then inserted into the headspace and the total VOC reading recorded. The PID screens for a wide range of VOCs but does not indicate a specific compound; therefore, the results of the PID screening provide a semi-quantitative indication of the concentration of VOCs present in soil pore spaces.

Where relevant testing was undertaken by the laboratory to MCerts standards. Selected samples were scheduled for analysis for a suite of contaminants designed to be reflective of the site's historical and contemporary uses, and specifically to investigate the PCLs identified in the PRA (as listed in Section 3.2).

⁴ Environment Agency (2020) Land Contamination: Risk Management

⁵ British Standards (2015) Code of Practice for site Investigation BS5930:2015+A1:2020

⁶ British Standards (2017) Code of Practice for the Investigation of Potentially Contaminated sites. BS10175:2011 + A2:2017

Monitoring

Wells were of appropriate construction for the ground conditions encountered. The well designs are detailed within the appended borehole logs.

Appendix 4 Laboratory Certificates

Ramboll
8 Village Way
Green Meadow Springs
Cardiff
United Kingdom
CF15 7NE



4225



Attention : Rob Hodgson
Date : 25th September, 2023
Your reference : 1620015885
Our reference : Test Report 23/15156 Batch 1
Location : First Milk Baseline Investigation
Date samples received : 14th September, 2023
Status : Final Report
Issue : 1

Nineteen samples were received for analysis on 14th September, 2023 of which nineteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 66.174 kg of CO2

Scope 1&2&3 emissions - 156.385 kg of CO2

Authorised By:



Simon Gomery BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15156

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

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15156

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

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15156

Report : Solid

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

EMT Sample No.	27-29	31-32	33-35	36-37	38-40	41-42	43-45	46-47			Please see attached notes for all abbreviations and acronyms		
Sample ID	WS10	WS10	WS09	WS09	WS08	WS08	WS11	WS11					
Depth	0.30	1.30	1.00	2.00	0.50	1.50	0.50	2.00					
COC No / misc													
Containers	V J B	V J	V J B	V J	V J B	V J	V J B	V J					
Sample Date	12/09/2023 11:00	12/09/2023 11:20	12/09/2023 12:20	12/09/2023 12:30	12/09/2023 15:00	12/09/2023 15:15	12/09/2023 16:00	12/09/2023 16:30					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1			LOD/LOR	Units	Method No.
Date of Receipt	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023					
Arsenic #	14.5	10.1	13.3	14.8	15.8	11.9	13.6	15.0			<0.5	mg/kg	TM30/PM15
Beryllium	1.5	1.0	1.2	1.7	1.5	1.9	1.5	1.7			<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Chromium #	40.1	32.5	51.3	41.8	42.0	48.4	34.7	42.8			<0.5	mg/kg	TM30/PM15
Copper #	54	16	12	24	24	27	22	26			<1	mg/kg	TM30/PM15
Lead #	36	59	14	13	16	21	18	19			<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1			<0.1	mg/kg	TM30/PM15
Nickel #	31.8	16.1	21.5	40.8	29.9	37.3	27.5	37.5			<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1	<1	<1	<1	<1	<1			<1	mg/kg	TM30/PM15
Vanadium	36	45	34	34	30	37	29	35			<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.4	0.7	<0.1	0.2	0.2	0.2	0.2	0.2			<0.1	mg/kg	TM74/PM3
Zinc #	150	46	47	100	78	102	71	96			<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.09	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.21	0.10	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Pyrene #	0.40	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03			<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.20	0.08	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06			<0.06	mg/kg	TM4/PM8
Chrysene #	0.37	0.07	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.30	0.10	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07			<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.25	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	0.12	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	0.22	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04			<0.04	mg/kg	TM4/PM8
PAH 16 Total	2.2	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6			<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.22	0.07	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05			<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.08	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02			<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	94	79	92	86	93	91	92	94			<0	%	TM4/PM8

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15156

Report : Solid

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

EMT Sample No.	27-29	31-32	33-35	36-37	38-40	41-42	43-45	46-47			Please see attached notes for all abbreviations and acronyms		
Sample ID	WS10	WS10	WS09	WS09	WS08	WS08	WS11	WS11					
Depth	0.30	1.30	1.00	2.00	0.50	1.50	0.50	2.00					
COC No / misc													
Containers	V J B	V J	V J B	V J	V J B	V J	V J B	V J					
Sample Date	12/09/2023 11:00	12/09/2023 11:20	12/09/2023 12:20	12/09/2023 12:30	12/09/2023 15:00	12/09/2023 15:15	12/09/2023 16:00	12/09/2023 16:30					
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil					
Batch Number	1	1	1	1	1	1	1	1					
Date of Receipt	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023	14/09/2023			LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	17	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	<19	<19	<19	<19	<19	<19	<19	<19			<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1			<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2			<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4	<4	<4	<4			<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	17	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	88	<7	<7	<7	<7	<7	<7	<7			<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	105	<19	<19	<19	<19	<19	<19	<19			<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics (C5-35) (EH+HS_CU_1D_Total)	105	<38	<38	<38	<38	<38	<38	<38			<38	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5			<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15			<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	10.8	36.2	19.3	8.3	9.4	8.0	11.7	8.6			<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3			<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0097	0.0122	0.0066	0.0042	0.0038	0.0029	0.0035	0.0039			<0.0015	g/l	TM38/PM20
Chromium III	40.1	32.5	51.3	41.8	42.0	48.4	34.7	42.8			<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5			<0.5	mg/kg	TM89/PM45
pH #	8.20	6.87	8.15	7.87	8.38	8.36	7.71	7.64			<0.01	pH units	TM73/PM11

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson

Note:

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

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

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

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/15156	1	WS16	0.30	3	Charlotte Taylor	19/09/2023	General Description (Bulk Analysis)	brown soil/stones
					Charlotte Taylor	19/09/2023	Asbestos Fibres	NAD
					Charlotte Taylor	19/09/2023	Asbestos ACM	NAD
					Charlotte Taylor	19/09/2023	Asbestos Type	NAD
23/15156	1	WS14	0.50	8	Simon Postlewhite	19/09/2023	General Description (Bulk Analysis)	Brown soil/stones
					Simon Postlewhite	19/09/2023	Asbestos Fibres	NAD
					Simon Postlewhite	19/09/2023	Asbestos ACM	NAD
					Simon Postlewhite	19/09/2023	Asbestos Type	NAD
23/15156	1	WS15	0.50	13	Catherine Coles	19/09/2023	General Description (Bulk Analysis)	brown soil,stone
					Catherine Coles	19/09/2023	Asbestos Fibres	NAD
					Catherine Coles	19/09/2023	Asbestos ACM	NAD
					Catherine Coles	19/09/2023	Asbestos Type	NAD
23/15156	1	WS13	0.50	16	Bart Kuznicki	19/09/2023	General Description (Bulk Analysis)	Brown Loose soil with stones
					Bart Kuznicki	19/09/2023	Asbestos Fibres	NAD
					Bart Kuznicki	19/09/2023	Asbestos ACM	NAD
					Bart Kuznicki	19/09/2023	Asbestos Type	NAD
23/15156	1	WS12	0.30	21	Simon Postlewhite	19/09/2023	General Description (Bulk Analysis)	Brown soil/stones
					Simon Postlewhite	19/09/2023	Asbestos Fibres	NAD
					Simon Postlewhite	19/09/2023	Asbestos ACM	NAD
					Simon Postlewhite	19/09/2023	Asbestos Type	NAD
23/15156	1	WS10	0.30	29	Simon Postlewhite	19/09/2023	General Description (Bulk Analysis)	Brown soil/stones
					Simon Postlewhite	19/09/2023	Asbestos Fibres	NAD
					Simon Postlewhite	19/09/2023	Asbestos ACM	NAD
					Simon Postlewhite	19/09/2023	Asbestos Type	NAD
23/15156	1	WS10 (ACM)	0.30	30	Charlotte Taylor	19/09/2023	General Description (Bulk Analysis)	cement
					Charlotte Taylor	19/09/2023	Asbestos Fibres	Fibre Bundles
					Charlotte Taylor	19/09/2023	Asbestos ACM	Asbestos Cement
					Charlotte Taylor	19/09/2023	Asbestos Type	Chrysotile
23/15156	1	WS09	1.00	35	Charlotte Taylor	19/09/2023	General Description (Bulk Analysis)	brown soil/stones
					Charlotte Taylor	19/09/2023	Asbestos Fibres	NAD
					Charlotte Taylor	19/09/2023	Asbestos ACM	NAD
					Charlotte Taylor	19/09/2023	Asbestos Type	NAD

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson

[illegible]

Client Name:	Ramboll
Reference:	1620015885
Location:	First Milk Baseline Investigation
Contact:	Rob Hodgson

[illegible]

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

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/15156

SOILS and ASH

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/15156

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 23/15156

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ramboll
8 Village Way
Green Meadow Springs
Cardiff
United Kingdom
CF15 7NE



4225



Attention : Rob Hodgson
Date : 28th September, 2023
Your reference : 1620015885
Our reference : Test Report 23/15334 Batch 1
Location : First Milk Baseline Investigation
Date samples received : 16th September, 2023
Status : Final Report
Issue : 1

Fourteen samples were received for analysis on 16th September, 2023 of which thirteen were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 47.712 kg of CO2

Scope 1&2&3 emissions - 112.755 kg of CO2

Authorised By:



Simon Gomery BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15334

Report : Solid

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

EMT Sample No.	1-3	4-5	6-8	9-10	11-13	14-15	16-18	19-20	21-23	24-25	Please see attached notes for all abbreviations and acronyms		
Sample ID	WS07	WS07	WS06	WS06	WS03	WS03	WS04	WS04	WS02	WS02			
Depth	0.80	2.50	0.50	2.00	0.50	1.50	0.50	1.50	0.50	1.50			
COC No / misc													
Containers	V J B	V J	V J B	V J	V J B	V J	V J B	V J	V J B	V J			
Sample Date	13/09/2023 09:30	13/09/2023 09:45	13/09/2023 10:30	13/09/2023 11:15	13/09/2023 14:00	13/09/2023 14:15	13/09/2023 15:15	13/09/2023 15:30	14/09/2023 09:30	14/09/2023 09:45			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1	LOD/LOR	Units	Method No.
Date of Receipt	16/09/2023	16/09/2023	16/09/2023	16/09/2023	16/09/2023	16/09/2023	16/09/2023	16/09/2023	16/09/2023	16/09/2023			
Arsenic #	16.5	9.6	14.6	16.9	15.0	19.3	8.9	14.6	12.8	26.9	<0.5	mg/kg	TM30/PM15
Beryllium	1.4	1.1	1.4	1.4	1.0	0.9	0.7	1.0	1.3	1.9	<0.5	mg/kg	TM30/PM15
Cadmium #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #	39.7	33.7	40.6	40.4	39.4	44.6	34.1	36.6	38.0	41.1	<0.5	mg/kg	TM30/PM15
Copper #	24	18	27	26	28	18	31	23	28	32	<1	mg/kg	TM30/PM15
Lead #	19	15	63	25	29	18	29	32	16	19	<5	mg/kg	TM30/PM15
Mercury #	0.1	<0.1	<0.1	<0.1	<0.1	0.1	3.8	<0.1	0.2	0.2	<0.1	mg/kg	TM30/PM15
Nickel #	31.0	30.3	33.0	30.1	26.2	28.4	28.4	23.8	34.3	39.2	<0.7	mg/kg	TM30/PM15
Selenium #	2	<1	<1	1	1	2	<1	2	<1	<1	<1	mg/kg	TM30/PM15
Vanadium	31	29	30	31	33	36	65	51	30	35	<1	mg/kg	TM30/PM15
Water Soluble Boron #	0.1	0.2	0.3	0.2	0.6	0.4	0.6	0.5	0.3	0.3	<0.1	mg/kg	TM74/PM30
Zinc #	81	74	85	85	66	68	122	68	81	97	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.09	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.32	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.24	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.22	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.22	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.39	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.19	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.13	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.13	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.9	<0.6	<0.6	<0.6	<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.28	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.11	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	85	95	94	93	95	97	88	89	92	93	<0	%	TM4/PM8

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15334

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

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15334

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

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15334

Report : Solid

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

EMT Sample No.	26-27	28-30	33-34								Please see attached notes for all abbreviations and acronyms		
Sample ID	WS01	WS05	WS05										
Depth	0.20	0.20	0.80										
COC No / misc													
Containers	V J	V J B	V J										
Sample Date	14/09/2023 11:15	14/09/2023 12:00	14/09/2023 12:30										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	16/09/2023	16/09/2023	16/09/2023								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 (HS_1D_AL) #	<0.1	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10 (HS_1D_AL)	<0.1	0.2 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 (EH_CU_1D_AL) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #	8	37	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	<19	37	<19								<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #	<0.1	<0.1 ^{SV}	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 (EH_CU_1D_AR) #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	97	195	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	97	195	<19								<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics (C5-35) (EH+HS_CU_1D_Total)	97	232	<38								<38	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Benzene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Toluene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Ethylbenzene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
m/p-Xylene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
o-Xylene #	<5	<5 ^{SV}	<5								<5	ug/kg	TM36/PM12
Total Phenols HPLC	<0.15	<0.15	<0.15								<0.15	mg/kg	TM26/PM21B
Natural Moisture Content	5.0	6.4	19.5								<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3								<0.3	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0031	0.0136	0.0052								<0.0015	g/l	TM38/PM20
Chromium III	30.9	92.3	42.2								<0.5	mg/kg	NONE/NONE
Total Cyanide #	<0.5	<0.5	<0.5								<0.5	mg/kg	TM89/PM45
pH #	8.26	8.17	6.84								<0.01	pH units	TM73/PM11

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson

Note:

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

The LOQ of the Asbestos Quantification is 0.001% dry fibre of dry mass of sample.

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

Where trace asbestos is reported the amount of asbestos will be <0.1%.

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analyst Name	Date Of Analysis	Analysis	Result
23/15334	1	WS07	0.80	3	Bart Kuznicki	21/09/2023	General Description (Bulk Analysis)	Brown Soil with stones
					Bart Kuznicki	21/09/2023	Asbestos Fibres	NAD
					Bart Kuznicki	21/09/2023	Asbestos ACM	NAD
					Bart Kuznicki	21/09/2023	Asbestos Type	NAD
23/15334	1	WS06	0.50	8	Catherine Coles	21/09/2023	General Description (Bulk Analysis)	brown soil,stone
					Catherine Coles	21/09/2023	Asbestos Fibres	NAD
					Catherine Coles	21/09/2023	Asbestos ACM	NAD
					Catherine Coles	21/09/2023	Asbestos Type	NAD
23/15334	1	WS03	0.50	13	Emily Anderton	20/09/2023	General Description (Bulk Analysis)	Brown soil with stones
					Emily Anderton	20/09/2023	Asbestos Fibres	NAD
					Emily Anderton	20/09/2023	Asbestos ACM	NAD
					Emily Anderton	20/09/2023	Asbestos Type	NAD
23/15334	1	WS04	0.50	18	Catherine Coles	21/09/2023	General Description (Bulk Analysis)	brown soil,stone
					Catherine Coles	21/09/2023	Asbestos Fibres	Fibre Bundles
					Catherine Coles	21/09/2023	Asbestos Fibres (2)	Fibre Bundles
					Catherine Coles	21/09/2023	Asbestos ACM	NAD
					Catherine Coles	21/09/2023	Asbestos ACM (2)	NAD
					Catherine Coles	21/09/2023	Asbestos Type	Chrysotile
					Catherine Coles	21/09/2023	Asbestos Type (2)	Amosite
23/15334	1	WS02	0.50	23	Bart Kuznicki	21/09/2023	General Description (Bulk Analysis)	Brown Soil with stones
					Bart Kuznicki	21/09/2023	Asbestos Fibres	NAD
					Bart Kuznicki	21/09/2023	Asbestos ACM	NAD
					Bart Kuznicki	21/09/2023	Asbestos Type	NAD
23/15334	1	WS01	0.20	27	Emily Anderton	20/09/2023	General Description (Bulk Analysis)	Brown soil with stones
					Emily Anderton	20/09/2023	Asbestos Fibres	NAD
					Emily Anderton	20/09/2023	Asbestos ACM	NAD
					Emily Anderton	20/09/2023	Asbestos Type	NAD
23/15334	1	WS05	0.20	30	Bart Kuznicki	21/09/2023	General Description (Bulk Analysis)	Brown Soil with stones
					Bart Kuznicki	21/09/2023	Asbestos Fibres	NAD
					Bart Kuznicki	21/09/2023	Asbestos ACM	NAD
					Bart Kuznicki	21/09/2023	Asbestos Type	NAD

Client Name:	Ramboll
Reference:	1620015885
Location:	First Milk Baseline Investigation
Contact:	Rob Hodgson

[illegible]

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

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/15334

SOILS and ASH

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/15334

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465:1993(E) and BS1377-2:1990.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GC-FID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM21B	As Received samples are extracted in Methanol: Water (60:40) by reciprocal shaker.			AR	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.			AD	Yes
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec.1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC-FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

EMT Job No: 23/15334

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GC/FID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248 Second edition (2021)	PM42	Modified SCA Blue Book V.12 draft 2017 and WM3 1st Edition v1.1:2018. Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
TM74	Analysis of water soluble boron (20:1 extract) by ICP-OES.	PM32	Hot water soluble boron is extracted from dried and ground samples using a 20:1 ratio.	Yes		AD	Yes
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM45	As received solid samples are extracted with 1M NaOH by orbital shaker for Cyanide, Sulphide and Thiocyanate analysis.	Yes		AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes

Ramboll
8 Village Way
Green Meadow Springs
Cardiff
United Kingdom
CF15 7NE



4225



Attention : Rob Hodgson
Date : 27th September, 2023
Your reference : 1620015885
Our reference : Test Report 23/15332 Batch 1
Location : First Milk Baseline Investigation
Date samples received : 16th September, 2023
Status : Final Report
Issue : 1

Two samples were received for analysis on 16th September, 2023 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 4.634 kg of CO2

Scope 1&2&3 emissions - 10.95 kg of CO2

Authorised By:



Simon Gomery BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15332

Report : Liquid

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

EMT Sample No.	1-5	6-10									Please see attached notes for all abbreviations and acronyms		
Sample ID	WS16	WS10											
Depth													
COC No / misc													
Containers	V H P G	V H P G											
Sample Date	14/09/2023 13:30	14/09/2023 14:30											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	16/09/2023	16/09/2023									LOD/LOR	Units	Method No.
Dissolved Arsenic #	<0.9	1.2									<0.9	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5									<0.5	ug/l	TM170/PM14
Dissolved Boron #	32	29									<12	ug/l	TM170/PM14
Dissolved Cadmium #	0.07	0.07									<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	0.3	<0.2									<0.2	ug/l	TM170/PM14
Dissolved Copper #	2	5									<1	ug/l	TM170/PM14
Dissolved Lead #	<0.4	<0.4									<0.4	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5									<0.5	ug/l	TM170/PM14
Dissolved Nickel #	17.7	16.1									<0.2	ug/l	TM170/PM14
Dissolved Selenium #	13.5	<1.2									<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	<0.6	<0.6									<0.6	ug/l	TM170/PM14
Dissolved Zinc #	2.8	2.5									<1.5	ug/l	TM170/PM14
Dissolved Calcium #	78.2	84.7									<0.2	mg/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	251	246									<1	mg/l	TM30/PM14
PAH MS													
Naphthalene #	<0.1	<0.1									<0.1	ug/l	TM4/PM30
Acenaphthylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Acenaphthene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluorene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Phenanthrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Fluoranthene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(a)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Chrysene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(b)fluoranthene #	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(a)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Indeno(123cd)pyrene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Dibenzo(ah)anthracene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
Benzo(ghi)perylene #	<0.005	<0.005									<0.005	ug/l	TM4/PM30
PAH 16 Total #	<0.173	<0.173									<0.173	ug/l	TM4/PM30
Benzo(b)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
Benzo(k)fluoranthene	<0.008	<0.008									<0.008	ug/l	TM4/PM30
PAH Surrogate % Recovery	92	97									<0	%	TM4/PM30
MTBE #	<5	<5									<5	ug/l	TM36/PM12
Benzene #	<5	<5									<5	ug/l	TM36/PM12
Toluene #	<5	<5									<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5									<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5									<5	ug/l	TM36/PM12
o-Xylene #	<5	<5									<5	ug/l	TM36/PM12

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15332

Report : Liquid

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

EMT Sample No.	1-5	6-10									Please see attached notes for all abbreviations and acronyms		
Sample ID	WS16	WS10											
Depth													
COC No / misc													
Containers	V H P G	V H P G											
Sample Date	14/09/2023 13:30	14/09/2023 14:30											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	16/09/2023	16/09/2023									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10									<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10									<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10									<10	ug/l	TM36/PM12
>C10-C12 #	54	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	360	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	660	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	120	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	1194	<10									<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10									<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10									<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10									<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	130	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	250	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	380	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	1574	<10									<10	ug/l	TM5/PM16/PM30
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/l	TM26/PM0
Sulphate as SO ₄ #	118.4	27.9									<0.5	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	0.30	3.82									<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<2	<2									<2	ug/l	TM38/PM0
Total Dissolved Chromium III	<2	<2									<2	ug/l	NONE/NONE
Dissolved Organic Carbon #	4	7									<2	mg/l	TM60/PM0
pH #	7.20	7.50									<0.01	pH units	TM73/PM0

Element Materials Technology **Notification of Deviating Samples**

Notification of Deviating Samples

Client Name: Ramboll

Reference: 1620015885

Location: First Milk Baseline Investigation

Contact: Rob Hodgson

Matrix : Liquid

[illegible]

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

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/15332

SOILS and ASH

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

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

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/15332

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM4	Modified USEPA 8270D v5:2014 method for the solvent extraction and determination of PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry): WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013	PM0	No preparation is required.	Yes			

EMT Job No: 23/15332

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
NONE	No Method Code	NONE	No Method Code				

Ramboll
8 Village Way
Green Meadow Springs
Cardiff
United Kingdom
CF15 7NE



4225



Attention : Rob Hodgson
Date : 29th September, 2023
Your reference : 1620015885
Our reference : Test Report 23/15463 Batch 1
Location : First Milk Baseline Investigation
Date samples received : 20th September, 2023
Status : Final Report
Issue : 1

Seven samples were received for analysis on 20th September, 2023 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

The greenhouse gas emissions generated (in Carbon – Co2e) to obtain the results in this report are estimated as:

Scope 1&2 emissions - 13.394 kg of CO2

Scope 1&2&3 emissions - 31.654 kg of CO2

Authorised By:



Simon Gomery BSc

Senior Project Manager

Please include all sections of this report if it is reproduced

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15463

Report : Liquid

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

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30	31-36				Please see attached notes for all abbreviations and acronyms		
Sample ID	WS13	WS12	WS09	WS08	WS04	WS02	WS05						
Depth													
COC No / misc													
Containers	V H P G	V H N P G	V H N P G	V H N P G	V H N P G	G	V H N P G						
Sample Date	19/09/2023 13:45	19/09/2023 10:00	19/09/2023 10:15	19/09/2023 10:30	19/09/2023 11:00	19/09/2023 11:15	19/09/2023 12:00						
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023				LOD/LOR	Units	Method No.
Dissolved Arsenic #	<0.9	<0.9	16.2	<0.9	3.4	-	<0.9				<0.9	ug/l	TM170/PM14
Dissolved Beryllium #	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5				<0.5	ug/l	TM170/PM14
Dissolved Boron #	35	41	38	48	29	-	30				<12	ug/l	TM170/PM14
Dissolved Cadmium #	<0.03	<0.03	0.10	0.12	<0.03	-	<0.03				<0.03	ug/l	TM170/PM14
Total Dissolved Chromium #	3.6	<0.2	1.5	0.4	1.8	-	<0.2				<0.2	ug/l	TM170/PM14
Dissolved Copper #	2	<1	4	2	2	-	1				<1	ug/l	TM170/PM14
Dissolved Lead #	<0.4	<0.4	1.3	0.5	<0.4	-	<0.4				<0.4	ug/l	TM170/PM14
Dissolved Mercury #	<0.5	<0.5	<0.5	<0.5	<0.5	-	<0.5				<0.5	ug/l	TM170/PM14
Dissolved Nickel #	4.1	5.5	190.7	4.1	1.9	-	4.2				<0.2	ug/l	TM170/PM14
Dissolved Selenium #	36.4	18.9	42.8	<1.2	12.8	-	3.7				<1.2	ug/l	TM170/PM14
Dissolved Vanadium #	0.8	<0.6	1.7	<0.6	10.0	-	<0.6				<0.6	ug/l	TM170/PM14
Dissolved Zinc #	4.8	7.1	39.1	2.7	2.2	-	3.0				<1.5	ug/l	TM170/PM14
Dissolved Calcium #	52.8	93.2	68.3	44.1	32.0	-	27.7				<0.2	mg/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	156	271	246	131	88	-	92				<1	mg/l	TM30/PM14
PAH MS													
Naphthalene*	<0.01	<0.01	0.05	<0.01	0.01	0.11	<0.01				<0.01	ug/l	Subcontracted
Acenaphthylene*	<0.005	<0.005	<0.005	<0.005	<0.005	0.009	<0.005				<0.005	ug/l	Subcontracted
Acenaphthene*	<0.005	<0.005	<0.005	<0.005	0.014	0.011	<0.005				<0.005	ug/l	Subcontracted
Fluorene*	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005				<0.005	ug/l	Subcontracted
Phenanthrene*	<0.005	<0.005	<0.005	<0.005	0.199	0.041	<0.005				<0.005	ug/l	Subcontracted
Anthracene*	<0.005	<0.005	<0.005	<0.005	0.078	<0.005	<0.005				<0.005	ug/l	Subcontracted
Fluoranthene*	<0.005	0.041	<0.005	<0.005	1.410	0.058	<0.005				<0.005	ug/l	Subcontracted
Pyrene*	<0.005	0.055	<0.005	<0.005	1.310	0.050	<0.005				<0.005	ug/l	Subcontracted
Benzo(a)anthracene*	<0.005	<0.005	0.030	<0.005	0.881	0.008	<0.005				<0.005	ug/l	Subcontracted
Chrysene*	<0.005	<0.005	0.061	<0.005	1.150	0.040	<0.005				<0.005	ug/l	Subcontracted
Benzo(b)fluoranthene*	<0.01	0.05	0.08	<0.01	3.87	0.09	<0.01				<0.01	ug/l	Subcontracted
Benzo(a)pyrene*	<0.002	0.025	<0.002	<0.002	1.740	<0.002	<0.002				<0.002	ug/l	Subcontracted
Indeno(123cd)pyrene*	<0.005	0.021	<0.005	<0.005	1.560	<0.005	<0.005				<0.005	ug/l	Subcontracted
Dibenzo(ah)anthracene*	<0.005	<0.005	<0.005	<0.005	0.290	<0.005	<0.005				<0.005	ug/l	Subcontracted
Benzo(ghi)perylene*	<0.005	<0.005	0.026	<0.005	1.460	<0.005	<0.005				<0.005	ug/l	Subcontracted
PAH 16 Total*	<0.082	0.191	0.248	<0.082	13.972	0.414	<0.082				<0.082	ug/l	Subcontracted
Benzo(b)fluoranthene*	<0.005	0.033	0.063	<0.005	2.840	0.087	<0.005				<0.005	ug/l	Subcontracted
Benzo(k)fluoranthene*	<0.005	0.016	0.018	<0.005	1.030	<0.005	<0.005				<0.005	ug/l	Subcontracted
MTBE #	<5	<5	<5	<5	<5	<5	<5				<5	ug/l	TM36/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/l	TM36/PM12
Toluene #	<5	<5	<5	<5	<5	462	<5				<5	ug/l	TM36/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/l	TM36/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/l	TM36/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/l	TM36/PM12

Element Materials Technology

Client Name: Ramboll
Reference: 1620015885
Location: First Milk Baseline Investigation
Contact: Rob Hodgson
EMT Job No: 23/15463

Report : Liquid

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

EMT Sample No.	1-5	6-11	12-17	18-23	24-29	30	31-36				Please see attached notes for all abbreviations and acronyms		
Sample ID	WS13	WS12	WS09	WS08	WS04	WS02	WS05						
Depth													
COC No / misc													
Containers	V H P G	V H N P G	V H N P G	V H N P G	V H N P G	G	V H N P G						
Sample Date	19/09/2023 13:45	19/09/2023 10:00	19/09/2023 10:15	19/09/2023 10:30	19/09/2023 11:00	19/09/2023 11:15	19/09/2023 12:00						
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023	20/09/2023				LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10				<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	143	<10				<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	12				<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	NDP	<5				<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	<10	<10	NDP	12				<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10				<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	462 ⁺	<10				<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10				<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	NDP	<5				<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	<10	<10	NDP	<10				<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	<10	<10	NDP	12				<10	ug/l	TM5/PM16/PM30
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	3.13	<0.15				<0.15	mg/l	TM26/PM0
Sulphate as SO4 #	145.7	112.4	133.0	18.4	42.2	-	30.1				<0.5	mg/l	TM38/PM0
Total Cyanide #	<0.20 ^{AA}	<0.20 ^{AA}	<0.20 ^{AA}	<0.20 ^{AA}	<0.20 ^{AA}	-	<0.20 ^{AA}				<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	<0.03	0.12	97.03	0.19	0.16	-	0.08				<0.03	mg/l	TM38/PM0
Hexavalent Chromium	<6	<6	<6	<6	<6	-	<6				<6	ug/l	TM38/PM0
Total Dissolved Chromium III	<6	<6	<6	<6	<6	-	<6				<6	ug/l	NONE/NONE
Dissolved Organic Carbon #	<2	<2	212	<2	<2	-	<2				<2	mg/l	TM60/PM0
pH #	8.03	7.33	7.60	7.76	8.07	-	7.53				<0.01	pH units	TM73/PM0

Matrix : Liquid

4 of 11

Element Materials Technology

Client Name:	Ramboll
Reference:	1620015885
Location:	First Milk Baseline Investigation
Contact:	Rob Hodgson

Notification of Deviating Samples

Matrix : Liquid

[illegible]

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

It is a requirement under ISO 17025 that we inform clients if samples are deviating i.e. outside what is expected. A deviating sample indicates that the sample 'may' be compromised but not necessarily will be compromised. The result is still accredited and our analytical reports will still show accreditation on the relevant analytes.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/15463

SOILS and ASH

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

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

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

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. Asbestos samples are retained for 6 months.

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Limits of detection for analyses carried out on as received samples are not moisture content corrected. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C. Ash samples are dried at 37°C ±5°C.

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

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

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

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

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

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

WATERS

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

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

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

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

STACK EMISSIONS

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation for Dioxins and Furans and Dioxin like PCBs has been performed on XAD-2 Resin, only samples which use this resin will be within our MCERTS scope.

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

DEVIATING SAMPLES

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

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

Laboratory records are kept for a period of no less than 6 years.

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Measurement Uncertainty

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

Customer Provided Information

Sample ID and depth is information provided by the customer.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
>>	Results above quantitative calibration range. The result should be considered the minimum value and is indicative only. The actual result could be significantly higher.
*	Analysis subcontracted to an Element Materials Technology approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x20 Dilution

HWOL ACRONYMS AND OPERATORS USED

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

EMT Job No: 23/15463

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified 8015B v2:1996 method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) within the range C8-C40 by GCFID. For waters the solvent extracts dissolved phase plus a sheen if present.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified				
TM30	Determination of Trace Metals by ICP-OES (Inductively Coupled Plasma – Optical Emission Spectrometry); WATERS by Modified USEPA Method 200.7, Rev. 4.4, 1994; Modified EPA Method 6010B, Rev.2, Dec 1996; Modified BS EN ISO 11885:2009: SOILS by Modified USEP 6010B, Rev.2, Dec.1996; Modified EPA Method 3050B, Rev.2, Dec.1996	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
TM36	Modified US EPA method 8015B v2:1996. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID. MTBE by GCFID co-elutes with 3-methylpentane if present and therefore can give a false positive. Positive MTBE results will be re-run using GC-MS to double check, when requested.	PM12	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.				
TM38	Soluble Ion analysis using Discrete Analyser. Modified US EPA methods: Chloride 325.2 (1978), Sulphate 375.4 (Rev.2 1993), o-Phosphate 365.2 (Rev.2 1993), TON 353.1 (Rev.2 1993), Nitrite 354.1 (1971), Hex Cr 7196A (1992), NH4+ 350.1 (Rev.2 1993) – All anions comparable to BS ISO 15923-1: 2013I	PM0	No preparation is required.	Yes			
TM60	TC/TOC analysis of Waters by High Temperature Combustion followed by NDIR detection. Based on the following modified standard methods: USEPA 9060A (2002), APHA SMEWW 5310B:1999 22nd Edition, ASTM D 7573, and USEPA 415.1.	PM0	No preparation is required.	Yes			
TM73	Modified US EPA methods 150.1 (1982) and 9045D Rev. 4 - 2004) and BS1377-3:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.	Yes			

EMT Job No: 23/15463

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM89	Modified USEPA method OIA-1667 (1999). Determination of cyanide by Flow Injection Analyser. Where WAD cyanides are required a Ligand displacement step is carried out before analysis.	PM0	No preparation is required.	Yes			
TM170	Determination of Trace Metals by ICP-MS (Inductively Coupled Plasma – Mass Spectrometry): Modified USEPA Method 200.8, Rev. 5.4, 1994; Modified EPA Method 6020A, Rev.1, Feb 2007; Modified BS EN ISO 17294-2:2016	PM14	Preparation of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for Dissolved metals, and remain unfiltered for Total metals then acidified	Yes			
NONE	No Method Code	NONE	No Method Code				
Subcontracted	See attached subcontractor report for accreditation status and provider.						