Appendix 13A

AECOM Site Investigation and Generic Quantitative Risk Assessment Report

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T-4 Site Investigation

Tarbert Generating Station

SSE Generation Ireland Limited

Project number: 60707258_ACM_RP_EN_0 SI Report

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Delivering a better world

Prepared for:

SSE Generation Ireland Limited

Prepared by:

AECOM Ireland Limited
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork

T: 021 436 5006
aecom.com

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The methodology adopted and the sources of information used by AECOM in providing its services are outlined in this Report. The work described in this Report was undertaken between 20 July 2023 and 09 August 2023 and is based on the conditions encountered and the information available during the said period of time. The scope of this Report and the services are accordingly factually limited by these circumstances. AECOM disclaim any undertaking or obligation to advise any person of any change in any matter affecting the Report, which may come or be brought to AECOM's attention after the date of the Report.

The exploratory holes carried out during the fieldwork, which investigate only a small volume of the ground in relation to the size of the Site, can only provide a general indication of site conditions. The comments made in this Report are based on the ground conditions apparent at the site of the exploratory holes. There may be exceptional ground conditions elsewhere on the Site which have not been disclosed by this investigation and which have therefore not been taken into account in this Report.

The comments made on groundwater conditions are based on observations made during site work and the limited monitoring programme. It should be noted that groundwater levels might vary owing to seasonal or other effects.

The opinions expressed in this Report concerning any contamination found and the risks arising there from are based on current good practice simple statistical assessment and comparison with available soil guideline values, AECOM generic assessment criteria and other guidance values.

It should be noted that the effects of ground and water borne contamination on the environment are constantly under review, and authoritative guidance values are potentially subject to change. The conclusions presented herein are based on the guidance values available at the time this Report was prepared, however, no liability by AECOM can be accepted for the retrospective effects of any changes or amendments to these values.

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Tables

1. Introduction

AECOM Ireland Limited (hereafter referred to as AECOM), is pleased to present SSE Generation Ireland Limited (SSE, the client), with this Phase 2 Environmental Site Assessment (ESA) report in relation to the proposed installation of an Open Cycle has Turbine (OCGT) at the Tarbert Generating Station, Co Kerry (the Site or Proposed Development Site), Figure 1, Appendix A.

1.1 Background

AECOM understands that SSE plan to install a new OCGT and the proposed development will be positioned to the immediate west and north of the existing power station at the Tarbert generating Station. Co Kerry. The Proposed Development Site is a brownfield site surrounded by electricity generation, transmission, and fuel storage infrastructure. The area to the west was previously used as a contractor's compound and previously contained a number of existing structures which were demolished as part of the proposed development plans.

Over the years, several phases of site investigation have been completed across the site however, a number of data gaps have been identified. SSE requested that AECOM complete a site investigation to close these data gaps.

Previous investigations have encountered asbestos containing materials (ACM) within the made ground across the site and, more specifically, within the former contractors work compound.

1.2 Previous Site Investigations

Several site investigations have been conducted at the Tarbert Power Station Site as a whole and relevant information is summarised in the following sections.

1.2.1 2009 Site Investigation

URS Ireland Limited (now AECOM) undertook Phase 1 and 2 Environmental Site Assessment (ESA) at the ESB Tarbert Power Generating Station in 2008 and 2009 on behalf of the electricity Supply Board (ESB), as part of the site divestment due diligence process at the Site.

The phased intrusive site investigations consisted of hand augering, test pitting and borehole drilling. Monitoring wells were installed at strategic locations and groundwater samples were collected. Samples of soil, sediment, surface water and groundwater were analysed for a broad range of potential contaminants of concern.

The Site investigations completed on the island portion of the Site found bedrock, consisting of dark grey shale or siltstone with an upper weathered horizon, generally encountered at shallow depths, <3.0 m below ground level (bgl), across the Site. Bedrock strata on the east side of the island dips gently (at approximately 25^{o}) towards the east.

At the Overall Project and Proposed Development Site, depth to the top of rock changed markedly to the north-west of the current boiler hall, from approx. 1 metre below ground level (m bgl) at locations BH304, BH305, BH307, BH308) to more than 4m bgl at BH313, BH315, BH316, 30-40m to the north-west. In deeper boreholes by the coast (BH309A, BH311, BH319) bedrock was between 5.5 and 9.3 m bgl.

Bedrock was directly overlain by compacted sand and gravel fill material at most locations. Stiff grey sandy gravelly or dark brown peaty clay subsoils underlaid the fill material at BH313, BH316 and BH320 and gravel and peat were encountered below the fill at TP08, TP10, BH315 and BH333.

Oily contamination was reported from trial pit soils (at TP08) and foreshore sediments (SED05) at the Heavy Waste Area, to the north-west of and outside of the Overall Project and Proposed Development Site (though not in groundwater from the nearby well BH319). This localised contamination was thought to result from the previous practice of storing items of redundant plant and machinery in this area of unsealed ground.

A 4,000 Litre diesel underground tank outside the mechanical workshop was noted to have been decommissioned in 2001.

Soils within the Overall Project and Proposed Development area showed some slightly elevated hydrocarbon and heavy metals concentrations which exceeded the Generic Assessment Criteria (GAC) protective of controlled waters used to screen the data. Some of these GAC exceedances were considered to be due to natural background soil chemistry conditions in the wider area, but others suspected to be due to historical ash deposition and disposal of boiler washings on the power station site, however it was considered unlikely that these findings would represent significant liability issues.

No remedial action was considered necessary at the Site under a continued industrial land use scenario, from the perspective of environmental soil and groundwater quality.

1.2.2 2022 Targeted Site Investigation

A site investigation on the island was overseen by AECOM Ireland Limited in 2022 following a loss to ground of heavy fuel oil (HFO) due to pipe clamp failure on the north side of the Turbine Hall in April 2022.

This site investigation and source removal was conducted by a combination of hand excavations (April 2022) and vacuum excavations (June 2022) to delineate the extent of hydrocarbon impacts to ground.

Bedrock was encountered within 1-2 m of the surface at the carpark north-east of the turbine hall, however up to 6.5 m of subsoil was previously encountered in borehole BH9, adjacent to the 220kV switching yard on the south-west portion of the island, suggesting quite variable top of bedrock elevations across the island.

Analytical results for samples of the soils remaining in situ did not exceed GAC protective of human health on a commercial / industrial site. Analytical results for soil leachate from those samples indicate limited exceedances of GAC protective of controlled waters (reported concentrations <100 times GAC).

Downgradient monitoring well 309A was also sampled as part of this study, with concentrations of some aromatic fractions and of C_3-C_{35} total petroleum hydrocarbons (TPH) exceeding the relevant GAC protective of groundwater. Due to the lack of any historic monitoring data for BH309A, it was not determined whether these detections were directly related to the 2022 HFO loss.

AECOM considered that the absence of aliphatic hydrocarbons in the groundwater sample (which were detected in the source area soil samples, and which tend to be more soluble than the aromatic hydrocarbon fractions) indicated that the detection of hydrocarbons in groundwater at BH309A in 2022 was likely related to an older source.

1.3 Data Gaps

The following data gaps were identified:

- The data from the 2009 site investigation is 14 years old;
- Per- and poly-fluoroalkylated substances were not included in previous site investigations; and
- No groundwater data is available within the Proposed Development area.

1.4 Objectives

The specific objectives of this ESA are to undertake intrusive works within made ground and subsoil beneath and retrieve soil / groundwater samples for laboratory analysis to close data gaps identified in Section 1.3.

2. Scope of Works

Service clearance and an initial site walkover were conducted on 20 July 2023. Groundwater well installation, trial pitting and soil sampling works were undertaken at the Site between 24 July and 25 July 2023.

Groundwater sampling took place on 09 August 2023.

The site investigation was conducted in line with BS 10175:2011+A2:2017 Code of Practice for Investigation of Potentially Contaminated Sites, the UK Environmental Agency CLR11 and by taking into account BS5930 (2015) Code of Practice for Site Investigations (where applicable). Sampling was carried out with techniques suitable to the conditions and materials encountered on Site and logged in accordance with BS5930.

2.1 Utility Clearance

In accordance with the AECOM subsurface clearance protocols, a utility clearance of the proposed trial pit and borehole locations was completed prior to intrusive works commencing on-Site, which included the following tasks:

- Review of available service plans to support the identification and location of relevant underground services;
- On-Site utility survey of each proposed borehole and trial pit location for underground utilities by specialist surveyors (GeoMax Surveys Limited) using a Cable Avoidance Tool (CAT), signal generator (Genny) and Ground Penetrating Radar (GPR);
- Hand digging of all borehole locations by the site investigation contractor Causeway Geotechnical Limited to a depth to 1.2 m bgl prior to drilling to prove the absence of live underground services; and
- Trial pitting using shallow scrapes with a toothless bucket.

An AECOM field scientist supervised the on-site utility clearance works.

Table 1. Site Services

Services	Reported Services	AECOM Identified Services
Electricity	None	An unmarked electrical cable was found crossing the former contractors' compound near the proposed location for TP102 and TP103.
Telecommunications	None	An unmarked data cable was identified at location MW402. The drilling location was moved further south to avoid the cable
Gas	None	None encountered
Water Main	None	None encountered
Surface Water Drainage	Surface water drainage located near MW402	Surface water drainage locations visually identified on site.
Foul Sewer	None	None encountered
Underground Storage Tank (UST)	None	None encountered

No services were identified during trial pitting or monitoring well installation.

2.2 Trial Pitting & Soil Sampling

Four trial pits (TP101 – TP104) were excavated using a 12 tonne tracked excavator fitted with a 600 mm wide toothless bucket, to depths of between 1.10 m and 3.50 m. In addition, soil samples were collected from the hand dug pits at monitoring well locations MW401 and MW402.

An AECOM field scientist recorded the following items during trial pitting:

- Trial pit number and location, which was marked on a map;
- Ground surfacing;
- Geological description of each stratum encountered, including major and minor grain sizes, colour, texture, moisture content, evidence of contamination – such as staining, noticeable odours or an elevated headspace reading,
- Depth groundwater was encountered (if any) and rate of ingress;
- The depth at which each stratum was encountered; and
- A photographic log of each trial pit location.

Up to two discrete soil samples were collected by AECOM from each trial pit. Sample selection for environmental analysis was based on an inspection of the soil for visual, olfactory and on-Site field-screening. To assess levels of volatile ionisable compounds, field headspace analyses of soil were undertaken at approximately 1.0 m intervals, using a calibrated portable photo ionisation detector (PID) fitted with a 10.6 eV lamp.

Soil samples selected for laboratory analysis were collected by AECOM directly from the sampling equipment and placed directly into laboratory-supplied sample containers. Samples for volatiles analysis were held in chilled conditions before courier transport to the contract laboratories.

Following the completion of sampling, excavated materials were returned to the trial pit and compacted in layers using the excavator bucket.

Trial pit logs including descriptions of materials encountered and reinstatement details are provided in Appendix C.

2.3 Groundwater Well Drilling

Two targeted boreholes (MW401–MW402) were advanced to depths of 11 m bgl and 15 m bgl, respectively. Well locations were selected to give areal coverage of the Site.

Drilling was undertaken using a track mounted Comacchio 405 air rotary rig, capable of advancing through the shale bedrock.

The wells were installed with a 3 m well screen and 3 m response zone constructed under the direction of the AECOM field scientist within the first water strike in the bedrock. The top of the well screen was positioned above the water table to allow entry of light non-aqueous phase liquids on the water table (if present).

Wells were constructed of PFAS-free, screw-threaded, high-density polyethylene (HDPE) plastic well screen and pipe, without the use of glues, solvents or any Teflon/polytetrafluoroethylene (PTFE) components (potential sources of PFAS).

Above the well response zone, the wall annulus was sealed using bentonite clay pellets.

The wells were completed with an upright well cover. Dedicated inertial lift sampling equipment (PFAS-free HDPE and Delrin Waterra™ equipment) was installed in both monitoring wells.

An AECOM field engineer supervised all rotary drilling works. Geological logs were recorded noting major and minor grain size, colour, moisture content and field evidence of impact.

Borehole logs detailing materials encountered during the drilling works and installation details are provided in Appendix C.

2.4 Surveying

Following well installation, AECOM carried out a Well Elevation Survey to survey the new well locations and well head elevations to Irish Transverse Mercator (ITM) coordinates and Ordnance Datum (Malin) elevations. This facilitated conversion of depth to groundwater measurements to groundwater elevations relative to Ordnance Datum (OD).

2.5 Sampling and Analysis

2.5.1 Soil Sampling

Excavated material was inspected for visual or olfactory evidence of impact. To assess the presence of VOC's, field headspace testing using a calibrated PID was undertaken on soil samples retrieved at approximately 1 m intervals during excavation.

Soil samples from the trial pits were placed in plastic zip-lock bags and allowed to equilibrate prior to on-site headspace testing.

Soil samples were collected into laboratory-supplied sample containers appropriate to the intended analysis. The sample containers were labelled on-site with a unique sample name and were stored on-Site in a chilled cool box during site works and transit to the analytical laboratory. A summary of the laboratory analyses performed is provided in Section 4.

The AECOM field scientists wore single-use disposable nitrile gloves, which were changed at each sampling location and depth to avoid cross-contamination of soil samples.

Soil samples were submitted to the laboratory for analysis in chilled cool boxes with appropriate chain-of-custody documentation.

2.5.2 Groundwater Sampling

Prior to groundwater purging and sampling, a water level measurement ('dip') was collected from both newly installed monitoring wells using an interface probe. An interface probe is capable of discerning between non-aqueous phase liquids (NAPLs, such as hydrocarbons) and water. The interface probe was used not only to measure the depth to groundwater but also to measure the total well depth, so that wells could be assessed for the presence of light (floating) and dense (sinking) NAPLs.

Groundwater samples were taken in accordance with strict AECOM groundwater sampling protocols, using newly installed, dedicated PFAS-free HDPE inertial lift sampling equipment in each monitoring well. Both wells were purged of at least five times the standing water well volume, to ensure that collected groundwater samples were representative of the aquifer.

Observations of groundwater appearance and odour were noted during purging and sampling. At the end of purging, field measurements of unstable water quality parameters were recorded using a flow-through cell and a calibrated water quality multi-meter. Field measurements of pH, temperature, electrical conductivity (EC), redox potential (ORP) and dissolved oxygen (DO) were recorded (see Appendix B Table 8). A summary of the laboratory analyses performed is provided in Section 4.

Groundwater was collected directly from the sampling tubing into laboratory-supplied sample containers. In accordance with current AECOM PFAS sampling guidance, groundwater samples for PFAS analysis were not field filtered due to concerns regarding PFAS sorption to filter membranes. The PFAS samples were collected in advance of collection of field readings and the other samples to minimise potential for cross-contamination.

Groundwater samples were submitted to Element Materials Technology in the UK for analysis of the parameters listed in Appendix B Table 1, other than PFAS, which was sent to SGS in the Netherlands.

All groundwater samples were transported to the contract analytical laboratory by overnight courier in cooler boxes with frozen, laboratory-supplied ice packs and appropriate chain-of-custody documentation.

3. Field Observations and Results

3.1 Geological Observations

Trial pit and well installation logs are presented in Appendix C, with a summary provided in Table 2 below.

Table 2. Generalised Geological Log

Approximate Depth to Stratum (m bgl)	Geology
0 – 3.00	**MADE GROUND**: Compacted light brown and grey sands and gravels with cobble and boulder content.
3.00 – 3.50	**SUBSOIL:** Brown gravelly clays with medium cobble and low boulder content. (TILL).
3.00– 15.00 (Total Depth)	**BEDROCK:** SHALE (Recovered as highly weathered grey shale, becoming more competent with depth).

No obvious anthropomorphic materials were encountered below surface in trial piths other than a piece of lead metal encountered in TP102 at 0.3m bgl.

Limestone boulders were encountered at approximately 0.8 m bgl at MW402. The boulders extended to 1.9 m bgl and are likely to be former coastal erosion defences before the land to the north of MW402 was reclaimed.

Bedrock was encountered at depths between 1.1 m bgl (TP103) and 8.4 m bgl (MW402). Depth to bedrock varied across the sample locations, consistent with previous site investigation on Site.

3.2 Field Evidence of Soil Impact

No field evidence of soil impact in the form of odours or discolouration was noted at any of shallow soil trial pits or groundwater wells.

No odours were noted in any soil samples retrieved for laboratory analysis; all field PID soil headspace readings were less than 1.0 parts per million (ppm) and are considered to indicate background readings.

3.3 Hydrogeology

3.3.1 Groundwater Occurrence

Details of the individual groundwater strikes, along with any relative changes in levels as works proceeded, are presented on the exploratory hole logs for each location presented in Appendix C.

Groundwater was encountered at MW401 in the overburden at 3.0 m bgl at the interface with weathered bedrock. Good flow of groundwater was noted in the bedrock.

Groundwater was encountered at 12.0 m bgl at well MW402.

Groundwater in trial pits was encountered at the overburden / bedrock interface at the following locations:

Table 3. Trial Pit Groundwater Strikes

Trial Pit	Depth (m)
TP01	1.90
TP02	1.70

3.3.2 Groundwater Flow

Prior to purging and sampling, a 'dip' round of depth to groundwater measurements in both on-Site monitoring wells was recorded. Depth to groundwater readings measured on 09 August 2023 are presented in Appendix B Table 8 and ranged from 1.363 m bgl at MW402 to 1.469 m bgl at MW401. Given the Site's location in the Shannon Estuary, groundwater beneath the site is likely to be tidal.

Depth to groundwater readings have been converted to groundwater table elevations relative to OD using the well elevation survey data (see Appendix B Table 8).

3.3.3 Groundwater Observations

During the dip round no light / dense NAPL layers were identified in any of the wells using the interface probe (see Appendix B Table 8).

3.3.4 Water Quality Parameters

Results for groundwater in-situ parameters are presented in Appendix B Table 8.

Values of groundwater pH were close to neutral (pH 7) ranging from 6.9 pH units (MW401) to 7.0 pH units (MW402).

Electrical conductivity (EC) values ranged between 471 μS/cm at MW402 to 1,710 μS/cm at MW402 indicating brackish groundwater conditions.

Field oxidation reduction potential (ORP) readings were compensated as recommended by the instrument manufacturer to the field readings to give Redox Potential (Eh). Eh readings ranged from 232 millivolts (mV) at MW402 to 252 mV at MW401, indicating borderline reducing (anaerobic) groundwater conditions.

Recorded dissolved oxygen (DO) readings ranged between 0.00 mg/L at MW401 and 0.02 mg/L at MW402, also indicating that groundwater beneath the Site is anaerobic.

4. Laboratory Results

A detailed sample inventory is presented in Appendix B Table 1.

Table 4. Scheduled Analysis

Parameter	Number of Soil Samples	Number of Groundwater Samples
Volatile Organic Compounds (VOCs)*	9	2
Polyaromatic Hydrocarbons (PAHs	9	2
Total Petroleum Hydrocarbons Criteria Working Group (TPH)	9	2
Polychlorinated Biphenyls (PCBs) 7 Congeners	9	2
Cyanide	9	2
pH	9	2
Sulphate and Sulphide	0	2
Nitrate and Nitrite	0	2
Ammoniacal Nitrogen	0	2
Chloride	0	2
Orthophosphate	0	2
Full CLEA Metals	9	2
Chemical Oxygen Demand (COD)	0	2
Biological Oxygen Demand (BOD)	0	2
Total and Faecal Coliforms	0	2
Asbestos Screening	8	0
PFAS Suite**	0	2

** Samples for VOC analysis is by modified USEPA 8260 collected by traditional methods.*

*** PFAS suite of 30 analytes in groundwater*

4.1 Soil Results

The results of laboratory analysis of soil samples are presented in Appendix B Tables 2 – 7.

Soil laboratory certificates are presented in Appendix D.

4.1.1 Volatile Organic Compounds (VOCs)

Soil VOC results are presented in Appendix B Table 2.

VOCs were below laboratory MDLs in the soil samples collected from TP103, TP104 and MW401. VOC compounds reported above the respective MDLs are summarised below.

Table 5. Polycyclic Aromatic hydrocarbons (PAHs) results above MDLs

Parameter	Range (µg/kg)	MDL (µg/kg)	Samples > MDL
Chloromethane	6	<3	**1/9 samples** TP101 (1.0 m bgl)
Chloroethane	3	<2	**1/9 samples** TP102 (2.0 m bgl)
1,1-Dichloroethane	9	<3	**1/9 samples** TP102 (2.0 m bgl)

Table 5. Polycyclic Aromatic hydrocarbons (PAHs) results above MDLs

1,1,1-Trichloroethane	6	<3	**1/9 samples** TP102 (2.0 m bgl)
Toluene	6 – 13	<3	**2/9 samples** TP101 (1.0 m bgl) TP102 (2.0 m bgl)

µg/kg: micrograms per kilogramme

4.1.2 Polycyclic Aromatic Hydrocarbons (PAHs)

PAHs were below laboratory MDLs in the soil samples collected from each of the trial pits and from MW401.

Three PAH compounds were reported from MW402 above the respective MDLs are presented in Appendix B Table 3 and summarised below.

Table 6. Polycyclic Aromatic hydrocarbons (PAHs) results above MDLs

Parameter	Range (mg/kg)	MDL (mg/kg)	Samples > MDL
Phenanthrene	0.25	<0.03	**1/9 samples** MW402 (0.8 m bgl)
Fluoranthene	0.96	<0.03	**1/9 samples** MW402 (0.8 m bgl)
Pyrene	0.51	<0.03	**1/9 samples** MW402 (0.8 m bgl)

mg/kg: milligrams per kilogramme

4.1.3 Hydrocarbons

Soil hydrocarbon results are presented in Appendix B Table 4.

Soil hydrocarbon compounds reported above the respective MDLs are summarised below.

Table 7. Polycyclic Aromatic hydrocarbons (PAHs) results above MDLs

Parameter	Range (mg/kg)	MDL (mg/kg)	Samples > MDL
>EC10-12 aliphatic	9.8	<0.02	**1/9 samples** TP101 (1.0 m bgl)
TPH (>EC12-16) aliphatic	26	<4	**1/9 samples** TP101 (1.0 m bgl)
TPH (>EC16-21) aliphatic	29	<7	**1/9 samples** TP101 (1.0 m bgl)
TPH (EC21-35) aliphatic	16 – 66	<7	**4/9 samples** TP102 (1.0 m bgl) TP103 (1.0 m bgl) MW401 (1.2 m bgl) MW402 (0.8 m bgl)

4.1.4 Metals

Soil metal results are presented in Appendix B Table 5.

Chromium VI was not reported above laboratory MDLs in any of the nine soil samples analysed.

All other metals were reported in one or more samples above the laboratory MDL. These metal results are summarised below:

Table 8. Soil Metal Results Above MDLs

Parameter	Range (mg/kg)	MDL (mg/kg)	Samples > MDL
Arsenic	2.6 – 14.5	<0.5	**All 9 samples**
Barium	9 – 41	<1.0	**All 9 samples**
Beryllium	<0.5 – 1.4	<0.5	**8/9 samples** All samples except MW401 (1.2 m bgl)
Cadmium	<0.2 – 0.2	<0.1	**1/9 samples** MW401 (1.2 m bgl)
Chromium III	5.9 – 50.6	<0.5	**All 9 samples**
Copper	10 – 31	<1.0	**All 9 samples**
Lead	<5 – 20	<5.0	**6/9 samples** TP101 (1.0 m bgl) TP101 (2.0 m bgl) TP102 (1.0 m bgl) TP102 (2.0 m bgl) TP104 (2.0 m bgl) MW402 (0.8 m bgl)
Mercury	<0.1 – 0.2	<0.1	**2/9 samples** TP102 (1.0 m bgl) TP102 (2.0 m bgl)
Nickel	12.5 – 48.8	<0.7	**All 9 samples**
Selenium	<1.0 – 2.0	<1.0	**8/9 samples** All samples except MW401 (1.2 m bgl)
Vanadium	15 – 31	<1.0	**All 9 samples**
Water Soluble Boron	0.1 – 0.4	<0.1	**8/9 samples** All samples except TP102 (2.0 m bgl)
Zinc	37 –133	<5.0	**All 9 samples**

4.1.5 PCBs

Soil PCB results are presented in Appendix B Table 6.

No PCBs were reported above the MDLs in any of the nine soil samples analysed.

4.1.6 Miscellaneous Soil Results

Miscellaneous other soil results are presented in Appendix B Table 7.

No asbestos was detected in any of the eight samples analysed.

Total phenols were detected at MW402 (0.8m) only, at a concentration of 0.26 mg/kg.

4.2 Groundwater Results

The results of laboratory analysis of groundwater samples are presented in Appendix B Tables 9 – 15 and summarised below.

4.2.1 Volatile Organic Compounds (VOCs)

Groundwater VOC results are presented in Appendix B Table 9.

No VOCs were reported as detected in groundwater from either of the two wells sampled in August 2023.

4.2.2 Polycyclic Aromatic Hydrocarbons (PAHs)

Groundwater PAH results are presented in Appendix B Table 10.

No PAHs were reported as detected in groundwater from either of the two wells sampled in August 2023.

4.2.3 Total Petroleum Hydrocarbons (TPHs)

Groundwater TPH results are presented in Appendix B Table 11.

No PAHs were reported as detected in groundwater from either of the two wells sampled in August 2023.

4.2.4 Metals

Groundwater metal results are presented in Appendix B Table 12.

Beryllium, cadmium, chromium, copper, lead, mercury, nickel and selenium were not reported above the laboratory MDLs in either of the two groundwater samples analysed in August 2023.

Concentrations of other dissolved metals reported in groundwater above MDL are summarised below:

Table 9. Groundwater Metal Results Above MDLs

Parameter	MDL (µg/L)	MW401 (µg/L)	MW402 (µg/L)
Arsenic	<2.5	9.1	35.2
Barium	<3.0	21	11
Boron	<12.0	163	91
Vanadium	<1.5	<1.5	1.6
Zinc	<3.0	9	14

µg/L: micrograms per litre

4.2.5 PCBs

Groundwater PCB results are presented in Appendix B Table 13.

No PCBs were reported as detected in groundwater from either of the two wells sampled in August 2023.

4.2.6 Per/Poly-fluorinated Alkyl Substances (PFAS)

Groundwater PFAS results are presented in Appendix B Table 14.

Concentrations of several PFAS compounds were reported in groundwater or surface water above their respective MDLs in both groundwater samples are summarised below:

Table 10. Groundwater PFAS Results Above MDLs

Parameter	MDL (ng/L)	MW401 (ng/L)	MW402 (ng/L)
Perfluorobutanoic acid (PFBA)	<1.0	13	91
Perfluoropentanoic acid (PFPeA)	<1.0	21	370

Table 10. Groundwater PFAS Results Above MDLs

Perfluorohexanoic acid (PFHxA)	<1.0	8.9	190
Perfluoroheptanoic acid (PFHpA)	<1.0	5	140
Perfluorooctanoic acid (PFOA)	<1.0	7.6	79
Perfluorononanoic acid (PFNA)	<1.0	1.2	20.0
Perfluorodecanoic acid (PFDA)	<1.0	<1	4.8
Perfluorohexane sulfonic acid (PFHxS)	<1.0	4	19
Perfluorooctane sulfonic acid (PFOS) Sum	<1.0	4.4	24.0
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	<1.0	1	130
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	<1.0	<1	16

ng/L: nanograms per litre

4.2.7 Major Ions and Miscellaneous Parameters

Groundwater major ion and miscellaneous parameters are presented in Appendix B Table 15.

Orthophosphate, sulphide, total cyanide, nitrate, nitrite and total phenols were not reported as detected from either of the two wells sampled in August 2023.

Major ion and miscellaneous parameters detected above laboratory MDLs is presented in the table below.

Table 11. Groundwater Major Ion and Miscellaneous Parameter Results Above MDLs

Parameter	MDL	MW401	MW402
Ammoniacal Nitrogen as N	<0.03 mg/L	1.01 mg/L	0.09 mg/L
Chloride	<2.0 mg/L	425.5 mg/L	70 mg/L
Total Sulphate as SO_4	<50 mg/L	32.9 mg/L	54 mg/L
Chemical Oxygen Demand (COD)	<7.0 mg/L	37 mg/L	<7 mg/L
Total Hardness	<1.0 mg/L	342 mg/L	46 mg/L
Biological Oxygen Demand (BOD)	<1.0 mg/L	1 mg/L	2 mg/L
Total Coliforms	<1 cfu/100 ml	84 MPN/100 ml	113.5 MPN/100 ml
Faecal Coliforms	<1 MPN/100 ml	220 cfu/100 ml	90 cfu/100 ml

mg/l milligrams per litre
MPN/100 ml most probable number per 100 millilitres
cfu/100 ml colony forming units per 100 millilitres

5. Data Screening

In accordance with the guidance presented in CLR 11[1] for contaminated land risk assessment, the soil and groundwater laboratory results were compared with Generic Assessment Criteria (GACs).

Constituent concentrations in groundwaters are deemed 'potentially significant' where they exceed a GAC. GACs are used for initial screening of parameter concentrations and, as such, it should be noted that GAC value exceedances are not an indication of the requirement for remediation, but rather an indication of the need for further assessment. In the absence of a generally agreed scale, exceedances are qualified in accordance with the table below.

Table 12. GAC Exceedance Quantification

GAC Multiplier	Exceedances	Potential Risk
<1x GAC	None	Negligible
1x to 2x GAC	Marginal Exceedance	Low
2x to 10x GAC	Minor Exceedance	Low
10x to 100x GAC	Moderate Exceedance	Moderate
>100x GAC	Significant Exceedance	Significant

5.1 Soil Screening

5.1.1 Soil Screening Criteria

For an assessment of the potential risk to human health, AECOM's in-house GAC for Commercial / Industrial land use were chosen.

AECOM considers that these GAC are consistent with the principles of human health protection in guidance from the Irish Environmental Protection Agency, UK DEFRA and UK Environment Agency.

It should be noted that the GAC protective of human health assumes a commercial/industrial end use and does not consider short-term exposure pathways to construction workers during development works. An assessment of impacts to construction workers is outside the current scope of work.

As groundwater results are available, soil samples were not screened against GAC protective of controlled waters. The estimated soil GACs for heavy metals are calculated using conservative soil:water partitioning coefficients and result in theoretical soil leaching values for metals that are likely to be very conservative. Therefore, greater reliance is placed by AECOM on actual, site-specific, measured concentrations of these substances in groundwater, if available, to assess the potential risks to controlled waters in the vicinity of the Site.

5.1.2 Screening of Soil Analytical Results

None of the soil results for any of the nine soil samples were reported above the GAC protective of human health receptors on-site under an Industrial / Commercial scenario.

5.2 Groundwater Screening

5.2.1 Groundwater Screening Criteria

Given the site's coastal location, it is unlikely that an abstraction well would be installed at this site. Therefore, there is no potential pathway to human health receptors, other than potentially through inhalation of vapours.

These GAC do not provide detailed information on site-specific risks and, in a significant number of circumstances, may be viewed as being overly health protective. Nevertheless, these values are considered to be appropriate for initial screening of site conditions for the protection of human health.

[1] UK DEFRA and EA, 2002, CLR 11 - 'Model Procedures for the Management of Land Contamination.'

For controlled waters, groundwater analytical data for January 2023 were assessed against Irish generic groundwater assessment criteria, specifically Groundwater Threshold Values (GTVs) and EPA Interim Guideline Values (IGVs):

- The GTVs are Irish regulatory groundwater quality standards developed to give effect to measures needed to achieve the objectives of the Water Framework and Groundwater Directives. They were originally published in January 2010 (Statutory Instrument No. 9 of 2010) and amended in 2016 (SI No. 366 of 2016). Exceedance of a threshold value triggers further investigation to confirm whether the criteria for poor groundwater chemical status are being met.
- IGVs are guidance values which represent negligible groundwater contamination and were published by the EPA in 2003, compiled from a number of existing water quality guidelines in use in Ireland and elsewhere, including existing national environmental quality standards, proposed common indicators for the groundwater directive, drinking water standards and Geological Survey of Ireland trigger values.

Note – separate GTVs and IGVs may have different concentration values for the same substance defined by legislation or by the Irish EPA under different exposure scenarios. These different assessment criteria are shown in the results tables in Appendix B and are referred to in the text as, for example, upper and lower GTVs.

The following additional standards were applied, where relevant:

- Environmental Quality Standards (EQS) – Coastal Waters (Aquatic Toxicity)
- DWS (Drinking Water Standards) published in SI No. 122 of 2014, as amended. While it is unlikely that groundwater will be used for potable supply given the Site's proximity to coastal waters, all groundwater in the Republic of Ireland is considered a potential drinking water source.

For PFAS in surface water and groundwater, the only Irish water-related PFAS standards are the surface water EQS for perfluoroctanesulfonic acid (PFOS) and its derivatives in surface water, with a Maximum Admissible Concentration of 7.2 µg/L[2] for 'other surface waters', and the drinking water standard of 0.1 µg/L for the sum of a specified list of PFAS.

5.2.2 Screening of Groundwater Results – Human Health

No results were reported above the GAC protective of human health receptors on-Site under an Industrial / Commercial scenario.

5.2.3 Screening of Groundwater Results – Controlled Waters

Groundwater detections were limited to PFAS, metals and major ions. Concentrations above laboratory MDLs were compared against the selected GAC.

Arsenic at MW402 (35.2 µg/L) exceeded the GTV (7.5 µg/L), the IGV (10 µg/L) and the EQS (20 µg/L). Arsenic at MW401 (9.1 µg/L) exceeded the GTV only. Arsenic detections are likely to be naturally occurring in the shale bedrock.

Ammoniacal nitrogen (as N) at MW401 (1.01 mg/L) exceeded the lower GTV (0.065 mg/L), the IGV (0.12 mg/L), the upper GTV (0.175 mg/L and the EQS (0.021 mg/L). Ammoniacal nitrogen (as N) at MW402 (0.09 mg/L) exceeded the EQS and lower GTV only.

Chloride at MW401 (452.5 mg/L) exceeded the lower GTV (24 mg/L), the IGV (30 mg/L), the upper GTV (187.5 mg/L with no EQS defined. Chloride at MW402 (70 mg/L) exceeded the lower GTV only and IGV only.

PFAS was detected in groundwater from wells MW401 and MW402. The concentration of PFOA were below the relevant assessment criteria.

The sum of PFAS was 95.1 ng/L at MW401 and 71.3 ng/L at MW402. This is below the drinking water standard of 100 ng/L for the sum of PFAS, however it should be noted that four parameters PFNS, PFUnDS, PFDoDS and PFTrDS are not included in the current suite of analysis. Groundwater

[2] European Union Environmental Objectives (Surface Waters) (Amendment) Regulations 2019 S.I. 77 of 2019 – Table 12 MAC-EQS Other Surface Waters

beneath the site is unlikely to be developed as a drinking water resource, given the site's coastal location leading to elevated salinity and the industrial site use history.

6. Conceptual Site Model

Potential pollutant linkages are considered viable where there is a source of impact on site which can migrate via a defined pathway to identified receptors. Receptors can be either environmental or human, and located either within or outside the site boundary.

A conceptual site model (CSM) has been developed for the site based on the information collated during the intrusive site investigation and is described in this section, identifying contaminant sources, contaminant migration pathways and potential receptors for the site.

6.1 Pollutant Linkages Concept

In the context of land contamination, there are three essential elements to any risk:

- A **source** – a substance that is in, on or under the land and has the potential to cause harm or to cause pollution of groundwater and surface waters.
- A **receptor** – in general terms, something that could be adversely affected by a contaminant, such as people, an ecological system, property, or a water body.
- A **pathway** – a route or means by which a receptor can be exposed to, or affected by, a contaminant.

Each of these elements can exist independently, but they create a risk only where they are linked together, so that a particular contaminant affects a particular receptor through a particular pathway. This kind of linked combination of contaminant source–pathway–receptor (SPR) is described as a pollutant linkage. The conceptual model was developed to describe viable SPR linkages for the site.

6.1.1 Potential Sources

A review of historical data identified potential contaminants of concern (PCOC), outlined in Table 13 below.

Table 13. Potential Sources

Potential Sources of Contamination	Potential Contaminants of Concern
Contractors' compound and potential historic handling processes	TPHs, PAHs and metals in soils
Foul Sewer network	Total and faecal coliforms
Aqueous Film Forming Foams (AFFF)	Firefighting foam, per and poly-fluoroalkyl substances (PFAS)

6.2 Potential Receptors

The potential receptors at the site and surrounding area are outlined in Table 14 below.

Table 14. Potential Receptors

Receptor Type	Receptor	Present	Potable Supply	Description
Human Health	Future site users – commercial / industrial use.	Yes	NA	AECOM understands that there is no planned change in site use. The most sensitive onsite human health receptor is, therefore, considered to be industrial workers.
	Offsite residential properties.	No	NA	Given the distance to the closest residential receptor (500m southeast of the T-4 Site), the risk of dermal contact, ingestion and inhalation of dust and/or vapour are considered low.

Receptor Type	Receptor	Present	Potable Supply	Description
Waters	Groundwater abstraction within 500 m of the site.	No	No	The site is located on a peninsula projecting into the Shannon Estuary. Groundwater beneath the Site is likely to be brackish/saline and unsuitable for potable use.
	Surface water body within 500m of the site in direct hydraulic connection with groundwater from the site.	Yes	No	It is likely that groundwater beneath the site is in direct hydraulic connection with the Shannon Estuary (a coastal waterbody).
	Groundwater in bedrock beneath the site.	Yes	No	Bedrock was encountered at depths ranging between 1 m bgl and 12 m bgl. No known groundwater abstraction in vicinity of site and it is unlikely before there to be any developed given the site's setting in a coastal area.
	Groundwater in superficial deposits beneath the site.	Yes	No	Due to the site's location on a peninsula projecting into the Shannon Estuary, it is unlikely that groundwater in superficial deposits are used as a potable drinking supply.

The Shannon Estuary is considered to be the most sensitive controlled water receptor in the vicinity of the site.

6.3 Potential Pathways

Given the site's setting and expected continued commercial/industrial site use, there are considered to be a number of potential exposure pathways for future site users, groundwater and surface waters. The potential pathways to human health and controlled waters which are considered viable are outlined in Table 15.

Table 15 Potential Pathways

Receptors	Pathway
Human health receptors in a commercial/industrial scenario.	• Soil and dust ingestion from near surface soils in areas of soft landscaping. • Dermal contact with near surface soils in areas of soft landscaping. • Inhalation of fugitive dust from near surface soils in areas of soft landscaping. • Inhalation of fugitive dust from near surface soils in soft landscaped areas • Inhalation of vapours.
Water receptors.	• Leaching from soil into perched groundwater followed by vertical migration. • Horizontal migration of impacted groundwater. • Horizontal groundwater migration to nearby surface waters.

6.3.1 Summary of Viable SPR Linkages

A summary of potential Source-Pathway-Receptor (SPR) linkages is outlined in the table below.

Table 16. Summary of Viable SPR Linkages

Receptor	Source	Pathway						
		1) Soil and dust ingestion	2) Dermal contact	3) Inhalation of fugitive dust	4) Inhalation of vapours	5) Leaching from unsaturated zone	6) Lateral migration of impacted groundwater	7) Horizontal groundwater migration to nearby surface waters
Industrial Site Users	Soil	✓	✓	✓	✓			
	Groundwater				✓			
Groundwater	Soil					✓	✓	✓
	Groundwater					✓	✓	✓
Surface Water	Soil					✓	✓	✓
	Groundwater					✓	✓	✓

6.3.2 Qualitative Risk Assessment Methodology

A qualitative risk assessment has been carried out by assessing the severity of the potential consequence, considering both the potential severity of the hazard and the sensitivity of the target. The risk assessment has been undertaken with reference to BS10175:2001 and CIRIA Document C552: 'Contaminated Land Risk Assessment – A Guide to Good Practice'. The risk assessment has been carried out by assessing the severity of the potential consequence, considering both the potential severity of the hazard and the sensitivity of the target, based on the categories given in Table 17.

Table 17. Potential Hazard Severity Definition

Category	Definition
Severe	Acute risks to human health, catastrophic damage to buildings/property, major pollution of controlled waters.
Medium	Chronic risk to human health, pollution of sensitive controlled waters, significant effects on sensitive ecosystems or species, significant damage to buildings or structures.
Mild	Pollution of non-sensitive waters, minor damage to buildings or structures.
Minor	Requirement for protective equipment during site works to mitigate health effects, damage to non-sensitive ecosystems or species.

The likelihood of an event (probability) considers both the presence of the hazard and target and the integrity of the pathway and has been assessed based on the categories given in Table 18.

Table 18. Probability of Risk Definition

Category	Definition
High likelihood	Pollutant linkage may be present, and risk is almost certain to occur in long term, or there is evidence of harm to the receptor.
Likely	Pollutant linkage may be present, and it is probable that the risk will occur over the long term.
Low likelihood	Pollutant linkage may be present, and there is a possibility of the risk occurring, although there is no certainty that it will do so.

Unlikely	Pollutant linkage may be present, but the circumstances under which harm would occur are improbable.

The potential severity of the risk and the probability of the risk occurring have been combined in accordance with the following matrix in order to give a level of risk for each potential hazard as shown in Table 19.

Table 19. Level of Risk for Potential Hazard Definition

	Potential Severity			
Probability of Risk	Severe	Medium	Mild	Minor
High	Very high	High	Moderate	Low/Moderate
Likely	High	Moderate	Low/Moderate	Low
Low	Moderate	Low/Moderate	Low	Very low
Unlikely	Low/Moderate	Low	Very low	Very low

A description of the levels of risk outlined in Table 20 is provided in the following table:

Table 20. Description of the Classified Risks and Likely Action Required

Level of Risk	Description
Very High Risk	• There is a high probability that severe harm could arise to a designated receptor from an identified hazard, or there is evidence that severe harm to a designated receptor is currently happening. • This risk, if realised, is likely to result in substantial liability. • Urgent investigation and remediation are likely to be required.
High Risk	• Harm is likely to arise to a designated receptor from an identified hazard. • Realisation of the risk is likely to present a substantial liability. • Urgent investigation is required, and remedial works may be necessary in the short term and are likely over the long term.
Moderate Risk	• It is possible that harm could arise to a designated receptor from an identified hazard. However, it is either relatively unlikely that any such harm would be severe, or if any harm were to occur it is more likely that the harm would be relatively mild, if realised.
Low Risk	• It is possible that harm could arise to a designated receptor from an identified hazard, but it is likely that this harm, if realised, would at worst normally be mild.
Very Low Risk	• There is a low possibility that harm could arise to a receptor. In the event of such harm being realised it is not likely to be severe.

6.3.3 T-4 Site CSM

A CSM has been prepared for the T-4 Site based on the information collected during this site investigation and the results of previous site investigations in the T-4 area.

Table 21. Summary of Viable SPR Linkages

Sources	Pollutants	Pathway	Receptor	Associated Severity	Likelihood of Occurrence	Discussion	Potential Risk
Made ground and shallow soils	TPH, PAH, PCB, metals	Dermal/ ingestion/inhalation of dust	Current and future site users	Medium	Unlikely	Analytical results did not exceed screening criteria protective of human health, therefore no potential source of contamination within soil on Site was identified that could pose a risk to current/future industrial workers on site.	Low Risk
	Asbestos	Dermal/ ingestion/inhalation of dust	Current and future site users	Medium	Unlikely	ACM was not encountered as part of the site investigation.	Low Risk
Made ground, shallow soils and groundwater	Volatiles	Inhalation of vapours	Current and future site users	Medium	Unlikely	Analytical results did not exceed screening criteria protective of human health, therefore no potential source of contamination within soil on Site was identified that could pose a risk to current/future industrial workers on site.	Low Risk
	TPH, phenols, metals	Migration of leachable contaminants through permeable strata Vertical migration through permeable deposits Vertical and horizontal migration of contaminants through groundwater. Horizontal migration of contaminants through groundwater to nearby surface water receptors.	Shallow groundwater Deep aquifer Surface water bodies (River Shannon)	Medium	Unlikely	No TPHs, VOCs, PCBs, PAHs or phenols were detected above GAC protective of controlled waters in groundwater samples collected in August 2023. Minor exceedances of GAC by arsenic in groundwater samples are likely to be naturally-occurring and not as a result of current or historic site operations.	Low Risk
Potential losses from foul sewer	Total and faecal coliforms	Migration of leachable contaminants through permeable strata Vertical migration through permeable deposits Vertical and horizontal migration of contaminants through groundwater. Horizontal migration of contaminants through groundwater to nearby surface water receptors.	Shallow groundwater Deep aquifer Surface water bodies (River Shannon)	Minor	Likely	Groundwater beneath the site is unlikely to be developed as a potable resource. Elevated coliforms were detected in both groundwater samples.	Low Risk

Sources	Pollutants	Pathway	Receptor	Associated Severity	Likelihood of Occurrence	Discussion	Potential Risk
Firefighting Foam	PFAS	Migration of leachable contaminants through permeable strata Vertical migration through permeable deposits Vertical and horizontal migration of contaminants through groundwater. Horizontal migration of contaminants through groundwater to nearby surface water receptors.	Vertical migration through permeable deposits	Medium	Unlikely	The presence of PFAS indicates potential historic use of AFFF containing PFAS (potentially due to firefighting training or historical fire incidents on the power station). Detected concentrations of PFAS in groundwater are below relevant assessment criteria. Groundwater beneath the site is unlikely to be developed as a drinking water supply due to the site's location adjacent to a transitional waterbody	Low Risk
			Controlled Waters Groundwater Shannon Estuary	Medium	Unlikely		Low Risk

7. Conclusions

An intrusive site investigation was completed on site in July and August 2023. As part of this investigation, two monitoring wells were installed and four trial pits were completed. The purpose of this investigation was to close data gaps identified following historic site investigations.

There were no visual or olfactory evidence of contamination at any of the sample locations. Asbestos and PCBs were not detected in any of the soil samples collected.

Trace VOCs, PAHs, phenols and TPHs were detected in one or more soil sample locations but at concentrations significantly below assessment criteria.

Groundwater samples were collected from both of the two newly installed wells. VOCs, PAHs, PCBs and TPH were below laboratory MDLs in both samples collected.

Where detected, PFAS, metals and major ions were below all relevant assessment criteria in groundwater with the exception of the following:

- Marginal to minor exceedances of arsenic was reported in the two groundwater samples.
- Ammoniacal nitrogen exceeded the IGV and GTV at MW401 in the former contractor compound only.
- Chloride exceeded the IGV and GTV in groundwater from both monitoring wells. Chloride exceedances are likely to be due to the site's coastal setting.
- Faecal coliforms in both groundwater samples indicate possible losses from on-Site foul sewer drainage.

A CSM was prepared based on the results of the 2023 site investigation and historic investigations. There were no sources of contamination in excess of human health criteria in soils.

Groundwater on site is unlikely to be used for potable water, given the Site's proximity to coastal waters, therefore there is no pathway to on-site humans for faecal coliforms or PFAS in groundwater.

Historic reports identified metals and TPHs in soils as a potential risk to controlled waters receptors. The estimated soil GACs for heavy metals are calculated using conservative soil:water partitioning coefficients and result in theoretical soil leaching values for metals that are likely to be very conservative. Therefore, greater reliance is placed by AECOM on actual, site-specific, measured concentrations of these substances in groundwater, if available, to assess the potential risks to controlled waters in the vicinity of the Site. TPHs and all metals, with the exception of arsenic, were below GAC protective of controlled waters. Arsenic is inferred to be naturally-occurring in groundwater beneath the site, derived from the shale bedrock.

Based on the above assessment, the risk to human health and controlled waters receptors is LOW. It should be noted that buildings and services in the area to the north of the main Tarbert power plant building prevented soil sampling from taking place in this section of the Proposed Development. AECOM recommends that soil samples are collected from this area of the site following the demolition of these buildings and prior to redevelopment to update the CSM.

Appendix A Figures

North

SAMPLE POINT PE4

SAMPLE POINT PE2/PE3

SAMPLE POINT PE1

PE5

FE7

FE1

MW402

MW401

TP104

TP103

TP102

TP101

CLIENT	SSE TARBERT
PROJECT	S-4 SITE INVESTIGATION
DRAWING TITLE	**FIGURE 1**_SAMPLE LOCATIONS

NOTES

- Groundwater Wells
- Trial Pit Locations

DRAWN	CHECKED	APPROVED	DATE
BMC	KF	KF	JUL 2023
SCALE	DRG NO.		
N.T.S	60707258_ACM_RP_SI_001		

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T : +353 (21)4365 006

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Appendix B Tables

Prepared by: BMC
Checked by: YMC

Table 1: Sample Inventory
Tarbert T-4 July/August 2023

Sampling Date	Location ID	Sample Depth m bgl	Sample Matrix	Laboratory Analysis												
				VOCs	TPH-CWG	BTEXs	PAHs	PCBs	CLEA Metals	Asbestos	PFAS Compounds	BOD	COD	Major Ions	Coliforms	Cyanide
25/07/2023	**TP101**	1	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**TP101**	2	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**TP102**	1	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**TP102**	1	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**TP103**	1	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**TP104**	1	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**TP104**	2	S	X	X	X	X	X	X	X	~	~	~	~	~	X
25/07/2023	**MW401**	1.2	S	X	X	X	X	X	X	~	~	~	~	~	~	X
25/07/2023	**MW402**	0.8	S	X	X	X	X	X	X	X	~	~	~	~	~	X
09/08/2023	**MW401**	-	GW	X	X	X	X	X	X	~	X	X	X	X	X	X
09/08/2023	**MW402**	-	GW	X	X	X	X	X	X	~	X	X	X	X	X	X

Notes:
S - soil/subsoil
GW - groundwater
VOCs - Volatile Organic Compounds
TPH-CWG - Total Petroleum Hydrocarbons Criteria Working Group (speciated hydrocarbons with aromatic/aliphatic split)
PAHs - polycyclic aromatic hydrocarbons
CLEA Metals - Contaminated Land Exposure Assessment Metals
PFAS - Per- and Polyfluoroalkyl Substances
X - analysis scheduled
~ - analysis not scheduled

Prepared by: BMC
Checked by: YMC

Table 2: Soil VOCs
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial	Max Concentration	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID					**TP101**	**TP101**	**TP102**	**TP102**	**TP103**	**TP104**	**TP104**	**MW401**	**MW402**
Sample Depth (m)					1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80
Date Sampled					25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023
Lab Reference					23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348
Parameter (Volatile Organic Compounds)													
Dichlorodifluoromethane	µg/kg	<2	ncr	-	-	-	-	-	-	-	-	-	-
Methyl Tertiary Butyl Ether	µg/kg	<2	ncr	-	-	-	-	-	-	-	-	-	-
Chloromethane	µg/kg	<3	1,000	6	6	-	-	-	-	-	-	-	-
Vinyl Chloride	µg/kg	<2	ncr	-	-	-	-	-	-	-	-	-	-
Bromomethane	µg/kg	<1	ncr	-	-	-	-	-	-	-	-	-	-
Chloroethane	µg/kg	<2	960,000	3	-	-	-	3	-	-	-	-	-
Trichlorofluoromethane	µg/kg	<2	ncr	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethene (1,1 DCE)	µg/kg	<6	ncr	-	-	-	-	-	-	-	-	-	-
Dichloromethane (DCM)	µg/kg	<30	ncr	-	-	-	-	-	-	-	-	-	-
trans-1-2-Dichloroethene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,1-Dichloroethane	µg/kg	<3	280,000	9	-	-	-	9	-	-	-	-	-
cis-1-2-Dichloroethene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
2,2-Dichloropropane	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
Bromochloromethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Chloroform	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,1,1-Trichloroethane (1,1,1 TCA)	µg/kg	<3	660,000	6	-	-	-	6	-	-	-	-	-
1,1-Dichloropropene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Carbon tetrachloride	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
1,2-Dichloroethane	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
Benzene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Trichloroethene (TCE)	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,2-Dichloropropane	µg/kg	<6	ncr	-	-	-	-	-	-	-	-	-	-
Dibromomethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Bromodichloromethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
cis-1-3-Dichloropropene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
Toluene	µg/kg	<3	56,000,000	13	13	-	6	-	-	-	-	-	-
trans-1-3-Dichloropropene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,1,2-Trichloroethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Tetrachloroethene (PCE)	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,3-Dichloropropane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Dibromochloromethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,2-Dibromoethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Chlorobenzene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,1,1,2-Tetrachloroethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Ethylbenzene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
p/m-Xylene	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
o-Xylene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Styrene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Bromoform	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Isopropylbenzene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,1,2,2-Tetrachloroethane	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
Bromobenzene	µg/kg	<2	ncr	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichloropropane	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
Propylbenzene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
2-Chlorotoluene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
4-Chlorotoluene	µg/kg	<3	ncr	-	-	-	-	-	-	-	-	-	-
tert-Butylbenzene	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
1,2,4-Trimethylbenzene	µg/kg	<6	ncr	-	-	-	-	-	-	-	-	-	-
sec-Butylbenzene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
4-Isopropyltoluene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
1,3-Dichlorobenzene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
1,4-Dichlorobenzene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
n-Butylbenzene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
1,2-Dichlorobenzene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
1,2-Dibromo-3-chloropropane	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
1,2,4-Trichlorobenzene	µg/kg	<7	ncr	-	-	-	-	-	-	-	-	-	-
Hexachlorobutadiene	µg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
Naphthalene	µg/kg	<27	ncr	-	-	-	-	-	-	-	-	-	-
1,2,3-Trichlorobenzene	µg/kg	<7	ncr	-	-	-	-	-	-	-	-	-	-

Notes:
MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required
ND - No TICs detected

Prepared by: BMC
Checked by: YMC

Table 3: Soil PAH

Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial	Max Concentration	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID					**TP101**	**TP101**	**TP102**	**TP102**	**TP103**	**TP104**	**TP104**	**MW401**	**MW402**
Sample Depth (m)					1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80
Date Sampled					25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023
Lab Reference					23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348
Parameter (Polyaromatic Hydrocarbons (PAHs))													
Naphthalene	mg/kg	<0.04	ncr	-	-	-	-	-	-	-	-	-	-
Acenaphthylene	mg/kg	<0.03	ncr	-	-	-	-	-	-	-	-	-	-
Acenaphthene	mg/kg	<0.05	ncr	-	-	-	-	-	-	-	-	-	-
Fluorene	mg/kg	<0.04	ncr	-	-	-	-	-	-	-	-	-	-
Phenanthrene	mg/kg	<0.03	22,000	0.25	-	-	-	-	-	-	-	-	0.25
Anthracene	mg/kg	<0.04	ncr	-	-	-	-	-	-	-	-	-	-
Fluoranthene	mg/kg	<0.03	23,000	1	-	-	-	-	-	-	-	-	0.96
Pyrene	mg/kg	<0.03	54,000	1	-	-	-	-	-	-	-	-	0.51
Benzo(a)anthracene	mg/kg	<0.06	ncr	-	-	-	-	-	-	-	-	-	-
Chrysene	mg/kg	<0.02	ncr	-	-	-	-	-	-	-	-	-	-
Benzo(bk)fluoranthene	mg/kg	<0.07	ncr	-	-	-	-	-	-	-	-	-	-
Benzo(a)pyrene	mg/kg	<0.04	ncr	-	-	-	-	-	-	-	-	-	-
Indeno(123cd)pyrene	mg/kg	<0.04	ncr	-	-	-	-	-	-	-	-	-	-
Dibenzo(ah)anthracene	mg/kg	<0.04	ncr	-	-	-	-	-	-	-	-	-	-
Benzo(ghi)perylene	mg/kg	<0.04	3,900	-	-	-	-	-	-	-	-	-	-
PAH 16 Total	mg/kg	<0.6	nca	1.7	-	-	-	-	-	-	-	-	1.7
Benzo(b)fluoranthene	mg/kg	<0.05	ncr		-	-	-	-	-	-	-	-	-
Benzo(k)fluoranthene	mg/kg	<0.02	ncr	-	-	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
nca - No criteria available
ncr - No criteria required
ND - No TICs detected

Prepared by: BMC
Checked by: YMC

Table 4: Soil SVOCs
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial	Max Concentration	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID					**TP101**	**TP101**	**TP102**	**TP102**	**TP103**	**TP104**	**TP104**	**MW401**	**MW402**
Sample Depth (m)					1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80
Date Sampled					25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023
Lab Reference					23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348
Parameter													
TPH Aromatics				-									
TPH (>EC5-7) aromatic	mg/kg	<0.1	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC7-8) aromatic	mg/kg	<0.1	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aromatic	mg/kg	<0.1	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC10-12) aromatic	mg/kg	<0.2	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC12-16) aromatic	mg/kg	<4	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC16-21) aromatic	mg/kg	<7	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC21-35) aromatic	mg/kg	<7	ncr	-	-	-	-	-	-	-	-	-	-
Total Aromatics (C5-35)	mg/kg	<19	ncr	-	-	-	-	-	-	-	-	-	-
TPH Aliphatics													
TPH (>EC5-6) aliphatic	mg/kg	<0.1	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC6-8) aliphatic	mg/kg	<0.1	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC8-10) aliphatic	mg/kg	<0.1	ncr	-	-	-	-	-	-	-	-	-	-
TPH (>EC10-12) aliphatic	mg/kg	<0.2	9,700	9.8	9.8	-	-	-	-	-	-	-	-
TPH (>EC12-16) aliphatic	mg/kg	<4	59,000	26	26	-	-	-	-	-	-	-	-
TPH (>EC16-21) aliphatic	mg/kg	<7	nca	29	29	-	-	-	-	-	-	-	-
TPH (EC21-35) aliphatic	mg/kg	<7	nca	66	-	-	66	-	32	-	-	33	16
Total Aliphatics (C5-35)	mg/kg	<19	nca	66	65	-	66	-	32	-	-	33	-
Total aliphatics and aromatics (C5-C35)	mg/kg	<38	nca	66	65	-	66	-	-	-	-	-	-

Notes:
MDL - Method Detection Limit
mg/kg - milligrams per kilogram
µg/kg - micrograms per kilogram
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required

Prepared by: BMC
Checked by: YMC

Table 5: Soil Metals
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial	Max Concentration	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID					**TP101**	**TP101**	**TP102**	**TP102**	**TP103**	**TP104**	**TP104**	**MW401**	**MW402**
Sample Depth (m)					1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80
Date Sampled					25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023
Lab Reference					23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348
Parameter (Metals)													
Arsenic	mg/kg	<0.5	640	15	9.7	8.6	9.6	12.1	14.4	14.5	8.8	2.6	9.2
Barium	mg/kg	<1.0	22,000	41	35	27	39	29	31	33	37	9	41
Beryllium	mg/kg	<0.5	12	1.4	1.3	1.0	1.3	1.1	1.1	1.4	1.0	-	1.2
Cadmium	mg/kg	<0.1	410	0.2	-	-	-	-	-	-	-	0.2	-
Chromium	mg/kg	<0.5	200,000	51	50.6	48.4	36.4	36.5	45.8	48.4	50.4	5.9	35.4
Chromium III	mg/kg	<0.5	49	-	50.6	48.4	36.4	36.5	45.8	48.4	50.4	5.9	35.4
Chromium VI	mg/kg	<0.3	8,600	0	-	-	-	-	-	-	-	-	-
Copper	mg/kg	<1.0	68,000	31	18	28	31	27	23	19	26	10	28
Lead	mg/kg	<5.0	2,330	20	13	15	16	10	-	-	20	-	16
Mercury	mg/kg	<0.1	350	0.2	-	-	0.2	0.2	-	-	-	-	0.1
Nickel	mg/kg	<0.7	980	49	41.1	40.3	42.8	39.3	38.4	48.8	35.1	12.5	41.7
Selenium	mg/kg	<1.0	12,000	2.0	2	2	1	1	1	2	2	-	2
Vanadium	mg/kg	<1.0	9,000	31	28	26	23	22	22	24	24	15	31
Water Soluble Boron	mg/kg	<0.1	240,000	0.4	0.4	0.2	0.2	-	0.1	0.1	0.3	0.1	0.4
Zinc	mg/kg	<5.0	730,000	133	80	119	133	93	54	51	76	37	87

Notes:
MDL - Method Detection Limit
mg/kg - milligrams per kilogram
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required
nca - No criteria available

Prepared by: BMC
Checked by: YMC

Table 6: PCBs
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Human Health GAC - Commercial / Industrial	Max Concentration	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID					**TP101**	**TP101**	**TP102**	**TP102**	**TP103**	**TP104**	**TP104**	**MW401**	**MW402**
Sample Depth (m)					1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80
Date Sampled					25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023
Lab Reference					23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348
Parameter (PCBs)													
PCB 28	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
PCB 52	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
PCB 101	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
PCB 118	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
PCB 138	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
PCB 153	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
PCB 180	µg/kg	<5	ncr	-	-	-	-	-	-	-	-	-	-
Total 7 PCBs	µg/kg	<35	ncr	-	-	-	-	-	-	-	-	-	-

Notes:

MDL - Method Detection Limit
mg/kg - milligrams per kilogram
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required
nca - No criteria available

PCB - Polychlorinated biphenyls

Prepared by: BMC
Checked by: YMC

Table 7: Soil Miscellaneous Results
Tarbert T-4 July/August 2023

Sample Type	**Units**	**MDL**	**Human Health GAC - Commercial / Industrial**	**Max Concentration**	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil
Sample ID					**TP101**	**TP101**	**TP102**	**TP102**	**TP103**	**TP104**	**TP104**	**MW401**	**MW402**
Sample Depth (m)					1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80
Date Sampled					25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023
Lab Reference					23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348	23/12348
Parameter													
Asbestos Screen & Identification													
Asbestos Fibres	None		ncr	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		NAD
Asbestos ACM	None		ncr	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		NAD
Asbestos Type	None		ncr	NAD	NAD	NAD	NAD	NAD	NAD	NAD	NAD		NAD
Miscellaneous													
Total Phenols	mg/kg	<0.01	440	0.26	-	-	-	-	-	-	-	-	0.26
pH	pH units	<0.01	ncr	-	6.51	7.41	8.25	7.82	8.44	7.88	6.78	11.15	8.41
Natural Moisture Content	%	<0.1	ncr	-	39.4	14.6	11.3	12.2	6.8	5.1	19.3	8.0	13.1
Total Organic Carbon	%	<0.02	ncr	-	1.15	0.32	0.44	0.25	0.41	0.4	0.6	0.05	0.75
Sample Type	None		ncr	-	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Silt	Clay
Sample Colour	None		ncr	-	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown
Other Items	None		ncr	-	stones	stones	stones	stones	stones	stones	stones	stones, water	stones, vegetation

Notes:
MDL - Method Detection Limit
mg/kg - milligrams per kilogram
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required
nca - No criteria available
NAD - No asbestos detected
Blank - Not Analysed

Prepared by: BMC
Checked by: YMC

Table 8: Groundwater Water Measurements
Tarbert T-4 July/August 2023

Well	Easting	Northing	Casing Elevation m ASD	Depth to Groundwater (m bgl)	Groundwater Elevation (m ASD)	Temperature	pH	Redox Potential (Eh)	Electrical Conductivity	Dissolved Oxygen	Comments/Observations
				09-Aug-23	09-Jan-23	°C		mV*	µS/cm @ 25°C	mg/L	
MW401	507475	649596	3.56	1.469	2.091	13.0	6.9	252	1,710	0.00	Silty, cloudy brown water, NEC.
MW402	507613	649658	3.62	1.363	2.255	13.7	7.0	232	471	0.02	Silty, cloudy brown water, NEC.

Notes:

m bgl - metres below ground level
m ASD - metres above site datum
^{o}C - Degrees Celsius
mV - Millivolts
µS/cm - Microsiemens per centimetre
mg/L - milligrams per litre
NEC - No Evidence of Contamination
ITM: Irish Transverse Marcator

* Field readings of Oxygen Reduction Potential (ORP) adjusted as per manufacturer's recommendations to give Redox Potential (Eh)

Sample Type	Units	MDL (µg/L)	Controlled Waters GAC	IGV	GTV	Max Concentration	Groundwater	Groundwater
Well							MW401	MW402
Date Sampled							09-Aug-23	09-Aug-23
Lab Reference							23/13298	23/13298
Parameter								
Dichlorodifluoromethane	µg/L	<2	ncr	----	----	-	-	-
Methyl Tertiary Butyl Ether	µg/L	<0.1	ncr	30	10	-	-	-
Chloromethane	µg/L	<3	ncr	----	----	-	-	-
Vinyl Chloride	µg/L	<0.1	ncr	----	0.375	-	-	-
Bromomethane	µg/L	<1	ncr	----	----	-	-	-
Chloroethane	µg/L	<3	ncr	----	----	-	-	-
Trichlorofluoromethane	µg/L	<3	ncr	----	----	-	-	-
1,1-Dichloroethene (1,1 DCE)	µg/L	<3	ncr	30[1]	----	-	-	-
Dichloromethane (DCM)	µg/L	<5	ncr	10	15	-	-	-
trans-1-2-Dichloroethene	µg/L	<3	ncr	30[2]	0.375[A]	-	-	-
1,1-Dichloroethane	µg/L	<3	ncr	----	----	-	-	-
cis-1-2-Dichloroethene	µg/L	<3	ncr	30[2]	0.375[A]	-	-	-
2,2-Dichloropropane	µg/L	<1	ncr	----	----	-	-	-
Bromochloromethane	µg/L	<2	ncr	----	----	-	-	-
Chloroform	µg/L	<2	ncr	12	----	-	-	-
1,1,1-Trichloroethane (1,1,1 TCA)	µg/L	<2	ncr	500	----	-	-	-
1,1-Dichloropropene	µg/L	<3	ncr	----	----	-	-	-
Carbon tetrachloride	µg/L	<2	ncr	2	----	-	-	-
1,2-Dichloroethane	µg/L	<2	ncr	3	2.25	-	-	-
Benzene	µg/L	<0.5	ncr	1	0.75	-	-	-
Trichloroethene (TCE)	µg/L	<3	ncr	70, 10[2]	7.5	-	-	-
1,2-Dichloropropane	µg/L	<2	ncr	----	----	-	-	-
Dibromomethane	µg/L	<3	ncr	----	----	-	-	-
Bromodichloromethane	µg/L	<2	ncr	----	----	-	-	-
cis-1-3-Dichloropropene	µg/L	<2	ncr	----	----	-	-	-
Toluene	µg/L	<5	ncr	10	525	-	-	-
trans-1-3-Dichloropropene	µg/L	<2	ncr	----	----	-	-	-
1,1,2-Trichloroethane	µg/L	<2	ncr	----	----	-	-	-
Tetrachloroethene (PCE)	µg/L	<3	ncr	40, 10[3]	7.5	-	-	-
1,3-Dichloropropane	µg/L	<2	ncr	----	----	-	-	-
Dibromochloromethane	µg/L	<2	ncr	----	----	-	-	-
1,2-Dibromoethane	µg/L	<2	ncr	----	----	-	-	-
Chlorobenzene	µg/L	<2	ncr	1	----	-	-	-
1,1,1,2-Tetrachloroethane	µg/L	<2	ncr	----	----	-	-	-
Ethylbenzene	µg/L	<1	ncr	10	----	-	-	-
p/m-Xylene	µg/L	<2	ncr	10[4]	----	-	-	-
o-Xylene	µg/L	<1	ncr	10[4]	----	-	-	-
Styrene	µg/L	<2	ncr	----	----	-	-	-
Bromoform	µg/L	<2	ncr	----	----	-	-	-
Isopropylbenzene	µg/L	<3	ncr	----	----	-	-	-
1,1,2,2-Tetrachloroethane	µg/L	<4	ncr	----	----	-	-	-
Bromobenzene	µg/L	<2	ncr	----	----	-	-	-
1,2,3-Trichloropropane	µg/L	<3	ncr	----	----	-	-	-
Propylbenzene	µg/L	<3	ncr	----	----	-	-	-
2-Chlorotoluene	µg/L	<3	ncr	----	----	-	-	-
1,3,5-Trimethylbenzene	µg/L	<3	ncr	----	----	-	-	-
4-Chlorotoluene	µg/L	<3	ncr	----	----	-	-	-
tert-Butylbenzene	µg/L	<3	ncr	----	----	-	-	-
1,2,4-Trimethylbenzene	µg/L	<3	ncr	----	----	-	-	-
sec-Butylbenzene	µg/L	<3	ncr	----	----	-	-	-
4-Isopropyltoluene	µg/L	<3	ncr	----	----	-	-	-
1,3-Dichlorobenzene	µg/L	<3	ncr	----	----	-	-	-
1,4-Dichlorobenzene	µg/L	<3	ncr	----	----	-	-	-
n-Butylbenzene	µg/L	<3	ncr	----	----	-	-	-
1,2-Dichlorobenzene	µg/L	<3	ncr	10	----	-	-	-
1,2-Dibromo-3-chloropropane	µg/L	<2	ncr	----	----	-	-	-
1,2,4-Trichlorobenzene	µg/L	<3	ncr	0.4[5]	----	-	-	-
Hexachlorobutadiene	µg/L	<3	ncr	0.1	----	-	-	-
Naphthalene	µg/L	<2	ncr	1	----	-	-	-
1,2,3-Trichlorobenzene	µg/L	<3	ncr	0.4[5]	----	-	-	-

Notes:

MDL - Method Detection Limit

µg/L - micrograms per litre

GAC - Generic Assessment Criteria

- <MDL

----: IGV/GTV Not Defined

GTV: Groundwater Threshold Value. S.I No. 366 of 2016. Sch

ncr - No criteria required

[A] GTV is for the sum of dichloroethenes

IGV - EPA Draft Interim Guideline Value

[1] IGV is for the sum of dichloroethenes

[2] Two IGVs are given for trichloroethene

[3] Two IGVs are given for tetrachloroethene

[4] IGV is for the sum of xylenes

[5] IGV is for the sum of trichlorobenzenes

XXX CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal

Table 9: Groundwater Volatile Organic Compound Results
Tarbert T-4 July/August 2023

Sample Type	Units	MDL (µg/L)	Controlled Waters GAC	IGV	GTV	Max Concentration	Groundwater	Groundwater
Well							MW401	MW402
Date Sampled							09-Aug-23	09-Aug-23
Lab Reference							23/13298	23/13298
Parameter								
Naphthalene	µg/L	0.100	ncr	1	0.075 ^		-	-
Acenaphthylene	µg/L	0.005	ncr	---	---	-	-	-
Acenaphthene	µg/L	0.005	ncr	---	---	-	-	-
Fluorene	µg/L	0.005	ncr	---	---	-	-	-
Phenanthrene	µg/L	0.005	ncr	---	---	-	-	-
Anthracene	µg/L	0.005	ncr	10,000	0.075 ^	-	-	-
Fluoranthene	µg/L	0.005	ncr	1	---	-	-	-
Pyrene	µg/L	0.005	ncr	---	---	-	-	-
Benzo(a)anthracene	µg/L	0.005	ncr	---	---	-	-	-
Chrysene	µg/L	0.005	ncr	---	---	-	-	-
Benzo(bk)fluoranthene	µg/L	0.008	ncr	0.5, 0.05	0.075 ^	-	-	-
Benzo(a)pyrene	µg/L	0.005	ncr	0.01	0.0075	-	-	-
Indeno(123cd)pyrene	µg/L	0.005	ncr	0.05	0.075 ^	-	-	-
Dibenzo(ah)anthracene	µg/L	0.005	ncr	---	---		-	-
Benzo(ghi)perylene	µg/L	0.005	ncr	0.05	0.075 ^	-	-	-
PAH 16 Total #	µg/L	0.173	ncr	---	---	-	-	-
Benzo(b)fluoranthene	µg/L	0.008	ncr			-	-	-
Benzo(k)fluoranthene	µg/L	0.008	ncr				-	-

Notes:

MDL: Method Detection Limit
µg/L - micrograms per litre
-: Indicates result below MDL
----: IGV/GTV Not Defined
ns: Not Sampled
ncr - No criteria required
GTV: Groundwater Threshold Value, S.I No. 366 of 2016, Schedule 5

A - PAH compounds specified in GTV

IGV - EPA Draft Interim Guideline Value

GTV: Groundwater Threshold Value. S.I No. 366 of 2016. Schedule 5

XXX CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal

Table 9: Groundwater Volatile Organic Compound Results
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Controlled Waters GAC	IGV	GTV	Max Concentration	Groundwater	Groundwater
Well							MW401	MW402
Date Sampled							09-Aug-23	09-Aug-23
Lab Reference							23/13298	23/13298
Parameter								
TPH Aromatics								
TPH (>EC5-7) aromatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC7-8) aromatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC8-10) aromatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC10-12) aromatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC12-16) aromatic	µg/L	10.0	ncr	---	---	-	-	-
TPH (>EC16-21) aromatic	µg/L	10.0	ncr	---	---	-	-	-
TPH (>EC21-35) aromatic	µg/L	10.0	ncr	---	---	-	-	-
Total Aromatics (C5-35)	µg/L	10.0	ncr	---	---	-	-	-
TPH Aliphatics								
TPH (>EC5-6) aliphatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC6-8) aliphatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC8-10) aliphatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC10-12) aliphatic	µg/L	5.0	ncr	---	---	-	-	-
TPH (>EC12-16) aliphatic	µg/L	10.0	ncr	---	---	-	-	-
TPH (>EC16-21) aliphatic	µg/L	10.0	ncr	---	---	-	-	-
TPH (EC21-35) aliphatic	µg/L	10.0	ncr	---	---	-	-	-
Total Aliphatics (C5-35)	µg/L	10.0	ncr	---	---	-	-	-
Total aliphatics and aromatics (C5-C35)	µg/L	10.0	ncr	10.0	7.5	-	-	-
BTEX								
Benzene	µg/L	0.5	ncr	1	0.75	-	-	-
Toluene	µg/L	0.5	ncr	10	525	-	-	-
Ethylbenzene	µg/L	0.5	ncr	10	---	-	-	-
m/p-Xylene	µg/L	1.0	ncr	10[1]	---	-	-	-
o-Xylene	µg/L	0.5	ncr	10[1]	---	-	-	-
MTBE								
MTBE	mg/L	0.1	ncr	30	10	-	-	-

Notes:

MDL - Method Detection Limit
µg/L - micrograms per litre
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required

IGV - EPA Draft Interim Guideline Value
GTV: Groundwater Threshold Value. S.I No. 366 of 2016. Schedule 5
[1] IGV is for the sum of xylenes
---: IGV/GTV Not Defined
XXX CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal

Table 9: Groundwater Volatile Organic Compound Results
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Controlled Waters GAC	IGV	GTV	Max Concentration	Groundwater	Groundwater
Well							**MW401**	**MW402**
Date Sampled							09-Aug-23	09-Aug-23
Lab Reference							23/13298	23/13298
Parameter								
Dissolved Arsenic	µg/L	<2.5	20[#1]	10	7.5	35.2	*9.1*	***35.2***
Dissolved Barium	µg/L	<3.0	ncr	100	----	51	51	11
Dissolved Beryllium	µg/L	<0.5	ncr	----	----	-	-	-
Dissolved Boron	µg/L	<12.0	7000[#2]	----	----	163	163	91
Dissolved Cadmium	µg/L	<0.5	ncr	5.0	----	-	-	-
Dissolved Total Chromium	µg/L	<1.5	ncr	30	37.5	-	-	-
Dissolved Chromium III	µg/L	<6.0	ncr	30	----	-	-	-
Dissolved Chromium VI	µg/L	<0.006	ncr	30	7.5	-	-	-
Dissolved Copper	µg/L	<7.0	ncr	30	37.5	-	-	-
Dissolved Lead	µg/L	<5.0	ncr	10	7.5	-	-	-
Dissolved Mercury	µg/L	<1.0	ncr	1	7.5	-	-	-
Dissolved Nickel	µg/L	<2.0	8.6	20.0	----	-	-	-
Dissolved Selenium	µg/L	<3.0	ncr	----	----	-	-	-
Dissolved Vanadium	µg/L	<1.5	100[#2]	----	----	2	-	1.6
Dissolved Zinc	µg/L	<3.0	40[#1]	100	75	14	9	14

Notes:

MDL - Method Detection Limit
µg/L - micrograms per litre
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required

IGV - EPA Draft Interim Guideline Value
GTV: Groundwater Threshold Value, S.I No. 366 of 2016, Schedule 5
[1] IGV is for the sum of xyleness
----: IGV/GTV Not Defined
XXX CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal

#1: EU Env. Objectives Regs 2009. (Ire) AA-EQS Marine
#2: SEPA WAT-SG-53 Marine EQS - AA - 2015

Table 9: Groundwater Volatile Organic Compound Results
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Controlled Waters GAC	Max Concentration	Groundwater	Groundwater
Sample ID					**MW401**	**MW402**
Date Sampled					09-Aug-23	09-Aug-23
Lab Reference					23/13298	23/13298
Parameter (PCBs)						
PCB 28	µg/L	<5	ncr	-	-	-
PCB 52	µg/L	<5	ncr	-	-	-
PCB 101	µg/L	<5	ncr	-	-	-
PCB 118	µg/L	<5	ncr	-	-	-
PCB 138	µg/L	<5	ncr	-	-	-
PCB 153	µg/L	<5	ncr	-	-	-
PCB 180	µg/L	<5	ncr	-	-	-
Total 7 PCBs	µg/L	<35	ncr	-	-	-

Notes:

MDL - Method Detection Limit

mg/L - milligrams per litre

µg/L - micrograms per litre

GAC - Generic Assessment Criteria

- <MDL

ncr - No criteria required

XXX CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal

Table 9: Groundwater Volatile Organic Compound Results
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Controlled Waters GAC	Max Concentration	Groundwater	Groundwater
Sample ID					**MW401**	**MW402**
Date Sampled					09-Aug-23	09-Aug-23
Lab Reference					23/13298	23/13298
Parameter						
Perfluorobutanoic acid (PFBA)	ng/l	<1	nca	17.0	13	17
Perfluoropentanoic acid (PFPeA)	ng/l	<1	nca	21.0	21	18
Perfluorohexanoic acid (PFHxA)	ng/l	<1	nca	8.9	8.9	7.9
Perfluoroheptanoic acid (PFHpA)	ng/l	<1	nca	7.3	5	7.3
Perfluorooctanoic acid (PFOA) Linear	ng/l	<1	nca	8.2	6.7	8.2
Perfluorooctanoic acid (PFOA) Branched	ng/l	<1	nca	0.0	-	-
Perfluorooctanoic acid (PFOA) Total	ng/l	<1	nca	8.7	7.6	8.7
Perfluorononanoic acid (PFNA)	ng/l	<1	nca	1.7	1.2	1.7
Perfluorodecanoic acid (PFDA)	ng/l	<1	nca	0.0	-	-
Perfluoroundecanoic acid (PFUnDA)	ng/l	<1	ncr	-	-	-
Perfluorododecanoic acid (PFDoDA)	ng/l	<2	ncr	-	-	-
Perfluorotridecanoic acid (PFTrDA)	ng/l	<1	ncr	-	-	-
Perfluorotetradecanoic acid (PFTeDA)	ng/l	<1	ncr	-	-	-
Perfluorohexadecanoic acid (PFHxDA)	ng/l	<2	ncr	-	-	-
Oerfluorooctadecanoic acid (PFODA)	ng/l	<1	ncr	-	-	-
Perfluorobutane sulfonic acid (PFBS)	ng/l	<1.4	ncr	-	1.7	-
Perfluoropentane sulfonic acid (PFPeS)	ng/l	<1	ncr	-	2.3	-
Perfluorohexane sulfonic acid (PFHxS)	ng/l	<1	nca	10.0	10	4
Perfluoroheptane sulfonic acid (PFHpS)	ng/l	<1	ncr	-	-	-
Perfluorooctane sulfonic acid (PFOS) Linear	ng/l	<1	nca	21.0	21	3.6
Perfluorooctane sulfonic acid (PFOS) Branched	ng/l	<1	nca	11.0	11	3
Perfluorooctane sulfonic acid (PFOS) Sum	ng/l	<1	7,200[#2]	32.0	32	6.7
Perfluorodecane sulfonic acid (PFDS)	ng/l	<1	ncr	-	-	-
4:2 Fluorotelomer sulfonic acid (4:2 FTS)	ng/l	<1	ncr	-	-	-
6:2 Fluorotelomer sulfonic acid (6:2 FTS)	ng/l	<1	ncr	7.2	6.2	7.2
8:2 Fluorotelomer sulfonic acid (8:2 FTS)	ng/l	<1	nca	1.2	-	1.2
10:2 Fluorotelomer sulfonic acid (10:2 FTS)	ng/l	<1	ncr	-	-	-
Perfluorooctane sulfonamide (PFOSA)	ng/l	<2	ncr	-	-	-
N-Methyl perfluorooctane sulfonamide (MeFOSA)	ng/l	<1	ncr	-	-	-
N-Methylperfluorooctane sulfonamidoacetic acid (MeMFOSAA)	ng/l	<1	ncr	-	-	-
N-Ethyl perfluorooctane sulfonamide (EtPFOSA)	ng/l	<1	ncr	-	-	-
8:2 Ppolyfluoroalkyl phosphate diester (8:2 DiAP)	ng/l	<1	ncr	-	-	-
Total PFAS	ng/l		100[#1]	-	95.1	**62.6**

Notes:

MDL - Method Detection Limit
ng/L - nanograms per litre
µg/L - micrograms per litre
GAC - Generic Assessment Criteria
- <MDL

#1 Drinking Water Directive Total PFAS
#2 PFOS maximum allowable concentration controlled waters 'Other'
ncr - No criteria required
NA - Not Analysed

Table 9: Groundwater Volatile Organic Compound Results
Tarbert T-4 July/August 2023

Sample Type	Units	MDL	Controlled Waters GAC	IGV	GTV	Max Concentration	Groundwater	Groundwater
Sample ID							**MW401**	**MW402**
Date Sampled							09-Aug-23	09-Aug-23
Lab Reference							23/13298	23/13298
Parameter								
Major Ions								
Ammoniacal Nitrogen as N	mg/L	<0.03	0.021 (unionised ammonia as nitrogen)#1	0.12	0.065 - 0.175	1.01	***1.01***	0.09
Chloride	mg/L	<2	ncr	30.0	187.5	452.5	***452.5***	***70***
Ortho Phosphate as PO_4	mg/L	<0.3	ncr	0.03	0.03	-	-	-
Total Sulphate as SO_4	mg/L	<50	ncr	nca	187.5	54.0	32.9	54.0
Sulphide	mg/L	<10	ncr	nca	nca	-	-	-
Total Cyanide	mg/L	<0.5	ncr	nca	nca	-	-	-
Nitrate as NO_3	mg/L	<0.2	ncr	25.0	nca	-	-	-
Nitrite as NO_2	mg/L	<0.1	ncr	0.1	nca	-	-	-
COD	mg/L	<7		nca	nca	37.0	37.0	-
Biological Parameters								
BOD	mg/L	<1	ncr	nca	nca	2.0	1.0	2.0
Total Colliforms	MPN/100 ml	<1	ncr	nca	nca	84.0	84.0	113.5
Faecal Colliforms	cfu/100 ml	<1	ncr	nca	nca	220.0	220.0	90.0
Miscellaneous								
Total Phenols	mg/L	<0.15	ncr	nca	nca	-	-	-
Total Hardness	mg/L	<1	nca	nca	nca	342	342	46

Notes:

MDL - Method Detection Limit
mg/L - milligrams per litre
µg/L - micrograms per litre
GAC - Generic Assessment Criteria
- <MDL
ncr - No criteria required
nca - no criteria available

MPN/100 ml most probable number per 100 millilitres
cfu/100 ml colony forming units
IGV - EPA Draft Interim Guideline Value
GTV: Groundwater Threshold Value, S.I No. 366 of 2016, Schedule 5
XXX CW/WE Water. Aquatic Toxicity - Ireland - Transitional/Coastal
#1: WFD (N.Ire) 2015. Saltwater Standards

Appendix C Borehole Logs

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 60707258

AECOM

Record of Rotary Open Holed Borehole

MW401

In situ Tests		Strata							
Depth	PID (ppm)	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Remarks	Water Level	Installation
		0.0	(0.70)	MADE GROUND: Compacted GRAVEL, coarse grained gravel (Fill).				
			0.70	MADE GROUND: Compacted dark grey SAND and GRAVEL, fine to coarse grained angular to subangular gravel, fine to medium grained sand, dry with subangular to angular cobbles and boulders.				
1								
			(2.30)			Groundwater ingress		
2								
			3.00	BEDROCK: Highly weathered SHALE.				
3								
4								
			(3.00)					
5								
			6.00	BEDROCK: Competent grey SHALE.				
6								
7			(5.00)					
8								

GENERAL REMARKS

Borehole terminated at target depth.
Groundwater strike encountered at 2.0m bgl.

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Boring Progress and Water Observations

Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed

Rotary Flush

From	To	Type	Return (%)

Logged by: BMC 24/7/23 Checked by: YMC 17/8/23 Status: FINAL	Equipment: Comacchio MC 405 Contractor: Causeway Geotech Ltd.	Coordinates: (ITM) Easting: 507475.18m Northing: 0.0649595.90m	Ground Level: 3.560 m AOD	Date: Start: 24/07/2023 End: 24/07/2023

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 60707258

AECOM

Record of Rotary Open Holed Borehole

MW401

In situ Tests		Strata						
Depth	PID (ppm)	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Remarks	Water Level	Installation
8				BEDROCK: Competent grey SHALE.				
9			(5.00)					
10								
11			11.00	**End of Borehole at 11.00m**				
12								
13								
14								
15								
16								

GENERAL REMARKS

Borehole terminated at target depth.
Groundwater strike encountered at 2.0m bgl.

Boring Progress and Water Observations

Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed

Rotary Flush

From	To	Type	Return (%)

Logged by: BMC 24/7/23
Checked by: YMC 17/8/23
Status: FINAL

Equipment: Comacchio MC 405
Contractor: Causeway Geotech Ltd.

Coordinates: (ITM)
Easting: 507475.18m
Northing: 649595.90m

Ground Level: 3.560 m AOD

Date:
Start: 24/07/2023
End: 24/07/2023

AGS

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 60707258

AECOM

Record of Rotary Open Holed Borehole

MW402

In situ Tests		Strata							
Depth	PID (ppm)	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Remarks	Water Level	Installation	
0.00		0.0	(0.80)	MADE GROUND: Soft brown gravelly CLAY, fine to coarse grained gravel.					
			0.80						
1			(1.10)	MADE GROUND: Subangular BOULDERS of LIMESTONE (Fill).					
			1.90						
2				Soft brown CLAY, occasional shale and gravel increasing with depth , shale fragments.					
3									
4									
5			(6.50)						
6									
7									
8									

GENERAL REMARKS

Borehole terminated at target depth.
Groundwater strike encountered at 12.0m bgl.

Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Boring Progress and Water Observations

Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed

Rotary Flush

From	To	Type	Return (%)

Logged by:	Equipment:	Coordinates: (ITM)	Ground Level:	Date:
BMC 25/7/23	Comacchio MC 405	Easting: 507612.61m	3.618 m AOD	Start: 25/07/2023
Checked by: YMC 17/8/23	Contractor: Causeway Geotech Ltd.	Northing: 649658.41m		End: 25/07/2023
Status: FINAL				Sheet 1 of 2

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 60707258

AECOM

Record of Rotary Open Holed Borehole

MW402

In situ Tests		Strata						
Depth	PID (ppm)	Reduced Level	Depth (Thick-ness)	DESCRIPTION	Legend	Remarks	Water Level	Installation
8			(6.50)	Soft brown CLAY, occasional shale and gravel increasing with depth, shale fragments.				
			8.40	BEDROCK: Competent dark grey SHALE.				
9								
10								
11								
			(6.60)					
12						Groundwater ingress		
13								
14								
15			15.00	**End of Borehole at 15.00m**				
16								

GENERAL REMARKS

Borehole terminated at target depth.
Groundwater strike encountered at 12.0m bgl.

Boring Progress and Water Observations

Date	Time	Hole Depth	Standing Level	Strike	Rise	Time (mins)	Sealed

Rotary Flush

From	To	Type	Return (%)

Logged by: BMC 25/7/23	Equipment: Comacchio MC 405	Coordinates: (ITM) Easting: 507612.61m	Ground Level: 3.618 m AOD	Date: Start: 25/07/2023	AGS
Checked by: YMC 17/8/23	Contractor: Causeway Geotech Ltd.	Northing: 633196.31m		End: 25/07/2023	Sheet 2 of 2
Status: FINAL					

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 6070707258

AECOM

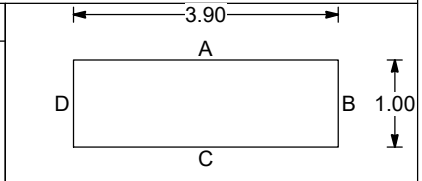
Record of Trial Pit

TP101

Samples & in situ Tests				Water Level	Strata				
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations
							(0.70)	MADE GROUND: Compacted grey SAND and GRAVEL, fine to coarse subangular to angular gravel, fine to medium grained sand, dry, with occasional subangular to subrounded cobbles and boulders.	NEC
							0.70		
1 1.0	ES/1.0		0.0				(1.30)	TILL: Soft, very gravelly CLAY, fine to coarse grained, subangular to angular gravel, moist. Groundwater ingress at 1.9m	NEC
2 2.0	ES/2.0		0.0				2.00	**Trial pit terminated at 2.00m**	
3									
4									

GENERAL REMARKS

Trial Pit Terminated at 2.00m bgl due to refusal of boulder.
Groundwater ingress at 1.90m bgl.



Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by:	Equipment:	Coordinates: (ITM)	Ground Level:	Date:	
YMC 25/7/23	12 tonne tracked excavator	Easting: 507458.00m	Not surveyed	Start: 25/07/2023	AGS
Checked by: YMC 9/8/23	Contractor: Causeway Geotech Ltd	Northing: 649544.00m		End: 25/07/2023	Sheet 1 of 1
Status: FINAL					

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 6070707258

AECOM

Record of Trial Pit

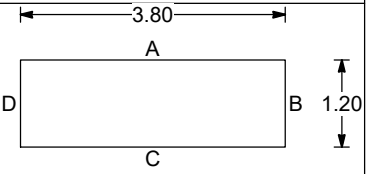
TP102

Samples & in situ Tests				Water Level	Strata				
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations
							(0.60)	MADE GROUND: Compacted grey SAND and GRAVEL, fine to coarse subangular to angular gravel, fine to medium grained sand, dry with frequent angular to subangular cobbles and boulders.	Lead at 0.3m
							0.60		
1 1.0	ES/1.0		0.1					MADE GROUND: Compacted light brown clayey GRAVEL, medium to coarse subangular to angular gravel, saturated with frequent angular to subangular cobbles and boulders.	
							(2.40)		NEC
2 2.0	ES/2.0		0.0						
							3.00		
3			0.0					NATURAL SOIL: Soft, dark brown, pseudo-fibrous PEAT moist with rootlets.	
							(0.50)	Groundwater ingress at 1.7m	NEC
							3.50		
								Trial pit terminated at 3.50m	

4

GENERAL REMARKS

Groundwater enocuntered at 1.70m bgl.



Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by: YMC 25/7/23	Equipment: 12 tonne tracked excavator	Coordinates: (ITM) Easting: 507427.00m Northing: 649564.00m	Ground Level: Not surveyed	Date: Start: 25/07/2023 End: 25/07/2023	AGS
Checked by: YMC 9/8/23	Contractor: Causeway Geotech Ltd				Sheet 1 of 1
Status: FINAL					

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 6070707258

AECOM

Record of Trial Pit

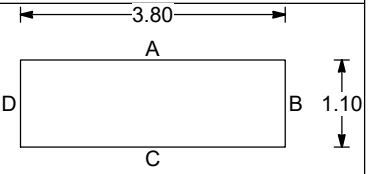
TP103

Samples & in situ Tests				Water Level	Strata				
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations
							0.05	MADE GROUND: MADE GROUND: Uncompacted, grey, GRAVEL, coarse gained, subangular gravel, dry.	NEC
								MADE GROUND: Compacted dark grey SAND and GRAVEL, coarse to fine angular to subangular gravel, fine to medium grained sand , dry, with subangular to angular cobbles and boulders.	
							(1.05)		NEC
1 1.0	ES/1.0		0.0				1.10		
								Trial pit terminated at 1.10m	

1.5

GENERAL REMARKS

Trail Pit Terminated at 1.10m bgl due to refusal of boulders.
No Groundwater encountered.



Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by: YMC 25/8/23	Equipment: 12 tonne tracked excavator	Coordinates: (ITM) Easting: 507466.00m Northing: 649581.00m	Ground Level: Not surveyed	Date: Start: 25/07/2023 End: 25/07/2023	AGS
Checked by: YMC 9/8/23	Contractor: Causeway Geotech Ltd				Sheet 1 of 1
Status: FINAL					

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 6070707258

AECOM

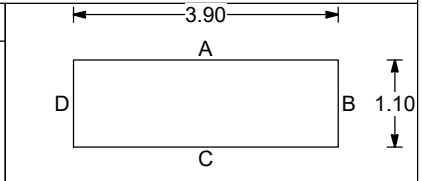
Record of Trial Pit

TP104

Samples & in situ Tests				Water Level	Strata				
Depth	Type/ No.	Test Results	PID (ppm)		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	Visual/Olfactory Observations
							0.05	MADE GROUND: Uncompacted, grey, GRAVEL, coarse gained, subangular gravel, dry.	NEC
							(1.45)	MADE GROUND: Compacted, dark grey SAND and GRAVEL, fine to coarse subangular to angular gravel, fine to medium sand, dry with subangular to angular cobbles and boulders.	NEC
1 1.0	ES/1.0		0.0				1.50		
							(0.60)	TILL: Soft, brown, very gravelly CLAY, fine to coarse subangular to angular gravel, slightly moist with frequent subangular cobbles and occasional subangular boulders.	NEC
2 2.0	ES/2.0		0.0				2.10		
								Trial pit terminated at 2.10m	
3									
4									

GENERAL REMARKS

Trail Pit Terminated at 2.10m bgl due to refusal of large boulders.
No Groundwater encountered.



Exploratory hole logs should be read in conjunction with corresponding Key Sheets.

Logged by:	Equipment:	Coordinates: (ITM)	Ground Level:	Date:	
YMC 25/7/23	12 tonne tracked excavator	Easting: 507492.00m	Not surveyed	Start: 25/07/2023	AGS
Checked by: YMC 9/8/23	Contractor: Causeway Geotech Ltd	Northing: 64461.00m		End: 25/07/2023	Sheet 1 of 1
Status: FINAL					

Client: SSE Generation Ireland Limited

Project: T-4 Site Investigation, Tarbert Generating Station, Tarbert, Co. Kerry.

Contract No: 6070707258

AECOM

Record of Trial Pit

Samples & in situ Tests					Strata			
Depth	Type/ No.	Test Results	P/FID (ppm)	Water Level	Reduced Level (mAOD)	Legend	Depth (Thick-ness)	DESCRIPTION
1	2	3	4	5	6	7	8	9

COLUMN DESCRIPTIONS

1. **Depth:** Depth in metres below ground level where sample obtained.
2. **Type/No.:** Type of sample taken at depth interval shown with sample identification number, if appropriate. Sample type abbreviations are explained below.
3. **Test Results:** Results of any in situ test carried out, e.g. hand shear vane or in situ CBR.
4. **P/FID*:** In situ or sample headspace hydrocarbon levels using Photo or Flame Ionisation Device, in ppm.
5. **Water Level:** See water level symbols in 'Other Graphic Symbols'.
6. **Reduced Level (mAOD):** Where exploratory holes are surveyed in, height above Ordnance or Site Datum is calculated.
7. **Legend:** Graphic depiction of subsurface material encountered; typical symbols are detailed below.
8. **Depth (Thickness):** Depth in metres below the ground surface with strata thickness calculated.
9. **Description:** Description of material encountered; may include strength/density, colour, particle size and material name.

* Column not displayed if data not present.

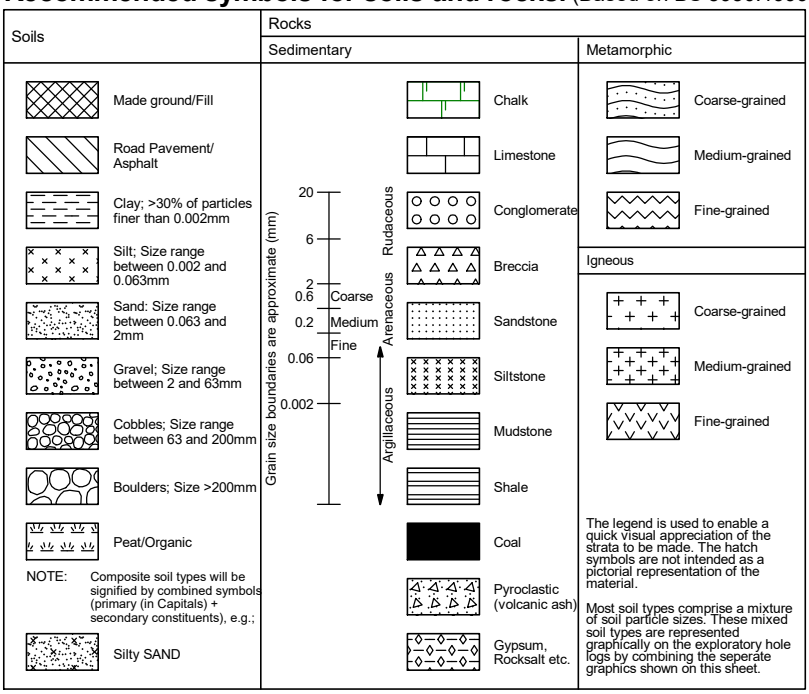
SAMPLE TYPE ABBREVIATIONS

B	Bulk disturbed sample	FTOC	Forensic TOC
J	Jar sample; glass	G	Gas sample
SDS/D	Small disturbed sample; tub	BLK	Block sample
WS	Water sample	HV	Hand shear vane test
ES	Soil sample for environmental testing.	ICBR	In situ CBR
		FID	FID test
EW	Water sample for environmental testing.	PID	PID test
A	Asbestos Quantification sample		
TOC	Total Organic Content		

OTHER GRAPHIC SYMBOLS

- 1st water strike, 2nd water strike, etc.
- Water level following 1st strike, Water level following 2nd strike, etc.
- Standing water level recorded at documented date.
- Indicating conditions at a specific depth within a layer.
- Change in material properties within a lithological stratum.
- Indicates details over a depth range.
- Inferred contact between strata or gradational change in lithology.

Recommended symbols for soils and rocks. (Based on BS 5930:1999)



GENERAL NOTES

1. All dimensions in metres.
2. Logged in general accordance with BS5930:2015. Field descriptions may have been modified to reflect results of lab tests. Soil classifications are based on BS EN ISO 14688-1:2018. Descriptions and stratum lines are interpretive; actual lithological changes may be gradual.
3. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.
4. Groundwater levels are subject to seasonal, tidal and other fluctuations and should not be taken as constant.

The data on any sheet showing the AGS icon is available in the AGS format.

Appendix D Validated Laboratory Soil Results

working for a healthy and sustainable world

CERTIFICATE OF ANALYSIS

ANALYSIS REQUESTED BY: AECOM Infrastructure & Environment Ireland Ltd
4th Floor
Adelphi Plaza
Adelphi Centre
George's Street Upper
Dun Laoghaire
Co. Dublin

CONTRACT NO: S34857

DATE OF ISSUE: 03.08.23

DATE SAMPLES RECEIVED: 27.07.23

DATE ANALYSIS COMPLETED: 02.08.23

SAMPLE DESCRIPTION: Nine soil/loose aggregate samples each weighing approximately 0.7-1.9kg.

ANALYSIS REQUESTED: Qualitative and quantitative analysis of soil/loose aggregate samples for mass determination of asbestos.

METHODS:

Qualitative - The samples were analysed qualitatively for asbestos by polarised light and dispersion staining as described by the Health and Safety Executive in HSG 248.

Quantitative - The analysis was carried out using our documented in-house method based on HSE Contract Research Report No. 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies *et al*, 1996) and HSG 248. Our method includes initial examination of the entire sample, detailed analysis of a representative sub-sample and quantification by hand picking/weighing and/or fibre counting/sizing as appropriate.

RESULTS:

Initial Screening

No asbestos was detected in any of the soil samples by stereo-binocular and polarised light microscopy.

A summary of the results is given in Table 1.

www.iom-world.org
Registered Address: Research Avenue North, Riccarton, Edinburgh, EH14 4AP, United Kingdom
Tel: 0131 449 8000 Fax: 0131 449 8084 Email: iom@iom-world.org

CONTRACT NO: S34857
DATE OF ISSUE: 03.08.23

RESULTS: (cont.)

Table 1: Qualitative Results

Client Ref.: 60707258/3068/BMC - Tarbert

IOM sample number	Client sample number	ACM type detected	PLM result
S34856-1	TP101 1m	-	No Asbestos Detected
S34856-2	TP101 2m	-	No Asbestos Detected
S34856-3	TP102 1m	-	No Asbestos Detected
S34856-4	TP102 2m	-	No Asbestos Detected
S34856-5	TP103 1m	-	No Asbestos Detected
S34856-6	TP104 1m	-	No Asbestos Detected
S34856-7	TP104 2m	-	No Asbestos Detected
S34856-8	MW102 0.8m	-	No Asbestos Detected
S34856-9	SA01	-	No Asbestos Detected

Our detection limit for this method is 0.001%.

COMMENTS:

IOM Consulting cannot accept responsibility for samples that have been incorrectly collected or despatched by external clients.

Any opinions and interpretations expressed herein are out with the scope of our UKAS accreditation.

Julie Simpson

AUTHORISED BY: .....

J Simpson
Senior Laboratory Analyst

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork
Ireland

Attention :	Brendan McCarthy
Date :	16th August, 2023
Your reference :	60707258
Our reference :	Test Report 23/12348 Batch 1
Location :	Tarbert
Date samples received :	27th July, 2023
Status :	Final Report
Issue :	1

Ten samples were received for analysis on 27th July, 2023 of which ten 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.

Authorised By:

Paul Boden BSc
Senior Project Manager

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/12348

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-14	15-17	18-20	21-22	23-24	25-27	LOD/LOR	Units	Method No.
Sample ID	TP1	TP1	TP2	TP2	TP3	TP4	TP4	MW401	MW402	SA01			
Depth	1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	J T	V J T	V J T	V J	V J	V J T			
Sample Date	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Silt	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023			
Antimony	-	-	-	-	-	-	-	-	-	1	<1	mg/kg	TM30/PM15
Arsenic #M	9.7	8.6	9.6	12.1	14.4	14.5	8.8	2.6	9.2	8.2	<0.5	mg/kg	TM30/PM15
Barium #M	35	27	39	29	31	33	37	9	41	37	<1	mg/kg	TM30/PM15
Beryllium	1.3	1.0	1.3	1.1	1.1	1.4	1.0	<0.5	1.2	-	<0.5	mg/kg	TM30/PM15
Cadmium #M	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.1	mg/kg	TM30/PM15
Chromium #M	50.6	48.4	36.4	36.5	45.8	48.4	50.4	5.9	35.4	37.5	<0.5	mg/kg	TM30/PM15
Copper #M	18	28	31	27	23	19	26	10	28	60	<1	mg/kg	TM30/PM15
Lead #M	13	15	16	10	<5	<5	20	<5	16	69	<5	mg/kg	TM30/PM15
Mercury #M	<0.1	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	mg/kg	TM30/PM15
Molybdenum #M	-	-	-	-	-	-	-	-	-	1.9	<0.1	mg/kg	TM30/PM15
Nickel #M	41.1	40.3	42.8	39.3	38.4	48.8	35.1	12.5	41.7	40.4	<0.7	mg/kg	TM30/PM15
Selenium #M	2	2	1	1	1	2	2	<1	2	1	<1	mg/kg	TM30/PM15
Total Sulphate as SO4 #M	-	-	-	-	-	-	-	-	-	85	<50	mg/kg	TM50/PM29
Vanadium	28	26	23	22	22	24	24	15	31	-	<1	mg/kg	TM30/PM15
Water Soluble Boron #M	0.4	0.2	0.2	<0.1	0.1	0.1	0.3	0.1	0.4	0.6	<0.1	mg/kg	TM74/PM32
Zinc #M	80	119	133	93	54	51	76	37	87	971	<5	mg/kg	TM30/PM15
PAH MS													
Naphthalene #M	<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 #M	<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 #M	<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 #M	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.25	0.07	<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 #M	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.96	0.13	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	0.51	0.11	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	0.08	<0.06	mg/kg	TM4/PM8
Chrysene #M	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.07	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #M	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	0.12	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.06	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #M	<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
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	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	-	-	-	-	-	-	-	-	-	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	-	-	-	-	-	-	-	-	-	0.31	<0.22	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	<0.6	1.7	-	<0.6	mg/kg	TM4/PM8
PAH 17 Total	-	-	-	-	-	-	-	-	-	0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.09	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	mg/kg	TM4/PM8
Benzo(j)fluoranthene	-	-	-	-	-	-	-	-	-	<1	<1	mg/kg	TM4/PM8
PAH Surrogate % Recovery	100	98	95	109	100	96	100	99	102	99	<0	%	TM4/PM8
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2	-	<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	<3	ug/kg	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/12348

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-14	15-17	18-20	21-22	23-24	25-27	LOD/LOR	Units	Method No.
Sample ID	TP1	TP1	TP2	TP2	TP3	TP4	TP4	MW401	MW402	SA01			
Depth	1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	J T	V J T	V J T	V J	V J	V J T			
Sample Date	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Silt	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023			
Toluene #	13	<3	6	<3	<3	<3	<3	<3	<3	-	<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	-	<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3	-	<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	82	106	90	103	95	104	92	97	92	-	<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	70	104	85	101	92	99	85	101	73	-	<0	%	TM15/PM10
Mineral Oil (C10-C40) (EH_CU_1D_AL)	-	-	-	-	-	-	-	-	-	34	<30	mg/kg	TM5/PM8/PM16
TPH CWG													
Aliphatics													
>C5-C6 (HS_1D_AL) #M	<0.1	<0.1	<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) #M	<0.1	<0.1	<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	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C12 (EH_CU_1D_AL) #M	9.8	<0.2	<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) #M	26	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>C16-C21 (EH_CU_1D_AL) #M	29	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>C21-C35 (EH_CU_1D_AL) #M	<7	<7	66	<7	32	<7	<7	33	16	34	<7	mg/kg	TM5/PM8/PM16
>C35-C40 (EH_CU_1D_AL)	-	-	-	-	-	-	-	-	-	<7	<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35 (EH+HS_CU_1D_AL)	65	<19	66	<19	32	<19	<19	33	<19	-	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics C5-40 (EH+HS_CU_1D_AL)	-	-	-	-	-	-	-	-	-	34	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
>C6-C10 (HS_1D_AL)	-	-	-	-	-	-	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>C10-C25 (EH_1D_AL)	-	-	-	-	-	-	-	-	-	<10	<10	mg/kg	TM5/PM8/PM16
>C25-C35 (EH_1D_AL)	-	-	-	-	-	-	-	-	-	22	<10	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	<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	<0.1	<0.1	mg/kg	TM36/PM12
>EC8-EC10 (HS_1D_AR) #M	<0.1	<0.1	<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	<0.2	<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 (EH_CU_1D_AR) #	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 (EH_CU_1D_AR) #	<7	<7	<7	<7	<7	<7	<7	<7	<7	28	<7	mg/kg	TM5/PM8/PM16
>EC35-EC40 (EH_CU_1D_AR)	-	-	-	-	-	-	-	-	-	<7	<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 (EH+HS_CU_1D_AR) #	<19	<19	<19	<19	<19	<19	<19	<19	<19	-	<19	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aromatics C5-40 (EH+HS_CU_1D_AR)	-	-	-	-	-	-	-	-	-	28	<26	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-35) (EH+HS_CU_1D_Total)	65	<38	66	<38	<38	<38	<38	<38	<38	-	<38	mg/kg	TM5/TM36/PM8/PM12/PM16
Total aliphatics and aromatics(C5-40) (EH+HS_CU_1D_Total)	-	-	-	-	-	-	-	-	-	62	<52	mg/kg	TM5/TM36/PM8/PM12/PM16
>EC6-EC10 (HS_1D_AR) #	-	-	-	-	-	-	-	-	-	<0.1	<0.1	mg/kg	TM36/PM12
>EC10-EC25 (EH_1D_AR)	-	-	-	-	-	-	-	-	-	<10	<10	mg/kg	TM5/PM8/PM16
>EC25-EC35 (EH_1D_AR)	-	-	-	-	-	-	-	-	-	25	<10	mg/kg	TM5/PM8/PM16
MTBE #	-	-	-	-	-	-	-	-	-	<5	<5	ug/kg	TM36/PM12
Benzene #	-	-	-	-	-	-	-	-	-	<5	<5	ug/kg	TM36/PM12
Toluene #	-	-	-	-	-	-	-	-	-	<5	<5	ug/kg	TM36/PM12

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/12348

Report : Solid

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

EMT Sample No.	1-3	4-6	7-9	10-12	13-14	15-17	18-20	21-22	23-24	25-27	LOD/LOR	Units	Method No.
Sample ID	TP1	TP1	TP2	TP2	TP3	TP4	TP4	MW401	MW402	SA01			
Depth	1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	J T	V J T	V J T	V J	V J	V J T			
Sample Date	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023			
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Silt	Clay	Clay			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023			
Ethylbenzene #	-	-	-	-	-	-	-	-	-	<5	<5	ug/kg	TM36/PM12
m/p-Xylene #	-	-	-	-	-	-	-	-	-	<5	<5	ug/kg	TM36/PM12
o-Xylene #	-	-	-	-	-	-	-	-	-	<5	<5	ug/kg	TM36/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Total Phenols HPLC	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	<0.15	0.26	-	<0.15	mg/kg	TM26/PM21B
Phenol #M	-	-	-	-	-	-	-	-	-	<0.01	<0.01	mg/kg	TM26/PM21B
Natural Moisture Content	39.4	14.6	11.3	12.2	6.8	5.1	19.3	8.0	13.1	10.5	<0.1	%	PM4/PM0
Moisture Content (% Wet Weight)	-	-	-	-	-	-	-	-	-	9.5	<0.1	%	PM4/PM0
Hexavalent Chromium #	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/kg	TM38/PM20
Chromium III	50.6	48.4	36.4	36.5	45.8	48.4	50.4	5.9	35.4	37.5	<0.5	mg/kg	NONE/NONE
Total Cyanide #M	-	-	-	-	-	-	-	-	-	<0.5	<0.5	mg/kg	TM89/PM45
Total Organic Carbon #	1.15	0.32	0.44	0.25	0.41	0.40	0.60	0.05	0.75	0.61	<0.02	%	TM21/PM24
Elemental Sulphur	-	-	-	-	-	-	-	-	-	3	<1	mg/kg	TM108/PM114
Loss on Ignition #	-	-	-	-	-	-	-	-	-	2.1	<1.0	%	TM22/PM0
pH #M	6.51	7.41	8.25	7.82	8.44	7.88	6.78	11.15	8.41	8.31	<0.01	pH units	TM73/PM11
Sulphide*	-	-	-	-	-	-	-	-	-	<15	<15	mg/kg	Subcontracted
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Silt	Clay	Clay		None	PM13/PM0
Sample Colour	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown	Medium Brown		None	PM13/PM0
Other Items	stones	stones	stones	stones	stones	stones	stones	stones, water	stones, vegetation	stones, vegetation		None	PM13/PM0

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/12348

Report : CEN 10:1 1 Batch

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

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	25-27										LOD/LOR	Units	Method No.
Sample ID	SA01												
Depth													
COC No / misc													
Containers	V J T												
Sample Date	25/07/2023												
Sample Type	Clay												
Batch Number	1												
Date of Receipt	27/07/2023												
Dissolved Antimony #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	0.0027										<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	0.027										<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.004										<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.04										<0.03	mg/kg	TM30/PM17
Dissolved Boron #	0.045										<0.012	mg/l	TM30/PM17
Dissolved Boron (A10) #	0.45										<0.12	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005										<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005										<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015										<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015										<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007										<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07										<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005										<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05										<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.006										<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.06										<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	<0.00001										<0.00001	mg/l	TM61/PM0
Mercury Dissolved by CVAF #	<0.0001										<0.0001	mg/kg	TM61/PM0
Phenol	<0.01										<0.01	mg/l	TM26/PM0
Phenol	<0.1										<0.1	mg/kg	TM26/PM0
Fluoride	0.3										<0.3	mg/l	TM173/PM0
Fluoride	3										<3	mg/kg	TM173/PM0
Sulphate as SO4 #	2.5										<0.5	mg/l	TM38/PM0
Sulphate as SO4 #	25										<5	mg/kg	TM38/PM0
Mass of raw test portion	0.1035											kg	NONE/PM17
Chloride #	17.7										<0.3	mg/l	TM38/PM0
Chloride #	177										<3	mg/kg	TM38/PM0
Mass of dried test portion	0.09											kg	NONE/PM17
Ammoniacal Nitrogen as N #	0.23										<0.03	mg/l	TM38/PM0

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/12348

Report : CEN 10:1 1 Batch

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

EMT Sample No.	25-27												
Sample ID	SA01												
Depth													
COC No / misc													
Containers	V J T												
Sample Date	25/07/2023												
Sample Type	Clay												
Batch Number	1												
Date of Receipt	27/07/2023												

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Ammoniacal Nitrogen as N #	2.3										<0.3	mg/kg	TM38/PM0
Dissolved Organic Carbon	5										<2	mg/l	TM60/PM0
Dissolved Organic Carbon	50										<20	mg/kg	TM60/PM0
Total Dissolved Solids #	107										<35	mg/l	TM20/PM0
Total Dissolved Solids #	1071										<350	mg/kg	TM20/PM0

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/12348

VOC Report : **Solid**

EMT Sample No.	1-3	4-6	7-9	10-12	13-14	15-17	18-20	21-22	23-24				
Sample ID	TP1	TP1	TP2	TP2	TP3	TP4	TP4	MW401	MW402				
Depth	1.00	2.00	1.00	2.00	1.00	1.00	2.00	1.20	0.80				
COC No / misc													
Containers	V J T	V J T	V J T	V J T	J T	V J T	V J T	V J	V J				
Sample Date	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023	25/07/2023				
Sample Type	Clay	Clay	Clay	Clay	Clay	Clay	Clay	Silt	Clay				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023	27/07/2023				
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	ug/kg	TM15/PM10
Chloromethane #	6	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1	<1	<1	<1		<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	3	<2	<2	<2	<2	<2		<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6	<6	<6	<6		<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<7	<7	<7	<7	<7	<7	<7	<7	<7		<7	ug/kg	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	9	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	6	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6	<6	<6	<6		<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
cis-1-3-Dichloropropene	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
Toluene #	13	<3	6	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
trans-1-3-Dichloropropene	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2	<2	<2	<2		<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3	<3	<3	<3		<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6	<6	<6	<6		<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
4-Isopropyltoluene	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
n-Butylbenzene	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene	<7	<7	<7	<7	<7	<7	<7	<7	<7		<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4	<4	<4	<4		<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27	<27	<27	<27		<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene	<7	<7	<7	<7	<7	<7	<7	<7	<7		<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	82	106	90	103	95	104	92	97	92		<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	70	104	85	101	92	99	85	101	73		<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM

Reference: 60707258

Location: Tarbert

Contact: Brendan McCarthy

Matrix : Solid

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	EPH Interpretation
23/12348	1	SA01		25-27	Possible trace of lubricating oil and possible naturally occurring compounds

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/12348						

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.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/12348

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 overesitimate 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: 23/12348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	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
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	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.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	
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.			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	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	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

EMT Job No: 23/12348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM13	A visual examination of the solid sample is carried out to ascertain sample make up, colour and any other inclusions. This is not a geotechnical description.	PM0	No preparation is required.			AR	No
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners 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
TM20	Modified BS 1377-3:1990/USEPA 160.1/3 (TDS/TS: 1971) Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified BS 7755-3:1995, ISO10694:1995 Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Preparation of Soil and Marine Sediment Samples for Total Organic Carbon.	Yes		AD	Yes
TM22	Modified BS1377-3:1990 Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (35C-440C). On request modified ASTM D2974-00 LOI (105C-440C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			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
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.	Yes	Yes	AR	Yes

EMT Job No: 23/12348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
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	Yes	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	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	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
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		AR	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	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	PM0	No preparation is required.	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		AR	Yes
TM50	Acid soluble sulphate (Total Sulphate) analysed by ICP-OES	PM29	A hot hydrochloric acid digest is performed on a dried and ground sample, and the resulting liquor is analysed.	Yes	Yes	AD	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.			AR	Yes

EMT Job No: 23/12348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM61	Determination of Mercury by Cold Vapour Atomic Fluorescence - WATERS: Modified USEPA Method 245.7, Rev 2, Feb 2005. SOILS: Modified USEPA Method 7471B, Rev.2, Feb 2007	PM0	No preparation is required.	Yes		AR	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.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes	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	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	Yes	AR	Yes
TM108	Determination of Elemental Sulphur by Reversed Phase High Performance Liquid Chromatography with Ultra Violet spectroscopy.	PM114	End over end extraction of dried and crushed soil samples for organic analysis. The solvent mix varies depending on analysis required			AD	Yes
TM173	Analysis of fluoride by ISE (Ion Selective Electrode) using modified ISE method 9214 - 340.2 (EPA 1998)	PM0	No preparation is required.			AR	Yes
NONE	No Method Code	NONE	No Method Code			AD	Yes
NONE	No Method Code	PM17	Modified method BS EN12457-2:2002 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	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.			AR	
Subcontracted	See attached subcontractor report for accreditation status and provider.					AR	Yes

EMT Job No: 23/12348

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15_A	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes

Appendix E Validated Laboratory Groundwater Results

Element Materials Technology
Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

P: +44 (0) 1244 833780
F: +44 (0) 1244 833781
W: www.element.com

AECOM
1st Floor, Montrose House
Carrigaline Road
Douglas
Cork
Ireland

Attention :	Brendan McCarthy
Date :	23rd August, 2023
Your reference :	60707258
Our reference :	Test Report 23/13298 Batch 1
Location :	Tarbert
Date samples received :	11th August, 2023
Status :	Final Report
Issue :	1

Two samples were received for analysis on 11th August, 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.

Authorised By:

Paul Boden BSc
Senior Project Manager

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/13298

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
H=H_2SO_4, Z=ZnAc, N=NaOH, HN=$HN0_3$

EMT Sample No.	1-10	11-20									LOD/LOR	Units	Method No.
Sample ID	MW401	MW402											
Depth													
COC No / misc													
Containers	V H HN N NB Z P G	V H HN N NB Z P G											
Sample Date	09/08/2023	09/08/2023											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	11/08/2023	11/08/2023											
Dissolved Arsenic #	9.1	35.2									<2.5	ug/l	TM30/PM14
Dissolved Barium #	51	11									<3	ug/l	TM30/PM14
Dissolved Beryllium	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Dissolved Boron	163	91									<12	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5									<0.5	ug/l	TM30/PM14
Total Dissolved Chromium #	<1.5	<1.5									<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7									<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5									<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1									<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2									<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3									<3	ug/l	TM30/PM14
Dissolved Vanadium #	<1.5	1.6									<1.5	ug/l	TM30/PM14
Dissolved Zinc #	9	14									<3	ug/l	TM30/PM14
Total Hardness Dissolved (as CaCO3)	342	46									<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(bk)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	76	80									<0	%	TM4/PM30
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	94	87									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	109	95									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

Element Materials Technology

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/13298

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

Please see attached notes for all abbreviations and acronyms

EMT Sample No.	1-10	11-20									LOD/LOR	Units	Method No.
Sample ID	MW401	MW402											
Depth													
COC No / misc													
Containers	V H HN N NB Z P G	V H HN N NB Z P G											
Sample Date	09/08/2023	09/08/2023											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	11/08/2023	11/08/2023											
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 #	<5	<5									<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/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 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10									<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10									<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10									<10	ug/l	TM5/TM36/PM12/PM16/PM30
PCB 28 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
PCB 52 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
PCB 101 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
PCB 118 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
PCB 138 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
PCB 153 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
PCB 180 #	<0.1	<0.1									<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7	<0.7									<0.7	ug/l	TM17/PM30
Total Phenols HPLC	<0.15	<0.15									<0.15	mg/l	TM26/PM0
Sulphate as SO4 #	32.9	54.0									<0.5	mg/l	TM38/PM0
Chloride #	452.5	70.0									<0.3	mg/l	TM38/PM0
Nitrate as NO3 #	<0.2	<0.2									<0.2	mg/l	TM38/PM0
Nitrite as NO2 #	<0.02	<0.02									<0.02	mg/l	TM38/PM0
Ortho Phosphate as PO4 #	<0.06	<0.06									<0.06	mg/l	TM38/PM0
Total Cyanide #	<0.01	<0.01									<0.01	mg/l	TM89/PM0
Ammoniacal Nitrogen as N #	1.01	0.09									<0.03	mg/l	TM38/PM0
Hexavalent Chromium #	<0.006	<0.006									<0.006	mg/l	TM38/PM0
Total Dissolved Chromium III	<6	<6									<6	ug/l	TM0/PM0

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/13298

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
$H=H_2SO_4$, Z=ZnAc, N=NaOH, $HN=HN0_3$

EMT Sample No.	1-10	11-20									LOD/LOR	Units	Method No.
Sample ID	MW401	MW402											
Depth													
COC No / misc													
Containers	V H HN N NB Z P G	V H HN N NB Z P G											
Sample Date	09/08/2023	09/08/2023											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	11/08/2023	11/08/2023											
Sulphide*	<0.01	<0.01									<0.01	mg/l	Subcontracted
COD (Settled)#	37	<7									<7	mg/l	TM57/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy
EMT Job No: 23/13298

VOC Report : **Liquid**

EMT Sample No.	1-10	11-20									LOD/LOR	Units	Method No.
Sample ID	MW401	MW402											
Depth													
COC No / misc													
Containers	V H HN N NB Z P G	V H HN N NB Z P G											
Sample Date	09/08/2023	09/08/2023											
Sample Type	Ground Water	Ground Water											
Batch Number	1	1											
Date of Receipt	11/08/2023	11/08/2023											
VOC MS													
Dichlorodifluoromethane	<2	<2									<2	ug/l	TM15/PM10
Methyl Tertiary Butyl Ether #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Chloromethane #	<3	<3									<3	ug/l	TM15/PM10
Vinyl Chloride #	<0.1	<0.1									<0.1	ug/l	TM15/PM10
Bromomethane	<1	<1									<1	ug/l	TM15/PM10
Chloroethane #	<3	<3									<3	ug/l	TM15/PM10
Trichlorofluoromethane #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<3	<3									<3	ug/l	TM15/PM10
Dichloromethane (DCM) #	<3	<3									<3	ug/l	TM15/PM10
trans-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
1,1-Dichloroethane #	<3	<3									<3	ug/l	TM15/PM10
cis-1-2-Dichloroethene #	<3	<3									<3	ug/l	TM15/PM10
2,2-Dichloropropane	<1	<1									<1	ug/l	TM15/PM10
Bromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
Chloroform #	<2	<2									<2	ug/l	TM15/PM10
1,1,1-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
1,1-Dichloropropene #	<3	<3									<3	ug/l	TM15/PM10
Carbon tetrachloride #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Benzene #	<0.5	<0.5									<0.5	ug/l	TM15/PM10
Trichloroethene (TCE) #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromomethane #	<3	<3									<3	ug/l	TM15/PM10
Bromodichloromethane #	<2	<2									<2	ug/l	TM15/PM10
cis-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
Toluene #	<5	<5									<5	ug/l	TM15/PM10
trans-1-3-Dichloropropene	<2	<2									<2	ug/l	TM15/PM10
1,1,2-Trichloroethane #	<2	<2									<2	ug/l	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichloropropane #	<2	<2									<2	ug/l	TM15/PM10
Dibromochloromethane #	<2	<2									<2	ug/l	TM15/PM10
1,2-Dibromoethane #	<2	<2									<2	ug/l	TM15/PM10
Chlorobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,1,1,2-Tetrachloroethane #	<2	<2									<2	ug/l	TM15/PM10
Ethylbenzene #	<1	<1									<1	ug/l	TM15/PM10
m/p-Xylene #	<2	<2									<2	ug/l	TM15/PM10
o-Xylene #	<1	<1									<1	ug/l	TM15/PM10
Styrene	<2	<2									<2	ug/l	TM15/PM10
Bromoform #	<2	<2									<2	ug/l	TM15/PM10
Isopropylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,1,2,2-Tetrachloroethane	<4	<4									<4	ug/l	TM15/PM10
Bromobenzene #	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichloropropane #	<3	<3									<3	ug/l	TM15/PM10
Propylbenzene #	<3	<3									<3	ug/l	TM15/PM10
2-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Chlorotoluene #	<3	<3									<3	ug/l	TM15/PM10
tert-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2,4-Trimethylbenzene #	<3	<3									<3	ug/l	TM15/PM10
sec-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
4-Isopropyltoluene #	<3	<3									<3	ug/l	TM15/PM10
1,3-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,4-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
n-Butylbenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dichlorobenzene #	<3	<3									<3	ug/l	TM15/PM10
1,2-Dibromo-3-chloropropane	<2	<2									<2	ug/l	TM15/PM10
1,2,4-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Hexachlorobutadiene	<3	<3									<3	ug/l	TM15/PM10
Naphthalene	<2	<2									<2	ug/l	TM15/PM10
1,2,3-Trichlorobenzene	<3	<3									<3	ug/l	TM15/PM10
Surrogate Recovery Toluene D8	94	87									<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	109	95									<0	%	TM15/PM10

Please see attached notes for all abbreviations and acronyms

All solid results are expressed on a dry weight basis unless stated otherwise.

Client Name: AECOM
Reference: 60707258
Location: Tarbert
Contact: Brendan McCarthy

EMT Job No.	Batch	Sample ID	Depth	EMT Sample No.	Analysis	Reason
No deviating sample report results for job 23/13298						

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.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

EMT Job No.: 23/13298

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 overesitimate 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: 23/13298

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM0	Not available	PM0	No preparation is required.				
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			
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.				
TM15	Modified USEPA 8260B v2:1996. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021A v2:2014. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM17	Modified US EPA method 8270D v5:2014. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.				

EMT Job No: 23/13298

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/SANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
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: 2013l	PM0	No preparation is required.	Yes			
TM57	Modified US EPA Method 410.4. (Rev. 2.0 1993) Comparable with ISO 15705:2002. Chemical Oxygen Demand is determined by hot digestion with Potassium Dichromate and measured spectrophotometerically.	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			
Subcontracted	See attached subcontractor report for accreditation status and provider.						

Appendix F Photographic Log

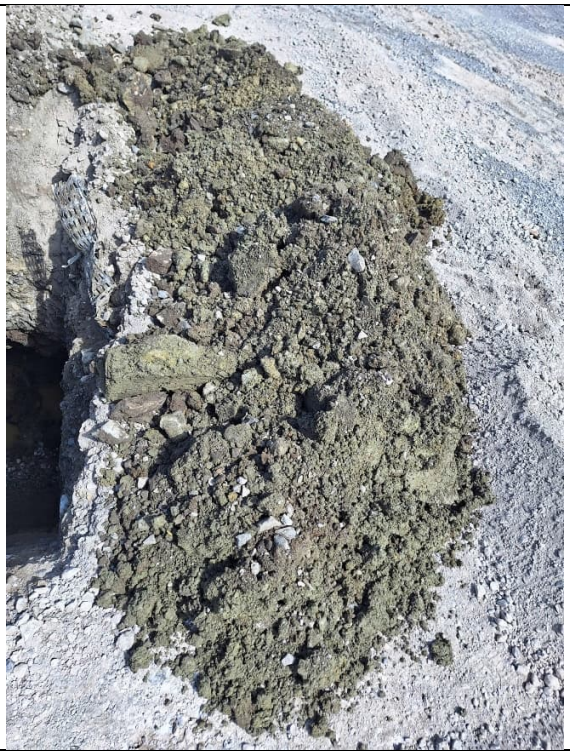
AECOM		PHOTOGRAPHIC LOG
Client Name: SSE	**Site Location:** Tarbert, Kerry.	Tarbert S-4 SI

Photo No. 1	**Date:** 25/07/2023

Description: TP101

Photo No. 2	**Date:** 25/07/2023

Description: TP101



AECOM	PHOTOGRAPHIC LOG	
Client Name: SSE	**Site Location:** Tarbert, Kerry.	Tarbert S-4 SI

Photo No. 3	**Date:** 25/07/2023

Description: TP102

Photo No. 4	**Date:** 25/07/2023

Description: TP102

AECOM

PHOTOGRAPHIC LOG

Client Name: SSE | **Site Location:** Tarbert, Kerry. | Tarbert S-4 SI

Photo No. 5	**Date:** 25/07/2023

Description: TP103

Photo No. 6	**Date:** 25/07/2023

Description: TP103

AECOM		PHOTOGRAPHIC LOG
Client Name: SSE	**Site Location:** Tarbert, Kerry.	Tarbert S-4 SI

Photo No. 7	**Date:** 25/07/2023

Description: TP104

Photo No. 8	**Date:** 25/07/2023

Description: MW401

PHOTOGRAPHIC LOG

Client Name: SSE	**Site Location:** Tarbert, Kerry.	Tarbert S-4 SI

Photo No.	**Date:**
9	25/07/2023

Description: MW402