



Phase 2 Contaminated Land Investigation: Former Firestone site, Wrexham Industrial Estate

Phase 2 Contaminated Land Investigation: Former Firestone site, Wrexham Industrial Estate

Prepared for

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CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION.....	3
1.1 Background	3
1.2 Scope of works.....	3
1.3 Scope of this report	4
1.4 Report structure.....	4
2 SITE LOCATION, HISTORY AND ENVIRONMENTAL SETTING	8
3 SITE INVESTIGATION WORKS.....	10
3.1 Previous site investigations / remediation	10
3.2 2012 Site investigation	11
3.2.1 Site investigation methods.....	11
3.2.2 Soil sampling.....	13
3.2.3 Groundwater sampling	14
3.2.4 Field measurements.....	14
4 SITE INVESTIGATION RESULTS.....	16
4.1 Soil profile and geology	16
4.2 Shallow groundwater	16
4.3 Field observations/measurements.....	17
4.4 Soil quality data	18
4.5 Groundwater quality data	20
5 CONCEPTUAL MODEL	26
5.1 Conceptual site model.....	26
5.2 Conceptual exposure model.....	27
5.2.1 Sources.....	28
5.2.2 Pathways.....	28
5.2.3 Receptors.....	29
5.3 Pollutant linkages	29
6 HUMAND HEALTH RISK ASSESSMENT	33
6.1 Approach and methodology.....	33

6.2	Risk screening (Pollutant linkages: PPL1, PPL2).....	33
7	PRELIMINARY CONTROLLED WATERS RISK ASSESSMENT.....	36
7.1	Approach and methodology.....	38
7.2	Assessment of groundwater quality data (Pollutant linkages: PPL6, PPL7).....	38
7.2.1	Discussion.....	39
8	PRELIMINARY GROUND GAS RISK ASSESSMENT.....	41
8.1	Methodology.....	41
8.2	Assessment of gas generation potential (Pollutant linkage: PPL4)	41
8.3	Discussion.....	43
9	RISKS TO BUILT STRUCTURES	45
9.1	Assessment of risks to below ground structures and services (Pollutant linkage: PPL5).....	45
10	CONCLUSIONS	47
10.1	Assessment of potential liabilities and constraints on redevelopment.....	48
10.1.1	Part IIA of the Environmental Protection Act 1990	48
10.1.2	Constraints on the future redevelopment of the Site due to land quality.....	48
11	REFERENCES.....	50

FIGURES

Figure 1.1	Site location	6
Figure 1.2	Current Site layout	7
Figure 3.1	Site investigation locations	15
Figure 4.1	Summary of PAHs in soils.....	23
Figure 4.2	Summary of aliphatic TPH fractions (C5-C35) in soils	24
Figure 4.3	Summary of aromatic TPH fractions (C5-C35) in soils.....	25
Figure 5.1	Conceptual site model.....	32

TABLES

Table 3.1	Summary of site investigation locations.....	12
Table 4.1	Summary of geological sequence.....	16
Table 4.2	Observed water strikes in trial pits.....	17
Table 4.3	Summary of soil quality data.....	18
Table 4.4	Summary of explosive compounds in soils	19
Table 4.5	Groundwater quality data	21
Table 5.1	Pollutant linkages	30
Table 6.1	Screening values adopted for the human health risk assessment.....	34
Table 6.2	Soil quality screening assessment.....	36
Table 7.1	Screening assessment of shallow groundwater quality data	39
Table 8.1	Classification system for low gas risk sites (after Card and Wilson, 2011).....	41
Table 8.2	Summary of gas generation potential at the Site	42

APPENDICES

Appendix A	Trial pit logs
Appendix B	Site investigation photographs
Appendix C	Laboratory certificates

EXECUTIVE SUMMARY

Wrexham County Borough Council (the Council), in partnership with the Welsh Government, commissioned Broadway Malyan to prepare a development framework and indicative masterplan for the land holding, known as the former Firestone site (the Site), situated to the south-east of Wrexham Industrial Estate.

ESI Ltd. (ESI) was commissioned by Broadway Malyan on behalf of the Council and Welsh Government to undertake a Phase I Preliminary Risk Assessment as the first stage of establishing the contamination status of the Site to inform preparation of the masterplan. The assessment confirmed that the Site had historically occupied part of a Royal Ordnance Factory (ROF) involved in the manufacture of explosives during World War II and that part of the Site was then subsequently developed for the Firestone tyre manufacturing facility that operated between the 1960s and the early 1990s.

The assessment identified that despite a programme of site investigation and remediation undertaken at the Site in the early 1990s following the closure of the Firestone facility there was some uncertainty over the sufficiency of the work undertaken; not least due to the unavailability of the associated documentation.

ESI was subsequently commissioned to undertake a programme of proportionate intrusive site investigation and monitoring works in order to confirm current land quality at the Site. The purpose of the site investigation was twofold; to determine any potential constraints associated with land quality on the future potential redevelopment of the Site and to assess any liabilities that may exist under Part IIA of the Environmental Protection Act 1990.

The site investigations and risk assessments undertaken have confirmed that there is unlikely to be any significant gross contamination at the Site; and that there is a general absence of any significant constraints on the potential future redevelopment of the Site for a commercial / industrial land use.

The site investigation was undertaken in October 2012 and the information collected has confirmed a number of potential pollutant linkages from areas of soil contamination to human health receptors (either during its current informal land use by members of the public or under a potential future commercial / industrial land use following redevelopment), potential future on Site buildings and to controlled waters receptors. The impact on these receptors was assessed in accordance with UK best practice.

Generally, low concentrations of metals were measured in Made Ground at the Site. Some low petroleum hydrocarbon concentrations (specifically the heavier and more environmentally persistent fractions) were observed. Low concentrations of various PAH species were detected in approximately a third of the samples of Made Ground taken. Generally, all other SVOCs and VOCs were less than the limit of detection. All explosive organic compounds were also below their limits of detection.

The results from analysis of four groundwater samples taken during the trial pitting have shown an absence of any TPH, SVOCs (including PAHs) and VOCs. Metal concentrations within shallow groundwater were generally low; however modest ammoniacal nitrogen, nitrite and sulphate concentrations were observed.

The observations and soil / groundwater quality data acquired during the site investigation are consistent with the scope of the remediation that was reportedly undertaken in the early 1990s.

A human health risk assessment showed that the maximum concentrations of all measured contaminants were significantly below screening values deemed to be protective of the current and potential future Site users. It has been concluded that no human health risks are likely to be posed to human health by the observed soil or groundwater quality either if the

current Site use is maintained or the Site was redeveloped for a commercial / industrial land use.

A preliminary controlled waters risk assessment considered pollutant linkages between potential contaminants that have been identified in soils and shallow groundwater and identified controlled waters receptors; namely the underlying alluvium and bedrock aquifers and the nearby River Clywedog / Afon Clywedog.

There is no evidence to suggest the presence of widespread shallow groundwater and it is unlikely that there is any significant lateral migration of contamination to the alluvium aquifer. Any potential impact to the adjacent river will also be limited, not least due to the significant dilution capacity that it will offer.

The assessment concluded that the presence of in the order of 40 m of clayey superficial deposits at the Site is likely to limit the potential vertical migration of the potential contaminants observed to the two bedrock aquifers. Overall risks to controlled waters from the Site are therefore considered to be low. It is unlikely that additional groundwater monitoring at the Site will significantly alter this conclusion.

Minimal degradable material was observed within Made Ground during the site investigation. A preliminary ground gas risk assessment indicates that generally the Made Ground offers only a limited potential source of ground gas and that risks to any future buildings on most areas of the Site and to current buildings off Site are not likely to be significant. Whilst there is some suggestion that the risks to future buildings in some areas of the Site may be marginally higher, standard construction methods could be used in new buildings to offer an additional level of gas protection.

An assessment of the risk of chemical attack to any future on-Site buildings or underground services has shown that there are unlikely to be significant issues.

A watching brief during construction with possible additional local data collection / ground preparation may be required to support the positions regarding risks from ground gas and to future on-Site buildings and underground services once any redevelopment plans are finalised.

The site investigation and risk assessments undertaken have confirmed that there is a general absence of any significant constraints associated with the current land quality on the future redevelopment of the Site for an industrial / commercial land use.

Potential liabilities associated with the ownership of the land relate to those of Part IIA of the Environmental Protection Act 1990. Either on the basis that the land use does not change in the future; or that the Site is only developed for an industrial / commercial land use, then the possibility of any future environmental liabilities associated with the current observed land quality are considered remote.

1 INTRODUCTION

1.1 Background

Wrexham County Borough Council (the Council), in partnership with the Welsh Government, require a development framework and indicative masterplan for a land holding, known as the former Firestone site (the Site), situated to the south-east of Wrexham Industrial Estate.

The Site is owned by the Welsh Government and was last occupied by the Firestone tyre factory. The potential issue of contamination associated with the Firestone factory, plus other former uses, has been identified as a key consideration for the development framework and indicative masterplan. The Council and the Welsh Government therefore require the contamination status of the Site to be established both to determine any potential constraints on its future development and to assess the liabilities that exist under Part IIA of the Environmental Protection Act 1990.

ESI Ltd. (ESI) was commissioned by Broadway Malyan on behalf of the Council and Welsh Government to undertake a Phase I Preliminary Risk Assessment as the first stage of establishing the contamination status of the Site. This was to enable a preliminary assessment of the potential contaminant risks which may be posed to relevant environmental receptors as defined in the Part IIA Statutory Guidance (Welsh Government, 2012).

The Phase I Preliminary Risk Assessment (ESI, 2012) confirmed that the Site historically occupied part of a Royal Ordnance Factory (ROF) involved in the manufacture of explosives during World War II and that part of the Site was subsequently developed for the Firestone tyre manufacturing facility that operated between the 1960s and the early 1990s.

The assessment identified that despite a programme of site investigation and remediation undertaken at the Site in the early 1990s following the closure of the Firestone facility there was some uncertainty over the sufficiency of the work undertaken; not least due to the unavailability of the associated documentation. Whilst it was considered unlikely that any areas of gross contamination remain on Site there was still the potential for localised areas of residual contamination within Made Ground which could pose a risk to current or future site users and to local groundwater and surface waters.

A programme of proportionate intrusive site investigation and monitoring works was recommended in order to confirm the nature of the Made Ground materials that are still present, characterise their current composition (including the potential for ground gas generation) and assess their significance as a potential contamination source.

The purpose of the site investigation is twofold: to determine any potential constraints associated with the current land quality on the future redevelopment of the Site; and to assess any liabilities that may exist under Part IIA of the Environmental Protection Act 1990.

ESI was subsequently commissioned by Broadway Malyan on behalf of the Council and Welsh Government to undertake the recommended investigations.

1.2 Scope of works

The agreed scope of works for the investigation was as follows:

- To establish the current soil profile across the Site, including the composition and thicknesses of the Made Ground deposits and also the depth to and the nature of the interface with the underlying glacial till.
- To gather information on the composition of the upper portion of the glacial till.
- To assess soil quality across the Site with particular focus on addressing the following:
 - Verify the remediation undertaken in the four locations identified by Travers Morgan (1994a).

- Confirm the soil quality in the areas that had previously been identified as 'contaminated' by Travers Morgan (1994a) but where no remediation was apparently specified (e.g. to the east of the main Firestone building).
- Assess the soil quality in areas where no previous site investigations have been undertaken (e.g. beneath the former Firestone building).
- To confirm the presence (or absence) and quality of any shallow groundwater within Made Ground and alluvium deposits overlying the glacial till.
- To establish the potential for bulk gas generation and migration through the unsaturated zone.

The agreed scope of the investigation was designed to focus on assessing risks to human health but also to provide sufficient information to inform a preliminary assessment of the likely significance of risks to controlled waters, to built structures or from ground gases to buildings. As such, the scope did not include the installation of permanent groundwater or ground gas monitoring points. The intention was to use the information gathered to establish whether further data were required (including from the installation of monitoring points and a programme of on-going sampling / monitoring) to allow these risks to be fully assessed.

1.3 Scope of this report

The scope of this report is as follows:

- Summarise the investigations undertaken, including observed ground conditions and the shallow groundwater regime, and the results of field monitoring and laboratory analysis;
- Provide all factual information acquired during the site investigation;
- Prepare an updated conceptual site model, in accordance with national guidance (Environment Agency, 2004; 2010), based on the information acquired; and
- Undertake risk assessments to identify potentially significant pollutant linkages for identified relevant receptors (including potential future site users; buildings and controlled waters).

1.4 Report structure

The information contained within this report comprises the following:

• Section 2: Site location, history and environmental setting	]	Details of both the current site setting and the historical site land use and a summary of physical characteristics of the Site and surrounding area
• Section 3: Site investigation works	]	Summary of the site investigations performed by ESI and other parties at the site
• Section 4: Site investigation results	]	Description of the salient site investigation findings relating to geology, hydrogeology and soil / groundwater quality
• Section 5: Conceptual model	]	Description of both the updated Conceptual Site Model (the physical Site setting) and the Conceptual Exposure Model, including details of contaminant sources, pathways and receptors
• Section 6: Human health risk assessment	]	Quantitative assessment of the risks posed to human health by observed soil and groundwater quality

- Section 7: Preliminary controlled waters risk assessment : Preliminary quantitative assessment of the risks posed to controlled waters by observed soil and groundwater quality
- Section 8: Preliminary ground gas risk assessment : Preliminary quantitative assessment of the risks posed to buildings and their occupants from ground gases
- Section 9: Risks to built structures : Preliminary quantitative assessment of the risks posed to built structures
- Section 10: Project conclusions : Salient project conclusions

Figure 1.1 Site location

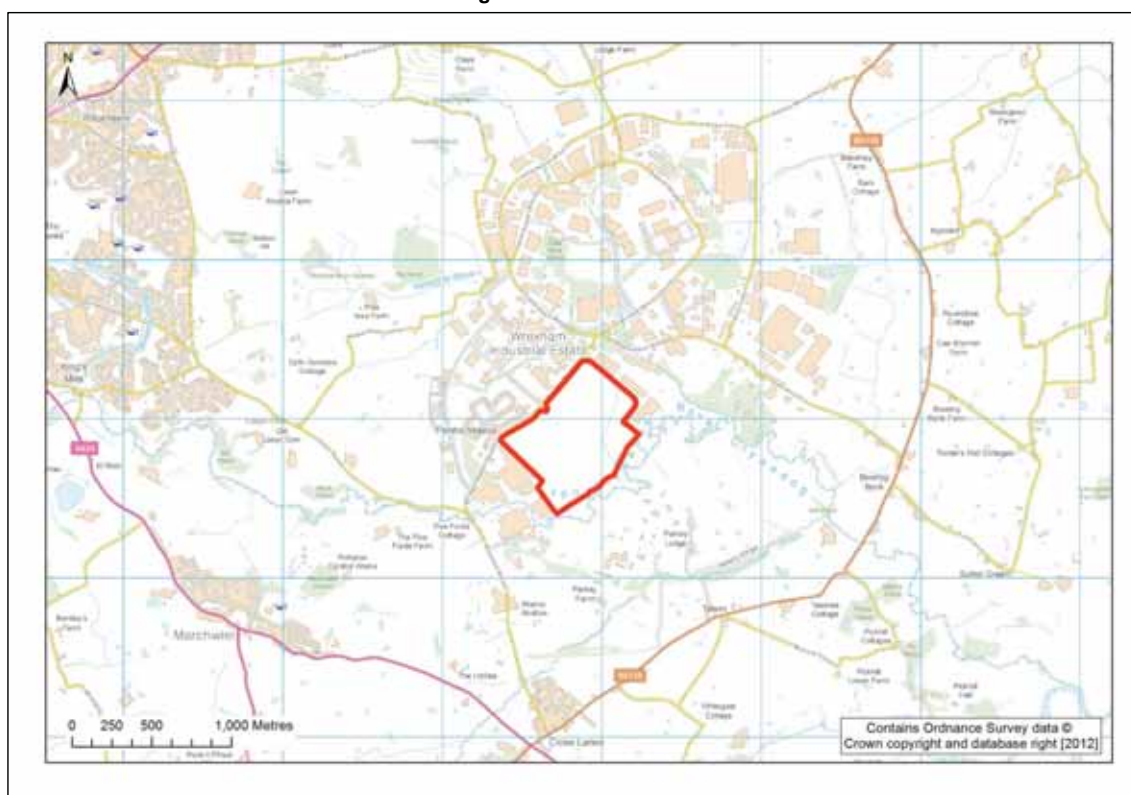
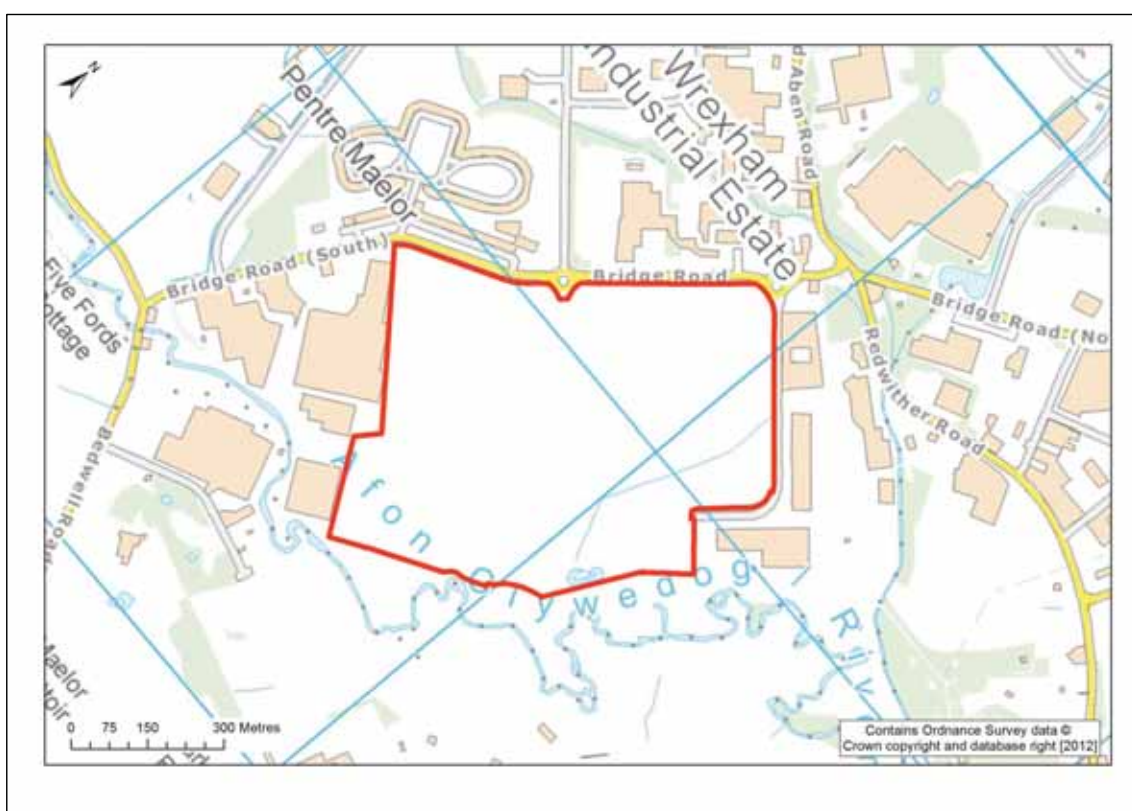


Figure 1.2 Current Site layout



2 SITE LOCATION, HISTORY AND ENVIRONMENTAL SETTING

The following pertinent information to this report is derived from the desk study and preliminary risk assessment prepared by ESI (2012).

- The Site covers a total area of ~45 ha and currently comprises vacant land on the southern edge of Wrexham Industrial Estate. It is bounded to the north, north-east and south-west by various industrial and commercial units and premises. An area of residential housing is located approximately 100 m to the north-west of the Site. The flood plain of the River Clywedog / Afon Clywedog is located along the south-eastern edge of the Site.
- The Site appears to have been agricultural land until the late 1930s when the ROF that manufactured explosives was built and operated until 1945. The specific activities and detailed use of the ROF buildings located on the Site is unknown. However, some evidence suggests that the majority of the buildings were used for the storage of materials or finished products rather than for manufacturing processes.
- The former ROF was sold for development following the end of World War II. By 1966 the Firestone tyre manufacturing factory had been built on the north-western part of the Site and this operated until the early 1990s.
- In 1994 following the closure of the Firestone factory the Site was cleared on behalf of the Welsh Development Agency; this included work to break out most of the foundations of the former buildings (from the Firestone factory and the ROF), undertaking soil remediation of several areas that were identified as being contaminated and the general re-grading of the surface of the Site. Since this time the Site has been left vacant, which has allowed shrubs, trees and other vegetation to become well established across the Site. Whilst public access to the Site is not permitted it is currently used informally (e.g. for dog-walking).
- A review of the available documentation of the work undertaken on behalf of the Welsh Development Agency concluded that there was some uncertainty over whether the remediation undertaken was entirely comprehensive. Whilst it was considered relatively unlikely that gross sources of contamination remained undetected on the Site the review concluded that this possibility could not be ruled out entirely.
- The Site and the wider Industrial Estate has been the subject of previous development which is known to have involved extensive landscaping; published geological mapping (BGS, 2012) indicates that formerly landscaped ground covers the entire Site. A reasonable thickness of Made Ground was therefore anticipated at the Site.
- BGS (2012) indicates beneath the landscaped ground there is a superficial cover of glacial till (clay with a mixture of gravel, cobbles and boulders) or alluvium (river sediments). This cover overlies the Salop Formation (a sequence of mudstones, sandstones and conglomerates) and the Kinnerton Sandstone Formation (which comprises fine to medium grained sandstone). The Salop Formation is present beneath the majority of the Site; the Kinnerton Formation is only present along a ~100 m wide strip along the south-east edge of the Site. Alluvium (sediments of clay, silts, and sand and gravel) is present immediately to the south-east of the Site associated with the River Clywedog / Afon Clywedog.
- The Environment Agency divides rock strata into three categories: "Principal" Aquifers are capable of providing a high level of water storage and may also support water supply and/or river base flow on a strategic scale; "Secondary A" Aquifers are capable of supporting water supplies at a local rather than a strategic scale. "Non-productive strata" do not supply water. The glacial till is classed as non-productive strata. The Kinnerton Sandstone Formation is designated as a Principal Aquifer and the alluvium and Salop

Formation as Secondary A aquifers. The superficial cover is up to 40 m thick beneath the Site, so it is likely to offer protection to the underlying Kinnerton and Salop aquifers from any near surface contaminants.

- Three licensed groundwater abstractions are located immediately to the east of the Site. All three abstractions are for process water drawn from the Kinnerton Sandstone aquifer. The Site is located within a Source Protection Zone (which appears to be associated with one of these abstractions) and is also located within a Groundwater Drinking Water Protected Area.
- Shallow groundwater present above the glacial till has previously been observed at the Site and could be in hydraulic connection with groundwater likely to be present within the alluvium and also with local surface water features such as the nearby River Clywedog / Afon Clywedog.
- No designated environmentally sensitive areas are located within 2 km of the Site.

3 SITE INVESTIGATION WORKS

3.1 Previous site investigations / remediation

As described above a series of site investigations and then a phase of remediation were undertaken on the Site in the early 1990s and were described in detail by ESI (2012). Relevant details of these investigations are summarised as follows:

- 11 boreholes were drilled on behalf of JR Grimley in 1992. However, other than their locations no further information is available.
- 12 boreholes, 81 trial pits and 20 trial trenches were drilled / excavated in 1993 across the Site. Whilst the reports that document this investigation are not available the information that was gathered is summarised and referred to by both Travers Morgan (1994a) and Symonds Travers Morgan (1995). In total 166 soil samples, 11 groundwater samples, two surface water samples and three samples from sumps were taken and analysed for a limited range of inorganic and organic compounds. In total 33 soil samples and 7 water samples were classified as 'contaminated' with either hydrocarbons, various metals or alkaline pH (in soils) and metals (lead and selenium), phenol, ammoniacal nitrogen and sulphate (in waters). The elevated hydrocarbon concentrations in soils were mainly restricted to the area of the Firestone site to the east of the main building. The overall conclusion made was that the observed 'contamination' was associated with 'occasional and isolated suspect material' and it was inferred that the results 'were not representative of the site materials as a whole'.
- A further 35 trial pits were excavated in 1994 (Travers Morgan, 1994a). The locations of these trial pits was restricted to the east of the main Firestone building and across the former ROF area. Whilst over 100 soil samples and 8 groundwater samples underwent laboratory analysis the results are missing from the copy of the report available, which includes only a summary of the investigation findings. This includes details of visual evidence of contamination in various locations (including to the east of the main Firestone building where contamination was observed during the earlier investigation). Four of the soil samples taken were considered to be 'heavily contaminated', due to sulphate, toluene extractable material (up to 28,400 mg/kg) and several metals (including lead up to 3,400 mg/kg). Twelve soil samples were 'moderately contaminated' (due to elevated pH, sulphate, phenol, toluene extractable material and zinc).
- A works order (Travers Morgan, 1994b) describes the remediation that was undertaken based on the results of the previous site investigations. The works order identified four areas of contamination that were to be excavated and removed off Site for disposal. It is noted that these locations do not correlate with the majority of the locations where samples were taken that were classified as 'contaminated' in the earlier site investigations (Travers Morgan, 1994a).
- A summary report describing the site preparation works undertaken (Symonds Travers Morgan, 1995) confirms that the four areas were remediated and also details how the works undertaken included identifying and removing all below ground obstructions from the former Firestone factory and the former ROF (this included identifying and tracing the majority of floor slabs; areas of hardstanding and pipework).

It is noted that much of the relevant detail from these previous investigations (i.e. borehole and trial pit logs; laboratory data) is not present in the copies of the reports available. However, where sufficient detail is available the information and observations made during these site investigations will be discussed where relevant in the following sections.

3.2 2012 Site investigation

The site investigation was conducted between 9 and 11 November 2012 and involved excavating 38 trial pits (TP1 to TP38) using a mechanical excavator and associated soil and groundwater sampling and in situ observations/ measurements. The locations of the trial pits are shown on Figure 3.1.

3.2.1 Site investigation methods

The investigations posed a number of potential health and safety risks to both the site investigation team and site workers; these risks included the consequences of disturbing buried services and also the potential exposure to sub surface contaminants possibly including asbestos fibres and explosive residues.

Appropriate health and safety procedures were developed and followed based on ESI's site investigation protocols in order to manage potential risks from the exposure to contaminated soils, water and ground gases, including the risks posed by potential asbestos fibres. Whilst it was recognised that the potential presence of any residual explosive materials still being present from the former use of the Site for explosives manufacture was low, this possibility was recognised in the site investigation planning and development of a safe system of work. This led to the adoption of measures recommended in published guidance for the investigations of such sites (Environment Agency, 2001). This included the use of field personnel with appropriate experience and training, selection of appropriate investigation techniques, specification of appropriate PPE, and the use of suitable processes for managing suspected contaminated materials.

Plans relating to buried services (including gas, electricity, water, sewerage and telecoms) and structures were obtained prior to the commencement of the site work. The presence of buried services / structures led to the re-positioning of some proposed sampling locations. All locations were scanned using a Cable Avoidance Tool as the excavations progressed.

A preliminary site investigation design was prepared to provide a broad coverage of sampling locations across the Site whilst also targeting the four areas previously remediated; selected areas that were identified during the previous site investigations as 'contaminated'; and several areas which had not been previously investigated.

The site investigation locations were reviewed and modified in light of information provided following the completion of the ecology survey (TEP, 2012a). The presence of several sensitive habitats (in particular along the south-east boundary of the Site) required a number of planned locations to be re-positioned before the site investigation commenced. Moreover, given the ecological sensitivity of the Site (specifically the confirmed presence of great crested newts and their habitats) a method statement was agreed with the Countryside Council of Wales to minimise the potential impact of the proposed site investigation (TEP, 2012b). This involved adopting several additional control measures during the site investigation including prior vegetation clearance and ecological searches of all proposed sampling locations and access routes; positioning locations as close to existing tracks and paths as possible; using access routes to minimise the disturbance of vegetation as far as possible; and temporarily laying all excavated materials on tarpaulin prior to backfilling. These precautions and the presence of several unmarked ditches and areas of significant vegetation growth (which prevented safe access for the mechanical excavator) meant that several of the planned sampling locations were re-positioned as the site investigation progressed. The locations were moved as small a distance as possible whilst still attempting to achieve the technical requirements of the site investigation.

The site investigation was also subject to a bio-security risk assessment given the particular ecological sensitivity of the Site. Additional measures that were required during the site investigation included cleaning of plant / equipment as it entered and exited the Site (to prevent the transfer of invasive species) and using an agricultural disinfectant on plant /

equipment to prevent the potential transfer of a particular disease to the great crested newt population.

The purpose of each trial pit was to establish the nature and thickness of Made Ground, to prove the underlying unconsolidated geology; and to permit soil and groundwater sampling. The depths of the trial pits ranged between 0.4 m and 1.5 m according to the materials and geological strata encountered.

The materials recovered from the trial pits were logged and sampled by a qualified environmental scientist in accordance with current best practice (British Standard 10175:2011 and 5930:1999; Eurocode 7:1997). In addition, any information concerning the shallow hydrogeology and any visible or olfactory signs of contamination were noted. Trial pit logs are presented in Appendix A and photographs showing materials recovered during the site investigations are included in Appendix B.

Table 3.1 presents a summary of the site investigation locations. The locations are shown in Figure 3.1.

Table 3.1 Summary of site investigation locations

Trial Pit	Date	Easting	Northing	Depth (m)	Sample depths (m)	Made Ground thickness (m)	Geological unit at base of Made Ground
TP1	09/10/2012	338138	349078	1.1	0.4	0.6	Glacial till
TP2	09/10/2012	337970	349214	1.3	0.4	0.9	Glacial till
TP3	09/10/2012	337995	349188	1.4	1.0	1.3	Alluvium
TP4	09/10/2012	337932	349201	1.2	0.2 1.0 ^w	>1.2	-
TP5	09/10/2012	337903	349321	1.0	0.5	0.8	Glacial till
TP6	09/10/2012	337860	349246	1.2	0.2	0.3	Glacial till
TP7	09/10/2012	337690	349004	1.1	0.2	0.3	Glacial till
TP8	09/10/2012	337619	348918	0.4	-	-	Glacial till
TP9	09/10/2012	337569	348917	0.4	-	-	Glacial till
TP10	09/10/2012	337570	348896	0.4	-	0.2	Glacial till
TP11	09/10/2012	337583	348735	0.4	-	-	Glacial till
TP12	09/10/2012	337613	348701	0.9	0.4	-	Alluvium
TP13	09/10/2012	337682	348548	1.2	0.5	0.7	Alluvium
TP14	09/10/2012	337813	348595	0.8	0.3	0.8	Alluvium
TP15	10/10/2012	338014	348872	1.2	0.4	0.6	Alluvium
TP16	10/10/2012	338058	348767	1.4	0.6	>1.4	-
TP17	10/10/2012	338052	348730	1.1	0.25	0.5	Glacial till
TP18	10/10/2012	337955	348663	1.2	0.3	0.7	Glacial till
TP19	10/10/2012	337909	348616	1.3	0.45	0.9	Glacial till
TP20	10/10/2012	338068	349191	1.0	0.5 1.0 ^w	>1.0	-
TP21	10/10/2012	338067	349139	1.2	0.2	0.45	Alluvium
TP22	10/10/2012	338011	349244	1.1	0.1 0.3	0.9	Glacial till
TP23	10/10/2012	337867	349196	1.2	0.6	>1.2	-
TP24	10/10/2012	337958	349110	1.1	0.6	0.6	Alluvium

Trial Pit	Date	Easting	Northing	Depth (m)	Sample depths (m)	Made Ground thickness (m)	Geological unit at base of Made Ground
TP25	10/10/2012	337721	349007	1.0	0.4	0.8	Glacial till
TP26	10/10/2012	337742	348958	1.0	0.35	0.7	Glacial till
TP27	11/10/2012	338007	348916	0.6	0.2	0.25	Alluvium
TP28	11/10/2012	337902	348696	0.6	0.2	0.4	Alluvium
TP29	11/10/2012	337916	348784	1.3	0.5	0.45	Alluvium
TP30	11/10/2012	337868	348881	0.6	0.3	0.45	Glacial till
TP31	11/10/2012	337735	349105	1.0	0.3	0.5	Glacial till
TP32	11/10/2012	337658	348649	1.5	0.2 0.5 ^w	1.0	Glacial till
TP33	11/10/2012	337747	348649	1.0	0.4	0.7	Alluvium
TP34	11/10/2012	337747	348786	1.0	0.3	0.4	Alluvium
TP35	11/10/2012	337716	348863	1.0	-	-	Alluvium
TP36	11/10/2012	337695	348931	1.0	0.2	0.5	Alluvium
TP37	11/10/2012	337835	349000	1.0	0.2	0.3	Alluvium
TP38	11/10/2012	337907	349209	1.2	1.0 ^w	>1.2	-

Notes

w – groundwater grab sample

3.2.2 Soil sampling

A total of 33 soil samples were taken following established sampling procedures. Sample depths and locations (as shown in Table 3.1) were selected to provide an appropriate spatial coverage from the different geological units, and on the basis of site observations and field measurements.

Laboratory testing was undertaken in order to ascertain the chemical quality of the soil samples. All analysis was performed at an UKAS accredited laboratory (i2 Analytical Ltd) using MCERTS certified tests where possible. Samples were submitted under chain of custody procedures for the following analysis:

- Heavy metals (including As, Ba, Cd, Cr (including Cr VI), Cu, Hg, Ni, Pb, Se, V and Zn)
- Petroleum hydrocarbons (TPH CWG, including BTEX)
- Semi-volatile organic compounds and poly-aromatic hydrocarbons (speciated PAHs or SVOCs including PAHs)
- Volatile organic compounds (VOCs, selected samples)
- Fraction of organic carbon
- Nitrate, nitrite and ammonium nitrate
- pH and water soluble sulphate

In addition, all soil samples were visually screened on-site for the presence of asbestos material.

Five selected samples were submitted for additional analysis for explosive residues. This analysis involved a range of environmental persistent compounds including the key explosive compounds (nitroglycerine, nitrocellulose and picrate) specifically known to be associated with the historical use of the Site (BAE Systems, 2001).

Laboratory certificates for all analysis are presented in Appendix C.

3.2.3 Groundwater sampling

Where sufficient groundwater was encountered in the base of a trial pit a grab sample was taken using a disposable bailer. In total there were only 4 trial pits (TP4, TP20, TP32 and TP38) where there was sufficient groundwater to permit sampling. All other locations were either dry or only minor seepages were observed.

All groundwater samples were submitted under chain of custody procedures to an accredited laboratory (i2 Analytical Ltd) for analysis of the following:

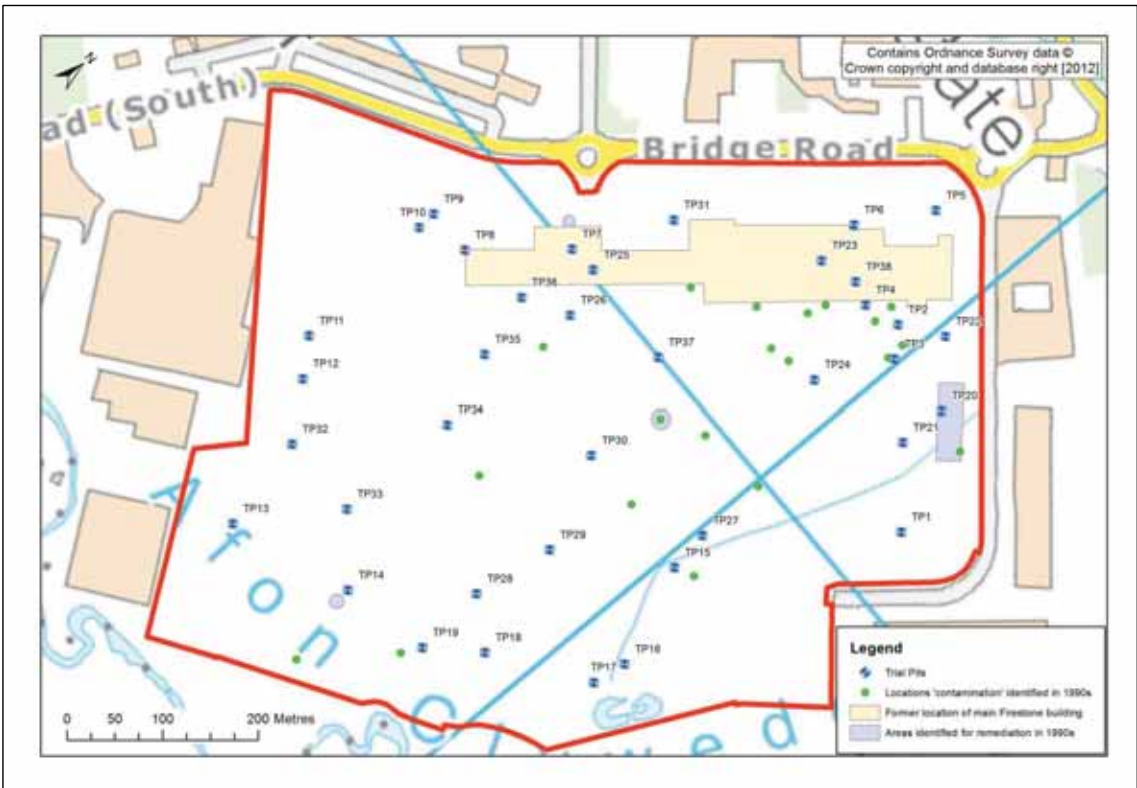
- Metals (including As, Ba, Cd, Cr, Cu, Hg, Ni, Pb, Se, V and Zn)
- Ammoniacal nitrogen, nitrate, nitrite and ammonium nitrate
- Chloride, sulphide and sulphate
- pH
- TPH CWG (including BTEX)
- VOCs
- SVOCs (including PAHs)

Laboratory certificates are presented in Appendix C.

3.2.4 Field measurements

Headspace measurements of net volatile gas concentrations were also taken from soil samples using a Photo Ionisation Detector (PID). The PID was operated and calibrated in accordance with the manufacturers' instructions.

Figure 3.1 Site investigation locations



4 SITE INVESTIGATION RESULTS

4.1 Soil profile and geology

Site specific geological information including the extent and composition of Made Ground and the nature of the underlying superficial deposits has been gained from the site investigation. This information complements the existing information described in Section 2. A summary of the findings is presented in Table 4.1.

Table 4.1 Summary of geological sequence

Unit	Thickness (m)	Description	Occurrence
Made Ground	0 to ≥1.4	Typically a red brown clayey sand/sandy clay with gravel containing fragments of demolition rubble (bricks, concrete etc). Small fragments of plaster, plastic, charcoal, metal, glass, ash and ceramics frequently observed. Significant occurrence of building demolition rubble / materials in the area of the north-eastern end of the former location of the main Firestone building (i.e. TP2, TP3, TP5, TP20, TP21, TP22 and TP24).	Made Ground was encountered in 33 of the 38 trial pits. It was only absent in four locations (TP8, TP9, TP11 and TP12) all located in the western corner of the Site. The base of the Made Ground was encountered in the majority of locations (see Table 3.1). Notably it was over 1.2 m in three locations (TP4, TP23 and TP38) towards the north-eastern end of the former location of the main Firestone building.
Alluvium	0 to >1.2	Red orange / mottled grey sand, silts and clays with very occasional gravel.	BGS geological mapping shows that the alluvium is associated with the River Clywedog / Afon Clywedog and only extends onto the south-eastern edge of the Site. The site investigation has shown that the alluvium may actually extend up to approximately 300 m onto the Site. In some places (i.e. TP17, TP18, TP19) along the south-eastern boundary of the Site it is absent where Made Ground was observed to be thicker. Glacial till is understood to be present either immediately beneath the Made Ground or beneath the alluvium across the entire Site.
Glacial till	>0.9 to ~37 Note BGS borehole (SJ34NE42) located immediately to the east of the Site proved 37 m of 'hard boulder clay' (see ESI, 2012)	Firm to stiff red brown clay with occasional gravel and cobbles. Weathering observed on upper surface on occasion.	
Salop Formation	Not proven (over 200 m in the local area according to BGS (2012))	A sequence of red brown mudstones and sandstones with pebbly sandstone and conglomerate beds,	BGS geological mapping shows that the Salop Formation is present beneath the majority of the Site; the Kinnerton Sandstone Formation is present along a ~100 m strip along the south-east edge of the Site.
Kinnerton Sandstone Formation	Not proven (between 0 and 150 m in the local area according to BGS (2012))	A red-brown to yellow fine to medium grained sandstone.	

4.2 Shallow groundwater

Damp or saturated conditions were only identified infrequently within the trial pits during the site investigation. Table 4.2 summarises water strike observations. Given the site investigation techniques used, the recorded depths at which water was encountered are only approximate. In all other locations either only very minor seepages (in TP3, TP16, TP23, TP34 and TP35) or no appreciable groundwater was encountered.

Table 4.2 Observed water strikes in trial pits

Location	Water Strike (m bgl)	Observations
TP4	0.8 (1.0)	Rapid flow encountered within unit of dense gravel and cobble backfill.
TP20	1.0	Water observed above concrete obstruction
TP32	0.6 (0.5)	Slow flow at base of Made Ground above glacial till
TP38	1.0	Rapid flow encountered within unit of dense gravel and cobble backfill.

Note: Where given, the value in brackets is initial level observed.

The following observations are made based on the information presented:

- No laterally continuous shallow groundwater body was observed at the Site. Rather, there appears to be localised perching of groundwater associated with infiltration and variable drainage in some isolated areas.
- The most significant groundwater observed was in two adjacent locations (TP4, TP23 and TP38). In both locations a distinct layer of gravel and cobbles was observed beneath a shallow top-soil; groundwater was consistently encountered at a depth of about 1 m bgl in this layer. The position of these trial pits corresponds to the former location of the main Firestone factory building; the gravel and cobbles appear to have been used as a backfill for the former structure. It would appear that shallow groundwater has preferentially accumulated within this area likely due to the presence of these more granular backfill materials.
- Shallow groundwater was encountered at the base of TP20 at ~1 m bgl; immediately below this depth a concrete obstruction was found. It appears that the groundwater may be perched on this structure.
- A number of un-marked shallow ditches are present on the Site; whilst many were dry during the site investigation several locally contained standing water. Moreover, following heavy rainfall during the site investigation areas of the Site became water logged with standing water accumulating quickly. These observations appear to confirm the variable nature of drainage across the Site.

4.3 Field observations/measurements

Visual or olfactory observations of potential contamination were made during all drilling and sampling activities. Measurements of net VOC vapour concentrations were also taken regularly during soil sampling using a PID. These measurements are included in the trial pit logs (see Appendix A). Comments on these field observations/measurements are as follows:

- Made Ground materials were observed to contain blackened materials / staining in five adjacent trial pits (TP2, TP3, TP4, TP20 and TP22) located at the north-eastern end of the former location of the main Firestone building. Some of these locations (TP3, TP20 and TP22) corresponded to some of the samples where PAHs and TPHs were detected.
- An orangey red solid material was found within shallow Made Ground in both TP29 and TP30 (located within the centre of the Site). This material may be 'burnt shale' a by-product often associated with the combustion of waste from collieries.
- A slight oily sheen was noted on the surface of the shallow groundwater encountered in TP20. It is noted that TP20 was in the approximate location of one of the four areas that were previously remediated (Travers Morgan, 1994b).
- No appreciable odours were noted during the trial pitting and soil sampling. This included an absence of any detectable VOC concentrations from the measurements made using the PID.

4.4 Soil quality data

All soil chemistry data relating to samples taken during the site investigation are presented in Appendix C. A summary of soil quality data is presented in Table 4.3 and Table 4.4.

Table 4.3 Summary of soil quality data

Determinands	Units		Made Ground				
			Number	Number ^ LOD	Minimum	Mean	Maximum
Metals							
Arsenic	mg/kg		33	33	2.2	9.7	22
Barium	mg/kg		33	33	53	126	370
Beryllium	mg/kg		33	33	0.4	0.83	1.4
Boron (Water Soluble)	mg/kg		33	12	<0.2	0.42	1.6
Cadmium	mg/kg		33	12	<0.2	0.75	16
Chromium VI	mg/kg		33	0	<4	-	<4
Chromium III	mg/kg		33	33	11	28.1	45
Chromium (Total)	mg/kg		33	33	11	28.1	45
Copper	mg/kg		33	33	5.9	21.3	68
Lead	mg/kg		33	33	14	63.6	300
Mercury	mg/kg		33	3	<0.3	0.33	1.3
Nickel	mg/kg		33	33	6.2	26.2	52
Selenium	mg/kg		33	2	<1	1.0	2.3
Vanadium	mg/kg		33	33	10	29.3	46
Zinc	mg/kg		33	33	39	170.3	2500
General inorganics							
pH	-		33	33	6.6	7.9	8.5
Water Soluble Sulphate (2:1) as SO4	mg/kg		33	33	14	104	520
Water Soluble Sulphate (2:1) as SO4	g/l		33	33	0.014	0.11	0.53
Ammonium as NH4	mg/kg		11	0	<5	-	<5
Fraction Organic Carbon	-		33	33	0.0006	0.009	0.032
Soil Organic Matter	%		33	33	0.1	1.5	5.5
Total Organic Content	%		33	33	0.1	0.9	3.2
Water Soluble Nitrate (2:1) as N	mg/kg		11	2	<2	2.2	3.5
Water Soluble Nitrite (2:1) as N	µg/kg		11	0	<20	-	<20
Phenols							
Phenols (Total monohydric)	mg/kg		15	0	<2	-	<2
Polycyclic aromatic hydrocarbon (PAH)							
Naphthalene	mg/kg		33	8	<0.05	0.17	0.74
Acenaphthylene	mg/kg		33	0	<0.2	-	<0.2
Acenaphthene	mg/kg		33	1	<0.1	0.1	0.2
Fluorene	mg/kg		33	0	<0.2	-	<0.2
Phenanthrene	mg/kg		33	8	<0.2	0.3	2.4
Anthracene	mg/kg		33	3	<0.1	0.1	0.3
Fluoranthene	mg/kg		33	11	<0.2	0.5	3
Pyrene	mg/kg		33	11	<0.2	0.5	2.8
Benzo(a)anthracene	mg/kg		33	11	<0.2	0.4	2.1
Chrysene	mg/kg		33	11	<0.05	0.3	2.4

Determinands	Units		Made Ground				
			Number	Number > LOD	Minimum	Mean	Maximum
Benzo(b)fluoranthene	mg/kg		33	11	<0.1	0.4	2.1
Benzo(k)fluoranthene	mg/kg		33	10	<0.2	0.3	1.4
Benzo(a)pyrene	mg/kg		33	12	<0.1	0.3	2
Indeno(1,2,3-cd)pyrene	mg/kg		33	5	<0.2	0.2	1.1
Dibenz(a,h)anthracene	mg/kg		33	0	<0.2	-	<0.2
Benzo(ghi)perylene	mg/kg		33	5	<0.05	0.2	1
PAH Total	mg/kg		15	4	<1.6	2.9	14
Monoaromatics							
Benzene	µg/kg		33	0	<1	-	<1
Toluene	µg/kg		33	0	<1	-	<1
Ethylbenzene	µg/kg		33	0	<1	-	<1
m,p-Xylene	µg/kg		33	0	<1	-	<1
o-Xylene	µg/kg		33	0	<1	-	<1
Methyl tertiary butyl ether (MTBE)	µg/kg		33	0	<1	-	<1
Petroleum hydrocarbons							
Aliphatic >EC5 - EC6	mg/kg		33	0	<0.1	-	<0.1
Aliphatic >EC6 - EC8	mg/kg		33	0	<0.1	-	<0.1
Aliphatic >EC8 - EC10	mg/kg		33	0	<0.1	-	<0.1
Aliphatic >EC10 - EC12	mg/kg		33	0	<1	-	<1
Aliphatic >EC12 - EC16	mg/kg		33	1	<2	2.0	2.5
Aliphatic >EC16 - EC21	mg/kg		33	1	<8	8.5	25
Aliphatic >EC21 - EC35	mg/kg		33	6	<8	12.6	59
Total Aliphatic (EC5 - EC35)	mg/kg		33	6	<10	15.1	59
Aromatic >EC5 - EC7	mg/kg		33	0	<0.1	-	<0.1
Aromatic >EC7 - EC8	mg/kg		33	0	<0.1	-	<0.1
Aromatic >EC8 - EC10	mg/kg		33	0	<0.1	-	<0.1
Aromatic >EC10 - EC12	mg/kg		33	0	<1	-	<1
Aromatic >EC12 - EC16	mg/kg		33	0	<2	-	<2
Aromatic >EC16 - EC21	mg/kg		33	1	<10	10.1	12
Aromatic >EC21 - EC35	mg/kg		33	5	<10	12.4	30
Total Aromatic (EC5 - EC35)	mg/kg		33	5	<10	12.8	38
Semi-Volatile Organic Compounds (SVOCs)							
Dibenzofuran	mg/kg		18	1	<0.2	0.23	0.8

Notes

- 1) For the calculation of mean concentrations any values below the laboratory limit of detection (LOD) have been assumed to be equal to the LOD.
- 2) Only those VOCs and SVOCs measured above the LOD are displayed.

Table 4.4 Summary of explosive compounds in soils

Determinands	Units	Location	TP1	TP12	TP23	TP28	TP36
		Depth (m)	0.4	0.4	0.6	0.2	0.2
2,4,6-trinitrotoluene	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5
2,4-dinitrotoluene	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
4,2- dinitrotoluene	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Hexanitrostilbene	mg/kg		<0.5	<0.5	<0.5	<0.5	<0.5

Determinands	Units	Location	TP1	TP12	TP23	TP28	TP36
		Depth (m)	0.4	0.4	0.6	0.2	0.2
MHX	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
PETN	mg/kg		<5.0	<5.0	<5.0	<5.0	<5.0
RDX	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Tetryl	mg/kg		<1.0	<1.0	<1.0	<1.0	<1.0
Picrite	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
Picric acid	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
Ethylene Glycol Dinitrate	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
Nitroglycerine	mg/kg		<0.1	<0.1	<0.1	<0.1	<0.1
Nitrocellulose	mg/kg		<5000	<5000	<5000	<5000	<5000

The following salient observations can be made regarding the soil quality data:

- Concentrations of metals are modest and did not show any particular spatial distribution.
- Ammonium and nitrite were not detected; nitrate was only detected in two samples at low concentrations.
- No BTEX compounds were detected in any of the samples analysed.
- The only volatile TPH fraction detected (aliphatic >EC12-EC16) was in one sample from TP30 (located in the former ROF area).
- Concentrations of non-volatile aliphatic and aromatic TPH fractions were only detected in seven samples. Three of these samples were taken from three adjacent trial pits located to the south of the north-eastern end of the former location of the main Firestone building (TP3, TP22 and TP20). These locations are close to some of the positions that were identified as being 'contaminated' during the site investigations undertaken in the early 1990s (Travers Morgan, 1994a). Moreover, TP20 is located in the approximate location of one of the four areas that was targeted for remediation (Symonds Travers Morgan, 1995). It is noted however, that whilst TPH has been detected in these and four other isolated locations, Total TPH concentrations are low. The maximum was only 89 mg/kg.
- Low concentrations of various PAH species were only detected in approximately a third of the samples taken. Some of these corresponded to those samples where TPHs were detected however others did not and are present separately. The two highest total PAH concentrations (both ~17 mg/kg) were measured in the samples taken from TP20 and TP3 (i.e. the area to the north-eastern end of the former location of the main Firestone building). Several PAH species were also detected at lower concentrations in TP3 and in several other locations in the immediate vicinity (TP21, TP24 and TP5). Low concentrations of PAH species were also detected in the former ROF area; and were consistently observed in TP16, TP17, TP18 and TP19 all located along the south-east boundary of the Site.
- The only other SVOC detected was dibenzofuran in the sample of 'burnt shale' taken from the Made Ground in TP30.
- No asbestos-containing materials were encountered during the site investigation or observed during the soil analyses.
- All explosive organic compounds were below their limits of detection.

4.5 Groundwater quality data

The chemical quality data associated with groundwater 'grab' samples taken from the trial pits are summarised in Table 4.5. The laboratory certificates for these data are also included in Appendix C.

Table 4.5 Groundwater quality data

Determinands	Units	TP4	TP20	TP32	TP38
Inorganics					
pH	-	7.4	7.2	7.2	7.4
Sulphate as SO ₄	mg/l	138	220	74.3	44.2
Sulphide	µg/l	<5.0	<5.0	<5.0	<5.0
Chloride	mg/l	20	18	25	50
Ammoniacal Nitrogen as N	mg/l	0.12	0.67	0.22	0.34
Nitrate as N	mg/l	<1.0	<1.0	<1.0	<1.0
Nitrite as N	µg/l	<10	120	79	<10
Metals					
Arsenic	µg/l	7.9	15	3.2	1.9
Barium	µg/l	94	170	140	62
Beryllium	µg/l	<0.2	<0.2	<0.2	<0.2
Boron	µg/l	150	180	73	64
Cadmium	µg/l	<0.1	<0.1	<0.1	<0.1
Chromium	µg/l	<0.4	<0.4	<0.4	0.8
Copper	µg/l	2.3	4	4.5	4.4
Lead	µg/l	1.5	1.3	4.3	2.5
Mercury	µg/l	<0.5	<0.5	<0.5	<0.5
Nickel	µg/l	2.2	2.9	2.7	0.9
Selenium	µg/l	<4.0	<4.0	<4.0	<4.0
Vanadium	µg/l	2.7	5.9	<1.7	<1.7
Zinc	µg/l	0.8	17	5.6	<0.4
Monoaromatics					
Benzene	µg/l	<1	<1	<1	<1
Toluene	µg/l	<1	<1	<1	<1
Ethylbenzene	µg/l	<1	<1	<1	<1
m,p-Xylene	µg/l	<1	<1	<1	<1
o-Xylene	µg/l	<1	<1	<1	<1
Methyl tertiary butyl ether (MTBE)	µg/l	<1	<1	<1	<1
Petroleum hydrocarbons					
Aliphatic >EC5 - EC6	µg/l	<10	<10	<10	<10
Aliphatic >EC6 - EC8	µg/l	<10	<10	<10	<10
Aliphatic >EC8 - EC10	µg/l	<10	<10	<10	<10
Aliphatic >EC10 - EC12	µg/l	<10	<10	<10	<10
Aliphatic >EC12 - EC16	µg/l	<10	<10	<10	<10
Aliphatic >EC16 - EC21	µg/l	<10	<10	<10	<10
Aliphatic >EC21 - EC35	µg/l	<10	<10	<10	<10
<i>Total Aliphatic (EC5 - EC35)</i>	µg/l	<10	<10	<10	<10
Aromatic >EC5 - EC7	µg/l	<10	<10	<10	<10
Aromatic >EC7 - EC8	µg/l	<10	<10	<10	<10
Aromatic >EC8 - EC10	µg/l	<10	<10	<10	<10
Aromatic >EC10 - EC12	µg/l	<10	<10	<10	<10
Aromatic >EC12 - EC16	µg/l	<10	<10	<10	<10
Aromatic >EC16 - EC21	µg/l	<10	<10	<10	<10
Aromatic >EC21 - EC35	µg/l	<10	<10	<10	<10

Determinands	Units	TP4	TP20	TP32	TP38
Total Aromatic (EC5 - EC35)	µg/l	<10	<10	<10	<10
Polycyclic aromatic hydrocarbon (PAH)					
Acenaphthene	µg/l	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	µg/l	<0.01	<0.01	<0.01	<0.01
Anthracene	µg/l	<0.01	<0.01	<0.01	<0.01
Benzo(g,h,i)perylene	µg/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)anthracene	µg/l	<0.01	<0.01	<0.01	<0.01
Benzo(a)pyrene	µg/l	<0.01	<0.01	<0.01	<0.01
Benzo(b)fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01
Benzo(k)fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01
Chrysene	µg/l	<0.01	<0.01	<0.01	<0.01
Dibenzo(a,h)anthracene	µg/l	<0.01	<0.01	<0.01	<0.01
Fluoranthene	µg/l	<0.01	<0.01	<0.01	<0.01
Fluorene	µg/l	<0.01	<0.01	<0.01	<0.01
Indeno(1,2,3-cd)pyrene	µg/l	<0.01	<0.01	<0.01	<0.01
Naphthalene	µg/l	<0.01	<0.01	<0.01	<0.01
Phenanthrene	µg/l	<0.01	<0.01	<0.01	<0.01
Pyrene	µg/l	<0.01	<0.01	<0.01	<0.01

Notes

1. No other VOCs or SVOCs were measured above the LOD.

The following salient observations are made regarding the groundwater quality data:

- Metal, chloride, sulphide and nitrate concentrations are generally low.
- Some sulphate, nitrite and ammoniacal nitrogen concentrations are modest.
- No BTEX, TPH, SVOCs (including PAHs) or VOCs were detected.

Figure 4.1 Summary of PAHs in soils

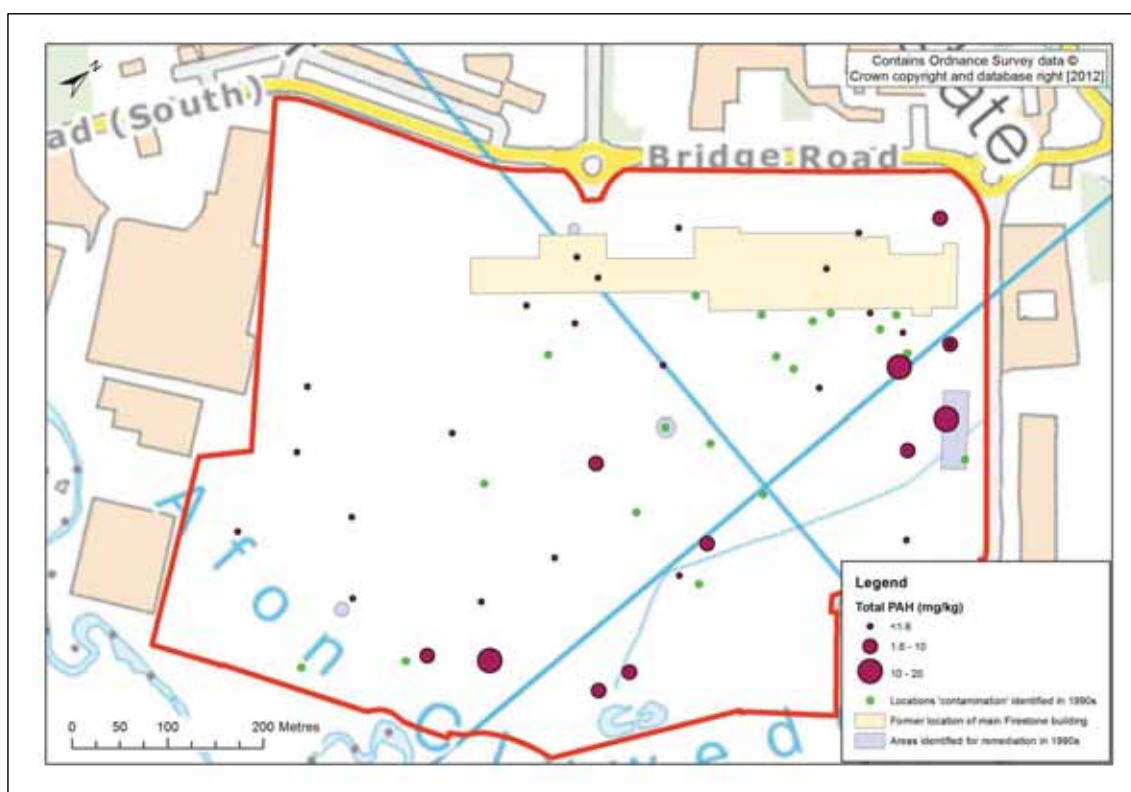


Figure 4.2 Summary of aliphatic TPH fractions (C5-C35) in soils

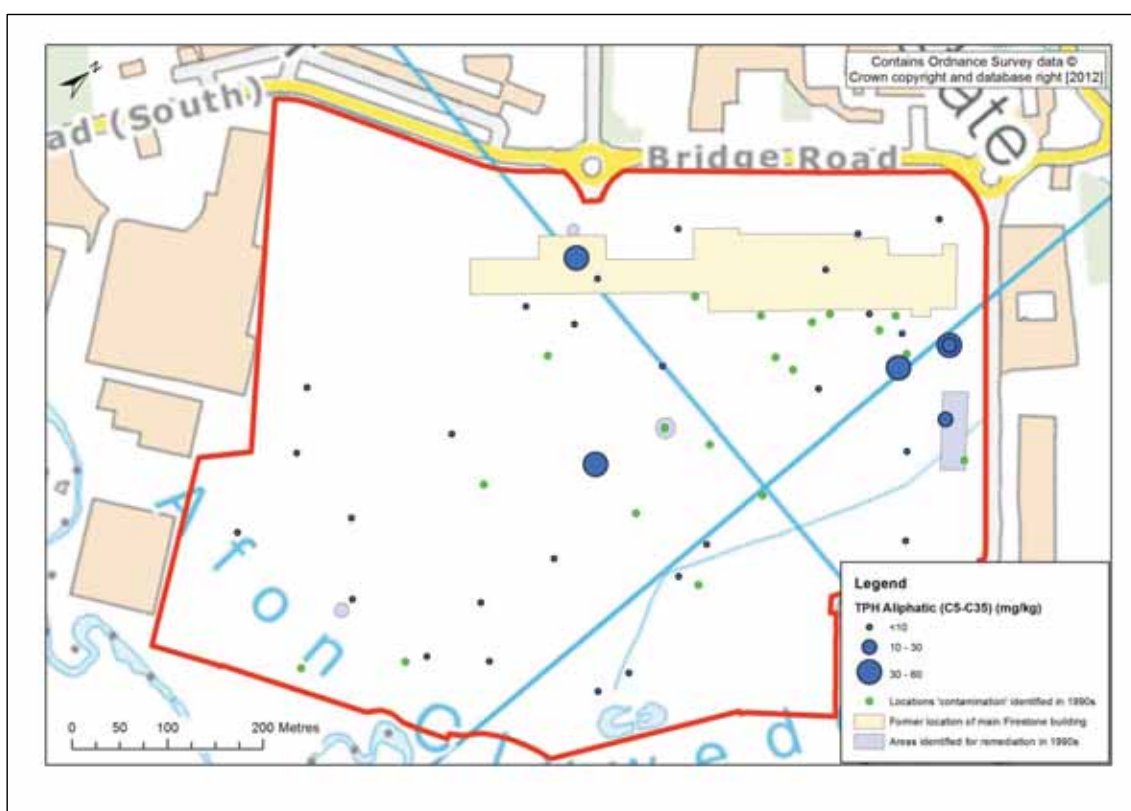
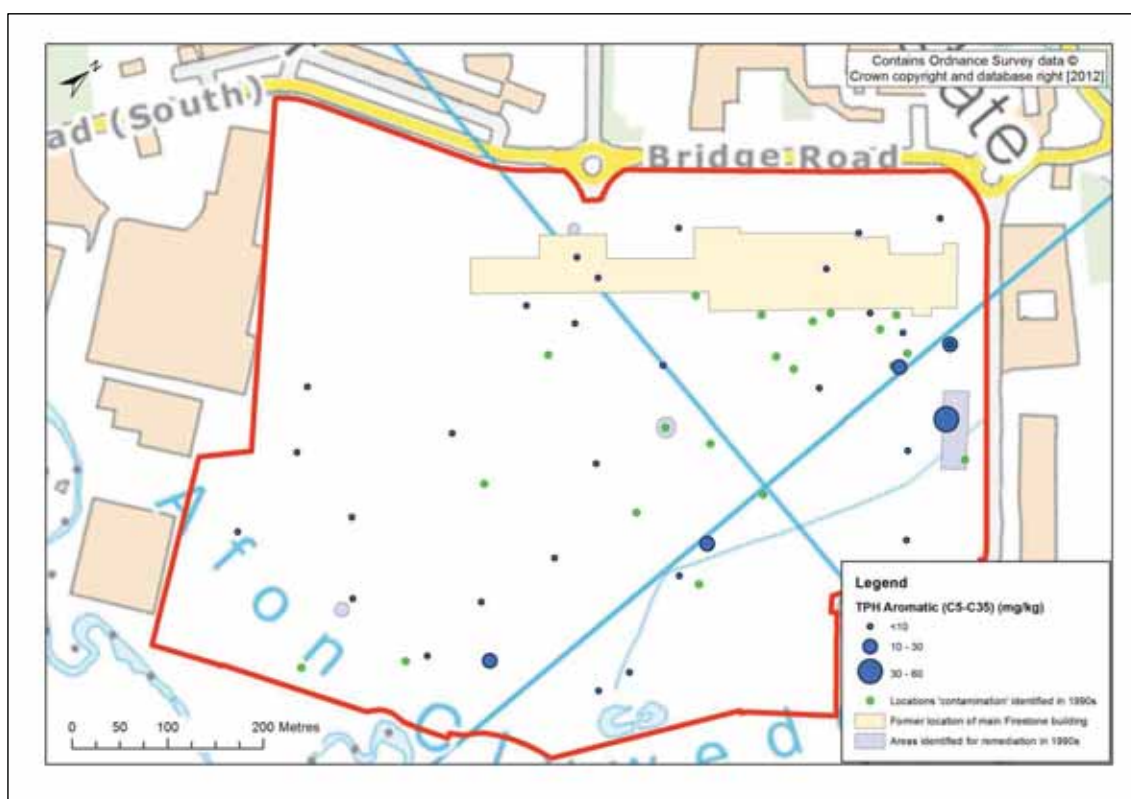


Figure 4.3 Summary of aromatic TPH fractions (C5-C35) in soils



5 CONCEPTUAL MODEL

A conceptual ground model has been developed which describes the current understanding of the physical aspects of the study area including geology, hydrogeology and surface waters. This is described in Section 5.1 and illustrated on Figure 5.1.

Building on this physical characterisation, a set of potential pollutant linkages has been identified. These linkages represent combinations of likely contaminant sources present on the Site, potential receptors, and the possible pathways linking sources and receptors. In order for harm or pollution to be caused to identified receptors all three elements must be present, i.e.:

A contaminant source: a substance that is in, on, or under the land and has the potential to cause harm or to cause pollution of controlled 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; and

A pathway: a route or means by which a receptor can be exposed to or be affected by a contaminant.

An environmental hazard is identified where all three of these elements are present (i.e., a pollutant linkage exists), and there is consequently the potential for a contaminant to affect a particular receptor through a particular pathway. The quantitative risk assessments presented in Sections 6, 7 and 8 aim to assess, the likelihood of harm or pollution occurring due to identified hazards.

The conceptual exposure model is presented in Section 5.2 and illustrated on Figure 5.1.

5.1 Conceptual site model

The Site is currently vacant land occupying an area of ~45 ha on the southern edge of Wrexham Industrial Estate. The Site is bounded to the north, north-east and south-west by industrial and commercial units and premises. An area of residential housing is located approximately 100 m to the east of the Site. The flood plain of the River Clywedog / Afon Clywedog is located along the south-eastern edge of the Site. At its closest the river is ~15 m from the Site.

The Site was initially developed as part of a ROF which manufactured explosives during World War II. Following the end of the war the former ROF was sold for redevelopment and is now occupied by much of Wrexham Industrial Estate. The Firestone tyre manufacturing factory was built on the north-western part of the Site in the late 1960s; eventually closing in the early 1990s. Following this, the Welsh Development Agency undertook a series of site investigations and remediation as part of extensive site clearance works. These works included locating and removing the foundations and below ground infrastructure that remained following the demolition of the former Firestone factory and ROF buildings.

The recent site investigations have confirmed the presence of a thin (i.e. up to 0.5 m) layer of Made Ground across much of the Site. It is however absent across a large part of the south-western corner of the Site where the ground surface is at a higher elevation than the rest of the Site. In the vicinity of the former location of the main Firestone building Made Ground is thicker (the building is known to have had basements which were in-filled when the factory was demolished). Made Ground is also thicker locally in some other areas of the Site; these locations may be associated with the former positions of buildings that originated from the ROF.

Made Ground tended to be clayey reflecting the composition of the underlying natural deposits. Frequent evidence of demolition waste / rubble was found (notably in the area immediately to the south of the north-eastern end of the former location of the main

Firestone building where significant quantities of bricks were encountered). Small fragments of plaster, plastic, charcoal, metal, glass and ceramics were also frequently observed.

The superficial deposits underlying the Made Ground (where present) comprise alluvium deposits (clays, silts and sands); and a glacial till (comprising a stiff clay containing occasional gravels). The alluvium is predominately restricted to the south-eastern half of the Site; that closest to the River Clywedog / Afon Clywedog. The glacial till is present across the entire Site beneath both Made Ground and alluvium.

Published mapping indicates that the superficial cover overlies the Salop Formation and the Kinnerton Sandstone Formation. The Salop Formation underlies the majority of the Site, whilst the Kinnerton Sandstone Formation is only present along a ~100 m wide strip along the south-east edge of the Site.

The alluvium deposits and the Salop Formation are classified as Secondary A aquifers; and the Kinnerton Sandstone Formation is classified as a Principal Aquifer. The Site is located on a Source Protection Zone which is associated with an abstraction immediately to the east of the Site from the Kinnerton Sandstone aquifer. The superficial deposits are up to 40 m thick beneath the Site so are likely to offer protection to the underlying Kinnerton and Salop aquifers from any near surface contaminants.

No continuous shallow groundwater unit has been observed at the Site; the groundwater that has been observed within the Made Ground is likely to be perched above the clayey glacial till and relatively isolated. It is possible that locally some areas of shallow groundwater may preferentially accumulate within backfill placed within former sub-surface structures present on the Site. It is also possible that locally some areas of perched groundwater at the Site along the south-eastern boundary of the Site could be in continuity with groundwater in alluvium and the nearby River Clywedog / Afon Clywedog.

The Site is relatively flat; although there is a general fall from the north-west to the south-east towards the river. Several un-marked shallow ditches are present on the Site; whilst many parts of these were dry during the recent site investigations a few contained standing water. Moreover, following a period of heavy rainfall some areas of the Site quickly became water logged with standing water accumulating. This suggests variable drainage across the Site which is likely to be dictated by the underlying local geology.

There are no designated environmentally sensitive areas within 2 km of the Site.

Generally, low concentrations of metals were measured in Made Ground at the Site. Some low petroleum hydrocarbon concentrations (specifically the heavier and more persistent fractions) were observed. Low concentrations of various PAH species were detected in approximately a third of the samples of Made Ground taken. Generally, all other SVOCs and VOCs were less than the limit of detection. All explosive organic compounds were also below their limits of detection.

Minimal degradable material was observed within Made Ground during the site investigation. This is largely supported by measurements of the organic content of soils which suggest that on average it comprises <1% of the total mass. This suggests that Made Ground materials only offer a limited source of ground gases.

The results from analysis of four groundwater samples taken during the trial pitting have shown an absence of any TPH, SVOCs (including PAHs) and VOCs. Metal concentrations within shallow groundwater were generally low; however modest ammoniacal nitrogen, nitrite and sulphate concentrations were observed.

5.2 Conceptual exposure model

An updated conceptual exposure model has been developed for the site which describes the likely contaminant sources present, potential receptors and the possible pathways linking sources and receptors.

5.2.1 Sources

An inspection of the data derived from the site investigations as presented in Section 4, suggests that the following contaminant sources may be present:

- Low concentrations of certain metals, petroleum hydrocarbons and SVOCs within the Made Ground across the Site.
- Low concentrations of some metals (including arsenic), chloride, sulphate, ammoniacal nitrogen and nitrite within shallow groundwater.
- Measurements of the organic content indicate only a modest potential source of ground gas associated with Made Ground at the Site.

5.2.2 Pathways

The potential pathways along which contamination may move from the identified contamination sources to possible receptors are described below.

Direct contact and ingestion

Dermal contact and ingestion of contaminants may occur where the ground materials are readily accessible to humans; in theory these exposure routes may be present in the areas of the Site where vegetation is absent or if it were to be removed in the future.

Migration via airborne dust

Disturbance of surficial or sub-surface soils (by either natural forces such as wind or animal activity, or through anthropogenic activities) offers the potential for dust generation which may contain contaminants. Inhalation and ingestion of contaminated dust is therefore a further potential exposure pathway.

Vapour/gas migration

Any volatile organic substances present within the sub-surface may migrate through the soil profile in the vapour phase. These vapours may then vent to atmosphere and present a hazard from outdoor inhalation of volatile gases.

Risks may also relate to the lateral migration of volatile gases through the sub-surface, the accumulation of such substances within building spaces, and subsequent indoor inhalation.

Exposure to ground gases, predominantly methane and carbon dioxide, (principally following gas accumulation within confined spaces) may pose acute health risks from asphyxiation and explosion.

The potential risks posed by vapour or gas migration would be greatest in buildings present on the Site itself. However, as there are no buildings currently on Site this would only be a potential issue following future development of the Site.

The extent of risk to buildings off Site will be dependent on the nature of the vapour and gas sources and presence of any lateral gas migration pathways.

Dissolution and transport in groundwater

Controlled waters (principally the underlying aquifers and also the nearby surface waters) may be exposed to contamination/pollution as a result of the dissolution of potential pollutants from across the Site and subsequent aqueous phase transport via lateral or vertical migration of groundwater.

It is noted that migration of contamination over any significant distances is unlikely at the Site due to the isolated nature of the shallow groundwater observed. Moreover, the significant thickness of clayey superficial deposits (potentially tens of metres) will offer protection to the underlying bedrock aquifers from the vertical migration of any contamination.

5.2.3 Receptors

Based on the knowledge of the site setting, the current conceptual site model and the potential future uses of the Site, the potential receptors which may be impacted upon by any contaminated ground conditions have been identified as follows:

Human health/building receptors:

- Humans (member of the public who currently use to Site informally and occupants of neighbouring industrial units)
- Humans (future Site users after potential redevelopment)
- Building off-site (neighbouring industrial units)
- Buildings / underground services on-site (if the Site were re-developed)

Controlled waters receptors:

- The alluvium deposits and Salop Formation (Secondary A aquifers)
- The Kinnerton Sandstone Formation (Principal aquifer)
- The River Clywedog / Afon Clywedog

There are no statutory sites of ecological importance within 2 km of the Site. As such there are no plausible pollutant linkages and no significant ecological impacts to statutory sites are therefore anticipated.

5.3 Pollutant linkages

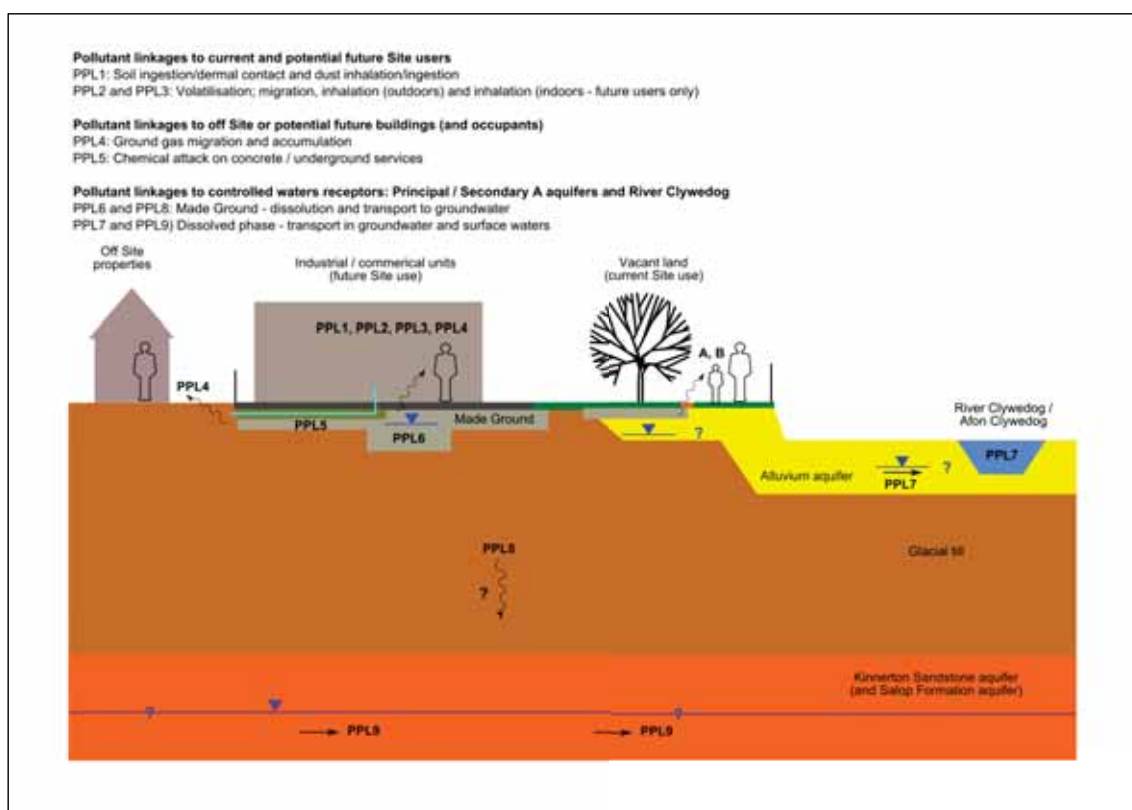
A summary of the potential pollutant linkages associated with Site is presented in Table 5.1. The potential pollutant linkages identified are considered in the risk assessments presented in Sections 6, 7, 8 and 9.

Table 5.1 Pollutant linkages

Potential pollution linkage ID	Source	Pathway	Receptor	Qualitative assessment
Human health/building linkages				
PPL1	Made Ground: metals, TPHs, PAHs and SVOCs	Soil ingestion, dermal contact and dust inhalation/ingestion from superficial soils	Site users (current or future)	Relevant linkage. Requirement for further assessment (see Section 6)
PPL2	Made Ground: TPH, PAH and SVOCs	Volatilisation from superficial soils. Migration and inhalation of contaminant vapours indoors and outdoors	Site users (current or future)	Relevant linkage. Requirement for further assessment (see Section 6)
PPL3	Made Ground: TPHs, PAHs and SVOCs	Dissolution and migration along prevailing groundwater flow path; subsequent volatilisation to indoor and outdoor spaces and inhalation	Site users (current or future)	Analysis of groundwater indicates an absence of volatile compounds within shallow groundwater beneath the site; and a the general absence / low concentrations of volatile compounds in soil samples. <i>There is therefore no requirement for any further assessment of this linkage.</i>
PPL4	Made Ground: ground gases (potentially methane and carbon dioxide)	Migration through unsaturated zone to buildings; potential accumulation in basements and sub flooring	Off-Site buildings (and occupants) Future on-Site buildings (and occupants)	Relevant linkage. Requirement for further assessment (see Section 8).
PPL5	Made Ground: metals, inorganics, TPHs, PAHs and SVOCs	Below ground structures and services (e.g. plastic water supply pipes) adversely affected by chemicals	Future on-Site buildings (and occupants)	Relevant linkage. Requirement for further assessment (see Section 9).

Potential pollution linkage ID	Source	Pathway	Receptor	Qualitative assessment
Controlled waters linkages				
PPL6	Made Ground strata: metals, TPHs and PAHs and VOCs	Migration of contaminants by dissolution into leachate/groundwater and subsequent lateral transport	Alluvium aquifer	Relevant linkage. Requirement for further assessment (see Section 7)
PPL7	Dissolved phase contaminants: metals and inorganics		River Clywedog / Afon Clywedog	Relevant linkage. Requirement for further assessment (see Section 7)
PPL8	Made Ground strata: metals, TPHs, PAHs and SVOCs	Migration of contaminants by dissolution into leachate/groundwater and subsequent lateral transport via groundwater pathways	Salop and Kinnerton Sandstone aquifers	Analysis of shallow groundwater (and soil) quality indicates a general absence of any significant contamination at the Site. Moreover, the conceptual model suggests that there is a significant thickness (up to ~40 m) of natural clayey deposits present above these aquifers which will offer a high degree of protection to deep groundwater beneath the Site. So whilst these linkages are possible they are very unlikely to be significant. <i>There is therefore no requirement for any further assessment of these linkages.</i>
PPL9	Dissolved phase contaminants: metals and inorganics			

Figure 5.1 Conceptual site model

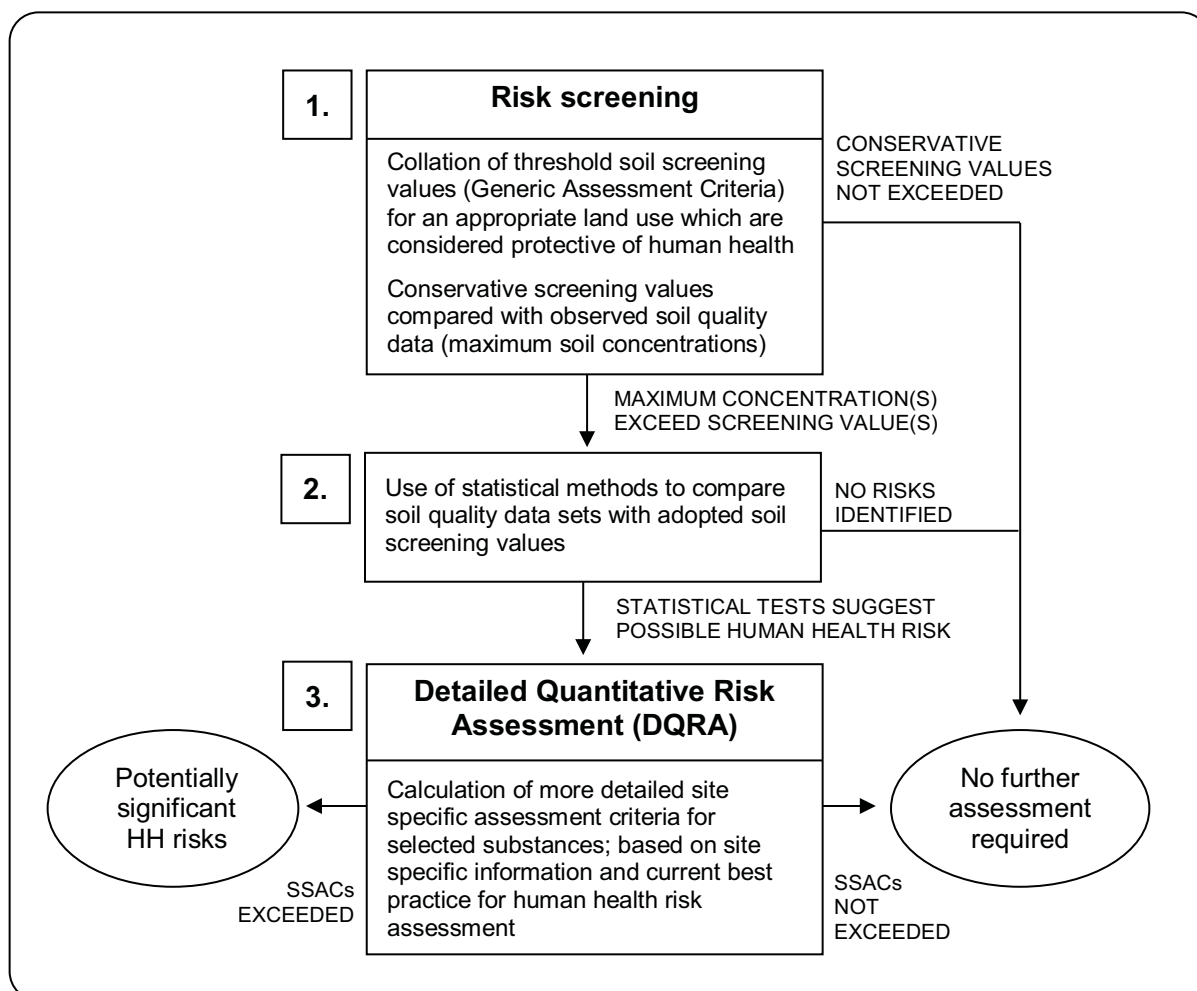


6 HUMAN HEALTH RISK ASSESSMENT

Potential pollutant linkages have been qualitatively assessed in Section 5 to identify those which may pose potential risks to key receptors. Having identified key linkages, a quantitative assessment of the potential risks posed to the identified human health receptors has been performed.

6.1 Approach and methodology

The process that will be adopted for assessing risks to human health is summarised in the following flow diagram:



Hence, the assessment of risks posed to human health receptors by the exposure to potentially contaminated soil has been conducted through a tiered process, whereby an initial screening exercise has been employed to identify any potentially hazardous contaminants. Where any such contaminants are identified, these are then subject to a detailed quantitative risk assessment (DQRA) utilising as much site specific information as possible in order to generate representative site specific assessment criteria (i.e. threshold soil concentrations, above which there is considered to be a potentially significant risk to human health for the prevailing conceptual model).

6.2 Risk screening (Pollutant linkages: PPL1, PPL2)

The initial screening exercise was conducted by comparing observed soil quality data with a set of generic human health screening values (commonly referred to as Generic Assessment Criteria (GAC)). The GACs have been derived using the updated CLEA methodology and have been compiled from various published sources, based on the following hierarchy:

- Soil Guideline Values (SGVs) issued by the Environment Agency using the updated CLEA methodology (Environment Agency, 2009a to 2009o).

Note: in the absence of a revised lead SGV, the former guideline value for lead (DEFRA and Environment Agency, 2002) has been adopted for the screening exercise. It is recognised that all former SGVs have been derived using an out-dated CLEA methodology. However, given the inherent conservatism used in the derivation of these values the use of the former lead SGV is considered appropriate for the purposes of a screening exercise.

- GACs derived by a consortium of industry professionals and published by LQM (LQM, 2009).
- GACs derived by a consortia of industry professionals under the guidance of the EIC and published by CL:AIRE (CL:AIRE, 2009).

The available soil quality data were initially assessed against GACs representative of a standard commercial land use, with a sandy loam soil type and a soil organic matter (SOM) content of 1%. This is conservative and protective of the current and likely future Site users.

For the purpose of the initial risk screening the observed analyte concentrations were compared with the adopted screening values (GACs). A listing of all GACs adopted for the screening exercise is presented in Table 6.1.

Table 6.1 Screening values adopted for the human health risk assessment

Parameter	Units	Screening value/GAC	Comment
Metals			
Arsenic	mg/kg	640	SGV: based on dermal and oral exposures only (as per published SGV report; EA, 2009e)
Barium	mg/kg	22000	EIC derived value
Beryllium	mg/kg	420	LQM derived value; based on inhalation exposure only
Boron	mg/kg	192000	LQM derived value
Cadmium	mg/kg	348	SGV (EA, 2009f)
Chromium III	mg/kg	8840	LQM derived value.
Chromium VI	mg/kg	35	LQM derived value.
Copper	mg/kg	71700	LQM derived value
Lead	mg/kg	750	Based on previous SGV report (DEFRA & EA, 2002)
Nickel	mg/kg	1800	Based on inhalation exposure only (as per published SGV report; EA, 2009h)
Mercury	mg/kg	26	SGV (EA, 2009g)
Selenium	mg/kg	13000	SGV (EA, 2009i)
Vanadium	mg/kg	3160	LQM derived value
Zinc	mg/kg	665000	LQM derived value
Phenols			
Phenol	mg/kg	3200	SGV (EA, 2009n)
PAHs			
Naphthalene	mg/kg	200 (76) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Acenaphthylene	mg/kg	84000 (86) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Acenaphthene	mg/kg	85000 (57) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Fluorene	mg/kg	64000 (31) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit

Parameter	Units	Screening value/GAC	Comment
Phenanthrene	mg/kg	22000	LQM derived value
Anthracene	mg/kg	530000	LQM derived value
Fluoranthene	mg/kg	23000	LQM derived value
Pyrene	mg/kg	54000	LQM derived value
Benzo(a)anthracene	mg/kg	90	LQM derived value
Chrysene	mg/kg	140	LQM derived value
Benzo(b)fluoranthene	mg/kg	100	LQM derived value
Benzo(k)fluoranthene	mg/kg	140	LQM derived value
Benzo(a)pyrene	mg/kg	14	LQM derived value.
Indeno(1,2,3-cd)pyrene	mg/kg	60	LQM derived value
Dibenz(a,h)anthracene	mg/kg	13	LQM derived value
BTEX and Speciated TPHs			
Benzene	mg/kg	28	Derived from SGV (EA, 2009j)
Toluene	mg/kg	59000	Derived from SGV (EA, 2009k)
Ethylbenzene	mg/kg	16800	Derived from SGV (EA, 2009L)
m & p Xylene	mg/kg	6460	Derived from SGV (EA, 2009m)
o Xylene	mg/kg	6220	Derived from SGV (EA, 2009m)
Aliphatics >EC5-EC6	mg/kg	3400 (304) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aliphatics >EC6-EC8	mg/kg	8300 (144) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aliphatics >EC8-EC10	mg/kg	2100 (78) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aliphatics >EC10-EC12	mg/kg	10000 (48) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aliphatics >EC12-EC16	mg/kg	61000 (24) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aliphatics >EC16-EC21	mg/kg	1600000	LQM derived value (based on GAC for >EC16-EC35 fraction)
Aliphatics >EC21-EC35	mg/kg	1600000	LQM derived value (based on GAC for >EC16-EC35 fraction)
Aromatics >EC5-EC7	mg/kg	28000 (1220) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aromatics >EC7-EC8	mg/kg	59000 (869) ^{vap}	LQM derived value. GAC exceeds theoretical vapour saturation limit
Aromatics >EC8-EC10	mg/kg	3700 (613) ^{vap}	LQM derived value. GAC exceeds theoretical vapour saturation limit
Aromatics >EC10-EC12	mg/kg	17000 (364) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aromatics >EC12-EC16	mg/kg	36000 (169) ^{sol}	LQM derived value. GAC exceeds theoretical soil saturation limit
Aromatics >EC16-EC21	mg/kg	28000	LQM derived value
Aromatics >EC21-EC35	mg/kg	28000	LQM derived value
Other VOCs and SVOCs			
Dibenzofuran	mg/kg	1000	USEPA derived value ¹

¹ (source: <http://www.epa.gov/region09/superfund/prg/>). It is acknowledged that the adopted GAC has been taken from a non-UK source. However, given the anticipated exposure to this substance (i.e. in the absence of any elevated concentrations) the adopted GAC is considered adequate.

The comparison of the soil quality data to the adopted screening values is presented in Table 6.2. As shown by this table, all of the maximum measured concentrations are significantly below the screening values. It may therefore be concluded that no human health risks are likely to be posed by the observed soil quality based on the current land use or if the Site were redeveloped for commercial / industrial purposes.

Table 6.2 Soil quality screening assessment

Determinands	Units	GAC		Made Ground				
				Number	Number ^ LOD	Minimum	Mean	Maximum
Metals								
Arsenic	mg/kg	640		33	33	2.2	9.7	22
Barium	mg/kg	22000		33	33	53	126	370
Beryllium	mg/kg	420		33	33	0.4	0.83	1.4
Boron (Water Soluble)	mg/kg	192000		33	12	<0.2	0.42	1.6
Cadmium	mg/kg	348		33	12	<0.2	0.75	16
Chromium VI	mg/kg	35		33	0	<4	-	<4
Chromium III	mg/kg	8840		33	33	11	28.1	45
Copper	mg/kg	71700		33	33	5.9	21.3	68
Lead	mg/kg	750		33	33	14	63.6	300
Mercury	mg/kg	26		33	3	<0.3	0.33	1.3
Nickel	mg/kg	1800		33	33	6.2	26.2	52
Selenium	mg/kg	13000		33	2	<1	1.0	2.3
Vanadium	mg/kg	3160		33	33	10	29.3	46
Zinc	mg/kg	665000		33	33	39	170.3	2500
Polycyclic aromatic hydrocarbon (PAH)								
Naphthalene	mg/kg	76		33	8	<0.05	0.17	0.74
Acenaphthylene	mg/kg	86		33	0	<0.2	-	<0.2
Acenaphthene	mg/kg	57		33	1	<0.1	0.1	0.2
Fluorene	mg/kg	31		33	0	<0.2	-	<0.2
Phenanthrene	mg/kg	22000		33	8	<0.2	0.3	2.4
Anthracene	mg/kg	530000		33	3	<0.1	0.1	0.3
Fluoranthene	mg/kg	23000		33	11	<0.2	0.5	3
Pyrene	mg/kg	54000		33	11	<0.2	0.5	2.8
Benzo(a)anthracene	mg/kg	90		33	11	<0.2	0.4	2.1
Chrysene	mg/kg	140		33	11	<0.05	0.3	2.4
Benzo(b)fluoranthene	mg/kg	100		33	11	<0.1	0.4	2.1
Benzo(k)fluoranthene	mg/kg	140		33	10	<0.2	0.3	1.4
Benzo(a)pyrene	mg/kg	14		33	12	<0.1	0.3	2
Indeno(1,2,3-cd)pyrene	mg/kg	60		33	5	<0.2	0.2	1.1
Dibenz(a,h)anthracene	mg/kg	13		33	0	<0.2	-	<0.2
Benzo(ghi)perylene	mg/kg	650		33	5	<0.05	0.2	1
Petroleum hydrocarbons								
Aliphatic >EC12 - EC16	mg/kg	24		33	1	<2	2.0	2.5
Aliphatic >EC16 - EC21	mg/kg	1600000		33	1	<8	8.5	25
Aliphatic >EC21 - EC35	mg/kg	1600000		33	6	<8	12.6	59
Aromatic >EC16 - EC21	mg/kg	28000		33	1	<10	10.1	12
Aromatic >EC21 - EC35	mg/kg	28000		33	5	<10	12.4	30
Semi-Volatile Organic Compounds (SVOCs)								
Dibenzofuran	mg/kg	1000		18	1	<0.2	0.23	0.8

As described in Section 4.4, none of the explosive compounds tested were above their limits of detection. The laboratory tests have been developed by a specialist analytical laboratory

with appropriate detection limits, based on a detailed understanding of potential explosive and human health risks for a medium sensitivity (e.g. industrial / commercial) land use. A threshold of 1% (or 10,000 mg/kg) is adopted for potentially explosive substances (the largest limit of detection used was for nitrocellulose which was <5000 mg/kg). The absence of any detectable concentrations is therefore deemed to be sufficiently protective of human health.

7 PRELIMINARY CONTROLLED WATERS RISK ASSESSMENT

As discussed in Section 1.2, the intention of this site investigation and risk assessment was to focus on the potential human health issues associated with the Site. As part of this work phase it was however intended to also attempt to identify any potentially significant risks to controlled waters based on an improved conceptual model and soil / groundwater quality data. If potential risks were identified then a further phase of investigation and assessment would be considered.

The conceptual site model illustrates that there are theoretical pollutant linkages from the contaminants that have been identified in the Made Ground to the underlying aquifers (the alluvium and the Salop and Kinnerton formations) and the nearby River Clywedog / Afon Clywedog. However, as described in Section 5.1, there is a significant thickness (in the order of ~40 m) of clayey superficial deposits above the Salop and Kinnerton aquifers. This combined with the generally low levels of contamination observed at the Site suggests that a significant risk to these aquifers is very unlikely. Consideration of risks to controlled waters will therefore focus on the shallow groundwater pathway to the alluvium and River Clywedog / Afon Clywedog receptors.

7.1 Approach and methodology

The assessment of risks to the identified controlled waters receptors has been performed using the Environment Agency's guidance on hydrogeological risk assessment, as described in the Remedial Targets Methodology (Environment Agency, 2006).

The Remedial Targets Methodology is based on a tiered approach to risk assessment as advocated by all relevant government guidance. The methodology consists of up to four assessment levels which progressively follow the pathway from the contaminant source through to the receptor. A remedial target (i.e. a calculated soil or groundwater source concentration which is protective of water quality based on the prevailing conceptual model and adopted water quality standard or target concentration) may be derived at each level. It is a general feature that remedial targets become less stringent at each successive assessment level. This is due to the incorporation of more complex transport processes (including dilution and a range of attenuation processes including dispersion, retardation and degradation) at the higher assessment levels, which invariably reduce the flux of contamination along the modelled pathway but require increasing amounts of site data.

A preliminary assessment was to undertake a Level 2 groundwater assessment by comparing shallow groundwater quality data to the adopted target concentrations to establish whether any potential impacts can be identified.

Given that the alluvium aquifer is a receptor that may be impacted by potential contaminants identified at the Site the target concentrations have been based on UK Drinking Water Standards (DWS). Where these are not available, they have been supplemented by various other relevant water quality standards; details of which are provided as appropriate.

7.2 Assessment of groundwater quality data (Pollutant linkages: PPL6, PPL7)

Groundwater data from the Site are presented with associated target concentrations in Table 7.1. Note that no organic contaminants (i.e. TPHs, SVOCs or VOCs) were detected, so they have not been considered further.

Table 7.1 Screening assessment of shallow groundwater quality data

Determinands	Units	Location				Target concentration	Dilution or attenuation factor required to reduce maximum to the target concentration
		TP4	TP20	TP32	TP38		
Inorganics							
Sulphate as SO4	mg/l	138	220	74.3	44.2	250	-
Chloride	mg/l	20	18	25	50	250	-
Ammoniacal Nitrogen as N	mg/l	0.12	0.67	0.22	0.34	0.39	1.7
Nitrate as N	mg/l	<1.0	<1.0	<1.0	<1.0	11	-
Nitrite as N	µg/l	<10	120	79	<10	100	1.2
Metals							
Arsenic	µg/l	7.9	15	3.2	1.9	10	1.5
Barium	µg/l	94	170	140	62	1000	-
Beryllium	µg/l	<0.2	<0.2	<0.2	<0.2	4 ^a	-
Boron	µg/l	150	180	73	64	1000	-
Cadmium	µg/l	<0.1	<0.1	<0.1	<0.1	5	-
Chromium	µg/l	<0.4	<0.4	<0.4	0.8	50	-
Copper	µg/l	2.3	4	4.5	4.4	2000	-
Lead	µg/l	1.5	1.3	4.3	2.5	10	-
Mercury	µg/l	<0.5	<0.5	<0.5	<0.5	1	-
Nickel	µg/l	2.2	2.9	2.7	0.9	20	-
Selenium	µg/l	<4.0	<4.0	<4.0	<4.0	10	-
Vanadium	µg/l	2.7	5.9	<1.7	<1.7	20 ^b	-
Zinc	µg/l	0.8	17	5.6	<0.4	5000	-

Notes

- a) US EPA National Primary Drinking Water Regulations (US EPA, 2011)
b) Freshwater Environmental Quality Standard (Environment Agency, 2012)

7.2.1 Discussion

The following observations are made regarding the data presented in Table 7.1.

- The groundwater quality data presented in Section 4.5 and summarised in Table 7.1 provide an indication of the actual impact from the contaminants observed in soils at the Site. These data illustrate that no organic contaminants have been detected in shallow groundwater. This would seem to indicate that the amount of attenuation within the unsaturated zone or dilution that occurs within shallow groundwater beneath the Site is sufficient to reduce the concentrations of any local organic contamination (which could in theory be derived from concentrations observed in Made Ground) below their target concentrations.
- Concentrations of arsenic, ammoniacal nitrogen and nitrite marginally exceed the target concentrations in shallow groundwater beneath the Site in one sample. The observed concentrations may indicate that shallow groundwater is being impacted from local sources at the Site. It is noted that the only location where target concentrations were exceeded was in the sample taken from TP20, which is a location that corresponds to one of the four areas remediated in the early 1990s (Travers Morgan, 1994a).

The assessment has shown that the shallow groundwater within the Made Ground beneath the Site is potentially being impacted by arsenic, ammoniacal nitrogen and nitrite. However, only very limited further dilution or attenuation along the groundwater pathway; or within the

receptors themselves would be required to reduce the observed concentrations below the target concentrations (the maximum reduction factor is 1.7). Moreover, observations made during the Site investigation suggest that the presence of shallow groundwater at the Site is very isolated; the absence of a continuous shallow groundwater body suggests that significant lateral transport across the Site into the alluvium and, if it is in hydraulic connection, on into the river is unlikely.

On balance, whilst the available information to assess risks to controlled waters is relatively limited, our review indicates that the risks to the identified controlled water receptors are not significant. This conclusion is based on:

- the low concentrations of any inorganic and organic contaminants (confirmed in both shallow groundwater and in soils);
- the absence of a continuous body of shallow groundwater on Site and consequently the very limited quantity of dissolved contaminants; and
- the likely absence of any significant lateral migration pathway within shallow groundwater.

8 PRELIMINARY GROUND GAS RISK ASSESSMENT

In general, hazardous ground gases may pose a variety of risks to human health and property including acute effects such as asphyxiation and explosion, as well as on-going physiological effects (CIRIA, 2007).

The most common hazardous ground gases in the context of risks to buildings and their occupants are methane and carbon dioxide (bulk gases), radon and hydrocarbon vapours. Methane and carbon dioxide are common gases generated through the degradation of organic material that can be contained in natural and Made Ground materials.

It was recognised that Made Ground and natural materials present at the Site are a possible source of ground gases which could pose a risk to buildings and their occupants. It was therefore the intention of the site investigation to gather sufficient information to inform a preliminary assessment of the risks posed by ground gases to neighbouring properties and to buildings on the Site if they were built in the future.

8.1 Methodology

The site investigation has shown that Made Ground thicknesses at the Site are relatively thin, contain minimal degradable content (which could form methane and carbon dioxide) and are known to have been in situ for at least 18 years (i.e. since the remediation was undertaken in 1994). The approach taken for the preliminary risk assessment is therefore based on the approach outlined by Card and Wilson (2011) for low gas risk sites.

This approach does not require the collection of long-term gas monitoring data which would be required to fully assess the risks posed by ground gases in accordance with the methodology set out by CIRIA (2007). Instead Card and Wilson (2011) suggest the assessment of soils to determine the equivalent “characteristic situation” that are defined by CIRIA (2007). These are presented Table 8.1.

Assessment includes undertaking a detailed inspection of soils encountered using trial pits that extend beyond the base of Made Ground combined with laboratory analysis of soils to determine their carbon content.

Table 8.1 Classification system for low gas risk sites (after Card and Wilson, 2011)

Characteristic Situation (CIRIA, 2007)	Depth of Made Ground (m)	Maximum total organic carbon content (%)	
		New Made Ground	Made Ground in place >20 years
Characteristic Situation 1	Maximum 5 m Average < 3 m	≤ 1.0	≤ 1.0
Characteristic Situation 2	Maximum 5 m Average < 3 m	≤ 1.5	≤ 3.0
Characteristic Situation 3	Maximum 5 m Average < 3 m	≤ 4.0	≤ 6.0

8.2 Assessment of gas generation potential (Pollutant linkage: PPL4)

The information presented in Table 8.2 summarises the information available to assess the gas generation potential at the Site based on the criteria given in Table 8.1. This illustrates that in the majority of locations Made Ground is less than 1 m thick and is often significantly thinner. Moreover, observations made from the trial pits illustrate that the materials tended to contain only limited degradable content; the observations are largely supported by the Total Organic Carbon (TOC) content from the laboratory analysis. This showed the majority of samples recorded a TOC content of ~1% with an average content of 0.9% (see Table 4.3). The highest observed TOC content, 3.2%, related to a sample of Made Ground that contained wood remains.

Table 8.2 Summary of gas generation potential at the Site

Location	Made Ground depth (m)	Soil sample depths (m)	Total Organic Carbon (%)	Observations of degradable material	Risk classification
TP1	0.6	0.4	2.0	Fibrous root remains	3 (Moderate risk)
TP2	0.9	0.4	1.4	Rare 'tarred paper' and fragments of charcoal	2 (Low risk)
TP3	1.3	1.0	1.6	Rare charcoal fragments and 'black organic' material	3 (Moderate risk)
TP4	>1.2	0.2	0.4	-	1 (Very low risk)
TP5	0.8	0.5	1.2	Rare fibrous material noted.	2 (Low risk)
TP6	0.3	0.2	1.1	Made Ground described as 'organic rich'.	2 (Low risk)
TP7	0.3	0.2	0.2	Made Ground described as 'organic rich'	1 (Very low risk)
TP12	-	0.4	0.1	-	1 (Very low risk)
TP13	0.7	0.5	1.1	Made Ground described as 'slightly organic'	2 (Low risk)
TP14	0.8	0.3	0.1	-	1 (Very low risk)
TP15	0.6	0.4	0.9	Rare fragments of charcoal	1 (Very low risk)
TP16	>1.4	0.6	0.6	Rare fragments of charcoal and tarred paper	1 (Very low risk)
TP17	0.5	0.25	1.2	-	2 (Low risk)
TP18	0.7	0.3	1.1	-	2 (Low risk)
TP19	0.9	0.45	0.2	Black fragments (possibly ash)	1 (Very low risk)
TP20	>1.0	0.5	0.5	Ash	1 (Very low risk)
TP21	0.45	0.2	2.0	-	3 (Moderate risk)
TP22	0.9	0.1 0.3	1.2 1.5	Some ash Black stains / ash	2 (Low risk)
TP23	>1.2	0.6	0.5	Rare ash and some 'dark clay / soil layering'	1 (Very low risk)
TP24	0.6	0.6	0.4	-	1 (Very low risk)
TP25	0.8	0.4	0.1	Some ash	1 (Very low risk)
TP26	0.7	0.35	0.1	Occasional wood fragments	1 (Very low risk)
TP27	0.25	0.2	3.2	Some wood remains	3 (Moderate risk)
TP28	0.4	0.2	1.0	Made Ground described as 'organic'	1 (Very low risk)
TP29	0.45	0.5	0.1	Made Ground described as 'organic'. <i>Sample taken from top of alluvium.</i>	1 (Very low risk)
TP30	0.45	0.3	1.5	Made Ground described as 'organic'	2 (Low risk)
TP31	0.5	0.3	0.1	-	1 (Very low risk)
TP32	1.0	0.2	0.6	Made Ground described as 'organic'	1 (Very low risk)
TP33	0.7	0.4	0.9	Made Ground described as 'organic'	1 (Very low risk)
TP34	0.4	0.3	0.9	Made Ground described as 'organic'	1 (Very low risk)

Location	Made Ground depth (m)	Soil sample depths (m)	Total Organic Carbon (%)	Observations of degradable material	Risk classification
TP36	0.5	0.2	0.9	-	1 (Very low risk)
TP37	0.3	0.2	0.3	-	1 (Very low risk)
TP38	>1.2	-	-	Rare fragments of charcoal	-

Note:

Risk classifications are based on the conservative assumption that Made Ground is 'new'. In fact Made Ground is known to have been in place for only marginally less than the 20 years specified for the alternative less conservative category.

The data collected from the Site and the classification system presented in Table 8.1 show that the majority of locations equate to Characteristic Situation 1 or a 'very low risk' which would not require specific gas protection measures (CIRIA, 2007).

A number of locations, most of which only marginally exceed the 1% TOC threshold, would equate to Characteristic Situation 2 or 'low risk'. The majority of these are grouped around the north-east end of the former location of the main Firestone building and the area immediately to the south. According to CIRIA (2007) these locations would normally require the following measures to be included in any new commercial or industrial developments:

- Reinforced concrete cast in situ floor slab (suspended, non-suspended or raft) with at least 1200 g DPM.
- Beam and block or pre-cast concrete slab and minimum 2000 g DPM/reinforced gas membrane.
- Possible under-floor venting or pressurisation in combination with a) and b) depending on use.
- All joints and penetrations sealed.

Four locations, TP1, TP3, TP21 and TP27, equate to Characteristic Situation 3 or 'moderate risk'. According to CIRIA (2007) they would require the same types of floor slabs as outlined above and the additional precautions of having all joints and penetrations sealed with a minimum 2000 g DPM or reinforced gas membrane with passively ventilated or positively pressurised under-floor sub-space. The classification of several of these locations as 'moderate' is again marginal, and in ~2 years three of them would be considered 'low risk'.

8.3 Discussion

Overall the data available from the site investigation confirm that the risks associated with ground gases at the Site are low; and that no specific gas protection measures are required in most locations.

The measures set out for Characteristic Situation 2 are construction methods commonly used in new developments and, as such, will not add significant additional costs to any new building constructed on the Site.

The assessment has shown that additional measures (suitable for Characteristic Situation 3) may be required in some localised parts of the Site. It is noted again however that the classification of a few locations where the assessment suggests that these measures are required was marginal. Rather than requiring the additional gas protection measures an alternative solution may be to undertake selected treatment and removal of such degradable content from Made Ground prior to building construction.

The data collected confirm that overall the Site appears to have a low risk of gas generation. The preliminary risk assessment suggests that risks to future buildings on the Site are not significant, and whilst there is some suggestion that the risks in some locations may be marginally higher, standard construction methods can be used to offer an additional level of gas protection in new buildings.

Given the limited gas generation potential of the Made Ground observed at the Site, and the likely absence of any lateral gas migration pathways due to the clayey nature of the ground, it is also unlikely that significant risks are posed to the buildings that are currently located adjacent to the Site.

9 RISKS TO BUILT STRUCTURES

Buildings and building materials represent an additional group of receptors that may be at risk from contaminated land. The implications of land contamination for buildings and building materials must also be considered under provisions contained under Part IIA (Welsh Government, 2012). However, there are no buildings currently on the Site and potential risks are therefore only associated with the construction of new buildings and underground services which present constraints on the future redevelopment of the Site.

The key risks to building materials are posed from the presence of aggressive substances, including inorganic and organic acids and alkalis, organic solvents, and inorganic salts such as sulphates and chlorides which may affect the long term performance and durability of construction materials used in contaminated ground.

Deterioration of concrete caused by chemical attack can therefore be the result of contact with gases or solutions of many chemicals, but in the ground it is generally due to exposure to solutions of sulphate salts or acidic solutions. Solutions of naturally occurring sulphates of sodium, potassium, calcium or magnesium, which may be present in some soils or groundwaters can cause expansion and disruption of concrete.

A British Standard (British Standards Institute, 2000) and industry guidance (BRE, 2005) have been developed for assessing the degree of protection required by new structures from aggressive ground conditions. Using this guidance, sites are divided into exposure classifications of increasing severity based on the sulphate and magnesium content of the local soil and/or groundwater. The soil is then classified as being natural or brownfield (i.e. sites that contain chemical wastes remaining from previous industrial use or from imported wastes). Further divisions by the pH and mobility of the groundwater complete the classification of the Site.

The approach advocated by BRE (2005) has been applied here in order to make an initial assessment of the risks posed to any future on-Site structures from the prevailing soil and water quality observed at the Site.

9.1 Assessment of risks to below ground structures and services (Pollutant linkage: PPL5)

Chemical tests on selected soil samples have recorded soluble sulphate concentrations with a mean value of 0.11 g/l and a mean pH of 7.9 (see Table 4.3). The mean sulphate and pH values correspond to a Design Sulphate Class of DS-1 and an Aggressive Chemical Environment for Concrete (ACEC) classification of AC-1. In essence, these classifications indicate that the ground conditions observed on Site are unlikely to pose any significant risk of chemical attack to any future on-Site buildings.

Organic contaminants can permeate certain types of plastic pipes used for water supply and can lead to the contamination of water within them. Certain other contaminants and pH levels may also affect metal pipes resulting in failure of the pipe rather than permeation.

It is beyond the scope of this report to complete a quantitative assessment of the potential risks to water supply pipes at the Site if it was redeveloped in the future. This is not least because it is necessary to collect soil samples from the routes along which the pipes are to be laid and these locations have not been identified at this stage. Nevertheless, the information and soil quality data that have been collected demonstrate that typical contaminant concentrations are low and that in many places on the Site there is an absence of any organic contamination. This will likely allow pipelines to be routed to avoid localised areas of any identified slightly elevated contamination. Moreover, the relatively thin nature of Made Ground should allow pipes to be routed within natural materials in most areas of the Site. Together this should allow a suitable supply network for the Site to be agreed with the local water company (Dee Valley Water). Where areas of contamination cannot be avoided the use of alternative materials (e.g. barrier pipes) may be required. Overall, the observed

contaminant concentrations on soils are not expected to place any significant constraints for the construction of underground services that would be required for the potential redevelopment of the Site.

10 CONCLUSIONS

The following conclusions are drawn from the work presented in this report.

- The information from the site investigation has identified a number of potential pollutant linkages from areas of possible soil contamination to human health receptors (based on the continued current land use or under a future industrial / commercial land use following redevelopment) and to controlled waters receptors. The impact on these receptors was assessed in accordance with UK best practice.
- Low concentrations of metals were measured in Made Ground, which was present across the majority of the Site. Low concentrations of more environmentally persistent petroleum hydrocarbons were observed locally. Low concentrations of various PAH species were also detected in approximately a third of the samples taken from Made Ground. Generally, all other SVOCs and VOCs were less than the limit of laboratory detection.
- The available analytical data provide a reasonable indication of current soil quality across the Site; it is noted that certain constraints were placed on where it was possible to sample soils due to the presence of ecological sensitive habitats and vegetation. As such, a number of the originally intended sampling locations, which were targeted at specific sources of potential contamination were relocated. As some of the alternative locations were not optimal to investigate certain potential contaminated areas, there is the possibility that localised areas of residual contamination are present, yet remain undetected. Regardless, the soil quality data and the available groundwater quality data suggest that there is an absence of any gross contamination at the Site.
- The observations made during the site investigation and the results of the analytical data appear to be consistent with the scope of the remediation that was reportedly undertaken in the early 1990s.
- A human health risk assessment has shown that the maximum concentrations of all measured contaminants were significantly below screening values deemed to be protective of the current and potential future Site users. It can be concluded that no human health risks are likely to be posed to human health by the observed soil or groundwater quality either if the current Site use is maintained or the Site is redeveloped for a commercial / industrial land use.
- A preliminary controlled waters risk assessment has considered pollutant linkages between potential contaminants that have been identified in soils and shallow groundwater and identified controlled waters receptors; namely the underlying alluvium and bedrock aquifers and the nearby River Clywedog / Afon Clywedog.
- The investigation found that low concentrations of a limited number of contaminants were observed in shallow groundwater beneath the Site. The observed contamination is broadly consistent with observed soil quality. There is no evidence to suggest the presence of widespread shallow groundwater and it is unlikely that there is any significant lateral migration of contamination to the alluvium aquifer. Any potential impact to the river will also be limited, not least due to the significant dilution capacity that it offers. It is unlikely that additional groundwater monitoring at the Site will significantly alter this conclusion.
- The assessment also identified that the presence of a significant thickness (in the order of 40 m) of clayey superficial deposits is likely to limit the potential vertical migration of the potential contaminants observed. It is therefore also unlikely that there are significant risks to the two bedrock aquifers. Overall risks to controlled waters from the Site are therefore considered to be low. It is unlikely that additional groundwater monitoring at the Site will significantly alter this conclusion.

- Minimal degradable material was observed within Made Ground during the site investigation. Measurements suggest that on average the organic component comprises <1% of the soil mass overall, which indicates only a limited potential source of ground gas.
- The preliminary ground gas risk assessment suggests that risks to future buildings on the Site are not significant, and whilst there is some suggestion that the risks in some areas of the Site may be marginally higher, standard construction methods can be used to offer an additional level of gas protection in new buildings.
- Given the limited gas generation potential of the Made Ground observed at the Site, and the likely absence of any lateral gas migration pathways due to the clayey nature of the ground, the preliminary ground gas risk assessment also concluded that it is unlikely that significant risks are posed from ground gases at the Site to neighbouring buildings.
- Ground conditions observed on Site are unlikely to pose any significant risk of chemical attack to any future on-Site buildings and are also unlikely to place any significant constraints for the installation of the underground services that would be required.

10.1 Assessment of potential liabilities and constraints on redevelopment

The purpose of the site investigations and risk assessments described in this report was twofold: to determine any potential constraints associated with the current land quality on the future redevelopment of the Site; and to assess any liabilities that may exist under Part IIA of the Environmental Protection Act 1990.

10.1.1 Part IIA of the Environmental Protection Act 1990

Part IIA of the Environmental Protection Act 1990 places a potential liability on the owner of the Site which could mean that they have a responsibility to remediate the land if it was deemed that either:

- Significant harm was being caused or there was a significant possibility of such harm being caused; or
- Significant pollution of the water environment was being caused or there was a significant possibility of such pollution being caused.

The risk assessments undertaken have demonstrated that under the current land use no significant human health or risks from ground gases are anticipated. The controlled waters risk assessment has identified possible minor impacts to the underlying shallow groundwater. However, based on the limited impact observed and the low likelihood of any significant lateral migration any pollution is very unlikely to be deemed significant.

On this basis the possibility of any future liabilities associated with the low levels of contamination that have been observed on Site are considered remote.

10.1.2 Constraints on the future redevelopment of the Site due to land quality

Current land quality at the Site could have placed logistical (e.g. timescale) or financial constraints on its potential future redevelopment. The site investigation that has been undertaken has confirmed that there is unlikely to be any significant gross contamination at the Site.

The human health risk assessment has demonstrated that the Site is suitable for a future commercial / industrial land use. The preliminary gas risk assessment has shown that there is limited gas generation potential at the Site and hence the associated risks to potential future buildings and their occupants are likely to be low (although additional local data collection may be required to support this position once any redevelopment plans are finalised). A preliminary assessment of risks to future buildings and underground services from aggressive substances in soils and groundwater also concluded that current conditions are unlikely to place any significant constraint on the future development of the Site.

Overall, there is general absence of any significant constraints associated with the current land quality for the future redevelopment of the Site for an industrial / commercial land use.

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APPENDICES

APPENDIX A

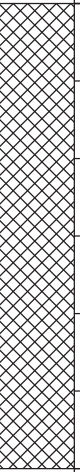
Trial pit logs



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP1
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,138.0 N 349,078.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	
0.40	ES	0.0 ppm				(0.60)	Firm to stiff red brown sandy clay with rare angular gravel to cobble brick, tile and cement fragments. Rare boulder of sandstone, lime plaster, asphalt and black fibrous root remains. (MADE GROUND)		
						0.60 (0.50) 1.10	Firm to soft red CLAY. (GLACIAL TILL)		

								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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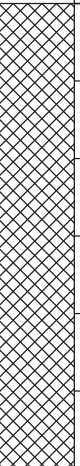
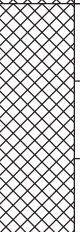
WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP2
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,970.0 N 349,214.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	
0.40	ES	0.0 ppm				(0.60)	Loose dark brown clayey sand with some gravel to boulder fragments of bricks, concrete and fine grey rock. Rare tarred paper. (MADE GROUND)		
						0.60 (0.30)	Firm to stiff clay with some brick fragments and patches of dark grey to black silt with small fragments of charcoal. (MADE GROUND)		
						0.90 (0.40)	Firm dark grey very sandy CLAY with rare black root remains. (GLACIAL TILL)		
						1.30			

								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP3
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,995.0 N 349,188.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
1.00	ES	0.0 ppm				(0.40)	Loose sandy clayey boulders of cemented bricks. (MADE GROUND)			
						0.40				
						(0.90)	Loose dark brown very sandy clay with brick and rock fragments. Rare plastic, charcoal, metal pipe and some patches of black organic material and ash. (MADE GROUND)			
						1.30				
						(0.10)	Firm to stiff light grey mottled orange SILT. (ALLUVIUM)			
						1.40				

GENERAL REMARKS

Minor seepage at 1 m bgl.

All dimensions in metres
Scale 1: 10

Client
Wrexham CB Council

Method/
Plant Used

Mechanical Excavator

Logged By
Pete Bemment

WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP4
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Contractor Harvey Plant Hire				Sheet 1 of 1

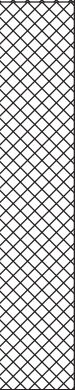
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP5
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,903.0 N 349,321.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	
0.50	ES	0.0 ppm				(0.30)	Loose sand and gravels of limestone with some glass and black ash. (MADE GROUND)		
						0.30 (0.50)	Firm red brown sandy clay with fragments of brick and concrete with rare fibrous material. Southern end of trench brick and concrete. (MADE GROUND)		
						0.80 (0.20)	Stiff red CLAY. (GLACIAL TILL).		
						1.00			

								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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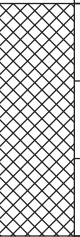
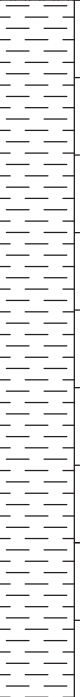
WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP6
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,860.0 N 349,246.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.20	ES	0.0 ppm				(0.30) 0.30	Soft brown organic rich sandy clay with occasional angular gravel of brick, tile and concrete. (MADE GROUND)			
						(0.90) 1.20	Stiff red mottled blue CLAY with occasional rounded cobbles or boulders. (GLACIAL TILL)			

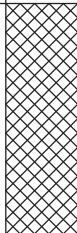
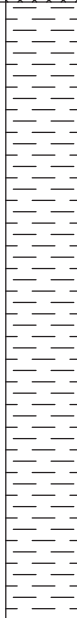
								GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP7
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,690.0 N 349,004.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.20	ES	0.0 ppm				(0.30)	Soft brown organic rich sandy clay with occasional angular gravel of brick, tile and concrete. (MADE GROUND)		
						(0.80)	Stiff red mottled blue CLAY with occasional rounded cobbles. (GLACIAL TILL)		

[illegible]

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP8
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,619.0 N 348,918.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

[illegible][illegible]

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP9
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,569.0 N 348,917.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
						(0.20) 0.20	Firm red brown sandy CLAY with gravel. (GLACIAL TILL)		
						(0.20) 0.40	Stiff red CLAY (GLACIAL TILL)		

										GENERAL REMARKS	

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP10
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,570.0 N 348,896.0	
Contractor Harvey Plant Hire				
Sheet 1 of 1				

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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP11
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,583.0 N 348,735.0	
Contractor Harvey Plant Hire				
Sheet 1 of 1				

[illegible][illegible]

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP12
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,613.0 N 348,701.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.40	ES	0.0 ppm				(0.20) 0.20	Loose dark brown slightly organic SAND. (ALLUVIUM)		
						(0.40) 0.60	Loose red mottled SAND. (ALLUVIUM)		
						(0.30) 0.90	Firm to stiff blue grey rounded slightly sandy CLAY. (ALLUVIUM)		

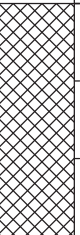
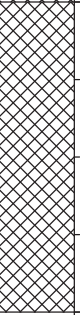
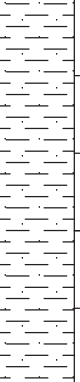
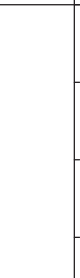
										GENERAL REMARKS	



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP13	
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,682.0 N 348,548.0		
Contractor Harvey Plant Hire				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.50	ES	0.0 ppm				(0.30)	Loose dark brown slightly organic clayey sand. (MADE GROUND)			
						0.30 (0.40)	Loose brown mottled orange very clayey sand with rare brick. (MADE GROUND)			
						0.70 (0.50)	Soft to firm red mottled blue golden brown sandy CLAY. (ALLUVIUM)			
						1.20				

								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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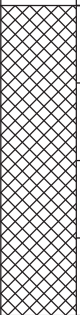
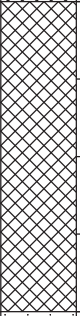
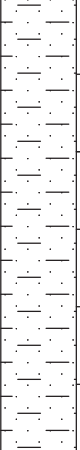
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP14
Job No 60895	Date 09-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,813.0 N 348,595.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS		
0.30	ES	0.0 ppm				(0.40)	Soft red slightly sandy clay with rare brick and pipe fragments. (MADE GROUND)			
				0.40						
						(0.40)	Loose dark grey clayey sand with possible fragments of clinker. (MADE GROUND)			
				0.80						
					(0.60)	Loose red orange grey green mottled slightly clayey SAND. (ALLUVIUM)				
					1.40					

GENERAL REMARKS

All dimensions in metres
Scale 1: 10

Client
Wrexham CB Council

Method/
Plant Used
Mechanical Excavator

Logged By
Pete Bemment

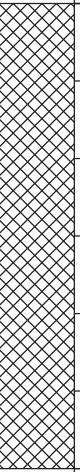
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP15
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,014.0 N 348,872.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	
0.40	ES	0.0 ppm				(0.60)	Soft to firm brown sandy clay with clumps of firm to stiff red clay and yellow grey sand. Rare fragments of brick, lime plaster and charcoal. (MADE GROUND)		
						(0.60)	Firm red mottled blue grey very sandy CLAY, mottled in places. (ALLUVIUM)		
						1.20			

								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP16
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,058.0 N 348,767.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.60	ES	0.0 ppm				(1.40)	Soft to very soft brown very sandy slightly gravelly clay. Gravel and cobbles sized angular brick fragments. Rare charcoal, cement and tarred paper. (MADE GROUND)			
						1.40				

GENERAL REMARKS

Minor seepage at 1.35 m bgl.

All dimensions in metres
Scale 1: 10

Client
Wrexham CB Council

Method/
Plant Used
Mechanical Excavator

Logged By
Pete Bemment

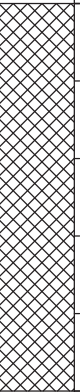
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP17
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,052.0 N 348,730.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.25	ES	0.0 ppm				(0.50)	Loose red orange cobbly sand and gravel with some brick, ash and plaster. (MADE GROUND)			
						0.50 (0.60)	Firm red brown sandy CLAY. (GLACIAL TILL)			
						1.10				

								GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Liam Carey
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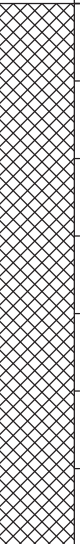
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP18
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,955.0 N 348,663.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.30	ES	0.0 ppm				(0.70)	Loose red brown sand with much brick. (MADE GROUND).			
						0.70 (0.50) 1.20	Firm red brown sandy CLAY. (GLACIAL TILL)			

								GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Liam Carey
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP19
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,909.0 N 348,616.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.45	ES	0.0 ppm				(0.90)	Loose to firm red brown very sandy clay with some angular brick, plaster and black fragments (possibly ash). (MADE GROUND)			
						(0.40)	Firm brown sandy CLAY. (GLACIAL TILL)			
						1.30				

								GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Liam Carey
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP20	
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,068.0 N 349,191.0		
Contractor Harvey Plant Hire				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.50	ES	0.0 ppm				(1.00)	Loose brown very clayey sand with much brick and concrete with some plastic, ash and tarmac. Numerous concrete slabs are present close to ground surface. (MADE GROUND)			
1.00	EW					1.00				

GENERAL REMARKS

Refusal on concrete obstruction at base of trial pit.

All dimensions in metres
Scale 1: 10

Client
Wrexham CB Council

Method/
Plant Used

Mechanical Excavator

Logged By
Liam Carey

WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

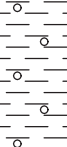
TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP21
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,067.0 N 349,139.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

[illegible][illegible]

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP22
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,011.0 N 349,244.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION		
0.10	ES	0.0 ppm				(0.25) 0.25	Loose black sandy cobbles and boulders of brick. Sand comprises ash / soot. (MADE GROUND)		
0.30	ES	0.0 ppm				(0.65) 0.90	Stiff brown gravelley cobbly clay. Gravel and cobble sized brick and concrete fragments with black stains / ash at top of layer. (MADE GROUND).		
						(0.20) 1.10	Stiff brown CLAY with cobbles and gravel of rounded rock. (GLACIAL TILL)		

[illegible]

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used	Mechanical Excavator	Logged By Pete Bemment
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP23
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,867.0 N 349,196.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

[illegible]

Material too dense to dig beyond 1.2m

GENERAL
REMARKS

Minor seepage noted in Made Ground.

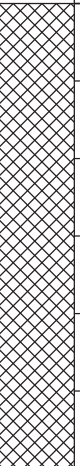
All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP24	
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,958.0 N 349,110.0		
Contractor Harvey Plant Hire				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.60	ES	0.0 ppm				(0.60)	Loose brown sandy cobble and boulder sized brick and concrete fragments. Slightly purple in places. (MADE GROUND)			
						0.60 (0.50)	Firm to stiff mottled yellow blue dark grey SILT. (ALLUVIUM)			
						1.10				

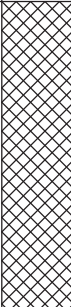
								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

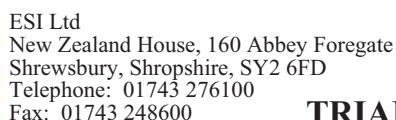
TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP25
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,721.0 N 349,007.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.40	ES	0.0 ppm				(0.40) 0.40	Stiff red brown sandy clay with some ash. (MADE GROUND)		
						(0.40) 0.80	Loose sandy gravel with much brick and ash. (MADE GROUND)		
						(0.20) 1.00	Stiff brown and grey silty CLAY. (GLACIAL TILL)		

										GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Liam Carey
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP26
Job No 60895	Date 10-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,742.0 N 348,958.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick-ness)	DESCRIPTION	COMMENTS		
0.35	ES	0.0 ppm				(0.70)	Firm red brown sandy clay with some angular brick fragments and occasional plaster and wood. (MADE GROUND)			
						(0.30)	Stiff red brown silty CLAY. (GLACIAL TILL)			
						1.00				

Large wood fragments at 0.1 m.	GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Liam Carey
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP27
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 338,007.0 N 348,916.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.20	ES	0.0 ppm				(0.25) 0.25	Very soft brown sandy clay with rare sand sized fragments of brick and rock. Some fibrous wood remains. (MADE GROUND)			
						(0.10) 0.35	Very soft mottled gold blue and grey very sandy CLAY/SILT. (ALLUVIUM)			
						(0.25) 0.60	Firm to stiff red brown CLAY. (GLACIAL TILL)			

GENERAL REMARKS

All dimensions in metres
Scale 1: 10

Client
Wrexham CB Council

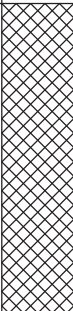
Method/
Plant Used
Mechanical Excavator

Logged By
Pete Bemment

WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP28
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,902.0 N 348,696.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION	COMMENTS		
0.20	ES	0.0 ppm				(0.40) 0.40	Loose dark brown clayey organic sand with occasional gravel sized angular fragments of brick. (MADE GROUND)			
						(0.20) 0.60	Firm to stiff mottled golden brown blue SILT/CLAY. (ALLUVIUM)			

										GENERAL REMARKS	

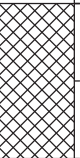
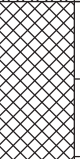
All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP29	
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,916.0 N 348,784.0		
Contractor Harvey Plant Hire				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.50	ES	0.0 ppm				(0.20)	Loose dark brown organic clayey sand. (MADE GROUND)			
						0.20 (0.25)	Loose red sometimes white sandy gravel and cobbles sized angular burnt shale fragments. (MADE GROUND)			
						0.45				
						(0.85)	Stiff blue grey green mottled golden SILT. (ALLUVIUM)			
						1.30				

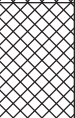
								GENERAL REMARKS	

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP30	
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,868.0 N 348,881.0		
Contractor Harvey Plant Hire				Sheet 1 of 1	

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.30	ES	0.0 ppm				(0.15) 0.15	Loose organic gravelly sand with fragments of angular burnt shale. (MADE GROUND)			
						(0.30) 0.45	Loose red brown slightly clayey sandy gravel and cobble sized angular and tabular burnt shale and occasional brick fragments. (MADE GROUND)			
						(0.15) 0.60	Stiff red brown mottled blue grey CLAY. (GLACIAL TILL)			

								GENERAL REMARKS	

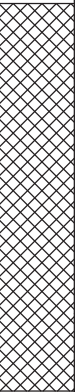
All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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ESI Ltd
New Zealand House, 160 Abbey Foregate
Shrewsbury, Shropshire, SY2 6FD
Telephone: 01743 276100
Fax: 01743 248600

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP31
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,735.0 N 349,105.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.30	ES	0.0 ppm				(0.50)	Firm brown clay with rare tile or brick fragment and occasional rounded cobble and gravel. (MADE GROUND)			
						0.50 (0.50)	Stiff red brown blue sandy CLAY with rare rounded gravel. (GLACIAL TILL)			
						1.00				

								GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



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Fax: 01743 248600

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP32
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,658.0 N 348,649.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS	
0.20	ES	0.0 ppm					Loose dark brown organic slightly clayey sand with gravel to cobble sized fragments of burnt shale and brick. (MADE GROUND)		
0.50	EW					(1.00)			
						1.00			
						(0.50)	Soft and very soft mottled golden brown and light grey silty CLAY. Becoming soft brown clay. (GLACIAL TILL)		
						1.50			

GENERAL REMARKS

All dimensions in metres
Scale 1: 10

Client
Wrexham CB Council

Method/
Plant Used
Mechanical Excavator

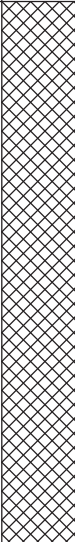
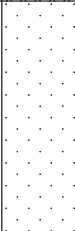
Logged By
Pete Bemment

WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12



TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP33
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,747.0 N 348,649.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION	COMMENTS		
0.40	ES	0.0 ppm				(0.70)	Loose dark brown mottled golden slightly clayey organic sand with rare fragments of brick and burnt shale. (MADE GROUND)			
						(0.30) 1.00	Firm blue grey SAND. (ALLUVIUM).			

	GENERAL REMARKS

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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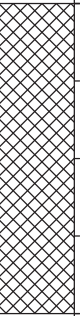
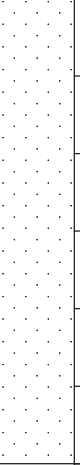
WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI_STANDARD.GDT 4/12/12



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New Zealand House, 160 Abbey Foregate
Shrewsbury, Shropshire, SY2 6FD
Telephone: 01743 276100
Fax: 01743 248600

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP34
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,747.0 N 348,786.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA					Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thickness)	DESCRIPTION	COMMENTS		
0.30	ES	0.0 ppm				(0.40) 0.40	Loose dark brown mottled golden slightly clayey organic sand with rare fragments of brick and burnt shale. (MADE GROUND)			
						(0.60) 1.00	Firm blue grey SAND. (ALLUVIUM).			
										

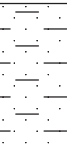
	GENERAL REMARKS
	Minor seepage at 1 m bgl.

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used Mechanical Excavator	Logged By Pete Bemment
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WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP35
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,716.0 N 348,863.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
						(0.20) 0.20	Soft dark brown organic clayey SAND. (TOP SOIL)		
						(0.80) 1.00	Stiff red brown mottled blue CLAY. (ALLUVIUM)		

		GENERAL REMARKS
	Minor seepage at 1 m bgl.	

WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used	Mechanical Excavator	Logged By Pete Bemment
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TRIAL PIT LOG

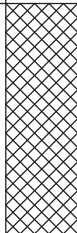
Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP36
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,695.0 N 348,931.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

[illegible]

										GENERAL REMARKS	

TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP37
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,835.0 N 349,000.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

SAMPLES & TESTS			Water	STRATA				Geology	Instrument/ Backfill
Depth	Type No	Test Result		Reduced Level	Legend	Depth (Thick- ness)	DESCRIPTION		
0.20	ES	0.0 ppm				(0.30)	Firm to stiff yellow grey clay with occasional cobble sized brick fragments. (MADE GROUND)		
						(0.70)	Stiff to firm red mottled blue CLAY. (ALLUVIUM)		

[illegible]

WINDOWLESS SAMPLE LOG TRIAL PIT LOGS.GPJ ESI STANDARD.GDT 4/12/12

All dimensions in metres Scale 1: 10	Client Wrexham CB Council	Method/ Plant Used	Mechanical Excavator	Logged By Pete Bemment
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TRIAL PIT LOG

Project Former Firestone site, Wrexham Industrial Estate				BOREHOLE No TP38
Job No 60895	Date 11-10-12	Ground Level (m) -	Co-Ordinates (OS National Grid) E 337,907.0 N 349,209.0	
Contractor Harvey Plant Hire				Sheet 1 of 1

[illegible]

										GENERAL REMARKS	

APPENDIX B

Site investigation photographs



TP1: General view of trial pit



TP1: Showing clayey nature of Made Ground



TP2: General view of trial pit showing 0.9 m of Made Ground over glacial till



TP3: Showing fragments of brick and rocks in Made Ground



TP3: General view of trial pit showing alluvium at base



TP3: Showing silt (alluvium) found at base of trial pit



TP4: Showing water at base of trial pit



TP5: Showing southern end of trial pit with typical demolition rubble (concrete / brick)



TP5: Showing clayey Made Ground with significant quantities of brick



TP6: Showing 0.3 m of clayey Made Ground over glacial till



TP8: Showing glacial till immediately below thin top soil



TP10: Showing glacial till below 0.2 m of clayey Made Ground



TP11: Showing glacial till immediately below thin top soil



TP12: Showing sandy clay (alluvium) at base of trial pit with overlying sands (alluvium)



TP13: Showing clayey Made Ground to 0.7 m overlying sandy clay (alluvium)



TP15: Showing clayey Made Ground to 0.6 m overlying sandy clay (alluvium)



TP16: Showing Made Ground to base of trial pit (1.4 m) with minor seepage evident



TP20: Showing Made Ground with ash, plastic and tarmac



TP20: Showing water strike at 1 m



TP20: Showing Made Ground from trial pit



TP21: Showing clayey Made Ground overlying silt (alluvium) at base of trial pit



TP22: Showing blacked Made Ground immediately below thin top soil



TP22: Showing general view of Made Ground from trial pit



TP23: Showing general view of dense gravel and cobble backfill (similar material also observed in TP4 and TP38)



TP24: Showing 0.6 m sandy Made Ground with brick and concrete fragments overlying silt (alluvium)



TP26: Showing clayey Made Ground with occasional plaster overlying silty clay (alluvium)



TP28: Showing 0.4 m sandy Made Ground with occasional plaster overlying silt / clay (alluvium)



TP29: Showing 0.25 m layer of 'burnt shale' encountered above silt (alluvium)



TP29: Showing general view of trial pit



TP31: Showing 0.5 m layer of clayey Made Ground with occasional tile / brick fragments above stiff clay (glacial till)



**TP32: Showing 1 m layer of clayey sandy Made Ground above soft clay (glacial till).
Water strike at 0.5 m within Made Ground**



TP34: Showing 0.4 m layer of clayey sandy Made Ground above sand (alluvium)



TP35: Showing sand and clay (alluvium) below a thin top soil. Minor seepage at 1 m



TP38: Showing dense gravel and cobble backfill with water strike at 1 m

APPENDIX C

Laboratory certificates

**Rob Gordon**

ESI Ltd
Soil And Groundwater Specialists
New Zealand House
160 Abbey Foregate
Shrewsbury
SY2 6FD

i2 Analytical Ltd.
Building 19,
BRE,
Garston,
Watford,
WD25 9XX

t: 01743 276 100
f: 01743 248 600
e: robgordon@esinternational.com

t: 01923 67 00 20
f: 01923 67 00 30
e: reception@i2analytical.com

Analytical Report Number : 12-36904

Project / Site name:	60895	Samples received on:	15/10/2012
Your job number:		Samples instructed on:	15/10/2012
Your order number:	1390	Analysis completed by:	23/10/2012
Report Issue Number:	1	Report issued on:	29/10/2012
Samples Analysed:	10 soil samples - 2 water samples		

Signed: 

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed: 

Rexona Rahman
Customer Services Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils - 4 weeks from reporting
leachates - 2 weeks from reporting
waters - 2 weeks from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230496	230497	230498	230499	230500
Sample Reference	TP27	TP28	TP29	TP30	TP31
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.20	0.50	0.30	0.30
Date Sampled	11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken	0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	30	13
Total mass of sample received	kg	0.001	NONE	0.52	0.42
				0.59	0.61
				0.61	0.62

General Inorganics

pH	pH Units	N/A	MCERTS	7.5	8.4	7.0	7.6	7.9
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.060	0.042	0.090	0.058	0.11
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	60	42	90	58	110
Ammonium as NH ₄	mg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.032	0.0096	0.0010	0.015	0.0007
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	-	< 2.0	< 2.0
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	-	-	-	< 20	< 20

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Fluorene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Phenanthrene	mg/kg	0.2	MCERTS	0.28	< 0.20	< 0.20	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Fluoranthene	mg/kg	0.2	MCERTS	0.81	< 0.20	< 0.20	-	-
Pyrene	mg/kg	0.2	MCERTS	0.72	< 0.20	< 0.20	-	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	0.48	< 0.20	< 0.20	-	-
Chrysene	mg/kg	0.05	MCERTS	0.46	< 0.05	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.59	< 0.10	< 0.10	-	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	0.24	< 0.20	< 0.20	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.40	< 0.10	< 0.10	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	4.0	< 1.6	< 1.6	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.8	6.2	2.2	20	6.2
Barium (aqua regia extractable)	mg/kg	1	MCERTS	95	89	190	370	100
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.8	0.6	0.5	1.4	0.8
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	0.3	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	27	13	14	22	31
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	13	14	22	31
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	15	5.9	68	28
Lead (aqua regia extractable)	mg/kg	2	MCERTS	50	39	25	49	20
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	1.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	27	15	6.2	28	40
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	2.3	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	20	16	34	31
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	93	58	39	58	72

Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230496	230497	230498	230499	230500
Sample Reference	TP27	TP28	TP29	TP30	TP31
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.20	0.50	0.30	0.30
Date Sampled	11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken	0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	2.5	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	25	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	18	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	46	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	22	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	22	< 10	< 10	< 10	< 10



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230496	230497	230498	230499	230500
Sample Reference	TP27	TP28	TP29	TP30	TP31
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.20	0.50	0.30	0.30
Date Sampled	11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken	0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

VOCs

Chloromethane	µg/kg	4	ISO 17025	-	-	-	< 4.0	< 4.0
Chloroethane	µg/kg	2	ISO 17025	-	-	-	< 2.0	< 2.0
Bromomethane	µg/kg	6	ISO 17025	-	-	-	< 6.0	< 6.0
Vinyl Chloride	µg/kg	24	ISO 17025	-	-	-	< 24	< 24
Trichlorofluoromethane	µg/kg	5	ISO 17025	-	-	-	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-dichloroethane	µg/kg	6	MCERTS	-	-	-	< 6.0	< 6.0
2,2-Dichloropropane	µg/kg	6	NONE	-	-	-	< 6.0	< 6.0
Trichloromethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,1,1-Trichloroethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,2-dichloroethane	µg/kg	4	MCERTS	-	-	-	< 4.0	< 4.0
1,1-Dichloropropene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Trans-1,2-dichloroethene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tetrachloromethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,2-dichloropropane	µg/kg	6	MCERTS	-	-	-	< 6.0	< 6.0
Trichloroethene	µg/kg	6	MCERTS	-	-	-	< 6.0	< 6.0
Dibromomethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
Bromodichloromethane	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	-	-	-	< 8.0	< 8.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	8	ISO 17025	-	-	-	< 8.0	< 8.0
Dibromochloromethane	µg/kg	2	ISO 17025	-	-	-	< 2.0	< 2.0
Tetrachloroethene	µg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
1,2-Dibromoethane	µg/kg	3	ISO 17025	-	-	-	< 3.0	< 3.0
Chlorobenzene	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	-	-	-	< 4.0	< 4.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Styrene	µg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
Tribromomethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	-	-	-	< 3.0	< 3.0
Isopropylbenzene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Bromobenzene	µg/kg	11	MCERTS	-	-	-	< 11	< 11
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	11	NONE	-	-	-	< 11	< 11
4-Chlorotoluene	µg/kg	11	NONE	-	-	-	< 11	< 11
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	-	-	-	< 4.0	< 4.0
Tert-Butylbenzene	µg/kg	4	NONE	-	-	-	< 4.0	< 4.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	NONE	-	-	-	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
P-Isopropyltoluene	µg/kg	16	ISO 17025	-	-	-	< 16	< 16
1,2-dichlorobenzene	µg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
Butylbenzene	µg/kg	4	NONE	-	-	-	< 4.0	< 4.0
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	-	-	-	< 9.0	< 9.0
Hexachlorobutadiene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
1,2,3-Trichlorobenzene	µg/kg	10	NONE	-	-	-	< 10	< 10

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The results included within the report are representative of the samples submitted for analysis.

Page 4 of 16



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230496	230497	230498	230499	230500
Sample Reference	TP27	TP28	TP29	TP30	TP31
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.20	0.50	0.30	0.30
Date Sampled	11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken	0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.1	ISO 17025	-	-	-	0.3	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	0.8	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Fluorene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.2	ISO 17025	-	-	-	2.4	< 0.2
Anthracene	mg/kg	0.1	MCERTS	-	-	-	0.1	< 0.1
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.2	MCERTS	-	-	-	0.5	< 0.2
Pyrene	mg/kg	0.2	ISO 17025	-	-	-	0.3	< 0.2
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	-	-	0.3	< 0.2
Chrysene	mg/kg	0.05	ISO 17025	-	-	-	0.3	< 0.1
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	-	-	-	0.3	< 0.1
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	0.2	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	-	-	-	< 0.1	< 0.1

Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230502	230503	230504	230505	230506
Sample Reference	TP32	TP33	TP34	TP36	TP37
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.20	0.40	0.30	0.20	0.20
Date Sampled	11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken	0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	19
Total mass of sample received	kg	0.001	NONE	0.64	0.68

General Inorganics

pH	pH Units	N/A	MCERTS	7.8	7.2	7.3	8.4	7.6
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.041	0.027	0.037	0.042	0.17
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	41	26	37	42	170
Ammonium as NH ₄	mg/kg	5	MCERTS	-	-	< 5.0	-	-
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0055	0.0086	0.0092	0.0093	0.0027
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	< 2.0	-	-
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	-	-	< 20	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Fluorene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Phenanthrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Fluoranthene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	< 0.10	< 0.10	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.6	< 1.6	< 1.6	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.5	9.6	4.6	10	8.7
Barium (aqua regia extractable)	mg/kg	1	MCERTS	75	110	160	130	150
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.5	0.7	0.5	0.9	1.2
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	13	19	13	25	42
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	13	19	13	25	42
Copper (aqua regia extractable)	mg/kg	1	MCERTS	13	18	13	20	27
Lead (aqua regia extractable)	mg/kg	2	MCERTS	34	32	40	37	14
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.4	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	17	24	14	30	52
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	16	23	15	31	43
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	49	59	39	68	64

Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230502	230503	230504	230505	230506
Sample Reference				TP32	TP33	TP34	TP36	TP37
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.40	0.30	0.20	0.20
Date Sampled				11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken				0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230502	230503	230504	230505	230506
Sample Reference				TP32	TP33	TP34	TP36	TP37
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.40	0.30	0.20	0.20
Date Sampled				11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken				0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	4	ISO 17025	-	-	-	< 4.0	< 4.0
Chloroethane	µg/kg	2	ISO 17025	-	-	-	< 2.0	< 2.0
Bromomethane	µg/kg	6	ISO 17025	-	-	-	< 6.0	< 6.0
Vinyl Chloride	µg/kg	24	ISO 17025	-	-	-	< 24	< 24
Trichlorofluoromethane	µg/kg	5	ISO 17025	-	-	-	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1-dichloroethane	µg/kg	6	MCERTS	-	-	-	< 6.0	< 6.0
2,2-Dichloropropane	µg/kg	6	NONE	-	-	-	< 6.0	< 6.0
Trichloromethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,1,1-Trichloroethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,2-dichloroethane	µg/kg	4	MCERTS	-	-	-	< 4.0	< 4.0
1,1-Dichloropropene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Trans-1,2-dichloroethene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Benzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Tetrachloromethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,2-dichloropropane	µg/kg	6	MCERTS	-	-	-	< 6.0	< 6.0
Trichloroethene	µg/kg	6	MCERTS	-	-	-	< 6.0	< 6.0
Dibromomethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
Bromodichloromethane	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	-	-	-	< 8.0	< 8.0
Toluene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	8	ISO 17025	-	-	-	< 8.0	< 8.0
Dibromochloromethane	µg/kg	2	ISO 17025	-	-	-	< 2.0	< 2.0
Tetrachloroethene	µg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
1,2-Dibromoethane	µg/kg	3	ISO 17025	-	-	-	< 3.0	< 3.0
Chlorobenzene	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	-	-	-	< 4.0	< 4.0
Ethylbenzene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
Styrene	µg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
Tribromomethane	µg/kg	7	MCERTS	-	-	-	< 7.0	< 7.0
o-xylene	µg/kg	1	MCERTS	-	-	-	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	-	-	-	< 3.0	< 3.0
Isopropylbenzene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
Bromobenzene	µg/kg	11	MCERTS	-	-	-	< 11	< 11
N-Propylbenzene	µg/kg	5	ISO 17025	-	-	-	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	11	NONE	-	-	-	< 11	< 11
4-Chlorotoluene	µg/kg	11	NONE	-	-	-	< 11	< 11
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	-	-	-	< 4.0	< 4.0
Tert-Butylbenzene	µg/kg	4	NONE	-	-	-	< 4.0	< 4.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	-	-	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	NONE	-	-	-	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
P-Isopropyltoluene	µg/kg	16	ISO 17025	-	-	-	< 16	< 16
1,2-dichlorobenzene	µg/kg	5	MCERTS	-	-	-	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	8	MCERTS	-	-	-	< 8.0	< 8.0
Butylbenzene	µg/kg	4	NONE	-	-	-	< 4.0	< 4.0
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	-	-	-	< 7.0	< 7.0
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	-	-	-	< 9.0	< 9.0
Hexachlorobutadiene	µg/kg	7	NONE	-	-	-	< 7.0	< 7.0
1,2,3-Trichlorobenzene	µg/kg	10	NONE	-	-	-	< 10	< 10

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The results included within the report are representative of the samples submitted for analysis.

Page 8 of 16



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230502	230503	230504	230505	230506
Sample Reference				TP32	TP33	TP34	TP36	TP37
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.40	0.30	0.20	0.20
Date Sampled				11/10/2012	11/10/2012	11/10/2012	11/10/2012	11/10/2012
Time Taken				0845	0845	0845	0845	0845
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
SVOCs								
Aniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Nitrobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	-	-	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Naphthalene	mg/kg	0.1	ISO 17025	-	-	-	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	-	-	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Acenaphthene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Fluorene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Azobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Phenanthrene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Anthracene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Carbazole	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	-	-	< 0.3	< 0.3
Fluoranthene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Pyrene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	-	-	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	-	-	< 0.2	< 0.2
Chrysene	mg/kg	0.05	ISO 17025	-	-	-	< 0.1	< 0.1
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	-	-	-	< 0.1	< 0.1
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	-	< 0.1	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	-	-	-	< 0.2	< 0.2
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	-	-	-	< 0.1	< 0.1



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230501	230507			
Sample Reference				TP32	TP38			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				11/10/2012	11/10/2012			
Time Taken				0845	0845			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.2	7.4			
Sulphate as SO ₄	ug/l	45	ISO 17025	74300	44200			
Sulphide	ug/l	5	NONE	< 5.0	< 5.0			
Chloride	mg/l	4	ISO 17025	25	50			
Ammoniacal Nitrogen as N	ug/l	15	ISO 17025	220	340			
Ammonium as NH ₄	ug/l	15	ISO 17025	280	440			
Nitrate as N	mg/l	1	ISO 17025	< 1.0	< 1.0			
Nitrite as N	ug/l	10	ISO 17025	79	< 10			

Heavy Metals / Metalloids

Arsenic (dissolved)	ug/l	1	ISO 17025	3.2	1.9			
Barium (dissolved)	ug/l	0.05	ISO 17025	140	62			
Beryllium (dissolved)	ug/l	0.2	ISO 17025	< 0.2	< 0.2			
Boron (dissolved)	ug/l	10	ISO 17025	73	64			
Cadmium (dissolved)	ug/l	0.1	ISO 17025	< 0.1	< 0.1			
Chromium (dissolved)	ug/l	0.4	ISO 17025	< 0.4	0.8			
Copper (dissolved)	ug/l	0.7	ISO 17025	4.5	4.4			
Lead (dissolved)	ug/l	1	ISO 17025	4.3	2.5			
Mercury (dissolved)	ug/l	0.5	ISO 17025	< 0.5	< 0.5			
Nickel (dissolved)	ug/l	0.3	ISO 17025	2.7	0.9			
Selenium (dissolved)	ug/l	4	ISO 17025	< 4.0	< 4.0			
Vanadium (dissolved)	ug/l	1.7	ISO 17025	< 1.7	< 1.7			
Zinc (dissolved)	ug/l	0.4	ISO 17025	5.6	< 0.4			

Monoaromatics

Benzene	ug/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	ug/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	ug/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	ug/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	ug/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	ug/l	1	ISO 17025	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C6 - C8	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C8 - C10	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C10 - C12	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	ug/l	10	NONE	< 10	< 10			

TPH-CWG - Aromatic >C5 - C7	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C7 - C8	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C8 - C10	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C10 - C12	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	ug/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	ug/l	10	NONE	< 10	< 10			



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230501	230507			
Sample Reference				TP32	TP38			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				11/10/2012	11/10/2012			
Time Taken				0845	0845			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tribromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0			
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0			
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1			
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0			



Analytical Report Number: 12-36904

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230501	230507			
Sample Reference				TP32	TP38			
Sample Number				None Supplied	None Supplied			
Depth (m)				0.50	1.00			
Date Sampled				11/10/2012	11/10/2012			
Time Taken				0845	0845			
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Phenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachloroethane	µg/l	0.05	NONE	< 0.05	< 0.05			
Nitrobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Isophorone	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Nitrophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05	< 0.05			
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dimethylphthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibenzofuran	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Diethyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
4-Nitroaniline	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Azobenzene	µg/l	0.05	NONE	< 0.05	< 0.05			
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05	< 0.05			
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02	< 0.02			
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Carbazole	µg/l	0.05	NONE	< 0.05	< 0.05			
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Anthraquinone	µg/l	0.05	NONE	< 0.05	< 0.05			
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05	< 0.05			
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01			

U/S = Unsuitable Sample I/S = Insufficient Sample

Iss No 12-36904-1

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The results included within the report are representative of the samples submitted for analysis.

Page 12 of 16



Analytical Report Number : 12-36904

Project / Site name: 60895

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of

a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
230496	TP27	None Supplied	0.20	Brown clay and topsoil.
230497	TP28	None Supplied	0.20	Light brown gravelly sand with vegetation.
230498	TP29	None Supplied	0.50	Beige clay and sand.
230499	TP30	None Supplied	0.30	Red topsoil and sand with gravel and vegetation.
230500	TP31	None Supplied	0.30	Brown clay.
230502	TP32	None Supplied	0.20	Brown clay and sand.
230503	TP33	None Supplied	0.40	Brown clay and sand.
230504	TP34	None Supplied	0.30	Brown clay and sand.
230505	TP36	None Supplied	0.20	Light brown clay and sand with vegetation.
230506	TP37	None Supplied	0.20	Brown clay.

Analytical Report Number : 12-36904

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of ammoniacal nitrogen in water by addition of buffer solution followed by ion selective electrode. Results for ammonia species are calculated from raw ammoniacal nitrogen data, and then reported to 2 significant figures.	In-house method	L035-PL	W	ISO 17025
Ammonium as NH ₄ in soil	Determination of ammonium in soil by extraction with potassium chloride followed by addition of buffer solution followed by ion selective electrode.	In-house method	L035-PL	W	MCERTS
Ammonium as NH ₄ in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Results for ammonia species are calculated from raw ammoniacal nitrogen data, and then reported to 2 significant figures.	In-house method	L035-PL	W	ISO 17025
Boron in water	Determination of boron by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0735-PL	W	MCERTS
BTEX and MTBE in water	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Chloride in water	Determination of chloride in water by titration against silver nitrate.	In-house method	L024-PL	W	ISO 17025
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	D	NONE
Explosives to RPS Mountainheath in Soil	Subcontracted.	Subcontracted analysis		W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE

Analytical Report Number : 12-36904

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Nitrate as N in water	Determination of nitrate in water by cadmium reduction followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L077-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L077-PL	W	ISO 17025
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L010-PL	W	NONE
TPH7 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-UK	W	NONE
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS



Analytical Report Number : 12-36904

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate in soil by extraction in water followed by reaction with sodium salicylate in the presence of sulphuric acid. The reaction product is nitrosalicylic acid, which forms a yellow	In-house method based on Polish Standard Method PN-82/C-04579.08.	L077-PL	D	NONE
Water Soluble Nitrite (2:1) as N in soil	Determination of nitrite in soil by extraction with water followed by with 4-aminobenzene sulphonamide reagent in the presence of orthophosphoric acid at pH 1.9 to form a	In-house method based on ISO:EN 26777:1993 nitrite.	L078-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

**Rob Gordon**

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Analytical Report Number : 12-36848

Project / Site name:	60895	Samples received on:	12/10/2012
Your job number:		Samples instructed on:	12/10/2012
Your order number:	1390	Analysis completed by:	25/10/2012
Report Issue Number:	1	Report issued on:	25/10/2012
Samples Analysed:	10 soil samples - 1 water sample		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Rexona Rahman
Customer Services Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting

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Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230143	230144	230145	230147	230148
Sample Reference				TP1	TP2	TP3	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.40	1.00	0.20	0.50
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1030	1100	1130	1215	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	22	19	18	11	20
Total mass of sample received	kg	0.001	NONE	0.42	0.46	0.42	0.43	0.39

General Inorganics

pH	pH Units	N/A	MCERTS	7.3	7.7	7.8	8.3	8.1
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.21	0.16	0.29	0.014	0.028
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	210	160	290	14	28
Ammonium as NH ₄	mg/kg	5	MCERTS	< 5.0	-	-	-	-
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.020	0.014	0.016	0.0036	0.012
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	-	-	-	-
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	< 20	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluorene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Phenanthrene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Fluoranthene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Pyrene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	-	-	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	-	-	-	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	-	-	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.6	-	-	-	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.2	10	12	7.6	13
Barium (aqua regia extractable)	mg/kg	1	MCERTS	84	110	140	55	130
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.8	0.8	0.8	0.5	1.4
Boron (water soluble)	mg/kg	0.2	MCERTS	0.7	0.6	1.1	< 0.2	0.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	< 0.2	1.0	0.3	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	30	32	33	20	45
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	30	32	33	20	45
Copper (aqua regia extractable)	mg/kg	1	MCERTS	16	16	40	18	25
Lead (aqua regia extractable)	mg/kg	2	MCERTS	53	71	120	30	180
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	25	27	28	19	36
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	32	31	33	17	46
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	130	140	290	93	110

Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230143	230144	230145	230147	230148
Sample Reference	TP1	TP2	TP3	TP4	TP5
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	0.40	0.40	1.00	0.20	0.50
Date Sampled	09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken	1030	1100	1130	1215	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	37	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	37	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	28	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	28	< 10	< 10



Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230143	230144	230145	230147	230148
Sample Reference				TP1	TP2	TP3	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.40	1.00	0.20	0.50
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1030	1100	1130	1215	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/kg	4	ISO 17025	-	< 4.0	< 4.0	< 4.0	< 4.0
Chloroethane	µg/kg	2	ISO 17025	-	< 2.0	< 2.0	< 2.0	< 2.0
Bromomethane	µg/kg	6	ISO 17025	-	< 6.0	< 6.0	< 6.0	< 6.0
Vinyl Chloride	µg/kg	24	ISO 17025	-	< 24	< 24	< 24	< 24
Trichlorofluoromethane	µg/kg	5	ISO 17025	-	< 5.0	< 5.0	< 5.0	< 5.0
1,1-dichloroethene	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	-	< 7.0	< 7.0	< 7.0	< 7.0
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/kg	6	MCERTS	-	< 6.0	< 6.0	< 6.0	< 6.0
2,2-Dichloropropane	µg/kg	6	NONE	-	< 6.0	< 6.0	< 6.0	< 6.0
Trichloromethane	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
1,1,1-Trichloroethane	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
1,2-dichloroethane	µg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
1,1-Dichloropropene	µg/kg	7	NONE	-	< 7.0	< 7.0	< 7.0	< 7.0
Trans-1,2-dichloroethene	µg/kg	7	NONE	-	< 7.0	< 7.0	< 7.0	< 7.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
1,2-dichloropropane	µg/kg	6	MCERTS	-	< 6.0	< 6.0	< 6.0	< 6.0
Trichloroethene	µg/kg	6	MCERTS	-	< 6.0	< 6.0	< 6.0	< 6.0
Dibromomethane	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
Bromodichloromethane	µg/kg	7	NONE	-	< 7.0	< 7.0	< 7.0	< 7.0
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	-	< 7.0	< 7.0	< 7.0	< 7.0
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	-	< 8.0	< 8.0	< 8.0	< 8.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/kg	5	MCERTS	-	< 5.0	< 5.0	< 5.0	< 5.0
1,3-Dichloropropane	µg/kg	8	ISO 17025	-	< 8.0	< 8.0	< 8.0	< 8.0
Dibromochloromethane	µg/kg	2	ISO 17025	-	< 2.0	< 2.0	< 2.0	< 2.0
Tetrachloroethene	µg/kg	8	MCERTS	-	< 8.0	< 8.0	< 8.0	< 8.0
1,2-Dibromoethane	µg/kg	3	ISO 17025	-	< 3.0	< 3.0	< 3.0	< 3.0
Chlorobenzene	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/kg	5	MCERTS	-	< 5.0	< 5.0	< 5.0	< 5.0
Tribromomethane	µg/kg	7	MCERTS	-	< 7.0	< 7.0	< 7.0	< 7.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	-	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/kg	7	NONE	-	< 7.0	< 7.0	< 7.0	< 7.0
Bromobenzene	µg/kg	11	MCERTS	-	< 11	< 11	< 11	< 11
N-Propylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0	< 5.0	< 5.0
2-Chlorotoluene	µg/kg	11	NONE	-	< 11	< 11	< 11	< 11
4-Chlorotoluene	µg/kg	11	NONE	-	< 11	< 11	< 11	< 11
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	-	< 4.0	< 4.0	< 4.0	< 4.0
Tert-Butylbenzene	µg/kg	4	NONE	-	< 4.0	< 4.0	< 4.0	< 4.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	< 5.0	< 5.0	< 5.0	< 5.0
Sec-Butylbenzene	µg/kg	5	NONE	-	< 5.0	< 5.0	< 5.0	< 5.0
1,3-dichlorobenzene	µg/kg	7	ISO 17025	-	< 7.0	< 7.0	< 7.0	< 7.0
P-Isopropyltoluene	µg/kg	16	ISO 17025	-	< 16	< 16	< 16	< 16
1,2-dichlorobenzene	µg/kg	5	MCERTS	-	< 5.0	< 5.0	< 5.0	< 5.0
1,4-dichlorobenzene	µg/kg	8	MCERTS	-	< 8.0	< 8.0	< 8.0	< 8.0
Butylbenzene	µg/kg	4	NONE	-	< 4.0	< 4.0	< 4.0	< 4.0
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	-	< 7.0	< 7.0	< 7.0	< 7.0
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	-	< 9.0	< 9.0	< 9.0	< 9.0
Hexachlorobutadiene	µg/kg	7	NONE	-	< 7.0	< 7.0	< 7.0	< 7.0
1,2,3-Trichlorobenzene	µg/kg	10	NONE	-	< 10	< 10	< 10	< 10

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The results included within the report are representative of the samples submitted for analysis.

Page 4 of 16



Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230143	230144	230145	230147	230148
Sample Reference				TP1	TP2	TP3	TP4	TP5
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.40	1.00	0.20	0.50
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1030	1100	1130	1215	1300
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Hexachloroethane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	< 0.2	< 0.2	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Naphthalene	mg/kg	0.1	ISO 17025	-	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	< 0.1	< 0.1	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2	< 0.2
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Fluorene	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2	< 0.2
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Phenanthrene	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2	< 0.2
Anthracene	mg/kg	0.1	MCERTS	-	< 0.1	< 0.1	< 0.1	< 0.1
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	< 0.2	< 0.2	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	< 0.3	< 0.3	< 0.3
Fluoranthene	mg/kg	0.2	MCERTS	-	< 0.2	3.0	< 0.2	0.6
Pyrene	mg/kg	0.2	ISO 17025	-	< 0.2	2.7	< 0.2	0.6
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	< 0.3	< 0.3	< 0.3
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	< 0.2	1.2	< 0.2	0.7
Chrysene	mg/kg	0.05	ISO 17025	-	< 0.1	2.4	< 0.1	0.3
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	-	< 0.1	1.8	< 0.1	0.5
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	-	< 0.2	1.4	< 0.2	0.3
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	< 0.1	2.0	< 0.1	0.4
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	-	< 0.2	1.1	< 0.2	< 0.2
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	-	< 0.2	< 0.2	< 0.2	< 0.2
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	-	< 0.1	1.0	< 0.1	< 0.1

Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230149	230150	230151	230152	230153
Sample Reference				TP6	TP7	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.40	0.50	0.30
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1300	1430	1530	1600	1630
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	20	16	14	19	18
Total mass of sample received	kg	0.001	NONE	0.45	0.47	0.53	0.48	0.51

General Inorganics

pH	pH Units	N/A	MCERTS	7.9	8.3	7.8	6.6	7.9
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.11	0.015	0.017	0.13	0.018
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	110	15	17	130	18
Ammonium as NH ₄	mg/kg	5	MCERTS	-	-	< 5.0	< 5.0	-
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.011	0.0019	0.0008	0.011	0.0006
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	< 2.0	3.2	-
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	-	-	< 20	< 20	-

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	< 2.0	-	< 2.0	< 2.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-
Acenaphthylene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Acenaphthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	-
Fluorene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Phenanthrene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Anthracene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	-
Fluoranthene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Pyrene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Chrysene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.10	-	< 0.10	< 0.10	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	< 0.20	-	< 0.20	< 0.20	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	-	< 0.05	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.6	-	< 1.6	< 1.6	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.0	9.1	5.3	8.7	9.7
Barium (aqua regia extractable)	mg/kg	1	MCERTS	76	74	150	120	92
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.7	0.7	0.4	0.7	0.9
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	41	30	11	25	33
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	41	30	11	25	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	21	18	15	12	19
Lead (aqua regia extractable)	mg/kg	2	MCERTS	170	33	30	60	40
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	22	30	15	22	33
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	40	29	10	24	30
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	83	70	60	75	73

Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230149	230150	230151	230152	230153
Sample Reference				TP6	TP7	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.40	0.50	0.30
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1300	1430	1530	1600	1630
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	47	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	47	< 10	< 10	< 10
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230149	230150	230151	230152	230153
Sample Reference				TP6	TP7	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.40	0.50	0.30
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1300	1430	1530	1600	1630
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	4	ISO 17025	-	< 4.0	-	-	< 4.0
Chloroethane	µg/kg	2	ISO 17025	-	< 2.0	-	-	< 2.0
Bromomethane	µg/kg	6	ISO 17025	-	< 6.0	-	-	< 6.0
Vinyl Chloride	µg/kg	24	ISO 17025	-	< 24	-	-	< 24
Trichlorofluoromethane	µg/kg	5	ISO 17025	-	< 5.0	-	-	< 5.0
1,1-dichloroethene	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	-	< 7.0	-	-	< 7.0
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1-dichloroethane	µg/kg	6	MCERTS	-	< 6.0	-	-	< 6.0
2,2-Dichloropropane	µg/kg	6	NONE	-	< 6.0	-	-	< 6.0
Trichloromethane	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
1,1,1-Trichloroethane	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
1,2-dichloroethane	µg/kg	4	MCERTS	-	< 4.0	-	-	< 4.0
1,1-Dichloropropene	µg/kg	7	NONE	-	< 7.0	-	-	< 7.0
Trans-1,2-dichloroethene	µg/kg	7	NONE	-	< 7.0	-	-	< 7.0
Benzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Tetrachloromethane	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
1,2-dichloropropane	µg/kg	6	MCERTS	-	< 6.0	-	-	< 6.0
Trichloroethene	µg/kg	6	MCERTS	-	< 6.0	-	-	< 6.0
Dibromomethane	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
Bromodichloromethane	µg/kg	7	NONE	-	< 7.0	-	-	< 7.0
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	-	< 7.0	-	-	< 7.0
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	-	< 8.0	-	-	< 8.0
Toluene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2-Trichloroethane	µg/kg	5	MCERTS	-	< 5.0	-	-	< 5.0
1,3-Dichloropropane	µg/kg	8	ISO 17025	-	< 8.0	-	-	< 8.0
Dibromochloromethane	µg/kg	2	ISO 17025	-	< 2.0	-	-	< 2.0
Tetrachloroethene	µg/kg	8	MCERTS	-	< 8.0	-	-	< 8.0
1,2-Dibromoethane	µg/kg	3	ISO 17025	-	< 3.0	-	-	< 3.0
Chlorobenzene	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	-	< 4.0	-	-	< 4.0
Ethylbenzene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
Styrene	µg/kg	5	MCERTS	-	< 5.0	-	-	< 5.0
Tribromomethane	µg/kg	7	MCERTS	-	< 7.0	-	-	< 7.0
o-xylene	µg/kg	1	MCERTS	-	< 1.0	-	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	< 3.0	< 3.0	-	< 3.0	< 3.0
Isopropylbenzene	µg/kg	7	NONE	-	< 7.0	-	-	< 7.0
Bromobenzene	µg/kg	11	MCERTS	-	< 11	-	-	< 11
N-Propylbenzene	µg/kg	5	ISO 17025	-	< 5.0	-	-	< 5.0
2-Chlorotoluene	µg/kg	11	NONE	-	< 11	-	-	< 11
4-Chlorotoluene	µg/kg	11	NONE	-	< 11	-	-	< 11
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	-	< 4.0	-	-	< 4.0
Tert-Butylbenzene	µg/kg	4	NONE	-	< 4.0	-	-	< 4.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	-	< 5.0	-	-	< 5.0
Sec-Butylbenzene	µg/kg	5	NONE	-	< 5.0	-	-	< 5.0
1,3-dichlorobenzene	µg/kg	7	ISO 17025	-	< 7.0	-	-	< 7.0
P-Isopropyltoluene	µg/kg	16	ISO 17025	-	< 16	-	-	< 16
1,2-dichlorobenzene	µg/kg	5	MCERTS	-	< 5.0	-	-	< 5.0
1,4-dichlorobenzene	µg/kg	8	MCERTS	-	< 8.0	-	-	< 8.0
Butylbenzene	µg/kg	4	NONE	-	< 4.0	-	-	< 4.0
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	-	< 7.0	-	-	< 7.0
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	-	< 9.0	-	-	< 9.0
Hexachlorobutadiene	µg/kg	7	NONE	-	< 7.0	-	-	< 7.0
1,2,3-Trichlorobenzene	µg/kg	10	NONE	-	< 10	-	-	< 10

Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230149	230150	230151	230152	230153
Sample Reference				TP6	TP7	TP12	TP13	TP14
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20	0.20	0.40	0.50	0.30
Date Sampled				09/10/2012	09/10/2012	09/10/2012	09/10/2012	09/10/2012
Time Taken				1300	1430	1530	1600	1630
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Hexachloroethane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Nitrobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	-	< 0.2	-	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Naphthalene	mg/kg	0.1	ISO 17025	-	< 0.1	-	-	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	-	< 0.1	-	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Acenaphthylene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Fluorene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Azobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Phenanthrene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Anthracene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Carbazole	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	-	< 0.3	-	-	< 0.3
Fluoranthene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Pyrene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	-	< 0.3	-	-	< 0.3
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	< 0.2	-	-	< 0.2
Chrysene	mg/kg	0.05	ISO 17025	-	< 0.1	-	-	< 0.1
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	-	< 0.1	-	-	< 0.1
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	< 0.1	-	-	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	-	< 0.2	-	-	< 0.2
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	-	< 0.1	-	-	< 0.1



Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230146					
Sample Reference	TP4					
Sample Number	None Supplied					
Depth (m)	1.00					
Date Sampled	09/10/2012					
Time Taken	1200					
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

General Inorganics

pH	pH Units	N/A	ISO 17025	7.4				
Sulphate as SO ₄	ug/l	45	ISO 17025	138000				
Sulphide	ug/l	5	NONE	< 5.0				
Chloride	mg/l	4	ISO 17025	20				
Ammoniacal Nitrogen as N	ug/l	15	ISO 17025	120				
Ammonium as NH ₄	ug/l	15	ISO 17025	150				
Nitrate as N	mg/l	1	ISO 17025	< 1.0				
Nitrite as N	ug/l	10	ISO 17025	< 10				

Heavy Metals / Metalloids

Arsenic (dissolved)	ug/l	1	ISO 17025	7.9				
Barium (dissolved)	ug/l	0.05	ISO 17025	94				
Beryllium (dissolved)	ug/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	ug/l	10	ISO 17025	150				
Cadmium (dissolved)	ug/l	0.1	ISO 17025	< 0.1				
Chromium (dissolved)	ug/l	0.4	ISO 17025	< 0.4				
Copper (dissolved)	ug/l	0.7	ISO 17025	2.3				
Lead (dissolved)	ug/l	1	ISO 17025	1.5				
Mercury (dissolved)	ug/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	ug/l	0.3	ISO 17025	2.2				
Selenium (dissolved)	ug/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	ug/l	1.7	ISO 17025	2.7				
Zinc (dissolved)	ug/l	0.4	ISO 17025	0.8				

Monoaromatics

Benzene	ug/l	1	ISO 17025	< 1.0				
Toluene	ug/l	1	ISO 17025	< 1.0				
Ethylbenzene	ug/l	1	ISO 17025	< 1.0				
p & m-xylene	ug/l	1	ISO 17025	< 1.0				
o-xylene	ug/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	ug/l	1	ISO 17025	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C6 - C8	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C8 - C10	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C10 - C12	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	ug/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	ug/l	10	NONE	< 10				

TPH-CWG - Aromatic >C5 - C7	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic >C7 - C8	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic >C8 - C10	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic >C10 - C12	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	ug/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	ug/l	10	NONE	< 10				



Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230146				
Sample Reference				TP4				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				09/10/2012				
Time Taken				1200				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0				
Chloroethane	µg/l	1	ISO 17025	< 1.0				
Bromomethane	µg/l	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0				
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0				
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0				
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloromethane	µg/l	1	ISO 17025	< 1.0				
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0				
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0				
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloroethene	µg/l	1	ISO 17025	< 1.0				
Dibromomethane	µg/l	1	ISO 17025	< 1.0				
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0				
Chlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
Styrene	µg/l	1	ISO 17025	< 1.0				
Tribromomethane	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0				
Bromobenzene	µg/l	1	ISO 17025	< 1.0				
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
p-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0				
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1				
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				



Analytical Report Number: 12-36848

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230146					
Sample Reference	TP4					
Sample Number	None Supplied					
Depth (m)	1.00					
Date Sampled	09/10/2012					
Time Taken	1200					
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status			

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05				
Phenol	µg/l	0.05	NONE	< 0.05				
2-Chlorophenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05				
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05				
2-Methylphenol	µg/l	0.05	NONE	< 0.05				
Hexachloroethane	µg/l	0.05	NONE	< 0.05				
Nitrobenzene	µg/l	0.05	NONE	< 0.05				
4-Methylphenol	µg/l	0.05	NONE	< 0.05				
Isophorone	µg/l	0.05	NONE	< 0.05				
2-Nitrophenol	µg/l	0.05	NONE	< 0.05				
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05				
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05				
4-Chloroaniline	µg/l	0.05	NONE	< 0.05				
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05				
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05				
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05				
Dimethylphthalate	µg/l	0.05	NONE	< 0.05				
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Dibenzofuran	µg/l	0.05	NONE	< 0.05				
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Diethyl phthalate	µg/l	0.05	NONE	< 0.05				
4-Nitroaniline	µg/l	0.05	NONE	< 0.05				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Azobenzene	µg/l	0.05	NONE	< 0.05				
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Carbazole	µg/l	0.05	NONE	< 0.05				
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05				
Anthraquinone	µg/l	0.05	NONE	< 0.05				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 12-36848

Project / Site name: 60895

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content of

a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
230143	TP1	None Supplied	0.40	Brown topsoil and clay with vegetation.
230144	TP2	None Supplied	0.40	Brown clay and sand.
230145	TP3	None Supplied	1.00	Brown clay and sand with brick.
230147	TP4	None Supplied	0.20	Brown clay and topsoil with gravel and vegetation.
230148	TP5	None Supplied	0.50	Brown topsoil and clay.
230149	TP6	None Supplied	0.20	Brown clay and sand with gravel and vegetation.
230150	TP7	None Supplied	0.20	Brown clay with gravel and vegetation.
230151	TP12	None Supplied	0.40	Brown sandy topsoil.
230152	TP13	None Supplied	0.50	Brown clay and sand with vegetation.
230153	TP14	None Supplied	0.30	Brown clay with gravel and vegetation.

Analytical Report Number : 12-36848

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of ammoniacal nitrogen in water by addition of buffer solution followed by ion selective electrode. Results for ammonia species are calculated from raw ammoniacal nitrogen data,	In-house method	L035-PL	W	ISO 17025
Ammonium as NH ₄ in soil	Determination of ammonium in soil by extraction with potassium chloride followed by addition of buffer solution followed by ion selective electrode.	In-house method	L035-PL	W	MCERTS
Ammonium as NH ₄ in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Results for ammonia species are calculated from raw ammoniacal nitrogen data,	In-house method	L035-PL	W	ISO 17025
Boron in water	Determination of boron by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS
BTEX and MTBE in water	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Chloride in water	Determination of chloride in water by titration against silver nitrate.	In-house method	L024-PL	W	ISO 17025
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	D	NONE
Explosives to RPS Mountainheath in Soil	Subcontracted.	Subcontracted analysis		W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE

Analytical Report Number : 12-36848

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Nitrate as N in water	Determination of nitrate in water by cadmium reduction followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L077-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L077-PI	W	ISO 17025
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L010-PL	W	NONE
TPH7 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-UK	W	NONE
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS



Analytical Report Number : 12-36848

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate in soil by extraction in water followed by reaction with sodium salicylate in the presence of sulphuric acid. The reaction product is nitrosalicylic acid, which forms a yellow	In-house method based on Polish Standard Method PN-82/C-04579.08.	L077-PL	D	NONE
Water Soluble Nitrite (2:1) as N in soil	Determination of nitrite in soil by extraction with water followed by with 4-aminobenzene sulphonamide reagent in the presence of orthophosphoric acid at pH 1.9 to form a	In-house method based on ISO:EN 26777:1993 nitrite.	L078-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.



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Analytical Report Number : 12-36843

Project / Site name:	60895	Samples received on:	12/10/2012
Your job number:		Samples instructed on:	12/10/2012
Your order number:	1390	Analysis completed by:	17/10/2012
Report Issue Number:	1	Report issued on:	25/10/2012
Samples Analysed:	13 soil samples - 1 water sample		

Signed:

Dr Claire Stone
Quality Manager
For & on behalf of i2 Analytical Ltd.

Signed:

Rexona Rahman
Customer Services Manager
For & on behalf of i2 Analytical Ltd.

Other office located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland

Standard sample disposal times, unless otherwise agreed with the laboratory, are :

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting

Excel copies of reports are only valid when accompanied by this PDF certificate.

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230114	230115	230116	230117	230118
Sample Reference				TP15	TP16	TP17	TP18	TP19
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.60	0.25	0.30	0.45
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	17	12	12	14
Total mass of sample received	kg	0.001	NONE	0.65	0.60	0.58	0.52	0.56

General Inorganics

pH	pH Units	N/A	MCERTS	8.3	8.3	8.2	8.1	8.3
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.014	0.049	0.088	0.068	0.072
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	14	49	88	68	72
Ammonium as NH ₄	mg/kg	5	MCERTS	-	-	-	< 5.0	-
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0092	0.0056	0.012	0.011	0.0022
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	-	< 2.0	-
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	-	-	-	< 20	-

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	-	< 2.0	-	< 2.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	0.51	-	0.74	-
Acenaphthylene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.10	-	< 0.10	-
Fluorene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Phenanthrene	mg/kg	0.2	MCERTS	-	0.24	-	0.68	-
Anthracene	mg/kg	0.1	MCERTS	-	< 0.10	-	0.16	-
Fluoranthene	mg/kg	0.2	MCERTS	-	0.61	-	2.1	-
Pyrene	mg/kg	0.2	MCERTS	-	0.53	-	2.0	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	0.52	-	1.6	-
Chrysene	mg/kg	0.05	MCERTS	-	0.46	-	1.5	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	0.44	-	1.6	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-	0.35	-	1.0	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	0.36	-	1.2	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-	< 0.20	-	0.45	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	0.70	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	4.0	-	14	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	11	12	22	12	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	95	190	180	160	150
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	1.2	0.8	0.9	1.0
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	< 0.2	< 0.2	< 0.2	< 0.2
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.7	16	0.6	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	35	36	20	26	33
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	35	36	20	26	33
Copper (aqua regia extractable)	mg/kg	1	MCERTS	11	18	28	23	19
Lead (aqua regia extractable)	mg/kg	2	MCERTS	53	40	300	81	36
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	26	33	22	24	30
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	1.2	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	36	37	25	30	35
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	78	200	2500	170	79



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230114	230115	230116	230117	230118
Sample Reference				TP15	TP16	TP17	TP18	TP19
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.60	0.25	0.30	0.45
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	23	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	23	< 10

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230114	230115	230116	230117	230118
Sample Reference				TP15	TP16	TP17	TP18	TP19
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.60	0.25	0.30	0.45
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	4	ISO 17025	< 4.0	-	< 4.0	-	< 4.0
Chloroethane	µg/kg	2	ISO 17025	< 2.0	-	< 2.0	-	< 2.0
Bromomethane	µg/kg	6	ISO 17025	< 6.0	-	< 6.0	-	< 6.0
Vinyl Chloride	µg/kg	24	ISO 17025	< 24	-	< 24	-	< 24
Trichlorofluoromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	< 5.0
1,1-dichloroethene	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1-dichloroethane	µg/kg	6	MCERTS	< 6.0	-	< 6.0	-	< 6.0
2,2-Dichloropropane	µg/kg	6	NONE	< 6.0	-	< 6.0	-	< 6.0
Trichloromethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,1,1-Trichloroethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,2-dichloroethane	µg/kg	4	MCERTS	< 4.0	-	< 4.0	-	< 4.0
1,1-Dichloropropene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Trans-1,2-dichloroethene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Tetrachloromethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,2-dichloropropane	µg/kg	6	MCERTS	< 6.0	-	< 6.0	-	< 6.0
Trichloroethene	µg/kg	6	MCERTS	< 6.0	-	< 6.0	-	< 6.0
Dibromomethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
Bromodichloromethane	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	< 8.0	-	< 8.0	-	< 8.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2-Trichloroethane	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
1,3-Dichloropropane	µg/kg	8	ISO 17025	< 8.0	-	< 8.0	-	< 8.0
Dibromochloromethane	µg/kg	2	ISO 17025	< 2.0	-	< 2.0	-	< 2.0
Tetrachloroethene	µg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
1,2-Dibromoethane	µg/kg	3	ISO 17025	< 3.0	-	< 3.0	-	< 3.0
Chlorobenzene	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	< 4.0	-	< 4.0	-	< 4.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Styrene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
Tri bromomethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	< 3.0	-	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Bromobenzene	µg/kg	11	MCERTS	< 11	-	< 11	-	< 11
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	< 5.0
2-Chlorotoluene	µg/kg	11	NONE	< 11	-	< 11	-	< 11
4-Chlorotoluene	µg/kg	11	NONE	< 11	-	< 11	-	< 11
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	< 4.0	-	< 4.0	-	< 4.0
Tert-Butylbenzene	µg/kg	4	NONE	< 4.0	-	< 4.0	-	< 4.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	< 5.0
Sec-Butylbenzene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	< 5.0
1,3-dichlorobenzene	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
P-Isopropyltoluene	µg/kg	16	ISO 17025	< 16	-	< 16	-	< 16
1,2-dichlorobenzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
1,4-dichlorobenzene	µg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
Butylbenzene	µg/kg	4	NONE	< 4.0	-	< 4.0	-	< 4.0
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	< 9.0	-	< 9.0	-	< 9.0
Hexachlorobutadiene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
1,2,3-Trichlorobenzene	µg/kg	10	NONE	< 10	-	< 10	-	< 10

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230114	230115	230116	230117	230118
Sample Reference				TP15	TP16	TP17	TP18	TP19
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.60	0.25	0.30	0.45
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.1	ISO 17025	< 0.1	-	0.5	-	0.4
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
Acenaphthene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Fluorene	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.2	ISO 17025	< 0.2	-	0.3	-	0.3
Anthracene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Fluoranthene	mg/kg	0.2	MCERTS	< 0.2	-	0.8	-	0.4
Pyrene	mg/kg	0.2	ISO 17025	< 0.2	-	0.8	-	0.4
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.2	-	0.9	-	0.3
Chrysene	mg/kg	0.05	ISO 17025	< 0.1	-	0.8	-	0.3
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	< 0.1	-	1.4	-	0.2
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	< 0.2	-	0.6	-	0.2
Benzo(a)pyrene	mg/kg	0.1	MCERTS	< 0.1	-	1.1	-	0.3
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	< 0.2	-	0.3	-	< 0.2
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	< 0.1	-	0.5	-	< 0.1

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The results included within the report are representative of the samples submitted for analysis.

Page 5 of 23

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230119	230121	230122	230123	230124
Sample Reference				TP20	TP21	TP22	TP22	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.10	0.30	0.60
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	19	23	17	7.0
Total mass of sample received	kg	0.001	NONE	0.60	0.55	0.59	0.59	0.71

General Inorganics

pH	pH Units	N/A	MCERTS	8.3	8.0	8.1	8.0	7.7
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.17	0.046	0.53	0.21	0.078
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	170	45	520	210	78
Ammonium as NH ₄	mg/kg	5	MCERTS	< 5.0	< 5.0	-	-	< 5.0
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0048	0.020	0.012	0.015	0.0051
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	< 2.0	3.5	-	-	< 2.0
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	< 20	< 20	-	-	< 20

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	-	< 2.0	-	< 2.0	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	0.51	-	< 0.05	-
Acenaphthylene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Acenaphthene	mg/kg	0.1	MCERTS	-	< 0.10	-	< 0.10	-
Fluorene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Phenanthrene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Anthracene	mg/kg	0.1	MCERTS	-	< 0.10	-	< 0.10	-
Fluoranthene	mg/kg	0.2	MCERTS	-	0.43	-	< 0.20	-
Pyrene	mg/kg	0.2	MCERTS	-	0.43	-	< 0.20	-
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	0.45	-	< 0.20	-
Chrysene	mg/kg	0.05	MCERTS	-	0.47	-	< 0.05	-
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	0.46	-	< 0.10	-
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-	0.36	-	< 0.20	-
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	0.49	-	< 0.10	-
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Dibenz(a,h)anthracene	mg/kg	0.2	MCERTS	-	< 0.20	-	< 0.20	-
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	< 0.05	-	< 0.05	-

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	3.6	-	< 1.6	-
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.2	13	8.6	9.6	9.5
Barium (aqua regia extractable)	mg/kg	1	MCERTS	85	110	210	98	53
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.7	0.9	1.1	0.9	0.5
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	0.7	1.6	1.4	1.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	0.3	0.5	0.3
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Chromium (III)	mg/kg	1	NONE	25	37	31	39	17
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	25	37	31	39	17
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	22	20	43	19
Lead (aqua regia extractable)	mg/kg	2	MCERTS	40	100	62	61	28
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	20	31	22	29	21
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	23	38	38	33	18
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	78	130	190	140	110



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230119	230121	230122	230123	230124
Sample Reference				TP20	TP21	TP22	TP22	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.10	0.30	0.60
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	18	< 8.0	59	21	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	18	< 10	59	21	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	12	< 10	< 10	< 10	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	26	< 10	30	< 10	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	38	< 10	30	< 10	< 10

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230119	230121	230122	230123	230124
Sample Reference				TP20	TP21	TP22	TP22	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.10	0.30	0.60
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	4	ISO 17025	< 4.0	-	< 4.0	-	< 4.0
Chloroethane	µg/kg	2	ISO 17025	< 2.0	-	< 2.0	-	< 2.0
Bromomethane	µg/kg	6	ISO 17025	< 6.0	-	< 6.0	-	< 6.0
Vinyl Chloride	µg/kg	24	ISO 17025	< 24	-	< 24	-	< 24
Trichlorofluoromethane	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	< 5.0
1,1-dichloroethene	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1-dichloroethane	µg/kg	6	MCERTS	< 6.0	-	< 6.0	-	< 6.0
2,2-Dichloropropane	µg/kg	6	NONE	< 6.0	-	< 6.0	-	< 6.0
Trichloromethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,1,1-Trichloroethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,2-dichloroethane	µg/kg	4	MCERTS	< 4.0	-	< 4.0	-	< 4.0
1,1-Dichloropropene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Trans-1,2-dichloroethene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Benzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Tetrachloromethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,2-dichloropropane	µg/kg	6	MCERTS	< 6.0	-	< 6.0	-	< 6.0
Trichloroethene	µg/kg	6	MCERTS	< 6.0	-	< 6.0	-	< 6.0
Dibromomethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
Bromodichloromethane	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	< 8.0	-	< 8.0	-	< 8.0
Toluene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2-Trichloroethane	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
1,3-Dichloropropane	µg/kg	8	ISO 17025	< 8.0	-	< 8.0	-	< 8.0
Dibromochloromethane	µg/kg	2	ISO 17025	< 2.0	-	< 2.0	-	< 2.0
Tetrachloroethene	µg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
1,2-Dibromoethane	µg/kg	3	ISO 17025	< 3.0	-	< 3.0	-	< 3.0
Chlorobenzene	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	< 4.0	-	< 4.0	-	< 4.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
Styrene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
Tri bromomethane	µg/kg	7	MCERTS	< 7.0	-	< 7.0	-	< 7.0
o-xylene	µg/kg	1	MCERTS	< 1.0	-	< 1.0	-	< 1.0
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	< 3.0	< 3.0	< 3.0	< 3.0	< 3.0
Isopropylbenzene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
Bromobenzene	µg/kg	11	MCERTS	< 11	-	< 11	-	< 11
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	< 5.0
2-Chlorotoluene	µg/kg	11	NONE	< 11	-	< 11	-	< 11
4-Chlorotoluene	µg/kg	11	NONE	< 11	-	< 11	-	< 11
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	< 4.0	-	< 4.0	-	< 4.0
Tert-Butylbenzene	µg/kg	4	NONE	< 4.0	-	< 4.0	-	< 4.0
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	-	< 5.0	-	< 5.0
Sec-Butylbenzene	µg/kg	5	NONE	< 5.0	-	< 5.0	-	< 5.0
1,3-dichlorobenzene	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
P-Isopropyltoluene	µg/kg	16	ISO 17025	< 16	-	< 16	-	< 16
1,2-dichlorobenzene	µg/kg	5	MCERTS	< 5.0	-	< 5.0	-	< 5.0
1,4-dichlorobenzene	µg/kg	8	MCERTS	< 8.0	-	< 8.0	-	< 8.0
Butylbenzene	µg/kg	4	NONE	< 4.0	-	< 4.0	-	< 4.0
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	< 7.0	-	< 7.0	-	< 7.0
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	< 9.0	-	< 9.0	-	< 9.0
Hexachlorobutadiene	µg/kg	7	NONE	< 7.0	-	< 7.0	-	< 7.0
1,2,3-Trichlorobenzene	µg/kg	10	NONE	< 10	-	< 10	-	< 10

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230119	230121	230122	230123	230124
Sample Reference				TP20	TP21	TP22	TP22	TP23
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.50	0.20	0.10	0.30	0.60
Date Sampled				10/10/2012	10/10/2012	10/10/2012	10/10/2012	10/10/2012
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Phenol	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Hexachloroethane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	-	< 0.2	-	< 0.2
Isophorone	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Naphthalene	mg/kg	0.1	ISO 17025	0.4	-	0.5	-	< 0.1
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	-	< 0.1	-	< 0.1
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	-	< 0.1	-	< 0.1
Acenaphthylene	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
Acenaphthene	mg/kg	0.1	MCERTS	0.2	-	< 0.1	-	< 0.1
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Fluorene	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Phenanthrene	mg/kg	0.2	ISO 17025	1.0	-	0.3	-	< 0.2
Anthracene	mg/kg	0.1	MCERTS	0.3	-	< 0.1	-	< 0.1
Carbazole	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	-	< 0.2	-	< 0.2
Anthraquinone	mg/kg	0.3	MCERTS	< 0.3	-	< 0.3	-	< 0.3
Fluoranthene	mg/kg	0.2	MCERTS	3.0	-	0.7	-	< 0.2
Pyrene	mg/kg	0.2	ISO 17025	2.8	-	0.7	-	< 0.2
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	-	< 0.3	-	< 0.3
Benzo(a)anthracene	mg/kg	0.2	MCERTS	2.1	-	0.7	-	< 0.2
Chrysene	mg/kg	0.05	ISO 17025	1.8	-	0.6	-	< 0.1
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	2.1	-	0.8	-	< 0.1
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	0.8	-	0.6	-	< 0.2
Benzo(a)pyrene	mg/kg	0.1	MCERTS	1.7	-	0.8	-	< 0.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	0.4	-	0.3	-	< 0.2
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	< 0.2	-	< 0.2	-	< 0.2
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	0.6	-	0.4	-	< 0.1

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The results included within the report are representative of the samples submitted for analysis.

Page 9 of 23

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230125	230126	230127		
Sample Reference				TP24	TP25	TP26		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.60	0.40	0.35		
Date Sampled				10/10/2012	10/10/2012	10/10/2012		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	19	17	15		
Total mass of sample received	kg	0.001	NONE	0.64	0.64	0.59		

General Inorganics

pH	pH Units	N/A	MCERTS	7.9	8.5	8.5		
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.23	0.085	0.12		
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	230	85	120		
Ammonium as NH ₄	mg/kg	5	MCERTS	-	-	< 5.0		
Fraction Organic Carbon (FOC)	N/A	0.00001	NONE	0.0043	0.0007	0.0006		
Water Soluble Nitrate (2:1) as N	mg/kg	2	NONE	-	-	< 2.0		
Water Soluble Nitrite (2:1) as N	µg/kg	20	NONE	-	-	< 20		

Total Phenols

Total Phenols (monohydric)	mg/kg	2	MCERTS	-	-	< 2.0		
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	< 0.05		
Acenaphthylene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Acenaphthene	mg/kg	0.1	MCERTS	-	-	< 0.10		
Fluorene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Phenanthrene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Anthracene	mg/kg	0.1	MCERTS	-	-	< 0.10		
Fluoranthene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Pyrene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Benzo(a)anthracene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Chrysene	mg/kg	0.05	MCERTS	-	-	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	-	-	< 0.10		
Benzo(k)fluoranthene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	-	-	< 0.10		
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Dibenzo(a,h)anthracene	mg/kg	0.2	MCERTS	-	-	< 0.20		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	-	-	< 0.05		

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	-	-	< 1.6		
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Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	8.0	10		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	110	78	140		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2	0.7	1.1		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.2	< 0.2	< 0.2		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Chromium (III)	mg/kg	1	NONE	42	29	38		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	42	29	38		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	17	17	23		
Lead (aqua regia extractable)	mg/kg	2	MCERTS	36	110	24		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	32	28	37		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	40	26	35		
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	89	63	69		



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230125	230126	230127		
Sample Reference				TP24	TP25	TP26		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.60	0.40	0.35		
Date Sampled				10/10/2012	10/10/2012	10/10/2012		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Monoaromatics								
Benzene				µg/kg	1	MCERTS	< 1.0	< 1.0
Toluene				µg/kg	1	MCERTS	< 1.0	< 1.0
Ethylbenzene				µg/kg	1	MCERTS	< 1.0	< 1.0
p & m-xylene				µg/kg	1	MCERTS	< 1.0	< 1.0
o-xylene				µg/kg	1	MCERTS	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)				µg/kg	1	MCERTS	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		

Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230125	230126	230127		
Sample Reference				TP24	TP25	TP26		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.60	0.40	0.35		
Date Sampled				10/10/2012	10/10/2012	10/10/2012		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
VOCs								
Chloromethane	µg/kg	4	ISO 17025	< 4.0	< 4.0	-		
Chloroethane	µg/kg	2	ISO 17025	< 2.0	< 2.0	-		
Bromomethane	µg/kg	6	ISO 17025	< 6.0	< 6.0	-		
Vinyl Chloride	µg/kg	24	ISO 17025	< 24	< 24	-		
Trichlorofluoromethane	µg/kg	5	ISO 17025	< 5.0	< 5.0	-		
1,1-dichloroethene	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/kg	7	ISO 17025	< 7.0	< 7.0	-		
Cis-1,2-dichloroethene	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1-dichloroethane	µg/kg	6	MCERTS	< 6.0	< 6.0	-		
2,2-Dichloropropane	µg/kg	6	NONE	< 6.0	< 6.0	-		
Trichloromethane	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
1,1,1-Trichloroethane	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
1,2-dichloroethane	µg/kg	4	MCERTS	< 4.0	< 4.0	-		
1,1-Dichloropropene	µg/kg	7	NONE	< 7.0	< 7.0	-		
Trans-1,2-dichloroethene	µg/kg	7	NONE	< 7.0	< 7.0	-		
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Tetrachloromethane	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
1,2-dichloropropane	µg/kg	6	MCERTS	< 6.0	< 6.0	-		
Trichloroethene	µg/kg	6	MCERTS	< 6.0	< 6.0	-		
Dibromomethane	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
Bromodichloromethane	µg/kg	7	NONE	< 7.0	< 7.0	-		
Cis-1,3-dichloropropene	µg/kg	7	ISO 17025	< 7.0	< 7.0	-		
Trans-1,3-dichloropropene	µg/kg	8	ISO 17025	< 8.0	< 8.0	-		
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2-Trichloroethane	µg/kg	5	MCERTS	< 5.0	< 5.0	-		
1,3-Dichloropropane	µg/kg	8	ISO 17025	< 8.0	< 8.0	-		
Dibromochloromethane	µg/kg	2	ISO 17025	< 2.0	< 2.0	-		
Tetrachloroethene	µg/kg	8	MCERTS	< 8.0	< 8.0	-		
1,2-Dibromoethane	µg/kg	3	ISO 17025	< 3.0	< 3.0	-		
Chlorobenzene	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
1,1,1,2-Tetrachloroethane	µg/kg	4	MCERTS	< 4.0	< 4.0	-		
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
Styrene	µg/kg	5	MCERTS	< 5.0	< 5.0	-		
Tribromomethane	µg/kg	7	MCERTS	< 7.0	< 7.0	-		
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	-		
1,1,2,2-Tetrachloroethane	µg/kg	3	MCERTS	< 3.0	< 3.0	< 3.0		
Isopropylbenzene	µg/kg	7	NONE	< 7.0	< 7.0	-		
Bromobenzene	µg/kg	11	MCERTS	< 11	< 11	-		
N-Propylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	-		
2-Chlorotoluene	µg/kg	11	NONE	< 11	< 11	-		
4-Chlorotoluene	µg/kg	11	NONE	< 11	< 11	-		
1,3,5-Trimethylbenzene	µg/kg	4	ISO 17025	< 4.0	< 4.0	-		
Tert-Butylbenzene	µg/kg	4	NONE	< 4.0	< 4.0	-		
1,2,4-Trimethylbenzene	µg/kg	5	ISO 17025	< 5.0	< 5.0	-		
Sec-Butylbenzene	µg/kg	5	NONE	< 5.0	< 5.0	-		
1,3-dichlorobenzene	µg/kg	7	ISO 17025	< 7.0	< 7.0	-		
p-Isopropyltoluene	µg/kg	16	ISO 17025	< 16	< 16	-		
1,2-dichlorobenzene	µg/kg	5	MCERTS	< 5.0	< 5.0	-		
1,4-dichlorobenzene	µg/kg	8	MCERTS	< 8.0	< 8.0	-		
Butylbenzene	µg/kg	4	NONE	< 4.0	< 4.0	-		
1,2-Dibromo-3-chloropropane	µg/kg	7	ISO 17025	< 7.0	< 7.0	-		
1,2,4-Trichlorobenzene	µg/kg	9	MCERTS	< 9.0	< 9.0	-		
Hexachlorobutadiene	µg/kg	7	NONE	< 7.0	< 7.0	-		
1,2,3-Trichlorobenzene	µg/kg	10	NONE	< 10	< 10	-		



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230125	230126	230127		
Sample Reference				TP24	TP25	TP26		
Sample Number				None Supplied	None Supplied	None Supplied		
Depth (m)				0.60	0.40	0.35		
Date Sampled				10/10/2012	10/10/2012	10/10/2012		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Phenol	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
2-Chlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Bis(2-chloroethyl)ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,3-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
1,2-Dichlorobenzene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
1,4-Dichlorobenzene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Bis(2-chloroisopropyl)ether	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2-Methylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Hexachloroethane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Nitrobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Methylphenol	mg/kg	0.2	NONE	< 0.2	< 0.2	-		
Isophorone	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Nitrophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
2,4-Dimethylphenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bis(2-chloroethoxy)methane	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
1,2,4-Trichlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Naphthalene	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	-		
2,4-Dichlorophenol	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
4-Chloroaniline	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
Hexachlorobutadiene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
4-Chloro-3-methylphenol	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2,4,6-Trichlorophenol	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,4,5-Trichlorophenol	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
2-Methylnaphthalene	mg/kg	0.1	NONE	< 0.1	< 0.1	-		
2-Chloronaphthalene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Dimethylphthalate	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,6-Dinitrotoluene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Acenaphthylene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Acenaphthene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
2,4-Dinitrotoluene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Dibenzofuran	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
4-Chlorophenyl phenyl ether	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Diethyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
4-Nitroaniline	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Fluorene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Azobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Bromophenyl phenyl ether	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Hexachlorobenzene	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Phenanthrene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Anthracene	mg/kg	0.1	MCERTS	< 0.1	< 0.1	-		
Carbazole	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Dibutyl phthalate	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Antraquinone	mg/kg	0.3	MCERTS	< 0.3	< 0.3	-		
Fluoranthene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Pyrene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Butyl benzyl phthalate	mg/kg	0.3	ISO 17025	< 0.3	< 0.3	-		
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.2	< 0.2	-		
Chrysene	mg/kg	0.05	ISO 17025	< 0.1	< 0.1	-		
Benzo(b)fluoranthene	mg/kg	0.1	ISO 17025	< 0.1	< 0.1	-		
Benzo(k)fluoranthene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.1	< 0.1	-		
Indeno(1,2,3-cd)pyrene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Dibenz(a,h)anthracene	mg/kg	0.2	ISO 17025	< 0.2	< 0.2	-		
Benzo(ghi)perylene	mg/kg	0.05	ISO 17025	< 0.1	< 0.1	-		



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230120				
Sample Reference				TP20				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				10/10/2012				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.2				
Sulphate as SO ₄	ug/l	45	ISO 17025	220000				
Sulphide	ug/l	5	NONE	< 5.0				
Chloride	mg/l	4	ISO 17025	18				
Ammoniacal Nitrogen as N	ug/l	15	ISO 17025	670				
Ammonium as NH ₄	ug/l	15	ISO 17025	860				
Nitrate as N	mg/l	1	ISO 17025	< 1.0				
Nitrite as N	ug/l	10	ISO 17025	120				

Heavy Metals / Metalloids

Arsenic (dissolved)	ug/l	1	ISO 17025	15				
Barium (dissolved)	ug/l	0.05	ISO 17025	170				
Beryllium (dissolved)	ug/l	0.2	ISO 17025	< 0.2				
Boron (dissolved)	ug/l	10	ISO 17025	180				
Cadmium (dissolved)	ug/l	0.1	ISO 17025	< 0.1				
Chromium (dissolved)	ug/l	0.4	ISO 17025	< 0.4				
Copper (dissolved)	ug/l	0.7	ISO 17025	4.0				
Lead (dissolved)	ug/l	1	ISO 17025	1.3				
Mercury (dissolved)	ug/l	0.5	ISO 17025	< 0.5				
Nickel (dissolved)	ug/l	0.3	ISO 17025	2.9				
Selenium (dissolved)	ug/l	4	ISO 17025	< 4.0				
Vanadium (dissolved)	ug/l	1.7	ISO 17025	5.9				
Zinc (dissolved)	ug/l	0.4	ISO 17025	17				



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230120				
Sample Reference				TP20				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				10/10/2012				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

Benzene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C6 - C8	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C8 - C10	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				

TPH-CWG - Aromatic >C5 - C7	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C7 - C8	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C8 - C10	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230120				
Sample Reference				TP20				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				10/10/2012				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

VOCs

Chloromethane	µg/l	1	ISO 17025	< 1.0				
Chloroethane	µg/l	1	ISO 17025	< 1.0				
Bromomethane	µg/l	1	ISO 17025	< 1.0				
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0				
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0				
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0				
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0				
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloromethane	µg/l	1	ISO 17025	< 1.0				
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0				
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0				
Benzene	µg/l	1	ISO 17025	< 1.0				
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0				
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0				
Trichloroethene	µg/l	1	ISO 17025	< 1.0				
Dibromomethane	µg/l	1	ISO 17025	< 1.0				
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0				
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0				
Toluene	µg/l	1	ISO 17025	< 1.0				
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0				
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0				
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0				
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0				
Chlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Ethylbenzene	µg/l	1	ISO 17025	< 1.0				
p & m-xylene	µg/l	1	ISO 17025	< 1.0				
Styrene	µg/l	1	ISO 17025	< 1.0				
Tribromomethane	µg/l	1	ISO 17025	< 1.0				
o-xylene	µg/l	1	ISO 17025	< 1.0				
1,1,2,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0				
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0				
Bromobenzene	µg/l	1	ISO 17025	< 1.0				
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0				
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0				
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0				
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
P-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0				
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Butylbenzene	µg/l	1	ISO 17025	< 1.0				
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0				
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0				
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1				



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230120				
Sample Reference				TP20				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				10/10/2012				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		
1,2,3-Trichlorobenzene				µg/l	1	ISO 17025	< 1.0	



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number	230120				
Sample Reference	TP20				
Sample Number	None Supplied				
Depth (m)	1.00				
Date Sampled	10/10/2012				
Time Taken	None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

SVOCs

Aniline	µg/l	0.05	NONE	< 0.05				
Phenol	µg/l	0.05	NONE	< 0.05				
2-Chlorophenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethyl)ether	µg/l	0.05	NONE	< 0.05				
1,3-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,2-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
1,4-Dichlorobenzene	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroisopropyl)ether	µg/l	0.05	NONE	< 0.05				
2-Methylphenol	µg/l	0.05	NONE	< 0.05				
Hexachloroethane	µg/l	0.05	NONE	< 0.05				
Nitrobenzene	µg/l	0.05	NONE	< 0.05				
4-Methylphenol	µg/l	0.05	NONE	< 0.05				
Isophorone	µg/l	0.05	NONE	< 0.05				
2-Nitrophenol	µg/l	0.05	NONE	< 0.05				
2,4-Dimethylphenol	µg/l	0.05	NONE	< 0.05				
Bis(2-chloroethoxy)methane	µg/l	0.05	NONE	< 0.05				
1,2,4-Trichlorobenzene	µg/l	0.05	NONE	< 0.05				
Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dichlorophenol	µg/l	0.05	NONE	< 0.05				
4-Chloroaniline	µg/l	0.05	NONE	< 0.05				
Hexachlorobutadiene	µg/l	0.05	NONE	< 0.05				
4-Chloro-3-methylphenol	µg/l	0.05	NONE	< 0.05				
2,4,6-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2,4,5-Trichlorophenol	µg/l	0.05	NONE	< 0.05				
2-Methylnaphthalene	µg/l	0.05	NONE	< 0.05				
2-Chloronaphthalene	µg/l	0.05	NONE	< 0.05				
Dimethylphthalate	µg/l	0.05	NONE	< 0.05				
2,6-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
2,4-Dinitrotoluene	µg/l	0.05	NONE	< 0.05				
Dibenzofuran	µg/l	0.05	NONE	< 0.05				
4-Chlorophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Diethyl phthalate	µg/l	0.05	NONE	< 0.05				
4-Nitroaniline	µg/l	0.05	NONE	< 0.05				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Azobenzene	µg/l	0.05	NONE	< 0.05				
Bromophenyl phenyl ether	µg/l	0.05	NONE	< 0.05				
Hexachlorobenzene	µg/l	0.02	NONE	< 0.02				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Carbazole	µg/l	0.05	NONE	< 0.05				
Dibutyl phthalate	µg/l	0.05	NONE	< 0.05				
Anthraquinone	µg/l	0.05	NONE	< 0.05				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Butyl benzyl phthalate	µg/l	0.05	NONE	< 0.05				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01				



Analytical Report Number: 12-36843

Project / Site name: 60895

Your Order No: 1390

Lab Sample Number				230120				
Sample Reference				TP20				
Sample Number				None Supplied				
Depth (m)				1.00				
Date Sampled				10/10/2012				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

U/S = Unsuitable Sample I/S = Insufficient Sample



Analytical Report Number : 12-36843

Project / Site name: 60895

* These descriptions are only intended to act as a cross check if sample identities are questioned. The major constituent of the sample is intended to act with respect to MCERTS validation. The laboratory is accredited for sand, clay and topsoil/loam soil types. Data for unaccredited types of solid should be interpreted with care.

Stone content

of a sample is calculated as the % weight of the stones not passing a 2 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
230114	TP15	None Supplied	0.40	Brown clay and sand with vegetation.
230115	TP16	None Supplied	0.60	Brown clay and sand with gravel.
230116	TP17	None Supplied	0.25	Brown gravelly topsoil with vegetation and brick.
230117	TP18	None Supplied	0.30	Brown clay and sand with gravel and brick.
230118	TP19	None Supplied	0.45	Brown clay and sand with gravel and brick.
230119	TP20	None Supplied	0.50	Brown clay and topsoil with gravel and vegetation.
230121	TP21	None Supplied	0.20	Brown clay and topsoil with vegetation.
230122	TP22	None Supplied	0.10	Grey topsoil and sand with vegetation.
230123	TP22	None Supplied	0.30	Grey clay.
230124	TP23	None Supplied	0.60	Brown topsoil and sand with gravel.
230125	TP24	None Supplied	0.60	Light brown clay and sand.
230126	TP25	None Supplied	0.40	Brown clay and sand.
230127	TP26	None Supplied	0.35	Brown clay and sand.



Analytical Report Number : 12-36843

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in water	Determination of ammoniacal nitrogen in water by addition of buffer solution followed by ion selective electrode. Results for ammonia species are calculated from raw ammoniacal nitrogen data, and then reported to 2 significant figures.	In-house method	L035-PL	W	ISO 17025
Ammonium as NH ₄ in soil	Determination of ammonium in soil by extraction with potassium chloride followed by addition of buffer solution followed by ion selective electrode.	In-house method	L035-PL	W	MCERTS
Ammonium as NH ₄ in water	Determination of ammonium in water by addition of buffer solution followed by ion selective electrode. Results for ammonia species are calculated from raw ammoniacal nitrogen data, and then reported to 2 significant figures.	In-house method	L035-PL	W	ISO 17025
Boron in water	Determination of boron by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0735-PL	W	MCERTS
BTEX and MTBE in water	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Chloride in water	Determination of chloride in water by titration against silver nitrate.	In-house method	L024-PL	W	ISO 17025
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	D	NONE
Explosives to RPS Mountainheath in Soil	Subcontracted.	Subcontracted analysis		W	NONE
Fraction of Organic Carbon in soil	Determination of fraction of organic carbon in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L023-PL	D	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE

Analytical Report Number : 12-36843

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Nitrate as N in water	Determination of nitrate in water by cadmium reduction followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L077-PL	W	ISO 17025
Nitrite as N in water	Determination of nitrite in water by addition of sulphanilamide and NED followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L077-PI	W	ISO 17025
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Semi-volatile organic compounds in soil	Determination of semi-volatile organic compounds in soil by extraction in dichloromethane and hexane followed by GC-MS.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Semi-volatile organic compounds in water	Determination of semi-volatile organic compounds in water by extraction in hexane followed by GC-MS.	In-house method based on USEPA 8270	L070-UK	W	NONE
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method	L010-PL	W	NONE
TPH7 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-UK	W	NONE
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS



Analytical Report Number : 12-36843

Project / Site name: 60895

Water matrix abbreviations: Surface Water (SW) Potable Water (PW) Ground Water (GW)

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Water Soluble Nitrate (2:1) as N in soil	Determination of nitrate in soil by extraction in water followed by reaction with sodium salicylate in the presence of sulphuric acid. The reaction product is nitrosalicylic acid, which forms a yellow	In-house method based on Polish Standard Method PN-82/C-04579.08.	L077-PL	D	NONE
Water Soluble Nitrite (2:1) as N in soil	Determination of nitrite in soil by extraction with water followed by with 4-aminobenzene sulphonamide reagent in the presence of orthophosphoric acid at pH 1.9 to form a	In-house method based on ISO:EN 26777:1993 nitrite.	L078-PL	D	NONE

For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

For method numbers ending in 'PL' analysis have been carried out in our laboratory in Poland.

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 30°C.

Analytical Report

i2 Analytical Limited
 Building 19
 BRE
 Garston
 Watford, WD25 9XX

Report No: 12-29140/2
 Date Received: 17/10/2012
 Date Tested: 19/10/2012 to 23/10/2012
 Date Issued: 29/10/2012
 Page: 1 of 2

For the attention of: Dee Theis

By email

2 soil samples received from i2 Analytical Limited (O/N: 4711, 12-36904; Project: 12-36904) in 100ml amber glass jars were analysed as shown below. Analytical methods employed are available on request.

Laboratory reference			215208 230497 TP8 / / (HHMM) 0.20m	215209 230505 TP36 / / (HHMM) 0.20m
2,4,6-trinitrotoluene ##	[118-96-7]	mg/kg	< 0.5	< 0.5
2,4-dinitrotoluene ##	[121-14-2]	mg/kg	< 1.0	< 1.0
2,6-dinitrotoluene ##	[606-20-2]	mg/kg	< 1.0	< 1.0
hexanitrostilbene ##	[20062-22-0]	mg/kg	< 0.5	< 0.5
HMX ##	[2691-41-0]	mg/kg	< 1.0	< 1.0
PETN ##	[78-11-5]	mg/kg	< 5.0	< 5.0
RDX ##	[121-82-4]	mg/kg	< 1.0	< 1.0
tetryl ##	[479-45-8]	mg/kg	< 1.0	< 1.0
picrite ##	[556-88-7]	mg/kg	< 0.10	< 0.10
picric acid ##	[88-89-1]	mg/kg	< 0.1	< 0.1
ethylene glycol dinitrate ##	[628-96-2]	mg/kg	< 0.1	< 0.1
nitroglycerine ##	[55-63-0]	mg/kg	< 0.1	< 0.1
nitrocellulose #	[9004-70-0]	mg/kg	< 5000.00	< 5000.00
soil type	n/a	n/a	Type 4	Type 4

This report replaces report 12-29140/1 in its entirety.

Comments:

No site name, sampling date or sampling time supplied with sample.



Marco Lattughi
Senior Operations Manager

This method is UKAS accredited.

This method is MCERTS accredited.



1663

SOIL TYPING:

Type 1. Clay - Brown
Type 2. Clay - Grey/Black
Type 3. Sand
Type 4. Top soil (standard)
Type 5. Top soil (high peat)
Type 6. Made ground (>50% clay)
Type 7. Made ground (>50% sand)
Type 8. Made ground (>50% top soil)
Type X. Other (outside the scope of MCERTS accreditation)

NOTES:

1. This test report shall not be reproduced except in full, without written approval of the laboratory.
2. All results for soil samples are reported based on the dry weight of soil which has been air-dried in open, shallow trays at temperatures below 30 °C and subsequently ground and sieved to pass through a nominal 710µm aperture sieve. Prior to grinding, any material which is retained on a sieve of mesh size 4.75mm is discarded. In most cases, analysis is carried out directly on these prepared soils.
3. Unless otherwise stated, results are not corrected for analytical recoveries.
4. All samples were received in good condition unless otherwise stated. Results provided by the Laboratory are based on samples submitted by clients. Once submitted, samples requiring analysis are stored at 5 ± 3 °C. The Laboratory cannot be held responsible for the storage, condition or preservation of samples prior to arrival.
5. Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
6. Soil descriptions are given in order to provide a log of sample matrices submitted and are not intended as full geological descriptions.
7. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report

i2 Analytical Limited
 Building 19
 BRE
 Garston
 Watford, WD25 9XX

Report No: 12-29108/2
 Date Received: 15/10/2012
 Date Tested: 17/10/2012
 Date Issued: 29/10/2012
 Page: 1 of 2

For the attention of: Dee Theis

By email

2 soil samples received from i2 Analytical Limited (O/N: 4704,12-36848; Project: 12-36848) in 100ml amber glass jars were analysed as shown below. Analytical methods employed are available on request.

Laboratory reference			215111 230143 TP1 / / (HHMM) 0.40m	215112 230151 TP12 / / (HHMM) 0.40m
2,4,6-trinitrotoluene ##	[118-96-7]	mg/kg	< 0.5	< 0.5
2,4-dinitrotoluene ##	[121-14-2]	mg/kg	< 1.0	< 1.0
2,6-dinitrotoluene ##	[606-20-2]	mg/kg	< 1.0	< 1.0
hexanitrostilbene ##	[20062-22-0]	mg/kg	< 0.5	< 0.5
HMX ##	[2691-41-0]	mg/kg	< 1.0	< 1.0
PETN ##	[78-11-5]	mg/kg	< 5.0	< 5.0
RDX ##	[121-82-4]	mg/kg	< 1.0	< 1.0
tetryl ##	[479-45-8]	mg/kg	< 1.0	< 1.0
picrite ##	[556-88-7]	mg/kg	< 0.10	< 0.10
picric acid ##	[88-89-1]	mg/kg	< 0.1	< 0.1
ethylene glycol dinitrate ##	[628-96-2]	mg/kg	< 0.1	< 0.1
nitroglycerine ##	[55-63-0]	mg/kg	< 0.1	< 0.1
nitrocellulose #	[9004-70-0]	mg/kg	< 5000.00	< 5000.00
soil type	n/a	n/a	Type 8	Type 7

This report replaces report 12-29108/1 in its entirety.

Comments:

No site name, sampling date or time supplied with sample.



Marco Lattughi
Senior Operations Manager

This method is UKAS accredited.

This method is MCERTS accredited.



1663

SOIL TYPING:

Type 1. Clay - Brown
Type 2. Clay - Grey/Black
Type 3. Sand
Type 4. Top soil (standard)
Type 5. Top soil (high peat)
Type 6. Made ground (>50% clay)
Type 7. Made ground (>50% sand)
Type 8. Made ground (>50% top soil)
Type X. Other (outside the scope of MCERTS accreditation)

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5. Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
6. Soil descriptions are given in order to provide a log of sample matrices submitted and are not intended as full geological descriptions.
7. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report

i2 Analytical Limited
 Building 19
 BRE
 Garston
 Watford, WD25 9XX

Report No: 12-29109/2
 Date Received: 15/10/2012
 Date Tested: 17/10/2012
 Date Issued: 29/10/2012
 Page: 1 of 2

For the attention of: Dee Theis

By email

1 soil sample received from i2 Analytical Limited (O/N: 4703,12-36843; Project: 12-36843) in a 100ml amber glass jar was analysed as shown below. Analytical methods employed are available on request.

Laboratory reference			215113 230124 TP23 / / (HHMM) 0.60m
2,4,6-trinitrotoluene ##	[118-96-7]	mg/kg	< 0.5
2,4-dinitrotoluene ##	[121-14-2]	mg/kg	< 1.0
2,6-dinitrotoluene ##	[606-20-2]	mg/kg	< 1.0
hexanitrostilbene ##	[20062-22-0]	mg/kg	< 0.5
HMX ##	[2691-41-0]	mg/kg	< 1.0
PETN ##	[78-11-5]	mg/kg	< 5.0
RDX ##	[121-82-4]	mg/kg	< 1.0
tetryl ##	[479-45-8]	mg/kg	< 1.0
picrite ##	[556-88-7]	mg/kg	< 0.10
picric acid ##	[88-89-1]	mg/kg	< 0.1
ethylene glycol dinitrate ##	[628-96-2]	mg/kg	< 0.1
nitroglycerine ##	[55-63-0]	mg/kg	< 0.1
nitrocellulose #	[9004-70-0]	mg/kg	< 5000.00
soil type	n/a	n/a	Type 4

This report replaces report 12-29109/1 in its entirety.

Comments:

No site name, sampling date or time supplied with sample.



Marco Lattughi
Senior Operations Manager

This method is UKAS accredited.

This method is MCERTS accredited.



1663

SOIL TYPING:

Type 1. Clay - Brown
Type 2. Clay - Grey/Black
Type 3. Sand
Type 4. Top soil (standard)
Type 5. Top soil (high peat)
Type 6. Made ground (>50% clay)
Type 7. Made ground (>50% sand)
Type 8. Made ground (>50% top soil)
Type X. Other (outside the scope of MCERTS accreditation)

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3. Unless otherwise stated, results are not corrected for analytical recoveries.
4. All samples were received in good condition unless otherwise stated. Results provided by the Laboratory are based on samples submitted by clients. Once submitted, samples requiring analysis are stored at 5 ± 3 °C. The Laboratory cannot be held responsible for the storage, condition or preservation of samples prior to arrival.
5. Samples were taken by the customer and, unless otherwise stated, sampling locations were not supplied.
6. Soil descriptions are given in order to provide a log of sample matrices submitted and are not intended as full geological descriptions.
7. Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.