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EXECUTIVE SUMMARY

Ramboll Environment and Health UK Limited (Ramboll) was instructed by Watkin Jones & Son Limited to prepare a Remediation Verification Report for the Thames Quarter development at King's Meadow, Reading, RG1 8BN. This report is required in connection with the proposed development of the site by the Client for residential apartment end use. This Verification Report follows a number of assessments that are typically undertaken to evaluate the contamination status of a site. Past assessments have included:

- A Preliminary Risk Assessment (including Conceptual Site Model);
- Phase II site investigation including a Generic Quantitative Risk Assessments for human health purposes; and,
- A Remediation Strategy.

This Verification Report has been produced to demonstrate that the approach outlined in the Remediation Strategy has been implemented. The Remediation Strategy outlined the final remediation activities, the Long-Term Works, following the completion of earlier remediation strategies for works known as the Short Term and Mid Term Works relating to a former pollution incident that had occurred on the site.

The remediation work was undertaken between 18th June and 13th July with Ramboll providing full time site attendance during the remediation activities, which involved bulk excavation of impacted soils, free phase product and structures associated with contamination (a fill pipe and interceptor). The works were validated through visual observation, PID readings and soil sampling. All soil samples taken were below the remedial target values and most recorded concentrations below the laboratory detection limit. In accordance with the remediation strategy, a grout wall was installed to encapsulate residual product entrained in the gravel packing beneath a culvert that crosses the site, as it was not possible to excavate beneath this area.

Subsequent post-remediation groundwater monitoring to verify and measure the efficiency of the remediation works was undertaken and all three rounds demonstrated the condition of groundwater to be acceptable, no free phase product was recorded and isolated detections of TPH concentrations present in two of nine wells over three rounds were recorded at concentrations below the remedial target values for controlled waters set in the remediation strategy.

Conclusion

In conclusion, Ramboll considers the soil and groundwater remediation that has been completed to satisfy the objectives outlined in the Remediation Strategy and that the site is now suitable for redevelopment. Further remediation or additional groundwater monitoring is not considered to be necessary.

Recommendations

It is recommended that this report is submitted to the regulatory authorities for approval. In future the installation of the capping layer in landscaped areas should be validated through visual observations and soil testing as is standard practice for residential development sites and in accordance with the validation practices set out in the Remediation Strategy.

During future excavations for foundation and utility runs unexpected contamination finds such as local spots of oil in the ground or asbestos (if identified) should be reported to the Local Authority in accordance with the watching brief procedure provided in the Remedial Strategy.

Piling work should be completed in accordance with the Foundation Works Risk Assessment.

1. INTRODUCTION

1.1 Background

Ramboll Environment and Health UK Limited ("Ramboll") was instructed by Watkin Jones & Son Limited (the "Client") to prepare a remediation Verification Report for the Thames Quarter development at King's Meadow, Reading, RG1 8BN (the "site").

A site location plan and former site layout plan are attached as Figure 1 and Figure 2 respectively in Appendix 1. The report is required in connection with the proposed redevelopment of the site by the Client for a residential apartment end use. The proposed development layout is attached as Figure 3, Appendix 1.

This Verification Report follows a number of assessments that have been undertaken in accordance with standard practices to evaluate the contamination status of a site. Previous assessments by Ramboll include:

- Preliminary Risk Assessment (including Conceptual Site Model), dated February 2018;
- Phase II Environmental Site Investigation (ESI), including a Generic Quantitative Risk Assessments for human health purposes, dated February 2018; and,
- Remediation Strategy, dated February 2018.

Previous remediation activities have been undertaken at the site in relation to a pollution incident that occurred in 2013. These are referred to as the Short Term or Source Removal Works followed by the Mid Term Works. The remediation strategy produced by Ramboll in February 2018 continued from the earlier strategies and covered the Long-Term Works that outlined the final remediation activities that were required to undertake the final stage of clean-up of the pollution incident and prepare the site for redevelopment to residential end use.

1.2 Objectives

This Verification Report has been produced to demonstrate that the approach outlined in the 2018 Remediation Strategy has been implemented and to satisfy the relevant planning condition.

1.3 Proposed Development and Planning Permission

The site is being developed under Reading Borough Council Planning Permission Number 162166, which was permitted on the 6th December 2016.

The Planning Permissions covers:

- "Erection of a part 12 storey, part 23 storey building comprising 315 apartments in a mix of studio, one-bedroom, two-bedroom and 3-bedroom units; residents' lounges, tech-hub, dining room, and cinema room, various rooftop outdoor amenity spaces, concierge/reception with coffee meeting area, residents' storage facilities, post room, ancillary back-of-house facilities, 315 secure cycle parking spaces, 49 car parking spaces, landscaping, and associated works. Demolition of existing multi-storey car park."

In relation to the ground contamination assessment, there are strips of soft landscaping proposed in the north of the site and two landscaped islands proposed in the west of the site. The remainder of the site will be covered by buildings and hardstanding. Also, of note, there are no residential apartments located at ground floor level which will be occupied by an entrance hall, cycle store, plant rooms, post room, a concierge space and car parking area. The proposed development floor plan is presented as Figure 3, Appendix 1.

Relating to ground contamination the Planning Conditions broadly require:

- Condition 06: Contamination (characterisation).

- Condition 07: Contamination (remediation scheme).
- Condition 08: Contamination (implementation of remediation).
- Condition 09: Contamination (unexpected contamination).
- Condition 10: Land Gas (site investigation).
- Condition 11: Land Gas (remediation scheme).
- Condition 12: Land Gas (implementation of remediation).
- Condition 13: Piling method statement (in line with the EA Foundation Works Risk Assessment guidance).

Ramboll's preceding Preliminary Risk Assessment, Phase II ESI and Remediation Strategy have been prepared to discharge Planning Conditions 06, 07, 09 and 10. It should be noted that the Phase II ESI did not identify a requirement for ground gas protection and therefore a remediation scheme for land gas risks and implementation of remedial measures for land gas risks as required by Planning Conditions 11 and 12 are not considered by Ramboll to be required.

This report has been prepared to support discharge of Planning Condition 08, which is detailed as follows:

- *The approved remediation scheme shall be implemented in accordance with the approved timetable of works. A validation report (that demonstrates the effectiveness of the remediation carried out and which identifies any requirements for longer-term monitoring of pollutants/pollutant linkages, maintenance and arrangements for contingency action) must be submitted to and approved by the Local Planning Authority prior to construction of the development. The long-term monitoring and maintenance plan shall be implemented as approved.*

This report has been prepared to support the discharge of the above condition.

Planning Condition 09 relating to unexpected contamination can be discharged once the remaining ground works and pile mat are complete. The limited unexpected contamination encountered during the Remediation Works was dealt with at the time and remediated as per the rest of the site (as documented in this report).

1.4 Relevant Parties

- **Client & Project Manager:** The works have been commissioned and were also project managed by Watkin Jones and Son Limited.
- **Principal Contractor:** The Client appointed J Mould (referred to as the "Principal Contractor") for the purposes of demolition and site preparation for redevelopment. J Mould was responsible for the CDM Principal Contractor role.
- **The Remediation Contractor:** The Client appointed Soilfix Limited (also referred to as the "Remediation Contractor") for the purposes of implementing the Ramboll Remediation Strategy. On completion of the remediation works, the Contractor prepared a completion report, which is presented in Appendix 6.
- **Environmental Consultant:** Ramboll is acting as the Environmental Consultant and monitored the soil and groundwater remediation works on behalf of the Client. This included attendance on site during key stages to undertake a watching brief and observe remediation activities, liaison with the Client/Project Manager, verification soil sampling and undertaking of post remediation groundwater monitoring.

1.5 Regulatory Authorities

The remediation strategy was provided to and agreed with the regulatory authorities prior to works taking place, the Environmental Health Officer responded via email on 6th February 2018 and the Environment Agency responded via email on 27th February 2018. Ramboll understands that the planning condition that required the remediation strategy has since been discharged.

1.6 Report Structure

The report is structured as follows:

- Section 2: previous assessment overview, summarises the previous soil and groundwater investigations which have taken place at the study area, the ground conditions encountered and identified contamination;
- Section 3: outlines the remediation strategy for the subject site;
- Section 4: describes the remediation works that were implemented;
- Section 5: details the remediation excavations and samples taken;
- Section 6: soil validation results discussion;
- Section 7: detail on the groundwater monitoring and sampling undertaken;
- Section 8: groundwater validation results discussion;
- Section 9: materials management plan implementation verification;
- Section 10: waste management undertaken at the site during the remediation works; and
- Section 11: presents the conclusions and recommendations following completion of the remediation works and verification process.

1.7 Constraints and Limitations

This report has been prepared for the exclusive use of Watkin Jones and Son Limited and should not be used in whole or in part by any third parties without the express permission of Ramboll in writing.

Remediation works implemented and documented within this report have been completed in-line with Ramboll's remediation strategy that took into account the findings of the Ramboll site investigation, which in turn was scoped and undertaken based on the findings of previous third-party site assessments and previous remediation works on-site.

This report in no way comprises a geotechnical / structural validation of the area subject to remedial works nor does it comment on considerations of such ground improvement, structural mitigation or conditions to facilitate future development.

As with any brownfield site it cannot be discounted that local hotspots of unexpected contamination may remain in areas of the site away from remediation areas or investigative exploratory positions.

The remediation constraints included a live foul drain running across the site from east to west which is operational and remained in place for the remediation works. The culvert was also a main constraint; the proposed remediation strategy had already taken this into consideration.

2. PREVIOUS ASSESSMENT OVERVIEW

2.1 RPS Site Investigation 2008

RPS undertook a site investigation in 2008 that was assessed based on a proposed residential end use for the site. This identified observations of hydrocarbon odours in soils and groundwater at three locations: WS9 (in the east of site), and WS2 and WS3 (close to the southern boundary).

2.2 Previous Ramboll Investigation and Remediation Works

Ramboll was involved in investigation and remediation at the site between 2013 and 2015, in relation to the pollution incident (late 2013). The remediation works are described in full in the Ramboll reports for the Short Term and Mid Term works, however, a summary is provided below:

- **Short Term Works (2013):** the initial response to the pollution incident involved the removal of oil from on-site drains, emptying of the underground oil tank, and clean-up of off-site surface waters. A site investigation was undertaken that identified neat oil in the ground generally within a 5 m radius from the UST and at the connection between site drainage discharge and the storm water culvert.
- **Source Removal (Summer 2014):** the UST and surrounding impacted soil was removed. Sumps were installed in the underlying aquifer and oil was extracted on a fortnightly basis. This was completed in a pre-defined area due to the presence of constraining structures. Generally only pockets of staining were encountered outside of the pre-defined area, although free phase product was encountered adjacent to the culvert in the gravel surround.
- **Mid Term Works (June - December 2015):** a second phase of remediation excavation primarily targeted the area to the immediate west of the Thames Water culvert. Contaminated pipe bedding was removed and oily contamination in the deeper gravels was also 'chased out' through excavation. The remediation works comprised the excavation of contamination over an area of approximately 88m²; this is in addition to the 117m² excavated during the Summer 2014 Source Removal works. Further extraction of free phase product took place during the works and on cessation residual product remained in Sump 1C and intermittently in Sump 1B located just to the west of the Thames Water Culvert.
- **Phase II ESI (2017):** Remediation was considered necessary for discrete areas where contamination remained following the Mid Term Works. Free phase product was identified in the existing Sumps 1B and 1C, and in nearby well installed in the alluvium in WS407 and WS410. No further significant soil or groundwater sources of contamination were identified outside of the previously targeted remediation areas and UST features. No evidence of significant ground contamination was encountered in locations that targeted the RPS locations WS2/WS3 and WS9.
- **DQRA:** A previous controlled waters DQRA was completed in December 2014 that provided an assessment of risks to the wider River Terrace Deposit / Chalk aquifer and the River Thames from on-site contamination, as part of the previous remediation strategy development. Site specific remedial targets were developed in the DQRA for soil and groundwater to be protective of controlled waters and were adopted in Ramboll's 2018 remediation strategy. Based on the groundwater data obtained in December 2017 the only location where the soil and groundwater remedial targets were exceeded was in WS407 (total TPH concentration of 62.8 mg/l recorded in groundwater and free phase product identified in soils and an oily sheen was present on Alluvial groundwater). The removal of neat free phase product and soil / groundwater remedial targets values were set as remediation criteria for the site under the earlier remediation strategies. These remain valid for the 2018 phase of remediation works.

3. OVERVIEW OF THE REMEDIATION STRATEGY

3.1 Introduction

The remediation strategy set out the standard to which the works were to be carried out, and the means by which the completion of the works were to be measured. An overview of the approach to the remediation is summarised below.

1. **Proof Dig:** a proof dig undertaken as part of the demolition works. The aim was to remove much of the existing redundant site drainage including oil / water interceptors and manhole chambers associated with the motor showroom and where residual oil was very locally encountered. Some of these features were scheduled for remediation – notably the removal of an oil water interceptor with residual product around it and removal of the remaining section of the underground tank's fuel fill pipe.
2. **Delineation:** to be undertaken in areas where remediation was known to be required or where evidence that remediation may be required was identified. The targeted areas were to be delineated through the excavation of trial pits/ trenches prior to the main remediation excavations.
3. **Remediation of Soil:** impacted soil was to be excavated incrementally and removed from site for disposal. The excavations were to be backfilled with 'clean' imported aggregate. Unimpacted soils were to be retained for placement back into the excavation in sequence as a proportional and sustainable approach to the work.
4. **Removal of Free Phase Product:** was to be removed through excavation where entrained in soils and skimmed from the surface where present on groundwater. The remediation strategy allowed for proposals to encapsulate or immobilise free phase product if it was identified beneath the culvert given it would not be possible to excavate beneath the culvert to remove the product because of the size of the culvert structure.
5. **Groundwater Treatment:** the presence of residual dissolved phase petroleum hydrocarbon contamination was considered possible where free phase product was locally present, therefore the strategy allowed for the application of a remediation compound (where deemed necessary) to reduce hydrocarbon concentrations.
6. **Validation:** the Remediation Contractor was required to produce records to validate that the works have been completed successfully. This was to include records of field observations, taking soil validation samples at set frequencies, confirmation that free phase product has been removed and groundwater sampling once the works are complete.
7. **Verification:** an independent verification report was to be prepared by Ramboll demonstrating that the works have been completed in line with the Remediation Strategy.

4. REMEDIATION WORKS

Prior to the main remediation works starting, Ramboll decommissioned two deep boreholes (CP01 and CP02) on 30th May 2018. These boreholes were recommended for decommissioning due to their close proximity to the proposed remediation area, and borehole design having the potential to connect the shallow strata with the deeper underlying chalk aquifer. The decommissioning of these boreholes removed the boreholes as a potential pathway for contaminant migration (if this occurred during the remediation works).

The remediation works commenced on 18th June and finished on 13th July, Ramboll were present on site throughout the remediation activities to record the progress and validate the works.

Given the time and space constraints associated with demolition and remediation works taking place concurrently, a traditional proof dig across the entire site was not undertaken prior to the remediation works taking place. Instead where features were known to exist and required remediation these were targeted for discrete excavation or captured as part of the bulk dig works. The removal of such features is discussed in Section 5.

4.1 Delineation Investigation

Based on the previous site investigations, contamination had been identified that warranted remediation and further delineation of the extent of the contamination was undertaken through a trial pitting exercise to further define the area that would be targeted for the bulk dig and product removal. At this point the structures above the culvert had not been entirely demolished and so the delineation exercise focussed on accessible areas of the site. Certain areas were not available for delineation and instead the ground was reviewed in these areas through extension of the bulk dig into these spaces. This is discussed in Table 4.1 below.

The delineation work began on 18th June 2018 targeting the available Remediation Locations identified in the Remediation Strategy report, which are shown on Figure 4 in Appendix 1. Soilfix undertook sixteen trial pits (STP1-STP16), which are shown on Figure 5 in Appendix 1. Soil samples were taken from the edges and bases of these trial pits to further define the remediation areas.

There were two types of areas identified in the Remediation Strategy where further delineation was proposed:

- areas where remediation was known to be required or is likely to be required; and
- areas where it cannot be entirely discounted that potentially significant contamination may be present based on the observations and data to date and where further trial pitting was required to provide assurance in these areas.

The areas identified for further investigation in the Remediation Strategy and the delineation findings from the works are detailed in Table 4.1 below. These locations are shown on Figure 4 in Appendix 1.

This table also references the five areas (Area 1-5) that Soilfix used to define the broad areas that required remediation. These areas are referenced below and shown on Figure 6.

Table 4.1: Summary of Remediation Target Locations and the Definition Findings		
Remediation Location	Previously Identified Contamination	Delineation Findings
Southern Face of 'Source Removal' Excavation.	Soil contamination met the Remedial Target Values (RTVs). No free phase product observed in former investigation.	This area was excavated through as part of the bulk dig and soils that appeared to be impacted were removed. Discussed further in Section 5.1.3 below.
Western Face of 'Source Removal' Excavation.	Soil contamination meets the RTVs. Mobile free phase product in north-west corner was identified that required removal.	Delineation trial pits STP 7, 8 and 9 were undertaken along the western face of the excavation. The results from all three of these trial pits came back below the level of detection. These trial pits formed the western extent of the main excavation in Area 1.
Northern Face of 'Source Removal' Excavation.	Delineation was not considered to be necessary in this area.	Nevertheless, the bulk dig was extended up to this area which is discussed further in Section 5.1.3 below.
Excavate around the culvert to 'chase out' and remove remaining free phase product and contaminated soils.	Delineation and removal of contamination along the length of the western culvert that ran beneath the former multi-storey car park.	The delineation along the culvert was conducted immediately before remediation activities took place in this area and this is discussed further in Section 5.2 below.
South-East Face of Mid Term Works Remedial Investigation.	Soil contamination met the RTVs. No free phase product was observed. However, further delineation in this area is recommended given the slightly elevated residual contaminants present on the face of the excavation.	This area was excavated through during the bulk dig in Area 1 and all impacted material was successfully removed as part of the excavation.
Free Phase Product in Gravel Aquifer (Sump 1B, 1C and WS410).	Free phase product remains present in Sump 1B and 1C. Free phase product has also been identified in the alluvium in WS410 and the contamination may extend into the gravel at this location, which is close to the two sumps. Whilst previous remedial excavations have been completed in this area the Contractor was required to excavate up to the manhole and culvert to verify contamination has not re-entered these areas.	Sump 1B, 1C and WS410 were extracted and oily water from the sumps was pumped into a tanker on site by Soilfix, and then the sumps were decommissioned. "New Sump 1C" was also installed for validation purposes in this area. This is discussed below in Section 7.
Free Phase Product in Alluvium at WS407.	Further delineation of the free phase product is required in this area.	WS407 was identified and removed as part of the main excavation within Area 1. Discussed further in Section 5.1.3 below.

Table 4.1: Summary of Remediation Target Locations and the Definition Findings		
Remediation Location	Previously Identified Contamination	Delineation Findings
RPS Locations WS2 / WS3 (and WS11)	A thin layer of free phase product was detected in WS3 in 2013. A dissolved phase petroleum hydrocarbon concentration was detected in this area in 2013 of 3.09 mg/l. However, subsequent monitoring visits did not record the presence of dissolved phase contamination or free phase product in this area. Further site investigation was targeted at this area in December 2017 and no evidence of significant petroleum hydrocarbon contamination was recorded in soils and groundwater. Dissolved phase hydrocarbon concentrations were below the detection limits of the laboratory in this area in December 2017.	STP1 and STP2 delineation trial pits were undertaken in this area. No significant contamination was noted, the results came back with levels below the limit of detect and no further remediation was required.
RPS Location WS9	Black streaking and a strong hydrocarbon odour was encountered in the alluvial clay from 2.2m. Soil at 2.8m recorded 530mg/kg of TPH.	Impacted soil was encountered in a 'pocket' (Soilfix Area 2). The impacted material was excavated and removed from the site. Validation samples were taken from the excavation. Discussed further in Section 5.1.3 below.
BH301	TPH detected at 1,430mg/kg at 1.7m bgl. Exceeds GAC for the C8-C10 Aliphatic GAC of 13mg/kg (detected concentration of 718.9mg/kg) and C10-C12 GAC of 120mg/kg (detected concentration of 129.4mg/kg). Samples at 1.0m and 2.5m did not exceed the GAC. This recorded the presence of timber fragments in the Made Ground.	Stockpile of creosote timbers relating to the former rail yard uncovered in the trial pit STP5 and removed from site.
Remaining Section of Fill Pipe	The remaining section of the fill point that runs beneath the building needs to be removed and the excavation validated.	The fill pipe was located during the main excavation in Area 1. It was removed, and the excavation extended to "clean" base below. Discussed further in Section 5.1.3 below.

4.2 Delineation Summary

In summary, the delineation works aided the identification of areas that required remediation. Where delineation was not possible at the start of the works the nature of the ground in such areas was confirmed through extension of the bulk dig to these locations. The detailed findings from the remediation excavations is provided in Section 5.

5. SOIL REMEDIATION EXCAVATIONS

Following the delineation exercise, the impacted material that was encountered and entrained free phase product was excavated as part of the remediation excavation exercise. The excavations were extended to 'chase out' the contamination to follow discrete features and allow validation of the resultant sides and bases by Soilfix and Ramboll.

5.1 Remediation Excavations

5.1.1 Lateral Extent of Remediation Excavations

The lateral extent of the remedial excavations were extended to the point where:

- there was no free phase product saturated soil;
- there was no heavily stained soils; and
- there were no strong hydrocarbon odours and/or PID (photo-ionization detector).

Ramboll agreed the final lateral and vertical extent of the soil excavations with the remediation contractor based on field screening, visual observations, the results of the contractor's validation sampling and verification samples obtained by Ramboll from the final remedial excavation edges and base.

5.1.2 Vertical Extent of Remediation Excavations

The vertical extent of the contamination in the bulk dig excavation was shown to be predominantly limited to the base of the Made Ground, which was formed of a layer of reworked chalk and at the very top of alluvium, as the alluvium clay has acted as a barrier for vertical downwards migration. However, discrete reed features within the alluvium were found to have acted as pathways for highly localised vertical downwards migration of neat oil along the reed and where such features were encountered the excavations were typically progressed down until such features had been entirely removed.

In certain locations, the excavations were extended vertically through the alluvium into the sand and gravels of the river terrace deposits beneath and validation samples were taken from this stratum to validate that contamination was not present in this underlying stratum or the associated gravel aquifer. A layer of unimpacted alluvium was then pressed back into place using the excavator to ensure a future migration pathway was not created.

5.1.3 Excavation of Contaminated Soils

The excavations were based on the findings of the delineation exercise listed in Table 4.1 and targeting known remediation areas. The Soilfix Completion Report refers to five different areas across the site containing the Remediation Locations. The Remediation Areas are shown on Figure 6 in Appendix 1.

Area 1 - Area 1 in the Soilfix Completion Report includes Ramboll targeted Remediation Locations 1, 2, 3, 5, 7, 8, 10 and 11.

Locations 1, 2, 3, 5, 7 and 11 - all became encompassed into one large excavation as this was the best way to ensure all excavation edges had been taken to "clean" levels for validation sampling and ensure that no unexpected contamination was present between the locations. The impacted material within this area was predominantly located within a layer of Made Ground comprising reworked chalk at approximately 1.0 m bgl. The bulk dig excavation within Area 1 was taken to a base depth of approximately 1.4 m bgl in the north, 1.9 m bgl in the west and 1.2 m bgl in the east. The extent of this excavation is shown on Figure 6 within Appendix 1.

An exception to this was where free phase product was found to be present along a historical drain and the former fuel pipe (Remediation Location 11). Although the free phase product had travelled along these preferential pathways, extending the excavation further than anticipated, the free phase product was generally contained within and close to the surrounds of the drain and fuel pipe. The neat oil contamination was mainly found along these features with limited evidence of migration into the adjacent or deeper soils given the lower permeability nature of the Made Ground and underlying alluvial soils.

Remediation Location 10 – By BH301 in the north of the site, a discrete area of contamination relating to former creosote-soaked railway timbers was encountered, not related to the historical fuel spill. This comprised a separate excavation as it was located to the north of the foul drain running east to west across the site. The timbers were excavated, and the excavation validated on all four sides and the base. The timbers were stored separately from other contaminated materials on a polythene sheet, until removal from site at the end of the remediation works.

Remediation Location 8 – (WS2, WS3 and WS11), in the south of the site, a separate excavation was undertaken, no impacted material was encountered during the delineation trial pits in this location, validation samples were taken, and no further remediation was considered necessary.

ORC was then applied to the locations where free phase product had been present beneath the base of the drains and fill pipe to facilitate further breakdown of residual hydrocarbons (if present).

Area 2 – correlates to *Remediation Location 9*, WS9. A limited pocket of contamination was observed around the borehole location and a hydrocarbon odour noted. The borehole was removed, and validation samples taken once the band of stained soil had been excavated.

Area 3 – correlates to *Remediation Location 6*, the free phase product in Sumps 1B, 1C and WS410. New Sump 1C was also installed for validation purposes in this area. This is discussed as part of the groundwater remediation in Section 7.

Area 4 – correlates to *Remediation Location 4*, along the western edge of the culvert, the remediation undertaken along this area is discussed in Section 5.2.

Area 5 – correlates to the area to along the east of the culvert. Delineation trial pits were undertaken along the length of the route and no significant contamination was observed. It was therefore agreed that grouting on this side was not considered necessary given the eastern side of the culvert was observed to be approximately 50cm deeper than the western side and appears to have provided a barrier to migration of oil to the east. This is discussed further in Section 5.2.3.

5.1.4 Removal of the Oil / Water Interceptor

During the excavation phase the oil / water interceptor located in the north-west corner of the remediation area was decommissioned in accordance with the guidelines set out in Environment Agency Pollution Prevention Guidance PPG23 “*Installation, Decommissioning and Removal of Underground Storage Tank*”. The contents were extracted into the vacuum tanker. The interceptor was identified to be a GRP interceptor with concrete jacket and both the interceptor and jacket were excavated out. Beneath the concrete staining, contamination was identified on the underlying soils and so the excavation was extended by an additional 0.3 m to ensure “clean” excavation faces and a validation sample (Sample V5) was obtained from the north of STP4.

5.2 Remediation Associated with the Culvert

The Thames Water culvert that runs north-south in the centre-east of the site is remaining in place as part of the proposed development. The culvert is formed of two pipes running in parallel

with a concrete section between the pipes that prevents excavation into the ground between the pipes. It has not been possible to excavate beneath or between the two pipes in previous remediation works.

The original proposed remediation method comprised grout injection works along the culvert at agreed intervals, by drilling injection points adjacent to the culvert and injecting grout at the depth of the base of the culvert to encapsulate and immobilise the product beneath the concrete culvert that could not be excavated.

5.2.1 Grout Injection Works

Soilfix's drilling subcontractor (Tor Drilling Ltd) attended site on 2nd July 2018 to undertake the grout injection works to encapsulate residual contamination beneath the culvert. Trial pits were undertaken to the base of the culvert prior to the grout injection, the purpose of these trial pits was to provide a way of validating that the grout was travelling along the base of the culvert and sealing in the contamination. A total of six injection points were undertaken at various locations along both sides of the culvert and the grout did not appear in any of the trial pits, therefore not taking the path of the base of the culvert. Instead the grout was daylighting a couple of metres away from the rig, indicating that there were paths of least resistance through the material above.

After the unsuccessful grout injection works, a decision was made by Soilfix and Ramboll to consider an alternative remediation method and demobilised the subcontractor from site.

Ramboll proposed the new method of remediation around the culvert to Tom Wickens of the Environment Agency in a Memo dated 6th July 2018. This stated that the new proposed method would entail excavating a trench along the western side of the culvert and then directly placing a slurry grout seal in line with the base of the culvert.

This new method was proposed to the EA by Ramboll and agreed via email by Tom Wickens of the Environment Agency on 9th July 2018. The Client and Principal Contractor were also made aware at the time of the change in method and were satisfied with the method proposed.

5.2.2 Installation of the West Culvert Grout Wall

As part of previous remediation undertaken at the site, a grout wall had been installed along a section of the culvert and proved successful. This method was undertaken by excavating just beyond the depth of the base of the culvert and emplacing the grout along the side of the bedding material to ensure that it was sealed in. An additional benefit of this method was that it was easier to validate, as the continuous wall sealing the base of the culvert can be fully viewed and photographed.

The ground conditions encountered comprised man-made aggregate backfill beneath the culvert in the centre of the site. This aggregate backfill is considered to be related to previous remediation works at the site. In the north of the site, the culvert sits slightly lower than in the south, i.e. sloping gradually to assist the direction of flow to the north. The base of the culvert here sat on the natural River Terrace Gravels beneath the Alluvium. In the south of the site, the base of the culvert sits within the Alluvium clay strata. The change from gravel at the base to alluvium at the base occurred 1-2m to the north of the live foul that crosses east-west and passes just beneath the culvert. The grout wall could not be installed through this foul line to ensure it was not damaged incidental to the excavation of the grout trench. However, clean natural alluvium was encountered overlying the foul line (which may have been emplaced back over the foul when it had been formed), and so grout wall was keyed into this clean alluvium to form a continual low permeability layer along the base of the culvert.

The full length of the western culvert was excavated in four sections, impacted material was removed as far as was reasonably possible from along the basal edge of the culvert, ORC (Oxygen Release Compound pellets) was also applied in target areas along the route and then a bentonite grout lay into a trench at the base, following validation/verification samples taken by Soilfix and Ramboll. Photographs of the works are included in Appendix 2. The validation samples are discussed in Section 8 and the results provided in Appendix 3.

At the northern and southern extents of the site where the culvert runs off site, it was originally discussed that a stank/seal may be emplaced to prevent migration off site along the culvert.

At the most northern extent of the culvert on site, little contamination was observed at the base of the culvert, this is the area beyond the east – west orientated foul drain. As a precautionary measure a grout seal was emplaced at the northern end to prevent future migration of residual product along the length of the culvert.

During the most southern grouting works, a large chamber was uncovered where the east and western culvert meet and split at the southern end of the site. No evidence of contamination was observed this far south, and it was considered that the large chamber would act as a stank itself due to its size and depth in relation to the culverts. The grout seal was taken all the way up to the chamber as a precautionary measure to provide a seal.

The grouting works along the length of the western culvert was considered a success and the residual contamination encased.

5.2.3 East Culvert Validation

Several trial pits were undertaken along the length of the east of the culvert to understand the ground conditions along this side of the culvert. No significant contamination was encountered along this side and validation samples were taken from all trial pits to validate the soil present along this boundary.

The two culverts running adjacent to each other are not of the same shape or age. The eastern culvert has a square outer shape, as opposed to the western round culvert; the eastern culvert is therefore deeper than the western one and has appeared to act as a barrier to prevent significant free phase product travelling eastwards beyond the culvert. This accords with all previous soil and groundwater data for the eastern side of the culvert, which showed no evidence of fuel migration to the east of the culvert following the spill.

6. SOIL VALIDATION RESULTS

The previous site investigations and remediation activities identified the potential contaminants of concern to be:

- the presence of free phase oil;
- petroleum hydrocarbons; and,
- fuel species of methyl-tert-butyl-ether (MTBE) benzene, toluene, ethylbenzene and xylenes.

All validation samples taken by Soilfix and Ramboll were therefore analysed for these contaminants only.

6.1 Soil Remedial Target Values

The remediation criteria for soil is set out in Table 6.1 below. The soil targets are compared to the Ramboll controlled waters GAC and for all contaminants of concern the residential GAC are the lower values. The GAC are therefore protective of both controlled waters and future residential receptors.

Table 6.1: Remedial Targets – Soil			
Contaminant	Groundwater Remedial Target (mg/l)	Ramboll Residential GAC (mg/kg)	Soil Remedial Target^
Benzene	0.01	0.37	0.37
Toluene	3.07	370	370
Ethylbenzene	0.02	34	34
Xylene	0.09	34	34
MTBE	0.012	39	39
Aliphatic C5-6	0.145	24	24
Aliphatic C6-8	0.15	53	53
Aliphatic C8-C10	0.01	13	13
Aliphatic C10-12	0.01	62	62
Aliphatic C12-16	FPP**	510	510
Aliphatic C16-21	FPP**	42,000	42,000
Aliphatic C21-35	FPP**		
Aromatic C5-7 (Benzene)	FPP**	0.37	0.37
Aromatic C7-8 (Toluene)	0.01	340	340
Aromatic C8-10 (Xylene)	0.2	22	22
Aromatic C10-12	0.09	120	120
Aromatic C12-16	0.14	1,100	1,100
Aromatic C16-21	0.14	1,900	1,900
Aromatic C21-35	0.14	1,900	1,900

Table 6.1: Remedial Targets – Soil

the controlled waters soil targets are set based on the existing DQRA.
** Model restricted to solubility levels – no risk at saturation concentrations to receptor, therefore removal of Free Phase Product (FPP) is set as remedial target.

6.2 Summary of Soil Validation Results

Ramboll carried out supplementary validation soil sampling of the excavation walls and base, ensuring good coverage of the remedial excavation in combination with Soilfix's sampling.

Soilfix samples are named V1- V30 and the Ramboll samples are names RV1-RV23. The sample locations are shown on Figure 6 in Appendix 1. The purpose of the Ramboll validation samples were to provide an additional level of validation to the remediation works. Some of the samples were taken from the excavation walls and base between the Soilfix locations and others taken from the same location, as a "mirror" sample. The duplicate "mirror" samples are detailed below in Table 6.2.

Table 6.2: Soilfix and Ramboll Duplicate Samples

Soilfix Sample Reference	Ramboll Sample Reference
V20	RV13
V23	RV17
V26	RV18
V27	RV19
V30	RV23

Soilfix took delineation samples from the initial delineation trial pits. The locations of these samples and the correlating trial pits are shown on Figure 5. A single delineation sample exceeded the remedial target values. This was in STP11 at the south of the pipe within Area 1. This material was later removed as part of the main excavation in Area 1.

All of the validation samples relating to the excavation works to validate the sides and bases of the excavations taken by Soilfix meet the remedial target values.

All Ramboll verification samples taken have recorded concentrations below the remedial target values, with the majority recording levels below the limit of detection.

Samples that recorded low levels of TPH above the limit of detection but below the remedial target values are listed below.

- RV3 – TPH of 116mg/kg – This sample was taken adjacent to the Soilfix sample from delineation sample STP11 that originally exceeded the remedial target values. The Soilfix validation sample adjacent to RV3, taken at the time of the main excavation, Sample V1 recorded levels below the limit of detection. The analytical results for RV3 being below the RTV's and V1 being below the limit of detection validate that this area was remediated to an acceptable level
- RV4 – TPH of 9mg/kg - Taken from the base of the main excavation in Area 1 showed very low levels (only 9mg/kg EC21-EC35 aromatic) of TPH and no risk remains in this location.
- RV5 – TPH of 2,233mg/kg - This sample was taken in the north-west corner of the main excavation and is below the RTVs.
- RV6 – TPH of 80mg/kg - This sample is located to the south of RV5 on the western edge of the main excavation within Area 1. It does not exceed the RTV's.

- RV11 – TPH of 124mg/kg - this is below the RTVs and samples V13 and V25 were located nearby and did not detected petroleum hydrocarbons.
- RV13 – TPG of 545mg/kg - This sample is taken from the side of the excavation along the west of the culvert in the previously impacted area. It is a duplicate of Soilfix sample V20. It recorded levels of TPH that do not exceed the RTVs.
- RV23 –TPH of 76mg/kg -this sample is taken from the side of a trial pit on the east of culvert and is a duplicate of Soilfix sample V30. An additional verification sample was also taken from this location and sent to i2 laboratories for analysis. The i2 sample showed lower results than the RV23 sample. All results were below the RTVs.

Ramboll considers that the results demonstrate that the remediation has been completed to satisfy the requirements outlined within the Remediation Strategy, and that no significant risk remains from soils at the site.

As an additional layer of verification Ramboll also submitted a set of samples to a second analytical laboratory during the works. These results were also all below the RTVs.

7. GROUNDWATER REMEDIATION

Based on the recent groundwater results from Ramboll's 2017 investigation, the majority of the site was not found to be significantly impacted by the pollution incident with either free phase product or dissolved phase contaminants. Previous remediation activities associated with the pollution incident were implemented including active groundwater treatment and injection of remediation compounds. As a result of this preceding remediation there was limited evidence of dissolved phase contamination within the groundwater during the remediation works and subsequent monitoring.

The 2018 groundwater remediation works were anticipated to comprise the localised removal of free phase product from groundwater and the implementation of Oxygen Releasing Compounds (ORC) within excavations where required (i.e. where free phase product had been removed).

7.1 Removal of Free Phase Product

Free phase product represents neat fuel considered by Ramboll to be a separate discernible fuel layer floating on the groundwater table.

Free phase product was encountered within sumps 1B and 1C at the beginning of the remediation works and was pumped out on several occasions during the remediation works. The source of product in these wells was considered to be product seeping from beneath the culvert, which is likely to have been enhanced by the presence of a preferential pathway of the open sump (which is why the sump was installed in the first place – to preferentially collect and remove product). Notably a trial pit extended down into the gravels approximately 2m west of Sump 1C during the works did not record any evidence of product in the gravels, which suggests the two sumps were acting to very locally collect product from beneath the culvert, rather than being indicative of more widespread impact to the gravels in this area.

At the end of the remediation works, once all impacted soil was removed from the bulk dig excavations, a final round of pumping of all locations where free phase product had been identified was undertaken. All product pumped into the on-site tank was removed from site at the end of the remediation works.

During the formation of the grout wall the sumps were excavated and residual product along the base of the culvert was excavated out prior to it being sealed.

7.2 Oxygen Releasing Compounds

ORC (Oxygen Release Compound) treatment chemicals were applied in the areas where previously localised free phase product had been present. This included the sumps in the centre of the site (where product had been present in the overlying alluvium); in the base of the main excavation in the centre of Area 1; and along the base of the excavation along the west of the culvert. The ORC was applied as an additional remediation measure to provide a final 'polish' to reduce concentrations of TPH in groundwater.

7.3 Decommissioning and Installation of Sumps

Soilfix decommissioned Sumps A, B and C. The groundwater was pumped out to the on-site tank and then the ORC applied to the base. Soilfix were also requested by Ramboll to install one new sump in a location adjacent to Sump 1C and named the sump, "New Sump 1C". This new location was in close proximity to where free phase product was previously present and was therefore considered a good location for the installation of an additional sampling location in the gravels to verify post grouting that product was not laterally migrating out from the culvert, which would not be expected given the seal that had been formed.

8. GROUNDWATER VALIDATION RESULTS

8.1 Post Remediation Groundwater Monitoring

Nine locations were selected for the groundwater monitoring by Ramboll during the remediation works and agreed with the EA prior to the first round of sampling. The boreholes include three deep boreholes in the chalk, three boreholes in the River Terrace Gravels and three installed into the Made Ground and Alluvium.

The locations selected in each of the strata were as follows:

- Alluvium: WS5, WS401 and WS402.
- Gravels: WS08, Sump 1E, New Sump 1C.
- Chalk: BH1, BH2 and CP03.

Three rounds of groundwater monitoring and sampling were undertaken to confirm that the groundwater conditions beneath the site do not represent a significant risk to controlled waters. The first round was undertaken by Soilfix for contractual purposes to verify their works were successful and the second and third round completed by Ramboll to validate the works were a success prior to piling taking place, the latter as agreed with the EA previously. The exploratory hole locations that were sampled are shown on Figure 7 in Appendix 1.

8.2 Groundwater Remedial Target Values

The remediation criteria for controlled waters were generated from the existing Detailed Quantitative Risk Assessment that informs the Long-Term Works. These have been compared to the Ramboll residential GAC for volatilisation risks and the lower value of the respective GAC has been used as the remedial target for groundwater. The target values are set out in Table 8.1 below.

Table 8.1: Remedial Targets - Groundwater			
Contaminant	Controlled water Remedial Target (mg/l)	Ramboll Residential GAC (mg/l)	Groundwater Remedial Target
Benzene	0.01	0.026	0.01
Toluene	NCG	3.07	3.07
Ethylbenzene	0.02	23.4	0.02
Xylene	0.09	0.87	0.09
MTBE	0.012	1,110	0.012
Aliphatic C5-6	0.145	0.309	0.145
Aliphatic C6-8	0.15	0.204	0.15
Aliphatic C8-10	0.18	0.0074	0.01 ^
Aliphatic C10-12	FPP**	0.0049	0.01 ^
Aliphatic C12-16	FPP**	FPP**	FPP**
Aliphatic C16-35	FPP**	FPP**	FPP**
Aromatic C5-7 (Benzene)	FPP**	FPP**	FPP**
Aromatic C7-8 (Toluene)	0.01	23.4	0.01

Table 8.1: Remedial Targets - Groundwater			
Contaminant	Controlled water Remedial Target (mg/l)	Ramboll Residential GAC (mg/l)	Groundwater Remedial Target
Aromatic C8-10	0.2	0.255	0.2
Aromatic C10-12	0.09	0.874	0.09
Aromatic C12-16	0.14	2.3	0.14
Aromatic C16-21	0.14	FPP**	0.14
Aromatic C21-35	0.14	FPP**	0.25
NCG = No Criteria Generated ** = Model restricted to solubility levels – no risk at saturation concentrations to receptor, therefore removal of Free Phase Product (FPP) is set as remedial target ^ = these values have been set at the method detection limit. This is considered to be appropriate given the reduced sensitivity of the ground floor use providing access and storage only and based on our experience of similar quantitative risk assessments the residential GAC are overly conservative for residential use. For example, the commercial GAC, which is likely a similar exposure scenario in terms of volatilisation risks to the proposed development would require free phase product to be present for a significant risk to exist.			

8.3 Summary of Groundwater Monitoring

Table 8.2: Groundwater Monitoring					
Exploratory Hole Location	Average Depth to Groundwater (m bgl)	Depth to Base of Borehole m bgl	Targeted Strata	PID (ppm)	Comments
BH1	1.98	14.07	Chalk	0	white chalk colouration
BH2	2.23	14.01	Chalk	0	white chalk colouration
CP03	2.2	11.6	Chalk	0	white chalk colouration
WS08	2.11	6.73	Gravels	0	No sheen noted
Sump 1E	2.07	2.46	Gravels	0	No sheen noted
New Sump 1C	2.07	3.23	Gravels	0	No sheen noted
WS5	2.38	2.86	Alluvium	0	Slow Recharge Rate
WS401	2.15	3.09	Alluvium	0	Slow Recharge Rate
WS402	1.97	2.61	Alluvium	0	Slow Recharge Rate

Groundwater samples were taken on three occasions following the remediation works. A summary of the monitoring is provided in Table 8.2. The first round was undertaken by Soilfix on 12/07/2018 and witnessed by a Ramboll engineer. The boreholes installed into the chalk and gravel strata were purged of at least three well volumes with a WaSP pump prior to sampling. The samples taken from the three shallow wells in the Made Ground and Alluvium were bailed one well volume and then a grab sample taken due to the limited amount of water present within these installations. The samples were taken using a new disposable bio-bailer per location and the samples sent to a UKAS accredited laboratory (Exova Jones Environmental Ltd) for TPH,

MTBE and BTEX analysis. None of the samples collected on the first round of monitoring detected analytes above the detection limits.

The second monitoring round was undertaken by Ramboll the following week, on 16/07/2018. One sample from WS08 recorded a limited amount of heavy end TPH but no MTBE or BTEX. The concentrations detected were below the RTVs – for the detected bands this corresponded to the removal of free phase product. All other locations were below the laboratory detection limit. No sheens or olfactory evidence of contamination was observed in this location, WS08, which is outside of the remediation area.

The third monitoring round was undertaken by Ramboll on 23/07/2018. One sample from Sump 1C recorded heavy end TPHs (C21-35 aliphatic at 2460 ug/l and aromatic at 550 ug/l) but no MTBE or BTEX. No sheen or olfactory evidence of contamination was observed in this location when sampled. The concentrations detected were below the RTVs – for the detected bands this corresponded to the removal of free phase product. No TPH was detected in WS08 above the laboratory detection limit, therefore the previous detection is considered to be isolated and potentially linked to the presence of sediment in a well that showed slow recharge. All other locations were below the laboratory detection limit.

To provide further validation, an additional sample was taken from New Sump 1C only on Wednesday 1st August 2018. The results from this sample came back below the limit of detection.

The laboratory certificates for all groundwater analysis are provided in Appendix 4.

9. MMP VERIFICATION

The MMP (Materials Management Plan) for re-use of demolition crush in backfilling remedial excavations and forming the pile matt on-site was submitted by Ramboll on 2nd July 2018 following a review by a QP (Suitably Qualified Person). Material re-used on-site has been undertaken under the CL: AIRE Development Industry Code of Practice (CoP) detailed within Ramboll's Materials Management Plan (MMP).

The MMP provided a robust and auditable trail to monitor where the materials originated from through to their final destination, including temporary storage or stockpiling as necessary. During the works it was considered viable to re-use tarmacadam and subbase as part of the pile matt, but not to backfill remedial excavations. This was discussed with the QP on 09/07/18 and a variation to the MMP was agreed given the material had been tested and was suitable for use in that it would not represent a significant risk to the environment or human health.

Three samples were taken of the tarmacadam (ES1, 4 and 5) and three of the subbase (ES2, 3 and 6) prior to the remediation works. The samples were tested for heavy metals, PAHs (speciated 16), BTEX, TPH CWG and PCB analysis. The tarmacadam samples were also scheduled for coal tar (which was not expected to be present given the age of the car park dated from circa 2014 and the analysis confirmed this was the case).

Once the building had started to be demolished, three concrete samples were taken from a stockpile of concrete (S1, S2 and S3). The results confirmed that the material was chemically suitable for use and screening of the data to the Ramboll GAC is presented in Appendix 5, alongside the relevant laboratory certificates.

In relation to the materials re-used there were no exceedances of the Ramboll GAC for a future human health in a residential without homegrown produce scenario.

Concrete from the demolition of the former carpark and subbase surfacing were all crushed by J Mould to meet a 6f2 standard to produce a material suitable to be retained on site and used as part of the pile mat as per the Specification for Highways Works. The subbase already met the 6F2 criteria. The material was visually reviewed by Ramboll during the works and no evidence of staining or olfactory evidence of contamination was observed.

The material was either crushed and used immediately to backfill the remedial excavations discussed in this report or was placed across the entire site once the remediation was completed to form the pile matt on-site.

Due to a failure of the crusher during the works some material was removed from the site and formed into a product under the necessary permits by J Mould and returned to site for re-use.

10. WASTE MANAGEMENT

All material removed from site was undertaken in accordance with the Duty of Care requirements of the Environmental Protection Act 1990, including the Waste (England and Wales) Regulations 2011. The materials from the excavations were classified by the remediation Contractor in line with current UK legislation and best practice guidance. Unimpacted Made Ground and alluvial soils were segregated outside of the excavation. The excavations, once validated were then backfilled with unimpacted material. This was a sustainable approach and reduced the amount of waste from site. The waste streams were limited to contaminated soil arisings from the excavations that were removed as hazardous waste; the former railway yard creosote-soaked timbers; the interceptors; and, the product and waste water pumped out of the ground and removed from site.

Waste materials that required off-site disposal were segregated and stored separately prior to removal as hazardous waste. Soilfix has kept a complete record of the waste transfer certificates and consignment notes for each load of material which exited the site for off-site disposal during the works, including proof of receipt of the material at the landfill or other disposal site. Copies of this duty of care documentation (e.g. waste transfer notes and/or hazardous waste consignment notes) are included as an appendix in the Soilfix Completion Report attached as Appendix 6.

10.1.1 Interceptors

The interceptors removed from the ground as part of the remediation excavation in Soilfix Area 1 were stockpiled separately in the south west corner of the site and disposed of at the end of the remediation works. The details of the decommissioning and waste transfer notes relating to the interceptors are included in the Soilfix Completion Report in Appendix 6.

10.1.2 Creosote Timbers

The stockpile of creosote timbers that were part of unexpected contamination encountered at Remediation Location 10 by former BH301, relating to the former railway sidings, were also stored separately throughout the remediation works in the south west corner of the site on a polythene sheet until being removed from site for off-site treatment on the final day of the remediation works, 13th July 2018. The relevant waste transfer notes are also included in the Soilfix Completion Report in Appendix 6 for reference.

10.1.3 Liquid Waste

A tank for contaminated groundwater was stored on site throughout the remediation works and all contaminated groundwater that was pumped out of the boreholes, sumps and interceptors was stored in here and emptied at the end of the remediation works for off-site disposal.

11. CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

The completed remediation works are summarised as follows:

- The excavation of targeted impacted soils on site was completed successfully. The excavations were extended and small areas of previously unidentified contamination (such as land drains acting as local pathways for free phase) were all removed. Validation samples were taken and visual observations and PID readings guided the final excavation extent. Impacted material was segregated, stored separately and taken off-site as hazardous waste. The interceptors were also removed separately as hazardous waste and the stockpile of creosote-soaked railway timbers were removed separately for treatment and disposal.
- Residual impacted material beneath the culvert structure may remain, but in accordance with the remediation strategy has been encapsulated and sealed in through the formation of a grout wall on the western side and with the eastern box structure of the culvert forming a barrier. The northern end has been sealed using a stank and the southern end is sealed against a large chamber. Impacted soil and residual product entrained in the soil was removed from the basal edge of the culvert as far as was reasonably practicable during the work, without endangering the culvert structure. No evidence of product migration from beneath the culvert has been identified in three rounds of groundwater sampling since installation of the grout wall.
- The majority of soil samples show concentrations of soils beneath and adjacent to the remediation areas to be below detection limits. A small proportion of samples with low concentrations detected are below the Remedial Target Values and all free phase product encountered has been removed. The low levels detected are in locations that will be at depth beneath hardstanding and therefore Ramboll consider there to be no significant residual risk to human health, the environment or the proposed development from such soil.
- The groundwater sampling has confirmed over three rounds that the remedial target values and objectives for the site have been met in all wells sampled.
- The material reused on site was classified as suitable for use against the Ramboll GACs and has been crushed to 6f2 by the Principal Contractor and re-placed as engineered fill within the new building footprint to backfill excavations and as part of the agreed pile mat design.
- In conclusion, the requirements relating to soil and groundwater remediation of the oil contamination as stated in the Remediation Strategy for the Thames Quarter site in Reading have been satisfied. Ramboll considers that piling works may now take place.

Based on the contents of this report, Ramboll considers that the soil and groundwater remediation has been completed and the objectives of the Remediation Strategy successfully achieved. Further remediation or additional groundwater monitoring is not considered necessary.

11.2 Recommendations

It is recommended that this report is submitted to the regulatory authorities for approval. In future the installation of the capping layer in landscaped areas should be validated through visual observations and soil testing as is standard practice for residential development sites and in accordance with the validation practices set out in the Remediation Strategy.

During future excavations for foundation and utility runs unexpected contamination finds such as oil in the ground or asbestos finds should be reported to the Local Authority in accordance with the watching brief procedure provided in the Remedial Strategy.

APPENDIX 1 FIGURES

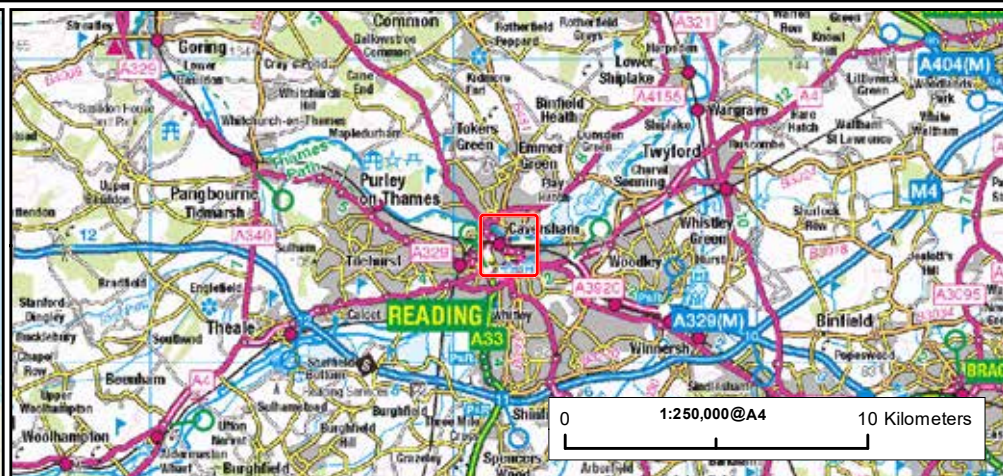
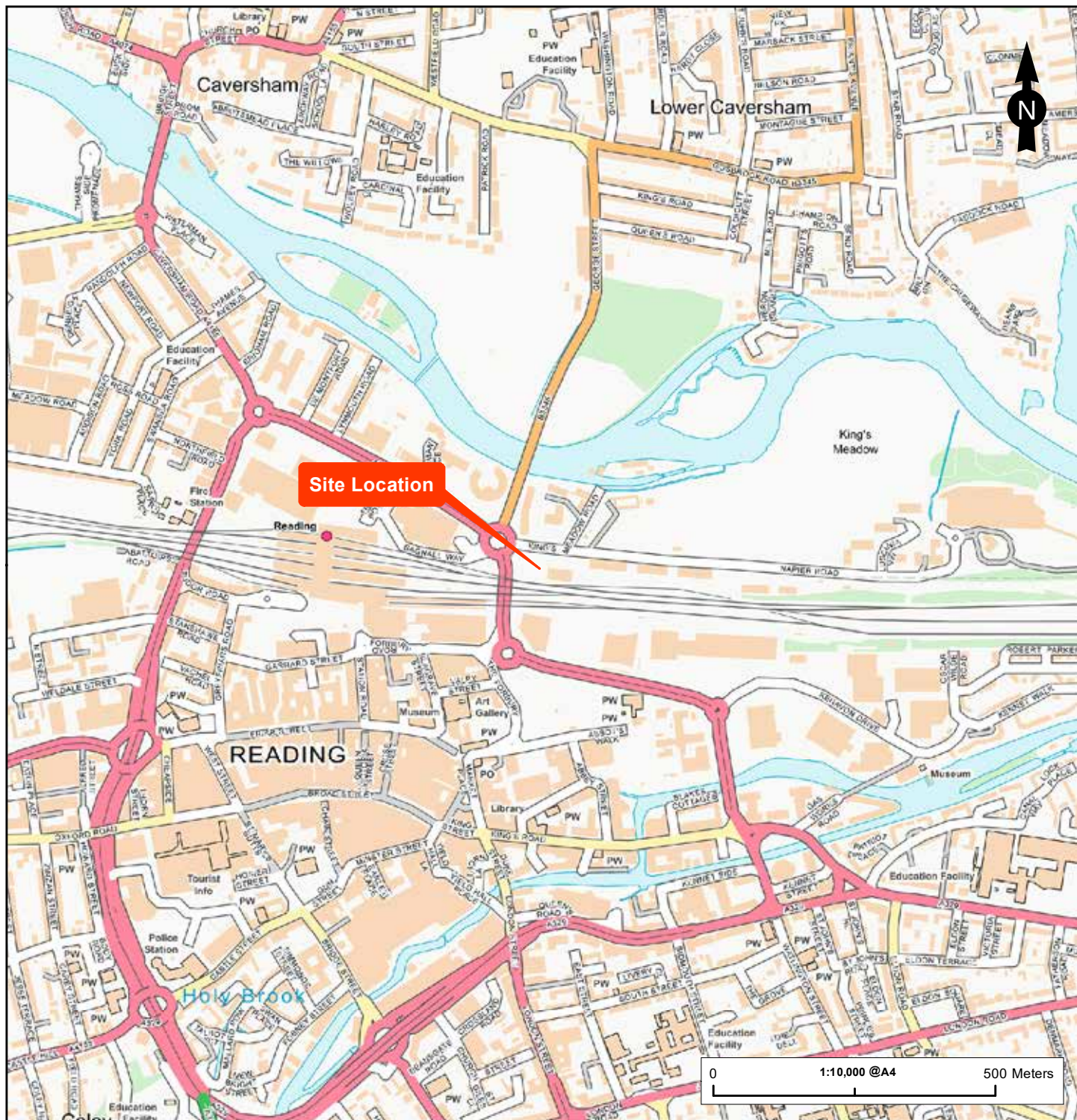
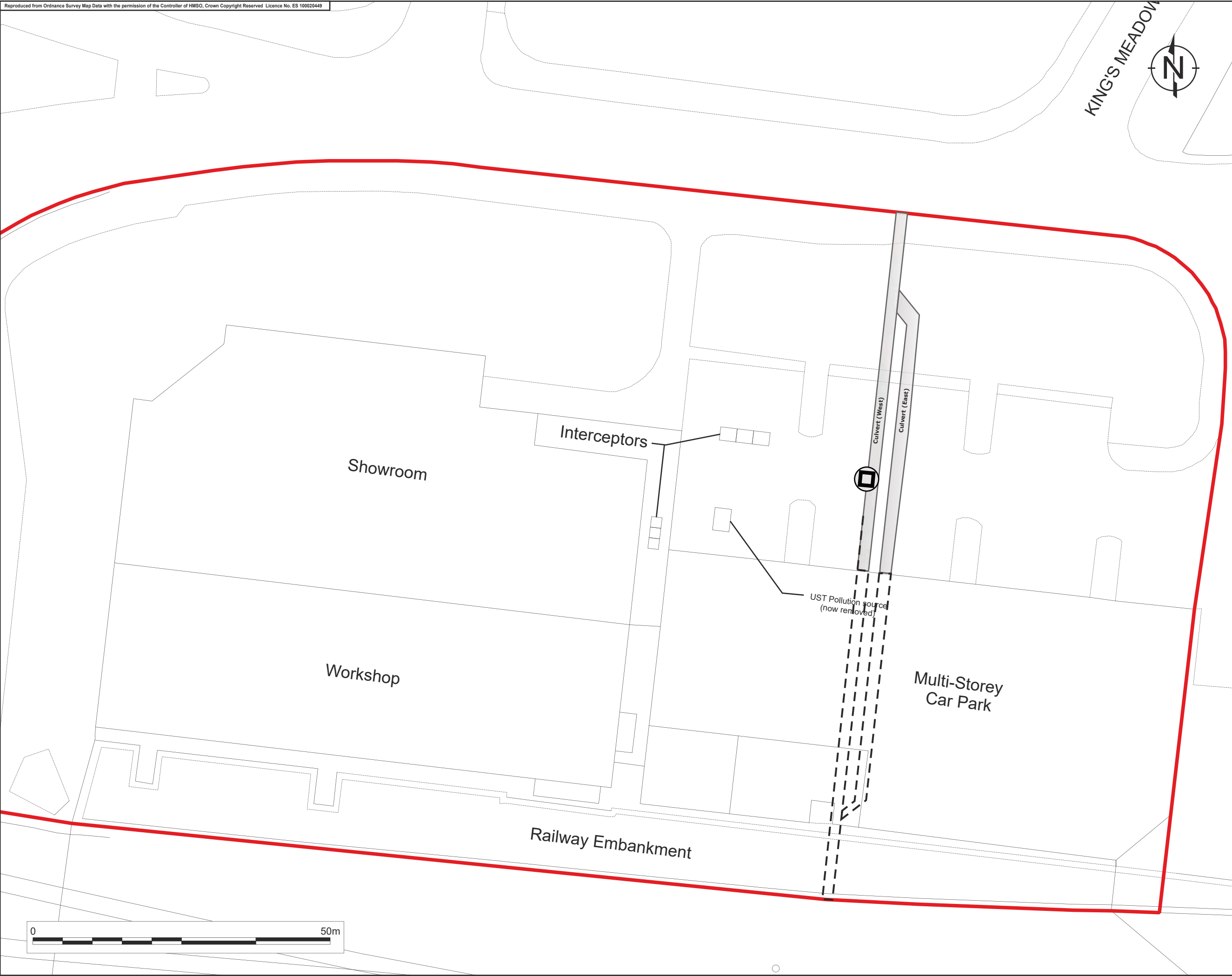


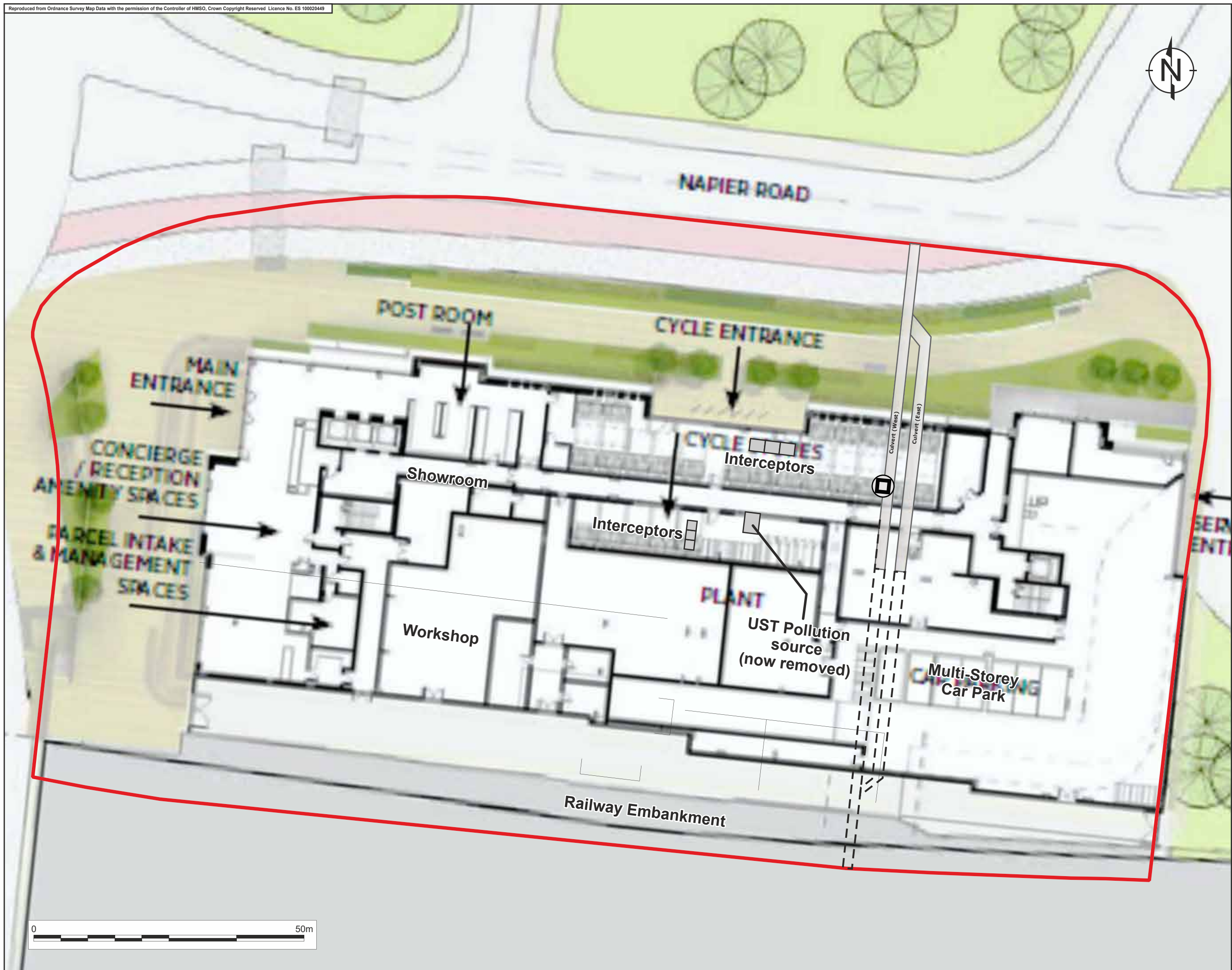
Figure Title Figure 1: Site Location	Project Name Thames Quarter, Kings Meadow Road, Reading	Date August 2018 Scale As shown	
Project Number 1700001374	Client Watkin Jones & Son Limited	Issue 1 Prepared By DM	



Key
Site Boundary

Title	Figure 2: Former Site Layout Plan	
Project No.	1700001374	
Site	Thames Quarter, Kings Meadow Road, Reading	
Client	Watkin Jones & Son Limited	
Date	August 2018	
Scale	1:400 @ A3	
Issue	1	Drawn by MI

RAMBOLL



Key
Site Boundary

Title Figure 3:
Proposed Development
Layout

Project No. 1700001374

Site Thames Quarter,
Kings Meadow Road,
Reading

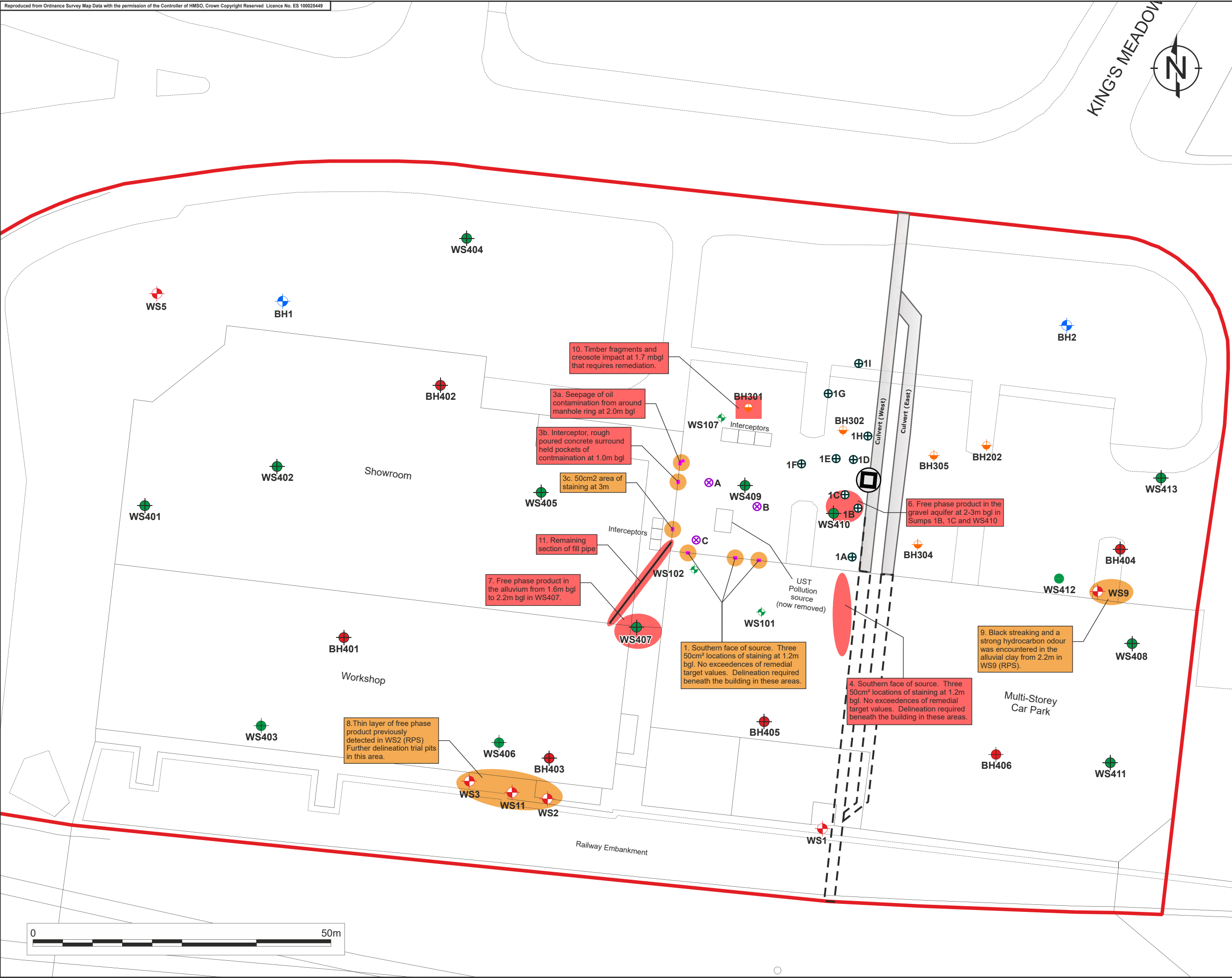
Client Watkin Jones & Son
Limited

Date August 2018

Scale Refer to scale bar

Issue 1 Drawn by BVK

RAMBOLL



Key

- Site Boundary
- 2017 Ramboll Environ Window Sample
- 2017 Ramboll Environ Borehole
- RPS Shell + Auger
- RPS window sample borehole with installation
- Ramboll Environ window sample borehole with installation
- Ramboll Environ rotary borehole
- Ramboll Environ rotary borehole sump for product removal
- Ramboll Environ gravel targeted sump installed during Source Removal remediation works
- Mid-Term Works**
- Ramboll Environ gravel targeted sump installed during Mid Term remediation works
- Delineation Required
- Delineation & Remediation Required

Note: this plan is intended to show the locations where contamination has been identified that requires remediation or where further exploratory trial pits are needed for re-assurance purposes. The actual extent of the contamination and therefore remediation that will be required will be defined by the Remediation Contractor based on their delineation investigations.

Title Figure 4:
Targeted Remediation Locations

Project No. 1700001374

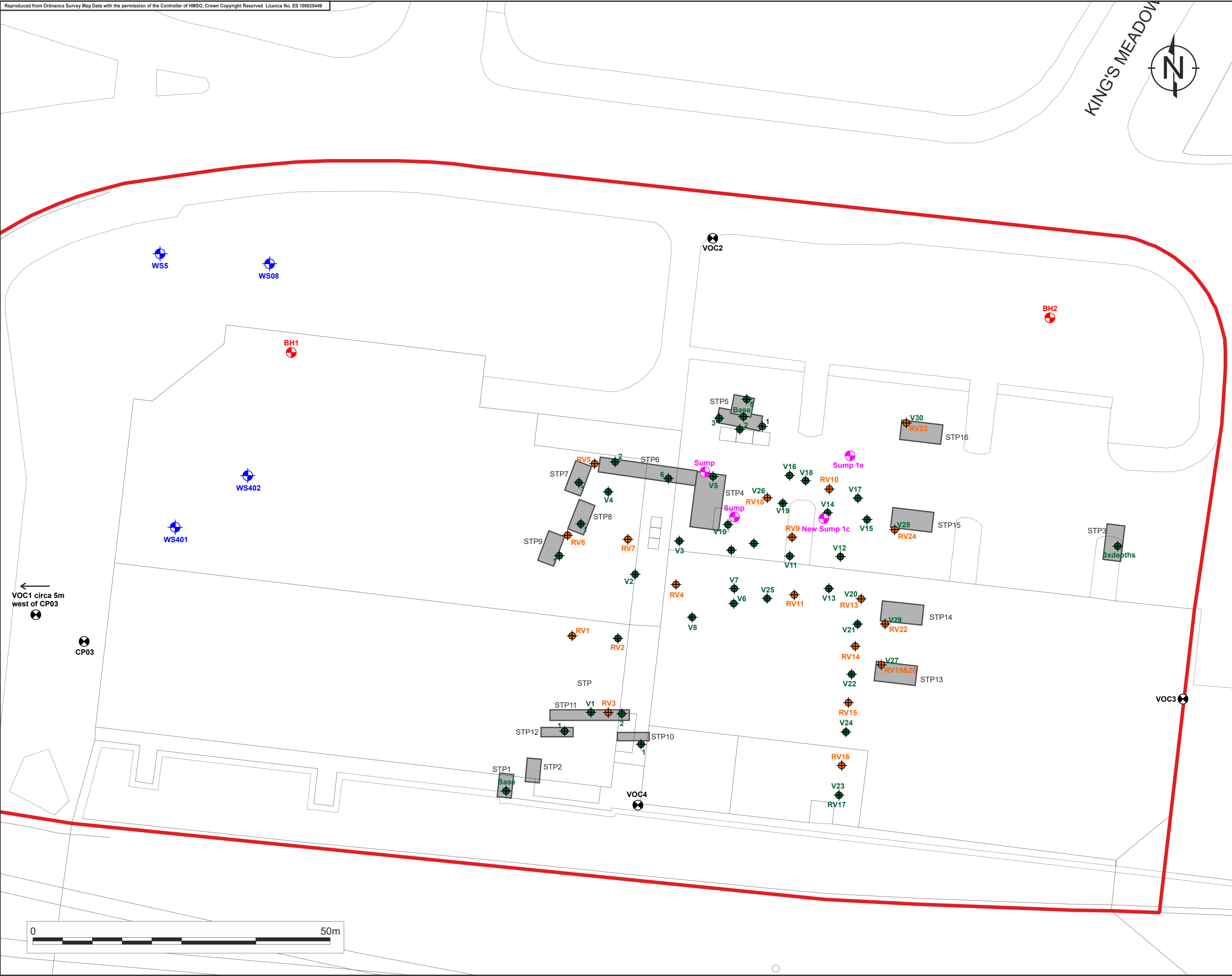
Site Thames Quarter,
Kings Meadow Road,
Reading

Client Watkin Jones & Son Limited

Date August 2018

Scale 1:400 @ A3

Issue 1 **Drawn by** BVK



Key

- Site Boundary
- Trial Pit

Title Figure 5:
Delineation Trial Pit
Location Plan

Project No. 1700001374

Site Thames Quarter,
Kings Meadow Road,
Reading

Client Watkin Jones & Son
Limited

Date August 2018

Scale 1:400 @ A3

Issue 1 Drawn by BVK

RAMBOLL



Key

- Site Boundary
- Work Areas
- Excavation Areas
- Soilfix Sample Locations
- Ramboll Sample Locations
- Alluvium
- Gravels
- Chalk boreholes

Title Figure 6:
Remediated Areas
Plan and Validation
Sample Locations

Project No. 1700001374

Site Thames Quarter,
Kings Meadow Road,
Reading

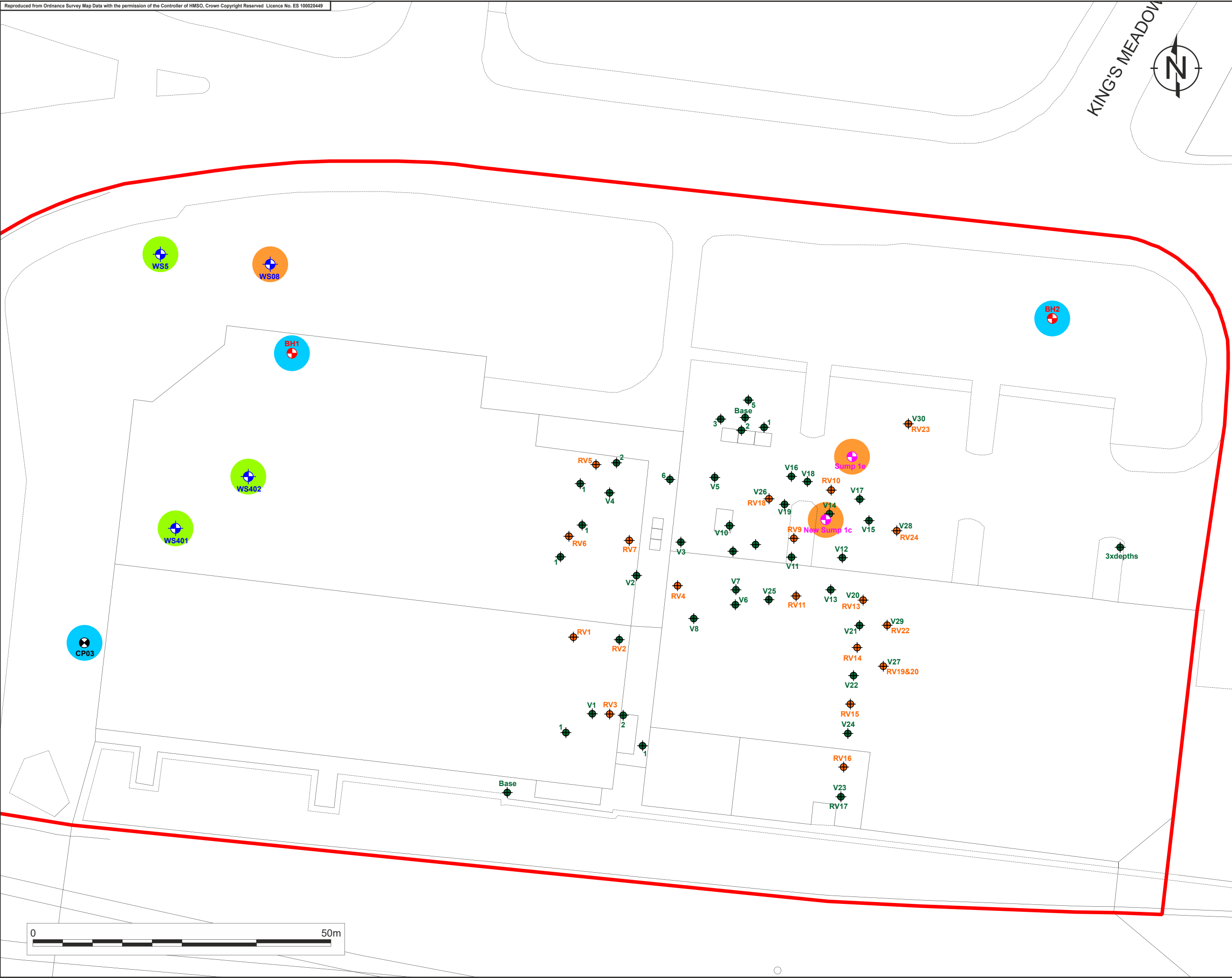
Client Watkin Jones & Son
Limited

Date August 2018

Scale 1:400 @ A3

Issue 1 Drawn by BVK

RAMBOLL



APPENDIX 2

PHOTOGRAPHIC RECORDS



Photo 1. Site Set Up on 18/06/2018



Demolition Material on 18/06/2018

Photo 2.

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 3. Building during demolition on 19/06/2018



Photo 4. Excavation Location around WS11 on 19/06/2018 (STP 1 & 2)

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 5. Excavation through alluvium to gravels by BH301 (Edge of STP5)



Photo 6. Stockpile of creosote railway sleepers by BH301 (STP5)

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 7. Concrete from around interceptors following removal



Photo 8. Top of alluvium at validation depth in Area 1

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 9. Excavation and stockpile of building material



Photo 10. Stockpile of material containing pipe and free product in Area 1

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 11. Top of alluvium at validation depth



Photo 12. Top of alluvium at validation depth

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 13. Top of alluvium clay strata (05/07/2018)



Photo 14. Bulk dig excavation (Area 1)

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 15. Application of ORC in target areas (05/07/2018)



Photo 16. Installation of New Sump 1C

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 17. Trial Pit exposing the west of the Culvert



Photo 18. Grout injection works in the north of the site (02/07/2018)

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 19. Grout appearing at surface on failed attempts (03/07/2018)



Photo 20. View along east of culvert showing bedding material

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 21. Grouting of culvert in the centre of the site.



Photo 22. View of the chamber in south of the site

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018



Photo 23. View of both culverts from chamber in the south (10/07/2018)



Photo 24. View of grouting works in the south of the site (12/07/2018)

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018

Title: Photographic Log	Client: Watkin Jones
Site: Thames Quarter, Reading	Date: July 2018

APPENDIX 3

LABORATORY RESULTS - SOILS



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Ramboll
240 Blackfriars Rd
London
SE1 8NW

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Siobhan McGeever
Date :	10th July, 2018
Your reference :	1700001374
Our reference :	Test Report 18/10139 Batch 1
Location :	Thames Quarter
Date samples received :	28th June, 2018
Status :	Final report
Issue :	1

Seven samples were received for analysis on 28th June, 2018 of which seven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Simon Gomery BSc
Project Manager

Exova Jones Environmental

Client Name: Ramboll
Reference: 1700001374
Location: Thames Quarter
Contact: Siobhan McGeever
JE Job No.: 18/10139

Report : Solid

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

J E Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28				Please see attached notes for all abbreviations and acronyms		
Sample ID	RV1	RV2	RV3	RV4	RV5	RV6	RV7						
Depth	1.20	1.90	1.10	1.10	1.10	1.30	1.80						
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J T	V J T						
Sample Date	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018	27/06/2018						
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil						
Batch Number	1	1	1	1	1	1	1						
Date of Receipt	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018	28/06/2018				LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	1.4	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	14	<4	<4				<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	47	<7	<7				<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	58	<7	1663	58	<7				<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	58	<19	1725	58	<19				<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1				<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2				<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4	8	<4				<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	32	14	<7				<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	58	9	476	<7	<7				<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	58	<19	508	22	<19				<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	<38	<38	116	<38	2233	80	<38				<38	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5				<5	ug/kg	TM31/PM12
Natural Moisture Content	53.2	65.6	16.1	4.0	24.0	37.2	36.1				<0.1	%	PM4/PM0

Matrix : Solid

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10139

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/10139

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
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Deeside
CH5 2UA

Ramboll
240 Blackfriars Rd
London
SE1 8NW

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Siobhan McGeever
Date :	11th July, 2018
Your reference :	1700001578
Our reference :	Test Report 18/10752 Batch 1
Location :	Thames Quarter, Reading
Date samples received :	10th July, 2018
Status :	Final report
Issue :	1

Two samples were received for analysis on 10th July, 2018 of which two were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Paul Boden BSc
Project Manager

Exova Jones Environmental

Client Name: Ramboll
Reference: 1700001578
Location: Thames Quarter, Reading
Contact: Siobhan McGeever
JE Job No.: 18/10752

Report : Solid

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

J E Sample No.	1-4	5-7									Please see attached notes for all abbreviations and acronyms		
Sample ID	RV10	RV12											
Depth	1.30	1.60											
COC No / misc													
Containers	V J T	V J											
Sample Date	06/07/2018	06/07/2018											
Sample Type	Soil	Soil											
Batch Number	1	1											
Date of Receipt	10/07/2018	10/07/2018									LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19									<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1									<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2									<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4									<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7									<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19									<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	<38	<38									<38	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5									<5	ug/kg	TM31/PM12
Benzene #	<5	<5									<5	ug/kg	TM31/PM12
Toluene #	<5	<5									<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5									<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5									<5	ug/kg	TM31/PM12
Natural Moisture Content	47.5	63.1									<0.1	%	PM4/PM0

Client Name: Ramboll
Reference: 1700001578
Location: Thames Quarter, Reading
Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10752

SOILS

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/10752

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes



Exova Jones Environmental

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Deeside Industrial Park
Deeside
CH5 2UA

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Fax: +44 (0) 1244 833781



Attention :	Siobhan McGeever
Date :	20th July, 2018
Your reference :	
Our reference :	Test Report 18/10819 Batch 1
Location :	Thames Quarter
Date samples received :	11th July, 2018
Status :	Final report
Issue :	1

Three samples were received for analysis on 11th July, 2018 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Lucas Halliwell
Project Co-ordinator

Client Name: Ramboll
 Reference:
 Location: Thames Quarter
 Contact: Siobhan McGeever
 JE Job No.: 18/10819

Report : Solid

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

J E Sample No.	1-4	5-8	9-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	RV13	RV14	RV15										
Depth	2.40	2.40	2.35										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	10/07/2018	10/07/2018	10/07/2018										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	11/07/2018	11/07/2018	11/07/2018								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	16	<7	<7								<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	400	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	416	<19	<19								<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	129	<7	<7								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	129	<19	<19								<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	545	<38	<38								<38	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5								<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5								<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5								<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5								<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5								<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5								<5	ug/kg	TM31/PM12
Natural Moisture Content	48.3	36.4	48.0								<0.1	%	PM4/PM0

Matrix : Solid

Location: Thames Quarter

Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10819

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/10819

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes



Exova Jones Environmental

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Fax: +44 (0) 1244 833781



Attention :	Siobhan McGeever
Date :	17th July, 2018
Your reference :	
Our reference :	Test Report 18/10918 Batch 1
Location :	Thames Quarter, Reading
Date samples received :	12th July, 2018
Status :	Final report
Issue :	1

Four samples were received for analysis on 12th July, 2018 of which four were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Paul Boden BSc
Project Manager

Client Name: Ramboll
 Reference:
 Location: Thames Quarter, Reading
 Contact: Siobhan McGeever
 JE Job No.: 18/10918

Report : Solid

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

J E Sample No.	1-3	4-5	6-8	9-11							Please see attached notes for all abbreviations and acronyms		
Sample ID	RV16	RV17	RV18	RV11									
Depth	2.20	2.00	1.95	2.20									
COC No / misc													
Containers	V J	V J	V J	V J									
Sample Date	11/07/2018	11/07/2018	11/07/2018	11/07/2018									
Sample Type	Soil	Soil	Soil	Soil									
Batch Number	1	1	1	1									
Date of Receipt	12/07/2018	12/07/2018	12/07/2018	12/07/2018							LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	124							<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	124							<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1							<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2							<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4							<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7							<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19							<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	<38	<38	<38	124							<38	mg/kg	TM5/PM8/PM16/PM12/PM10
MTBE #	<5	<5	<5	17							<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5							<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5							<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5							<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5							<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5							<5	ug/kg	TM31/PM12
Natural Moisture Content	65.9	89.2	31.9	55.2							<0.1	%	PM4/PM0

Matrix : Solid

Location: Thames Quarter, Reading

Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/10918

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/10918

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes



Exova Jones Environmental

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Attention :	Siobhan McGeever
Date :	18th July, 2018
Your reference :	C413 WKJ
Our reference :	Test Report 18/11017 Batch 1
Location :	Thames Quarter Reading
Date samples received :	13th July, 2018
Status :	Final report
Issue :	1

Five samples were received for analysis on 13th July, 2018 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Paul Boden BSc
Project Manager

Client Name: Ramboll
Reference: C413 WKJ
Location: Thames Quarter Reading
Contact: Siobhan McGeever
JE Job No.: 18/11017

Report : Solid

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

J E Sample No.	1-3	4-5	6-7	8-9	10-13						Please see attached notes for all abbreviations and acronyms		
Sample ID	RV19	RV20	RV21	RV22	RV23								
Depth	1.7	2.5	1.6										
COC No / misc													
Containers	V J	V J	V J	V J	V								
Sample Date	12/07/2018	12/07/2018	12/07/2018	12/07/2018	12/07/2018								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	13/07/2018	13/07/2018	13/07/2018	13/07/2018	13/07/2018						LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	<7	<7	<7	<7	47						<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	<19	<19	<19	<19	47						<19	mg/kg	TM5/PM8/PM16
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2						<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	<4	<4						<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	<7	<7	<7	<7	<7						<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	<7	<7	<7	<7	29						<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	<19	<19	<19	<19	29						<19	mg/kg	TM5/PM8/PM16
Total aliphatics and aromatics(C5-35)	<38	<38	<38	<38	76						<38	mg/kg	TM5/PM8/PM16
MTBE #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Natural Moisture Content	43.0	14.5	38.9	45.1	15.7						<0.1	%	PM4/PM0

Client Name: Ramboll
Reference: C413 WKJ
Location: Thames Quarter Reading
Contact: Siobhan McGeever

Client Name: Ramboll **Matrix :** Solid

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/11017

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/11017

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes

APPENDIX 4

LABORATORY RESULTS – GROUNDWATERS



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Soilfix (East) Ltd
23 Bellingham Lane
Rayleigh
Essex
SS6 7ED

Tel: +44 (0) 1244 833780

Fax: +44 (0) 1244 833781



Attention :	Tim Blake
Date :	18th July, 2018
Your reference :	C413.WKJ
Our reference :	Test Report 18/11090 Batch 1
Location :	Thames Quarter Reading
Date samples received :	14th July, 2018
Status :	Final report
Issue :	1

Three samples were received for analysis on 14th July, 2018 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Lucas Halliwell
Project Co-ordinator

Client Name: Soilfix (East) Ltd
Reference: C413.WKJ
Location: Thames Quarter Reading
Contact: Tim Blake
JE Job No.: 18/11090

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃

J E Sample No.	1-4	5-8	9-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	WS401	SUMP 1E	SUMP NEW 1C										
Depth													
COC No / misc													
Containers	V P G	V P G	V P G										
Sample Date	12/07/2018	12/07/2018	12/07/2018										
Sample Type	Ground Water	Ground Water	Ground Water										
Batch Number	1	1	1										
Date of Receipt	14/07/2018	14/07/2018	14/07/2018								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10								<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10								<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
MTBE #	<5	<5	<5								<5	ug/l	TM31/PM12
Benzene #	<5	<5	<5								<5	ug/l	TM31/PM12
Toluene #	<5	<5	<5								<5	ug/l	TM31/PM12
Ethylbenzene #	<5	<5	<5								<5	ug/l	TM31/PM12
m/p-Xylene #	<5	<5	<5								<5	ug/l	TM31/PM12
o-Xylene #	<5	<5	<5								<5	ug/l	TM31/PM12

Client Name: Soilfix (East) Ltd
Reference: C413.WKJ
Location: Thames Quarter Reading
Contact: Tim Blake

Matrix : Liquid

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/11090

SOILS

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/11090

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Ramboll
240 Blackfriars Rd
London
SE1 8NW

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Attention : Siobhan McGeever
Date : 23rd July, 2018
Your reference :
Our reference : Test Report 18/11268 Batch 1
Location : Thames Quarter
Date samples received : 18th July, 2018
Status : Final report
Issue : 1

Nine samples were received for analysis on 18th July, 2018 of which nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

A handwritten signature in black ink, appearing to read 'Paul Boden'.

Paul Boden BSc
Project Manager

Client Name: Ramboll
 Reference:
 Location: Thames Quarter
 Contact: Siobhan McGeever
 JE Job No.: 18/11268

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃

J E Sample No.	1-4	5-8	9-12	13-16	17-20	21-24	25-28	29-32	33-36		Please see attached notes for all abbreviations and acronyms		
Sample ID	BH2	BH1	CP03	WS08	1E	1C NEW	WS5	WS401	WS402				
Depth													
COC No / misc													
Containers	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V P G	V P G				
Sample Date	16/07/2018	16/07/2018	16/07/2018	16/07/2018	16/07/2018	16/07/2018	16/07/2018	16/07/2018	16/07/2018				
Sample Type	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	18/07/2018	18/07/2018	18/07/2018	18/07/2018	18/07/2018	18/07/2018	18/07/2018	18/07/2018	18/07/2018		LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>C6-C8	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>C8-C10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>C10-C12	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10	<10	40	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10	4240	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	<10	<10	<10	4280	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>EC7-EC8	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>EC8-EC10	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>EC10-EC12	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10	640	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	<10	<10	<10	640	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35)	<10	<10	<10	4920	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
MTBE	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
Benzene	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
Toluene	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
Ethylbenzene	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
m/p-Xylene	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
o-Xylene	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12

Client Name: Ramboll
Reference:
Location: Thames Quarter
Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/11268

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/11268

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Deeside
CH5 2UA

Ramboll
240 Blackfriars Rd
London
SE1 8NW

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention : Siobhan McGeever
Date : 27th July, 2018
Your reference :
Our reference : Test Report 18/11572 Batch 1
Location : Thames Quater
Date samples received : 24th July, 2018
Status : Final report
Issue : 1

Nine samples were received for analysis on 24th July, 2018 of which nine were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: Ramboll
 Reference:
 Location: Thames Quater
 Contact: Siobhan McGeever
 JE Job No.: 18/11572

Report : Liquid

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

J E Sample No.	1-4	5-8	9-11	12-15	16-19	20-23	24-27	28-29,33	30-32		Please see attached notes for all abbreviations and acronyms		
Sample ID	BH1	BH2	CP03	SUMP 1E	NEW SUMP 1C	WS5	WS08	WS401	WS402				
Depth													
COC No / misc													
Containers	V P G	V P G	V G	V P G	V P G	V P G	V P G	V G	V G				
Sample Date	23/07/2018	23/07/2018	23/07/2018	23/07/2018	23/07/2018	23/07/2018	23/07/2018	23/07/2018	23/07/2018				
Sample Type	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water				
Batch Number	1	1	1	1	1	1	1	1	1				
Date of Receipt	24/07/2018	24/07/2018	24/07/2018	24/07/2018	24/07/2018	24/07/2018	24/07/2018	24/07/2018	24/07/2018		LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>C6-C8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>C8-C10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>C10-C12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM5/PM16/PM30
>C12-C16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>C16-C21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>C21-C35 #	<10	<10	<10	2460	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35 #	<10	<10	<10	2460	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Aromatics													
>C5-EC7 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>EC7-EC8 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>EC8-EC10 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM36/PM12
>EC10-EC12 #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM5/PM16/PM30
>EC12-EC16 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>EC16-EC21 #	<10	<10	<10	<10	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
>EC21-EC35 #	<10	<10	<10	550	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35 #	<10	<10	<10	550	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
Total aliphatics and aromatics(C5-35) #	<10	<10	<10	3010	<10	<10	<10	<10	<10		<10	ug/l	TM5/PM16/PM30
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5		<5	ug/l	TM31/PM12

Matrix : Liquid

Contact: Siobhan McGeever

[illegible]

Client Name: Ramboll **Matrix :** Liquid

Reference:

Location: Thames Quater

Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/11572

SOILS

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/11572

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.	Yes			
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details	Yes			
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes			



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Deeside
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Ramboll
240 Blackfriars Rd
London
SE1 8NW

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

Attention :	Siobhan McGeever
Date :	8th August, 2018
Your reference :	Thames Quarter
Our reference :	Test Report 18/12179 Batch 1
Location :	Reading
Date samples received :	3rd August, 2018
Status :	Final report
Issue :	1

One sample were received for analysis on 3rd August, 2018 of which one were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

A handwritten signature in black ink, appearing to read 'Paul Boden'.

Paul Boden BSc
Senior Project Manager

Client Name: Ramboll
Reference: Thames Quarter
Location: Reading
Contact: Siobhan McGeever
JE Job No.: 18/12179

Report : Liquid

Liquids/products: V=40ml vial, G=glass bottle, P=plastic bottle
 H=H₂SO₄, Z=ZnAc, N=NaOH, HN=HN0₃

J E Sample No.	1-4										Please see attached notes for all abbreviations and acronyms		
Sample ID	SUMP 1E												
Depth													
COC No / misc													
Containers	V G												
Sample Date	31/07/2018												
Sample Type	Liquid												
Batch Number	1												
Date of Receipt	03/08/2018										LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6	<10										<10	ug/l	TM36/PM12
>C6-C8	<10										<10	ug/l	TM36/PM12
>C8-C10	<10										<10	ug/l	TM36/PM12
>C10-C12	<5										<5	ug/l	TM5/PM16/PM30
>C12-C16	<10										<10	ug/l	TM5/PM16/PM30
>C16-C21	<10										<10	ug/l	TM5/PM16/PM30
>C21-C35	<10										<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	<10										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Aromatics													
>C5-EC7	<10										<10	ug/l	TM36/PM12
>EC7-EC8	<10										<10	ug/l	TM36/PM12
>EC8-EC10	<10										<10	ug/l	TM36/PM12
>EC10-EC12	<5										<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10										<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10										<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10										<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	<10										<10	ug/l	TM5/TM36/PM12/PM16/PM30
Total aliphatics and aromatics(C5-35)	<10										<10	ug/l	TM5/TM36/PM12/PM16/PM30
MTBE	<5										<5	ug/l	TM31/PM12
Benzene	<5										<5	ug/l	TM31/PM12
Toluene	<5										<5	ug/l	TM31/PM12
Ethylbenzene	<5										<5	ug/l	TM31/PM12
m/p-Xylene	<5										<5	ug/l	TM31/PM12
o-Xylene	<5										<5	ug/l	TM31/PM12

Client Name: Ramboll
Reference: Thames Quarter
Location: Reading
Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/12179

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

JE Job No: 18/12179

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.				
TM5/TM36	please refer to TM5 and TM36 for method details	PM12/PM16/PM30	please refer to PM16/PM30 and PM12 for method details				
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.				

APPENDIX 5

RE-USED MATERIAL GAC SCREENING AND CERTIFICATES



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Ramboll
240 Blackfriars Rd
London
SE1 8NW

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781



Attention :	Siobhan McGeever
Date :	19th June, 2018
Your reference :	17000017
Our reference :	Test Report 18/8538 Batch 1 Schedule A 18/8538 Batch 1 Schedule B
Location :	Thames Quarter, Reading
Date samples received :	1st June, 2018
Status :	Final report
Issue :	1

Six samples were received for analysis on 1st June, 2018 of which six were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever
JE Job No.: 18/8538

Report : Solid

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

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018					LOD/LOR	Units	Method No.
Arsenic #	NDP	NDP	NDP	NDP	NDP	NDP					<0.5	mg/kg	TM30/PM15
Cadmium #	NDP	NDP	NDP	NDP	NDP	NDP					<0.1	mg/kg	TM30/PM15
Chromium #	NDP	NDP	NDP	NDP	NDP	NDP					<0.5	mg/kg	TM30/PM15
Copper #	NDP	NDP	NDP	NDP	NDP	NDP					<1	mg/kg	TM30/PM15
Lead #	NDP	NDP	NDP	NDP	NDP	NDP					<5	mg/kg	TM30/PM15
Mercury #	NDP	NDP	NDP	NDP	NDP	NDP					<0.1	mg/kg	TM30/PM15
Nickel #	NDP	NDP	NDP	NDP	NDP	NDP					<0.7	mg/kg	TM30/PM15
Selenium #	NDP	NDP	NDP	NDP	NDP	NDP					<1	mg/kg	TM30/PM15
Zinc #	NDP	NDP	NDP	NDP	NDP	NDP					<5	mg/kg	TM30/PM15
Arsenic	12.0	13.5	11.9	2.8	2.2	15.8					<0.5	mg/kg	TM30/PM62
Cadmium	0.2	0.4	0.3	<0.1	<0.1	0.2					<0.1	mg/kg	TM30/PM62
Chromium	19.2	23.8	24.2	36.0	42.4	43.1					<0.5	mg/kg	TM30/PM62
Copper	25	33	24	51	38	41					<1	mg/kg	TM30/PM62
Lead	32	76	50	21	13	61					<5	mg/kg	TM30/PM62
Mercury	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	mg/kg	TM30/PM62
Nickel	17.6	17.2	16.1	18.1	28.8	23.5					<0.7	mg/kg	TM30/PM62
Selenium	<1	1	1	<1	<1	3					<1	mg/kg	TM30/PM62
Zinc	61	180	95	73	91	112					<5	mg/kg	TM30/PM62
PAH MS													
Naphthalene #	<0.20 ^{AA}	0.13	0.09	<0.40 ^{AB}	<0.40 ^{AB}	0.10					<0.04	mg/kg	TM4/PM8
Acenaphthylene	0.93 ^{AA}	0.26	0.31	<0.30 ^{AB}	<0.30 ^{AB}	0.18					<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.25 ^{AA}	0.12	0.13	<0.50 ^{AB}	<0.50 ^{AB}	0.23					<0.05	mg/kg	TM4/PM8
Fluorene #	0.54 ^{AA}	0.08	0.09	<0.40 ^{AB}	<0.40 ^{AB}	0.16					<0.04	mg/kg	TM4/PM8
Phenanthrene #	6.32 ^{AA}	2.38	2.66	<0.30 ^{AB}	<0.30 ^{AB}	1.76					<0.03	mg/kg	TM4/PM8
Anthracene #	2.63 ^{AA}	1.10	1.30	<0.40 ^{AB}	<0.40 ^{AB}	0.79					<0.04	mg/kg	TM4/PM8
Fluoranthene #	9.99 ^{AA}	6.38	8.07	<0.30 ^{AB}	<0.30 ^{AB}	4.14					<0.03	mg/kg	TM4/PM8
Pyrene #	8.50 ^{AA}	5.54	6.94	<0.30 ^{AB}	<0.30 ^{AB}	3.44					<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	4.18 ^{AA}	3.32	3.71	<0.60 ^{AB}	<0.60 ^{AB}	1.85					<0.06	mg/kg	TM4/PM8
Chrysene #	4.29 ^{AA}	3.28	4.05	<0.20 ^{AB}	<0.20 ^{AB}	1.96					<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	8.41 ^{AA}	7.09	8.77	<0.70 ^{AB}	<0.70 ^{AB}	4.47					<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	4.53 ^{AA}	3.73	4.52	<0.40 ^{AB}	<0.40 ^{AB}	2.25					<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	2.41 ^{AA}	2.47	3.18	<0.40 ^{AB}	<0.40 ^{AB}	1.67					<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	0.71 ^{AA}	0.43	0.63	<0.40 ^{AB}	<0.40 ^{AB}	0.41					<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	2.40 ^{AA}	2.21	2.96	<0.40 ^{AB}	<0.40 ^{AB}	1.52					<0.04	mg/kg	TM4/PM8
PAH 16 Total	55.8 ^{AA}	38.5	47.4	<6.0 ^{AB}	<6.0 ^{AB}	24.9					<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	6.06 ^{AA}	5.10	6.31	<0.50 ^{AB}	<0.50 ^{AB}	3.22					<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	2.35 ^{AA}	1.99	2.46	<0.20 ^{AB}	<0.20 ^{AB}	1.25					<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	87 ^{AA}	89	87	90 ^{AB}	88 ^{AB}	84					<0	%	TM4/PM8
VOC TICs	ND	ND	ND	ND	ND	ND						None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10

Client Name: Ramboll
 Reference: 17000017
 Location: Thames Quarter, Reading
 Contact: Siobhan McGeever
 JE Job No.: 18/8538

Report : Solid

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

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018					LOD/LOR	Units	Method No.
Ethylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
p/m-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	69	84	83	52	54	89					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	61	66	62	55	55	65					<0	%	TM15/PM10
SVOC TICs	See Attached	See Attached	See Attached	See Attached	See Attached	ND						None	TM16/PM8
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2	10.1	3.4	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	74	1196	1067	<4					<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	<7	<7	331	4665	4264	<7					<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	27	<7	135	217	248	<7					<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	27	<19	540	6088	5582	<19					<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1	<0.1 ^{SV}	<0.1	<0.1					<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2					<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4	81	71	<4					<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	21	50	41	330	295	<7					<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	251	221	131	295	395	73					<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	272	271	172	706	761	73					<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	299	271	712	6794	6343	73					<38	mg/kg	TM5/PM8/PM16/PM12/PM10
PCB 28 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<50 ^{AB}	<50 ^{AB}	<5					<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35	<350 ^{AB}	<350 ^{AB}	<35					<35	ug/kg	TM17/PM8
Natural Moisture Content	<0.1	11.2	10.3	3.8	1.6	13.4					<0.1	%	PM4/PM0
Sulphate as SO4 (2:1 Ext) #	NDP	NDP	NDP	NDP	NDP	NDP					<0.0015	g/l	TM38/PM20
Sulphate as SO4 (2:1 Ext)	0.1218	0.0342	0.0695	0.0298	0.0323	0.1366					<0.0015	g/l	TM38/PM60
Total Organic Carbon #	NDP	NDP	NDP	NDP	NDP	NDP					<0.02	%	TM21/PM24

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever
JE Job No.: 18/8538

Report : CEN 10:1 1 Batch

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

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018					LOD/LOR	Units	Method No.
Dissolved Arsenic #	5.3	11.5	10.5	4.9	5.2	14.2					<2.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM30/PM14
Dissolved Chromium #	4.1	2.7	1.9	<1.5	<1.5	2.6					<1.5	ug/l	TM30/PM14
Dissolved Copper #	<7	<7	<7	<7	<7	<7					<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5	<5	<5	<5					<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1	<1	<1	<1					<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	<2	<2	<2	<2					<2	ug/l	TM30/PM14
Dissolved Selenium #	<3	<3	<3	<3	<3	<3					<3	ug/l	TM30/PM14
Dissolved Zinc #	<3	7	4	<3	<3	12					<3	ug/l	TM30/PM14
PAH MS													
Naphthalene	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM4/PM30
Acenaphthylene	0.221	0.213	0.155	<0.013	0.013	0.097					<0.013	ug/l	TM4/PM30
Acenaphthene	0.076	0.127	0.195	<0.013	<0.013	0.041					<0.013	ug/l	TM4/PM30
Fluorene	0.038	0.043	0.065	<0.014	<0.014	0.024					<0.014	ug/l	TM4/PM30
Phenanthrene	0.285	0.369	0.418	0.014	0.028	0.152					<0.011	ug/l	TM4/PM30
Anthracene	0.264	0.436	0.413	<0.013	0.014	0.145					<0.013	ug/l	TM4/PM30
Fluoranthene	2.177	2.802	2.767	<0.012	0.069	0.976					<0.012	ug/l	TM4/PM30
Pyrene	2.391	2.435	2.494	<0.013	0.074	0.846					<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	1.776	2.009	1.913	<0.015	0.055	0.640					<0.015	ug/l	TM4/PM30
Chrysene	1.665	1.719	1.607	<0.011	0.064	0.614					<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	3.846	5.003	3.860	<0.018	0.169	1.562					<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	2.616	3.737	2.735	<0.016	0.124	1.102					<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	1.264	1.957	1.340	<0.011	0.065	0.512					<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	0.22	0.32	0.23	<0.01	0.01	0.10					<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	0.875	1.400	1.058	0.012	0.065	0.429					<0.011	ug/l	TM4/PM30
PAH 16 Total	17.714	22.570	19.250	<0.195	0.750	7.240					<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	2.77	3.60	2.78	<0.01	0.12	1.12					<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	1.08	1.40	1.08	<0.01	0.05	0.44					<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	74	76	74	73	74	74					<0	%	TM4/PM30
VOC TICs	ND	ND	ND	ND	ND	ND						None	TM15/PM69
Methyl Tertiary Butyl Ether	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM15/PM69
Toluene	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM69
Ethylbenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
p/m-Xylene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
o-Xylene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
Surrogate Recovery Toluene D8	102	99	105	97	99	97					<0	%	TM15/PM69
Surrogate Recovery 4-Bromofluorobenzene	99	99	107	98	99	98					<0	%	TM15/PM69
SVOC TICs	ND	ND	ND	ND	ND	ND						None	TM16/PM30

Client Name: Ramboll
 Reference: 17000017
 Location: Thames Quarter, Reading
 Contact: Siobhan McGeever
 JE Job No.: 18/8538

Report : CEN 10:1 1 Batch

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

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018					LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM69
>C6-C8	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM69
>C8-C10	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM69
>C10-C12	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10	<10	30	50	<10					<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10	<10	140	180	<10					<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	<10	<10	<10	170	230	<10					<10	ug/l	TM5/PM16/PM30/PM69
Aromatics													
>C5-EC7	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM69
>EC7-EC8	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM69
>EC8-EC10	<10	<10	<10	<10	<10	<10					<10	ug/l	TM36/PM69
>EC10-EC12	<5	<5	<5	<5	<5	<5					<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	<10	<10	<10	<10	<10	<10					<10	ug/l	TM5/PM16/PM30/PM69
Total aliphatics and aromatics(C5-35)	<10	<10	<10	170	230	<10					<10	ug/l	TM5/PM16/PM30/PM69
PCB 28	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
PCB 52	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
PCB 101	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
PCB 118	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
PCB 138	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
PCB 153	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
PCB 180	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7	<0.7	<0.7	<0.7	<0.7	<0.7					<0.7	ug/l	TM17/PM30
Sulphate as SO4 #	44.99	9.98	19.27	16.75	11.76	8.43					<0.05	mg/l	TM38/PM0
Dissolved Organic Carbon	4	4	4	<2	2	5					<2	mg/l	TM60/PM0
pH	10.21	8.70	9.51	8.74	8.66	8.36					<0.01	pH units	TM73/PM0

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018							
SVOC MS													
Phenols													
2-Chlorophenol #	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2-Methylphenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2-Nitrophenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2,4-Dichlorophenol #	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2,4-Dimethylphenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2,4,5-Trichlorophenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2,4,6-Trichlorophenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
4-Chloro-3-methylphenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
4-Methylphenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
4-Nitrophenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
Pentachlorophenol	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
Phenol #	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
PAHs													
2-Chloronaphthalene #	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2-Methylnaphthalene #	<10	95	106	<10	<10	28					<10	ug/kg	TM16/PM8
Phthalates													
Bis(2-ethylhexyl) phthalate	<100	<100	<100	<100	<100	<100					<100	ug/kg	TM16/PM8
Butylbenzyl phthalate	<100	<100	<100	<100	<100	<100					<100	ug/kg	TM16/PM8
Di-n-butyl phthalate	<100	<100	<100	<100	<100	<100					<100	ug/kg	TM16/PM8
Di-n-Octyl phthalate	<100	<100	<100	<100	<100	<100					<100	ug/kg	TM16/PM8
Diethyl phthalate	<100	<100	<100	<100	<100	<100					<100	ug/kg	TM16/PM8
Dimethyl phthalate #	<100	<100	<100	<100	<100	<100					<100	ug/kg	TM16/PM8
Other SVOCs													
1,2-Dichlorobenzene	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
1,2,4-Trichlorobenzene #	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
1,3-Dichlorobenzene	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
1,4-Dichlorobenzene	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2-Nitroaniline	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2,4-Dinitrotoluene	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
2,6-Dinitrotoluene	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8
3-Nitroaniline	<10	<10	<10	<10	<10	<10					<10	ug/kg	TM16/PM8

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever
JE Job No.: 18/8538

SVOC Report : CEN 10:1 1 Batch

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc													
Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1					LOD/LOR	Units	Method No.
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018							
SVOC MS													
Phenols													
2-Chlorophenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2-Methylphenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2-Nitrophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,4-Dichlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,4-Dimethylphenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2,4,5-Trichlorophenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,4,6-Trichlorophenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Chloro-3-methylphenol	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
4-Methylphenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Nitrophenol	<10	<10	<10	<10	<10	<10					<10	ug/l	TM16/PM30
Pentachlorophenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Phenol	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
PAHs													
2-Chloronaphthalene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2-Methylnaphthalene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Phthalates													
Bis(2-ethylhexyl) phthalate	<5	<5	<5	<5	<5	<5					<5	ug/l	TM16/PM30
Butylbenzyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Di-n-butyl phthalate	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5					<1.5	ug/l	TM16/PM30
Di-n-Octyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Diethyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Dimethyl phthalate	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Other SVOCs													
1,2-Dichlorobenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
1,2,4-Trichlorobenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
1,3-Dichlorobenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
1,4-Dichlorobenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2-Nitroaniline	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
2,4-Dinitrotoluene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
2,6-Dinitrotoluene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
3-Nitroaniline	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Bromophenylphenylether	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Chloroaniline	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Chlorophenylphenylether	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
4-Nitroaniline	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Azobenzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Bis(2-chloroethoxy)methane	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Bis(2-chloroethyl)ether	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Carbazole	<0.5	0.5	1.0	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Dibenzofuran	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Hexachlorobenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Hexachlorobutadiene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Hexachlorocyclopentadiene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Hexachloroethane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Isophorone	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
N-nitrosodi-n-propylamine	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM16/PM30
Nitrobenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM16/PM30
Surrogate Recovery 2-Fluorobiphenyl	81	86	86	74	87	90					<0	%	TM16/PM30
Surrogate Recovery p-Terphenyl-d14	129	89	113	94	103	85					<0	%	TM16/PM30

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever
JE Job No.: 18/8538

VOC Report : Solid

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018					LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1	<1	<1	<1					<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6	<6	<6	<6					<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30	<30	<30	<30					<30	ug/kg	TM15/PM10
trans-1,2-Dichloroethene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
cis-1,2-Dichloroethene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	7	<3	<3	<3	9					<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6	<6	<6	<6					<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
cis-1,3-Dichloropropene	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
Toluene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
trans-1,3-Dichloropropene	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
p/m-Xylene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2	<2	<2	<2					<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3	<3	<3	<3					<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5	<5	<5	<5					<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6	<6	<6	<6					<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7	<7	<7	<7					<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4	<4	<4	<4					<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27	<27	<27	<27					<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7	<7	<7	<7					<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	69	84	83	52	54	89					<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	61	66	62	55	55	65					<0	%	TM15/PM10

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever
JE Job No.: 18/8538

VOC Report : CEN 10:1 1 Batch

J E Sample No.	1-5	6-10	11-15	16-20	21-25	26-29					Please see attached notes for all abbreviations and acronyms		
Sample ID	ES1	ES2	ES3	ES4	ES5	ES6							
Depth	0.10	0.30	0.40	0.02	0.03	0.60							
COC No / misc Containers	V J T	V J T	V J T	V J T	V J T	V J							
Sample Date	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018	30/05/2018							
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1	1							
Date of Receipt	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018	01/06/2018					LOD/LOR	Units	Method No.
VOC MS													
Dichlorodifluoromethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Methyl Tertiary Butyl Ether	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
Chloromethane	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Vinyl Chloride	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1					<0.1	ug/l	TM15/PM69
Bromomethane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
Chloroethane	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Trichlorofluoromethane	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,1-Dichloroethene (1,1 DCE)	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Dichloromethane (DCM)	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM69
trans-1-2-Dichloroethene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,1-Dichloroethane	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
cis-1-2-Dichloroethene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
2,2-Dichloropropane	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
Bromochloromethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Chloroform	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,1,1-Trichloroethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,1-Dichloropropene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Carbon tetrachloride	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,2-Dichloroethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Benzene	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5					<0.5	ug/l	TM15/PM69
Trichloroethene (TCE)	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,2-Dichloropropane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Dibromomethane	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Bromodichloromethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
cis-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Toluene	<5	<5	<5	<5	<5	<5					<5	ug/l	TM15/PM69
trans-1-3-Dichloropropene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,1,2-Trichloroethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Tetrachloroethene (PCE)	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,3-Dichloropropane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Dibromochloromethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,2-Dibromoethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Chlorobenzene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,1,1,2-Tetrachloroethane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Ethylbenzene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
p/m-Xylene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
o-Xylene	<1	<1	<1	<1	<1	<1					<1	ug/l	TM15/PM69
Styrene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Bromoform	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
Isopropylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,1,2,2-Tetrachloroethane	<4	<4	<4	<4	<4	<4					<4	ug/l	TM15/PM69
Bromobenzene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,2,3-Trichloropropane	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Propylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
2-Chlorotoluene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,3,5-Trimethylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
4-Chlorotoluene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
tert-Butylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,2,4-Trimethylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
sec-Butylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
4-Isopropyltoluene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,3-Dichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,4-Dichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
n-Butylbenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,2-Dichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
1,2-Dibromo-3-chloropropane	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,2,4-Trichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Hexachlorobutadiene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Naphthalene	<2	<2	<2	<2	<2	<2					<2	ug/l	TM15/PM69
1,2,3-Trichlorobenzene	<3	<3	<3	<3	<3	<3					<3	ug/l	TM15/PM69
Surrogate Recovery Toluene D8	102	99	105	97	99	97					<0	%	TM15/PM69
Surrogate Recovery 4-Bromofluorobenzene	99	99	107	98	99	98					<0	%	TM15/PM69

Please include all sections of this report if it is reproduced

Exova Jones Environmental

Method: SVOC

Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Exova Jones Environmental

Method: SVOC

Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Exova Jones Environmental

Method: SVOC

Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Exova Jones Environmental

Job number: 18/8538

Method: SVOC

Sample number: 18

Matrix: Solid

Sample identity: ES4

Sample depth: 0.02

Sample Type: Soil

Units: ug/kg

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Exova Jones Environmental

Job number: 18/8538 **Method:** SVOC
Sample number: 23 **Matrix:** Solid
Sample identity: ES5
Sample depth: 0.03
Sample Type: Soil
Units: ug/kg

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

CAS No.	Tentative Compound Identification	Retention Time (minutes)	% Match	Concentration
40250-64-4	Perhydrophenalene, (3a.alpha., 6a.alpha., 9a.alpha., 9b.beta.)-	8.112	95	1996
629-59-4	Tetradecane	8.342	83	8083
-	Octatriacontyl pentafluoropropionate	8.929	86	13553
55162-61-3	Tetracontane, 3,5,24-trimethyl-	9.242	91	76629
-	Sulfurous acid, 2-propyl tetradecyl ester	9.269	91	23882
629-92-5	Nonadecane	9.460	91	68337
-	Oxalic acid, cyclobutyl hexadecyl ester	9.757	87	97754
-	Sulfurous acid, pentadecyl 2-propyl ester	9.822	83	35029
56862-62-5	10-Methylnonadecane	9.966	91	90631
-	1-Octadecanesulphonyl chloride	10.018	83	56675
544-76-3	Hexadecane	10.188	93	70106
-	Tetrapentacontane, 1,54-dibromo-	10.267	87	39246
593-49-7	Heptacosane	10.437	91	93670
630-01-3	Hexacosane	10.883	91	48426
112-88-9	1-Octadecene	11.082	94	6545
-	Sulfurous acid, octadecyl 2-propyl ester	11.132	87	3042
629-78-7	Heptadecane	11.152	95	1849
593-45-3	Octadecane	11.192	90	4671
112-95-8	Eicosane	11.301	97	21345
630-02-4	Octacosane	12.568	96	1822
646-31-1	Tetracosane	13.026	97	1124
630-07-9	Pentatriacontane	13.954	95	304
629-99-2	Pentacosane	14.393	92	1217

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever

Note:

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

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/8538	1	ES1	0.10	4	13/06/2018	General Description (Bulk Analysis)	Soil/Stone
					13/06/2018	Asbestos Fibres	Fibre Bundles
					13/06/2018	Asbestos ACM	NAD
					13/06/2018	Asbestos Type	Chrysotile
					13/06/2018	Asbestos Level Screen	less than 0.1%
18/8538	1	ES2	0.30	9	13/06/2018	General Description (Bulk Analysis)	Soil/Stone
					13/06/2018	Asbestos Fibres	Fibre Bundles
					13/06/2018	Asbestos ACM	NAD
					13/06/2018	Asbestos Type	Chrysotile
					13/06/2018	Asbestos Level Screen	less than 0.1%
18/8538	1	ES3	0.40	14	13/06/2018	General Description (Bulk Analysis)	Soil/Stone
					13/06/2018	Asbestos Fibres	Fibre Bundles
					13/06/2018	Asbestos ACM	NAD
					13/06/2018	Asbestos Type	Chrysotile
					13/06/2018	Asbestos Level Screen	less than 0.1%
18/8538	1	ES4	0.02	19	13/06/2018	General Description (Bulk Analysis)	Tar
					13/06/2018	Asbestos Fibres	NAD
					13/06/2018	Asbestos Fibres (2)	NAD
					13/06/2018	Asbestos ACM	NAD
					13/06/2018	Asbestos ACM (2)	NAD
					13/06/2018	Asbestos Type	NAD
					13/06/2018	Asbestos Type (2)	NAD
					13/06/2018	Asbestos Level Screen	NAD
18/8538	1	ES5	0.03	24	13/06/2018	General Description (Bulk Analysis)	Bitumen
					13/06/2018	Asbestos Fibres	NAD
					13/06/2018	Asbestos Fibres (2)	NAD
					13/06/2018	Asbestos ACM	NAD
					13/06/2018	Asbestos ACM (2)	NAD
					13/06/2018	Asbestos Type	NAD
					13/06/2018	Asbestos Type (2)	NAD
					13/06/2018	Asbestos Level Screen	NAD
18/8538	1	ES6	0.60	28	13/06/2018	General Description (Bulk Analysis)	Soil/Stones
					13/06/2018	Asbestos Fibres	Fibre Bundles
					13/06/2018	Asbestos ACM	Unable to characterise

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever

[illegible]

Client Name: Ramboll
Reference: 17000017
Location: Thames Quarter, Reading
Contact: Siobhan McGeever

Matrix : Solid

[illegible]

Matrix : Solid

Client Name: Ramboll **Matrix : Solid**
Reference: 17000017

Reference: 17000017
Location: Thames Quarter, Reading

Location: Thames Quarter, Reading

Contact: Siobhan McGeever

[illegible]

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

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/8538

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x5 Dilution
AB	x10 Dilution

JE Job No: 18/8538

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes

JE Job No: 18/8538

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM69	Modified BS EN 12457 method. One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM69	Modified BS EN 12457 method. One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

JE Job No: 18/8538

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM62	Acid digestion of as received solid samples using Aqua Regia refluxed at 112.5 °C.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM69	Modified BS EN 12457 method. One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM60	As received solid samples are extracted with deionised water in a 2:1 ratio of water to solid.			AR	Yes

JE Job No: 18/8538

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO ₂ and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes



Exova Jones Environmental

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Attention :	Siobhan McGeever
Date :	10th July, 2018
Your reference :	17000017
Our reference :	Test Report 18/8538 Batch 1 Schedule D
Location :	Thames Quarter, Reading
Date samples received :	1st June, 2018
Status :	Final report
Issue :	1

Six samples were received for analysis on 1st June, 2018 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Simon Gomery BSc
Project Manager

Please see attached notes for all abbreviations and acronyms

Matrix : Solid

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 18/8538

SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS Ref No. 4225) accredited - UK.
SA	ISO17025 (SANAS Ref No.T0729) accredited - South Africa.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to an Exova Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range
AA	x10 Dilution

JE Job No: 18/8538

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM7	Modified USEPA 3540 and 9071 for oily wastes. In house method for the gravimetric determination of a sample following solvent extraction.	PM6	Samples are extracted using Soxtec apparatus and solvent.	Yes		AR	Yes
TM13	Determination of Saturates, Aromatics, Resins and Asphaltenes by Thin Layer Chromatography with Flame Ionisation Detection.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM6	Samples are extracted using Soxtec apparatus and solvent.			AR	



Exova Jones Environmental

Registered Address : Exova (UK) Ltd, Lochend Industrial Estate, Newbridge, Midlothian, EH28 8PL

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Attention : Siobhan McGeever
Date : 29th June, 2018
Your reference :
Our reference : Test Report 18/9662 Batch 1
Location : Thames Quarter Reading
Date samples received : 21st June, 2018
Status : Final report
Issue : 1

Three samples were received for analysis on 21st June, 2018 of which three were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.

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

Compiled By:

Simon Gomery BSc
Project Manager

Client Name: Ramboll
 Reference:
 Location: Thames Quarter Reading
 Contact: Siobhan McGeever
 JE Job No.: 18/9662

Report : Solid

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

J E Sample No.	1-4	5-8	9-12							Please see attached notes for all abbreviations and acronyms		
Sample ID	S1	S2	S3									
Depth	Stockpile	Stockpile	Stockpile									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	19/06/2018	19/06/2018	19/06/2018									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	21/06/2018	21/06/2018	21/06/2018							LOD/LOR	Units	Method No.
Arsenic #	13.3	14.3	14.6							<0.5	mg/kg	TM30/PM15
Cadmium #	0.2	0.4	<0.1							<0.1	mg/kg	TM30/PM15
Chromium #	66.3	68.7	71.9							<0.5	mg/kg	TM30/PM15
Copper #	9	9	9							<1	mg/kg	TM30/PM15
Lead #	15	46	8							<5	mg/kg	TM30/PM15
Mercury #	<0.1	<0.1	<0.1							<0.1	mg/kg	TM30/PM15
Nickel #	15.9	20.0	19.3							<0.7	mg/kg	TM30/PM15
Selenium #	<1	<1	<1							<1	mg/kg	TM30/PM15
Zinc #	40	48	45							<5	mg/kg	TM30/PM15
PAH MS												
Naphthalene #	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03							<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05							<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.04	0.08							<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	0.04							<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	0.04	0.06							<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	0.09							<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	0.05	0.16							<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	0.09							<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	0.06							<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04							<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	0.08							<0.04	mg/kg	TM4/PM8
PAH 16 Total	<0.6	<0.6	0.7							<0.6	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	0.06							<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	0.03							<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	86	81							<0	%	TM4/PM8
VOC TICs	ND	ND	ND								None	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2							<2	ug/kg	TM15/PM10
Benzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
Toluene #	5	58	<3							<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
p/m-Xylene #	5	<5	<5							<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3							<3	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	98	95	101							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	88	83	95							<0	%	TM15/PM10
SVOC TICs	See Attached	See Attached	See Attached								None	TM16/PM8

Client Name: Ramboll
Reference:
Location: Thames Quarter Reading
Contact: Siobhan McGeever
JE Job No.: 18/9662

Report : Solid

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

J E Sample No.	1-4	5-8	9-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	S1	S2	S3										
Depth	Stockpile	Stockpile	Stockpile										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	19/06/2018	19/06/2018	19/06/2018										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	21/06/2018	21/06/2018	21/06/2018								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C6-C8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C8-C10	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>C10-C12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>C12-C16 #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>C16-C21 #	15	<7	13								<7	mg/kg	TM5/PM8/PM16
>C21-C35 #	449	<7	267								<7	mg/kg	TM5/PM8/PM16
Total aliphatics C5-35	464	<19	280								<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Aromatics													
>C5-EC7 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC7-EC8 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC8-EC10 #	<0.1	<0.1	<0.1								<0.1	mg/kg	TM36/PM12
>EC10-EC12 #	<0.2	<0.2	<0.2								<0.2	mg/kg	TM5/PM8/PM16
>EC12-EC16 #	<4	<4	<4								<4	mg/kg	TM5/PM8/PM16
>EC16-EC21 #	9	<7	<7								<7	mg/kg	TM5/PM8/PM16
>EC21-EC35 #	800	<7	311								<7	mg/kg	TM5/PM8/PM16
Total aromatics C5-35 #	809	<19	311								<19	mg/kg	TM5/PM8/PM16/PM12/PM10
Total aliphatics and aromatics(C5-35)	1273	<38	591								<38	mg/kg	TM5/PM8/PM16/PM12/PM10
PCBs													
PCB 28 #	<5	<5	<5								<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5								<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5								<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5								<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5								<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5								<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5								<5	ug/kg	TM17/PM8
Total 7 PCBs #	<35	<35	<35								<35	ug/kg	TM17/PM8
Other													
Natural Moisture Content	4.5	4.3	4.4								<0.1	%	PM4/PM0
Sulphate as SO4 (2:1 Ext) #	0.0336	0.0053	0.0096								<0.0015	g/l	TM38/PM20
Total Organic Carbon #	0.48	1.30	0.77								<0.02	%	TM21/PM24
pH #	12.36	12.25	12.21								<0.01	pH units	TM73/PM11

Client Name: Ramboll
Reference:
Location: Thames Quarter Reading
Contact: Siobhan McGeever
JE Job No.: 18/9662

Report : CEN 10:1 1 Batch

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

J E Sample No.	1-4	5-8	9-12							Please see attached notes for all abbreviations and acronyms		
Sample ID	S1	S2	S3									
Depth	Stockpile	Stockpile	Stockpile									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	19/06/2018	19/06/2018	19/06/2018									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	21/06/2018	21/06/2018	21/06/2018							LOD/LOR	Units	Method No.
Dissolved Arsenic #	3.3	<2.5	3.0							<2.5	ug/l	TM30/PM14
Dissolved Cadmium #	<0.5	<0.5	<0.5							<0.5	ug/l	TM30/PM14
Dissolved Chromium #	22.7	26.4	23.9							<1.5	ug/l	TM30/PM14
Dissolved Copper #	9	8	9							<7	ug/l	TM30/PM14
Dissolved Lead #	<5	<5	<5							<5	ug/l	TM30/PM14
Dissolved Mercury #	<1	<1	<1							<1	ug/l	TM30/PM14
Dissolved Nickel #	<2	<2	<2							<2	ug/l	TM30/PM14
Dissolved Selenium #	8	<3	12							<3	ug/l	TM30/PM14
Dissolved Zinc #	5	5	3							<3	ug/l	TM30/PM14
PAH MS												
Naphthalene	<0.1	0.2	0.2							<0.1	ug/l	TM4/PM30
Acenaphthylene	0.013	0.169	0.400							<0.013	ug/l	TM4/PM30
Acenaphthene	0.016	0.106	0.092							<0.013	ug/l	TM4/PM30
Fluorene	<0.014	0.112	0.162							<0.014	ug/l	TM4/PM30
Phenanthrene	0.048	0.141	0.209							<0.011	ug/l	TM4/PM30
Anthracene	<0.013	0.015	0.026							<0.013	ug/l	TM4/PM30
Fluoranthene	0.030	0.038	0.054							<0.012	ug/l	TM4/PM30
Pyrene	0.035	0.042	0.062							<0.013	ug/l	TM4/PM30
Benzo(a)anthracene	<0.015	<0.015	0.015							<0.015	ug/l	TM4/PM30
Chrysene	0.015	0.020	0.023							<0.011	ug/l	TM4/PM30
Benzo(bk)fluoranthene	0.036	0.033	0.044							<0.018	ug/l	TM4/PM30
Benzo(a)pyrene	<0.016	<0.016	0.016							<0.016	ug/l	TM4/PM30
Indeno(123cd)pyrene	<0.011	<0.011	0.013							<0.011	ug/l	TM4/PM30
Dibenzo(ah)anthracene	<0.01	<0.01	<0.01							<0.01	ug/l	TM4/PM30
Benzo(ghi)perylene	<0.011	<0.011	<0.011							<0.011	ug/l	TM4/PM30
PAH 16 Total	<0.195	0.876	1.316							<0.195	ug/l	TM4/PM30
Benzo(b)fluoranthene	0.03	0.02	0.03							<0.01	ug/l	TM4/PM30
Benzo(k)fluoranthene	0.01	<0.01	0.01							<0.01	ug/l	TM4/PM30
PAH Surrogate % Recovery	77	81	85							<0	%	TM4/PM30
VOC TICs	ND	ND	ND								None	TM15/PM69
Methyl Tertiary Butyl Ether	<1	<1	<1							<1	ug/l	TM15/PM69
Benzene	<0.5	<0.5	<0.5							<0.5	ug/l	TM15/PM69
Toluene	<5	<5	<5							<5	ug/l	TM15/PM69
Ethylbenzene	<1	<1	<1							<1	ug/l	TM15/PM69
p/m-Xylene	<2	<2	<2							<2	ug/l	TM15/PM69
o-Xylene	<1	<1	<1							<1	ug/l	TM15/PM69
Surrogate Recovery Toluene D8	102	107	105							<0	%	TM15/PM69
Surrogate Recovery 4-Bromofluorobenzene	113	112	111							<0	%	TM15/PM69
SVOC TICs	ND	ND	ND								None	TM16/PM30

Client Name: Ramboll
 Reference:
 Location: Thames Quarter Reading
 Contact: Siobhan McGeever
 JE Job No.: 18/9662

Report : CEN 10:1 1 Batch

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

J E Sample No.	1-4	5-8	9-12								Please see attached notes for all abbreviations and acronyms		
Sample ID	S1	S2	S3										
Depth	Stockpile	Stockpile	Stockpile										
COC No / misc													
Containers	V J T	V J T	V J T										
Sample Date	19/06/2018	19/06/2018	19/06/2018										
Sample Type	Soil	Soil	Soil										
Batch Number	1	1	1										
Date of Receipt	21/06/2018	21/06/2018	21/06/2018								LOD/LOR	Units	Method No.
TPH CWG													
Aliphatics													
>C5-C6	<10	<10	<10								<10	ug/l	TM36/PM69
>C6-C8	<10	<10	<10								<10	ug/l	TM36/PM69
>C8-C10	<10	<10	<10								<10	ug/l	TM36/PM69
>C10-C12	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>C12-C16	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C16-C21	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>C21-C35	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aliphatics C5-35	<10	<10	<10								<10	ug/l	TM5/PM16/PM30/PM30
Aromatics													
>C5-EC7	<10	<10	<10								<10	ug/l	TM36/PM69
>EC7-EC8	<10	<10	<10								<10	ug/l	TM36/PM69
>EC8-EC10	<10	<10	<10								<10	ug/l	TM36/PM69
>EC10-EC12	<5	<5	<5								<5	ug/l	TM5/PM16/PM30
>EC12-EC16	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC16-EC21	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
>EC21-EC35	<10	<10	<10								<10	ug/l	TM5/PM16/PM30
Total aromatics C5-35	<10	<10	<10								<10	ug/l	TM5/PM16/PM30/PM30
Total aliphatics and aromatics(C5-35)	<10	<10	<10								<10	ug/l	TM5/PM16/PM30/PM30
PCB 28	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
PCB 52	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
PCB 101	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
PCB 118	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
PCB 138	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
PCB 153	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
PCB 180	<0.1	<0.1	<0.1								<0.1	ug/l	TM17/PM30
Total 7 PCBs	<0.7	<0.7	<0.7								<0.7	ug/l	TM17/PM30
Sulphate as SO4 #	13.21	29.77	15.10								<0.05	mg/l	TM38/PM0
Dissolved Organic Carbon	6	6	6								<2	mg/l	TM60/PM0
pH	12.25	12.31	12.39								<0.01	pH units	TM73/PM0

Please see attached notes for all abbreviations and acronyms

Please see attached notes for all abbreviations and acronyms

Client Name: Ramboll
Reference:
Location: Thames Quarter Reading
Contact: Siobhan McGeever
JE Job No.: 18/9662

VOC Report : Solid

J E Sample No.	1-4	5-8	9-12							Please see attached notes for all abbreviations and acronyms		
Sample ID	S1	S2	S3									
Depth	Stockpile	Stockpile	Stockpile									
COC No / misc												
Containers	V J T	V J T	V J T									
Sample Date	19/06/2018	19/06/2018	19/06/2018									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1							LOD/LOR	Units	Method No.
Date of Receipt	21/06/2018	21/06/2018	21/06/2018									
VOC MS												
Dichlorodifluoromethane	<2	<2	<2							<2	ug/kg	TM15/PM10
Methyl Tertiary Butyl Ether #	<2	<2	<2							<2	ug/kg	TM15/PM10
Chloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Vinyl Chloride	<2	<2	<2							<2	ug/kg	TM15_A/PM10
Bromomethane	<1	<1	<1							<1	ug/kg	TM15/PM10
Chloroethane #	<2	<2	<2							<2	ug/kg	TM15/PM10
Trichlorofluoromethane #	<2	<2	<2							<2	ug/kg	TM15/PM10
1,1-Dichloroethene (1,1 DCE) #	<6	<6	<6							<6	ug/kg	TM15/PM10
Dichloromethane (DCM) #	<30	<30	<30							<30	ug/kg	TM15/PM10
trans-1,2-Dichloroethene #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1-Dichloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
cis-1,2-Dichloroethene #	<3	<3	<3							<3	ug/kg	TM15/PM10
2,2-Dichloropropane	<4	<4	<4							<4	ug/kg	TM15/PM10
Bromochloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Chloroform #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,1-Trichloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1-Dichloropropene #	<3	<3	<3							<3	ug/kg	TM15/PM10
Carbon tetrachloride #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dichloroethane #	<4	<4	<4							<4	ug/kg	TM15/PM10
Benzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
Trichloroethene (TCE) #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,2-Dichloropropane #	<6	<6	<6							<6	ug/kg	TM15/PM10
Dibromomethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Bromodichloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
cis-1,3-Dichloropropene	<4	<4	<4							<4	ug/kg	TM15/PM10
Toluene #	5	58	<3							<3	ug/kg	TM15/PM10
trans-1,3-Dichloropropene	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,2-Trichloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Tetrachloroethene (PCE) #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,3-Dichloropropane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Dibromochloromethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,2-Dibromoethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Chlorobenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,1,2-Tetrachloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Ethylbenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
p/m-Xylene #	5	<5	<5							<5	ug/kg	TM15/PM10
o-Xylene #	<3	<3	<3							<3	ug/kg	TM15/PM10
Styrene	<3	<3	<3							<3	ug/kg	TM15_A/PM10
Bromoform	<3	<3	<3							<3	ug/kg	TM15/PM10
Isopropylbenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
1,1,2,2-Tetrachloroethane #	<3	<3	<3							<3	ug/kg	TM15/PM10
Bromobenzene	<2	<2	<2							<2	ug/kg	TM15/PM10
1,2,3-Trichloropropane #	<4	<4	<4							<4	ug/kg	TM15/PM10
Propylbenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
2-Chlorotoluene	<3	<3	<3							<3	ug/kg	TM15/PM10
1,3,5-Trimethylbenzene #	<3	<3	<3							<3	ug/kg	TM15/PM10
4-Chlorotoluene	<3	<3	<3							<3	ug/kg	TM15/PM10
tert-Butylbenzene #	<5	<5	<5							<5	ug/kg	TM15/PM10
1,2,4-Trimethylbenzene #	<6	<6	<6							<6	ug/kg	TM15/PM10
sec-Butylbenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
4-Isopropyltoluene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,3-Dichlorobenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,4-Dichlorobenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
n-Butylbenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dichlorobenzene #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2-Dibromo-3-chloropropane #	<4	<4	<4							<4	ug/kg	TM15/PM10
1,2,4-Trichlorobenzene #	<7	<7	<7							<7	ug/kg	TM15/PM10
Hexachlorobutadiene	<4	<4	<4							<4	ug/kg	TM15/PM10
Naphthalene	<27	<27	<27							<27	ug/kg	TM15/PM10
1,2,3-Trichlorobenzene #	<7	<7	<7							<7	ug/kg	TM15/PM10
Surrogate Recovery Toluene D8	98	95	101							<0	%	TM15/PM10
Surrogate Recovery 4-Bromofluorobenzene	88	83	95							<0	%	TM15/PM10

Client Name: Ramboll

VOC Report : CEN 10:1 1 Batch

Reference:

Location: Thames Quarter Reading

Contact: Siobhan McGeever

JE Job No.: 18/9662

J E Sample No.	1-4	5-8	9-12							Please see attached notes for all abbreviations and acronyms		
Sample ID	S1	S2	S3									
Depth	Stockpile	Stockpile	Stockpile									
COC No / misc Containers	V J T	V J T	V J T									
Sample Date	19/06/2018	19/06/2018	19/06/2018									
Sample Type	Soil	Soil	Soil									
Batch Number	1	1	1									
Date of Receipt	21/06/2018	21/06/2018	21/06/2018							LOD/LOR	Units	Method No.
VOC MS												
Dichlorodifluoromethane	<2	<2	<2							<2	ug/l	TM15/PM69
Methyl Tertiary Butyl Ether	<1	<1	<1							<1	ug/l	TM15/PM69
Chloromethane	<3	<3	<3							<3	ug/l	TM15/PM69
Vinyl Chloride	<0.1	<0.1	<0.1							<0.1	ug/l	TM15/PM69
Bromomethane	<1	<1	<1							<1	ug/l	TM15/PM69
Chloroethane	<3	<3	<3							<3	ug/l	TM15/PM69
Trichlorofluoromethane	<3	<3	<3							<3	ug/l	TM15/PM69
1,1-Dichloroethene (1,1 DCE)	<3	<3	<3							<3	ug/l	TM15/PM69
Dichloromethane (DCM)	<5	<5	<5							<5	ug/l	TM15/PM69
trans-1-2-Dichloroethene	<3	<3	<3							<3	ug/l	TM15/PM69
1,1-Dichloroethane	<3	<3	<3							<3	ug/l	TM15/PM69
cis-1-2-Dichloroethene	<3	<3	<3							<3	ug/l	TM15/PM69
2,2-Dichloropropane	<1	<1	<1							<1	ug/l	TM15/PM69
Bromochloromethane	<2	<2	<2							<2	ug/l	TM15/PM69
Chloroform	<2	<2	<2							<2	ug/l	TM15/PM69
1,1,1-Trichloroethane	<2	<2	<2							<2	ug/l	TM15/PM69
1,1-Dichloropropene	<3	<3	<3							<3	ug/l	TM15/PM69
Carbon tetrachloride	<2	<2	<2							<2	ug/l	TM15/PM69
1,2-Dichloroethane	<2	<2	<2							<2	ug/l	TM15/PM69
Benzene	<0.5	<0.5	<0.5							<0.5	ug/l	TM15/PM69
Trichloroethene (TCE)	<3	<3	<3							<3	ug/l	TM15/PM69
1,2-Dichloropropane	<2	<2	<2							<2	ug/l	TM15/PM69
Dibromomethane	<3	<3	<3							<3	ug/l	TM15/PM69
Bromodichloromethane	<2	<2	<2							<2	ug/l	TM15/PM69
cis-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM69
Toluene	<5	<5	<5							<5	ug/l	TM15/PM69
trans-1-3-Dichloropropene	<2	<2	<2							<2	ug/l	TM15/PM69
1,1,2-Trichloroethane	<2	<2	<2							<2	ug/l	TM15/PM69
Tetrachloroethene (PCE)	<3	<3	<3							<3	ug/l	TM15/PM69
1,3-Dichloropropane	<2	<2	<2							<2	ug/l	TM15/PM69
Dibromochloromethane	<2	<2	<2							<2	ug/l	TM15/PM69
1,2-Dibromoethane	<2	<2	<2							<2	ug/l	TM15/PM69
Chlorobenzene	<2	<2	<2							<2	ug/l	TM15/PM69
1,1,1,2-Tetrachloroethane	<2	<2	<2							<2	ug/l	TM15/PM69
Ethylbenzene	<1	<1	<1							<1	ug/l	TM15/PM69
p/m-Xylene	<2	<2	<2							<2	ug/l	TM15/PM69
o-Xylene	<1	<1	<1							<1	ug/l	TM15/PM69
Styrene	<2	<2	<2							<2	ug/l	TM15/PM69
Bromoform	<2	<2	<2							<2	ug/l	TM15/PM69
Isopropylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
1,1,2,2-Tetrachloroethane	<4	<4	<4							<4	ug/l	TM15/PM69
Bromobenzene	<2	<2	<2							<2	ug/l	TM15/PM69
1,2,3-Trichloropropane	<3	<3	<3							<3	ug/l	TM15/PM69
Propylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
2-Chlorotoluene	<3	<3	<3							<3	ug/l	TM15/PM69
1,3,5-Trimethylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
4-Chlorotoluene	<3	<3	<3							<3	ug/l	TM15/PM69
tert-Butylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
1,2,4-Trimethylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
sec-Butylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
4-Isopropyltoluene	<3	<3	<3							<3	ug/l	TM15/PM69
1,3-Dichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM69
1,4-Dichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM69
n-Butylbenzene	<3	<3	<3							<3	ug/l	TM15/PM69
1,2-Dichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM69
1,2-Dibromo-3-chloropropane	<2	<2	<2							<2	ug/l	TM15/PM69
1,2,4-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM69
Hexachlorobutadiene	<3	<3	<3							<3	ug/l	TM15/PM69
Naphthalene	<2	<2	<2							<2	ug/l	TM15/PM69
1,2,3-Trichlorobenzene	<3	<3	<3							<3	ug/l	TM15/PM69
Surrogate Recovery Toluene D8	102	107	105							<0	%	TM15/PM69
Surrogate Recovery 4-Bromofluorobenzene	113	112	111							<0	%	TM15/PM69

Please include all sections of this report if it is reproduced

Exova Jones Environmental

Method: SVOC

Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Exova Jones Environmental

Job number:	18/9662
Sample number:	7
Sample identity:	S2
Sample depth:	Stockpile
Sample Type:	Soil
Units:	ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Exova Jones Environmental

Job number:	18/9662
Sample number:	11
Sample identity:	S3
Sample depth:	Stockpile
Sample Type:	Soil
Units:	ug/kg

Method: SVOC
Matrix: Solid

Note: Only samples with TICs (if requested) are reported. If TICs were requested but no compounds found they are not reported.

[illegible]

Client Name: Ramboll
Reference:
Location: Thames Quarter Reading
Contact: Siobhan McGeever

Note:

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

Opinions, including ACM type and Asbestos level, lie outside the scope of our UKAS accreditation.

Where the sample is not taken by a Jones Environmental Laboratory consultant, Jones Environmental Laboratory cannot be responsible for inaccurate or unrepresentative sampling.

Signed on behalf of Jones Environmental Laboratory:

Ryan Butterworth
 Asbestos Team Leader

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Date Of Analysis	Analysis	Result
18/9662	1	S1	Stockpile	3	26/06/2018	General Description (Bulk Analysis)	stones.soil
					26/06/2018	Asbestos Fibres	NAD
					26/06/2018	Asbestos Fibres (2)	NAD
					26/06/2018	Asbestos ACM	NAD
					26/06/2018	Asbestos ACM (2)	NAD
					26/06/2018	Asbestos Type	NAD
					26/06/2018	Asbestos Type (2)	NAD
					26/06/2018	Asbestos Level Screen	NAD
18/9662	1	S2	Stockpile	7	26/06/2018	General Description (Bulk Analysis)	stones.soil
					26/06/2018	Asbestos Fibres	NAD
					26/06/2018	Asbestos Fibres (2)	NAD
					26/06/2018	Asbestos ACM	NAD
					26/06/2018	Asbestos ACM (2)	NAD
					26/06/2018	Asbestos Type	NAD
					26/06/2018	Asbestos Type (2)	NAD
					26/06/2018	Asbestos Level Screen	NAD
18/9662	1	S3	Stockpile	11	26/06/2018	General Description (Bulk Analysis)	stones.soil
					26/06/2018	Asbestos Fibres	NAD
					26/06/2018	Asbestos Fibres (2)	NAD
					26/06/2018	Asbestos ACM	NAD
					26/06/2018	Asbestos ACM (2)	NAD
					26/06/2018	Asbestos Type	NAD
					26/06/2018	Asbestos Type (2)	NAD
					26/06/2018	Asbestos Level Screen	NAD

Matrix : Solid

Location: Thames Quarter Reading

Contact: Siobhan McGeever

[illegible]

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

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

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SOILS

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

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

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

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

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

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

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

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

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

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

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

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

WATERS

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

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

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

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

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

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

DILUTIONS

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

BLANKS

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

NOTE

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

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

REPORTS FROM THE SOUTH AFRICA LABORATORY

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

Please include all sections of this report if it is reproduced

ABBREVIATIONS and ACRONYMS USED

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

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/S ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16/PM30	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE/Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM8/PM16	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required/Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.	Yes		AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM16/PM30/PM69	please refer to PM16/PM30 and PM69 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details			AR	Yes
TM5/TM36	please refer to TM5 and TM36 for method details	PM8/PM12/PM16	please refer to PM8/PM16 and PM12 for method details	Yes		AR	Yes

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM69	Modified BS EN 12457 method. One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM15	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds (VOCs) by Headspace GC-MS.	PM69	Modified BS EN 12457 method. One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM16	Modified USEPA 8270. Quantitative determination of Semi-Volatile Organic compounds (SVOCs) by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM30	Water samples are extracted with solvent using a magnetic stirrer to create a vortex.			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO ₂ generated is quantified using infra-red detection. Organic Matter (SOM) calculated as per EA MCERTS Chemical Testing of Soil, March 2012 v4.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM14	Analysis of waters and leachates for metals by ICP OES/ICP MS. Samples are filtered for dissolved metals and acidified if required.	Yes		AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7, 6010B and BS EN ISO 11885 2009	PM15	Acid digestion of dried and ground solid samples using Aqua Regia refluxed at 112.5 °C. Samples containing asbestos are not dried and ground.	Yes		AD	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM36	Modified US EPA method 8015B. Determination of Gasoline Range Organics (GRO) in the carbon chain range of C4-12 by headspace GC-FID.	PM69	Modified BS EN 12457 method. One part soil is mixed with 10 parts water in a vial leaving no headspace. The mixture is shaken and then left to leach for 24 hours before VOC analysis.			AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground or as received samples with deionised water in a 2:1 water to solid ratio using a reciprocal shaker for all analytes except hexavalent chromium. Extraction of as received sample using 10:1 ratio of 0.2M sodium hydroxide to soil for hexavalent chromium using a reciprocal shaker.	Yes		AD	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO ₂ and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM65	Asbestos Bulk Identification method based on HSG 248.	PM42	Solid samples undergo a thorough visual inspection for asbestos fibres prior to asbestos identification using TM065.	Yes		AR	

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Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS/ANAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM0	No preparation is required.			AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D and BS1377:1990. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	
TM15_A	Modified USEPA 8260. Quantitative Determination of Volatile Organic Compounds, Vinyl Chloride & Styrene by Headspace GC-MS.	PM10	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes