

APPENDIX P

CGL Technical Report on Ammoniacal Nitrogen



Providing Ground Solutions

Clark Smith Partnership

Western Access, Southall

*Technical Report on Ammoniacal
Nitrogen*

Revision 2

January, 2020



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1. INTRODUCTION

1.1 Brief

Card Geotechnics Limited (CGL), on behalf of Clark Smith Partnership (CSP) and FM Conway Limited (FMC), has prepared this technical note following concerns raised over increased concentrations of ammoniacal nitrogen encountered within groundwater on the Southall Western Access site. This report follows the issuing of a previous report by Ramboll¹ which investigated the superficial soils and associated groundwater body within the area local to BH3B (CGL borehole) and BH3/BH3R (Ramboll borehole).

It is recommended that both reports be read in conjunction to provide a clear understanding of the ground conditions and the potential risks posed by elevated concentrations of ammoniacal nitrogen present. This report supersedes an earlier version issued in July 2019 and has been updated to include additional information on the construction programme, site activities, and material movements during construction, and ammonia concentrations detected in the site won and imported soils. Further discussion is included on the possibility of pollutant linkages arising from the site works, and the potential risks to surface water in the future.

1.2 Objectives

The objective of this technical note is to present the information obtained during the construction monitoring works and review the ammoniacal nitrogen concentrations in groundwater and assess if there has been a corresponding potential impact to surface water quality. Additionally the monitoring data has been reviewed against the construction programme to determine if a link can be established between on-site activities and the concentrations of ammoniacal nitrogen present in groundwater.

1.3 Background

1.3.1 Site

Prior to the development of the Western Access site, CGL installed groundwater monitoring wells during an intrusive investigation in May 2017. Monitoring of these wells was undertaken by CGL prior to investigation (to establish baseline conditions) and during the construction works from June 2017 up until mid-May 2018. Between May 2018 and July 2018 the monitoring works were paused whilst the responsibilities of involved parties were re-assessed. Monitoring works were recommenced with

¹ Ramboll (November 2018) Report on Ammoniacal Nitrogen Delineation Investigation: Southall Western Access, Minet Tip, Hayes

Socotec undertaking a single round of monitoring at the end of July 2018, followed by CET undertaking all subsequent monthly rounds up until the present time.

Under a separate appointment Ramboll UK Limited (Ramboll) was commissioned by Berkeley Homes West Thames Limited (Berkeleys) to install and monitor additional groundwater at the site from May 2017 on an approximate two monthly basis.

Alongside the sampling and monitoring of groundwater, CGL, Socotech, CET and Ramboll undertook routine surface water monitoring across the controlled waters of the Yeading Brook, the River Crane and Grand Union Canal (GUC). CGL's construction monitoring location plan, CG/28308/ANP/001, showing the Ramboll and CGL monitoring positions, is appended.

Groundwater and surface water monitoring by CET and Ramboll is currently continuing on a regular basis and is subject to ongoing review by the regulators with cessation of works subject to regulatory agreement.

1.3.2 Overview of Ammoniacal Nitrogen Risk

Elevated concentrations of ammoniacal nitrogen were first recorded in May 2018, in the Ramboll replacement monitoring borehole (BH3R), which was drilled following decommissioning of their original borehole (BH3). The replacement hole BH3R is located on the western bank of Yeading Brook, where the River Crane diversion converges with the brook, see appended. Following the re-commencement of monitoring by Socotech and CET in July 2018 elevated concentrations of ammoniacal nitrogen were recorded in CGL's borehole BH3B, nearby.

Ramboll was subsequently commissioned by Berkeleys to delineate the elevated concentrations by installation of additional monitoring wells and analysis of groundwater samples, details of which are given in the Ramboll letter report¹. The findings of their works concluded that the elevated concentrations of ammoniacal nitrogen likely represent a groundwater hotspot and that the concentrations of ammoniacal nitrogen within the nearby Yeading Brook had not notably increased.

Additionally, it is noted that the ground conditions in BH3 and BH3R differ slightly in that the geology at BH3 is predominantly cohesive, with BH3R recording a 0.5m thickness of gravel. The borehole log for BH3R records the gravel as natural ground rather than material relating to the adjacent bridge construction.

A recommendation was made by Ramboll to continue monitoring of both the groundwater and surface waters. Since the issuing of the Ramboll report approximately seven more months of ongoing monitoring data has been collected and is included within the assessment in Section 2.

2. REVIEW OF POTENTIAL POLLUTANT LINKAGES

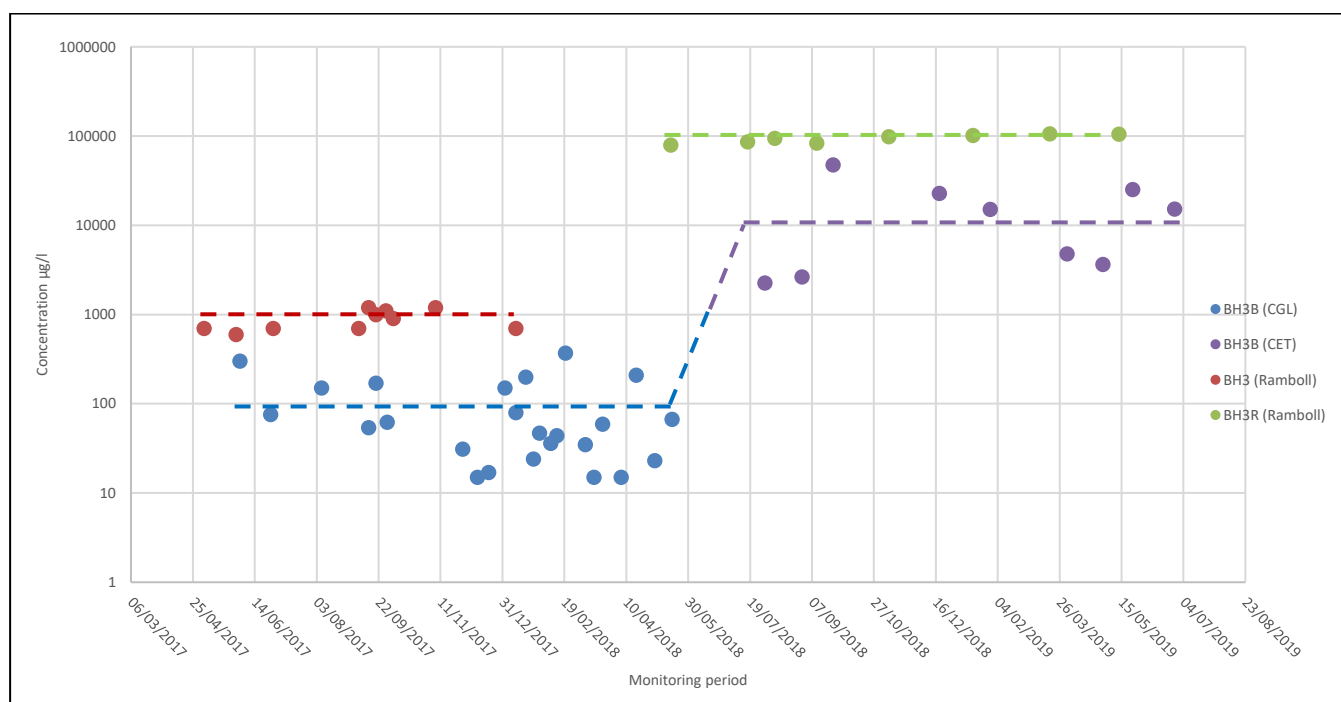
A review of the ongoing construction monitoring data has been undertaken by CGL with information obtained and provided by Ramboll, CGL, CET and Socotec. The review has been split into groundwater and surface water concentrations to establish the dissolved phase concentrations and then review the impact, if any, to the controlled surface water, namely the Yeading Brook.

The monitoring data has been reviewed in relation to construction activities and ammonia test data obtained from pre-construction site investigations and the construction materials, and the potential for pollutant linkages arising from construction materials and site activities are discussed.

2.1 Groundwater Concentrations

Concentrations of ammoniacal nitrogen within groundwater and throughout the monitoring period have been plotted on Plate 1, below.

Plate 1. Concentrations of Ammoniacal Nitrogen as N within the Groundwater around BH3B

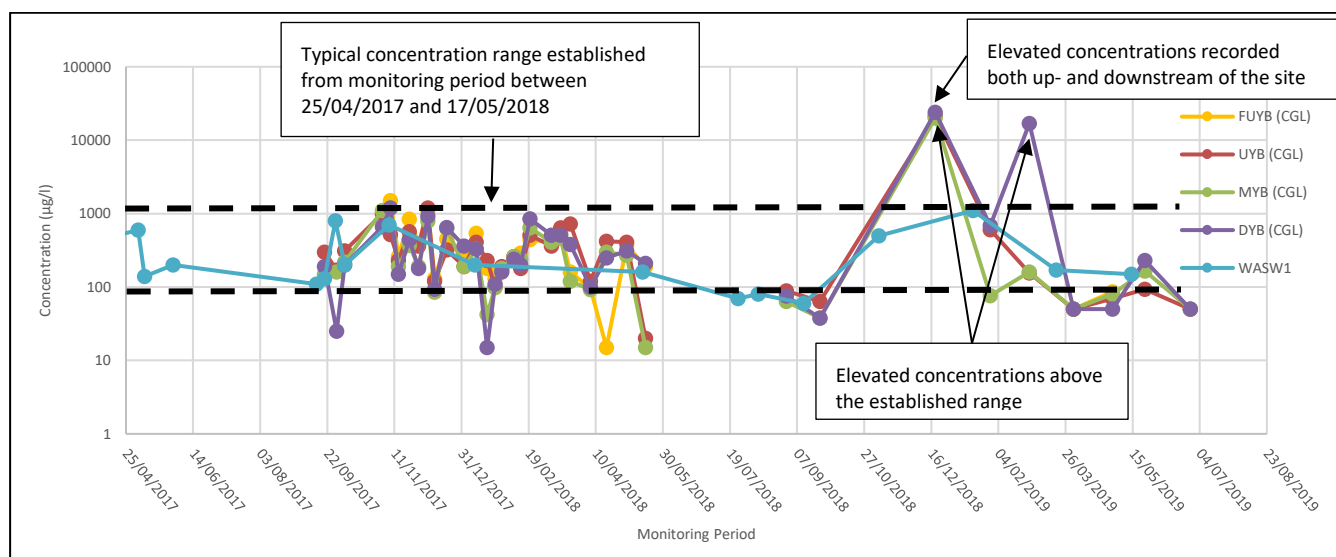


A clear spike in concentration of ammoniacal nitrogen occurred after 17th May 2018 and has been maintained throughout the most recent rounds. The increase in concentration was recorded within both the CGL and Ramboll boreholes. The elevated concentrations of ammoniacal nitrogen appear to have increased by a factor of approximately 100 within their respective boreholes.

2.2 Surface Water Concentrations

The concentrations of ammoniacal nitrogen within Yeading Brook have been plotted on Plate 2, covering the duration of the monitoring period. The data set was compiled from chemical data obtained at five surface water monitoring locations CGL surface water monitoring locations 1 to 4; Further Upstream Yeading Brook (FUYB), Upstream Yeading Brook (UYB), Midstream Yeading Brook (MYB) and Downstream Yeading Brook (DYB), and Ramboll monitoring location WASW1. These monitoring locations are shown on CGL drawing CG/28308-ANP-001. It should be noted that insufficient data exists for the River Crane upstream at monitoring point 5, for it to be included in this review.

Plate 2. Concentrations of Ammoniacal Nitrogen as N within the Yeading Brook

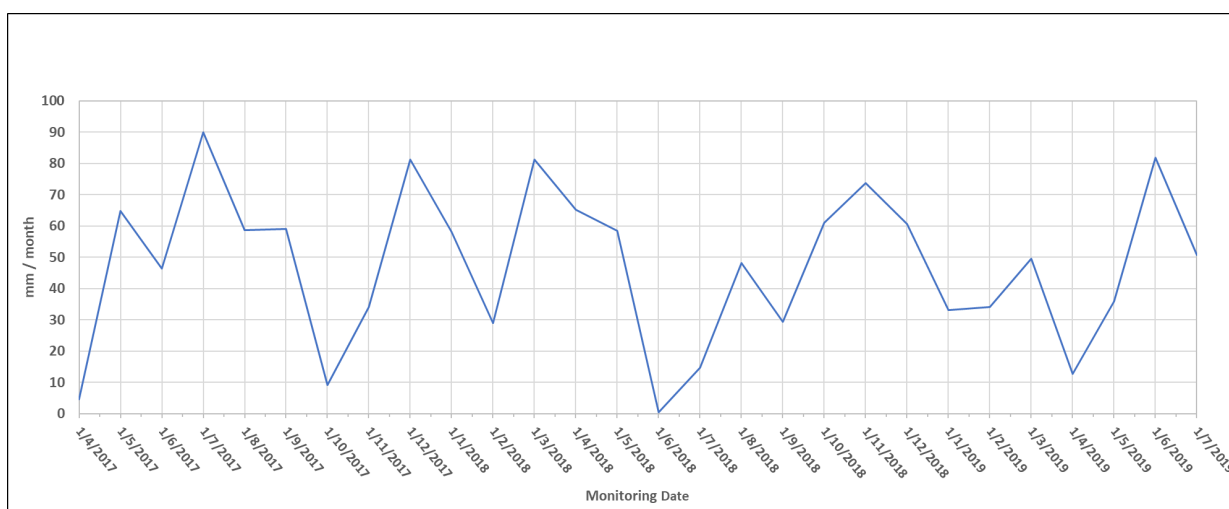


A relatively stable ammoniacal nitrogen concentration range was recorded between 25th April 2017 and 17th May 2018. The average concentration within this range was approximately 350µg/l. On two occasions; namely 16th December 2018 and 27th February 2019, concentrations of ammoniacal nitrogen were shown to be elevated above the upper limit of the established range (1,000µg/l). The first group of elevated readings were recorded at locations UYB, MYB and DYB indicating that the source of higher concentrations was likely located upstream of Western Access and, therefore, off site. The second elevated reading was only identified within the downstream sample, DYB. This isolated exceedance represents an outlier within the greater data range as it was not repeated on any other occasion and may represent a localised incident or influence from the River Crane.

2.3 Rainfall Data

A graphical representation of rainfall monitoring data obtained from Heathrow (London Airport) which is close to the site, is presented in Plate 3. This data shows that precipitation in May 2018 was not abnormally high or low for the time of year but there was a very dry June and July which roughly coincides with the time the initial ammonia peaks were recorded in the groundwater monitoring data. However, rainfall recovered in the following months to normal levels of seasonal fluctuation, and ammonia concentrations remained high. Similarly, there does not appear to be a significant correlation between surface water monitoring and rainfall. Ammonia peaks in surface water samples were recorded in December 2018 when rainfall was high, but during the second peak in March 2018 rainfall was very low.

Plate 3. Rainfall Data for Heathrow Airport



2.4 On Site Activities

The site was sub-divided into zones for construction works, with the key zones relating to this ammonia paper being Zone 4; the embankment between Yeading Brook and the Grand Union Canal, Zone 2; the river diversion from the River Crane upstream of the Western Access alignment to the Yeading Brook bridge, and the lagoon area located on the northern side of Zone 4, adjacent to the Grand Union Canal where site won material was stockpiled prior to treatment and reuse or disposal off site. In relation to the ground conditions, a number of key intrusive / ground disturbing activities have been undertaken in these areas as summarised below:

- Piling works, Yeading Brook and GUC western bridge abutments / wing wall excavations. It is understood that the piling works were completed by approximately 4th October 2017. Excavations for the abutments were completed by the end of October 2017.

- Excavation of the River Crane Diversion in Zone 2 commenced in October 2017 and was completed by the end of December 2017. The River Crane Diversion pipes were in place during this period during the month of October 2017. A second diversion was implemented from around the beginning of May 2018 until mid-May 2018, to allow the dredging of Yeading Brook and installation of reed beds south of Yeading Brook bridge. The brook was diverted from beneath YB bridge and piped around the detention basin to outfall back into the River Crane in the southwest corner of the site.
- Filling of Zone 4 with imported Class 6N (IBBA) was completed during January 2018 and February 2018.
- Filling of Zone 4 with site won Class 2C and Class 7F/9B lime/cement stabilised material and material from the Flood Compensation Area and the lagoon stockpiles 4, 5, 6, 8, 9, 12 and 16 was completed between February 2018 and end of March 2018.
- Zones 3, 4 and 7 placement of imported Class 6F2/6F5 on haul roads and west GUC pile mat was completed between August 2017 and February 2018. Stripping of Class 6F2/6F5 from haul roads and west GUC pile mat, and placement to east YB pile mat in Zone 4 and lagoon access road was completed in February 2018. Stripping of Class 6F2/6F5 from east YB pile mat to Zone 5 west GUC was completed in March 2018.
- Shallow excavation and placement of scour protection rockfill to east and west Yeading Brook occurred between October 2018 and January 2019.
- Tree pit excavations and planting in Zone 4 embankment was carried out during April 2019.
- Segregation and placement of topsoil stockpiles SP1, 3 and 13 occurred site wide between April 2019 and July 2019.
- The lagoon liner was removed and disposed off site between July and September 2019, following removal of stockpiled material from within the lagoon basin.

Drawing No. CG/28308-WGUC-003 (extracted from the CGL Environmental Verification Report²) presents the source, type and volume of material placed within the key zones outlined above and the wider site to the west of the GUC.

² CGL (October 2018). Western Access, Southall: Environmental Verification Report – London Borough of Hillingdon.

The piling works were completed well in advance of the concentration spikes of ammoniacal nitrogen encountered within the groundwater samples, as were the excavations for the bridge abutments and filling to the embankment in Zone 4.

Movement of materials to stockpiles within the lagoon or around the site was predominantly undertaken between May 2017 and December 2017. Prior to stockpiling material in the lagoon, an impermeable membrane was placed across the lagoon base to mitigate the potential risk of leachate infiltrating the ground from the stockpiles. A swale and leachate drainage system were installed within the lagoon basin to contain the leachate, and a layer of imported Class 6F2/6F5 was spread across the top of the liner to provide protection against damage to the liner, and a drainage blanket for potential leachate run off, during the works, as discussed in CGL's appraisal report³. The stockpiled materials were at maximum volumes within the lagoon during November and December 2017, as shown the FMC stockpile survey plans in Appendix A. Although stockpiled material was still present within the lagoon at the time of the initial groundwater ammonia peak in May 2018, the bioremediation treatment of stockpiles by Cognition had been completed in February 2018, and no new stockpiles were formed within the lagoon between December 2017 and the time of the initial peak in ammonia concentrations in May 2018.

2.5 Ammoniacal Nitrogen Testing

2.5.1 Ground Investigation Data

Ground Investigation exploratory hole locations referenced in this section are shown on the CGL construction monitoring locations plan CG/28308-ANP-001.

The ground investigation for the proposed construction of the Western Access was presented in the Arup report dated February 2015⁴. The maximum ammoniacal nitrogen concentration in samples obtained from this ground investigation were from borehole CP04 located in the Minet Tip where ammoniacal nitrogen as N was 57mg/kg in the Made Ground at 3.0m depth, and 62mg/kg in the Head Deposits. A maximum ammoniacal nitrogen concentration of 25mg/l, was recorded in the groundwater in CP06, also located in the Minet Tip at the south west corner of the lagoon bund wall.

CGL undertook two additional ground investigations, one in February and March 2017 to provide a preliminary assessment of material suitability for direct transfer off site or reuse, and a second in May and June 2017⁵ to support geotechnical design works. No chemical test data for ammonia was

³ CGL Southall western Access, Lagoon Temporary Stockpile Appraisal, Revision 2 (June 2017)

⁴ Arup Proposed Pump Lane Access Works for Southall Gas Works Redevelopment, Ground Investigation Report. (February 2015)

⁵ CGL Factual Report on Ground Investigation Works at Wester Access Scheme, CGN/03732E (July 2017)

obtained from either of these CGL investigations. The data assessment following these ground investigations did not record exceedances of the Generic Assessment Criteria (GAC) for a “commercial” land-use for risks to human health, although asbestos was positively identified within the Made Ground. In the lagoon area exceedances were recorded for controlled water GAC, of sulfates, total phenols, metals, and PAHs and fourteen contaminant exceedances of the freshwater EQS criteria (considered to be the more applicable given the potential receptor of the Yeading Brook) were recorded, while six metals / metalloids (arsenic, cadmium, chromium III, lead, nickel and zinc) and one PAH (anthracene) also failed the DWV criteria. Within Zone 4 there were exceedances of sulfate, total phenols, and metals, with eight different contaminants exceeding the freshwater EQS criteria, while two metals (cadmium and lead) failed both the EQS and DWS criteria.

Groundwater monitoring boreholes were installed by Ramboll⁶ in the Minet Tip and adjacent to Yeading Brook in April 2017 to provide baseline data prior to the construction works. The maximum concentration of ammoniacal nitrogen as N obtained from these water samples, was 11.1mg/l from BH1 located close to Arup’s borehole CP04 in the Minet Tip.

2.5.2 Construction Data

Chemical testing of the site won stockpiled materials to assess for reuse as general fill was undertaken between August 2017 and February 2018 by Cognition, with some additional independent verification testing by CGL. Testing on site won topsoil stockpiled in the lagoon was undertaken by CGL at a later date, in January 2019, prior to placement.

The Cognition material chemical testing is presented on the Cognition tracking sheet with the laboratory test results in Appendix B.

Table 1 below summarises the test certificates which relate to chemical testing on each stockpile pre-treatment and the corresponding CGL test certificates can be found in Appendix C.

Table 1. Summary of CGL Testing on Site Won Material Pre-Treatment

Source	Stockpile (SP) Ref. Number	No. of Sample Location and Number Tested	Test Certificate Ref.	Test Certificate Sample Ref’s
Topsoil (site wide)	1,3	13 at stockpile	19-26103	TP1 – TP11
Minet Tip bund	4	2, at source	17-58339	‘BB’ (blue billy) and ‘BG’ (brick gravel)

⁶ Ramboll Environ, Baseline Site Investigation Report, western Access and Minet Tip Country Park Footbridge, Minet Tip, Hayes (May 2017).

Source	Stockpile (SP) Ref. Number	No. of Sample Location and Number Tested	Test Certificate Ref.	Test Certificate Sample Ref's
West GUC pile mat excavation	5&6	5, at source	17-58339-2, 17-57682	DC (dark clay) , GC (granular clay) and TP101
EYB and WYB pile mat arisings and river diversion works prior to separation to stockpile 10	7	7 at source, 3 at stockpile	17-60711, 17-60408, 17-59543	WYBPM arisings, EYBPM1-4 arisings, RD1
Lagoon bund (from reprofiling) and WGUC pile mat excavation	8	None – similar material to stockpile 4	None – combined and treated with stockpile 4 material	N/A
WGUC pile arisings and mat excavation	9 (combined with SP4)	3 at source	17-60711	WGUC arisings
River Diversion and WYB pile mat excavation	10	4 at source, 1 at stockpile	17-61856, 17-65529	WYBPM Cropping, Stockpile 10
Bailey Bridge excavation	11&11A	3 at stockpile	17-61856	RCBBS
WGUC abutment excavation	12	5 at stockpile	17-65049, 17-63010	WGUCPA1-4, Stockpile 12
River Diversion and YB topsoil/subsoil strip	13 (combined with SP1,3)	1 at stockpile	17-65049	Stockpile 13
River Diversion excavation	16	2 at source	17-647261	YBBA 1 and YBBA2

A summary of ammoniacal nitrogen test data on site won material stockpiled in lagoon material movements is presented in Table 2. Stockpiles 4, 5 and 6 were chemically treated by bioremediation to reduce concentrations of hydrocarbons and ammoniacal nitrogen. The post bioremediation test data on Stockpiles 4, 5 and 6 is presented in Table 3. All test results were below the Reuse Criteria limit for total ammonia of 161mg/kg or 100.4mg/l for Level 3 RTC excluding one exceedance of 310mg/kg for a sample taken from Stockpile 5 and 6 prior to bioremediation. Following bioremediation, the maximum ammonia concentration for the combined Stockpiles 4, 5 and 6 was below the reuse criteria with a maximum result 9.9mg/kg - see Table 3. Following treatment, the chemical testing of all stockpiles and the material placed in Zone 4, demonstrated that the material did not exceed the re-use criteria. In addition, no exceedances were recorded on imported material- see test data in Appendix D and summarised in Table 4. A summary of the test results for material placed in Zone 4 is presented in Table 5.

Table 2 Summary of Site Won Material Stockpiled in Lagoon for Reuse (or Prior to Disposal) and Ammoniacal Nitrogen Test Data

Stockpile Ref.	Location of Stockpile	Material and Source	End Location	Ammoniacal Nitrogen as N, NH3 Conversion (max value) (mg/kg) [mg/l]^a	Ammoniacal Nitrogen as N (max value)^a	Date of Movement to Stockpile	Date of Movement from Lagoon (approx.)	Volume (m3)
Stockpiles 1,3,13	Lagoon west	Topsoil in lagoon area from Zones 2, 3, 3A, 4,6, 7 and 8	Zone 2, 3, 3A, 4, 6, 7 and 8	1.65	45.00	Aug 2017 - Sept 2017	Apr 2019 - Jul 2019	4710
Stockpile 2	Lagoon west	Timber from tree/ vegetation removal	Disposed off site	-	-	Aug 2017 - Sept 2017	Sept 2019	920
Stockpiles 4 pre bioremediation	Lagoon east	MG material from west GUC excavation works (SP4). MG Pile west GUC pile mat (SP8)	Zone 4	-	<0.50	Aug 2017 - Sept 2017	Feb 2018	3540
Stockpile 5 & 6 pre bioremediation	Lagoon east	MG arisings from west GUC	Zone 4	-	310.00	Aug 2017 - Sept 2017	Feb - Mar 2018	680
Stockpile 7	Lagoon east	2C arisings from west YB and river diversion works	Zone 4	11.50	-	Aug 2017 - Sept 2017	Feb - Mar 2018	2140
Stockpile 8 (moved to SP4)	Lagoon east	MG material from west GUC pile mat	Zone 4	-	-	Sept 2017	Feb - Mar 2018	250
Stockpile 9	Lagoon east	MG Pile arisings from west GUC and east YB	Zone 4	17.30	-	Aug 2017- Sept 2017	Feb - Mar 2018	1820
Stockpile 10	Pump lane	2C arisings from River Diversion cut and West YB excavation.	Zones 3/3A	<0.42	0.12	Sept 2017	Oct 2017	500
Stockpile 11/11A	Pump lane	2C/1A material from Bailey Bridge 3 excavation	Zone 8		9.60	Sept 2017 - Oct 2017	Oct - Nov 2017	960
Stockpile 12 (moved to SP17)	West GUC	MG from West GUC, stockpiled on plastic lining outside lagoon as lagoon full	Disposed off site	42.80	30.00	Oct 2017	Apr 2018	1350
Stockpile 13 (combined with SP1 & 3)	East YB	Topsoil arisings from east YB	Zone 2, 3, 3A, 4, 6, 7 and 8	0.45	-	Oct 2017	Apr 2019 - Jul 2019	230

Stockpile Ref.	Location of Stockpile	Material and Source	End Location	Ammoniacal Nitrogen as N, NH3 Conversion (max value) (mg/kg) [mg/l]^a	Ammoniacal Nitrogen as N (max value)^a	Date of Movement to Stockpile	Date of Movement from Stockpile (approx)	Volume (m3)
Stockpile 14	Pump Lane	R. Crane concrete liner broken out	Disposed off site	-	-	Apr 2018	Jul 2018	300
Stockpile 15	Pump Lane near Bailey Bridge	Unclassified material from excavation of hoarding works	Disposed off site	-	-	Oct 2017	Unknown	170
Stockpile 16	Lagoon east	2C arisings from east YB	Zone 4	3.79	-	Oct 2017	Feb - Mar 2018	2820
Stockpile 17	Lagoon west	2C material from edge of west GUC and bank reprofiling	Disposed off site	0.43	-	Oct 2017 - Nov 2017	Apr 2019	2260

Notes

a. '-' denotes 'no ammonia test data available'

Table 3 Summary of Ammoniacal Nitrogen Test Data Post-Bioremediation for Stockpiles 4, 5 and 6

Stockpile Ref.	Location of Stockpile	Material and Source	End Location	Ammoniacal Nitrogen as N, NH3 Conversion (max value) (mg/kg) [mg/l]	Ammoniacal Nitrogen as N (max value)^a	Date of Movement to Stockpile	Date of Movement from Stockpile (approx.)	Volume (m3)
Stockpiles 4,5,6 post bioremediation	Lagoon east	MG material from west GUC excavation works (SP4,5,6). MG material from west GUC pile mat (SP8). MG Pile arisings from west GUC and east YB (SP9)	Zone 4	9.9 [0.63]	-	Feb 2018	Feb 2018	4220

Notes

a. '-' denotes 'no ammonia test data available'

Table 4 Summary of Imported Material and Ammoniacal Nitrogen Test Data

Imported Material	Material Use	Import Source	End Location	Ammoniacal Nitrogen as N Conversion from NH₃/NH₄^{a.b.} (max value) (mg/kg)^c	Ammoniacal Nitrogen as N (max value) (mg/kg)^c	Date of Import and Placement	Volume (m³)
6F2/6F5 Crushed concrete	Pile and WGUC crane mats, haul roads	Day Aggregates, Heathrow	Zone 3,3A,4,5,7	-	-	Jan 2018 – May 2018	3720
6N IBAA Incinerated Bottom Ashe Aggregate (IBAA)	Structural backfill to YB and GUC abutments and wingwalls	Day Aggregates, Heathrow	Zones 4,5 and 7	5.4	1.8	Jan 2018 - Feb 2018	6500
6N Incinerated Bottom Ash Aggregate (IBAA)	Structural backfill to YB and GUC abutments and wingwalls	Thorney Wash, London Rock Group (LRG)	Zones 4, 7	-	<0.5	Jan 2018	850
Class 1A Stockpile 111 SW Main Site	Fill to Zone 5	Blackwells, Southall Waterside	Zone 5	5.9	-	Apr - Jun 2018	1400
Stockpile 11 SW Main Site	Fill to Zone 5	Blackwells, Southall Waterside	Zone 5	4.2	-	Apr - Jun 2018	1750
Type 1 Unbound granular subbase	Haul roads, capping to Zone 3,7	Day Aggregates, Heathrow	Zone 3, 4,5,7	-	<0.5	April - Jul 2018	880

Notes

a. Where test results are given as NH₄, conversion to NH₃ = NH₄*(17/18)

b. Ammoniacal nitrogen as N conversion = NH₃*(14/17)

c. '-' denotes 'no ammonia test data available'

Table 5 Summary of Materials and Ammoniacal Nitrogen Test Data for Zone 4

Zone Ref.	Imported/ Site won	Material	Material Use	Ammoniacal Nitrogen as N Conversion from NH ₃ /NH ₄ ^{a,b,c} (mg/kg)	Ammoniacal Nitrogen as N (max value) ^c (mg/kg)	Date of Movement to Zone 4	Zone 4 Fill Volumes (m ³)
Zone 4 - Mainline - East Yeading Brook to West Grand Union Canal	Imported Day Aggregates, Heathrow	6F2/6F5 crushed concrete	Pile and WGUC crane mats, haul roads	-	-	-	700
	Imported Day Aggregates, Heathrow	6N IBAA Incinerated Bottom Ash Aggregate (IBBA)	Structural backfill to YB and GUC abutments and wingwalls	5.5	-	Jan 2018 – Mar 2018	1000
	Imported - Thorney Wash, London Rock Group (LRG)	6N Incinerated Bottom Ash Aggregate (IBBA)	Structural backfill to YB and GUC abutments and wingwalls	-	-	Jan 2018	420
	Site won	7F/9B FCA MG	Embankment general fill	5.1	-	Feb - Mar 2018	2000
	Site won	2C FCA RTG, 7F/9B lagoon treated stockpiles 4, 5, 6, 8 ,9, 12 and 2C Stockpile 16	Embankment general fill	-	2.3	Feb - Mar 2018	12070
	Site won	5A Topsoil Stockpiles 1,3, 13	Topsoil/cover soil	<0.5	-	June 2019	Unknown

Notes

a. Where test results are given as NH₄, conversion to NH₃ = NH₄*(17/18)

b. Ammoniacal nitrogen as N conversion = NH₃*(14/17)

c. '-' denotes 'no ammonia test data available'

3. CONCLUSION

Based on the information available, no direct link has been identified between the elevated concentrations of ammoniacal nitrogen within the groundwater and the concentrations observed within the surface water of the Yeading Brook.

From available data no direct link can be established between the site activities, or from the existing ground conditions at the site prior to construction works, and the elevated concentrations of ammonia recorded within the groundwater. Neither does there appear to be a strong correlation with rainfall data.

It is possible that low permeability soils exist between the brook and Zone 4, which would explain the reason why the peak and continued elevated ammonia concentrations in the groundwater, have not been observed in the surface water. It is unlikely that the elevated ammonia concentrations would be attributable to the Western Access construction as all significant intrusive works were completed by December 2017, some five months before the initial ammonia peak in groundwater in May 2018. Concentrations of ammonia have remained relatively steady in both groundwater and surface water since May 2018. Given that the Western Access construction is now complete and no major intrusive earthworks are planned at the site, it is considered unlikely that the Western Access works would, at this stage, contribute to increases of ammonia in the surface water.

It is recommended that ongoing monitoring be carried out until the completion of the Western Access works to the satisfaction of the Environment Agency. A strategy for post-construction monitoring, is also currently in discussion, for agreement with the regulators.

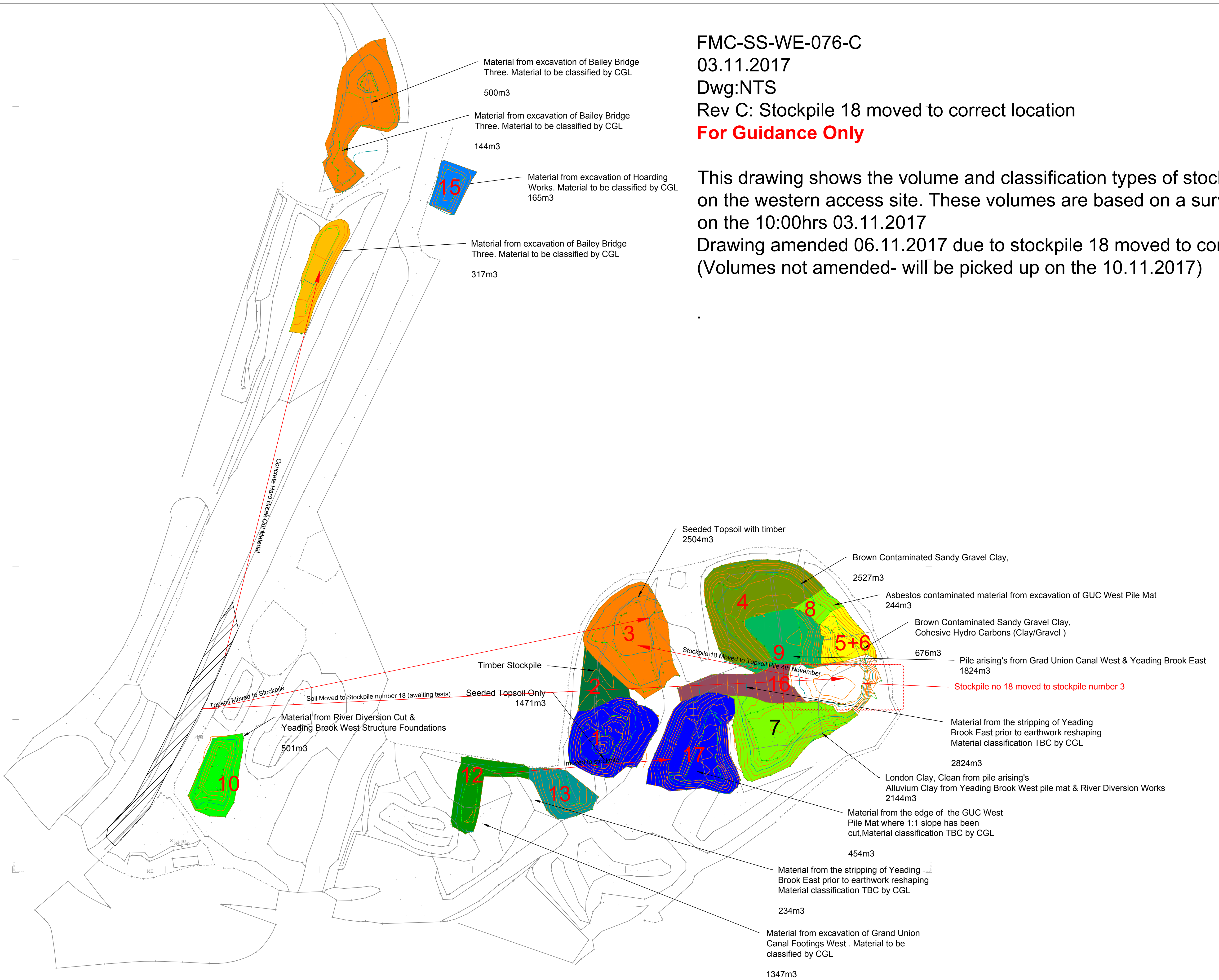
Subsequent to this assessment one of the Western Access boreholes, BH4B, close to the canal, was decommissioned in error in July 2019, and another, BH2A in the lagoon, was damaged in October 2019. These boreholes were subsequently reinstated, under supervision by CGL, in November 2019.

APPENDIX A

FM Conway Stockpile Survey Plans

FMC-SS-WE-076-C
03.11.2017
Dwg:NTS
Rev C: Stockpile 18 moved to correct location
For Guidance Only

This drawing shows the volume and classification types of stockpiles located on the western access site. These volumes are based on a survey carried out on the 10:00hrs 03.11.2017
Drawing amended 06.11.2017 due to stockpile 18 moved to correct location (Volumes not amended- will be picked up on the 10.11.2017)



This drawing shows the location and volumes of spoil on the Lagoon area as of 05.12.2017 and is to be used as the basis for volumes with regards to sub contractor works.

Stockpile number 17 is still to be moved at the east side due to it currently being situated on the main spine separating the two number Lagoons

Seeded Topsoil with timber
3238m3

Asbestos contaminated material from excavation of GUC West Pile Mat
244m3

676m3

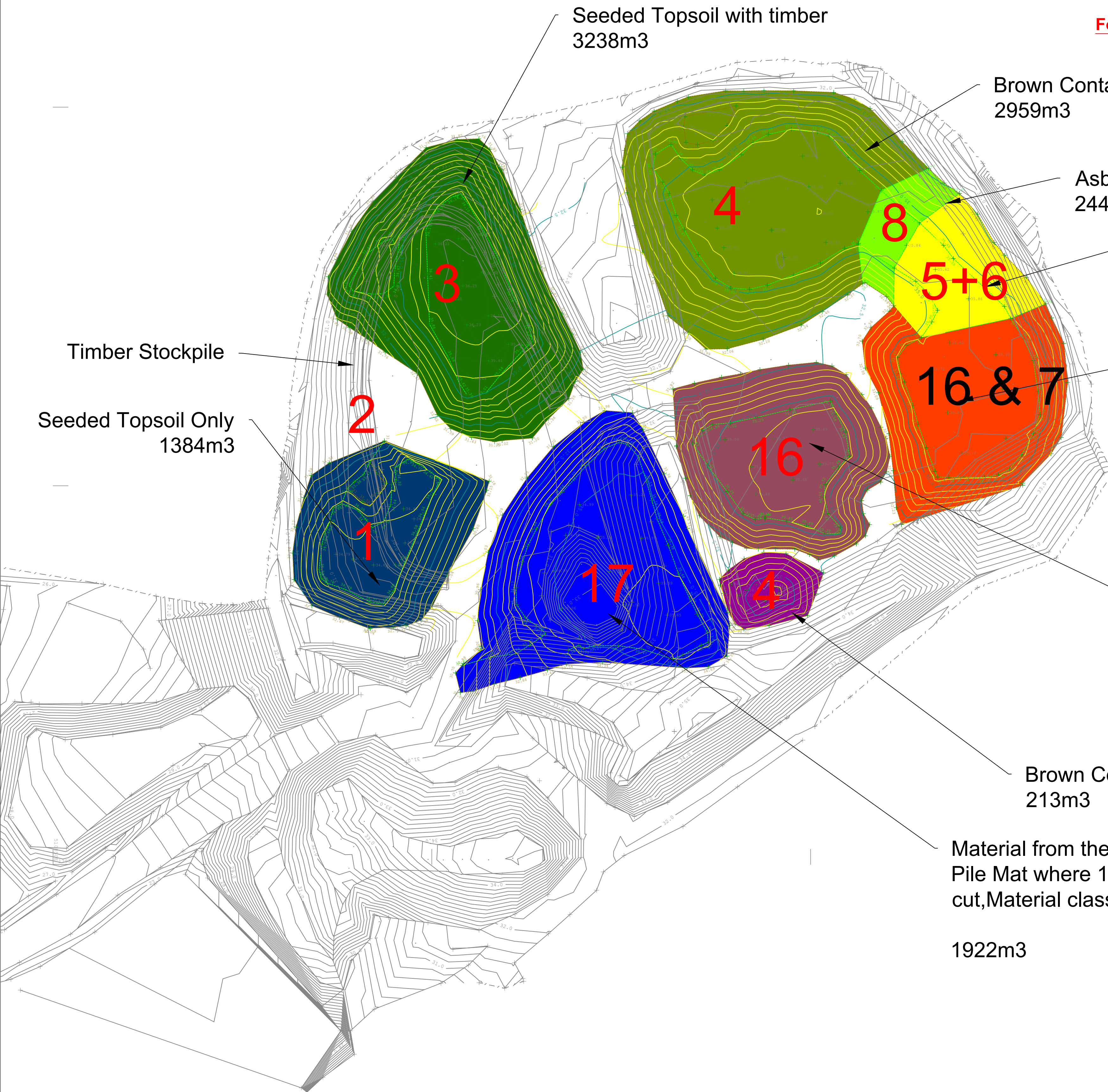
Material from the stripping of Yeading Brook East prior to earthwork reshaping
Material classification Class 2b London Clay, Clean from pile arising's
Alluvium Clay from Yeading Brook West pile mat & River Diversion Works
1770m³

1513m3

Material from the edge of the GUC West
Pile Mat where 1:1 slope has been
cut, Material classification TBC by CGL

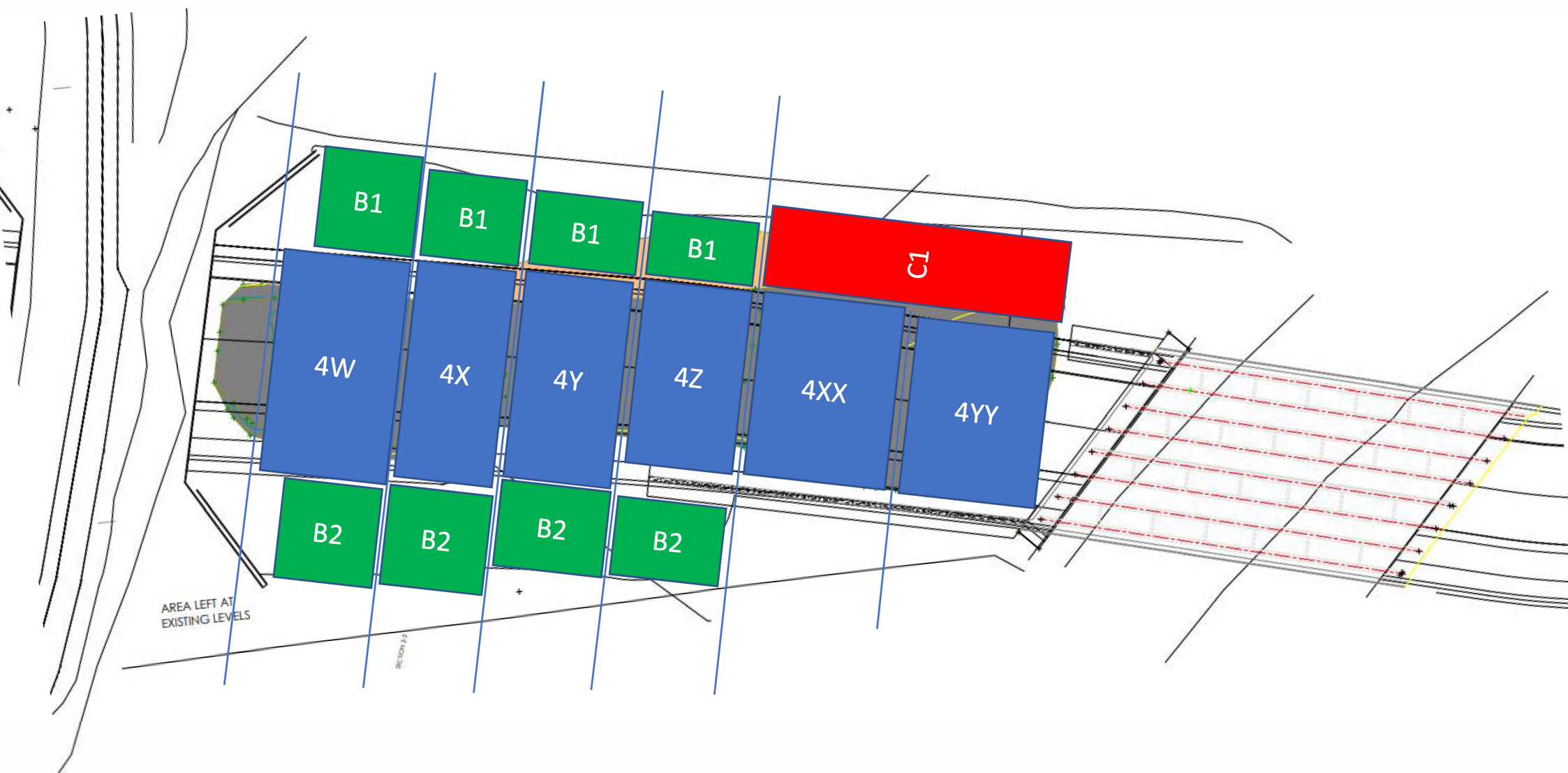
1922m3

Seeded Topsoil Only
1384m3



APPENDIX B

Cognition Material Chemical Test Data



Material Reference								Contamination Screening/Reporting			Specification
Test Type:	Reuse Zone:	Reference (Grid or Report)	Class	Material Type	Area From	Area To	Quantity	Report Date	Report ID:	Chemical	
Chemical Analysis	Zone 5	Z5SP111XX	RTG	SP111	Blackwell Soil Hospital	Zone 5	~500m3	19/04/2018	18-82248	18-82248	Within reuse/remedial target criteria
Chemical Analysis	Zone 5	Z5SP111XY	RTG	SP111	Blackwell Soil Hospital	Zone 5	~500m3	19/04/2018	18-82248	18-82248	Within reuse/remedial target criteria
Chemical Analysis	Zone 5	Z5SP111XZ	RTG	SP111	Blackwell Soil Hospital	Zone 5	~500m3	19/04/2018	18-82248	18-82248	Within reuse/remedial target criteria
Chemical Analysis	Zone 5	Z5SP111YY	RTG	SP111	Blackwell Soil Hospital	Zone 5	~500m3	19/04/2018	18-82248	18-82248	Within reuse/remedial target criteria
Chemical Analysis	Zone 5	Z5SP111YZ	RTG	SP111	Blackwell Soil Hospital	Zone 5	~500m3	19/04/2018	18-82248	18-82248	Within reuse/remedial target criteria
Chemical Analysis	Zone 5	Z5SP11AA	RTG	SP11	Blackwell Soil Hospital	Zone 5	~500m3	30/04/2018	18-83413	18-83413	Within reuse/remedial target criteria
Chemical Analysis	Zone 5	Z5SP11AB	RTG	SP11	Blackwell Soil Hospital	Zone 5	~500m3	30/04/2018	18-83413	18-83413	Within reuse/remedial target criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NXX	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	19/04/2018	18-82248	18-82248	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NXY	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	25/04/2018	18-82864	18-82864	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NXZ	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	25/04/2018	18-82864	18-82864	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NYX	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	25/04/2018	18-82864	18-82864	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NYY	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	25/04/2018	18-82864	18-82864	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NYZ	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	25/04/2018	18-82864	18-82864	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NAA	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	30/04/2018	18-83413	18-83413	Within import criteria
Chemical Analysis	Zone 5, 4, & 7	Z56NAB	Import	6N IBAA	Import	Zone 5, 4, & 7	~500m3	30/04/2018	18-83413	18-83413	Within import criteria
Chemical Analysis	Zone 4	SP7XY	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP16XY	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP16XZ	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP16XY	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP16XZ	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP7XY	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP16YCX	Made Ground	Lagoon 2C	Lagoon SP16	Zone 4	~500m3	22/02/2018	18-76507	18-76507	Within reuse/remedial target criteria

Material Reference								Contamination Screening/Reporting			Specification
Test Type:	Reuse Zone:	Reference (Grid or Report)	Class	Material Type	Area From	Area To	Quantity	Report Date	Report ID:	Chemical	
Chemical Analysis	Zone 4	SP4XW	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XX	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XZ	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YW	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YX	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YY	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YZ	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XX	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XZ	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XW	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YX	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YY	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YZ	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4YW	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XCB	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	22/02/2018	18-76507	18-76507	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XCD	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	22/02/2018	18-76507	18-76507	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XCX	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	22/02/2018	18-76507	18-76507	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP4XCY	Made Ground	Lagoon 2C	Lagoon SP4	Zone 4	~500m3	22/02/2018	18-76507	18-76507	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP8XX	Made Ground	Lagoon 2C	Lagoon SP8	Zone 4	~500m3	15/02/2018	18-75590	18-75590	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP8XX	Made Ground	Lagoon 2C	Lagoon SP8	Zone 4	~500m3	19/02/2018	18-76082	18-76082	Within reuse/remedial target criteria
Chemical Analysis	Zone 4	SP8YCY	Made Ground	Lagoon 2C	Lagoon SP8	Zone 4	~500m3	22/02/2018	18-76507	18-76507	Within reuse/remedial target criteria

Material Reference								Contamination Screening/Reporting			Specification
Test Type:	Reuse Zone:	Reference (Grid or Report)	Class	Material Type	Area From	Area To	Quantity	Report Date	Report ID:	Chemical	
Chemical Analysis	Zone 4 & 3	MGFCXXC	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	MGFCYXC	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	MGFCXZC	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	FCAMGR1	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	08/03/2018	18-78096	18-78096	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	FCAMGR2	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	08/03/2018	18-78096	18-78096	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	FCAMGXX	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	20/03/2018	18-78846	18-78846	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	FCAMGY Y	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	20/03/2018	18-78846	18-78846	Within reuse/remedial target criteria
Chemical Analysis	Zone 4 & 3	FCAMG71	Made Ground	FCA MG 2C	Site Won - FCA	Zone 4 & 3	~500m3	23/03/2018	18-79663-B	18-79663-B	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7XX	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7XY	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7XZ	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7YX	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7YY	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7YZ	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7ZX	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7ZY	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7ZZ	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCAZ7WX	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	02/05/2018	18-83240	18-83240	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCA1	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	25/05/2018	18-85602	18-85602	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCA2	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	25/05/2018	18-85602	18-85602	Within reuse/remedial target criteria
Chemical Analysis	Zone 7 & 4	FCA3	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	25/05/2018	18-85602	18-85602	Within reuse/remedial target criteria

Material Reference								Contamination Screening/Reporting			Specification
Test Type:	Reuse Zone:	Reference (Grid or Report)	Class	Material Type	Area From	Area To	Quantity	Report Date	Report ID:	Chemical	
Chemical Analysis	Zone 7 & 4	FCA4	RTG	FCA 2C	Site Won - FCA	Zone 7 & 4	~500m3	25/05/2018	18-85602	18-85602	Within reuse/remedial target criteria
Chemical Analysis	Zone 3	Z7SPXY	Made Ground	Class 2C MG	Site Won - Pump Lane Z3	Zone 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria
Chemical Analysis	Zone 3	Z7SPYZ	Made Ground	Class 2C MG	Site Won - Pump Lane Z3	Zone 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria
Chemical Analysis	Zone 3	Z7SPXYC	Made Ground	Class 2C MG	Site Won - Pump Lane Z3	Zone 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria
Chemical Analysis	Zone 3	Z7SPYZC	Made Ground	Class 2C MG	Site Won - Pump Lane Z3	Zone 3	~500m3	02/03/2018	18-77417	18-77417	Within reuse/remedial target criteria

APPENDIX C

CGL Material Chemical Test Data

Stockpiles 1 and 3

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Analytical Report Number : 19-26103

Project / Site name:	Southall	Samples received on:	23/01/2019
Your job number:	CG-28308	Samples instructed on:	23/01/2019
Your order number:		Analysis completed by:	01/02/2019
Report Issue Number:	1	Report issued on:	01/02/2019
Samples Analysed:	13 soil samples		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

Analytical Report Number: 19-26103

Project / Site name: Southall

Lab Sample Number				1139227	1139228	1139229	1139230	1139231
Sample Reference				TP1	TP2	TP3	TP3	TP4
Sample Number				S1	S1	S1	S2	S1
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	24	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	16	19	11	23	12
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.1	1.3	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	7.7	8.2	7.7	9.1
Total Cyanide	mg/kg	1	MCERTS	< 1	2	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.10	0.49	0.53	0.18	0.60
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	45	15	< 0.5	26	< 0.5
Organic Matter	%	0.1	MCERTS	6.1	4.9	3.0	6.9	3.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	4.6	3.1	2.0	2.0	1.9
Chrysene	mg/kg	0.05	MCERTS	3.3	2.8	1.6	1.5	1.5
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.0	4.0	2.4	2.9	2.3
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.5	1.4	0.96	0.76	0.92
Benzo(a)pyrene	mg/kg	0.05	MCERTS	4.0	3.4	2.0	2.1	2.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.0	1.8	1.1	1.2	1.1
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.56	0.47	0.27	0.31	0.29

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	15	12	18	13
Barium (aqua regia extractable)	mg/kg	1	MCERTS	220	170	160	200	190
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.96	1.1	0.92	1.1	0.95
Boron (water soluble)	mg/kg	0.2	MCERTS	3.4	4.4	3.0	4.1	2.5
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.1	2.9	1.8	1.2	0.9
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	-	44	38	-	-
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	44	39	35	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110	110	120	120	150
Lead (aqua regia extractable)	mg/kg	1	MCERTS	460	250	190	360	160
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3.8	1.7	1.0	2.9	1.2
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	22	27	29	22	25
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	53	54	45	53	52
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	210	240	240	200	170

Analytical Report Number: 19-26103

Project / Site name: Southall

Lab Sample Number	1139227	1139228	1139229	1139230	1139231
Sample Reference	TP1	TP2	TP3	TP3	TP4
Sample Number	S1	S1	S1	S2	S1
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics & Oxygenates

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	12	< 8.0	8.9
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	79	77	84	14	80
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	82	85	97	14	89

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.2	2.4	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	11	4.3	5.0	< 2.0	7.8
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	60	43	30	11	50
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	170	120	85	40	220
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	240	170	120	51	280

TPH (C10 - C25)	mg/kg	10	MCERTS	130	100	86	19	140
TPH (C25 - C40)	mg/kg	10	NONE	240	200	180	67	300

Analytical Report Number: 19-26103

Project / Site name: Southall

Lab Sample Number				1139232	1139233	1139234	1139235	1139236
Sample Reference				TP5	TP5	TP6	TP7	TP8
Sample Number				S1	S2	S1	S1	S1
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	18
Moisture Content	%	N/A	NONE	13	19	18	12	10
Total mass of sample received	kg	0.001	NONE	1.1	1.2	1.1	1.2	1.2

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	< 0.001

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.0	7.7	7.8	7.7	8.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.38	0.14	0.14	0.087	0.93
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	38	21	9.2	< 0.5
Organic Matter	%	0.1	MCERTS	4.7	5.7	4.4	3.1	2.6

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.9	1.8	2.0	0.95	2.8
Chrysene	mg/kg	0.05	MCERTS	1.9	1.6	1.8	1.1	2.7
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	2.3	2.4	2.4	1.4	3.6
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.3	0.97	1.1	0.46	2.0
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.2	2.0	2.2	1.1	3.5
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.2	1.1	1.1	0.62	2.3
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.35	0.28	0.33	< 0.05	0.56

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	16	13	13	14	22
Barium (aqua regia extractable)	mg/kg	1	MCERTS	180	200	150	120	220
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.97	0.89	0.92	0.91	1.1
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	2.3	2.9	2.1	3.4
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.2	0.8	1.0	0.5	7.4
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	-	-	-	-	70
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	29	33	31	70
Copper (aqua regia extractable)	mg/kg	1	MCERTS	98	89	83	59	170
Lead (aqua regia extractable)	mg/kg	1	MCERTS	300	290	220	140	190
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3.0	2.7	2.5	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	23	22	21	22	41
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	51	50	48	48	57
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	190	180	160	120	340

Analytical Report Number: 19-26103

Project / Site name: Southall

Lab Sample Number				1139232	1139233	1139234	1139235	1139236
Sample Reference				TP5	TP5	TP6	TP7	TP8
Sample Number				S1	S2	S1	S1	S1
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				22/01/2019	22/01/2019	22/01/2019	22/01/2019	22/01/2019
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	4.9
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	43
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	59	< 8.0	12	< 8.0	270
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	67	< 10	12	< 10	320
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	11	5.2	4.0	2.3	3.6
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	45	34	31	12	67
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	120	110	110	32	260
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	170	150	150	46	330
TPH (C10 - C25)	mg/kg	10	MCERTS	99	64	61	22	230
TPH (C25 - C40)	mg/kg	10	NONE	180	120	110	25	510

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Project / Site name: Southall

Lab Sample Number				1139237	1139238	1139239		
Sample Reference				TP9	TP10	TP11		
Sample Number				S1	S1	S1		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				22/01/2019	22/01/2019	22/01/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	18	16	12		
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.1		

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile & Crocidolite	-		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Not-detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	< 0.001	-		
Asbestos Quantification Total	%	0.001	ISO 17025	-	< 0.001	-		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.0	7.9	8.8		
Total Cyanide	mg/kg	1	MCERTS	< 1	2	4		
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Water Soluble SO4 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.46	0.65	1.5		
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5		
Organic Matter	%	0.1	MCERTS	4.6	5.2	4.7		

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.86	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.4	4.6	3.6		
Chrysene	mg/kg	0.05	MCERTS	2.5	3.3	3.6		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	4.4	5.2	5.5		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.4	2.5	1.7		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.7	4.9	4.4		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.0	2.9	2.7		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.55	0.56	0.73		

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	17	21	20		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	160	220	210		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.0	1.1	1.1		
Boron (water soluble)	mg/kg	0.2	MCERTS	3.4	4.7	4.5		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.7	9.2	9.6		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (III)	mg/kg	1	NONE	45	76	83		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	45	76	83		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	100	240	240		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	190	270	250		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.8	1.9	1.9		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	28	40	42		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	55	53	53		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	220	370	430		

Analytical Report Number: 19-26103

Project / Site name: Southall

Lab Sample Number				1139237	1139238	1139239		
Sample Reference				TP9	TP10	TP11		
Sample Number				S1	S1	S1		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				22/01/2019	22/01/2019	22/01/2019		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics & Oxygenates								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.7	2.8		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	4.5	11		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	17	30	48		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	120	210	260		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	140	240	320		
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.6	1.3	3.6		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	12	9.7	12		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	38	49	64		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	110	130	270		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	170	190	350		
TPH (C10 - C25)	mg/kg	10	MCERTS	120	160	260		
TPH (C25 - C40)	mg/kg	10	NONE	250	340	480		



Analytical Report Number: 19-26103

Project / Site name: Southall

Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1139236	TP8		135	Loose Fibres	Chrysotile	< 0.001	< 0.001
1139238	TP10		134	Loose Fibres	Chrysotile & Crocidolite	< 0.001	< 0.001

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

Analytical Report Number : 19-26103
Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1139227	TP1	S1	None Supplied	3,21,17,18
1139228	TP2	S1	None Supplied	Brown loam and clay with gravel and vegetation.
1139229	TP3	S1	None Supplied	Brown loam and clay with gravel and stones.
1139230	TP3	S2	None Supplied	Brown loam and clay with gravel and vegetation.
1139231	TP4	S1	None Supplied	Brown loam and clay with gravel.
1139232	TP5	S1	None Supplied	Brown loam and sand with gravel.
1139233	TP5	S2	None Supplied	Brown loam and clay with gravel and vegetation.
1139234	TP6	S1	None Supplied	Brown loam and clay with gravel.
1139235	TP7	S1	None Supplied	Brown loam and clay with gravel and vegetation.
1139236	TP8	S1	None Supplied	Brown loam and clay with brick and stones.
1139237	TP9	S1	None Supplied	Brown loam and clay with gravel.
1139238	TP10	S1	None Supplied	Brown loam and sand with gravel and vegetation.
1139239	TP11	S1	None Supplied	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 19-26103

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method,10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
DRO C10-28 (Soil)	Determination of TPH bands by HS-GC-MS/GC-FID	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

Iss No 19-26103-1 Southall CG-28308

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

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Analytical Report Number : 19-26103

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
TPH Oils (Soils)	Determination of extractable hydrocarbons in soil by GC-MS/FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L088/76-PL	W	MCERTS

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

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

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

Stockpile 4 (including Stockpile 8 material)

**Chris Gordon**

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Analytical Report Number : 17-58339

Replaces Analytical Report Number : 17-58339, issue no. 1

Project / Site name:	Southall Western Access	Samples received on:	24/08/2017
Your job number:	CG-20308	Samples instructed on:	24/08/2017
Your order number:		Analysis completed by:	14/09/2017
Report Issue Number:	2	Report issued on:	14/09/2017
Samples Analysed:	6 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number	804974	804975	804976	804977	804978
Sample Reference	ES1 BB	ES2 DC	ES3 DC	ES4 BG	ES5 GC
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.20	1.20	2.00	2.00	2.00
Date Sampled	22/08/2017	22/08/2017	23/08/2017	23/08/2017	23/08/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	25	35
Total mass of sample received	kg	0.001	NONE	1.4	1.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	Chrysotile & Crocidolite	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.001	< 0.001	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.001	< 0.001	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	8.0	7.7	6.8	7.5
Total Cyanide	mg/kg	1	MCERTS	2	5	1	< 1	3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	21000	1500	2700	20000	6800
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	310	< 0.5	< 0.5	< 0.5
Organic Matter	%	0.1	MCERTS	3.1	7.2	3.8	1.3	8.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.18	< 0.05	< 0.05	0.58
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	0.50
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.72	< 0.05	0.19	0.47
Fluorene	mg/kg	0.05	MCERTS	< 0.05	1.2	< 0.05	0.24	0.55
Phenanthrene	mg/kg	0.05	MCERTS	0.55	7.7	0.24	3.3	5.8
Anthracene	mg/kg	0.05	MCERTS	0.10	2.2	< 0.05	0.71	1.4
Fluoranthene	mg/kg	0.05	MCERTS	1.1	15	0.94	5.0	10
Pyrene	mg/kg	0.05	MCERTS	1.0	14	0.81	4.3	9.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.54	5.6	1.6	2.3	6.2
Chrysene	mg/kg	0.05	MCERTS	0.74	7.2	2.0	2.0	5.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1	5.9	1.6	2.6	7.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.74	6.5	2.0	1.9	4.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	6.4	0.93	2.6	6.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.91	4.6	0.91	1.4	3.8
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.19	1.3	0.41	0.35	1.1
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	5.7	1.1	1.8	4.5
Coronene	mg/kg	0.05	NONE	< 0.05	1.2	< 0.05	< 0.05	0.64

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	9.1	85	12	29	69
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	6.6	7.1	24	76	47
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	20	320	170	170
Barium (aqua regia extractable)	mg/kg	1	MCERTS	85	240	810	300	1300
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.40	1.2	2.6	3.7	6.5
Boron (water soluble)	mg/kg	0.2	MCERTS	5.0	6.1	4.4	5.9	7.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	7.2	12	54	11	8.1
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	60	88	350	120	77
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	61	88	350	130	77
Copper (aqua regia extractable)	mg/kg	1	MCERTS	4500	250	800	960	760
Lead (aqua regia extractable)	mg/kg	1	MCERTS	180	560	530	7600	1800
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.0	< 0.3	< 0.3	2.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	100	60	98	120	70
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	59	83	130	130
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	980	670	1700	1900	2200



Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804974	804975	804976	804977	804978
Sample Reference				ES1 BB	ES2 DC	ES3 DC	ES4 BG	ES5 GC
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.20	2.00	2.00	2.00
Date Sampled				22/08/2017	22/08/2017	23/08/2017	23/08/2017	23/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804974	804975	804976	804977	804978
Sample Reference				ES1 BB	ES2 DC	ES3 DC	ES4 BG	ES5 GC
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.20	2.00	2.00	2.00
Date Sampled				22/08/2017	22/08/2017	23/08/2017	23/08/2017	23/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	45	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	8.6	650	5.7	< 2.0	3.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	43	1300	< 8.0	19	31
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	280	4100	24	130	200
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	330	6100	36	150	240

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.8	< 1.0	2.4	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	220	< 2.0	5.3	5.2
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	21	640	< 10	14	54
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	230	1500	19	45	180
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	250	2300	22	67	240

Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804979				
Sample Reference				ES6 DC				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				23/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	27				
Total mass of sample received	kg	0.001	NONE	1.9				

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile				
Asbestos in Soil	Type	N/A	ISO 17025	Detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002				
Asbestos Quantification Total	%	0.001	ISO 17025	0.002				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7				
Total Cyanide	mg/kg	1	MCERTS	44				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2300				
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	51				
Organic Matter	%	0.1	MCERTS	6.6				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.63				
Acenaphthylene	mg/kg	0.05	MCERTS	0.72				
Acenaphthene	mg/kg	0.05	MCERTS	0.44				
Fluorene	mg/kg	0.05	MCERTS	0.95				
Phenanthrene	mg/kg	0.05	MCERTS	6.6				
Anthracene	mg/kg	0.05	MCERTS	2.2				
Fluoranthene	mg/kg	0.05	MCERTS	13				
Pyrene	mg/kg	0.05	MCERTS	11				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.0				
Chrysene	mg/kg	0.05	MCERTS	10				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	12				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	8.1				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	12				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	7.9				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.3				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	8.7				
Coronene	mg/kg	0.05	NONE	< 0.05				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	100				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	17				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	55				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	890				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2				
Boron (water soluble)	mg/kg	0.2	MCERTS	5.2				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	230				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	750				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	750				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3600				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	680				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3.4				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	310				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	780				



Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804979				
Sample Reference				ES6 DC				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				23/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804979				
Sample Reference				ES6 DC				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				23/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.2				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	110				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	510				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	3100				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	3800				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.8				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	15				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	260				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1600				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	1900				



Analytical Report Number: **17-58339**
Project / Site name: **Southall Western Access**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
804975	ES2 DC	1.20	101	Loose Fibrous Debris	Chrysotile	0.001	0.001
804976	ES3 DC	2.00	112	Loose Fibres	Chrysotile & Crocidolite	< 0.001	< 0.001
804977	ES4 BG	2.00	100	Loose Fibres	Chrysotile	< 0.001	< 0.001
804979	ES6 DC	2.00	116	Loose Fibres	Chrysotile	0.002	0.002

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



Analytical Report Number : 17-58339

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
804974	ES1 BB	None Supplied	1.20	Grey loam and sand with gravel and vegetation.
804975	ES2 DC	None Supplied	1.20	Brown clay and sand.
804976	ES3 DC	None Supplied	2.00	Brown loam and clay with gravel.
804977	ES4 BG	None Supplied	2.00	Brown loam and clay with gravel.
804978	ES5 GC	None Supplied	2.00	Brown loam and clay with gravel.
804979	ES6 DC	None Supplied	2.00	Brown clay and sand.

Analytical Report Number : 17-58339

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method,10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

Iss No 17-58339-2 Southall Western Access CG-20308

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

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Analytical Report Number : 17-58339

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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



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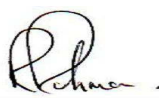
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Analytical Report Number : 17-60711

Project / Site name:	Southall Western Access	Samples received on:	18/09/2017
Your job number:	CG-28308	Samples instructed on:	18/09/2017
Your order number:	4586	Analysis completed by:	21/09/2017
Report Issue Number:	1	Report issued on:	21/09/2017
Samples Analysed:	6 soil samples		

Signed: 

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-60711

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number	819189	819190	819191	819192	819193
Sample Reference	RD1	RD1	RD1	WGUC Arisings	WGUC Arisings
Sample Number	ES1	ES2	ES3	ES1	ES2
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	15/09/2017	15/09/2017	15/09/2017	15/09/2017	15/09/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.1	25
Total mass of sample received	kg	0.001	NONE	1.5	1.5

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	21	15

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.41	< 0.05	0.36	0.31

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	26	31	49	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 17-60711

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				819194				
Sample Reference				WGUC Arisings				
Sample Number				ES3				
Depth (m)				None Supplied				
Date Sampled				15/09/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	19				
Total mass of sample received	kg	0.001	NONE	1.5				

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5				
Ammonia as NH ₃	mg/kg	0.5	MCERTS	17				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0				
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Analytical Report Number : 17-60711

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
819189	RD1	ES1	None Supplied	Brown clay with stones.
819190	RD1	ES2	None Supplied	Grey clay.
819191	RD1	ES3	None Supplied	Brown clay with gravel.
819192	WGUC Arisings	ES1	None Supplied	Grey clay and loam.
819193	WGUC Arisings	ES2	None Supplied	Grey clay and loam.
819194	WGUC Arisings	ES3	None Supplied	Grey clay and loam.

Analytical Report Number : 17-60711

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpiles 5 and 6

**Tom Fairweather**

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Analytical Report Number : 17-57682

Project / Site name:	Southall Western Access	Samples received on:	17/08/2017
Your job number:	CG-28308	Samples instructed on:	17/08/2017
Your order number:		Analysis completed by:	22/08/2017
Report Issue Number:	1	Report issued on:	22/08/2017
Samples Analysed:	1 soil sample		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-57682

Project / Site name: Southall Western Access

Lab Sample Number				800924				
Sample Reference				TP101				
Sample Number				ES1				
Depth (m)				1.80				
Date Sampled				17/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	35				
Total mass of sample received	kg	0.001	NONE	1.0				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.9				
Total Cyanide	mg/kg	1	MCERTS	3				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1300				
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	220				
Organic Matter	%	0.1	MCERTS	6.7				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.15				
Acenaphthylene	mg/kg	0.05	MCERTS	0.54				
Acenaphthene	mg/kg	0.05	MCERTS	0.80				
Fluorene	mg/kg	0.05	MCERTS	1.3				
Phenanthrene	mg/kg	0.05	MCERTS	6.8				
Anthracene	mg/kg	0.05	MCERTS	1.6				
Fluoranthene	mg/kg	0.05	MCERTS	16				
Pyrene	mg/kg	0.05	MCERTS	15				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.0				
Chrysene	mg/kg	0.05	MCERTS	8.5				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	7.8				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	8.5				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	8.0				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	4.5				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.4				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	5.1				
Coronene	mg/kg	0.05	NONE	< 0.05				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	93				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	6.6				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	24				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	230				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.3				
Boron (water soluble)	mg/kg	0.2	MCERTS	10				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	8.4				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	82				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	83				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	200				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	460				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	60				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	63				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	490				

Analytical Report Number: 17-57682

Project / Site name: Southall Western Access

Lab Sample Number				800924				
Sample Reference				TP101				
Sample Number				ES1				
Depth (m)				1.80				
Date Sampled				17/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	7.7				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	340				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	1300				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	4100				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	5700				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	170				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	840				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1900				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	2900				



Analytical Report Number : 17-57682

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
800924	TP101	ES1	1.80	Brown clay with vegetation and oil / petroleum.

Analytical Report Number : 17-57682

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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

Iss No 17-57682-1 Southall Western Access CG-28308

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

Page 5 of 5

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Analytical Report Number : 17-58339

Replaces Analytical Report Number : 17-58339, issue no. 1

Project / Site name:	Southall Western Access	Samples received on:	24/08/2017
Your job number:	CG-20308	Samples instructed on:	24/08/2017
Your order number:		Analysis completed by:	14/09/2017
Report Issue Number:	2	Report issued on:	14/09/2017
Samples Analysed:	6 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number	804974	804975	804976	804977	804978
Sample Reference	ES1 BB	ES2 DC	ES3 DC	ES4 BG	ES5 GC
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)	1.20	1.20	2.00	2.00	2.00
Date Sampled	22/08/2017	22/08/2017	23/08/2017	23/08/2017	23/08/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	25	35
Total mass of sample received	kg	0.001	NONE	1.4	1.9

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	Chrysotile	Chrysotile & Crocidolite	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Detected	Detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	0.001	< 0.001	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	0.001	< 0.001	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.6	8.0	7.7	6.8	7.5
Total Cyanide	mg/kg	1	MCERTS	2	5	1	< 1	3
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	21000	1500	2700	20000	6800
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	310	< 0.5	< 0.5	< 0.5
Organic Matter	%	0.1	MCERTS	3.1	7.2	3.8	1.3	8.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	0.18	< 0.05	< 0.05	0.58
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	0.45	< 0.05	< 0.05	0.50
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	0.72	< 0.05	0.19	0.47
Fluorene	mg/kg	0.05	MCERTS	< 0.05	1.2	< 0.05	0.24	0.55
Phenanthrene	mg/kg	0.05	MCERTS	0.55	7.7	0.24	3.3	5.8
Anthracene	mg/kg	0.05	MCERTS	0.10	2.2	< 0.05	0.71	1.4
Fluoranthene	mg/kg	0.05	MCERTS	1.1	15	0.94	5.0	10
Pyrene	mg/kg	0.05	MCERTS	1.0	14	0.81	4.3	9.7
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.54	5.6	1.6	2.3	6.2
Chrysene	mg/kg	0.05	MCERTS	0.74	7.2	2.0	2.0	5.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1	5.9	1.6	2.6	7.1
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.74	6.5	2.0	1.9	4.7
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	6.4	0.93	2.6	6.9
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.91	4.6	0.91	1.4	3.8
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.19	1.3	0.41	0.35	1.1
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.2	5.7	1.1	1.8	4.5
Coronene	mg/kg	0.05	NONE	< 0.05	1.2	< 0.05	< 0.05	0.64

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	9.1	85	12	29	69
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	6.6	7.1	24	76	47
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	10	20	320	170	170
Barium (aqua regia extractable)	mg/kg	1	MCERTS	85	240	810	300	1300
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.40	1.2	2.6	3.7	6.5
Boron (water soluble)	mg/kg	0.2	MCERTS	5.0	6.1	4.4	5.9	7.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	7.2	12	54	11	8.1
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	60	88	350	120	77
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	61	88	350	130	77
Copper (aqua regia extractable)	mg/kg	1	MCERTS	4500	250	800	960	760
Lead (aqua regia extractable)	mg/kg	1	MCERTS	180	560	530	7600	1800
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	1.0	< 0.3	< 0.3	2.7
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	100	60	98	120	70
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	59	83	130	130
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	980	670	1700	1900	2200



Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804974	804975	804976	804977	804978
Sample Reference				ES1 BB	ES2 DC	ES3 DC	ES4 BG	ES5 GC
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.20	2.00	2.00	2.00
Date Sampled				22/08/2017	22/08/2017	23/08/2017	23/08/2017	23/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804974	804975	804976	804977	804978
Sample Reference				ES1 BB	ES2 DC	ES3 DC	ES4 BG	ES5 GC
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.20	1.20	2.00	2.00	2.00
Date Sampled				22/08/2017	22/08/2017	23/08/2017	23/08/2017	23/08/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	45	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	8.6	650	5.7	< 2.0	3.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	43	1300	< 8.0	19	31
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	280	4100	24	130	200
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	330	6100	36	150	240

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.8	< 1.0	2.4	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	220	< 2.0	5.3	5.2
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	21	640	< 10	14	54
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	230	1500	19	45	180
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	250	2300	22	67	240

Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804979				
Sample Reference				ES6 DC				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				23/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	27				
Total mass of sample received	kg	0.001	NONE	1.9				

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile				
Asbestos in Soil	Type	N/A	ISO 17025	Detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002				
Asbestos Quantification Total	%	0.001	ISO 17025	0.002				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.7				
Total Cyanide	mg/kg	1	MCERTS	44				
Free Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2300				
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	51				
Organic Matter	%	0.1	MCERTS	6.6				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.63				
Acenaphthylene	mg/kg	0.05	MCERTS	0.72				
Acenaphthene	mg/kg	0.05	MCERTS	0.44				
Fluorene	mg/kg	0.05	MCERTS	0.95				
Phenanthrene	mg/kg	0.05	MCERTS	6.6				
Anthracene	mg/kg	0.05	MCERTS	2.2				
Fluoranthene	mg/kg	0.05	MCERTS	13				
Pyrene	mg/kg	0.05	MCERTS	11				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.0				
Chrysene	mg/kg	0.05	MCERTS	10				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	12				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	8.1				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	12				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	7.9				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.3				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	8.7				
Coronene	mg/kg	0.05	NONE	< 0.05				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	100				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	17				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	55				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	890				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.2				
Boron (water soluble)	mg/kg	0.2	MCERTS	5.2				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	230				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	750				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	750				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3600				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	680				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	3.4				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	310				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	38				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	780				



Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804979				
Sample Reference				ES6 DC				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				23/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Analytical Report Number: 17-58339

Project / Site name: Southall Western Access

Lab Sample Number				804979				
Sample Reference				ES6 DC				
Sample Number				None Supplied				
Depth (m)				2.00				
Date Sampled				23/08/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.2				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	110				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	510				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	3100				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	3800				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.8				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	15				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	260				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	1600				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	1900				



Analytical Report Number: **17-58339**
Project / Site name: **Southall Western Access**
Your Order No:

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
804975	ES2 DC	1.20	101	Loose Fibrous Debris	Chrysotile	0.001	0.001
804976	ES3 DC	2.00	112	Loose Fibres	Chrysotile & Crocidolite	< 0.001	< 0.001
804977	ES4 BG	2.00	100	Loose Fibres	Chrysotile	< 0.001	< 0.001
804979	ES6 DC	2.00	116	Loose Fibres	Chrysotile	0.002	0.002

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



Analytical Report Number : 17-58339

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
804974	ES1 BB	None Supplied	1.20	Grey loam and sand with gravel and vegetation.
804975	ES2 DC	None Supplied	1.20	Brown clay and sand.
804976	ES3 DC	None Supplied	2.00	Brown loam and clay with gravel.
804977	ES4 BG	None Supplied	2.00	Brown loam and clay with gravel.
804978	ES5 GC	None Supplied	2.00	Brown loam and clay with gravel.
804979	ES6 DC	None Supplied	2.00	Brown clay and sand.

Analytical Report Number : 17-58339

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method,10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

Iss No 17-58339-2 Southall Western Access CG-20308

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

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Analytical Report Number : 17-58339

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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

Stockpile 7



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Analytical Report Number : 17-59543

Project / Site name:	Southall	Samples received on:	06/09/2017
Your job number:	CG-28308	Samples instructed on:	06/09/2017
Your order number:	4586	Analysis completed by:	11/09/2017
Report Issue Number:	1	Report issued on:	11/09/2017
Samples Analysed:	4 soil samples		

Signed:

Dr Irma Doyle
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-59543

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				811760	811761	811762	811763	
Sample Reference				EYBPM1	EYBPM2	EYBPM3	EYBPM4	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.30	0.30	None Supplied	None Supplied	
Date Sampled				04/09/2017	04/09/2017	04/09/2017	04/09/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	11	28	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	12	11	20	17	
Total mass of sample received	kg	0.001	NONE	1.6	1.4	1.3	1.5	

General Inorganics

Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.06	0.08	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.8	3.5	0.23	0.58	

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.2	3.3	1.7	1.4	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	110	130	28	46	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.7	< 0.3	< 0.3	< 0.3	

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Analytical Report Number : 17-59543

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
811760	EYBPM1	None Supplied	0.30	Brown loam and clay with stones and vegetation.
811761	EYBPM2	None Supplied	0.30	Brown clay and loam with stones and vegetation.
811762	EYBPM3	None Supplied	None Supplied	Light brown clay.
811763	EYBPM4	None Supplied	None Supplied	Light brown clay.

Analytical Report Number : 17-59543

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 dphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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



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Analytical Report Number : 17-60408

Replaces Analytical Report Number : 17-60408, issue no. 1

Project / Site name:	Southall Western Access	Samples received on:	15/09/2017
Your job number:	CG-28308	Samples instructed on:	15/09/2017
Your order number:	4586	Analysis completed by:	21/09/2017
Report Issue Number:	2	Report issued on:	21/09/2017
Samples Analysed:	3 soil samples		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-60408

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				816866	816867	816868		
Sample Reference				WYBPM Arisings	WYBPM Arisings	WYBPM Arisings		
Sample Number				ES1	ES2	ES3		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				12/09/2017	12/09/2017	12/09/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	18	38		
Moisture Content	%	N/A	NONE	21	17	8.9		
Total mass of sample received	kg	0.001	NONE	1.8	1.8	1.8		

General Inorganics

Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Ammonia as NH ₃	mg/kg	0.5	MCERTS	14	3.8	11		

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.18	< 0.05	< 0.05		

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	22	23	32		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
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Analytical Report Number : 17-60408

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
816866	WYBPM Arisings	ES1	None Supplied	Brown clay and loam.
816867	WYBPM Arisings	ES2	None Supplied	Brown clay and loam with stones.
816868	WYBPM Arisings	ES3	None Supplied	Brown loam and gravel with stones.

Analytical Report Number : 17-60408

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

Soil analytical results are expressed on a dry weight basis. Where analysis is carried out on as-received the results obtained are multiplied by a moisture correction factor that is determined gravimetrically using the moisture content which is carried out at a maximum of 300C.



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Analytical Report Number : 17-60711

Project / Site name:	Southall Western Access	Samples received on:	18/09/2017
Your job number:	CG-28308	Samples instructed on:	18/09/2017
Your order number:	4586	Analysis completed by:	21/09/2017
Report Issue Number:	1	Report issued on:	21/09/2017
Samples Analysed:	6 soil samples		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-60711

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number	819189	819190	819191	819192	819193
Sample Reference	RD1	RD1	RD1	WGUC Arisings	WGUC Arisings
Sample Number	ES1	ES2	ES3	ES1	ES2
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	15/09/2017	15/09/2017	15/09/2017	15/09/2017	15/09/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.1	25
Total mass of sample received	kg	0.001	NONE	1.5	1.5

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	21	15

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.41	< 0.05	0.36	0.31

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	26	31	49	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 17-60711

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				819194				
Sample Reference				WGUC Arisings				
Sample Number				ES3				
Depth (m)				None Supplied				
Date Sampled				15/09/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	19				
Total mass of sample received	kg	0.001	NONE	1.5				

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5				
Ammonia as NH ₃	mg/kg	0.5	MCERTS	17				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0				
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Analytical Report Number : 17-60711

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
819189	RD1	ES1	None Supplied	Brown clay with stones.
819190	RD1	ES2	None Supplied	Grey clay.
819191	RD1	ES3	None Supplied	Brown clay with gravel.
819192	WGUC Arisings	ES1	None Supplied	Grey clay and loam.
819193	WGUC Arisings	ES2	None Supplied	Grey clay and loam.
819194	WGUC Arisings	ES3	None Supplied	Grey clay and loam.

Analytical Report Number : 17-60711

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpile 9

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Analytical Report Number : 17-60711

Project / Site name:	Southall Western Access	Samples received on:	18/09/2017
Your job number:	CG-28308	Samples instructed on:	18/09/2017
Your order number:	4586	Analysis completed by:	21/09/2017
Report Issue Number:	1	Report issued on:	21/09/2017
Samples Analysed:	6 soil samples		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-60711

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				819189	819190	819191	819192	819193
Sample Reference				RD1	RD1	RD1	WGUC Arisings	WGUC Arisings
Sample Number				ES1	ES2	ES3	ES1	ES2
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				15/09/2017	15/09/2017	15/09/2017	15/09/2017	15/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	47	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.1	25	9.8	17	17
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.8	1.6	1.5

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	21	15

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.41	< 0.05	0.36	0.31

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	25	26	31	49	45
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 17-60711

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				819194				
Sample Reference				WGUC Arisings				
Sample Number				ES3				
Depth (m)				None Supplied				
Date Sampled				15/09/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	19				
Total mass of sample received	kg	0.001	NONE	1.5				

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5				
Ammonia as NH ₃	mg/kg	0.5	MCERTS	17				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	28				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0				
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Analytical Report Number : 17-60711

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
819189	RD1	ES1	None Supplied	Brown clay with stones.
819190	RD1	ES2	None Supplied	Grey clay.
819191	RD1	ES3	None Supplied	Brown clay with gravel.
819192	WGUC Arisings	ES1	None Supplied	Grey clay and loam.
819193	WGUC Arisings	ES2	None Supplied	Grey clay and loam.
819194	WGUC Arisings	ES3	None Supplied	Grey clay and loam.

Analytical Report Number : 17-60711

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpile 10

**Tom Fairweather**

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Analytical Report Number : 17-61856

Project / Site name:	Southall	Samples received on:	28/09/2017
Your job number:	CG-28308	Samples instructed on:	28/09/2017
Your order number:	4586	Analysis completed by:	02/10/2017
Report Issue Number:	1	Report issued on:	02/10/2017
Samples Analysed:	2 leachate samples - 5 soil samples		

Signed: _____

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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4041



Environmental Science

Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825353	825354	825355	825356	825357
Sample Reference				WYBPM Cropping	WYBPM Cropping	WYBPM Cropping	RCBBS	RCBBS
Sample Number				ES2	ES5	ES9	ES2	ES6
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/09/2017	27/09/2017	27/09/2017	27/09/2017	27/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	6.3	15	26	11
Moisture Content	%	N/A	NONE	14	7.5	5.5	5.6	5.6
Total mass of sample received	kg	0.001	NONE	1.3	1.1	1.1	1.2	2.0

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.1	7.6	8.0	7.6	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1600	1600	1900	1400	1000
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	9.6	4.8
Organic Matter	%	0.1	MCERTS	0.7	0.8	0.8	0.4	1.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.14	0.20	0.21	0.14	1.2
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.38
Fluoranthene	mg/kg	0.05	MCERTS	0.23	0.46	0.46	0.25	3.4
Pyrene	mg/kg	0.05	MCERTS	0.21	0.41	0.41	0.19	3.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.23	0.23	0.12	2.0
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.19	0.21	0.12	1.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.22	0.23	< 0.05	2.0
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.16	0.14	< 0.05	1.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.23	0.24	< 0.05	2.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05	< 0.05	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.31
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.13	< 0.05	< 0.05	1.3
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	2.4	2.1	< 0.9	20
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.2	1.2	3.2	< 1.0	3.1
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	25	15	1.0	21
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	83	170	59	170
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.2	1.1	0.61	0.82
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	1.9	3.0	2.1	2.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.7
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	43	40	44	23	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	43	40	44	23	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	51	90	370	4000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	42	78	80	43	260
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	37	38	39	15	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	71	72	71	31	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	84	97	110	130	630

Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825353	825354	825355	825356	825357
Sample Reference				WYBPM Cropping	WYBPM Cropping	WYBPM Cropping	RCBBS	RCBBS
Sample Number				ES2	ES5	ES9	ES2	ES6
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/09/2017	27/09/2017	27/09/2017	27/09/2017	27/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	37
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	10	10	43

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	2.1	< 2.0	< 2.0	3.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	18
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	12	< 10	< 10	76
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	19	10	10	97

VOCs

Trichloroethene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825358	825359			
Sample Reference				WYBPM Cropping	RCBBS			
Sample Number				ES2	ES2			
Depth (m)				None Supplied	None Supplied			
Date Sampled				27/09/2017	27/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.7	7.5			
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0			
Free Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1	< 1			
Sulphate as SO ₄	µg/l	100	ISO 17025	444000	181000			
Ammoniacal Nitrogen as N	µg/l	15	NONE	120	2500			
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	5.72	7.20			

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2			
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Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1			
Barium (dissolved)	µg/l	0.05	ISO 17025	25	32			
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Boron (dissolved)	µg/l	10	ISO 17025	96	120			
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08			
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0			
Chromium (III)	µg/l	1	NONE	5.7	< 1.0			
Chromium (dissolved)	µg/l	0.4	ISO 17025	5.7	< 0.4			
Copper (dissolved)	µg/l	0.7	ISO 17025	20	20			
Lead (dissolved)	µg/l	1	ISO 17025	2.1	< 1.0			
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5			
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.2	0.9			
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0			
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Zinc (dissolved)	µg/l	0.4	ISO 17025	11	9.7			
Calcium (dissolved)	mg/l	0.012	ISO 17025	110	58			



Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825358	825359			
Sample Reference				WYBPM Cropping	RCBBS			
Sample Number				ES2	ES2			
Depth (m)				None Supplied	None Supplied			
Date Sampled				27/09/2017	27/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

VOCs

Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0			
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Analytical Report Number : 17-61856

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
825353	WYBPM Cropping	ES2	None Supplied	Brown clay and loam with gravel.
825354	WYBPM Cropping	ES5	None Supplied	Brown clay and loam with stones and vegetation.
825355	WYBPM Cropping	ES9	None Supplied	Brown clay and loam with stones.
825356	RCBBS	ES2	None Supplied	Brown clay and sand with stones.
825357	RCBBS	ES6	None Supplied	Brown clay with stones.

Analytical Report Number : 17-61856

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L023-PL	W	NONE
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS

Iss No 17-61856-1 Southall CG-28308

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

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Analytical Report Number : 17-61856

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	W	NONE
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

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

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

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

**Chris Gordon**

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Analytical Report Number : 17-65529

Project / Site name:	Southall	Samples received on:	26/10/2017
Your job number:	CG-28308	Samples instructed on:	27/10/2017
Your order number:	4586	Analysis completed by:	06/11/2017
Report Issue Number:	1	Report issued on:	06/11/2017
Samples Analysed:	1 soil sample		


Signed: _____

Vineetha Meethale Vettil
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-65529

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				845629				
Sample Reference				Stockpile 10				
Sample Number				B104				
Depth (m)				None Supplied				
Date Sampled				25/10/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	20				
Total mass of sample received	kg	0.001	NONE	1.2				

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5				
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05				

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	16				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0				
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Analytical Report Number : 17-65529

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
845629	Stockpile 10	B104	None Supplied	Brown clay.

Analytical Report Number : 17-65529

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 dphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpiles 11 and 11A

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Analytical Report Number : 17-61856

Project / Site name:	Southall	Samples received on:	28/09/2017
Your job number:	CG-28308	Samples instructed on:	28/09/2017
Your order number:	4586	Analysis completed by:	02/10/2017
Report Issue Number:	1	Report issued on:	02/10/2017
Samples Analysed:	2 leachate samples - 5 soil samples		

Signed: _____

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Environmental Science

Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825353	825354	825355	825356	825357
Sample Reference				WYBPM Cropping	WYBPM Cropping	WYBPM Cropping	RCBBS	RCBBS
Sample Number				ES2	ES5	ES9	ES2	ES6
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/09/2017	27/09/2017	27/09/2017	27/09/2017	27/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	6.3	15	26	11
Moisture Content	%	N/A	NONE	14	7.5	5.5	5.6	5.6
Total mass of sample received	kg	0.001	NONE	1.3	1.1	1.1	1.2	2.0

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.1	7.6	8.0	7.6	7.5
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1600	1600	1900	1400	1000
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	9.6	4.8
Organic Matter	%	0.1	MCERTS	0.7	0.8	0.8	0.4	1.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.14	0.20	0.21	0.14	1.2
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.38
Fluoranthene	mg/kg	0.05	MCERTS	0.23	0.46	0.46	0.25	3.4
Pyrene	mg/kg	0.05	MCERTS	0.21	0.41	0.41	0.19	3.1
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	0.23	0.23	0.12	2.0
Chrysene	mg/kg	0.05	MCERTS	< 0.05	0.19	0.21	0.12	1.6
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.22	0.23	< 0.05	2.0
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	0.16	0.14	< 0.05	1.3
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.23	0.24	< 0.05	2.0
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.12	< 0.05	< 0.05	1.2
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.31
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	0.13	< 0.05	< 0.05	1.3
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	2.4	2.1	< 0.9	20
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	1.2	1.2	3.2	< 1.0	3.1
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	23	25	15	1.0	21
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	83	170	59	170
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.1	1.2	1.1	0.61	0.82
Boron (water soluble)	mg/kg	0.2	MCERTS	2.8	1.9	3.0	2.1	2.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.7
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	43	40	44	23	27
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	43	40	44	23	27
Copper (aqua regia extractable)	mg/kg	1	MCERTS	32	51	90	370	4000
Lead (aqua regia extractable)	mg/kg	1	MCERTS	42	78	80	43	260
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	0.7	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	37	38	39	15	26
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	71	72	71	31	36
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	84	97	110	130	630

Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825353	825354	825355	825356	825357
Sample Reference				WYBPM Cropping	WYBPM Cropping	WYBPM Cropping	RCBBS	RCBBS
Sample Number				ES2	ES5	ES9	ES2	ES6
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				27/09/2017	27/09/2017	27/09/2017	27/09/2017	27/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	37
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	10	10	43

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	2.1	< 2.0	< 2.0	3.3
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	18
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	12	< 10	< 10	76
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	19	10	10	97

VOCs

Trichloroethene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825358	825359			
Sample Reference				WYBPM Cropping	RCBBS			
Sample Number				ES2	ES2			
Depth (m)				None Supplied	None Supplied			
Date Sampled				27/09/2017	27/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	7.7	7.5			
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0			
Free Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1	< 1			
Sulphate as SO ₄	µg/l	100	ISO 17025	444000	181000			
Ammoniacal Nitrogen as N	µg/l	15	NONE	120	2500			
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	5.72	7.20			

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01			
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01			
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01			
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01			
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01			
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01			

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2			
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Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1			
Barium (dissolved)	µg/l	0.05	ISO 17025	25	32			
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2			
Boron (dissolved)	µg/l	10	ISO 17025	96	120			
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08			
Chromium (hexavalent)	µg/l	5	NONE	< 5.0	< 5.0			
Chromium (III)	µg/l	1	NONE	5.7	< 1.0			
Chromium (dissolved)	µg/l	0.4	ISO 17025	5.7	< 0.4			
Copper (dissolved)	µg/l	0.7	ISO 17025	20	20			
Lead (dissolved)	µg/l	1	ISO 17025	2.1	< 1.0			
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5			
Nickel (dissolved)	µg/l	0.3	ISO 17025	1.2	0.9			
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0			
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7			
Zinc (dissolved)	µg/l	0.4	ISO 17025	11	9.7			
Calcium (dissolved)	mg/l	0.012	ISO 17025	110	58			



Analytical Report Number: 17-61856

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				825358	825359			
Sample Reference				WYBPM Cropping	RCBBS			
Sample Number				ES2	ES2			
Depth (m)				None Supplied	None Supplied			
Date Sampled				27/09/2017	27/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0			
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10			
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10			

VOCs

Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0			
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Analytical Report Number : 17-61856

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
825353	WYBPM Cropping	ES2	None Supplied	Brown clay and loam with gravel.
825354	WYBPM Cropping	ES5	None Supplied	Brown clay and loam with stones and vegetation.
825355	WYBPM Cropping	ES9	None Supplied	Brown clay and loam with stones.
825356	RCBBS	ES2	None Supplied	Brown clay and sand with stones.
825357	RCBBS	ES6	None Supplied	Brown clay with stones.

Analytical Report Number : 17-61856

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L023-PL	W	NONE
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS

Iss No 17-61856-1 Southall CG-28308

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

Page 7 of 8

Analytical Report Number : 17-61856

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	W	NONE
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

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

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

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

Stockpile 12

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Analytical Report Number : 17-63010

Project / Site name:	Southall Western Access	Samples received on:	06/10/2017
Your job number:	CG-28308	Samples instructed on:	09/10/2017
Your order number:	4586	Analysis completed by:	11/10/2017
Report Issue Number:	1	Report issued on:	11/10/2017
Samples Analysed:	4 soil samples		


Signed: _____

Vineetha Meethale Vettil
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-63010

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				831644	831645	831646	831647
Sample Reference				WGUCPA1	WGUCPA2	WGUCPA3	WGUCPA4
Sample Number				SP12	SP12	SP12	SP12
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/10/2017	06/10/2017	06/10/2017	06/10/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status				
Stone Content	%	0.1	NONE	< 0.1	< 0.1	19	< 0.1
Moisture Content	%	N/A	NONE	26	30	16	19
Total mass of sample received	kg	0.001	NONE	1.8	1.8	1.8	2.0

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.8	6.9	9.2	9.7
Total Cyanide	mg/kg	1	MCERTS	26	13	3	3
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5
Total Sulphate as SO ₄	mg/kg	50	MCERTS	1400	1400	4300	5500
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	22	30	2.0	5.6
Ammonia as NH ₃	mg/kg	0.5	MCERTS	27	36	2.4	6.9
Organic Matter	%	0.1	MCERTS	8.1	9.7	3.5	4.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.7	1.7	0.52	0.47
Acenaphthylene	mg/kg	0.05	MCERTS	2.0	2.6	0.65	0.59
Acenaphthene	mg/kg	0.05	MCERTS	1.2	1.3	0.39	0.40
Fluorene	mg/kg	0.05	MCERTS	1.5	1.6	0.42	0.45
Phenanthrene	mg/kg	0.05	MCERTS	13	14	3.4	3.6
Anthracene	mg/kg	0.05	MCERTS	3.1	3.6	0.93	1.0
Fluoranthene	mg/kg	0.05	MCERTS	28	33	8.6	8.5
Pyrene	mg/kg	0.05	MCERTS	25	29	7.5	7.5
Benzo(a)anthracene	mg/kg	0.05	MCERTS	17	20	5.2	6.0
Chrysene	mg/kg	0.05	MCERTS	15	17	4.5	4.2
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	23	29	8.1	7.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	9.0	9.5	2.4	3.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	19	22	6.0	5.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	15	18	5.1	5.0
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	2.5	3.0	0.91	0.85
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	13	15	4.3	4.4
Coronene	mg/kg	0.05	NONE	13	14	4.3	4.0

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	200	230	63	63
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	11	13	11	13
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	39	46	37	36
Barium (aqua regia extractable)	mg/kg	1	MCERTS	430	510	310	900
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	1.7	2.0	1.2	1.3
Boron (water soluble)	mg/kg	0.2	MCERTS	11	12	2.1	5.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	41	48	9.7	8.6
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	230	260	82	93
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	230	260	83	93
Copper (aqua regia extractable)	mg/kg	1	MCERTS	710	800	310	440
Lead (aqua regia extractable)	mg/kg	1	MCERTS	530	600	350	450
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	2.1	2.1	0.9	1.0
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	93	110	55	68
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	65	74	52	50
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	910	1200	660	740

Analytical Report Number: 17-63010

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				831644	831645	831646	831647	
Sample Reference				WGUCPA1	WGUCPA2	WGUCPA3	WGUCPA4	
Sample Number				SP12	SP12	SP12	SP12	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				06/10/2017	06/10/2017	06/10/2017	06/10/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	6.0	14	5.4	12	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	62	110	43	56	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	410	750	240	290	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	480	880	280	360	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.8	1.9	1.8	2.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	20	23	15	18	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	170	210	80	76	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	830	890	390	440	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	1000	1100	480	540	



Analytical Report Number : 17-63010

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
831644	WGUCPA1	SP12	None Supplied	Brown clay and loam.
831645	WGUCPA2	SP12	None Supplied	Brown clay and loam.
831646	WGUCPA3	SP12	None Supplied	Brown clay and loam with stones and brick.
831647	WGUCPA4	SP12	None Supplied	Brown clay and loam with gravel and vegetation.

Analytical Report Number : 17-63010

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests ^{***}	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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Analytical Report Number : 17-63010

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

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Analytical Report Number : 17-63012

Project / Site name:	Southall Western Access	Samples received on:	06/10/2017
Your job number:	CG-28308	Samples instructed on:	09/10/2017
Your order number:	4586	Analysis completed by:	13/10/2017
Report Issue Number:	1	Report issued on:	13/10/2017
Samples Analysed:	1 WAC 10:1 Sample		

Signed: _____

Vineetha Meethale Vettil
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Waste Acceptance Criteria Analytical Results							
Report No:	17-63012						
					Client: CARDGEO		
Location	Southall Western Access						
Lab Reference (Sample Number)	831692 / 831693				Landfill Waste Acceptance Criteria		
Sampling Date	06/10/2017				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID	WGUCPA1						
Depth (m)							
Solid Waste Analysis							
TOC (%)**	5.7				3%	5%	6%
Loss on Ignition (%) **	16.6				--	--	10%
BTEX (µg/kg) **	< 10				6000	--	--
Sum of PCBs (mg/kg) **	< 0.007				1	--	--
Mineral Oil (mg/kg)	1700				500	--	--
Total PAH (WAC-17) (mg/kg)	180				100	--	--
pH (units)**	7.5				--	>6	--
Acid Neutralisation Capacity (mol / kg)	6.3				--	To be evaluated	To be evaluated
Eluate Analysis					Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1			10:01	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
	mg/l			mg/kg			
Arsenic *	0.0166			0.105	0.5	2	25
Barium *	0.107			0.678	20	100	300
Cadmium *	0.0010			0.0064	0.04	1	5
Chromium *	0.0061			0.039	0.5	10	70
Copper *	0.022			0.14	2	50	100
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *	0.0531			0.336	0.5	10	30
Nickel *	0.013			0.083	0.4	10	40
Lead *	0.015			0.098	0.5	10	50
Antimony *	0.034			0.21	0.06	0.7	5
Selenium *	< 0.0040			< 0.040	0.1	0.5	7
Zinc *	0.042			0.26	4	50	200
Chloride *	12			76	800	4000	25000
Fluoride	0.66			4.2	10	150	500
Sulphate *	30			190	1000	20000	50000
TDS	190			1200	4000	60000	100000
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-
DOC	30.2			191	500	800	1000
Leach Test Information							
Stone Content (%)	< 0.1						
Sample Mass (kg)	1.8						
Dry Matter (%)	74						
Moisture (%)	26						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.					*= UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation					** = MCERTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



Analytical Report Number : 17-63012

Project / Site name: Southall Western Access

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
831692	WGUCPA1	None Supplied	None Supplied	Brown clay and loam.

Analytical Report Number : 17-63012

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-UK	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L033B-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L009-PL	D	MCERTS



Analytical Report Number : 17-63012

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

**Chris Gordon**

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Analytical Report Number : 17-65049

Project / Site name:	Southall	Samples received on:	25/10/2017
Your job number:	CG-28308	Samples instructed on:	25/10/2017
Your order number:	4586	Analysis completed by:	01/11/2017
Report Issue Number:	1	Report issued on:	01/11/2017
Samples Analysed:	2 soil samples		

Signed: _____

Vineetha Meethale Vettil
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-65049

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				842921	842922			
Sample Reference				Stockpile 12	Stockpile 13			
Sample Number				ES1	ES1			
Depth (m)				None Supplied	None Supplied			
Date Sampled				23/10/2017	23/10/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	17
Moisture Content				%	N/A	NONE	20	14
Total mass of sample received				kg	0.001	NONE	1.4	1.2

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5			
Ammonia as NH ₃	mg/kg	0.5	MCERTS	52	0.6			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.76	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.3	1.1			

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	3.7	0.4			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	51	160			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	230	46			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1	< 0.3			

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
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Analytical Report Number : 17-65049

Project / Site name: Southall

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
842921	Stockpile 12	ES1	None Supplied	Brown clay with gravel and rubble.
842922	Stockpile 13	ES1	None Supplied	Light brown clay with gravel and stones.

Analytical Report Number : 17-65049

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpile 13

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Analytical Report Number : 17-65049

Project / Site name:	Southall	Samples received on:	25/10/2017
Your job number:	CG-28308	Samples instructed on:	25/10/2017
Your order number:	4586	Analysis completed by:	01/11/2017
Report Issue Number:	1	Report issued on:	01/11/2017
Samples Analysed:	2 soil samples		

Signed: _____

Vineetha Meethale Vettil
Senior Account Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-65049

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				842921	842922			
Sample Reference				Stockpile 12	Stockpile 13			
Sample Number				ES1	ES1			
Depth (m)				None Supplied	None Supplied			
Date Sampled				23/10/2017	23/10/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		
Stone Content				%	0.1	NONE	< 0.1	17
Moisture Content				%	N/A	NONE	20	14
Total mass of sample received				kg	0.001	NONE	1.4	1.2

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5			
Ammonia as NH ₃	mg/kg	0.5	MCERTS	52	0.6			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.76	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.3	1.1			

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	3.7	0.4			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	51	160			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	230	46			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.1	< 0.3			

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
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Analytical Report Number : 17-65049

Project / Site name: Southall

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Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
842921	Stockpile 12	ES1	None Supplied	Brown clay with gravel and rubble.
842922	Stockpile 13	ES1	None Supplied	Light brown clay with gravel and stones.

Analytical Report Number : 17-65049

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpile 16

**Chris Gordon**

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Analytical Report Number : 17-64726

Project / Site name:	Southall	Samples received on:	20/10/2017
Your job number:	CG-28308	Samples instructed on:	20/10/2017
Your order number:	4586	Analysis completed by:	30/10/2017
Report Issue Number:	1	Report issued on:	30/10/2017
Samples Analysed:	2 soil samples		

Signed: 

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-64726

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				841158	841159			
Sample Reference				YBBA 1	YBBA 2			
Sample Number				Granular	Cohesive			
Depth (m)				None Supplied	None Supplied			
Date Sampled				19/10/2017	19/10/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	18	< 0.1			
Moisture Content	%	N/A	NONE	3.9	26			
Total mass of sample received	kg	0.001	NONE	1.5	1.5			

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5			
Ammonia as NH ₃	mg/kg	0.5	MCERTS	4.6	14			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2			
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	9.4	26			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			

Monoaromatics

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0			
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Analytical Report Number : 17-64726

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
841158	YBBA 1	Granular	None Supplied	Grey clay and sand with gravel and stones.
841159	YBBA 2	Cohesive	None Supplied	Brown clay.

Analytical Report Number : 17-64726

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphénylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Stockpile 17



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Analytical Report Number : 19-47039

Project / Site name:	Southall	Samples received on:	19/06/2019
Your job number:	CG-28308	Samples instructed on:	25/06/2019
Your order number:	2917	Analysis completed by:	04/07/2019
Report Issue Number:	1	Report issued on:	04/07/2019
Samples Analysed:	16 soil samples		

Signed: 

Katarzyna Lewicka
Head of Reporting Section
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

Analytical Report Number: 19-47039

Project / Site name: Southall

Your Order No: 2917

Lab Sample Number	1252905	1252906	1252907	1252908	1252909
Sample Reference	SP17B	SP17B	SP17B	SP17C	SP17A
Sample Number	1	2	3	1	1
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	0.20
Date Sampled	18/06/2019	18/06/2019	18/06/2019	18/06/2019	18/06/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	-	-
Moisture Content	%	N/A	NONE	-	-
Total mass of sample received	kg	0.001	NONE	-	-

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	Chrysotile	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	0.001	0.001	0.004	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	0.001	0.001	0.004	< 0.001

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	-	-	-	-	-
Ammonia as NH ₃	mg/kg	0.5	MCERTS	-	-	-	-	-

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	-	-	-	-
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	-	-	-	-
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	-	-	-	-

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	-	-	-	-
Chromium (hexavalent)	mg/kg	4	MCERTS	-	-	-	-	-
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	-	-	-	-
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	-	-	-	-

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-	-	-	-	-
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Analytical Report Number: 19-47039

Project / Site name: Southall

Your Order No: 2917

Lab Sample Number	1252910	1252911	1252912	1252913	1252914
Sample Reference	SP17A	PLTP2	PLTP2	PLTP1	PLTP1
Sample Number	2	1	2	1	2
Depth (m)	2.00	0.10	0.30	0.10	0.30
Date Sampled	18/06/2019	18/06/2019	18/06/2019	18/06/2019	18/06/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	-	< 0.1
Moisture Content	%	N/A	NONE	-	17
Total mass of sample received	kg	0.001	NONE	-	1.1

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	Chrysotile	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	0.001	< 0.001	< 0.001	< 0.001	< 0.001

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	-	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia as NH ₃	mg/kg	0.5	MCERTS	-	< 0.5	< 0.5	< 0.5	< 0.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	-	0.67	< 0.05	0.37	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	-	6.6	4.6	4.5	6.7

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	-	3.7	1.6	6.7	3.8
Chromium (hexavalent)	mg/kg	4	MCERTS	-	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	-	270	160	320	390
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	-	1.7	0.9	2.2	1.2

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	-	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 19-47039

Project / Site name: Southall

Your Order No: 2917

Lab Sample Number	1252915	1252916	1252917	1252918	1252919
Sample Reference	PLTP3	PLTP3	EYBN	EYBN	EYBS
Sample Number	1	2	1	2	1
Depth (m)	0.10	0.30	0.10	0.10	0.10
Date Sampled	18/06/2019	18/06/2019	18/06/2019	18/06/2019	18/06/2019
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	18	11
Total mass of sample received	kg	0.001	NONE	1.2	1.1

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile	Chrysotile	Chrysotile	Chrysotile	Chrysotile
Asbestos in Soil	Type	N/A	ISO 17025	Detected	Detected	Detected	Detected	Detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001

General Inorganics

Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	0.7	< 0.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.35	0.28	0.28	0.23	0.42
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.9	4.0	4.4	3.1	4.2

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	3.9	3.4	2.1	2.1	8.0
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	250	280	220	270	270
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.7	1.3	1.5	1.9	1.8

Monoaromatics & Oxygenates

Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 19-47039

Project / Site name: Southall

Your Order No: 2917

Lab Sample Number				1252920				
Sample Reference				WYBS				
Sample Number				1				
Depth (m)				0.10				
Date Sampled				18/06/2019				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	18				
Total mass of sample received	kg	0.001	NONE	1.2				
Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile				
Asbestos in Soil	Type	N/A	ISO 17025	Detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	< 0.001				
Asbestos Quantification Total	%	0.001	ISO 17025	< 0.001				
General Inorganics								
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5				
Ammonia as NH ₃	mg/kg	0.5	MCERTS	< 0.5				
Total Phenols								
Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
Speciated PAHs								
Naphthalene	mg/kg	0.05	MCERTS	0.30				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	2.4				
Heavy Metals / Metalloids								
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.0				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	240				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	1.7				
Monoaromatics & Oxygenates								
Benzene	µg/kg	1	MCERTS	< 1.0				



Analytical Report Number: **19-47039**
Project / Site name: **Southall**
Your Order No: **2917**

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
1252905	SP17B		139	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252906	SP17B		120	Loose Fibres	Chrysotile	0.001	0.001
1252907	SP17B		127	Loose Fibres	Chrysotile	0.001	0.001
1252908	SP17C		113	Loose Fibrous Debris	Chrysotile	0.004	0.004
1252909	SP17A	0.20	126	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252910	SP17A	2.00	122	Loose Fibres	Chrysotile	0.001	0.001
1252911	PLTP2	0.10	124	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252912	PLTP2	0.30	138	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252913	PLTP1	0.10	125	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252914	PLTP1	0.30	160	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252915	PLTP3	0.10	128	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252916	PLTP3	0.30	160	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252917	EYBN	0.10	119	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252918	EYBN	0.10	136	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252919	EYBS	0.10	138	Loose Fibres	Chrysotile	< 0.001	< 0.001
1252920	WYBS	0.10	142	Loose Fibres	Chrysotile	< 0.001	< 0.001



Analytical Report Number: 19-47039
Project / Site name: Southall
Your Order No: 2917

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
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Opinions and interpretations expressed herein are outside the scope of UKAS accreditation.

Analytical Report Number : 19-47039

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1252905	SP17B	1	None Supplied	-
1252906	SP17B	2	None Supplied	-
1252907	SP17B	3	None Supplied	-
1252908	SP17C	1	None Supplied	-
1252909	SP17A	1	0.20	-
1252910	SP17A	2	2.00	-
1252911	PLTP2	1	0.10	Brown loam and clay with gravel and vegetation.
1252912	PLTP2	2	0.30	Brown loam and clay with gravel and vegetation.
1252913	PLTP1	1	0.10	Brown loam and clay with gravel and vegetation.
1252914	PLTP1	2	0.30	Brown loam and clay with gravel and vegetation.
1252915	PLTP3	1	0.10	Brown loam and clay with gravel and vegetation.
1252916	PLTP3	2	0.30	Brown loam and clay with gravel and vegetation.
1252917	EYBN	1	0.10	Brown loam and clay with gravel and vegetation.
1252918	EYBN	2	0.10	Brown loam and clay with gravel and vegetation.
1252919	EYBS	1	0.10	Brown loam and clay with gravel and vegetation.
1252920	WYBS	1	0.10	Brown loam and clay with gravel and vegetation.

Analytical Report Number : 19-47039

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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



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Analytical Report Number : 19-47040

Project / Site name:	Southall	Samples received on:	19/06/2019
Your job number:	CG-28308	Samples instructed on:	25/06/2019
Your order number:	2917	Analysis completed by:	04/07/2019
Report Issue Number:	1	Report issued on:	04/07/2019
Samples Analysed:	6 WAC 10:1 SAMPLES		

Signed: 

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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

Any assessments of compliance with specifications are based on actual analytical results with no contribution from uncertainty of measurement. Application of uncertainty of measurement would provide a range within which the true result lies. An estimate of measurement uncertainty can be provided on request.

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Waste Acceptance Criteria Analytical Results								
Report No:	19-47040							
					Client: CARDGEO			
Location	Southall							
Lab Reference (Sample Number)	1252921 / 1252922				Landfill Waste Acceptance Criteria			
Sampling Date	18/06/2019				Limits			
Sample ID	SP17B 1				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)								
Solid Waste Analysis								
TOC (%)**	3.1				3%	5%	6%	
Loss on Ignition (%) **	6.1				--	--	10%	
BTEX (µg/kg) **	< 10				6000	--	--	
Sum of PCBs (mg/kg) **	0.059				1	--	--	
Mineral Oil (mg/kg)	2000				500	--	--	
Total PAH (WAC-17) (mg/kg)	120				100	--	--	
pH (units)**	7.7				--	>6	--	
Acid Neutralisation Capacity (mol / kg)	14				--	To be evaluated	To be evaluated	
Eluate Analysis								
	10:1			10:1	Limit values for compliance leaching test			
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.0141			0.128	0.5	2	25	
Barium *	0.0295			0.269	20	100	300	
Cadmium *	< 0.0001			< 0.0008	0.04	1	5	
Chromium *	0.0020			0.018	0.5	10	70	
Copper *	0.029			0.26	2	50	100	
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2	
Molybdenum *	0.0263			0.239	0.5	10	30	
Nickel *	0.0075			0.068	0.4	10	40	
Lead *	0.0034			0.031	0.5	10	50	
Antimony *	0.040			0.36	0.06	0.7	5	
Selenium *	< 0.0040			< 0.040	0.1	0.5	7	
Zinc *	0.0030			0.027	4	50	200	
Chloride *	13			110	800	4000	25000	
Fluoride	1.0			9.5	10	150	500	
Sulphate *	240			2200	1000	20000	50000	
TDS*	330			3000	4000	60000	100000	
Phenol Index (Monohydric Phenols) *	< 0.010			< 0.10	1	-	-	
DOC	21.6			197	500	800	1000	
Leach Test Information								
Stone Content (%)	< 0.1							
Sample Mass (kg)	1.2							
Dry Matter (%)	77							
Moisture (%)	23							
Results are expressed on a dry weight basis, after correction for moisture content where applicable.								
					* = UKAS accredited (liquid eluate analysis only)			
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation								
** = MCERTS accredited								

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.



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Waste Acceptance Criteria Analytical Results								
Report No:	19-47040							
					Client: CARDGEO			
Location	Southall							
Lab Reference (Sample Number)	1252927 / 1252928				Landfill Waste Acceptance Criteria			
Sampling Date	18/06/2019				Limits			
Sample ID	SP17C 1				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill	
Depth (m)								
Solid Waste Analysis								
TOC (%)**	2.8				3%	5%	6%	
Loss on Ignition (%) **	5.5				--	--	10%	
BTEX (µg/kg) **	< 10				6000	--	--	
Sum of PCBs (mg/kg) **	0.055				1	--	--	
Mineral Oil (mg/kg)	890				500	--	--	
Total PAH (WAC-17) (mg/kg)	49				100	--	--	
pH (units)**	7.3				--	>6	--	
Acid Neutralisation Capacity (mol / kg)	4.4				--	To be evaluated	To be evaluated	
Eluate Analysis								
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)	10:1			10:1	Limit values for compliance leaching test			
	mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)			
Arsenic *	0.0055			0.0479	0.5	2	25	
Barium *	0.0433			0.375	20	100	300	
Cadmium *	< 0.0001			< 0.0008	0.04	1	5	
Chromium *	0.0041			0.036	0.5	10	70	
Copper *	0.024			0.21	2	50	100	
Mercury *	< 0.0005			< 0.0050	0.01	0.2	2	
Molybdenum *	0.0109			0.0947	0.5	10	30	
Nickel *	0.0041			0.036	0.4	10	40	
Lead *	< 0.0010			< 0.010	0.5	10	50	
Antimony *	0.014			0.12	0.06	0.7	5	
Selenium *	< 0.0040			< 0.040	0.1	0.5	7	
Zinc *	0.0070			0.060	4	50	200	
Chloride *	20			170	800	4000	25000	
Fluoride	0.69			6.0	10	150	500	
Sulphate *	480			4200	1000	20000	50000	
TDS*	500			4300	4000	60000	100000	
Phenol Index (Monhydric Phenols) *	< 0.010			< 0.10	1	-	-	
DOC	15.8			137	500	800	1000	
Leach Test Information								
Stone Content (%)	< 0.1							
Sample Mass (kg)	0.95							
Dry Matter (%)	81							
Moisture (%)	19							
Results are expressed on a dry weight basis, after correction for moisture content where applicable.								
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation								
Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.								
This analysis is only applicable for landfill acceptance criteria (The Environmental Permitting (England and Wales) Regulations) and does not give any indication as to whether a waste may be hazardous or non-hazardous.								

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Waste Acceptance Criteria Analytical Results								
Report No:		19-47040						
						Client: CARDGEO		
Location		Southall						
Lab Reference (Sample Number)		1252929 / 1252930				Landfill Waste Acceptance Criteria		
Sampling Date		18/06/2019				Inert Waste Landfill	Stable Non-reactive HAZARDOUS waste in non-hazardous Landfill	Hazardous Waste Landfill
Sample ID		SP17A 1						
Depth (m)		0.20						
Solid Waste Analysis								
TOC (%)**		2.2				3%	5%	6%
Loss on Ignition (%) **		4.3				--	--	10%
BTEX (µg/kg) **		< 10				6000	--	--
Sum of PCBs (mg/kg) **		< 0.007				1	--	--
Mineral Oil (mg/kg)		460				500	--	--
Total PAH (WAC-17) (mg/kg)		66				100	--	--
pH (units)**		7.9				--	>6	--
Acid Neutralisation Capacity (mol / kg)		6.6				--	To be evaluated	To be evaluated
Eluate Analysis		10:1			10:1	Limit values for compliance leaching test		
(BS EN 12457 - 2 preparation utilising end over end leaching procedure)		mg/l			mg/kg	using BS EN 12457-2 at L/S 10 l/kg (mg/kg)		
Arsenic *		0.0075			0.0680	0.5	2	25
Barium *		0.0325			0.297	20	100	300
Cadmium *		< 0.0001			< 0.0008	0.04	1	5
Chromium *		0.0019			0.018	0.5	10	70
Copper *		0.029			0.26	2	50	100
Mercury *		< 0.0005			< 0.0050	0.01	0.2	2
Molybdenum *		0.0186			0.170	0.5	10	30
Nickel *		0.0040			0.037	0.4	10	40
Lead *		0.0025			0.023	0.5	10	50
Antimony *		0.015			0.14	0.06	0.7	5
Selenium *		< 0.0040			< 0.040	0.1	0.5	7
Zinc *		0.0027			0.025	4	50	200
Chloride *		13			120	800	4000	25000
Fluoride		0.73			6.7	10	150	500
Sulphate *		190			1700	1000	20000	50000
TDS*		270			2500	4000	60000	100000
Phenol Index (Monhydric Phenols) *		< 0.010			< 0.10	1	-	-
DOC		13.8			126	500	800	1000
Leach Test Information								
Stone Content (%)		< 0.1						
Sample Mass (kg)		1.3						
Dry Matter (%)		83						
Moisture (%)		17						
Results are expressed on a dry weight basis, after correction for moisture content where applicable.						** = UKAS accredited (liquid eluate analysis only)		
Stated limits are for guidance only and i2 cannot be held responsible for any discrepancies with current legislation						** = MCFRTS accredited		

Landfill WAC analysis (specifically leaching test results) must not be used for hazardous waste classification purposes as defined by the Waste (England and Wales) Regulations 2011 (as amended) and EA Guidance WM3.

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Analytical Report Number : 19-47040

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
1252921	SP17B	1	None Supplied	Grey clay and sand with gravel and brick.
1252923	SP17B	2	None Supplied	Brown clay and sand with gravel.
1252925	SP17B	3	None Supplied	Brown clay and sand with gravel.
1252927	SP17C	1	None Supplied	Brown clay and sand with gravel.
1252929	SP17A	1	0.20	Brown clay and sand with gravel and brick.
1252931	SP17A	2	2.00	Brown clay and sand with gravel and vegetation.

Analytical Report Number : 19-47040

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Acid neutralisation capacity of soil	Determination of acid neutralisation capacity by addition of acid or alkali followed by electronic probe.	In-house method based on Guidance on Sampling and Testing of Wastes to Meet Landfill Waste Acceptance"	L046-PL	W	NONE
BS EN 12457-2 (10:1) Leachate Prep	10:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-2.	L043-PL	W	NONE
BTEX in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L0738-PL	W	MCERTS
Chloride 10:1 WAC	Determination of Chloride colorimetrically by discrete analyser.	In house based on MEWAM Method ISBN 0117516260.	L082-PL	W	ISO 17025
Dissolved organic carbon 10:1 WAC	Determination of dissolved inorganic carbon in leachate by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Fluoride 10:1 WAC	Determination of fluoride in leachate by 1:1ratio with a buffer solution followed by Ion Selective Electrode.	In-house method based on Use of Total Ionic Strength Adjustment Buffer for Electrode Determination"	L0338-PL	W	ISO 17025
Loss on ignition of soil @ 450oC	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L047-PL	D	MCERTS
Metals in leachate by ICP-OES	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Mineral Oil (Soil) C10 - C40	Determination of mineral oil fraction extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method with silica gel split/clean up.	L076-PL	D	NONE
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols 10:1 WAC	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
PCB's By GC-MS in soil	Determination of PCB by extraction with acetone and hexane followed by GC-MS.	In-house method based on USEPA 8082	L027-PL	D	MCERTS
pH in soil	Determination of pH in soil by addition of water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270. MCERTS accredited except Coronene.	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate 10:1 WAC	Determination of sulphate in leachate by ICP-OES	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil"	L039-PL	W	ISO 17025
Total dissolved solids 10:1 WAC	Determination of total dissolved solids in water by electrometric measurement.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L004-PL	W	NONE

Iss No 19-47040-1 Southall CG-28308

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

Page 9 of 10

Analytical Report Number : 19-47040

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Total organic carbon (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests [™]	L009-PL	D	MCERTS

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

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

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

APPENDIX D

Imported Material Chemical Test Data

**Tom Fairweather**

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Analytical Report Number : 17-60426

Project / Site name:	Southall Western Access	Samples received on:	15/09/2017
Your job number:	CG-28308	Samples instructed on:	15/09/2017
Your order number:	4586	Analysis completed by:	21/09/2017
Report Issue Number:	1	Report issued on:	21/09/2017
Samples Analysed:	12 soil samples		

Signed: _____

Emma Winter
Assistant Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-60426

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number	817101	817102	817103	817104	817105
Sample Reference	PM1	PM1	PM3	PM3	Canal Mound
Sample Number	S5	S6	S1	S2	S3
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	5.9	8.1
Total mass of sample received	kg	0.001	NONE	2.0	2.0

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.5	11.0	11.4	11.3	11.2
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	11000	14000	12000	12000	11000
Organic Matter	%	0.1	MCERTS	0.9	1.4	1.1	2.1	1.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.36	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.10	0.12	0.16	0.31	0.16
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.36	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.69	0.83	0.94	3.1	1.1
Anthracene	mg/kg	0.05	MCERTS	0.19	0.28	< 0.05	0.82	0.26
Fluoranthene	mg/kg	0.05	MCERTS	1.5	2.1	1.7	6.8	2.2
Pyrene	mg/kg	0.05	MCERTS	1.3	2.0	1.5	6.2	2.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.54	0.78	0.81	3.3	0.97
Chrysene	mg/kg	0.05	MCERTS	0.55	0.99	1.0	2.4	1.0
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.62	1.0	1.2	4.0	1.3
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.39	0.73	0.63	1.8	0.69
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.65	1.1	0.97	3.3	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.28	0.44	0.47	1.3	0.47
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	0.13	0.38	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.30	0.53	0.57	1.6	0.59
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	7.0	11	10	36	12
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	8.4	8.9	17	15	12
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	8.8	9.4	15	12	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	140	170	200	210	190
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.49	0.58	0.35	0.54	0.42
Boron (water soluble)	mg/kg	0.2	MCERTS	3.3	3.8	1.4	3.9	3.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.0	1.7	1.8	1.7	1.6
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	24	28	42	37	34
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	24	29	42	38	35
Copper (aqua regia extractable)	mg/kg	1	MCERTS	110	180	290	220	180
Lead (aqua regia extractable)	mg/kg	1	MCERTS	56	120	240	190	86
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	17	19	20	47	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	2.2	< 1.0	2.9
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	28	35	28	34	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	280	450	390	620	410

Analytical Report Number: 17-60426

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number	817101	817102	817103	817104	817105
Sample Reference	PM1	PM1	PM3	PM3	Canal Mound
Sample Number	S5	S6	S1	S2	S3
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	07/09/2017	07/09/2017	07/09/2017	07/09/2017	07/09/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.4	< 1.0	< 1.0	< 1.0	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	12	2.4	4.9	3.2	4.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	18	16	14	9.3	20
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	80	150	89	92	130
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	110	160	110	100	160

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.5	< 1.0	1.3	2.8	3.3
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	9.2	2.9	4.4	12	12
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	22	28	13	53	31
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	97	200	68	280	150
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	130	230	87	340	200



Analytical Report Number: 17-60426

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number	817106	817107	817108	817109	817110
Sample Reference	Haul	Lagoon 1	Lagoon 1	Lagoon 2	Lagoon 2
Sample Number	S4	ES1	ES2	ES1	ES2
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	07/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	11	11
Total mass of sample received	kg	0.001	NONE	2.0	1.7

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-	Chrysotile	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-	< 0.001	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-	< 0.001	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.8	10.9	11.6	10.6	11.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	10000	17000	17000	16000	17000
Organic Matter	%	0.1	MCERTS	1.8	1.1	0.9	1.4	1.4

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.27	0.14	< 0.05	0.20	0.15
Acenaphthene	mg/kg	0.05	MCERTS	0.45	0.30	1.4	0.23	0.20
Fluorene	mg/kg	0.05	MCERTS	0.51	0.30	1.1	0.21	0.16
Phenanthrene	mg/kg	0.05	MCERTS	5.3	2.1	2.5	2.0	1.6
Anthracene	mg/kg	0.05	MCERTS	1.5	0.40	0.39	0.54	0.40
Fluoranthene	mg/kg	0.05	MCERTS	8.7	3.0	1.7	4.1	3.7
Pyrene	mg/kg	0.05	MCERTS	7.2	2.5	1.3	3.5	3.2
Benzo(a)anthracene	mg/kg	0.05	MCERTS	3.5	1.4	0.62	1.9	1.6
Chrysene	mg/kg	0.05	MCERTS	2.3	1.2	0.62	1.6	1.3
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	3.2	1.5	0.65	1.9	1.7
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.8	0.99	0.40	1.2	1.1
Benzo(a)pyrene	mg/kg	0.05	MCERTS	3.0	1.3	0.60	1.9	1.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.2	0.62	0.26	0.76	0.72
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.32	0.16	< 0.05	0.21	0.23
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.4	0.70	0.29	0.87	0.83
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	41	17	12	21	19
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	11	7.8	5.1	9.7	12
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.7	6.5	15	10	12
Barium (aqua regia extractable)	mg/kg	1	MCERTS	220	140	95	160	190
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.47	0.34	0.37	0.41	0.41
Boron (water soluble)	mg/kg	0.2	MCERTS	4.3	3.4	3.1	3.8	2.9
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.9	1.0	0.7	1.3	1.4
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	33	23	20	29	29
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	34	24	20	29	29
Copper (aqua regia extractable)	mg/kg	1	MCERTS	220	91	82	310	130
Lead (aqua regia extractable)	mg/kg	1	MCERTS	180	78	63	94	97
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	36	23	16	38	23
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	2.4	1.5	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	27	24	31	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	540	280	190	360	430

Analytical Report Number: 17-60426

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				817106	817107	817108	817109	817110
Sample Reference				Haul	Lagoon 1	Lagoon 1	Lagoon 2	Lagoon 2
Sample Number				S4	ES1	ES2	ES1	ES2
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				07/09/2017	08/09/2017	08/09/2017	08/09/2017	08/09/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	1.3
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	2.6	2.3	4.1	9.7
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	9.5	23	15	11	21
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	82	100	77	51	110
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	92	130	95	66	140
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.3	< 1.0	2.6	< 1.0	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	9.9	3.1	14	8.9	5.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	65	27	20	42	33
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	190	77	53	190	120
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	270	110	90	240	160



Analytical Report Number: 17-60426

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				817111	817112			
Sample Reference				EYBPM	EYBPM			
Sample Number				ES1	ES2			
Depth (m)				None Supplied	None Supplied			
Date Sampled				08/09/2017	08/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	9.1	7.5			
Total mass of sample received	kg	0.001	NONE	1.6	1.7			

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-			
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-			
Asbestos Quantification Total	%	0.001	ISO 17025	-	-			

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.3	10.8			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO ₄	mg/kg	50	MCERTS	12000	8500			
Organic Matter	%	0.1	MCERTS	1.6	1.6			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.66	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	0.63	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	0.68	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	0.73	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	6.8	0.90			
Anthracene	mg/kg	0.05	MCERTS	1.7	0.30			
Fluoranthene	mg/kg	0.05	MCERTS	13	2.0			
Pyrene	mg/kg	0.05	MCERTS	11	1.8			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	7.2	0.93			
Chrysene	mg/kg	0.05	MCERTS	4.0	0.83			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	5.7	0.94			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	4.0	0.75			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	5.8	1.0			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.7	0.43			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.58	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	3.0	0.49			
Coronene	mg/kg	0.05	NONE	1.6	< 0.05			

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	70	11			
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	15	10			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.4	6.6			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	200	180			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.39	0.30			
Boron (water soluble)	mg/kg	0.2	MCERTS	3.4	3.1			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.7	1.3			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2			
Chromium (III)	mg/kg	1	NONE	38	24			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	39	24			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	180	130			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	87	71			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	24	21			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	30	22			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	480	880			

Analytical Report Number: 17-60426

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				817111	817112			
Sample Reference				EYBPM	EYBPM			
Sample Number				ES1	ES2			
Depth (m)				None Supplied	None Supplied			
Date Sampled				08/09/2017	08/09/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0			
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0			
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0			
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0			
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0			

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	69	49			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	76	55			
TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.7	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	16	4.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	110	24			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	360	120			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	480	140			



Analytical Report Number: 17-60426
Project / Site name: Southall Western Access
Your Order No: 4586

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
817109	Lagoon 2		140	Loose Fibres	Chrysotile	< 0.001	< 0.001

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



Analytical Report Number : 17-60426

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
817101	PM1	S5	None Supplied	Brown sandy loam with gravel.
817102	PM1	S6	None Supplied	Brown sandy loam with gravel and brick.
817103	PM3	S1	None Supplied	Light brown rubble.**
817104	PM3	S2	None Supplied	Brown sandy loam with gravel and rubble.
817105	Canal Mound	S3	None Supplied	Brown sandy loam with gravel and rubble.
817106	Haul	S4	None Supplied	Brown clay and gravel with clinker
817107	Lagoon 1	ES1	None Supplied	Brown gravelly clay with glass.
817108	Lagoon 1	ES2	None Supplied	Brown gravelly sand with rubble.
817109	Lagoon 2	ES1	None Supplied	Brown gravelly sand with rubble.
817110	Lagoon 2	ES2	None Supplied	Brown gravelly sand with rubble.
817111	EYBPM	ES1	None Supplied	Brown gravelly sand with rubble.
817112	EYBPM	ES2	None Supplied	Brown gravelly sand with rubble.

**Non MCerts matrix

Analytical Report Number : 17-60426

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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

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

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Sample No.	D3625	2
Site Ref.	-	
Project Ref.	17 DAY 42	

CONSTITUENTS OF COARSE RECYCLED AGGREGATES
SHW710 – BS EN 933-11:2009

Client	Day Aggregates	Sampled By	AP
Scheme / Site	Day Aggregates August 2017 - Brentford		
Location	Sampled from stockpile at source		
Material Type	6F5 Capping	Date Sampled	02/08/2017
Material Spec.	SHW Class 6F5	Date Received	07/08/2017
Source	Day Aggregates, Brentford	Date Tested	16/08/2017

Test Results

Floating particles	FL	(Cm³/kg)	12.5
Concrete, concrete products, mortar, concrete masonry units	Rc	(%)	73
Unbound Aggregate, natural stone, hydraulically bound aggregate	Ru	(%)	12
Clay masonry units (brick & tiles), calcium silicate masonry units, aerated non-floating concrete	Rb	(%)	6.2
Bituminous material	Ra	(%)	3.7
Glass	Rg	(%)	2.0
Other materials Cohesive (clay & soils) Misc: Metals (ferrous & non-ferrous) Non-floating wood & plastics (Of Total sample prior to riffle & wash)	X	(%)	0.3

Drying temperature	(°C)	45.0
Retained 63mm	(%)	58.0
Passing 4mm	(%)	36.0

Remarks :

Client Name Day Aggregates
F.A.O. Mr L Reid
Transport Avenue
Great Western Road
Brentford
Middlesex
Postcode TW8 9HQ

Signed :

Date : 17/08/2017

Authorised Signatories

P Parker / M Bustin	Compliance Team Leaders	J Nicholls	Senior Technician
J Tanzilli	Laboratory Team Leader	J Durrant	Senior Technician

ACS TESTING LIMITED SUMMARY OF ANALYSIS for Job No.17-84134**Client :** DAY Group Limited**Site :** Recycled - Batch Testing SampleCertificate Address Day Group Limited
Transport Avenue
Brentford
Middlesex
TW8 9HFContact Mr. Leighton Reid
Contact Telephone No. :
Contact e-mail Leighton.Reid@DayGroup.co.uk

Sample No.	Material Source	Clients Reference	Sample Location	Date Sampled	Sampled By	Date Received	Material Description	Clients Specification	Test Ref	Test Name
344157	Brentford	DAT846	DNS	08/06/2017	LR	15/06/2017	0/50mm Recycled Aggregate (White)	DNS	U012_MI BAA	MIBAAA 2:1 & 8:1 Leachate Suite

Certificate of Analysis

Certificate Number : 17-07009-Issue 1-Page: 1

Report Fao: Martin Slater
Site Address: Recycled - Batch Testing Sample
Customer Order No: 17-84134
Date of Sampling: 08/06/2017
Date Received: 16/06/2017
Report Date: 30/06/2017

Please find your certificates of test attached for your samples received in the laboratory on 16/06/2017 under our laboratory reference 17-07009.

Remarks:

Z - A Minor Deviation from the Test Method was necessary but this is deemed to have no impact on the Test Results, the Legitimacy of the method validation or the Accreditation Status of the Test Method

Results reviewed by:



David Redfern Technical Supervisor

Results approved by:



Mark Rowley Laboratory Manager

*Any opinions or interpretations indicated are outside the scope of our UKAS accreditation.
This certificate should not be reproduced, except in full, without the express permission of the laboratory.
The results included within the report are representative of the samples submitted for analysis.
Excel copies of reports are valid only when accompanied by this PDF certificate.
Client's Sample Description / ACS Material Description are noted for reference only.*

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ACS Environmental Testing Limited
Registered in England and
Wales No. 6000065

**Quality Testing & Materials Consultancy
to the
Construction Industry**

ACSE Sample Number 29474
Sample ID 344157 - 17-84134
Clients Sample Ref. DAT845
Location / Sample Depth (m) DNS
Time Sampled
Date Sampled 08/06/2017
Sample Deviating Codes cdfg
Client's Sample Description 0/50mm Recycled Aggregate (White)
ACS Testing Material Description 0/50mm Recycled Aggregate (White)
Principal Matrix (as received) GRAVEL

TEST VALUES

Mass of Undried Test Portion (Mw)	183	g	Volume of Leachant Used (L2)	0.342	litres
Mass of Dried Test Portion (Mp)	175	g	Volume of Leachant Used (L8)	1.202	litres
Moisture Content Ratio (MC)	4.4	%	Volume of Eluate (VE1)	0.290	litres
Dry Matter Content (DR)	95.7	%	Volume of Eluate (VE2)	1.337	litres

SOLIDS ANALYSIS

Analyte	Method	AS	Sample Condition for Analysis	Results
Total Organic Carbon (%)	MT/ACSE/102	*d	As received	1.49
Loss on ignition (%)	MT/ACSE/302	*g	Air dried at 30°C	6.4
Mineral oil (C10 - C40) (mg/kg)	MT/ACSE/105	*cfg	As received	163
pH (units)	MT/ACSE/301	*dfg	Air dried at 30°C	7.1

ELUATE ANALYSIS

Analyte	Method	AS	Concentration in Eluate (mg/l)		Amount Leached (mg/kg)	
Eluate Preparation	LP/ACSE/102	*				
Liquid : Solid Ratio (L/S)	LP/ACSE/101	*	L/S 2	L/S 8	L/S 2	L/S 10
pH (units)	MT/ACSE/301	*	10.9	11.8		
Temperature (°C)	MT/ACSE/301		20	20		
Conductivity (mS/m)	MT/ACSE/303	*	522	112		
Ammoniacal Nitrogen	MT/ACSE/203		0.131	0.024	0.262	0.417
Antimony	MT/ACSE/205	*	< 0.003	0.014	< 0.006	0.098
Arsenic	MT/ACSE/205	*	< 0.003	< 0.003	< 0.006	< 0.030
Barium	MT/ACSE/205	*	0.305	0.123	0.610	1.53
Boron	MT/ACSE/205		< 0.200	< 0.200	< 0.400	< 2.00
Bromide	SC		7.00	0.790	14.0	18.2
Cadmium	MT/ACSE/205	*	< 0.0003	< 0.0003	< 0.0006	< 0.003
Chloride	MT/ACSE/204	*	1510	102	3020	3360
Chromium (total)	MT/ACSE/205	*	0.267	0.053	0.534	0.885
Cobalt	MT/ACSE/205		0.001	< 0.001	0.003	< 0.010
Copper	MT/ACSE/205	*Z	0.921	0.119	1.84	2.52
Fluoride	MT/ACSE/204	*	< 0.01	0.16	< 0.010	1.30
Lead	MT/ACSE/205	*	< 0.004	0.010	< 0.008	0.073
Mercury	MT/ACSE/202	*	< 0.0001	< 0.0001	< 0.0002	< 0.0010
Molybdenum	MT/ACSE/205	*	0.116	0.0134	0.232	0.304
Nickel	MT/ACSE/205	*	0.0324	0.0090	0.065	0.129
Selenium	MT/ACSE/205	*	0.182	0.176	0.363	1.57
Sulphate	MT/ACSE/204	*	679	150	1360	2208
Tin	MT/ACSE/205		0.017	0.019	0.035	0.184
Vanadium	MT/ACSE/205		0.013	0.013	0.026	0.129
Zinc	MT/ACSE/205	*	< 0.002	< 0.002	< 0.004	< 0.020
Total dissolved solids	MT/ACSE/304	*	3740	500	7470	9795
Dissolved organic carbon	MT/ACSE/103	*	96.1	11.2	192	253

Comments: (comments are beyond the scope of UKAS accreditation)

Eluates prepared in accordance with BS EN 12457-3:2002*

Technical Information for Analytical Results

Analysis

* - denotes analysis covered by our UKAS accreditation
- denotes analysis covered by our MCERTS certification
AD = Sample tested in air dried condition.
AR = Sample tested in as-received condition.
D = Sample tested in dry condition.
L = Laboratory prepared leachate
SC = sub contracted

Where results are less than the limit of detection, the value of 0 is used in calculations.

For Phenol index, m- and p- cresol are reported as mixed isomers, calibrated with reference to a p-cresol reference solution.

The individual concentrations of m- and p- cresol cannot be quantified using this method, however, the result reported for the mixed isomers will be an over estimation of the true result in samples where m-cresol is present.

Deviating Codes

Deviating Samples

The use of any of the following symbols indicates that the sample was deviating and it is possible therefore that the results provided may not be representative of the sample taken.

a – The date and/or time of sampling has not been provided, therefore it is not known if the time lapse between sampling and analysis has exceeded the acceptable holding time(s). It is possible that some deterioration may have compromised sample and/or analyte integrity, rendering the results non-representative of the original sample taken.

b – No sampling time given (waters only) unable to confirm if samples are within acceptable holding times.

c – This test item was received in a container which has not been recommended; it is possible that the sample and/or analyte integrity has not been maintained and that results may be non-representative of the sample when taken.

d – On receipt, the temperature of the sample received was found to fall outside the recommendations of BS ISO 18512:2007. Soil Quality. Guidance on long and short term storage of soil samples.

e – The sample was received in a container that had been filled incorrectly which may have compromised sample and/or analyte integrity, rendering the results non-representative of the original sample taken.

f – The delay between Sampling and Sample Receipt is greater than the recommended holding time for the analyte of interest in this matrix. It is possible that some deterioration may have compromised sample and/or analyte integrity, rendering the results non-representative of the original sample taken.

g – The delay between Sampling and Analysis is greater than the recommended holding time for the analyte of interest in this matrix. It is possible that some deterioration may have compromised sample and/or analyte integrity, rendering the results non-representative of the original sample taken.

The following Additional Deviating Sample Codes may also be used.

I/S – Insufficient sample mass/volume received for accurate quantification of this analyte.

U/S – The sample received was deemed unsuitable for accurate determination of this analyte using the Test Methods available.

Deviating Methods

Z – A minor deviation from the Test Method was necessary but this is deemed to have had no impact on the Test Result, the legitimacy of the method validation or the Accreditation Status of the Test Method.

Y – A significant deviation from the Test Method was necessary which is deemed to have had no impact on the Test Result, however, due to a lack of sufficient supporting validation, the Accreditation Status of the Method has been removed.

W – The normal LOD of the instrument/method could not be attained, thus an elevated LOD or LOQ has been applied to the Test Data, however, the data reported meets the requirements of the Client and does not affect compliance with the specification limit (where applicable).

V – One of the QA/QC parameters failed, however, the increased implied Uncertainty associated with the Test Result meets the requirements of the Client and does not affect compliance with the specification limit (where applicable) (Quality Manual, Section 18.2.9).

U – The precision acceptance criteria associated with the Test Method could not be met but the Test Result fulfils the Client's objectives and the elevated Uncertainty does not affect compliance with the specification limit (where applicable) (Quality Manual, Section 18.8.10).

T – The Test Method used was supplied by the Client and involved a simple modification of a Test Method for which ACSE holds accreditation (Quality Manual, Section 18.3.8).

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to the
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Analytical Report Number : 17-65606

Project / Site name:	Southall	Samples received on:	27/10/2017
Your job number:	CG-28308	Samples instructed on:	27/10/2017
Your order number:	4586	Analysis completed by:	01/11/2017
Report Issue Number:	1	Report issued on:	01/11/2017
Samples Analysed:	1 soil sample		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-65606

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				845967				
Sample Reference				6N				
Sample Number				ES1				
Depth (m)				None Supplied				
Date Sampled				26/10/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	1.4				

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	Chrysotile				
Asbestos in Soil	Type	N/A	ISO 17025	Detected				
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	0.002				
Asbestos Quantification Total	%	0.001	ISO 17025	0.002				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.5				
Total Cyanide	mg/kg	1	MCERTS	< 1				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	31000				
Organic Matter	%	0.1	MCERTS	1.3				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05				
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05				
Fluorene	mg/kg	0.05	MCERTS	< 0.05				
Phenanthrene	mg/kg	0.05	MCERTS	1.1				
Anthracene	mg/kg	0.05	MCERTS	< 0.05				
Fluoranthene	mg/kg	0.05	MCERTS	1.4				
Pyrene	mg/kg	0.05	MCERTS	0.95				
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.29				
Chrysene	mg/kg	0.05	MCERTS	0.29				
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.39				
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.11				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.27				
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.15				
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.19				
Coronene	mg/kg	0.05	NONE	< 0.05				

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	5.1				
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	97				
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13				
Barium (aqua regia extractable)	mg/kg	1	MCERTS	190				
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.44				
Boron (water soluble)	mg/kg	0.2	MCERTS	5.7				
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	18				
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2				
Chromium (III)	mg/kg	1	NONE	120				
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	120				
Copper (aqua regia extractable)	mg/kg	1	MCERTS	2200				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	590				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3				
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	110				
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0				
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	26				
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	7200				

Analytical Report Number: 17-65606

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				845967				
Sample Reference				6N				
Sample Number				ES1				
Depth (m)				None Supplied				
Date Sampled				26/10/2017				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0				
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	16				
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	20				

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001				
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0				
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0				
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	14				
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	16				
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	31				



Analytical Report Number: 17-65606
Project / Site name: Southall
Your Order No: 4586

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
845967	6N		117	Loose Fibres	Chrysotile	0.002	0.002

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



Analytical Report Number : 17-65606

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
845967	6N	ES1	None Supplied	Brown loam with gravel.

Analytical Report Number : 17-65606

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in ouse method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests ^{***}	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

Iss No 17-65606-1 Southall CG-28308

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

Page 6 of 7



Analytical Report Number : 17-65606

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
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For method numbers ending in 'UK' analysis have been carried out in our laboratory in the United Kingdom.

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

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

**Chris Gordon**

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Analytical Report Number : 17-66340

Project / Site name:	Southall	Samples received on:	02/11/2017
Your job number:	CG-28308	Samples instructed on:	02/11/2017
Your order number:	4586	Analysis completed by:	07/11/2017
Report Issue Number:	1	Report issued on:	07/11/2017
Samples Analysed:	2 soil samples		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-66340

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				850099	850100			
Sample Reference				EGUC-6N	EGUC-6N			
Sample Number				ES7	ES8			
Depth (m)				None Supplied	None Supplied			
Date Sampled				01/11/2017	01/11/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1			
Moisture Content	%	N/A	NONE	17	12			
Total mass of sample received	kg	0.001	NONE	2.0	2.0			

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected			
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.3	10.1			
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1			
Total Sulphate as SO ₄	mg/kg	50	MCERTS	25000	33000			
Organic Matter	%	0.1	MCERTS	1.2	1.2			

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0			
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05			
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05			

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	< 0.9			
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	100	130			
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	12	11			
Barium (aqua regia extractable)	mg/kg	1	MCERTS	120	110			
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.30	0.31			
Boron (water soluble)	mg/kg	0.2	MCERTS	3.5	9.2			
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	17	17			
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2			
Chromium (III)	mg/kg	1	NONE	140	130			
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	140	130			
Copper (aqua regia extractable)	mg/kg	1	MCERTS	2900	3200			
Lead (aqua regia extractable)	mg/kg	1	MCERTS	430	700			
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3			
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	150	70			
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0			
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	24			
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	6100	7300			

Analytical Report Number: 17-66340

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				850099	850100			
Sample Reference				EGUC-6N	EGUC-6N			
Sample Number				ES7	ES8			
Depth (m)				None Supplied	None Supplied			
Date Sampled				01/11/2017	01/11/2017			
Time Taken				None Supplied	None Supplied			
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0			
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001			
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0			
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0			
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10			
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10			



Analytical Report Number : 17-66340

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
850099	EGUC-6N	ES7	None Supplied	Brown clay and loam with gravel.
850100	EGUC-6N	ES8	None Supplied	Grey gravelly clay.

Analytical Report Number : 17-66340

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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

Iss No 17-66340-1 Southall CG-28308

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

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Analytical Report Number : 17-68217

Project / Site name:	Southall	Samples received on:	02/11/2017
Your job number:	CG-28308	Samples instructed on:	21/11/2017
Your order number:	4586	Analysis completed by:	24/11/2017
Report Issue Number:	1	Report issued on:	24/11/2017
Samples Analysed:	3 leachate samples		

Signed:

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

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-68217

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number	861303	861304	861305		
Sample Reference	EGUC-6N	EGUC-6N	6N		
Sample Number	ES7	ES8	ES1		
Depth (m)	None Supplied	None Supplied	None Supplied		
Date Sampled	01/11/2017	01/11/2017	26/10/2017		
Time Taken	None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	11.0	10.5	11.4		
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10		
Sulphate as SO ₄	µg/l	100	ISO 17025	193000	562000	188000		
Ammoniacal Nitrogen as N	µg/l	15	NONE	700	1200	1800		
Ammonium as NH ₄	µg/l	15	NONE	890	1500	2300		
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	43.6	95.2	126		

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	16	22	42		
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01		

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2		
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Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	15	11	15		
Arsenic (dissolved)	µg/l	1.1	ISO 17025	2.0	< 1.1	1.3		
Barium (dissolved)	µg/l	0.05	ISO 17025	330	160	330		
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2		
Boron (dissolved)	µg/l	10	ISO 17025	31	< 10	18		
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08		
Chromium (hexavalent)	µg/l	5	NONE	12	240	43		
Chromium (III)	µg/l	1	NONE	12	< 1.0	8.3		
Chromium (dissolved)	µg/l	0.4	ISO 17025	24	170	51		
Copper (dissolved)	µg/l	0.7	ISO 17025	610	780	1200		
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	3.7		
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Nickel (dissolved)	µg/l	0.3	ISO 17025	9.3	14	22		
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	5.7		
Vanadium (dissolved)	µg/l	1.7	ISO 17025	< 1.7	< 1.7	2.1		
Zinc (dissolved)	µg/l	0.4	ISO 17025	12	23	23		
Calcium (dissolved)	mg/l	0.012	ISO 17025	190	240	130		



Analytical Report Number: 17-68217

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				861303	861304	861305		
Sample Reference				EGUC-6N	EGUC-6N	6N		
Sample Number				ES7	ES8	ES1		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				01/11/2017	01/11/2017	26/10/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10		
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10		

VOCs

Trichloroethene	µg/l	1	NONE	< 1.0	< 1.0	< 1.0		
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Analytical Report Number : 17-68217

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammonium as NH ₄ in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
Cr (III) in leachate	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L023-PL	W	NONE
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
Volatile organic compounds in leachate	Determination of volatile organic compounds in leachate by headspace GC-MS	In-house method based on USEPA8260	L073B-PL	W	NONE

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

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

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

Iss No 17-68217-1 Southall CG-28308

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

Page 4 of 4

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Analytical Report Number : 18-73323

Project / Site name:	Southall Western Access	Samples received on:	17/01/2018
Your job number:	CG-28308	Samples instructed on:	19/01/2018
Your order number:		Analysis completed by:	29/01/2018
Report Issue Number:	1	Report issued on:	29/01/2018
Samples Analysed:	5 leachate samples - 10 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-73323

Project / Site name: Southall Western Access

Lab Sample Number				891691	891692	891693	891694	891695
Sample Reference				6N-IBBA	6N-IBBA	6N-IBBA	6N-IBBA	6N-IBBA
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	17	17	17	16	16
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2	1.1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.1	10.2	10.1	10.3	10.4
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Total Sulphate as SO ₄	mg/kg	50	MCERTS	33000	35000	32000	37000	35000
Ammonium as NH ₄	mg/kg	0.5	MCERTS	2.4	4.3	2.7	2.2	2.1
Organic Matter	%	0.1	MCERTS	1.6	1.6	1.6	1.6	1.5

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.20	< 0.05	0.23	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.22	< 0.05	0.26	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.3	1.3	1.3	0.69	0.96
Anthracene	mg/kg	0.05	MCERTS	0.41	0.37	0.23	0.15	0.22
Fluoranthene	mg/kg	0.05	MCERTS	2.0	1.9	1.7	0.96	1.2
Pyrene	mg/kg	0.05	MCERTS	1.6	1.5	1.3	0.80	1.0
Benzo(a)anthracene	mg/kg	0.05	MCERTS	0.84	0.66	0.56	0.33	0.40
Chrysene	mg/kg	0.05	MCERTS	0.56	0.52	0.50	0.29	0.30
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.81	0.79	0.61	0.39	0.31
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.35	0.34	0.35	0.29	0.22
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.74	0.67	0.59	0.34	0.34
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.32	0.33	0.28	0.17	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.43	0.34	0.33	0.19	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	9.8	8.7	8.3	4.6	5.0
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	140	150	100	170	95
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	12	11	12	11
Barium (aqua regia extractable)	mg/kg	1	MCERTS	160	160	140	150	180
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.41	0.42	0.35	0.39	0.36
Boron (water soluble)	mg/kg	0.2	MCERTS	9.8	10	8.7	9.1	8.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	23	27	17	23	33
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	170	180	160	190	180
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	170	180	160	200	180
Copper (aqua regia extractable)	mg/kg	1	MCERTS	4300	4200	3100	3800	4600
Lead (aqua regia extractable)	mg/kg	1	MCERTS	430	470	390	570	400
Lead (aqua regia extractable) %	mg/kg	1	MCERTS	430	470	390	570	400
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	110	150	110	160	140
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	29	29	25	27	26
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	6400	8300	6600	7600	6500

Analytical Report Number: 18-73323

Project / Site name: Southall Western Access

Lab Sample Number	891691	891692	891693	891694	891695
Sample Reference	6N-IBBA	6N-IBBA	6N-IBBA	6N-IBBA	6N-IBBA
Sample Number	ES1	ES2	ES3	ES4	ES5
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled	16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	2.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	4.0	< 2.0	2.4	3.8	7.8
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	11
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	30	41	35	43	58
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	39	48	44	55	79

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	3.4	< 1.0	< 1.0	< 1.0	2.1
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	9.0	< 2.0	5.2	< 2.0	7.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	16	< 10	13	< 10	11
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	58	21	49	19	39
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	86	28	67	24	60

VOCs

Trichloroethene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Analytical Report Number: 18-73323

Project / Site name: Southall Western Access

Lab Sample Number				891696	891697	891698	891699	891700
Sample Reference				6F5	6F5	6F5	6F5	6F5
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	10	9.5	12	12	12
Total mass of sample received	kg	0.001	NONE	1.3	1.3	1.3	1.3	1.3

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	Not-detected
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	11.3	11.0	10.8	11.0	11.0
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Free Cyanide	mg/kg	1	MCERTS	-	-	-	-	-
Total Sulphate as SO ₄	mg/kg	50	MCERTS	15000	17000	16000	17000	18000
Ammonium as NH ₄	mg/kg	0.5	MCERTS	-	-	-	-	-
Organic Matter	%	0.1	MCERTS	1.2	1.2	1.3	1.3	1.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.22	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	1.6	0.91	1.2	2.2	1.2
Anthracene	mg/kg	0.05	MCERTS	0.53	0.23	0.29	0.60	0.37
Fluoranthene	mg/kg	0.05	MCERTS	2.6	1.5	2.2	4.4	2.4
Pyrene	mg/kg	0.05	MCERTS	2.1	1.2	1.9	3.5	1.9
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.1	0.77	0.99	2.0	1.0
Chrysene	mg/kg	0.05	MCERTS	0.91	0.40	0.79	1.5	0.79
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	1.1	0.63	1.0	1.7	1.3
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.62	0.39	0.77	1.3	0.84
Benzo(a)pyrene	mg/kg	0.05	MCERTS	1.1	0.66	0.92	1.9	1.1
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.46	0.31	0.47	0.84	0.57
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.13	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.51	0.33	0.47	0.95	0.65
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	13	7.3	11	21	12
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	19	23	21	23	22
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	9.4	9.6	12	13	12
Barium (aqua regia extractable)	mg/kg	1	MCERTS	250	280	230	260	280
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.43	0.45	0.63	0.56	0.57
Boron (water soluble)	mg/kg	0.2	MCERTS	3.2	3.7	3.2	3.1	3.0
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	2.7	40	2.9	3.3	3.3
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	39	43	46	46	49
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	40	43	46	47	49
Copper (aqua regia extractable)	mg/kg	1	MCERTS	300	400	460	430	690
Lead (aqua regia extractable)	mg/kg	1	MCERTS	200	180	120	150	230
Lead (aqua regia extractable) %	mg/kg	1	MCERTS	200	180	120	150	230
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	25	33	28	31	54
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	24	23	28	28	29
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	750	1100	750	910	910

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Project / Site name: Southall Western Access

Lab Sample Number				891696	891697	891698	891699	891700
Sample Reference				6F5	6F5	6F5	6F5	6F5
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	ug/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	2.1	< 1.0	< 1.0	1.3
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	11	6.3	8.2	4.2
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	12	21	18	24	18
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	78	89	86	110	92
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	92	120	110	140	120

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	5.2	< 1.0	< 1.0	1.9	5.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	9.8	2.4	3.5	5.6	12
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	19	13	16	20	26
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	110	51	68	81	91
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	140	67	88	110	130

VOCs

Trichloroethene	ug/kg	1	MCERTS	-	-	-	-	-
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Analytical Report Number: 18-73323

Project / Site name: Southall Western Access

Lab Sample Number				891701	891702	891703	891704	891705
Sample Reference				6N-IBBA	6N-IBBA	6N-IBBA	6N-IBBA	6N-IBBA
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				16/01/2018	16/01/2018	16/01/2018	16/01/2018	16/01/2018
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	20	23	26	20	18
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	1.4	1.2	< 1.1	< 1.1
Barium (dissolved)	µg/l	0.05	ISO 17025	370	360	340	420	530
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Boron (dissolved)	µg/l	10	ISO 17025	48	61	69	45	35
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	52	43	69	47	27
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chromium (dissolved)	µg/l	0.4	ISO 17025	44	38	59	41	25
Copper (dissolved)	µg/l	0.7	ISO 17025	900	690	680	750	800
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	8.6	5.3	< 1.0	4.9
Mercury - CV-AFS	µg/l	0.007	ISO 17025	< 0.0070	< 0.0070	< 0.0070	< 0.0070	< 0.0070
Nickel (dissolved)	µg/l	0.3	ISO 17025	13	12	12	10	12
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Vanadium (dissolved)	µg/l	1.7	ISO 17025	6.4	7.2	10	3.7	5.6
Zinc (dissolved)	µg/l	0.4	ISO 17025	27	19	45	26	49
Calcium (dissolved)	mg/l	0.012	ISO 17025	210	180	180	180	150



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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
891691	6N-IBBA	ES1	None Supplied	Grey sand with gravel.
891692	6N-IBBA	ES2	None Supplied	Grey sandy clay with gravel.
891693	6N-IBBA	ES3	None Supplied	Grey sand with gravel.
891694	6N-IBBA	ES4	None Supplied	Grey sand with gravel.
891695	6N-IBBA	ES5	None Supplied	Grey sand with gravel.
891696	6F5	ES1	None Supplied	Brown sand with gravel and brick.
891697	6F5	ES2	None Supplied	Brown sand with gravel and brick.
891698	6F5	ES3	None Supplied	Brown clay and sand with gravel and brick.
891699	6F5	ES4	None Supplied	Brown clay and sand with gravel and brick.
891700	6F5	ES5	None Supplied	Brown sand with gravel.

Analytical Report Number : 18-73323

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonium as NH ₄ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Mercury Low Level in leachate	Mercury in leachate by CV-AFS,	In-house method based on USEPA method 1631	L085-PL	W	ISO 17025
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests ^{***}	L009-PL	D	MCERTS

Iss No 18-73323-1 Southall Western Access CG-28308

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

Page 8 of 9

Analytical Report Number : 18-73323

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS

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

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

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

**Chris Gordon**

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Analytical Report Number : 18-74149

Project / Site name:	Southall	Samples received on:	26/01/2018
Your job number:	CG-28308	Samples instructed on:	29/01/2018
Your order number:	4586	Analysis completed by:	02/02/2018
Report Issue Number:	1	Report issued on:	02/02/2018
Samples Analysed:	4 leachate samples - 4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-74149

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number	896704	896705	896706	896707	
Sample Reference	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	
Sample Number	ES1	ES2	ES3	ES4	
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled	26/01/2018	26/01/2018	26/01/2018	26/01/2018	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		
Stone Content	%	0.1	NONE	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	15	14
Total mass of sample received	kg	0.001	NONE	1.3	1.1

Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected	Not-detected	
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General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.2	10.4	10.3	10.5	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Total Sulphate as SO ₄	mg/kg	50	MCERTS	31000	22000	23000	34000	
Organic Matter	%	0.1	MCERTS	1.3	1.2	1.2	1.2	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	< 0.9	< 0.9	< 0.9	
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Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	140	100	160	160	
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	13	12	14	14	
Barium (aqua regia extractable)	mg/kg	1	MCERTS	230	150	190	180	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.38	0.40	0.41	0.45	
Boron (water soluble)	mg/kg	0.2	MCERTS	7.5	6.0	6.6	5.9	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	19	13	14	33	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	
Chromium (III)	mg/kg	1	NONE	160	250	160	170	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	160	250	160	170	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	2500	3900	5400	3600	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	670	570	600	430	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	160	220	170	310	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	1.4	1.7	1.9	1.8	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	34	35	35	38	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	6000	6600	6900	7500	

Analytical Report Number: 18-74149

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number	896704	896705	896706	896707	
Sample Reference	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	
Sample Number	ES1	ES2	ES3	ES4	
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled	26/01/2018	26/01/2018	26/01/2018	26/01/2018	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	25	18	33	9.6	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	26	18	33	< 10	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	1.8	< 1.0	< 1.0	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	5.3	< 2.0	< 2.0	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	11	26	< 10	27	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	15	38	< 10	28	



Analytical Report Number: 18-74149

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number	896708	896709	896710	896711	
Sample Reference	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	
Sample Number	ES1	ES2	ES3	ES4	
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled	26/01/2018	26/01/2018	26/01/2018	26/01/2018	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH Units	N/A	ISO 17025	11.2	11.2	11.2	11.3	
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Free Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1	< 1	< 1	< 1	
Sulphate as SO ₄	µg/l	100	ISO 17025	112000	135000	112000	131000	
Ammoniacal Nitrogen as N	µg/l	15	NONE	1300	1600	1300	1500	
Ammonium as NH ₄	µg/l	15	NONE	1700	2100	1700	2000	
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	79.1	71.9	60.3	69.3	

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	38	39	28	32	
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Speciated PAHs

Naphthalene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	

Total PAH

Total EPA-16 PAHs	µg/l	0.2	NONE	< 0.2	< 0.2	< 0.2	< 0.2	
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Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	1.7	ISO 17025	19	15	18	14	
Arsenic (dissolved)	µg/l	1.1	ISO 17025	< 1.1	< 1.1	< 1.1	< 1.1	
Barium (dissolved)	µg/l	0.05	ISO 17025	440	420	360	430	
Beryllium (dissolved)	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	
Boron (dissolved)	µg/l	10	ISO 17025	47	44	45	44	
Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	
Chromium (hexavalent)	µg/l	5	NONE	20	22	26	22	
Chromium (III)	µg/l	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	
Chromium (dissolved)	µg/l	0.4	ISO 17025	17	18	23	18	
Copper (dissolved)	µg/l	0.7	ISO 17025	1600	1500	1100	1500	
Lead (dissolved)	µg/l	1	ISO 17025	8.3	2.6	< 1.0	1.3	
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	
Nickel (dissolved)	µg/l	0.3	ISO 17025	27	24	18	22	
Selenium (dissolved)	µg/l	4	ISO 17025	< 4.0	< 4.0	< 4.0	< 4.0	
Vanadium (dissolved)	µg/l	1.7	ISO 17025	5.2	< 1.7	< 1.7	< 1.7	
Zinc (dissolved)	µg/l	0.4	ISO 17025	18	26	27	18	
Calcium (dissolved)	mg/l	0.012	ISO 17025	200	220	190	190	



Analytical Report Number: 18-74149

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number	896708	896709	896710	896711	
Sample Reference	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	WYB-6N-IBAA	
Sample Number	ES1	ES2	ES3	ES4	
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled	26/01/2018	26/01/2018	26/01/2018	26/01/2018	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status		

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	



Analytical Report Number : 18-74149

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
896704	WYB-6N-IBAA	ES1	None Supplied	Grey sandy loam.
896705	WYB-6N-IBAA	ES2	None Supplied	Grey sandy loam with gravel.
896706	WYB-6N-IBAA	ES3	None Supplied	Grey sandy loam.
896707	WYB-6N-IBAA	ES4	None Supplied	Grey sandy loam.

Analytical Report Number : 18-74149

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammonium as NH ₄ in leachate	Determination of Ammonium/Ammonia/ Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Boron in leachate	Determination of boron in leachate. Sample acidified and followed by ICP-OES.	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BS EN 12457-1 (2:1) Leachate Prep	2:1 (as recieved, moisture adjusted) end over end extraction with water for 24 hours. Eluate filtered prior to analysis.	In-house method based on BSEN12457-1.	L043-PL	W	NONE
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Dissolved Organic Carbon in leachate	Determination of dissolved organic carbon in leachate by the measurement on a non-dispersive infrared analyser of carbon dioxide released by acidification.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L023-PL	W	NONE
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate - LOW LEVEL 1 ug/l	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025

Iss No 18-74149-1 Southall CG-28308

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

Page 7 of 8

Analytical Report Number : 18-74149

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH at 20oC in leachate	Determination of pH in leachate by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in leachates	Determination of sulphate in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in leachate - 1µg/l	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Leachates)	Determination of dichloromethane extractable hydrocarbons in leachate by GC-MS.	In-house method	L070-PL	W	NONE
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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

**Chris Gordon**

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Analytical Report Number : 18-75046

Project / Site name:	Southall Western Access	Samples received on:	06/02/2018
Your job number:	CG-28308	Samples instructed on:	06/02/2018
Your order number:	4586	Analysis completed by:	08/02/2018
Report Issue Number:	1	Report issued on:	08/02/2018
Samples Analysed:	1 soil sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-75046

Project / Site name: Southall Western Access

Your Order No: 4586

Lab Sample Number				902028				
Sample Reference				Bulk 1 of 4				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				29/01/2018				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1				
Moisture Content	%	N/A	NONE	12				
Total mass of sample received	kg	0.001	NONE	1.2				

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.6				
Total Sulphate as SO ₄	mg/kg	50	MCERTS	33000				
Water Soluble SO ₄ 16hr extraction (2:1 Leachate Equivalent)	g/l	0.00125	MCERTS	0.21				
Total Sulphur	mg/kg	50	MCERTS	11000				



Analytical Report Number : 18-75046

Project / Site name: Southall Western Access

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
902028	Bulk 1 of 4	None Supplied	None Supplied	Brown loam and sand with gravel.

Analytical Report Number : 18-75046

Project / Site name: Southall Western Access

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate, water soluble, in soil (16hr extraction)	Determination of water soluble sulphate by ICP-OES. Results reported directly (leachate equivalent) and corrected for extraction ratio (soil equivalent).	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests, 2:1 water:soil extraction, analysis by ICP-OES.	L038-PL	D	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Total Sulphur in soil	Determination of total sulphur in soil by extraction with aqua-regia, potassium bromide/bromate followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, and MEWAM 2006 Methods for the Determination of Metals in Soil	L038-PL	D	MCERTS

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

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

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

**Tom Kiddier**

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Analytical Report Number : 18-82248

Project / Site name:	Southall	Samples received on:	16/04/2018
Your job number:		Samples instructed on:	16/04/2018
Your order number:		Analysis completed by:	19/04/2018
Report Issue Number:	1	Report issued on:	19/04/2018
Samples Analysed:	6 leachate samples - 6 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-82248

Project / Site name: Southall

Lab Sample Number				943449	943450	943451	943452	943453
Sample Reference				Z56NXX	Z5SP111XX	Z5SP111XY	Z5SP111XZ	Z5SP111YY
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	32	46	26	55
Moisture Content	%	N/A	NONE	14	5.7	6.1	7.8	4.6
Total mass of sample received	kg	0.001	NONE	0.97	1.3	1.4	1.3	1.3

General Inorganics

Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Ammonia as NH ₃	mg/kg	0.5	MCERTS	1.2	6.4	6.7	6.7	7.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	0.29	0.26	0.25	0.45

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	15	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	460	33	34	29	24
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	0.4	< 0.3	< 0.3	0.3

Monoaromatics

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
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Analytical Report Number: 18-82248

Project / Site name: Southall

Lab Sample Number				943454				
Sample Reference				Z5SP111YZ				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	36				
Moisture Content	%	N/A	NONE	7.4				
Total mass of sample received	kg	0.001	NONE	1.4				

General Inorganics

Free Cyanide	mg/kg	1	MCERTS	< 1				
Ammonia as NH ₃	mg/kg	0.5	MCERTS	6.6				

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0				
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05				
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.25				

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2				
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0				
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29				
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.3				

Monoaromatics

Benzene	mg/kg	0.001	MCERTS	< 0.001				
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Analytical Report Number: 18-82248

Project / Site name: Southall

Lab Sample Number				943455	943456	943457	943458	943459
Sample Reference				Z56NXX	Z5SP111XX	Z5SP111XY	Z5SP111XZ	Z5SP111YY
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

Free Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Ammonia as NH ₃	µg/l	15	NONE	34	600	590	650	560

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Heavy Metals / Metalloids

Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08	< 0.08	< 0.08	< 0.08	< 0.08
Chromium (hexavalent)	µg/l	5	NONE	72	< 5.0	< 5.0	< 5.0	< 5.0
Lead (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	1.2	2.6	1.8
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 18-82248

Project / Site name: Southall

Lab Sample Number				943460				
Sample Reference				Z5SP111YZ				
Sample Number				None Supplied				
Depth (m)				None Supplied				
Date Sampled				Deviating				
Time Taken				None Supplied				
Analytical Parameter (Leachate Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

Free Cyanide	µg/l	10	ISO 17025	< 10				
Ammonia as NH ₃	µg/l	15	NONE	750				

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10				
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				

Heavy Metals / Metalloids

Cadmium (dissolved)	µg/l	0.08	ISO 17025	< 0.08				
Chromium (hexavalent)	µg/l	5	NONE	< 5.0				
Lead (dissolved)	µg/l	1	ISO 17025	2.0				
Mercury (dissolved)	µg/l	0.5	ISO 17025	< 0.5				
Benzene	µg/l	1	ISO 17025	< 1.0				



Analytical Report Number : 18-82248

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
943449	Z56NXX	None Supplied	None Supplied	Light grey loam and gravel with ash.
943450	Z5SP111XX	None Supplied	None Supplied	Light brown clay and sand with stones.
943451	Z5SP111XY	None Supplied	None Supplied	Light brown clay and sand with stones.
943452	Z5SP111XZ	None Supplied	None Supplied	Light brown clay and sand with stones.
943453	Z5SP111YY	None Supplied	None Supplied	Light brown clay and sand with stones.
943454	Z5SP111YZ	None Supplied	None Supplied	Light brown clay and sand with stones.

Analytical Report Number : 18-82248

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in leachate	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates (Monoaromatics)	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025

Analytical Report Number : 18-82248

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Sample Deviation Report



Sample ID	Other ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
Z56NXX		L	18-82248	943455	a			
Z56NXX		S	18-82248	943449	a			
Z5SP111XX		L	18-82248	943456	a			
Z5SP111XX		S	18-82248	943450	a			
Z5SP111XY		L	18-82248	943457	a			
Z5SP111XY		S	18-82248	943451	a			
Z5SP111XZ		L	18-82248	943458	a			
Z5SP111XZ		S	18-82248	943452	a			
Z5SP111YY		L	18-82248	943459	a			
Z5SP111YY		S	18-82248	943453	a			
Z5SP111YZ		L	18-82248	943460	a			
Z5SP111YZ		S	18-82248	943454	a			

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Analytical Report Number : 18-82864

Project / Site name:	Southall	Samples received on:	20/04/2018
Your job number:		Samples instructed on:	20/04/2018
Your order number:		Analysis completed by:	25/04/2018
Report Issue Number:	1	Report issued on:	25/04/2018
Samples Analysed:	5 leachate samples - 5 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-82864

Project / Site name: Southall

Lab Sample Number				947001	947002	947003	947004	947005
Sample Reference				Z56NXY	Z56NXZ	Z56NYX	Z56NYY	Z56NYZ
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	9.6	4.6	12	10	9.6
Total mass of sample received	kg	0.001	NONE	1.2	1.2	1.2	1.2	0.45

General Inorganics

Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	< 1
Ammonia as NH ₃	mg/kg	0.5	MCERTS	3.7	6.6	1.9	5.4	3.3

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	17	34	17	46	19
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
Lead (aqua regia extractable)	mg/kg	1	MCERTS	430	440	460	410	410
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3

Monoaromatics

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
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Analytical Report Number: 18-82864

Project / Site name: Southall

Lab Sample Number				947006	947007	947008	947009	947010
Sample Reference				Z56NXY	Z56NXZ	Z56NYX	Z56NYY	Z56NYZ
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				Deviating	Deviating	Deviating	Deviating	Deviating
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

Total Cyanide	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010	< 0.010	< 0.010
Ammonia as NH ₃	mg/l	0.015	NONE	0.52	0.34	0.20	0.52	0.46

Total Phenols

Total Phenols (monohydric)	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010	< 0.010	0.014
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Speciated PAHs

Naphthalene	mg/l	0.00001	ISO 17025	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Benzo(a)pyrene	mg/l	0.00001	ISO 17025	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001

Heavy Metals / Metalloids

Cadmium (dissolved)	mg/l	0.0001	ISO 17025	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Chromium (hexavalent)	mg/l	0.005	NONE	0.101	0.076	0.020	0.079	0.054
Lead (dissolved)	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Mercury (dissolved)	mg/l	0.0005	ISO 17025	< 0.0005	< 0.0005	< 0.0005	< 0.0005	< 0.0005

Monoaromatics

Benzene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
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Analytical Report Number : 18-82864

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
947001	Z56NXY	None Supplied	None Supplied	Grey loam and gravel.
947002	Z56NXZ	None Supplied	None Supplied	Grey loam and gravel.
947003	Z56NYX	None Supplied	None Supplied	Grey loam and gravel.
947004	Z56NYY	None Supplied	None Supplied	Grey loam and gravel.
947005	Z56NYZ	None Supplied	None Supplied	Grey loam and gravel.

Analytical Report Number : 18-82864

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in leachate	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L017-PL	W	ISO 17025
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025

Analytical Report Number : 18-82864

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in leachate	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L080-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS

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

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

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

Sample Deviation Report



Sample ID	Other ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
Z56NXY		L	18-82864	947006	a			
Z56NXY		S	18-82864	947001	a			
Z56NXZ		L	18-82864	947007	a			
Z56NXZ		S	18-82864	947002	a			
Z56NYX		L	18-82864	947008	a			
Z56NYX		S	18-82864	947003	a			
Z56NYY		L	18-82864	947009	a			
Z56NYY		S	18-82864	947004	a			
Z56NYZ		L	18-82864	947010	a			
Z56NYZ		S	18-82864	947005	a			

**Tom Kiddier**

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Analytical Report Number : 18-83413

Project / Site name:	Southall	Samples received on:	26/04/2018
Your job number:		Samples instructed on:	26/04/2018
Your order number:		Analysis completed by:	30/04/2018
Report Issue Number:	1	Report issued on:	30/04/2018
Samples Analysed:	4 leachate samples - 4 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 18-83413

Project / Site name: Southall

Lab Sample Number				949779	949780	949781	949782	
Sample Reference				Z5SP11AA	Z5SP11AB	Z56NAA	Z56NAB	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				Deviating	Deviating	Deviating	Deviating	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	9.2	23	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	4.7	2.9	11	11	
Total mass of sample received	kg	0.001	NONE	1.2	1.3	1.1	1.1	

General Inorganics

Free Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Ammonia as NH ₃	mg/kg	0.5	MCERTS	5.1	5.0	< 0.5	< 0.5	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.48	< 0.05	< 0.05	< 0.05	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.60	0.15	< 0.05	< 0.05	

Heavy Metals / Metalloids

Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	17	21	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	29	38	620	400	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	0.7	0.3	< 0.3	< 0.3	

Monoaromatics

Benzene	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
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Analytical Report Number: 18-83413

Project / Site name: Southall

Lab Sample Number				949783	949784	949785	949786	
Sample Reference				Z5SP11AA	Z5SP11AB	Z56NAA	Z56NAB	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				Deviating	Deviating	Deviating	Deviating	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Leachate Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

Free Cyanide	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010	< 0.010	
Ammonia as NH ₃	mg/l	0.015	NONE	0.49	0.47	0.059	0.036	

Total Phenols

Total Phenols (monohydric)	mg/l	0.01	ISO 17025	< 0.010	< 0.010	< 0.010	< 0.010	
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Speciated PAHs

Naphthalene	mg/l	0.00001	ISO 17025	< 0.00001	< 0.00001	< 0.00001	< 0.00001	
Benzo(a)pyrene	mg/l	0.00001	ISO 17025	< 0.00001	< 0.00001	< 0.00001	< 0.00001	

Heavy Metals / Metalloids

Cadmium (dissolved)	mg/l	0.0001	ISO 17025	< 0.0001	< 0.0001	< 0.0001	< 0.0001	
Chromium (hexavalent)	mg/l	0.005	NONE	< 0.005	< 0.005	0.039	0.067	
Lead (dissolved)	mg/l	0.001	ISO 17025	< 0.001	0.002	< 0.001	< 0.001	
Mercury (dissolved)	mg/l	0.0005	ISO 17025	< 0.0005	< 0.0005	< 0.0005	< 0.0005	

Monoaromatics

Benzene	mg/l	0.001	ISO 17025	< 0.001	< 0.001	< 0.001	< 0.001	
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Analytical Report Number : 18-83413

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
949779	Z5SP11AA	None Supplied	None Supplied	Brown sand with stones.
949780	Z5SP11AB	None Supplied	None Supplied	Brown sand with stones.
949781	Z56NAA	None Supplied	None Supplied	Grey loam and gravel.
949782	Z56NAB	None Supplied	None Supplied	Grey loam and gravel.

Analytical Report Number : 18-83413

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in leachate	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	NONE
Ammonia as NH ₃ in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX in leachates	Determination of BTEX in leachates by headspace GC-MS.	In-house method based on USEPA8260	L017-PL	W	ISO 17025
Free cyanide in leachate	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Hexavalent chromium in leachate	Determination of hexavalent chromium in leachate by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	NONE
Hexavalent chromium in soil	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals by ICP-OES in leachate	Determination of metals in leachate by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in leachate	Determination of phenols in leachate by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS



Analytical Report Number : 18-83413

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
NRA Leachate Prep	10:1 extract with de-ionised water shaken for 24 hours then filtered.	In-house method based on National Rivers Authority	L020-PL	W	NONE
Speciated EPA-16 PAHs in leachate	Determination of PAH compounds in leachate by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L102B-PL	W	ISO 17025
Speciated EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE

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

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

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

Sample Deviation Report



Sample ID	Other_ID	Sample Type	Job	Sample Number	Sample Deviation Code	test_name	test_ref	Test Deviation code
Z56NAA		L	18-83413	949785	a			
Z56NAA		S	18-83413	949781	a			
Z56NAB		L	18-83413	949786	a			
Z56NAB		S	18-83413	949782	a			
Z5SP11AA		L	18-83413	949783	a			
Z5SP11AA		S	18-83413	949779	a			
Z5SP11AB		L	18-83413	949784	a			
Z5SP11AB		S	18-83413	949780	a			

**Chris Gordon**

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Analytical Report Number : 17-70131

Project / Site name:	Southall	Samples received on:	07/12/2017
Your job number:	CG-28308	Samples instructed on:	07/12/2017
Your order number:	4586	Analysis completed by:	14/12/2017
Report Issue Number:	1	Report issued on:	14/12/2017
Samples Analysed:	8 soil samples		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

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

soils	- 4 weeks from reporting
leachates	- 2 weeks from reporting
waters	- 2 weeks from reporting
asbestos	- 6 months from reporting

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Analytical Report Number: 17-70131

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				872221	872222	872223	872224	872225
Sample Reference				EGUCF	EGUCF	EGUCF	EGUCF	LRG-6N
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/12/2017	06/12/2017	06/12/2017	06/12/2017	06/12/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1	< 0.1	21
Moisture Content	%	N/A	NONE	8.0	6.7	7.9	6.4	2.1
Total mass of sample received	kg	0.001	NONE	1.3	1.4	1.4	1.3	1.6

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	Chrysotile	-	-
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Detected	Not-detected	Not-detected
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	0.001	-	-
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	0.001	-	-

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	7.2	7.1	7.1	7.1	8.7
Total Cyanide	mg/kg	1	MCERTS	5	5	4	5	< 1
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Total Sulphate as SO ₄	mg/kg	50	MCERTS	5900	4500	5300	4900	160
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	20	41	36	31	< 0.5
Organic Matter	%	0.1	MCERTS	0.3	0.3	0.3	0.3	< 0.1

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.36	0.31	0.35	0.32	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.34	0.32	0.50	0.32	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.19	0.15	0.20	0.13	< 0.05
Fluorene	mg/kg	0.05	MCERTS	0.60	0.49	0.95	0.40	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	3.4	2.9	4.7	2.9	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.82	0.68	1.1	0.78	< 0.05
Fluoranthene	mg/kg	0.05	MCERTS	3.1	2.7	3.6	2.9	< 0.05
Pyrene	mg/kg	0.05	MCERTS	3.1	2.9	3.9	3.0	< 0.05
Benzo(a)anthracene	mg/kg	0.05	MCERTS	1.2	1.2	1.7	1.3	< 0.05
Chrysene	mg/kg	0.05	MCERTS	1.4	1.3	1.5	1.3	< 0.05
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	0.83	0.72	1.2	0.86	< 0.05
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.59	0.65	0.63	0.55	< 0.05
Benzo(a)pyrene	mg/kg	0.05	MCERTS	0.80	0.78	1.1	0.94	< 0.05
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.25	0.28	0.55	0.36	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.45	0.42	0.66	0.54	< 0.05
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	18	16	23	17	< 0.9
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Analytical Report Number: 17-70131

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				872221	872222	872223	872224	872225
Sample Reference				EGUCF	EGUCF	EGUCF	EGUCF	LRG-6N
Sample Number				ES1	ES2	ES3	ES4	ES5
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Date Sampled				06/12/2017	06/12/2017	06/12/2017	06/12/2017	06/12/2017
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	4.3	3.2	4.0	4.0	< 1.0
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	19	17	18	16	1.9
Barium (aqua regia extractable)	mg/kg	1	MCERTS	66	54	62	54	11
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.73	0.60	0.60	0.59	0.29
Boron (water soluble)	mg/kg	0.2	MCERTS	1.5	1.5	1.6	1.6	0.3
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	< 1.2
Chromium (III)	mg/kg	1	NONE	27	25	27	25	9.5
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	27	25	27	25	9.5
Copper (aqua regia extractable)	mg/kg	1	MCERTS	170	33	47	49	3.9
Lead (aqua regia extractable)	mg/kg	1	MCERTS	33	28	32	30	4.2
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	26	28	24	23	6.5
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	45	42	39	37	10
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	120	94	120	100	12

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	1.9	< 1.0	3.0	1.7	< 1.0
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	5.3	6.6	2.3	3.9	< 2.0
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	12	11	< 8.0	12	< 8.0
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	12	< 8.0	< 8.0	11	< 8.0
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	31	23	12	29	< 10

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	4.1	5.2	< 1.0	1.8	< 1.0
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	18	16	11	11	< 2.0
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	47	47	47	50	< 10
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	66	63	44	60	< 10
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	140	130	100	120	< 10

Analytical Report Number: 17-70131

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				872226	872227	872228		
Sample Reference				LRG-6N	LRG-6N	LRG-6N		
Sample Number				ES6	ES7	ES8		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				06/12/2017	06/12/2017	06/12/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	< 0.1	< 0.1	< 0.1		
Moisture Content	%	N/A	NONE	2.6	3.6	2.6		
Total mass of sample received	kg	0.001	NONE	1.5	1.5	1.6		

Asbestos in Soil Screen / Identification Name	Type	N/A	ISO 17025	-	-	-		
Asbestos in Soil	Type	N/A	ISO 17025	Not-detected	Not-detected	Not-detected		
Asbestos Quantification (Stage 2)	%	0.001	ISO 17025	-	-	-		
Asbestos Quantification Total	%	0.001	ISO 17025	-	-	-		

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	8.9	8.8	8.3		
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1		
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5		
Total Sulphate as SO ₄	mg/kg	50	MCERTS	170	81	140		
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5		
Organic Matter	%	0.1	MCERTS	< 0.1	< 0.1	< 0.1		

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Phenanthrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Chrysene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(a)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05		
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05		

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	< 0.9	< 0.9	< 0.9		
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Analytical Report Number: 17-70131

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				872226	872227	872228		
Sample Reference				LRG-6N	LRG-6N	LRG-6N		
Sample Number				ES6	ES7	ES8		
Depth (m)				None Supplied	None Supplied	None Supplied		
Date Sampled				06/12/2017	06/12/2017	06/12/2017		
Time Taken				None Supplied	None Supplied	None Supplied		
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Heavy Metals / Metalloids								
Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0		
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	2.7	2.1	1.1		
Barium (aqua regia extractable)	mg/kg	1	MCERTS	15	11	8.9		
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.26	0.28	0.24		
Boron (water soluble)	mg/kg	0.2	MCERTS	0.3	0.3	0.4		
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2		
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2		
Chromium (III)	mg/kg	1	NONE	7.9	8.7	8.2		
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	7.8	8.7	8.1		
Copper (aqua regia extractable)	mg/kg	1	MCERTS	3.7	4.2	2.9		
Lead (aqua regia extractable)	mg/kg	1	MCERTS	5.9	4.6	3.4		
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3		
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	6.3	7.4	6.0		
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	10	10	7.1		
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	15	15	12		

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0		
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001		
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0		
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0		
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10		
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10		



Analytical Report Number: 17-70131
Project / Site name: Southall
Your Order No: 4586

Certificate of Analysis - Asbestos Quantification

Methods:

Qualitative Analysis

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

Quantitative Analysis

The analysis was carried out using our documented in-house method A006 based on HSE Contract Research Report No: 83/1996: Development and Validation of an analytical method to determine the amount of asbestos in soils and loose aggregates (Davies et al, 1996) and HSG 248. Our method includes initial examination of the entire representative sample, then fractionation and detailed analysis of each fraction, with quantification by hand picking and weighing.

The limit of detection (reporting limit) of this method is 0.001 %.

The method has been validated using samples of at least 100 g, results for samples smaller than this should be interpreted with caution.

Both Qualitative and Quantitative Analyses are UKAS accredited.

Sample Number	Sample ID	Sample Depth (m)	Sample Weight (g)	Asbestos Containing Material Types Detected (ACM)	PLM Results	Asbestos by hand picking/weighing (%)	Total % Asbestos in Sample
872223	EGUCF		126	Loose Fibres	Chrysotile	0.001	0.001

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



Analytical Report Number : 17-70131

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
872221	EGUCF	ES1	None Supplied	Brown clay and sand with gravel.
872222	EGUCF	ES2	None Supplied	Brown clay and sand with gravel.
872223	EGUCF	ES3	None Supplied	Brown clay and sand with gravel.
872224	EGUCF	ES4	None Supplied	Brown clay and sand with gravel.
872225	LRG-6N	ES5	None Supplied	Brown sand with gravel and stones.
872226	LRG-6N	ES6	None Supplied	Brown sand with gravel.
872227	LRG-6N	ES7	None Supplied	Brown sand with gravel.
872228	LRG-6N	ES8	None Supplied	Brown sand with gravel.

Analytical Report Number : 17-70131

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method,10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Asbestos identification in soil	Asbestos Identification with the use of polarised light microscopy in conjunction with disperion staining techniques.	In house method based on HSG 248	A001-PL	D	ISO 17025
Asbestos Quantification - Gravimetric	Asbestos quantification by gravimetric method - in house method based on references.	HSE Report No: 83/1996, HSG 248, HSG 264 & SCA Blue Book (draft).	A006-PL	D	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
Cr (III) in soil	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
D.O. for Gravimetric Quant if Screen/ID positive	Dependent option for Gravimetric Quant if Screen/ID positive scheduled.	In house asbestos methods A001 & A006.	A006-PL	D	NONE
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazine followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests"	L009-PL	D	MCERTS
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE

Analytical Report Number : 17-70131

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total sulphate (as SO ₄ in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS

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

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

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

**Chris Gordon**

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Analytical Report Number : 17-67634

Project / Site name:	Southall	Samples received on:	15/11/2017
Your job number:	CG-28308	Samples instructed on:	15/11/2017
Your order number:	4586	Analysis completed by:	20/11/2017
Report Issue Number:	1	Report issued on:	20/11/2017
Samples Analysed:	4 soil samples - 1 water sample		

Signed:

Jordan Hill
Reporting Manager
For & on behalf of i2 Analytical Ltd.

Standard Geotechnical, Asbestos and Chemical Testing Laboratory located at: ul. Pionierów 39, 41 -711 Ruda Śląska, Poland.

Accredited tests are defined within the report, opinions and interpretations expressed herein are outside the scope of accreditation.

Standard sample disposal times, unless otherwise agreed with the laboratory, are :	soils	- 4 weeks from reporting
	leachates	- 2 weeks from reporting
	waters	- 2 weeks from reporting
	asbestos	- 6 months from reporting

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Analytical Report Number: 17-67634

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				858029	858030	858031	858032	
Sample Reference				TYPE1	TYPE1	TYPE1	TYPE1	
Sample Number				ES1	ES2	ES3	ES4	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				14/11/2017	14/11/2017	14/11/2017	14/11/2017	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Stone Content	%	0.1	NONE	17	17	11	20	
Moisture Content	%	N/A	NONE	3.6	3.3	3.6	3.2	
Total mass of sample received	kg	0.001	NONE	1.6	1.3	1.6	1.3	

General Inorganics

pH - Automated	pH Units	N/A	MCERTS	10.4	10.8	10.8	10.7	
Total Cyanide	mg/kg	1	MCERTS	< 1	< 1	< 1	< 1	
Free Cyanide (low level)	mg/kg	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	
Total Sulphate as SO ₄	mg/kg	50	MCERTS	2300	2100	2200	2100	
Ammoniacal Nitrogen as N	mg/kg	0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	
Organic Matter	%	0.1	MCERTS	4.4	5.6	4.6	5.6	

Total Phenols

Total Phenols (monohydric)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
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Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	1.6	2.2	2.2	1.6	
Acenaphthylene	mg/kg	0.05	MCERTS	1.4	1.5	1.5	1.4	
Acenaphthene	mg/kg	0.05	MCERTS	4.0	4.6	4.1	4.6	
Fluorene	mg/kg	0.05	MCERTS	4.7	6.0	5.7	5.5	
Phenanthrene	mg/kg	0.05	MCERTS	29	35	34	30	
Anthracene	mg/kg	0.05	MCERTS	8.0	9.4	9.0	9.0	
Fluoranthene	mg/kg	0.05	MCERTS	31	37	38	34	
Pyrene	mg/kg	0.05	MCERTS	25	29	30	27	
Benzo(a)anthracene	mg/kg	0.05	MCERTS	15	17	16	16	
Chrysene	mg/kg	0.05	MCERTS	11	13	13	13	
Benzo(b)fluoranthene	mg/kg	0.05	MCERTS	14	13	16	14	
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	9.1	12	9.0	11	
Benzo(a)pyrene	mg/kg	0.05	MCERTS	14	15	15	15	
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	6.7	6.8	7.2	7.2	
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	1.9	2.0	2.2	2.2	
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	7.9	8.2	8.4	8.3	
Coronene	mg/kg	0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	

Total PAH

Total WAC-17 PAHs	mg/kg	0.85	NONE	180	210	210	200	
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Analytical Report Number: 17-67634

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number	858029	858030	858031	858032	
Sample Reference	TYPE1	TYPE1	TYPE1	TYPE1	
Sample Number	ES1	ES2	ES3	ES4	
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled	14/11/2017	14/11/2017	14/11/2017	14/11/2017	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status		

Heavy Metals / Metalloids

Antimony (aqua regia extractable)	mg/kg	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	
Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	7.5	8.8	11	9.9	
Barium (aqua regia extractable)	mg/kg	1	MCERTS	100	100	100	100	
Beryllium (aqua regia extractable)	mg/kg	0.06	MCERTS	0.61	0.59	0.59	0.54	
Boron (water soluble)	mg/kg	0.2	MCERTS	0.6	0.4	1.1	0.6	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	1.2	MCERTS	< 1.2	< 1.2	< 1.2	< 1.2	
Chromium (III)	mg/kg	1	NONE	31	30	30	31	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	32	30	31	32	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	30	38	30	31	
Lead (aqua regia extractable)	mg/kg	1	MCERTS	62	56	66	57	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	1	MCERTS	15	15	16	14	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Vanadium (aqua regia extractable)	mg/kg	1	MCERTS	35	39	38	36	
Zinc (aqua regia extractable)	mg/kg	1	MCERTS	62	72	65	66	

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >EC5 - EC6	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC6 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	4.3	2.3	2.2	1.7	
TPH-CWG - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	37	44	41	45	
TPH-CWG - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	69	79	89	83	
TPH-CWG - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	420	490	560	610	
TPH-CWG - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	530	620	690	740	

TPH-CWG - Aromatic >EC5 - EC7	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC7 - EC8	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC8 - EC10	mg/kg	0.001	MCERTS	< 0.001	< 0.001	< 0.001	< 0.001	
TPH-CWG - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	2.9	2.9	3.9	4.8	
TPH-CWG - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	49	63	39	59	
TPH-CWG - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	180	230	200	200	
TPH-CWG - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	980	1200	890	1200	
TPH-CWG - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	1200	1500	1100	1500	



Analytical Report Number: 17-67634

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				858033				
Sample Reference				RRCC				
Sample Number				EW9				
Depth (m)				None Supplied				
Date Sampled				14/11/2017				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

General Inorganics

pH	pH Units	N/A	ISO 17025	7.6				
Total Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1.0				
Free Cyanide (Low Level 1 µg/l)	µg/l	1	ISO 17025	< 1				
Sulphate as SO ₄	µg/l	45	ISO 17025	123000				
Ammoniacal Nitrogen as N	µg/l	15	ISO 17025	930				
Ammonia as NH ₃	µg/l	15	ISO 17025	1100				
Dissolved Organic Carbon (DOC)	mg/l	0.1	NONE	8.05				
Hardness - Total	mgCaCO ₃ /l	1	ISO 17025	280				

Total Phenols

Total Phenols (monohydric)	µg/l	1	ISO 17025	3.3				
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Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01				
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01				
Fluorene	µg/l	0.01	ISO 17025	< 0.01				
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01				
Anthracene	µg/l	0.01	ISO 17025	< 0.01				
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Pyrene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01				
Chrysene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 0.01				
Benzo(a)pyrene	µg/l	0.01	ISO 17025	< 0.01				
Indeno(1,2,3-cd)pyrene	µg/l	0.01	NONE	< 0.01				
Dibenz(a,h)anthracene	µg/l	0.01	NONE	< 0.01				
Benzo(ghi)perylene	µg/l	0.01	NONE	< 0.01				

Total PAH

Total EPA-16 PAHs	µg/l	0.16	NONE	< 0.16				
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Analytical Report Number: 17-67634

Project / Site name: Southall

Your Order No: 4586

Lab Sample Number				858033				
Sample Reference				RRCC				
Sample Number				EW9				
Depth (m)				None Supplied				
Date Sampled				14/11/2017				
Time Taken				None Supplied				
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Heavy Metals / Metalloids

Antimony (dissolved)	µg/l	0.4	ISO 17025	1.4				
Arsenic (dissolved)	µg/l	0.15	ISO 17025	1.29				
Barium (dissolved)	µg/l	0.06	ISO 17025	42				
Beryllium (dissolved)	µg/l	0.1	ISO 17025	< 0.1				
Boron (dissolved)	µg/l	10	ISO 17025	88				
Cadmium (dissolved)	µg/l	0.02	ISO 17025	0.05				
Calcium (dissolved)	mg/l	0.012	ISO 17025	91				
Chromium (hexavalent)	µg/l	5	ISO 17025	< 5.0				
Chromium (III)	µg/l	1	NONE	< 1.0				
Chromium (dissolved)	µg/l	0.2	ISO 17025	0.5				
Copper (dissolved)	µg/l	0.5	ISO 17025	6.2				
Lead (dissolved)	µg/l	0.2	ISO 17025	3.4				
Magnesium (dissolved)	mg/l	0.005	ISO 17025	13				
Mercury (dissolved)	µg/l	0.05	ISO 17025	< 0.05				
Nickel (dissolved)	µg/l	0.5	ISO 17025	2.6				
Selenium (dissolved)	µg/l	0.6	ISO 17025	0.9				
Vanadium (dissolved)	µg/l	0.2	ISO 17025	1.6				
Zinc (dissolved)	µg/l	0.5	ISO 17025	27				

Monoaromatics

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

Petroleum Hydrocarbons

TPH-CWG - Aliphatic >C5 - C6	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C6 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aliphatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10				

TPH-CWG - Aromatic >C5 - C7	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C7 - C8	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C8 - C10	µg/l	1	ISO 17025	< 1.0				
TPH-CWG - Aromatic >C10 - C12	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C12 - C16	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C16 - C21	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic >C21 - C35	µg/l	10	NONE	< 10				
TPH-CWG - Aromatic (C5 - C35)	µg/l	10	NONE	< 10				

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



Analytical Report Number : 17-67634

Project / Site name: Southall

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

Stone content of a sample is calculated as the % weight of the stones not passing a 10 mm sieve. Results are not corrected for stone content.

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
858029	TYPE1	ES1	None Supplied	Brown loam with stones.
858030	TYPE1	ES2	None Supplied	Brown loam and sand with stones.
858031	TYPE1	ES3	None Supplied	Brown loam and sand with stones and vegetation.
858032	TYPE1	ES4	None Supplied	Brown loam and sand with stones.

Analytical Report Number : 17-67634

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Ammonia as NH ₃ in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the colorimetric salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Ammoniacal Nitrogen as N in soil	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method, 10:1 water extraction.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	MCERTS
Ammoniacal Nitrogen as N in water	Determination of Ammonium/Ammonia/Ammoniacal Nitrogen by the discrete analyser (colorimetric) salicylate/nitroprusside method. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L082-PL	W	ISO 17025
Boron in water	Determination of boron in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW	In-house method based on MEWAM	L039-PL	W	ISO 17025
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil (Monoaromatics)	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073B-PL	W	MCERTS
BTEX and MTBE in water (Monoaromatics)	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW GW	In-house method based on USEPA8260	L073B-PL	W	ISO 17025
Cr (III) in water	In-house method by calculation from total Cr and Cr VI.	In-house method by calculation	L080-PL	W	NONE
Dissolved Organic Carbon in water	Determination of dissolved inorganic carbon in water by TOC/DOC NDIR Analyser.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L037-PL	W	NONE
Free cyanide (Low level) in soil	Determination of free cyanide by distillation followed by colorimetry.	In-house method	L080-PL	W	ISO 17025
Free cyanide (low level) in water	Determination of free cyanide by distillation followed by colorimetry. Accredited matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Hexavalent chromium in soil (Lower Level)	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method	L080-PL	W	MCERTS
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method by continuous flow analyser. Accredited Matrices SW, GW, PW.	L080-PL	W	ISO 17025
Low level total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	ISO 17025
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Metals in water by ICP-MS (dissolved)	Determination of metals in water by acidification followed by ICP-MS. Accredited Matrices: SW, GW, PW except B=SW,GW, Hg=SW,PW, Al=SW,PW.	In-house method based on USEPA Method 6020 & 200.8 "for the determination of trace elements in water by ICP-MS.	L012-PL	W	ISO 17025
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited Matrices SW, GW, PW, PrW.(Al, Cu,Fe,Zn).	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025

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

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Analytical Report Number : 17-67634

Project / Site name: Southall

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 2, 1990, Chemical and Electrochemical Tests	L019-UK/PL	W	NONE
Monohydric phenols in soil	Determination of phenols in soil by extraction with sodium hydroxide followed by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	MCERTS
Monohydric phenols in water - LOW LEVEL 1 ug/l	Determination of phenols in water by continuous flow analyser. Accredited matrices: SW PW GW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (skalar)	L080-PL	W	ISO 17025
Organic matter (Automated) in soil	Determination of organic matter in soil by oxidising with potassium dichromate followed by titration with iron (II) sulphate.	BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L009-PL	D	MCERTS
pH at 20oC in water (automated)	Determination of pH in water followed by electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	W	ISO 17025
pH in soil (automated)	Determination of pH in soil by addition of water followed by automated electrometric measurement.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L099-PL	D	MCERTS
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in dichloromethane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L102B-PL	W	NONE
Speciated WAC-17 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	NONE
Stones content of soil	Standard preparation for all samples unless otherwise detailed. Gravimetric determination of stone > 10 mm as % dry weight.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK/PL	D	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES. Accredited matrices: SW PW GW, PrW.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-PL	W	ISO 17025
Total cyanide in soil	Determination of total cyanide by distillation followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton (Skalar)	L080-PL	W	MCERTS
Total Hardness of water	Determination of hardness in waters by calculation from calcium and magnesium. Accredited Matrices SW, GW, PW.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L045-PL	W	ISO 17025
Total sulphate (as SO4 in soil)	Determination of total sulphate in soil by extraction with 10% HCl followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
TPHCWG (Soil)	Determination of hexane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L088/76-PL	W	MCERTS
TPHCWG (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-PL	W	NONE

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

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

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