



RPS Health, Safety & Environment, 1st Floor West, Cottons Centre, Cottons Lane, London, SE1 2QG
T +44 (0)20 3117 0900 F +44 (0)20 7939 8098 E glavinr@rpsgroup.com W www.rpsgroup.com

Our Ref: RG/HLEI15948

Date: 8 March 2011

James Bishop
Cathedral Group

By email: j.bishop@cathedralgroup.com

Dear Mr Bishop,

**Geotechnical & Environmental Investigation
Purple Hayes - London Gate, Hayes**

The purpose of this letter report is to provide information on the potential environmental and geotechnical constraints associated with the purchase and redevelopment of the above site. This has been produced on behalf of *Cathedral Group* and their lenders. The basis of this report has comprised the excavation of additional trial pits and boreholes, combined with the interpretation of pre-existing data.

The site is situated to the west of Hayes in an area dominated by mixed commercial/industrial and residential land uses. A Site Location Plan is presented as Figure 1. The current Master Plan comprises the refurbishment of a number of the existing structures, combined with the construction of new residential blocks, office accommodation, an hotel and multi-storey car-parks. Only very limited areas of soft landscaping are illustrated on the master plan. The proposed development plan is presented as Figure 2.

The key aims of the most recent intrusive site investigation were to:

- Undertake an initial geotechnical assessment for preliminary foundation design;
- Investigate subsurface obstructions in the central area of the site; and,
- Investigate the potential for contamination in the eastern area of the site.

Environmental Setting

Geology

Based on British Geological Survey (BGS) 1:50,000 scale survey sheet No 269 and BGS logs for the area the stratigraphic sequence in the vicinity of the site is as follows:

- | | |
|-----------------|--------------|
| • Made Ground | (Quaternary) |
| • Brickearth | (Quaternary) |
| • Taplow Gravel | (Quaternary) |
| • London Clay | (Tertiary) |
| • Lambeth Group | (Tertiary) |
| • Chalk | (Cretaceous) |



Hydrogeology and Hydrology

Groundwater beneath the site rests within the Taplow Gravel, at depths between 3.0 and 3.5 metres below ground level (mbgl). The groundwater flow direction is generally to the south-east, controlled by the topography of the underlying London Clay. The Taplow Gravel is classed as a Principal Aquifer in the vicinity of the site; however, the site is not located within a groundwater source protection zone.

The surface water courses in the vicinity of the site are the Grand Union Canal which is situated approximately 200m to the north of the site and the River Crane which is situated approximately 900m to the southeast of the site.

Site Investigation

The site investigation was carried out in February 2011 and comprised:

- The drilling of four boreholes to a depth of 20 mbgl using cable percussive drilling techniques;
- The installation of two groundwater monitoring wells; and,
- The excavation of eight trial pits.

Boreholes BH103 and BH104 were located within the footprint of the vinyl factory, which is the portion of the site most likely to be affected by ground contamination. This is due to the type and nature of the processes undertaken on site. The other two boreholes were positioned to provide geotechnical data across the remainder of the site. Figure 3 illustrates the location of current and previous exploratory locations. Borehole and trial pit logs are presented as Appendix A.

Ground Conditions

The site investigation identified reinforced concrete hardstanding of considerable thickness (up to 600mm) in the central region of the site. The investigation also identified sizeable sub-surface tunnels and utility trenches in this area. The thickness of hard standing is illustrated on Figure 4, which also indicates the location of identified underground structures (note, a GPR survey has been undertaken which should also be referred to when considering the presence of underground structures). Of note, sub-surface concrete slabs were identified in the vicinity of Neptune House (BH01, BH05, TP5) at a depth of 2.0 mbgl, in the vicinity of BH101 at a depth of 1.2 mbgl and in the vicinity of BH09 at 1.6 mbgl.

Beneath the surfacing layer, Made Ground was encountered across the site to depths of between 0.4m and 2.6m bgl. The Made Ground comprised both granular and cohesive material with varying proportions of brick, concrete, ash and clinker.

Brickearth, typically comprising sandy clay with flint gravel, was encountered in a number of the boreholes. The clay was described as soft to firm. The deposit was not laterally continuous across the site and was more prevalent in the boreholes drilled in the western area. A maximum thickness of 2.4m of Brickearth was encountered in borehole BH10, in the western half of the site.

The Taplow Gravel Formation was encountered beneath the Made Ground and Brickearth across the site at depths of between 0.4m and 2.8m bgl. The deposit typically comprised sandy gravel. SPT N values within the deposit ranged from N= 17 to N>50, corresponding to a range from medium dense to very dense compaction. The base of the Taplow Gravel was encountered in the deeper boreholes at depths of between 3.8 and 8.2m bgl.

The London Clay, encountered beneath the Taplow Gravel in the deeper boreholes, was found to comprise typically stiff, brown and blue/grey clay with variable silty and sandy layers. The base of the deposit was not encountered during the site investigation. SPT N values within the deposit ranged from N= 18 to N = 50. Approximate shear strengths were calculated from the SPT results using the formula:

$$C = f_1 \times N$$

where, for high plasticity clays, $f_1 = 4.5$ (after Stroud, 1975).

Calculated shear strengths for the London Clay range from 81kN/m² to 225kN/m², corresponding to a range from stiff to very stiff consistency.

Visual and Olfactory Evidence of Contamination

Visual and olfactory evidence of contamination by petroleum hydrocarbons was identified below the groundwater water table in the Taplow Gravel Formation at depths between 3.0 mbgl and 5.10 mbgl in boreholes BH103 and BH104. A thin veneer (<10mm) of free phase product was also identified in BH07, which was installed during the previous site investigation.

Preliminary Geotechnical Assessment

The proposed development comprises a mixed use scheme, with a combination of both low rise and high rise buildings with associated multi-storey car parks. A proposed development plan is presented as Figure 2.

Shallow Foundations

Due to the inherent variability of the Made Ground, it is not considered suitable as a bearing layer without treatment. The underlying Brickearth was described as soft to firm, and therefore is also unlikely to provide a suitable bearing layer for shallow foundations. Furthermore, the Brickearth is not laterally consistent and, in order to minimise differential settlements, all foundations for a single unit should be designed to bear within the same deposit.

For low-rise buildings (fewer than three storeys), traditional strip foundations bearing within the Taplow Gravel are likely to be appropriate. The foundations should fully penetrate the Made Ground and the Brickearth and extend at least 150mm into the bearing layer. Foundation depths of up to 2m bgl would be required across the majority of the site. However, in the western area, foundations may need to be deepened. The formation layer should be inspected by a qualified engineer for cohesive or loose pockets and to confirm the gravels are of the required density. If soft or loose pockets are encountered, these should be excavated and replaced with suitably compacted granular material or alternatively the foundations could be taken deeper in order to bear upon a suitable layer.

Groundwater within the Taplow Gravel was typically found to be resting at depths greater than 3m bgl. Significant groundwater control measures are therefore unlikely to be required during foundation construction, unless excavations to depths greater than 3m are proposed. However, the adopted bearing pressures should allow for the shallow groundwater.

For the taller structures proposed on site, piled foundations will be adopted. Where strip foundations need to be deepened to more than 2.5m bgl, it may be more cost effective to consider a piled solution once the piling rig has been mobilised to site.

Piled Foundations

The proposed development comprises a number of multi-storey carparks and a number of buildings with more than three storeys are also proposed. Piled foundations are likely to be appropriate for these structures. Either driven or bored piles may be considered. However, driven piles may refuse within the dense Taplow Gravel at shallow depths and therefore bored piles may be a more appropriate option. A specialist piling contractor should be consulted in this regard.

A number of underground tunnels are located beneath the central section of the site. Prior to piling, it will be necessary to ensure that the piling process will not impact on the integrity of the tunnels. In addition to the tunnels, a number of other obstructions were encountered beneath the site. Some pre-pile probing would therefore be prudent in order to assess the feasibility of the proposed pile locations.

A preliminary assessment of pile working loads has been made, assuming the use of bored piles and the ground model presented in Table 1, below. This assessment is for preliminary guidance only and should be confirmed with a specialist piling contractor prior to construction. Furthermore, average ground conditions for the site have been assumed and the detailed design should take into account the variable thickness of the shallow deposits across the site.

Table 1. Ground model used for preliminary pile calculations

Strata	Depth z (m bgl)	SPT N (average)	Average undrained shear strength C_u kN/m^2	Adhesion factor α
Made Ground/ Brickearth	0.0-1.5	Ignored in assessment, except to provide unit weight		
Taplow Gravel	1.5-5.0	50		
London Clay	1.5-10		115	0.45

The Made Ground and Brickearth have been ignored in the assessment, other than applying an assumed unit weight. The calculations have been made for individual piles and the action of groups of piles has not been considered. Potential settlements associated with pile groups should be considered in the detailed design.

A summary of the calculated working loads for bored piles is presented in Table 2, below. The calculated safe working loads are for preliminary design purposes only and specialist piling contractors should be consulted with regards to the design and performance of their foundations.

Table 2. Summary of preliminary pile working loads

Pile length	Pile Diameter		
	300mm	450mm	600mm
15m	250kN	360kN	470kN
18m	330kN	530kN	700kN

Floor Slabs

Where Made Ground is present to depths of greater than 0.6m, NHBC guidelines recommend adopting suspended floor slabs. However, following ground improvement across the building footprint, ground bearing slabs could also be considered.

Excavations

Excavation through the Made Ground, Brickearth and the Taplow Gravel should be possible with conventional earth moving plant. However, a number of below ground concrete structures have been identified and it is likely that a mechanical breaker would be required in order to remove these where necessary. Excavations in granular deposits are unlikely to remain stable and shoring or battering systems may be required. Shoring will be mandatory where access is required for construction personnel. It is recommended that trial pitting be carried out in the vicinity of proposed deeper foundations prior to the start of the development, in order to confirm the likely stability of the trenches.

Environmental Assessment

Soil Analytical Data

The analytical data has been assessed for potential risks to human health using Site Specific Assessment Criteria (AC) derived using CLEA v1.06 and the most appropriate contaminant and exposure data. The analytical data is presented as Appendix B. The assessment has been based upon the new Master Plan which comprises mixed use residential and commercial landuses. As a conservative measure, and in recognition of the integrated nature of the proposed development,

screening values for a residential end use, without private gardens have been adopted. Based on the analytical data, a pH value of 8.22 and a soil organic matter of 1.9% were used for the modelling process. A copy of the CLEA model input and output data is presented as Appendix C.

The data from the current and previous site investigations have been compared to the relevant acceptance criteria.

A range of polyaromatic hydrocarbons (PAH) were identified concentrations in excess of the screening criteria in several of the samples collected during the September 2010 investigation. Figure 5 illustrates the spatial distribution of elevated contaminant concentrations, which are also summarised in Table 3. The analytical data is presented in full in Appendix B.

Table 3. Elevated contaminant concentrations based on residential landuse.

Contaminant	AC	Mean	Maximum	Exceedances
	(mg/kg)			(No)
Arsenic	35	13.6	87	1 (29)
Lead	271	70	420	2 (29)
Nickel	127	31.4	170	1 (29)
Benzo(a)anthracene	4.81	4.9	62	4 (29)
Chrysene	9.53	4.1	57	2 (29)
Benzo(b)fluoranthene	7.19	6.1	80	3 (29)
Benzo(k)fluoranthene	10.2	3.0	49	2 (29)
Benzo(a)pyrene	1.02	4.4	60	8 (29)
Indeno(1,2,3-cd)pyrene	4.31	3.1	44	3 (29)
Dibenz(a,h)anthracene	0.899	0.9	14	4 (29)
TPH (Aro C21-C35)	1,330	167.7	1,600	1 (29)

Contamination appears to be restricted to the shallow Made Ground and found in association with fragments of ash and clinker, with little evidence of deeper impact, or the potential to impact upon groundwater quality. However, the presence of shallow contamination would result in a requirement for the provision of clean topsoil in areas of sot landscaping, and may limit the use of infiltration solutions.

In addition, the levels of phytotoxic contaminants in shallow soils are such that a clean growing medium should be provided to any areas of planting.

Groundwater Analytical Data

The site is situated on a Principal Aquifer associated with the Taplow Gravel Formation. As a result, groundwater analytical data have therefore been compared to the UK Drinking Water Standards. The screening levels used for the assessment of groundwater are presented in Appendix C.

Samples of groundwater were collected from monitoring wells BH03, BH08, BH011 and BH15 on 14th September 2010 and were analysed for a wide range of potential contaminants. No elevated contaminant concentrations were identified in these groundwater samples.

Samples collected from monitoring wells BH03, BH08, BH11, BH103 and BH104 on 23rd February 2011 were analysed for a wide range of contaminants including metals, hydrocarbons and volatile organic compounds. Elevated concentrations of aliphatic (C10-C35) and aromatic (C16-C35) hydrocarbons were identified in the samples collected from monitoring wells BH103 from BH104. This correlates to the visual and olfactory evidence of contamination identified during advancement of these boreholes.

The samples collected from monitoring well BH104 also contained detectable concentrations of 1,1,2-Trichloro1,2,2-trifluoroethane (23 µg/l) and Cis-1,2-dichloroethene (1.2 µg/l). The samples collected from BH08 contained a detectable concentration of tetrachloroethene (5.9 µg/l). No suitable screening criteria exist for these compounds.

Slightly elevated concentrations of nickel were also recorded in one sample collected from borehole BH103.

Ground Gas Assessment

Ground gas monitoring was undertaken on three occasions during September 2010 and on two occasions during February 2011. Installations were monitored for concentrations of volatile gases (calibrated to methane), carbon dioxide and oxygen. The ground gas monitoring data is presented in Appendix D.

Concentrations of volatile gases in excess of 100% v/v have been identified in monitoring well BH07. This is likely to be the result of the breakdown of hydrocarbons in groundwater in this borehole (indicating that biodegradation is likely to be occurring beneath the site). In order to assess the gas risk to the site as a whole, the data from borehole BH07 has been excluded, but it is apparent that localised remediation or mitigation measures will be required.

CIRIA Report C665 'Assessing risks posed by hazardous ground gases to buildings' outlines indicative guideline concentrations for carbon dioxide and methane in association with gas flow rates for which gas protection measures may be required in new residential or commercial developments. The maximum recorded concentration of methane identified on the site was 2.1% v/v (BH15). The maximum-recorded concentration of carbon dioxide was 7.3% v/v (BH103). The maximum flow rate identified in the residential zone of the site was 0.3 l/hr.

The methodology of assessing gas risk for any development other than low rise housing is based on the Modified Wilson and Card approach that characterises the gas regime into a series of Characteristic Situations (1 to 5), with corresponding indicative gas protection measures. Using this methodology, the ground gas regime associated with the site corresponds to Characteristic Situation 1, whereby no specific gas protection measures are required. However, due to the concentrations of carbon dioxide, which are greater than 5%, gas protection measures to new buildings should be considered and it is recommended that these are incorporated into the cost plan.

The potential gas risk to existing buildings is likely to be low once the hydrocarbon contamination in the vicinity of the vinyl factory has been remediated.

Risk Assessment

The UK approach to the management of land contamination is a risk-based approach as implemented by Part IIA of the Environmental Protection Act (1990). Part IIA identifies that harm to human health and the environment arises not solely from the presence of contaminating substances or 'sources', but from their migration along a 'pathway' to where they can impact a 'receptor'.

Contamination of shallow soils has been recorded in a number of the historical and current boreholes. This contamination is generally associated with fragments of ash and clinker within the made ground, and as a result, is likely to be of limited mobility and availability. The contamination has the potential to represent a risk to both future site users and plants or shrubs. In the site's current state, the extensive hard standing will prevent contact with contaminated soils or the generation of contaminated dust. However, under the proposed development areas of soft landscaping should be provided with a minimum of 300 mm of clean imported topsoil. Should it be proposed to cultivate vegetables or other home grown produce, this should increase to 600 mm.

The contamination encountered in shallow soils does not appear to be sufficiently mobile to represent a potential risk to controlled waters; however, the use of soak-aways may be restricted in certain areas of the site.

Groundwater contamination was encountered in association with the vinyl factory. There are two types of contaminants, chlorinated solvents and petroleum hydrocarbons. The highly porous nature of the made ground and underlying gravels means that any discharge of contaminated fluids will impact directly upon groundwater, with very little impact upon soils. It appears that the hydrocarbon contamination is the result of ongoing processes on site, with the exhaust from a diesel generator as well as fuel storage tanks likely to be the principal culprits. Chlorinated solvents are likely to be the result of spillages or leaks on site. Given that groundwater is classed as a Principal Aquifer, remediation will be required. This should comprise the adaptation of current processes to stop ongoing contamination, integrity testing and repair of all chemical and fuel storage tanks, the construction of bunded areas for chemical storage, combined with the remediation of contaminated groundwater. Once the source of contamination has been stopped, this will most likely comprise the pumping and subsequent treatment/disposal of groundwater as well as treatment of the saturated zone.

The gas risk assessment indicates that, whilst ground gas represents a low risk, gas protection measures are likely to be required in new buildings and an allowance should be made in the cost plan.

Contaminant concentrations in shallow soils are such that upgraded services will be required as part of the proposed development, again, this should be incorporated into the cost plan.

Conclusions & Recommendations

For proposed low-rise buildings, shallow foundations bearing within the Taplow Gravel are likely to be appropriate. Foundation depths of less than 2m should be achievable across the majority of the site. However, where Made Ground and Brickearth extend to depths greater than 2.5m bgl, piled foundations may be more cost effective.

For buildings more than three storeys tall, piled foundations should be adopted. Driven piles may refuse within the dense Taplow Gravel at shallow depths and therefore bored piles into the London Clay are likely to be more appropriate. A specialist piling contractor should be consulted in this regard.

A number of underground tunnels are located beneath the central portion of the site. Prior to construction, confirmation should be sought that piling will not affect the integrity of the tunnels. Concrete obstructions were also encountered within the Made Ground across the site. Pre-pile probing would be prudent in order to confirm the feasibility of the proposed pile locations.

From an environmental perspective, there are a number of areas, which should be given consideration as part of the cost plan. These are:

1. Contamination of shallow soils; as a result, the provision of clean 300mm should be allowed in areas of soft landscaping. This should be increased to 600 mm if it is proposed to cultivate vegetables etc. (allow £23 per m³ of import).
2. The provision of upgraded services, specifically for potable water.
3. It is likely that gas protection measures will be required in new buildings (allow an extra-over cost of £9 per m² of building footprint). The potential gas risk to existing buildings is likely to be low once the hydrocarbon contamination in the vicinity of the vinyl factory has been remediated.
4. Contamination of groundwater has been encountered in the vicinity of the vinyl factory. Remediation of this area will be required as part of the redevelopment of the site. Based upon experience of similar remediation schemes, the likely remedial costs for this will be in



the region of £350,000 to £450,000. In addition, the processed on this portion of the site should be modified to prevent ongoing contamination.

The greatest environmental risk is associated with the contamination of groundwater; however, depending upon the terms of the lease, it may be possible to require the current tenant to remediate any contamination resulting from their operations.

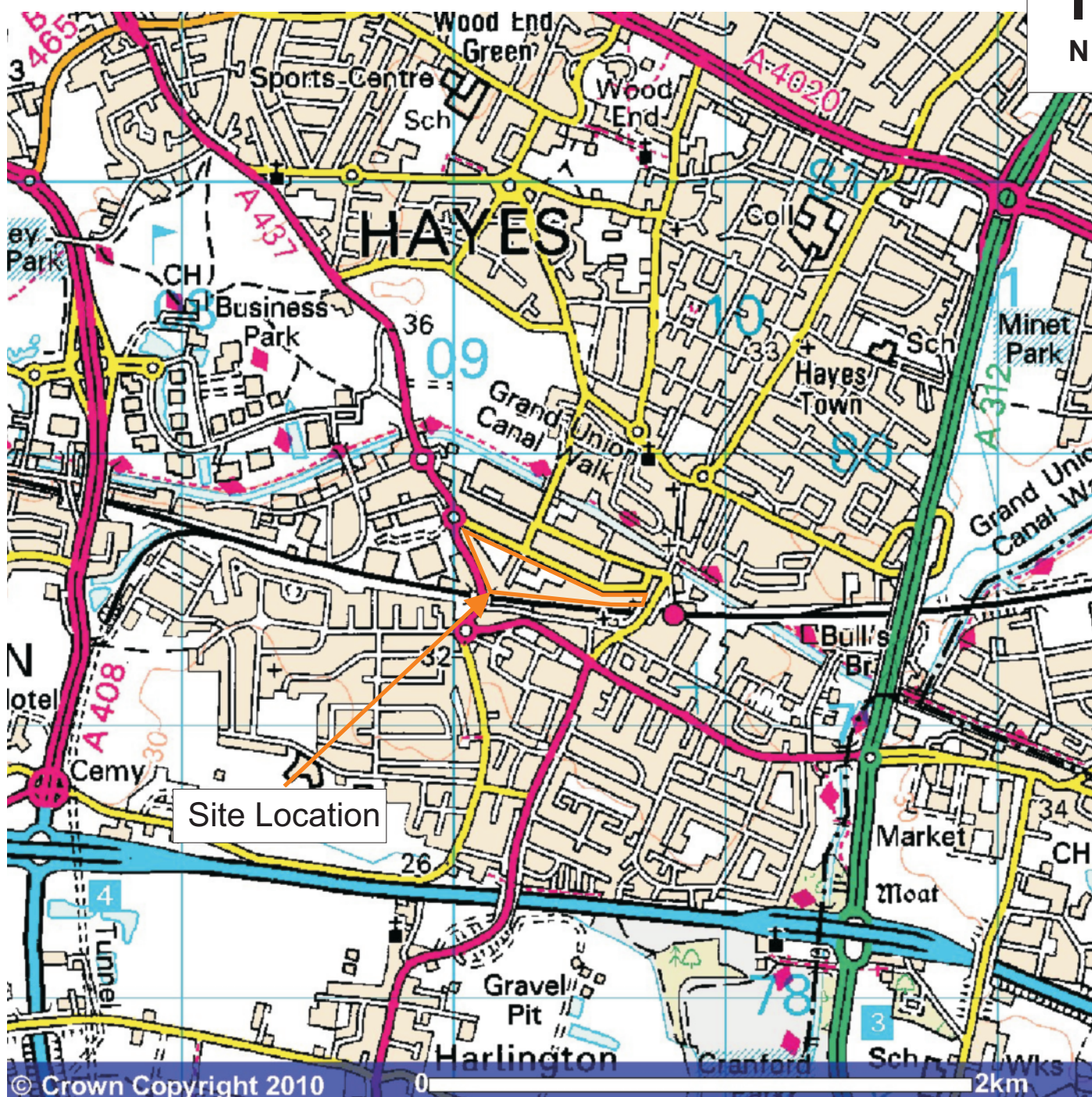
Please do not hesitate to contact me if you wish to discuss these matters in detail.

Yours sincerely,
for RPS Health, Safety & Environment

A handwritten signature in black ink, appearing to read 'R Glavin'.

Rob Glavin
Technical Director

Encl.	Figure 1	Site Location Plan
	Figure 2	Proposed Development Plan
	Figure 3	Exploratory Hole Location Plan
	Figure 4	Sub-surface Obstructions
	Figure 5	Identified Contamination
	Appendix A	Exploratory Hole Logs
	Appendix B	Analytical Data
	Appendix C	Assessment Criteria
	Appendix D	Field Monitoring Data



RPS

Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
 T 0161 2373315 F 0161 2373315 W www.rpsgroup.com

Client: Cathedral Group

Project: Purple Hayes

Title: Site Location Plan

Date: March 2011

Scale: NTS

Figure: 1

Rev: 1

Job Ref: RCEI15708



Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T 01612373315 F 0161 2373315 W www.rpsgroup.com

Client: Cathedral Group

Project: Purple Hayes

Title: Proposed Site Plan

Date: March 2011

Scale: NTS

Drawn: JR

Checked: AC

Job Ref: RCEI15708

Figure Number: 2

Rev: 2

www.rpsgroup.com



-  Trial Pit
-  Window Sample
-  Borehole 2010
-  Borehole 2011



Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T 01612373315 F 0161 2373315 W www.rpsgroup.com

 Client: Cathedral Group

Project: Purple Hayes

Title: Borehole Location Plan

Date: March 2011

Scale: NTS

Drawn: JR

Checked: AC

Job Ref: RCEI15708

 Figure Number: 3

Rev: 2

www.rpsgroup.com



-  Trial Pit
-  Window Sample
-  Borehole 2010
-  Borehole 2011
-  Manhole
-  Underground Tunnel
-  Covered Utilities Trench
-  Concrete Obstruction (Undefined) Depth Annotated
- (0.00) Approximate Thickness of Concrete at Surface (mbgl)



Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T 01612373315 F 0161 2373315 W www.rpsgroup.com

Client: Cathedral Group	
Project: Purple Hayes	
Title: Subsurface Obstructions	
Date: March 2011	Scale: NTS
Drawn: JR	Checked: AC
Job Ref: RCEI15708	
Figure Number: 4	Rev: 2



- Window Sample
- Borehole 2010

Contaminant	AC
1) Benzo(a)anthracene	4.81
2) Chrysene	9.53
3) Benzo(b)fluoranthene	7.19
4) Benzo(k)fluoranthene	10.2
5) Benzo(a)pyrene	1.02
6) Indeno(1,2,3-cd)pyrene	4.31
7) Dibenzo(a,h)anthracene	0.899
8) Arsenic	35
9) Lead	271
10) Nickel	127
11) TPH7 - Aromatic >C21 - C35	1330



Unit 12, Watersedge Business Park, Modwen Road, Salford Quays, M5 3EZ
T 01612373315 F 0161 2373315 W www.rpsgroup.com



Client: Cathedral Group

Project: Purple Hayes

Title: Elevated Soil Contaminants

Date: March 2011

Scale: NTS

Drawn: JR

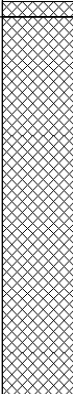
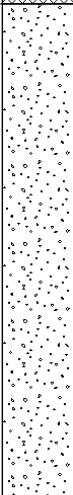
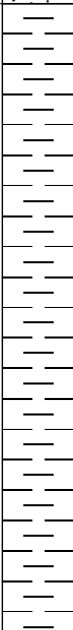
Checked: AC

Job Ref: RCEI15078

Figure Number: 5 Rev: 2

Appendix A

Exploratory Hole Logs

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Borehole Number BH101	
		Boring Method Cable Percussion		Casing Diameter 150mm cased to 6.10m		Ground Level (mOD)		Client J E R Partners	
		Location		Dates 22/02/2011		Engineer Aaron Cousins		Job Number 13784	
								Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.30	B1					(0.10) 0.10	Bitumen bonded aggregate. [Made Ground]		
0.80	B2						Dark Brown ashy sandy GRAVEL of flint with fragments of brick, concrete and clinker. [Made Ground]		
1.20-1.65 1.20-1.70	CPT N=9 B3			2,4/2,2,3,2		(2.50)			
2.20-2.65 2.20-2.70	CPT N=20 D4			1,3/2,2,4,12		2.60	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]		▽1
3.20-3.65 3.20-3.70	CPT N=50 B5			5,8/13,14,15,8					
4.20-4.65 4.20-4.70	CPT N=50 D6			8,14/17,20,13 Water strike(1) at 4.50m.		(3.25)			
5.50-5.95 5.50-5.85	CPT N=17 B7			5,7/6,5,3,3		5.85	Stiff to very stiff dark grey CLAY. [London Clay Formation]		
5.85-6.00 6.00-6.45	B8 U9								
6.50	D10								
7.00-7.50	B11								
7.50-7.95 7.50	SPT N=18 D12			1,2/4,4,4,6					
9.00-9.45 9.00	SPT N=20 D13			2,3/4,4,6,6					
Remarks Hand excavated to 1.2 m.bgl. No monitoring well installed. Water added from 2.60m to 5.00m.								Scale (approx) 1:50	Logged By AC
								Figure No. 13784.BH101	

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes		Borehole Number BH101	
		Boring Method Cable Percussion		Casing Diameter 150mm cased to 6.10m		Ground Level (mOD)		Client J E R Partners		Job Number 13784
		Location		Dates 22/02/2011		Engineer Aaron Cousins		Sheet 2/2		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	
10.50-10.95	U14									
11.00	D15									
12.00-12.45 12.00	SPT N=22 D16			2,4/5,5,6,6						
13.50-13.95 13.50	SPT N=25 D17			3,4/5,6,7,7						
15.00-15.40	U18					(14.15)				
15.45	D19									
16.00-16.45 16.00-16.50	SPT N=50 B20			5,19/36,14						
18.00-18.45 18.00	SPT N=27 D21			5,3/5,6,8,8						
19.50-19.80	U22									
19.85	D23					20.00				
Remarks								Scale (approx) 1:50	Logged By AC	
								Figure No. 13784.BH101		

RPS		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Borehole Number BH102			
Boring Method Cable Percussion		Casing Diameter 150mm cased to 7.60m		Ground Level (mOD)		Client J E R Partners		Job Number 13784			
		Location		Dates 22/02/2011- 23/02/2011		Engineer Aaron Cousins		Sheet 1/2			
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water		
0.30	B1					(0.10)	Bitumen bonded aggregate. [Made Ground]				
						0.10	Concrete. [Made Ground]				
						(0.10)					
						0.20					
0.80	B2					(0.90)	Dark Brown ashy sandy GRAVEL of flint with fragments of brick and concrete. [Made Ground]				
1.20-1.65 1.20	CPT N=49 B3			7,7/12,14,23		1.10	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]				
2.10-2.55 2.10	CPT N=50 B4			7,9/13,18,19							
3.00-3.45 3.00	CPT N=50 B5			9,14/16,20,14							
4.00-4.45 4.00	CPT N=50 B6			3,6/8,12,17,13		(5.55)					
5.00-5.45 5.00	CPT N=47 B7			5,10/10,10,13,14 Water strike(1) at 5.10m.							
6.50-6.95 6.50	CPT N=17 B8			5,4/3,4,4,6		6.65	Stiff to very stiff dark grey CLAY. [London Clay Formation]				
7.50	D9										
8.00 8.00-8.25 8.30-8.75 8.30	D10A B10 SPT N=30 D11			24,14/6,6,8,10							
9.25	D13										
9.50-9.75	U12										
Remarks No monitoring well installed. Hand excavated to 1.2 m.bgl. Water added from 1.20m to 6.65m.								Scale (approx) 1:50			Logged By AC
								Figure No. 13784.BH102			



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

**Borehole
Number
BH102**

Boring Method
Cable Percussion

Casing Diameter
150mm cased to 7.60m

Ground Level (mOD)

Client
J E R Partners

Job Number
13784

Location

Dates	22/02/2011- 23/02/2011
--------------	---------------------------

Engineer
Aaron Cousins

Sheet
2/2

Depth
(m)

Sample / Tests

Casing
Depth
(m)Water
Depth
(m)

Field Records

Level
(mOD)

Depth
(m)
(Thickness)

Description

Legend

Water

(13.35)

20.00

Remarks

Scale (approx)

1:50

Logged
By

AC

Figure No.
13784.BH102

RPS		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes			Borehole Number BH103		
Boring Method Cable Percussion		Casing Diameter 150mm cased to 5.50m			Ground Level (mOD)		Client J E R Partners			Job Number 13784	
		Location			Dates 21/02/2011		Engineer Aaron Cousins			Sheet 1/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
0.30	B1					(0.10) 0.10 (0.20) 0.30	Bitumen bonded aggregate. [Made Ground] Reinforced concrete. [Made Ground]				
0.80	B2					(1.20)	Dark Brown ashy sandy GRAVEL of flint with fragments of brick, concrete and clinker. [Made Ground]				
1.20-1.65 1.20-1.70	CPT N=50 B3			5,16/31,19		1.50	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]				
2.20-2.65 2.20-2.70	CPT N=50 D4			1,18/35,15							
3.20-3.65 3.20-3.70	CPT N=50 B5			6,12/16,15,19		(3.60)	Hydrocarbon contamination between 3.2 m.bgl and 5.1 m.bgl.				
4.20-4.65 4.20-4.70	CPT N=50 D6			5,13/15,17,18 Water strike(1) at 4.50m.							
5.10-5.50	B7					5.10	Stiff to very stiff dark grey CLAY. [London Clay Formation]				
5.50-5.95	U8										
6.00	D9										
6.50-7.00	B10										
7.00-7.45 7.00	SPT N=21 D11			2,2/4,5,6,6							
8.50-8.95 8.50	SPT N=23 D12			2,3/4,6,6,7							
Remarks Hand excavated to 1.2 m.bgl. Water added from 1.20m to 5.10m.								Scale (approx) 1:50	Logged By AC		
								Figure No. 13784.BH103			

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes		Borehole Number BH103	
Boring Method Cable Percussion		Casing Diameter 150mm cased to 5.50m			Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location			Dates 21/02/2011		Engineer Aaron Cousins		Sheet 2/2	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
10.00-10.45	U13									
10.50	D14									
11.50-11.95 11.50	SPT N=25 D15			3,4/5,6,7,7						
13.00-13.45 13.00	SPT N=27 D16			3,5/6,7,7,7						
14.50-14.95	U17									
15.00	D18					(14.90)				
16.00-16.45 16.00	SPT N=28 D19			3,4/6,7,7,8						
17.50-17.95 17.50	SPT N=29 D20			3,5/6,7,8,8						
19.00-19.45	U21									
19.50-19.95 19.50 19.50	SPT N=33 D23 D22			5,5/7,8,8,10		20.00				
Remarks								Scale (approx) 1:50	Logged By AC	
								Figure No. 13784.BH103		

RPS		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes			Borehole Number BH104		
Boring Method Cable Percussion		Casing Diameter 150mm cased to 6.30m			Ground Level (mOD)		Client J E R Partners			Job Number 13784	
		Location			Dates 21/02/2011- 22/02/2011		Engineer Aaron Cousins			Sheet 1/3	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
0.30	B1					(0.10) 0.10 (0.25) 0.35	Bitumen bonded aggregate. [Made Ground]				
0.80	B2					(0.95)	Reinforced concrete. [Made Ground]				
1.20-1.65 1.20	CPT N=24 B3			1,2/5,6,5,8		1.30	Dark Brown ashy sandy GRAVEL of flint with fragments of brick, concrete and clinker. [Made Ground]				
2.00-2.45 2.00	CPT N=50 B4			12,13/25,25			Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]				
3.00-3.45 3.00	CPT N=50 B5			3,6/9,14,16,11		(4.20)	Hydrocarbon contamination between 3.0 m.bgl and 5.5 m.bgl.				
4.00-4.45 4.00	CPT N=42 B6			4,6/9,9,12,12							
5.00-5.45 5.00	CPT N=29 B7			8,13/7,9,6,7							
5.60	D8			Water strike(1) at 5.60m.		5.50	Stiff to very stiff dark grey CLAY. [London Clay Formation]		Σ1		
6.50-6.95	U9										
6.95	D10										
8.00-8.45 8.00	SPT N=34 D11			3,5/6,8,9,11							
9.00	D12										
9.50-9.90	U13										
9.90	D14										
Remarks Hand excavated to 1.2 m.bgl. Chiselling from 1.20m to 5.50m.								Scale (approx) 1:50	Logged By AC		
								Figure No. 13784.BH104			

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes		Borehole Number BH104	
		Boring Method Cable Percussion		Casing Diameter 150mm cased to 6.30m		Ground Level (mOD)		Client J E R Partners		Job Number 13784
		Location		Dates 21/02/2011- 22/02/2011		Engineer Aaron Cousins		Sheet 2/3		
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
11.00-11.45 11.00	SPT N=25 D15			5,5/5,6,6,8						
12.00	D16									
12.50-12.95	U17									
12.95	D18									
14.00-14.45 14.00	SPT N=40 D19			6,6/8,10,11,11						
15.00	D20					(14.50)				
15.50-15.95	U21									
15.95	D22									
17.00-17.45 17.00 17.20	SPT N=32 D24 W23			3,6/6,7,8,11						
18.00	D25									
18.50-18.95	U26									
18.95	D27									
20.00-20.45	SPT N=41			5,7/8,9,12,12		20.00				
Remarks								Scale (approx) 1:50	Logged By AC	
								Figure No. 13784.BH104		

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes			Borehole Number BH104	
Boring Method Cable Percussion		Casing Diameter 150mm cased to 6.30m			Ground Level (mOD)		Client J E R Partners			Job Number 13784	
		Location			Dates 21/02/2011- 22/02/2011		Engineer Aaron Cousins			Sheet 3/3	
Depth (m)	Sample / Tests	Casing Depth (m)	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
20.00	D28										
Remarks								Scale (approx)	Logged By		
								1:50	AC		
								Figure No. 13784.BH104			



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

**Trial Pit
Number**
TP1

Trial Pit

Location

Dates

J E R Partners

Job Number
13784

22/02/2011

Aaron Cousins

1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

Bitumen bonded aggregate. [Made Ground]

Reinforced concrete beam. [Made Ground]

Complete at 0.30m

No groundwater encountered.
Trial pit identified concrete beam over tunnel.

1.25

AC

13784 TP1



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

**Trial Pit
Number**
TP2

Trial Pit

Location

Dates

J E R Partners

Job Number
13784

22/02/2011

Aaron Cousins

1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

Bitumen bonded aggregate. [Made Ground]

Reinforced concrete beam. [Made Ground]

Complete at 0.30m

No groundwater encountered.
Trial pit identified concrete beam over tunnel.

1:25

AC

13784.TP2



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

**Trial Pit
Number**
TP3

Trial Pit

Location

Dates

J E R Partners

Job Number
13784

22/02/2011

Aaron Cousins

1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

Bitumen bonded aggregate. [Made Ground]

Reinforced concrete. [Made Ground]

Complete at 0.35m

No groundwater encountered.
Trial pit terminated at 0.35 m.bgl as breaker broke down.

1.25

AC

13784 TP3



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

Site
London Gate, Blyth Road, Haves

**Trial Pit
Number**
TP4

Excavation Method
Trial Pit

Dimensions

Ground Level (mOD)

Client	J E R Partners
---------------	----------------

Job Number
13784

Location

Dates	22/02/2011
--------------	------------

Engineer
Aaron Cousins

Sheet
1/1

Depth
(m)

Sample / Tests

Water
Depth
(m)

Field Records

Level
(mOD)Depth
(m)
(Thickness)

Description

Legend

Water

(0.05)

0.05

(0.25)

(0125)

0.30

Bitumen bonded aggregate. [Made Ground]

Reinforced concrete. [Made Ground]

Complete at 0.30m

Plan

Remarks

No groundwater encountered.
Unknown pipe identified at 0.3 m.bgl, did not want to break. Terminated at 0.3m.bgl.

Scale (approx)

1:25

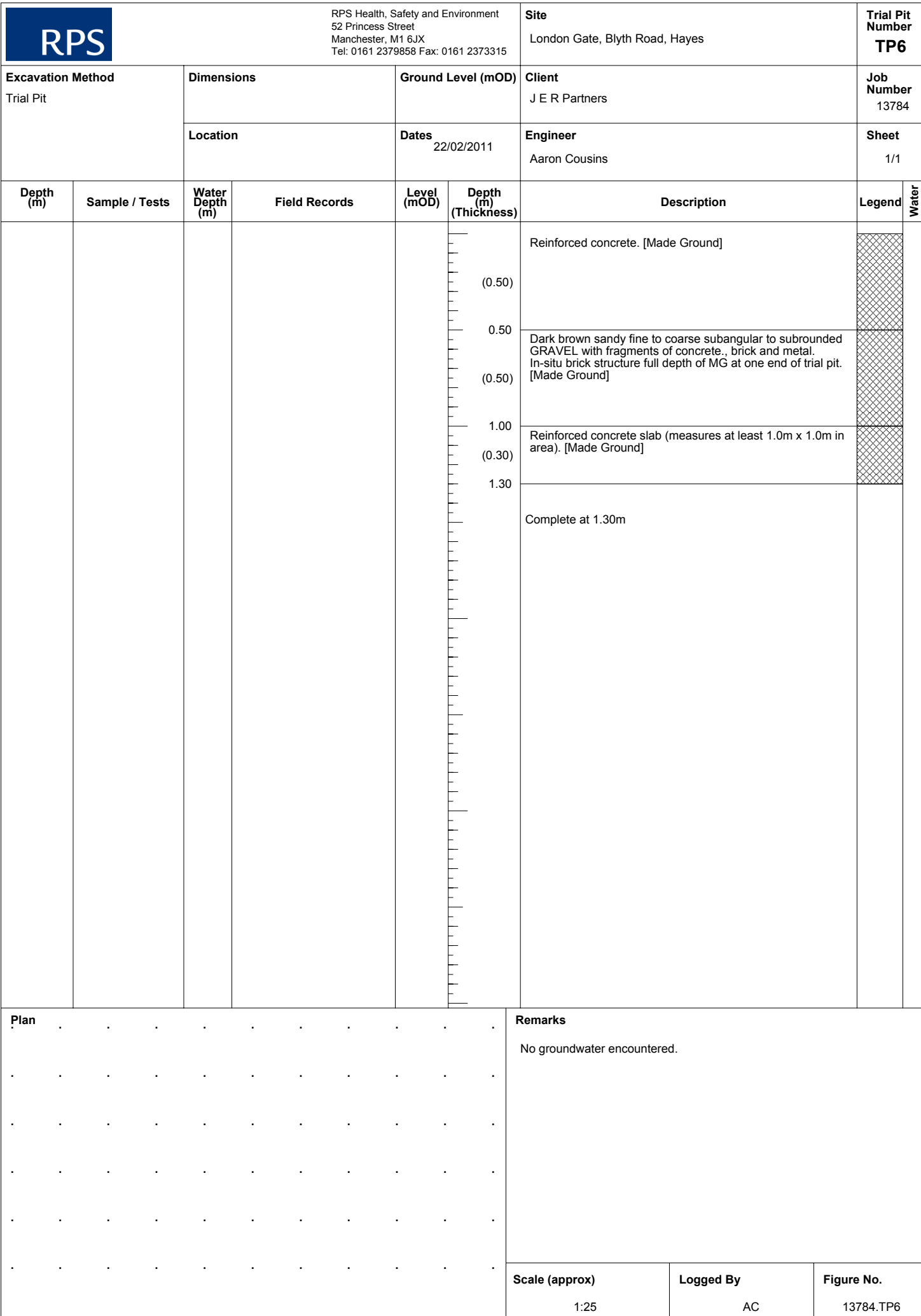
Logged By

AC

Figure No.

13784.TP4

				RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes				Trial Pit Number TP5	
Excavation Method Trial Pit			Dimensions			Ground Level (mOD)		Client J E R Partners			Job Number 13784		
			Location			Dates 22/02/2011		Engineer Aaron Cousins			Sheet 1/1		
Depth (m)	Sample / Tests	Water Depth (m)	Field Records		Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water		
0.50	S1					(0.30) 0.30	Black ashy fine to coarse SAND with fine to coarse subangular gravel of brick and concrete. [Made Ground]						
						(1.70)	Dark brown sandy fine to coarse subangular to subrounded GRAVEL with fragments of concrete., brick, metal up to 500mm in diameter. [Made Ground]						
						2.00 (0.10) 2.10	Reinforced concrete slab (measures at least 1.5m x 1.0m in area). [Made Ground]						
						Complete at 2.00m							
Plan							Remarks						
.							No groundwater encountered.						
.													
.													
.													
.													
.							Scale (approx)		Logged By		Figure No.		
							1:25		AC		13784.TP5		





RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

Trial Pit Number
TP7

Trial Pit

Location

Dates

J E R Partners

Sheet
1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

Reinforced concrete. [Made Ground]

Black ashy fine to coarse sand and gravel with brick and concrete fragments. [Made Ground]

Complete at 1.20m

No groundwater encountered.

1:25

AC

13784.TP7



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

**Trial Pit
Number**
TP8

Trial Pit

Location

Dates

J E R Partners

Job Number
13784

22/02/2011

Aaron Cousins

1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Description

Legend

Water

Bitumen bonded aggregate. [Made Ground]

Black/dark brown ashy sand with fragments of brick and concrete. [Made Ground]

Reinforced concrete. [Made Ground]

Complete at 0.50m

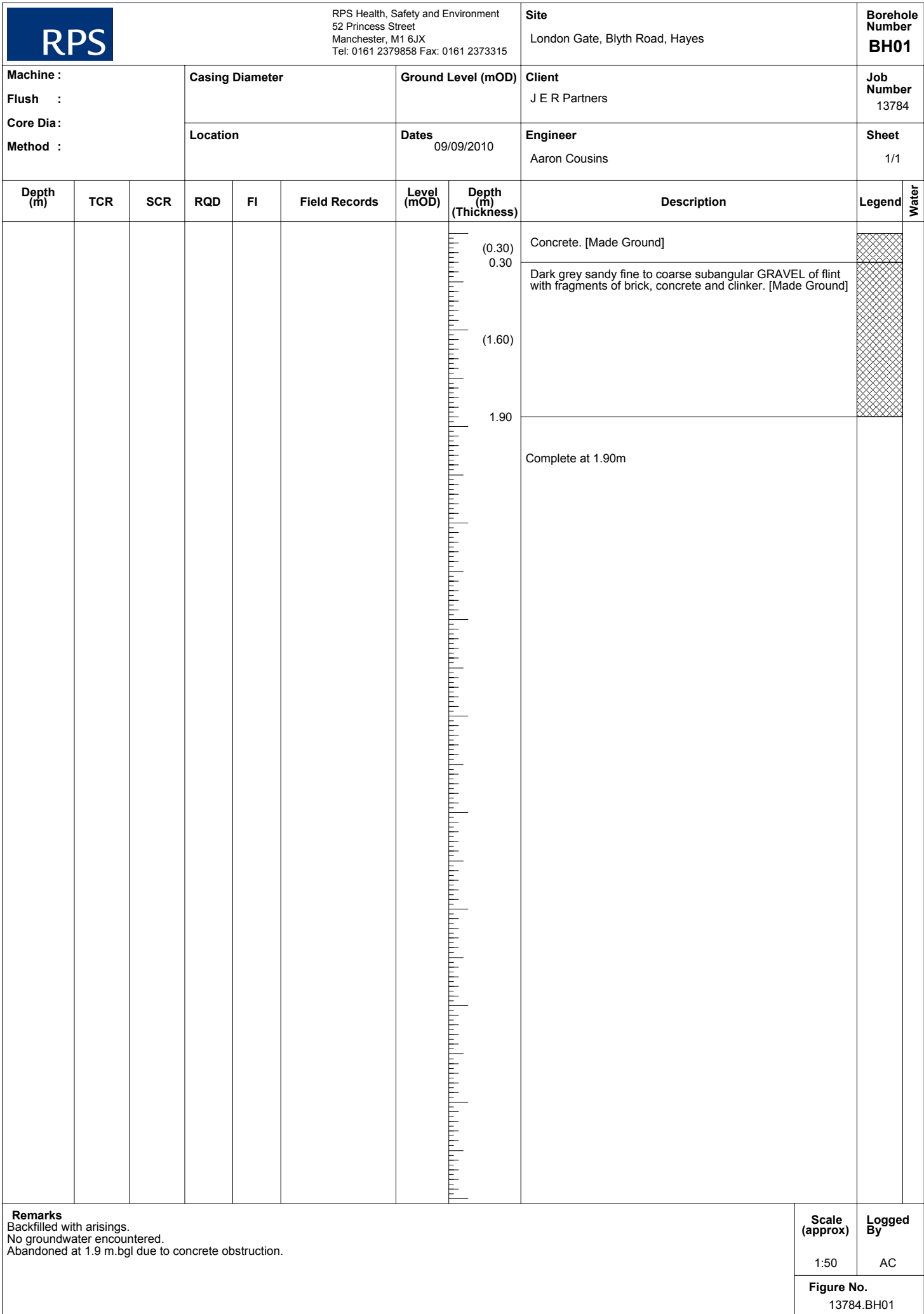
No groundwater encountered.

1.25

AC

13784 TP8

RPS		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Trial Pit Number TP6A	
Excavation Method Trial Pit		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 22/02/2011		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20	S1				(0.20)	Black ashy fine to coarse sand and gravel with brick an concrete fragments. [Made Ground]			
					0.20	Reinforced concrete slab. [Made Ground]			
					(0.40)				
					0.60	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]			
					(0.60)				
					1.20	Complete at 1.20m			
Plan					Remarks				
.					No groundwater encountered.				
.									
.									
.									
.									
.									
.									
					Scale (approx)		Logged By		Figure No.
					1:25		AC		13784.TP6A



		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Number WS2	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 10/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30-0.50	S1 1.6 ppm				(0.30)	Concrete. [Made Ground]			
0.50-0.70	S2 0 ppm				0.30				
					(0.40)	Pale brown gravelly fine to coarse SAND with fragments of brick, concrete and clinker. [Made Ground]			
0.70-0.90	S3 0.5 ppm				0.70				
0.90-1.00	S4 4.1 ppm				(0.20)	Soft to firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular flint. [Brickearth]			
					0.90				
					(0.10)	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]			
					1.00				
						Complete at 1.00m			
Remarks Backfilled with arisings. Abandoned at 1.0 m.bgl due to dense gravels. No groundwater encountered.								Scale (approx)	Logged By
								1:50	AC
								Figure No. 13784.WS2	

RPS			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes				Borehole Number BH03		
Machine :			Casing Diameter			Ground Level (mOD)		Client J E R Partners				Job Number 13784	
Flush :								Engineer Aaron Cousins				Sheet 1/1	
Core Dia :			Location			Dates 10/09/2010							
Method :													
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr		
0.50					S1 0.2 ppm		(0.10)	Bitumen bonded aggregate. [Made Ground]					
							0.10	Concrete. [Made Ground]					
							(0.20)	Dark grey ashy sandy GRAVEL with fragments of brick, concrete and clinker. [Made Ground]					
							0.30						
							(0.90)	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]					
						1.20							
						(3.60)							
					Water strike(1) at 3.20m.								
						4.80	Stiff to very stiff dark grey CLAY. [London Clay Formation]						
						(1.20)							
						6.00							
							Complete at 6.00m						
Remarks Advanced using sonic drilling techniques. Damp from 3.2 m.bgl.									Scale (approx) 1:50	Logged By AC	Figure No. 13784.BH03		

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Number WS04			
		Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 10/09/2010		Engineer Aaron Cousins		Sheet 1/1			
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water		
0.80-1.00	S1 0 ppm				(0.30)	Concrete. [Made Ground]					
					0.30	Dark brown ashy sandy GRAVEL with fragments of brick, concrete and clinker. [Made Ground]					
					(0.70)						
					1.00	Soft to firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular flint. [Brickearth]					
1.90-2.20	S2 0 ppm				(0.90)						
					1.90						
					(0.30)	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]					
					2.20	Complete at 2.20m					
Remarks Backfilled with arisings. Abandoned at 2.2 m.bgl due to dense gravels. No groundwater encountered.										Scale (approx) 1:50	
										Logged By AC	
										Figure No. 13784.WS04	



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

Site
London Gate, Blyth Road, Hayes

**Borehole
Number
BH05**

Machine
Flush
Core Dia
Method

Casing Diameter

Ground Level (mOD)

Client
J E R Partners

Job
Number
13784

Location

Dates 09/09/2010

Engineer
Aaron Cousins

Sheet
1/1

TCR

SCR

SCR

RQD

FI

Field Records

Level
(mOD)Depth
(m)
(Thickness)

Description

Legend

Water

Bitumen bonded aggregate. [Made Ground]

Concrete. [Made Ground]

Complete at 0.50m

Remarks
No installation. Backfilled with arisings.
No groundwater encountered.
Abandoned at 0.5 m.bgl due to thickness of concrete.

Scale (approx)

1.50

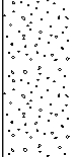
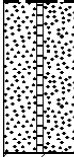
Logged
By

AC

Figure No

13784.BH05

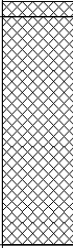
RPS RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Number WS06			
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 10/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
					(0.35) 0.35	COncrete. [Made Ground]			
						Complete at 0.35m			
Remarks Terminated at 0.35 m.bgl due to concrete obstruction.								Scale (approx) 1:50	Logged By AC
								Figure No. 13784.WS06	

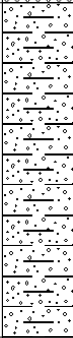
RPS			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes			Borehole Number BH07		
Machine :			Casing Diameter			Ground Level (mOD)		Client J E R Partners			Job Number 13784	
Flush :												
Core Dia :			Location			Dates 10/09/2010		Engineer Aaron Cousins			Sheet 1/1	
Method :												
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr	
0.50					S1 0 ppm		(0.10) 0.10 (0.30) 0.40	Bitumen bonded aggregate. [Made Ground] Soft pale brown sandy gravelly CLAY with fragments of brick, concrete and clinker. [Made Ground] Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]	  		  	
1.50					S2 0 ppm							
					Water strike(1) at 3.00m.		(4.60)			▽1		
							5.00	Complete at 5.00m				
Remarks Casing could not be advanced beyond 2.0 m.bgl due to dense gravels. Damp from 3.0 m.bgl. Advanced using sonic drilling techniques. Abandoned at 5.0 m.bgl due to very dense gravel.									Scale (approx) 1:50	Logged By AC	Figure No. 13784.BH07	

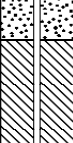
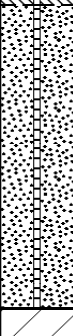


Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.20-1.00					S1 0 ppm		(0.10) 0.10 (0.20) 0.30 (0.90)	Bitumen bonded aggregate. [Made Ground] Concrete. [Made Ground] Pale brown fine to coarse sandy GRAVEL of flint brick, concrete and clinker. [Made Ground]			
1.00-1.20					S2 0 ppm		1.20 (0.60)	Soft to firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular flint. [Brickearth]			
1.80-2.00					S3 0 ppm		1.80	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]		Σ1	
					Water strike(1) at 2.50m.		(4.00)				
							5.80 (0.20) 6.00	Stiff to very stiff dark grey CLAY. [London Clay Formation]			
								Complete at 6.00m			

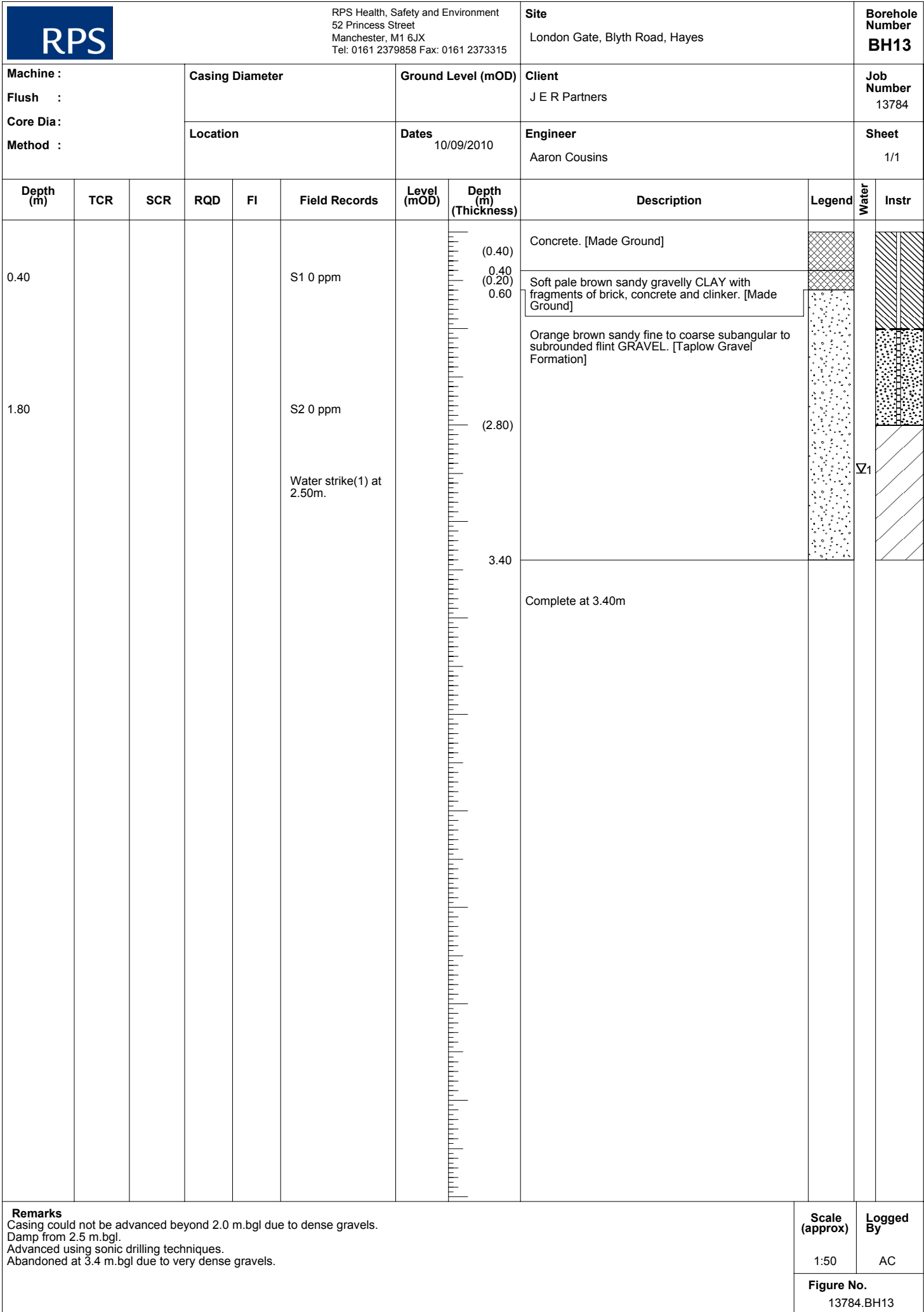
Figure No.
13784 BH08

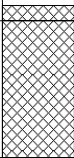
			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes			Borehole Number BH09		
Machine :			Casing Diameter			Ground Level (mOD)		Client J E R Partners			Job Number 13784		
Flush :								Engineer Aaron Cousins			Sheet 1/1		
Core Dia:			Location			Dates 08/09/2010							
Method :													
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description			Legend	Water	
0.20-1.00					S1		(0.10)	Bitumen bonded aggregate. [Made Ground]					
							0.10	Soft pale brown sandy gravelly CLAY with fragments of brick, concrete and clinker. [Made Ground]					
							(1.50)						
							1.60	Complete at 1.60m					
Remarks No installation. Backfilled with arisings. No groundwater encountered. Advanced using sonic drilling techniques. Terminated at 1.6 m.bgl due to concrete obstruction.												Scale (approx) 1:50	Logged By AC
												Figure No. 13784.BH09	

			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes		Borehole Number BH10
Machine : Flush : Core Dia: Method :			Casing Diameter		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
			Location		Dates 08/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.15					S1 0 ppm		(0.20)	Concrete. [Made Ground]		
0.50-1.00					S2 0 ppm		(0.20) (0.40) 0.60	Soft pale brown sandy gravelly CLAY with fragments of brick, concrete and clinker. [Made Ground]		
							(2.20)	Soft to firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular flint. [Brickearth]		
3.00-3.50					Water strike(1) at 3.00m. S3 0 ppm		2.80	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]		▽1
							(1.50) 4.30	Stiff to very stiff dark grey CLAY. [London Clay Formation]		
							(1.70) 6.00	Complete at 6.00m		
Remarks Backfilled with arisings. Advanced using sonic drilling techniques. Damp from 3.0 m.bgl.									Scale (approx) 1:50	Logged By AC
									Figure No. 13784.BH10	

			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes			Borehole Number BH11
Machine : Flush : Core Dia: Method :			Casing Diameter			Ground Level (mOD)		Client J E R Partners			Job Number 13784
			Location			Dates 09/09/2010		Engineer Aaron Cousins			Sheet 1/1
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.40-0.60					S1 0 ppm		(0.20) 0.20	Bitumen bonded aggregate. [Made Ground]			
							(1.00) 1.20	Soft pale brown ashy sandy gravelly CLAY with fragments of brick, concrete and clinker. [Made Ground]			
1.80					S2 0 ppm		(0.50) 1.70	Soft to firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular flint. [Brickearth]			
					Water strike(1) at 3.00m.		(2.30) 4.00	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]		Σ1	
								Complete at 4.00m			
Remarks Advanced using sonic drilling techniques. Damp from 3.0 m.bgl.									Scale (approx) 1:50	Logged By AC	Figure No. 13784.BH11

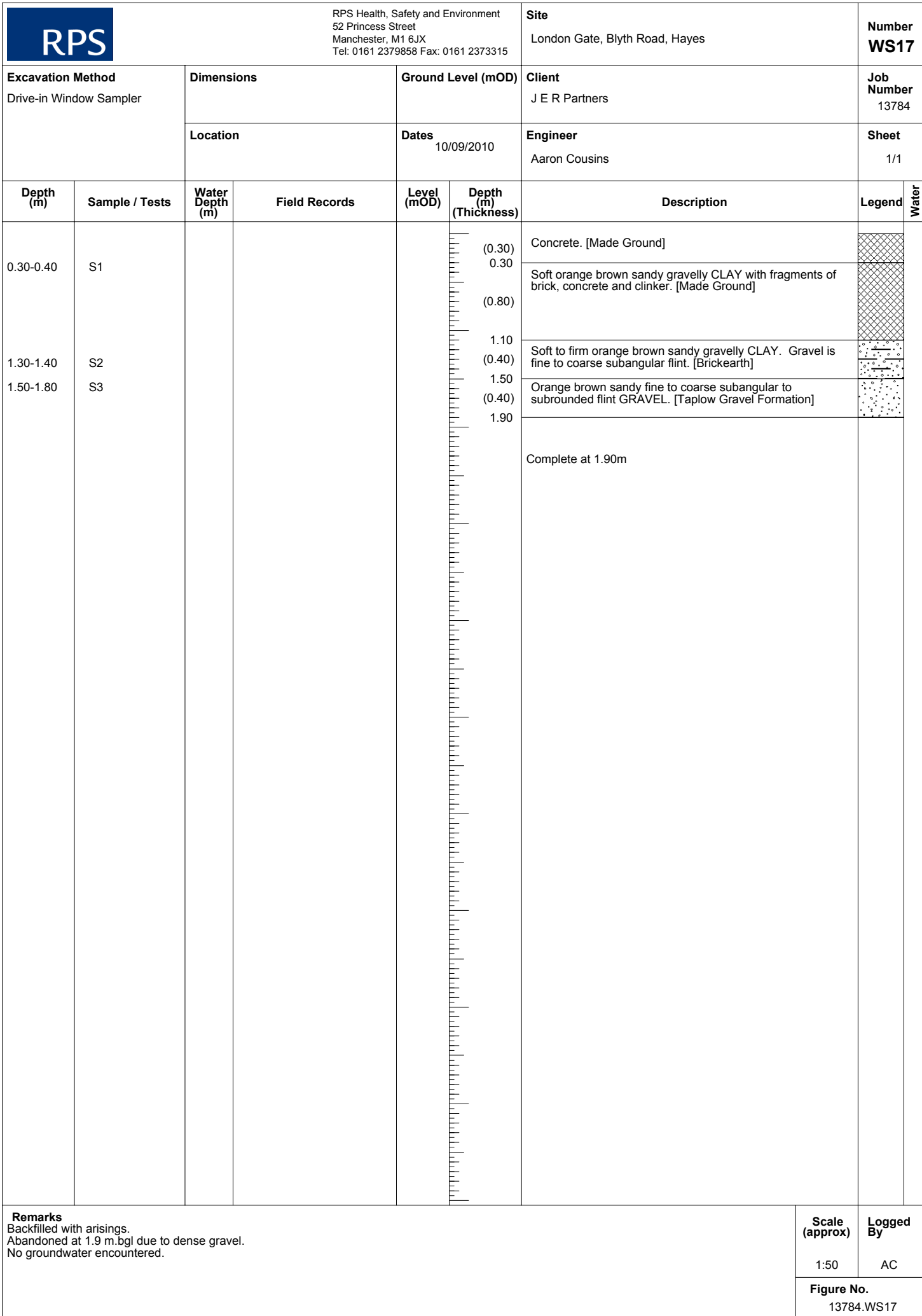
		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Number WS12	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 10/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.20-0.60	S1 0.3 ppm				(0.20)	Bitumen bonded aggregate. [Made Ground]			
					0.20	Concrete. [Made Ground]			
					(0.40)				
					0.60	Complete at 0.60m			
Remarks Backfilled with arisings. Abandoned at 0.6 m.bgl due to concrete obstruction. No groundwater encountered.								Scale (approx)	Logged By
								1:50	AC
								Figure No. 13784.WS12	



			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes		Borehole Number BH14
Machine : Flush : Core Dia: Method :			Casing Diameter		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
			Location		Dates 09/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water
0.10-1.00					S1 0 ppm		(0.10) 0.10 (0.90)	Bitumen bonded aggregate. [Made Ground] Soft dark grey ashy sandy gravelly CLAY. Gravel is fine to coarse sa of flint with fragments of brick, concrete and clinker. [Made Ground]		
1.00-2.00					S2 0 ppm		1.00	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]		
3.00					Water strike(1) at 2.50m. S3 0 ppm		(3.90) 4.90 (1.10) 6.00	Stiff to very stiff dark grey CLAY. [London Clay Formation]		
								Complete at 6.00m		
Remarks No installation. Backfilled with arisings. Damp from 2.5 m.bgl. Advanced using sonic drilling techniques.									Scale (approx) 1:50	Logged By AC
									Figure No. 13784.BH14	

			RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315					Site London Gate, Blyth Road, Hayes			Borehole Number BH15
Machine : Flush : Core Dia: Method :			Casing Diameter			Ground Level (mOD)		Client J E R Partners			Job Number 13784
			Location			Dates 09/09/2010		Engineer Aaron Cousins			Sheet 1/1
Depth (m)	TCR	SCR	RQD	FI	Field Records	Level (mOD)	Depth (m) (Thickness)	Description	Legend	Water	Instr
0.30-0.70					S1 0 ppm		(0.10) 0.10	Bitumen bonded aggregate. [Made Ground]			
							(0.20) 0.10	Concrete with green staining. [Made Ground]			
0.70-1.00					S2 0 ppm		(0.30) 0.20	Dark grey ashy sandy GRAVEL of flint with fragments of brick, concrete and clinker. [Made Ground]			
							(0.40) 0.10	Soft to firm orange brown sandy gravelly CLAY. Gravel is fine to coarse subangular flint. [Brickearth]			
1.50-1.80					S3 0 ppm		(1.10) 0.30				
							1.80	Orange brown sandy fine to coarse subangular to subrounded flint GRAVEL. [Taplow Gravel Formation]			
					Water strike(1) at 3.00m.		(3.70)			Σ1	
							5.50 (0.50)	Stiff to very stiff dark grey CLAY. [London Clay Formation]			
							6.00	Complete at 6.00m			
Remarks Damp from 3.0 m.bgl. Advanced using sonic drilling techniques.									Scale (approx) 1:50	Logged By AC	Figure No. 13784.BH15

		RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Number WS16	
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 10/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
0.30-0.50	S1 1.3 ppm				(0.30)	Concrete. [Made Ground]			
					(0.30)	Pale grey sandy fine to coarse subangular flint GRAVEL			
					(0.20)	with fragments. of brick and concrete. [Made Ground]			
					(0.10)	Concrete. [Made Ground]			
					0.60	Complete at 0.60m			
Remarks No groundwater encountered. Abandoned at 0.6 m.bgl due to concrete obstruction. Backfilled with arisings.								Scale (approx) 1:50	Logged By AC
								Figure No. 13784.WS16	



RPS RPS Health, Safety and Environment 52 Princess Street Manchester, M1 6JX Tel: 0161 2379858 Fax: 0161 2373315				Site London Gate, Blyth Road, Hayes		Number WS18			
Excavation Method Drive-in Window Sampler		Dimensions		Ground Level (mOD)		Client J E R Partners		Job Number 13784	
		Location		Dates 10/09/2010		Engineer Aaron Cousins		Sheet 1/1	
Depth (m)	Sample / Tests	Water Depth (m)	Field Records	Level (mOD)	Depth (m) (Thickness)	Description		Legend	Water
					(0.35) 0.35	Concrete. [Made Ground]			
						Complete at 0.35m			
Remarks Terminated at 0.35 m.bgl due to concrete obstruction.								Scale (approx) 1:50	Logged By AC
								Figure No. 13784.WS18	



RPS Health, Safety and Environment
52 Princess Street
Manchester, M1 6JX
Tel: 0161 2379858 Fax: 0161 2373315

London Gate, Blyth Road, Hayes

Number
WS19

Drive-in Window Sampler

Location

Dates

J E R Partners

**Job
Number**
13784

10/09/2010

Aaron Cousins

1/1

Sample / Tests

Field Records

Depth
(m)
(Thickness)

Legend

Water

S1 0 ppm

Concrete. [Made Ground]

Pale grey sandy GRAVEL with fragments of brick, concrete and clinker. [Made Ground]

Complete at 1.10m

Backfilled with arisings.
Abandoned at 1.1 m.bgl due to unknown obstruction.
No groundwater encountered.

1:50

AC

13784.WS19

[illegible]

Appendix B

Analytical Data



Aaron Cousins

RPS Group
1st Floor
Cotton Centre
Cottons Lane
London
SE1 2QG

t: 0203 117 0900
f: 020 7928 0708

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

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

Analytical Report Number : 11-26423

Project / Site name: Blyth Rd, Hayes

Samples received on: 23/02/2011

Your job number: RCEI 13889

Samples instructed on: 23/02/2011

Your order number:

Analysis completed by: 02/03/2011

Report Issue Number: 1

Report issued on: 02/03/2011

Samples Analysed: 4 soil samples

Signed: 

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

Signed: 

Thurstan Plummer
Organics Technical Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

Analytical Report Number: 11-26423

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168259	168260	168261	168262	
Sample Reference				BH103	BH103	BH104	BH104	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50	3.20	0.30	3.50	
Date Sampled				21/02/2011	21/02/2011	21/02/2011	21/02/2011	
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	< 0.1	< 0.1	
Moisture Content	%	N/A	NONE	5.2	6.8	17	4.3	
Total mass of sample received	kg	0.001	NONE	0.54	0.79	0.76	0.59	

General Inorganics

pH	pH Units	N/A	MCERTS	8.6	8.2	7.8	7.9	
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.037	0.014	0.035	0.013	
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	37	14	35	13	
Sulphide	mg/kg	1	MCERTS	< 1.0	< 1.0	1.2	< 1.0	
Organic Matter	%	0.1	MCERTS	0.1	< 0.1	3.1	1.3	

Total Phenols

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

Speciated PAHs

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

Total PAH

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

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.5	12	18	11	
Boron (water soluble)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	
Chromium (hexavalent)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	16	16	21	15	
Copper (aqua regia extractable)	mg/kg	1	MCERTS	6.9	6.1	62	6.5	
Lead (aqua regia extractable)	mg/kg	2	MCERTS	17	5.4	190	5.6	
Mercury (aqua regia extractable)	mg/kg	0.3	MCERTS	< 0.3	< 0.3	< 0.3	< 0.3	
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	11	26	20	23	
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	14	16	55	17	

Analytical Report Number: 11-26423

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168259	168260	168261	168262	
Sample Reference				BH103	BH103	BH104	BH104	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50	3.20	0.30	3.50	
Date Sampled				21/02/2011	21/02/2011	21/02/2011	21/02/2011	
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

TPH7 - Aliphatic >EC5 - EC6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH7 - Aliphatic >EC6 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH7 - Aliphatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH7 - Aliphatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.2	< 1.0	
TPH7 - Aliphatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	2.4	< 2.0	
TPH7 - Aliphatic >EC16 - EC21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	22	
TPH7 - Aliphatic >EC21 - EC35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	43	
TPH7 - Aliphatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	64	

TPH7 - Aromatic >EC5 - EC7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH7 - Aromatic >EC7 - EC8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH7 - Aromatic >EC8 - EC10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	
TPH7 - Aromatic >EC10 - EC12	mg/kg	1	MCERTS	< 1.0	< 1.0	1.3	< 1.0	
TPH7 - Aromatic >EC12 - EC16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	
TPH7 - Aromatic >EC16 - EC21	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >EC21 - EC35	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	
TPH7 - Aromatic (EC5 - EC35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	



Analytical Report Number: 11-26423

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168259	168260	168261	168262	
Sample Reference				BH103	BH103	BH104	BH104	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				0.50	3.20	0.30	3.50	
Date Sampled				21/02/2011	21/02/2011	21/02/2011	21/02/2011	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

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

Analytical Report Number : 11-26423

Project / Site name: Blyth Rd, Hayes

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

Stone content

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
168259	BH103	None Supplied	0.50	Light brown gravelly sand with brick.
168260	BH103	None Supplied	3.20	Light brown gravelly sand.
168261	BH104	None Supplied	0.30	Brown clay.
168262	BH104	None Supplied	3.50	Light brown gravelly sand.

Analytical Report Number : 11-26423

Project / Site name: Blyth Rd, Hayes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron, water soluble, in soil	Determination of water soluble boron in soil by hot water extract followed by ICP-OES.	In-house method based on Second Site Properties version 3	L038-PL	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS
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	L068-PL	D	MCERTS
Metals in soil by ICP-OES	Determination of metals in soil by aqua-regia digestion followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L038-PL	D	MCERTS
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L019-UK	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	W	MCERTS
Organic matter 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	L023-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 EPA-16 PAHs in soil	Determination of PAH compounds in soil by extraction in dichloromethane and hexane followed by GC-MS with the use of surrogate and internal standards.	In-house method based on USEPA 8270	L064-PL	D	MCERTS
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK	D	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L038-PL	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method	L010-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	W	MCERTS
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-PL	W	MCERTS
Volatile organic compounds in soil	Determination of volatile organic compounds in soil by headspace GC-MS.	In-house method based on USEPA8260	L073S-PL	W	MCERTS

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.

**Aaron Cousins**

RPS Group
Unit 12
Waters Edge Business Park
Modweng Road
Salford Quays
Manchester
M5 3EZ

t: 0161 872 2443
f: 0161 877 3959
e: cousinsa@rpsgroup.com

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

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

Analytical Report Number : 11-26432

Project / Site name: Blyth Rd, Hayes

Samples received on: 23/02/2011

Your job number: RCEI13889

Samples instructed on: 23/02/2011

Your order number:

Analysis completed by: 07/03/2011

Report Issue Number: 1

Report issued on: 07/03/2011

Samples Analysed: 5 water samples

Signed:

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

Signed:

Sian John
Senior Scientist - Organics
For & on behalf of i2 Analytical Ltd.

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

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

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



Analytical Report Number: 11-26432

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168291	168292	168293	168294	168295
Sample Reference				BH103	BH104	BH11	BH03	BH08
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				23/02/2011	23/02/2011	23/02/2011	23/02/2011	23/02/2011
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	6.8	7.4	7.1	7.3	6.9
Total Cyanide	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Sulphate as SO ₄	µg/l	100	NONE	70000	77000	99000	140000	120000
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	< 5.0
Total Organic Carbon (TOC)	mg/l	0.1	NONE	2.2	3.5	1.9	2.9	2.7

Total Phenols

Total Phenols (monohydric)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
----------------------------	------	----	-----------	------	------	------	------	------

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(k)fluoranthene	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
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Total PAH

Total EPA-16 PAHs	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
-------------------	------	-----	-----------	-------	-------	-------	-------	-------

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Cadmium (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium (hexavalent)	µg/l	5	NONE	< 10	< 10	< 10	< 10	< 10
Chromium (dissolved)	µg/l	1	ISO 17025	38	< 1.0	9.3	4.8	2.5
Copper (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	4.3	< 1.0	< 1.0
Lead (dissolved)	µg/l	5	ISO 17025	< 5.0	6.0	13	8.5	5.8
Mercury (dissolved)	µg/l	1.5	NONE	< 1.5	< 1.5	< 1.5	< 1.5	< 1.5
Nickel (dissolved)	µg/l	1	ISO 17025	130	15	13	11	14
Selenium (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	< 10
Zinc (dissolved)	µg/l	1	ISO 17025	< 1.0	< 1.0	11	34	17



Analytical Report Number: 11-26432

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168291	168292	168293	168294	168295
Sample Reference				BH103	BH104	BH11	BH03	BH08
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				23/02/2011	23/02/2011	23/02/2011	23/02/2011	23/02/2011
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons



Analytical Report Number: 11-26432

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168291	168292	168293	168294	168295
Sample Reference				BH103	BH104	BH11	BH03	BH08
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				23/02/2011	23/02/2011	23/02/2011	23/02/2011	23/02/2011
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
TPH7 - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aliphatic >C10 - C12	µg/l	10	NONE	15	< 10	< 10	< 10	< 10
TPH7 - Aliphatic >C12 - C16	µg/l	10	NONE	31	49	< 10	< 10	< 10
TPH7 - Aliphatic >C16 - C21	µg/l	10	NONE	360	430	< 10	< 10	< 10
TPH7 - Aliphatic >C21 - C35	µg/l	10	NONE	2800	9300	< 10	< 10	< 10
TPH7 - Aliphatic (C5 - C35)	µg/l	10	NONE	3200	9800	< 10	< 10	< 10
TPH7 - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	< 10
TPH7 - Aromatic >C16 - C21	µg/l	10	NONE	55	89	< 10	< 10	< 10
TPH7 - Aromatic >C21 - C35	µg/l	10	NONE	220	420	< 10	< 10	< 10
TPH7 - Aromatic (C5 - C35)	µg/l	10	NONE	280	510	< 10	< 10	< 10



Analytical Report Number: 11-26432

Project / Site name: Blyth Rd, Hayes

Lab Sample Number	168291	168292	168293	168294	168295
Sample Reference	BH103	BH104	BH11	BH03	BH08
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	23/02/2011	23/02/2011	23/02/2011	23/02/2011	23/02/2011
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied

Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					
--	-------	-----------------------	-------------------------	--	--	--	--	--

VOCs								
Chloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Vinyl Chloride	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichlorofluoromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloro 1,2,2-Trifluoroethane	µg/l	1	ISO 17025	< 1.0	23	< 1.0	< 1.0	< 1.0
Cis-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	1.2	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2,2-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1-Dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,2-dichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Benzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trichloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromodichloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Cis-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Trans-1,3-dichloropropene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,2-Trichloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-Dichloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Dibromochloromethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tetrachloroethene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	5.9
1,2-Dibromoethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Chlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,1,1,2-Tetrachloroethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Styrene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tri bromomethane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Isopropylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Bromobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
N-Propylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
2-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
4-Chlorotoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3,5-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Tert-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trimethylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Sec-Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,3-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
P-Isopropyltoluene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,4-dichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Butylbenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2-Dibromo-3-chloropropane	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
1,2,4-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Hexachlorobutadiene	µg/l	0.1	ISO 17025	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,2,3-Trichlorobenzene	µg/l	1	ISO 17025	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0



Analytical Report Number: 11-26432

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				168291	168292	168293	168294	168295
Sample Reference				BH103	BH104	BH11	BH03	BH08
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				23/02/2011	23/02/2011	23/02/2011	23/02/2011	23/02/2011
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Water Analysis)				Units	Limit of detection	Accreditation Status		
VOCs TICs Compound Name					10	NONE	NONE	NONE
VOC % Match				µg/l	10	NONE	NONE	NONE

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



Analytical Report Number : 11-26432

Project / Site name: Blyth Rd, Hayes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
BTEX and MTBE in water	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L026-UK	W	NONE
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	ISO 17025
Monohydric phenols in water	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	W	ISO 17025
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests	L005-PL	W	ISO 17025
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L070-UK	W	ISO 17025
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES.	In-house method based on MEWAM 2006 Methods for the Determination of Metals in Soil.	L039-UK	W	NONE
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L010-UK	W	NONE
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	W	ISO 17025
Total organic carbon in water	Determination of total organic carbon in water 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	L037-UK	W	NONE
TPH7 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS, speciation by interpretation.	In-house method	L070-UK	W	NONE
Volatile organic compounds in water	Determination of volatile organic compounds in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
Volatile, tentatively identified, organic compound	Determination of volatile organic compounds total ion count in water by headspace GC-MS followed by a full library scan.	In-house method based on USEPA8260	L036-UK	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.



Aaron Cousins

RPS Group
1st Floor
Cotton Centre
Cottons Lane
London
SE1 2QG

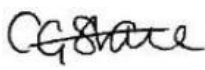
t: 0203 117 0932
f: 020 7928 0708

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

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

Analytical Report Number : 10-24330

Project / Site name:	Blyth Rd, Hayes	Samples received on:	15/09/2010
Your job number:	RCEI1389	Samples instructed on:	15/09/2010
Your order number:		Analysis completed by:	20/09/2010
Report Issue Number:	1	Report issued on:	20/09/2010
Samples Analysed:	25 soil samples - 4 water samples		

Signed: 

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

Signed: 

David Ashworth
UK Technical Manager
For & on behalf of i2 Analytical Ltd.

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

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

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

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155367	155368	155369	155370	155371
Sample Reference				BH02	BH02	BH02	BH03	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	0.50-0.70	0.90-1.00	0.50	0.80-1.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
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	60	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	7.5	8.4	6.5	12	23
Total mass of sample received	kg	0.001	NONE	0.61	0.60	0.54	0.78	0.53

General Inorganics

pH	pH Units	N/A	MCERTS	9.7	10.9	7.1	8.3	7.6
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.64	0.308	0.112	0.168	0.12
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	640	308	112	168	120
Sulphide	mg/kg	1	NONE	1.7	20	< 1.0	< 1.0	< 1.0
Organic Matter	%	0.1	MCERTS	3.5	1.5	< 0.10	7.6	13

Total Phenols

Total Phenols (monohydric)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	0.65	0.16	< 0.05	0.67	0.06
Acenaphthylene	mg/kg	0.05	MCERTS	2.9	0.16	0.12	0.31	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	5.5	0.53	< 0.05	0.27	< 0.05
Fluorene	mg/kg	0.05	MCERTS	5.2	0.68	0.07	0.37	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	44	7.7	0.12	4.7	0.15
Anthracene	mg/kg	0.05	MCERTS	25	2.3	< 0.05	1.6	< 0.05
Fluoranthene	mg/kg	0.1	MCERTS	49	8.0	0.15	11	0.19
Pyrene	mg/kg	0.05	MCERTS	49	5.8	0.10	8.6	0.16
Benzo(a)anthracene	mg/kg	0.2	MCERTS	49	4.3	< 0.20	7.1	< 0.20
Chrysene	mg/kg	0.05	MCERTS	39	3.2	< 0.05	5.2	0.13
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	58	4.5	< 0.10	8.9	0.21
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	23	1.7	< 0.05	2.9	< 0.05
Benzo(a)pyrene	mg/kg	0.1	MCERTS	43	3.2	< 0.10	5.6	0.11
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	23	1.7	< 0.05	3.7	0.16
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	5.6	0.50	< 0.05	1.0	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	22	1.7	< 0.05	3.9	0.18

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	440	46	< 1.6	66	< 1.6
-----------------------------	-------	-----	--------	-----	----	-------	----	-------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	87	7.1	7.0	15	6.6
Boron (water soluble)	mg/kg	0.2	MCERTS	2.4	2.7	3.2	2.3	5.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	0.4	< 0.2	1.2	0.4
Chromium (hexavalent)	mg/kg	4.3	NONE	< 4.3	< 4.3	< 4.3	< 4.3	< 4.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	140	36	18	19	22
Copper (aqua regia extractable)	mg/kg	1	MCERTS	130	41	7.6	180	77
Lead (aqua regia extractable)	mg/kg	2	MCERTS	98	19	6.5	230	42
Mercury (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	0.6	< 0.2
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	32	16	14	30	51
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	430	120	25	340	80

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155367	155368	155369	155370	155371
Sample Reference				BH02	BH02	BH02	BH03	WS04
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	0.50-0.70	0.90-1.00	0.50	0.80-1.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)				Units	Limit of detection	Accreditation Status		

Monoaromatics

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

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	1.0	4.7	< 1.0	13	< 1.0
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	12	19	< 2.0	96	< 2.0
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	41	50	< 8.0	170	< 8.0
TPH7 - Aliphatic >C21 - C35	mg/kg	8	MCERTS	76	99	< 8.0	250	< 8.0
TPH7 - Aliphatic (C5 - C35)	mg/kg	10	MCERTS	130	170	< 10	530	< 10

TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	5.0	2.0	< 1.0	33	< 1.0
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	32	27	< 2.0	110	< 2.0
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	380	67	< 10	360	< 10
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	990	290	< 10	880	< 10
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	1400	390	< 10	1400	< 10

PCBs by GC-ECD

PCB Congener 28	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 52	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 101	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 118	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 138	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 153	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 180	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
Total PCBs	mg/kg	0.2	MCERTS	N/A	N/A	N/A	N/A	N/A

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155372	155373	155374	155375	155376
Sample Reference				WS04	BH07	BH07	BH08	BH08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.50	1.50	1.00-1.20	1.80-2.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
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	6.2	7.6	5.2	18	13
Total mass of sample received	kg	0.001	NONE	0.53	0.78	0.74	0.69	0.81

General Inorganics

pH	pH Units	N/A	MCERTS	8.3	7.4	7.2	7.3	8.1
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.224	0.0264	0.0068	0.14	0.072
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	224	26.4	6.8	140	72
Sulphide	mg/kg	1	NONE	3.5	< 1.0	< 1.0	14	< 1.0
Organic Matter	%	0.1	MCERTS	1.3	0.72	0.75	3.7	0.99

Total Phenols

Total Phenols (monohydric)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.07	< 0.05
Acenaphthylene	mg/kg	0.05	MCERTS	0.10	0.07	0.05	0.05	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	0.08	< 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	0.29	< 0.05	< 0.05	0.30	< 0.05
Anthracene	mg/kg	0.05	MCERTS	0.09	< 0.05	< 0.05	0.09	< 0.05
Fluoranthene	mg/kg	0.1	MCERTS	0.32	< 0.10	< 0.10	0.59	< 0.10
Pyrene	mg/kg	0.05	MCERTS	0.29	0.05	< 0.05	0.52	0.05
Benzo(a)anthracene	mg/kg	0.2	MCERTS	0.36	< 0.20	< 0.20	0.43	< 0.20
Chrysene	mg/kg	0.05	MCERTS	0.36	< 0.05	< 0.05	0.45	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.39	< 0.10	< 0.10	0.83	< 0.10
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.11	< 0.05	< 0.05	0.21	< 0.05
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.25	< 0.10	< 0.10	0.50	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.48	< 0.05	< 0.05	0.86	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.17	< 0.05	< 0.05	0.06	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.53	< 0.05	< 0.05	0.82	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	3.8	< 1.6	< 1.6	5.8	< 1.6
-----------------------------	-------	-----	--------	-----	-------	-------	-----	-------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	6.5	15	9.4	27	16
Boron (water soluble)	mg/kg	0.2	MCERTS	1.7	2.8	1.1	5.5	2.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4.3	NONE	< 4.3	< 4.3	< 4.3	< 4.3	< 4.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	14	37	21	40	72
Copper (aqua regia extractable)	mg/kg	1	MCERTS	27	9.4	6.6	240	27
Lead (aqua regia extractable)	mg/kg	2	MCERTS	20	11	4.7	300	33
Mercury (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	17	24	13	55	42
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	32	32	18	130	54

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155372	155373	155374	155375	155376
Sample Reference				WS04	BH07	BH07	BH08	BH08
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				1.90-2.20	0.50	1.50	1.00-1.20	1.80-2.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic >C21 - C35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic (C5 - C35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	11	< 2.0
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	< 10	< 10	< 10	22	< 10
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	< 10	< 10	< 10	43	< 10
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	< 10	< 10	< 10	76	< 10

PCBs by GC-ECD

PCB Congener 28	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 52	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 101	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 118	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 138	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 153	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 180	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
Total PCBs	mg/kg	0.2	MCERTS	N/A	N/A	N/A	N/A	N/A

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155377	155378	155379	155380	155381
Sample Reference				BH09	BH10	BH11	BH11	WS12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20-1.60	0.50-1.00	0.40-0.60	1.80	0.20-0.60
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
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	13	12	14	8.4	6.6
Total mass of sample received	kg	0.001	NONE	0.67	0.61	0.73	0.71	0.65

General Inorganics

pH	pH Units	N/A	MCERTS	9.9	8.4	7.5	7.3	9.3
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.72	0.232	0.244	0.1	0.84
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	720	232	244	100	840
Sulphide	mg/kg	1	NONE	5.0	1.6	< 1.0	< 1.0	1.2
Organic Matter	%	0.1	MCERTS	1.3	0.63	1.7	0.82	2.1

Total Phenols

Total Phenols (monohydric)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	0.25
Acenaphthylene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	< 0.05	1.3
Acenaphthene	mg/kg	0.05	MCERTS	0.05	< 0.05	< 0.05	< 0.05	9.3
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	12
Phenanthrene	mg/kg	0.05	MCERTS	0.51	0.10	0.06	< 0.05	61
Anthracene	mg/kg	0.05	MCERTS	0.23	< 0.05	< 0.05	< 0.05	47
Fluoranthene	mg/kg	0.1	MCERTS	3.9	0.20	0.17	< 0.10	63
Pyrene	mg/kg	0.05	MCERTS	4.1	0.19	0.15	< 0.05	51
Benzo(a)anthracene	mg/kg	0.2	MCERTS	3.9	< 0.20	< 0.20	< 0.20	62
Chrysene	mg/kg	0.05	MCERTS	2.4	< 0.05	0.08	< 0.05	57
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	5.5	0.17	0.25	< 0.10	80
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	1.5	0.07	0.22	< 0.05	49
Benzo(a)pyrene	mg/kg	0.1	MCERTS	3.9	0.11	0.14	< 0.10	60
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	2.2	0.07	0.20	< 0.05	44
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.53	< 0.05	0.11	< 0.05	14
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	2.3	0.10	0.28	< 0.05	42

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	31	< 1.6	1.8	< 1.6	650
-----------------------------	-------	-----	--------	----	-------	-----	-------	-----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	5.3	9.2	10	17	12
Boron (water soluble)	mg/kg	0.2	MCERTS	3.3	1.8	1.8	1.7	3.7
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	0.3	0.2	0.7	< 0.2	< 0.2
Chromium (hexavalent)	mg/kg	4.3	NONE	< 4.3	< 4.3	< 4.3	< 4.3	< 4.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	130	81	16	320	14
Copper (aqua regia extractable)	mg/kg	1	MCERTS	15	16	58	18	11
Lead (aqua regia extractable)	mg/kg	2	MCERTS	140	20	420	11	15
Mercury (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	29	34	18	170	14
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	230	40	130	38	38

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155377	155378	155379	155380	155381
Sample Reference				BH09	BH10	BH11	BH11	WS12
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.20-1.60	0.50-1.00	0.40-0.60	1.80	0.20-0.60
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	6.7	< 2.0	< 2.0	< 2.0	< 2.0
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	44	< 8.0	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic >C21 - C35	mg/kg	8	MCERTS	69	< 8.0	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic (C5 - C35)	mg/kg	10	MCERTS	120	< 10	< 10	< 10	< 10

TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	12
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	18	< 2.0	18	< 2.0	45
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	36	< 10	20	< 10	600
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	180	< 10	40	< 10	1600
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	230	< 10	79	< 10	2300

PCBs by GC-ECD

PCB Congener 28	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
PCB Congener 52	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
PCB Congener 101	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
PCB Congener 118	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
PCB Congener 138	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
PCB Congener 153	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
PCB Congener 180	mg/kg	0.02	MCERTS	N/A	N/A	< 0.02	< 0.02	N/A
Total PCBs	mg/kg	0.2	MCERTS	N/A	N/A	< 0.2	< 0.2	N/A

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155382	155383	155384	155385	155386
Sample Reference				BH13	BH14	BH14	BH15	BH15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.10-1.00	1.00-2.00	0.30-0.70	0.70-1.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
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	29	< 0.1	< 0.1	< 0.1	< 0.1
Moisture Content	%	N/A	NONE	13	6.8	6.5	17	6.3
Total mass of sample received	kg	0.001	NONE	0.71	0.67	0.70	0.76	0.72

General Inorganics

pH	pH Units	N/A	MCERTS	7.8	7.3	7.3	7.2	9.0
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.06	0.096	0.0244	0.096	0.248
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	60	96	24.4	96	248
Sulphide	mg/kg	1	NONE	< 1.0	< 1.0	< 1.0	< 1.0	66
Organic Matter	%	0.1	MCERTS	1.2	0.63	0.71	1.7	2.1

Total Phenols

Total Phenols (monohydric)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

Speciated PAHs

Naphthalene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.08	0.18
Acenaphthylene	mg/kg	0.05	MCERTS	0.11	0.17	0.12	0.39	0.39
Acenaphthene	mg/kg	0.05	MCERTS	0.08	< 0.05	0.06	0.14	0.22
Fluorene	mg/kg	0.05	MCERTS	0.09	< 0.05	< 0.05	0.13	0.22
Phenanthrene	mg/kg	0.05	MCERTS	0.93	0.29	0.47	1.6	3.1
Anthracene	mg/kg	0.05	MCERTS	0.33	0.15	0.23	0.64	1.2
Fluoranthene	mg/kg	0.1	MCERTS	1.3	0.80	1.4	4.4	8.6
Pyrene	mg/kg	0.05	MCERTS	0.94	0.66	1.2	3.8	8.0
Benzo(a)anthracene	mg/kg	0.2	MCERTS	0.75	0.58	0.78	3.1	5.9
Chrysene	mg/kg	0.05	MCERTS	0.84	0.43	0.66	2.4	3.9
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.94	0.54	1.1	3.4	6.5
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	0.25	0.22	0.35	1.4	2.5
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.51	0.32	0.62	2.3	4.7
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	1.1	0.51	1.7	4.5	3.0
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	0.24	0.23	0.43	1.2	0.12
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	1.1	0.62	1.9	4.7	2.9

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	9.6	5.6	11	34	51
-----------------------------	-------	-----	--------	-----	-----	----	----	----

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	14	9.0	13	9.4	6.5
Boron (water soluble)	mg/kg	0.2	MCERTS	1.9	1.6	1.4	1.0	1.1
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	0.5
Chromium (hexavalent)	mg/kg	4.3	NONE	< 4.3	< 4.3	< 4.3	< 4.3	< 4.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	46	87	120	23	16
Copper (aqua regia extractable)	mg/kg	1	MCERTS	26	12	13	30	40
Lead (aqua regia extractable)	mg/kg	2	MCERTS	96	20	17	64	44
Mercury (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	31	48	61	22	12
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	51	31	34	74	70

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155382	155383	155384	155385	155386
Sample Reference				BH13	BH14	BH14	BH15	BH15
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.40	0.10-1.00	1.00-2.00	0.30-0.70	0.70-1.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic >C21 - C35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	< 8.0	< 8.0
TPH7 - Aliphatic (C5 - C35)	mg/kg	10	MCERTS	< 10	< 10	< 10	< 10	< 10

TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	2.1	1.8
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	12	15	14	16	14
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	26	22	21	34	47
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	87	49	58	100	200
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	130	85	93	150	260

PCBs by GC-ECD

PCB Congener 28	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 52	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 101	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 118	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 138	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 153	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 180	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
Total PCBs	mg/kg	0.2	MCERTS	N/A	N/A	N/A	N/A	N/A

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155387	155388	155389	155390	155391
Sample Reference				WS16	WS17	WS17	WS19	BH20
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	0.30-0.40	1.30-1.40	0.40-0.80	0.20-1.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
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	9.2	< 0.1	< 0.1	9.8
Moisture Content	%	N/A	NONE	6.2	12	13	5.3	12
Total mass of sample received	kg	0.001	NONE	0.63	0.65	0.57	0.62	0.81

General Inorganics

pH	pH Units	N/A	MCERTS	9.1	7.7	7.5	10.1	8.5
Total Cyanide	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Water Soluble Sulphate as SO ₄ (2:1)	g/l	0.0025	MCERTS	0.208	0.44	0.252	0.68	0.196
Water Soluble Sulphate as SO ₄ (2:1)	mg/kg	2.5	MCERTS	208	440	252	680	196
Sulphide	mg/kg	1	NONE	17	< 1.0	< 1.0	6.4	< 1.0
Organic Matter	%	0.1	MCERTS	0.66	0.75	0.78	1.9	0.79

Total Phenols

Total Phenols (monohydric)	mg/kg	4	MCERTS	< 4.0	< 4.0	< 4.0	< 4.0	< 4.0
----------------------------	-------	---	--------	-------	-------	-------	-------	-------

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	0.27	< 0.05
Acenaphthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.06	< 0.05
Fluorene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Phenanthrene	mg/kg	0.05	MCERTS	0.12	< 0.05	< 0.05	0.52	< 0.05
Anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.36	< 0.05
Fluoranthene	mg/kg	0.1	MCERTS	0.19	< 0.10	< 0.10	2.3	0.11
Pyrene	mg/kg	0.05	MCERTS	0.16	0.07	< 0.05	2.3	0.09
Benzo(a)anthracene	mg/kg	0.2	MCERTS	< 0.20	< 0.20	< 0.20	2.0	< 0.20
Chrysene	mg/kg	0.05	MCERTS	0.09	< 0.05	0.06	1.4	< 0.05
Benzo(b)fluoranthene	mg/kg	0.1	MCERTS	0.16	< 0.10	< 0.10	2.9	0.19
Benzo(k)fluoranthene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.71	0.18
Benzo(a)pyrene	mg/kg	0.1	MCERTS	0.10	< 0.10	< 0.10	1.9	< 0.10
Indeno(1,2,3-cd)pyrene	mg/kg	0.05	MCERTS	0.08	< 0.05	< 0.05	1.2	< 0.05
Dibenz(a,h)anthracene	mg/kg	0.05	MCERTS	< 0.05	< 0.05	< 0.05	0.26	< 0.05
Benzo(ghi)perylene	mg/kg	0.05	MCERTS	0.06	< 0.05	< 0.05	1.4	< 0.05

Total PAH

Speciated Total EPA-16 PAHs	mg/kg	1.6	MCERTS	< 1.6	< 1.6	< 1.6	18	< 1.6
-----------------------------	-------	-----	--------	-------	-------	-------	----	-------

Heavy Metals / Metalloids

Arsenic (aqua regia extractable)	mg/kg	1	MCERTS	4.9	14	11	2.7	11
Boron (water soluble)	mg/kg	0.2	MCERTS	0.9	3.4	2.3	1.6	1.6
Cadmium (aqua regia extractable)	mg/kg	0.2	MCERTS	1.3	< 0.2	< 0.2	0.3	< 0.2
Chromium (hexavalent)	mg/kg	4.3	NONE	< 4.3	< 4.3	< 4.3	< 4.3	< 4.3
Chromium (aqua regia extractable)	mg/kg	1	MCERTS	9.0	30	34	12	44
Copper (aqua regia extractable)	mg/kg	1	MCERTS	9.5	22	23	27	28
Lead (aqua regia extractable)	mg/kg	2	MCERTS	37	75	14	53	21
Mercury (aqua regia extractable)	mg/kg	0.2	MCERTS	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Nickel (aqua regia extractable)	mg/kg	2	MCERTS	7.8	27	30	9.7	24
Selenium (aqua regia extractable)	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	1.0	< 1.0
Zinc (aqua regia extractable)	mg/kg	2	MCERTS	220	50	48	64	53

Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155387	155388	155389	155390	155391
Sample Reference				WS16	WS17	WS17	WS19	BH20
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Depth (m)				0.30-0.50	0.30-0.40	1.30-1.40	0.40-0.80	0.20-1.00
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Analytical Parameter (Soil Analysis)	Units	Limit of detection	Accreditation Status					
Monoaromatics								
Benzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Toluene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
Ethylbenzene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
p & m-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
o-xylene	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
MTBE (Methyl Tertiary Butyl Ether)	µg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C6 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aliphatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	2.6	< 1.0
TPH7 - Aliphatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	14	< 2.0
TPH7 - Aliphatic >C16 - C21	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	27	< 8.0
TPH7 - Aliphatic >C21 - C35	mg/kg	8	MCERTS	< 8.0	< 8.0	< 8.0	54	< 8.0
TPH7 - Aliphatic (C5 - C35)	mg/kg	10	MCERTS	< 10	< 10	< 10	98	< 10

TPH7 - Aromatic >C5 - C7	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C7 - C8	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C8 - C10	mg/kg	0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
TPH7 - Aromatic >C10 - C12	mg/kg	1	MCERTS	< 1.0	< 1.0	< 1.0	4.0	< 1.0
TPH7 - Aromatic >C12 - C16	mg/kg	2	MCERTS	< 2.0	< 2.0	< 2.0	17	13
TPH7 - Aromatic >C16 - C21	mg/kg	10	MCERTS	< 10	< 10	< 10	33	15
TPH7 - Aromatic >C21 - C35	mg/kg	10	MCERTS	< 10	< 10	< 10	170	26
TPH7 - Aromatic (C5 - C35)	mg/kg	10	MCERTS	< 10	< 10	< 10	220	54

PCBs by GC-ECD

PCB Congener 28	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 52	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 101	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 118	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 138	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 153	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
PCB Congener 180	mg/kg	0.02	MCERTS	N/A	N/A	N/A	N/A	N/A
Total PCBs	mg/kg	0.2	MCERTS	N/A	N/A	N/A	N/A	N/A



Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number	155392	155393	155394	155395	
Sample Reference	BH03	BH08	BH14	BH015	
Sample Number	None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)	None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	
Time Taken	None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status		

General Inorganics

pH	pH units	N/A	ISO 17025	7.7	7.5	7.7	7.5	
Total Cyanide	µg/l	25	ISO 17025	< 25	< 25	< 25	< 25	
Sulphate as SO ₄	µg/l	100	NONE	140000	82000	130000	76000	
Sulphide	µg/l	5	NONE	< 5.0	< 5.0	< 5.0	< 5.0	

Total Phenols

Total Phenols (monohydric)	µg/l	15	ISO 17025	< 15	< 15	< 15	< 15	
----------------------------	------	----	-----------	------	------	------	------	--

Speciated PAHs

Naphthalene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Acenaphthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluorene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Phenanthrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(a)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Chrysene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(b)fluoranthene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(k)fluoranthene	µg/l	0.01	ISO 17025	< 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	
Indeno(1,2,3-cd)pyrene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Dibenz(a,h)anthracene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	
Benzo(ghi)perylene	µg/l	0.01	ISO 17025	< 0.01	< 0.01	< 0.01	< 0.01	

Total PAH

Total EPA-16 PAHs	µg/l	0.2	ISO 17025	< 0.2	< 0.2	< 0.2	< 0.2	
-------------------	------	-----	-----------	-------	-------	-------	-------	--

Heavy Metals / Metalloids

Arsenic (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	
Boron (dissolved)	µg/l	10	NONE	280	210	370	200	
Cadmium (dissolved)	µg/l	0.5	ISO 17025	< 0.5	< 0.5	< 0.5	< 0.5	
Chromium (hexavalent)	µg/l	10	NONE	< 10	< 10	< 10	< 10	
Chromium (dissolved)	µg/l	1	ISO 17025	5.7	6.5	15	3.2	
Copper (dissolved)	µg/l	3	ISO 17025	5.9	3.8	10	5.8	
Lead (dissolved)	µg/l	5	ISO 17025	18	15	17	19	
Mercury (dissolved)	µg/l	1.5	ISO 17025	< 1.5	< 1.5	< 1.5	< 1.5	
Nickel (dissolved)	µg/l	1	ISO 17025	13	18	20	12	
Selenium (dissolved)	µg/l	10	ISO 17025	< 10	< 10	< 10	< 10	
Zinc (dissolved)	µg/l	1	ISO 17025	9.3	2.9	22	3.1	



Analytical Report Number: 10-24330

Project / Site name: Blyth Rd, Hayes

Lab Sample Number				155392	155393	155394	155395	
Sample Reference				BH03	BH08	BH14	BH015	
Sample Number				None Supplied	None Supplied	None Supplied	None Supplied	
Depth (m)				None Supplied	None Supplied	None Supplied	None Supplied	
Date Sampled				None Supplied	None Supplied	None Supplied	None Supplied	
Time Taken				None Supplied	None Supplied	None Supplied	None Supplied	
Analytical Parameter (Water Analysis)	Units	Limit of detection	Accreditation Status					

Monoaromatics

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

Petroleum Hydrocarbons

TPH7 - Aliphatic >C5 - C6	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic >C6 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aliphatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	

TPH7 - Aromatic >C5 - C7	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >C7 - C8	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >C8 - C10	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >C10 - C12	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >C12 - C16	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >C16 - C21	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic >C21 - C35	µg/l	10	NONE	< 10	< 10	< 10	< 10	
TPH7 - Aromatic (C5 - C35)	µg/l	10	NONE	< 10	< 10	< 10	< 10	

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

Analytical Report Number : 10-24330
Project / Site name: Blyth Rd, Hayes

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

Stone content

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

Lab Sample Number	Sample Reference	Sample Number	Depth (m)	Sample Description *
155367	BH02	None Supplied	0.30-0.50	Brown sandy gravel with rubble.
155368	BH02	None Supplied	0.50-0.70	Beige clay and sand with gravel and rubble.
155369	BH02	None Supplied	0.90-1.00	Brown clay and gravel with stones.
155370	BH03	None Supplied	0.50	Black sandy clay with gravel and tar.
155371	WS04	None Supplied	0.80-1.00	Black sandy clay with gravel and tar.
155372	WS04	None Supplied	1.90-2.20	Light brown sandy clay with gravel and rubble.
155373	BH07	None Supplied	0.50	Light brown sandy clay with gravel and rubble.
155374	BH07	None Supplied	1.50	Light brown sand with rubble.
155375	BH08	None Supplied	1.00-1.20	Brown clay with rubble.
155376	BH08	None Supplied	1.80-2.00	Light brown clay and sand with gravel and rubble.
155377	BH09	None Supplied	0.20-1.60	Brown sandy gravel with rubble and brick.
155378	BH10	None Supplied	0.50-1.00	Brown clay.
155379	BH11	None Supplied	0.40-0.60	Brown clay.
155380	BH11	None Supplied	1.80	Light brown clay and sand with gravel and rubble.
155381	WS12	None Supplied	0.20-0.60	Light brown sandy gravel with rubble.
155382	BH13	None Supplied	0.40	Light brown clay and gravel with rubble.
155383	BH14	None Supplied	0.10-1.00	Light brown clay and gravel with rubble.
155384	BH14	None Supplied	1.00-2.00	Light brown clay and sand with gravel and stones.
155385	BH15	None Supplied	0.30-0.70	Brown clay.
155386	BH15	None Supplied	0.70-1.00	Brown sandy clay with gravel and rubble.
155387	WS16	None Supplied	0.30-0.50	Brown clay and sand with gravel and rubble.
155388	WS17	None Supplied	0.30-0.40	Light brown clay and gravel with stones.
155389	WS17	None Supplied	1.30-1.40	Light brown clay.
155390	WS19	None Supplied	0.40-0.80	Brown sandy gravel with rubble.
155391	BH20	None Supplied	0.20-1.00	Light brown clay and gravel with stones.

Analytical Report Number : 10-24330

Project / Site name: Blyth Rd, Hayes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Boron in water	Determination of boron by acidification followed by ICP-OES.	In-house method based on MEWAM	L039-UK	W	NONE
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-UK	D	MCERTS
BTEX and MTBE in soil	Determination of BTEX in soil by headspace GC-MS.	In-house method based on USEPA8260	L017-UK	W	MCERTS
BTEX and MTBE in water	Determination of BTEX and MTBE in water by headspace GC-MS. Accredited matrices: SW PW	In-house method based on USEPA8260	L036-UK	W	ISO 17025
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 based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L026-UK	D	NONE
Hexavalent chromium in water	Determination of hexavalent chromium in water by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L026-UK	W	NONE
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 1986 Methods for the Determination of Metals in Soil""	L038-UK	D	MCERTS
Metals in water by ICP-OES (dissolved)	Determination of metals in water by acidification followed by ICP-OES. Accredited matrices: SW PW	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-UK	W	ISO 17025
Moisture Content	Moisture content, determined gravimetrically.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L019-UK	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	L006-UK	W	MCERTS
Monohydric phenols in water	Determination of phenols in water by distillation followed by colorimetry. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L006-UK	W	ISO 17025
Organic matter 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""	L023-UK	D	MCERTS
PCB's By GC-ECD in soil	Determination of PCB by extraction with acetone and hexane followed by GC-ECD.	In-house method based on USEPA 8082	L027-UK	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-UK	W	MCERTS
pH in water	Determination of pH in water by electrometric measurement. Accredited matrices: SW PW GW	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L005-UK	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-UK	D	MCERTS
Speciated EPA-16 PAHs in water	Determination of PAH compounds in water by extraction in hexane followed by GC-MS with the use of surrogate and internal standards. Accredited matrices: SW PW GW	In-house method based on USEPA 8270	L070-UK	W	ISO 17025

Analytical Report Number : 10-24330

Project / Site name: Blyth Rd, Hayes

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

Analytical Test Name	Analytical Method Description	Analytical Method Reference	Method number	Wet / Dry Analysis	Accreditation Status
Stones content of soil	Stones not passing through a 2 mm sieve is determined gravimetrically and reported as a percentage of the dry weight. Sample results are not corrected for the stone content of the sample.	In-house method based on British Standard Methods and MCERTS requirements.	L019-UK	D	NONE
Sulphate in water	Determination of sulphate in water by acidification followed by ICP-OES.	In-house method based on MEWAM 1986 Methods for the Determination of Metals in Soil""	L039-UK	W	NONE
Sulphate, water soluble, in soil	Determination of water soluble sulphate by extraction with water followed by ICP-OES.	In-house method based on BS1377 Part 3, 1990, Chemical and Electrochemical Tests""	L038-UK	D	MCERTS
Sulphide in soil	Determination of sulphide in soil by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L010-UK	D	NONE
Sulphide in water	Determination of sulphide in water by ion selective electrode.	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L010-UK	W	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	L007-UK	W	MCERTS
Total cyanide in water	Determination of total cyanide by distillation followed by colorimetry. Accredited matrices: SW PW	In-house method based on Examination of Water and Wastewater 20th Edition: Clesceri, Greenberg & Eaton	L007-UK	W	ISO 17025
TPH7 (Waters)	Determination of dichloromethane extractable hydrocarbons in water by GC-MS.	In-house method	L070-UK	W	NONE
TPHCWG (Soil)	Determination of pentane extractable hydrocarbons in soil by GC-MS/GC-FID.	In-house method	L076-UK	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.

Appendix C

Assessment Criteria

CLEA Software Version 1.06

Page 1 of 5

Report generated 07/03/2011
Report title Purple Hayes
Created by AC at RPS HSE



BASIC SETTINGS

Land Use Residential without homegrown produce

Building Small terraced house

Receptor Female (res)

Start age class 1

End age class 6

Exposure Duration 6 years

Soil Sandy loam

Exposure Pathways

Direct soil and dust ingestion	☒
Consumption of homegrown produce	☐
Soil attached to homegrown produce	☐

Dermal contact with indoor dust	☒
Dermal contact with soil	☒

Inhalation of indoor dust	☒
Inhalation of soil dust	☒
Inhalation of indoor vapour	☒
Inhalation of outdoor vapour	☒

**Land Use** Residential without homegrown produce

Age Class	Exposure Frequencies (days yr ⁻¹)						Occupation Periods (hr day ⁻¹)		Soil to skin adherence factors (mg cm ²)		Direct soil ingestion rate (g day ⁻¹)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	
1	180	0	180	180	365	365	23.0	1.0	0.06	1.00	0.10
2	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10
3	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10
4	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10
5	365	0	365	365	365	365	19.0	1.0	0.06	1.00	0.10
6	365	0	365	365	365	365	19.0	1.0	0.06	1.00	0.10
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00



Receptor Female (res)

Age Class	Body weight (kg)	Body height (m)	Inhalation rate (m ³ day ⁻¹)	Max exposed skin factor			Consumption rates (g FW kg ⁻¹ BW day ⁻¹)					
				Indoor (m ² m ⁻²)	Outdoor (m ² m ⁻²)	Total skin area (m ²)	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	5.60	0.7	8.5	0.32	0.26	3.43E-01	7.12	10.69	16.03	1.83	2.23	3.82
2	9.80	0.8	13.3	0.33	0.26	4.84E-01	6.85	3.30	5.46	3.96	0.54	11.96
3	12.70	0.9	12.7	0.32	0.25	5.82E-01	6.85	3.30	5.46	3.96	0.54	11.96
4	15.10	0.9	12.2	0.35	0.28	6.36E-01	6.85	3.30	5.46	3.96	0.54	11.96
5	16.90	1.0	12.2	0.35	0.28	7.04E-01	3.74	1.77	3.38	1.85	0.16	4.26
6	19.70	1.1	12.2	0.33	0.26	7.94E-01	3.74	1.77	3.38	1.85	0.16	4.26
7	22.10	1.2	12.4	0.22	0.15	8.73E-01	3.74	1.77	3.38	1.85	0.16	4.26
8	25.30	1.2	12.4	0.22	0.15	9.36E-01	3.74	1.77	3.38	1.85	0.16	4.26
9	27.50	1.3	12.4	0.22	0.15	1.01E+00	3.74	1.77	3.38	1.85	0.16	4.26
10	31.40	1.3	12.4	0.22	0.15	1.08E+00	3.74	1.77	3.38	1.85	0.16	4.26
11	35.70	1.4	12.4	0.22	0.14	1.19E+00	3.74	1.77	3.38	1.85	0.16	4.26
12	41.30	1.4	13.4	0.22	0.14	1.29E+00	3.74	1.77	3.38	1.85	0.16	4.26
13	47.20	1.5	13.4	0.22	0.14	1.42E+00	3.74	1.77	3.38	1.85	0.16	4.26
14	51.20	1.6	13.4	0.22	0.14	1.52E+00	3.74	1.77	3.38	1.85	0.16	4.26
15	56.70	1.6	13.4	0.21	0.14	1.60E+00	3.74	1.77	3.38	1.85	0.16	4.26
16	59.00	1.6	13.4	0.21	0.14	1.63E+00	3.74	1.77	3.38	1.85	0.16	4.26
17	70.00	1.6	14.8	0.33	0.27	1.78E+00	2.94	1.40	1.79	1.61	0.22	2.97
18	70.90	1.6	12.0	0.33	0.27	1.80E+00	2.94	1.40	1.79	1.61	0.22	2.97

**Building** Small terraced house

Building footprint (m ²)	2.80E+01
Living space air exchange rate (hr ⁻¹)	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm ²)	4.23E+02
Dust loading factor (µg m ⁻³)	5.00E+01

Soil Sandy loam

Porosity, Total (cm ³ cm ⁻³)	5.30E-01
Porosity, Air-Filled (cm ³ cm ⁻³)	2.00E-01
Porosity, Water-Filled (cm ³ cm ⁻³)	3.30E-01
Residual soil water content (cm ³ cm ⁻³)	1.20E-01
Saturated hydraulic conductivity (cm s ⁻¹)	3.56E-03
van Genuchten shape parameter <i>m</i> (dimensionless)	3.20E-01
Bulk density (g cm ⁻³)	1.21E+00
Threshold value of wind speed at 10m (m s ⁻¹)	7.20E+00
Empirical function (<i>F_x</i>) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	8.22E+00
Soil Organic Matter content (%)	1.90E+00
Fraction of organic carbon (g g ⁻¹)	1.10E-02
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm ²)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm ²)	3.05E-08

**Soil - Vapour Model**

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($\text{cm}^3 \text{s}^{-1}$)	2.50E+01
Building ventilation rate ($\text{cm}^3 \text{s}^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($\text{m}^2 \text{m}^{-2}$)	0.75

* Air dispersion factor in $\text{g m}^{-2} \text{s}^{-1}$ per kg m^{-3} **Soil - Plant Model**

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	Average	High		
		dimensionless		g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

CLEA Software Version 1.06

Page 1 of 11

Report generated 07-Mar-11

Report title Purple Hayes

Created by AC at RPS HSE



RESULTS



		Assessment Criterion (mg kg ⁻¹)			Ratio of ADE to HCV			Saturation Limit (mg kg ⁻¹)	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
1	Arsenic	3.50E+01	8.50E+01	NR	1.00	0.41	NR	NR	No	No
2	Cadmium	2.41E+01	2.97E+01	1.77E+01	0.58	0.42	1.00	NR	Yes	Yes
3	Chromium (III)	1.98E+04	3.55E+03	3.01E+03	0.15	0.85	1.00	NR	No	No
4	Chromium (VI)	8.40E+01	4.25E+00	4.12E+00	0.03	0.97	1.00	NR	Yes	No
5	Lead	2.84E+02	6.00E+03	2.71E+02	0.95	0.05	1.00	NR	Yes	No
6	Mercury, inorganic	2.62E+02	2.55E+03	2.38E+02	0.91	0.09	1.00	NR	No	No
7	Nickel	7.86E+02	1.27E+02	NR	0.09	1.00	NR	NR	Yes	Yes
8	Selenium	5.95E+02	NR	NR	1.00	NR	NR	NR	Yes	No
9	Copper	1.08E+04	1.04E+04	6.20E+03	0.40	0.60	1.00	NR	Yes	No
10	Zinc	4.05E+04	2.55E+07	4.04E+04	1.00	0.00	1.00	NR	Yes	No
11	Acenaphthene	4.85E+03	6.51E+03	2.78E+03	0.57	0.43	1.00	1.07E+02 (sol)	No	No
12	Acenaphthylene	4.85E+03	6.13E+03	2.71E+03	0.56	0.44	1.00	1.62E+02 (sol)	No	No
13	Anthracene	2.43E+04	2.02E+05	2.17E+04	0.89	0.11	1.00	2.21E+00 (vap)	No	No
14	Benz[a]anthracene	1.12E+01	8.46E+00	4.81E+00	0.43	0.57	1.00	3.25E+00 (sol)	No	No
15	Benzo[a]pyrene	1.62E+00	2.77E+00	1.02E+00	0.63	0.37	1.00	1.73E+00 (vap)	No	No
16	Benzo[b]fluoranthene	1.15E+01	1.93E+01	7.19E+00	0.63	0.37	1.00	2.31E+00 (sol)	No	No
17	Benzo[ghi]perylene	7.35E+01	1.31E+02	4.71E+01	0.64	0.36	1.00	2.92E-02 (vap)	No	No
18	Benzo[k]fluoranthene	1.62E+01	2.79E+01	1.02E+01	0.63	0.37	1.00	1.30E+00 (sol)	No	No
19	Chrysene	1.62E+01	2.32E+01	9.53E+00	0.59	0.41	1.00	8.36E-01 (vap)	No	No
20	Dibenz[ah]anthracene	1.46E+00	2.36E+00	8.99E-01	0.62	0.38	1.00	7.46E-03 (vap)	No	No

[illegible]



		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg ⁻¹	mg m ⁻³	mg kg ⁻¹	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW
1	Arsenic	99.9	0.1	0.0	100.0	3.50E+01	NR	1.75E+01	1.49E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
2	Cadmium	99.7	0.3	0.0	100.0	1.77E+01	NR	8.84E+00	7.52E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
3	Chromium (III)	100.0	0.0	0.0	100.0	3.01E+03	NR	1.51E+03	1.28E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
4	Chromium (VI)	98.5	1.5	0.0	100.0	4.12E+00	NR	2.06E+00	1.75E-09	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
5	Lead	100.0	0.0	0.0	100.0	2.71E+02	NR	1.36E+02	1.15E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
6	Mercury, inorganic	99.9	0.1	0.0	100.0	2.38E+02	NR	1.19E+02	1.01E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
7	Nickel	99.9	0.1	0.0	100.0	1.27E+02	NR	6.37E+01	5.42E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
8	Selenium	99.5	0.5	0.0	100.0	5.95E+02	NR	2.98E+02	2.53E-07	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
9	Copper	99.7	0.3	0.0	100.0	6.20E+03	NR	3.10E+03	2.64E-06	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
10	Zinc	99.3	0.7	0.0	100.0	4.04E+04	NR	2.02E+04	1.72E-05	0.00E+00	0.00E+00	0.00E+00	0.00E+00	NA	NA	NA	NA	NA	NA
11	Acenaphthene	99.0	1.0	0.0	100.0	2.78E+03	8.08E+01	1.39E+03	1.18E-06	0.00E+00	2.76E-02	2.20E-04	0.00E+00	NA	NA	NA	NA	NA	NA
12	Acenaphthylene	98.7	1.3	0.0	100.0	2.71E+03	7.57E+01	1.35E+03	1.15E-06	0.00E+00	2.86E-02	2.25E-04	0.00E+00	NA	NA	NA	NA	NA	NA
13	Anthracene	99.6	0.4	0.0	100.0	2.17E+04	6.30E+01	1.08E+04	9.22E-06	0.00E+00	3.41E-02	7.65E-04	0.00E+00	NA	NA	NA	NA	NA	NA
14	Benzo[a]anthracene	100.0	0.0	0.0	100.0	4.81E+00	1.78E-04	2.41E+00	2.05E-09	0.00E+00	1.71E-07	3.72E-08	0.00E+00	NA	NA	NA	NA	NA	NA
15	Benzo[a]pyrene	100.0	0.0	0.0	100.0	1.02E+00	1.27E-06	5.10E-01	4.34E-10	0.00E+00	1.67E-09	5.82E-09	0.00E+00	NA	NA	NA	NA	NA	NA
16	Benzo[b]fluoranthene	100.0	0.0	0.0	100.0	7.19E+00	1.28E-05	3.60E+00	3.06E-09	0.00E+00	1.67E-08	4.52E-08	0.00E+00	NA	NA	NA	NA	NA	NA
17	Benzo[ghi]perylene	100.0	0.0	0.0	100.0	4.71E+01	2.93E-05	2.35E+01	2.00E-08	0.00E+00	3.78E-08	1.47E-07	0.00E+00	NA	NA	NA	NA	NA	NA
18	Benzo[k]fluoranthene	100.0	0.0	0.0	100.0	1.02E+01	1.09E-05	5.12E+00	4.36E-09	0.00E+00	1.44E-08	5.42E-08	0.00E+00	NA	NA	NA	NA	NA	NA
19	Chrysene	100.0	0.0	0.0	100.0	9.53E+00	5.00E-05	4.77E+00	4.06E-09	0.00E+00	6.43E-08	8.45E-08	0.00E+00	NA	NA	NA	NA	NA	NA
20	Dibenz[ah]anthracene	100.0	0.0	0.0	100.0	8.99E-01	2.37E-06	4.50E-01	3.83E-10	0.00E+00	2.94E-09	4.13E-09	0.00E+00	NA	NA	NA	NA	NA	NA

[illegible]



		Average Daily Exposure (mg kg ⁻¹ bw day ⁻¹)							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Arsenic	2.60E-04	0.00E+00	4.01E-05	8.25E-07	0.00E+00	0.00E+00	0.00E+00	86.41	0.00	13.32	0.27	0.00	0.00	0.00	0.00
2	Cadmium	1.31E-04	0.00E+00	6.73E-07	4.16E-07	0.00E+00	7.54E-04	1.21E-06	49.59	0.00	0.25	0.16	0.00	0.00	49.84	0.16
3	Chromium (III)	2.23E-02	0.00E+00	0.00E+00	7.09E-05	0.00E+00	3.39E-03	1.64E-05	86.54	0.00	0.00	0.27	0.00	0.00	13.12	0.06
4	Chromium (VI)	3.05E-05	0.00E+00	0.00E+00	9.69E-08	0.00E+00	3.77E-04	0.00E+00	49.92	0.00	0.00	0.16	0.00	0.00	49.92	0.00
5	Lead	2.01E-03	0.00E+00	0.00E+00	6.38E-06	0.00E+00	1.46E-03	1.82E-06	57.77	0.00	0.00	0.18	0.00	0.00	42.00	0.05
6	Mercury, inorganic	1.76E-03	0.00E+00	0.00E+00	5.59E-06	0.00E+00	5.63E-05	0.00E+00	96.61	0.00	0.00	0.31	0.00	0.00	3.08	0.00
7	Nickel	9.45E-04	0.00E+00	2.43E-05	3.00E-06	0.00E+00	7.31E-03	3.64E-06	48.45	0.00	1.24	0.15	0.00	0.00	49.85	0.15
8	Selenium	4.41E-03	0.00E+00	0.00E+00	1.40E-05	0.00E+00	1.97E-03	3.64E-06	68.96	0.00	0.00	0.22	0.00	0.00	30.82	0.00
9	Copper	4.60E-02	0.00E+00	0.00E+00	1.46E-04	0.00E+00	3.94E-01	4.12E-05	49.90	0.00	0.00	0.16	0.00	0.00	49.90	0.04
10	Zinc	3.00E-01	0.00E+00	0.00E+00	9.52E-04	0.00E+00	1.52E+00	1.45E-04	49.91	0.00	0.00	0.16	0.00	0.00	49.91	0.02
11	Acenaphthene	2.06E-02	0.00E+00	1.38E-02	6.54E-05	2.55E-02	5.51E-05	1.52E-06	34.33	0.00	22.93	0.11	42.53	0.02	0.09	0.00
12	Acenaphthylene	2.01E-02	0.00E+00	1.34E-02	6.37E-05	2.64E-02	7.88E-06	6.67E-07	33.47	0.00	22.35	0.11	44.04	0.02	0.01	0.00
13	Anthracene	1.61E-01	0.00E+00	1.07E-01	5.10E-04	3.16E-02	4.50E-06	6.67E-07	53.54	0.00	35.76	0.17	10.52	0.01	0.00	0.00
14	Benzo[a]anthracene	3.57E-05	0.00E+00	2.38E-05	1.13E-07	1.60E-07	3.38E-06	6.67E-07	59.68	0.00	39.86	0.19	0.26	0.00	0.00	0.00
15	Benzo[a]pyrene	7.57E-06	0.00E+00	5.06E-06	2.40E-08	1.79E-09	6.19E-06	3.64E-07	59.83	0.00	39.96	0.19	0.01	0.00	0.00	0.00
16	Benzo[b]fluoranthene	5.34E-05	0.00E+00	3.56E-05	1.69E-07	1.73E-08	6.19E-06	7.88E-07	59.83	0.00	39.96	0.19	0.02	0.00	0.00	0.00
17	Benzo[ghi]perylene	3.49E-04	0.00E+00	2.33E-04	1.11E-06	4.11E-08	3.38E-06	6.06E-07	59.84	0.00	39.96	0.19	0.01	0.00	0.00	0.00
18	Benzo[k]fluoranthene	7.60E-05	0.00E+00	5.07E-05	2.41E-07	1.56E-08	5.06E-06	4.24E-07	59.84	0.00	39.96	0.19	0.01	0.00	0.00	0.00
19	Chrysene	7.07E-05	0.00E+00	4.72E-05	2.24E-07	6.30E-08	6.19E-06	1.03E-06	59.81	0.00	39.95	0.19	0.05	0.00	0.00	0.00
20	Dibenz[ah]anthracene	6.67E-06	0.00E+00	4.46E-06	2.12E-08	2.89E-09	2.25E-06	2.00E-06	59.83	0.00	39.96	0.19	0.02	0.00	0.00	0.00



	Average Daily Exposure ($\text{mg kg}^{-1} \text{ bw day}^{-1}$)	Distribution by Pathway (%)
	Direct soil ingestion Consumption of homegrown produce and attached soil Dermal contact with soil and dust Inhalation of dust Inhalation of vapour Background (oral) Background (inhalation)	Direct soil ingestion Consumption of homegrown produce Dermal contact with soil and dust Inhalation of dust Inhalation of vapour (indoor) Inhalation of vapour (outdoor) Background (oral) Background (inhalation)
21 Fluoranthene	7.33E-03 0.00E+00 4.90E-03 2.33E-05 2.30E-04 1.97E-05 5.09E-06	58.62 0.00 39.15 0.19 1.83 0.01 0.16
22 Fluorene	1.72E-02 0.00E+00 1.15E-02 5.45E-05 1.13E-02 3.32E-05 5.82E-06	42.94 0.00 28.68 0.14 28.13 0.01 0.08
23 Indeno[123-cd]pyrene	3.20E-05 0.00E+00 2.14E-05 1.02E-07 1.23E-08 5.63E-06 5.46E-07	59.83 0.00 39.96 0.19 0.02 0.00 0.00
24 Naphthalene	2.23E-05 0.00E+00 1.49E-05 7.08E-08 6.89E-04 3.94E-04 1.70E-04	2.39 0.00 1.60 0.01 73.82 0.01 3.99
25 Phenanthrene	6.73E-03 0.00E+00 4.49E-03 2.13E-05 1.18E-03 8.66E-05 3.14E-05	53.67 0.00 35.84 0.17 9.37 0.01 0.69
26 Pyrene	1.76E-02 0.00E+00 1.18E-02 5.58E-05 5.78E-04 1.97E-05 3.94E-06	58.64 0.00 39.17 0.19 1.92 0.01 0.07
27		
28		
29		
30		



																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														</
--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	----

[illegible]

Environment
Agency

		Soil-to-water partition coefficient (cm ³ g ⁻¹)	Vapour pressure (Pa)	Water solubility (mg L ⁻¹)	Soil-to-plant concentration factor for green vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for root vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for tree fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)
1	Arsenic	5.00E+02	NR	1.25E+06	0.00043 fw	0.0004 fw	0.00023 fw	0.00033 fw	0.0002 fw	0.0011 fw
2	Cadmium	1.00E+02	NR	1.62E+06	0.052 fw	0.029 fw	0.031 fw	0.016 fw	0.0031 fw	0.0014 fw
3	Chromium (III)	4.80E+03	NR	5.85E+05	0.00003 fw	0.00003 fw	0.00003 fw	0.00003 fw	0.00003 fw	0.00003 fw
4	Chromium (VI)	1.80E+01	NR	2.30E+06	0.0002 fw	0.0001 fw	0.0001 fw	0.09 fw	0.0003 fw	0.09 fw
5	Lead	3.00E+03	NR	0.00E+00	model	model	model	model	model	model
6	Mercury, inorganic	5.00E+02	NR	7.40E+04	0.0038 fw	0.0069 fw	0.0043 fw	0.001 fw	0.0011 fw	0.001 fw
7	Nickel	5.00E+02	NR	2.50E+06	0.0038 fw	0.0043 fw	0.0019 fw	0.0025 fw	0.0025 fw	0.0034 fw
8	Selenium	5.00E+01	NR	2.17E+06	0.0108 fw	0.00364 fw	0.00083 fw	0.00271 fw	0.003 fw	0.003 fw
9	Copper	1.00E+02	NR	1.38E+06	0.0206 fw	0.0206 fw	0.0206 fw	0.0233 fw	0.0206 fw	0.0206 fw
10	Zinc	3.80E+01	NR	4.32E+06	0.054 fw	0.054 fw	0.054 fw	0.143 fw	0.054 fw	0.054 fw
11	Acenaphthene	2.58E+01	7.37E-02	4.11E+00	model	model	model	model	model	model
12	Acenaphthylene	2.01E+01	7.08E-02	7.95E+00	model	model	model	model	model	model
13	Anthracene	6.20E+01	8.49E-05	5.60E-02	model	model	model	model	model	model
14	Benzo[a]anthracene	8.55E+02	1.24E-06	3.80E-03	model	model	model	model	model	model
15	Benzo[a]pyrene	1.42E+03	2.00E-08	3.80E-03	model	model	model	model	model	model
16	Benzo[b]fluoranthene	1.15E+03	6.34E+08	2.00E-03	model	model	model	model	model	model
17	Benzo[ghi]perylene	4.59E+03	1.55E-10	2.60E-04	model	model	model	model	model	model
18	Benzo[k]fluoranthene	1.63E+03	1.64E-08	8.00E-04	model	model	model	model	model	model
19	Chrysene	6.06E+02	4.52E-08	2.00E-03	model	model	model	model	model	model
20	Dibenz[ah]anthracene	2.05E+03	1.66E-10	6.00E-04	model	model	model	model	model	model

[illegible]

CLEA Software Version 1.06

Page 1 of 5

Report generated 07/03/2011
Report title Purple Hayes
Created by AC at RPS HSE



BASIC SETTINGS

Land Use Residential without homegrown produce

Building Small terraced house

Receptor Female (res)

Start age class 1

End age class 6

Exposure Duration 6 years

Soil Sandy loam

Exposure Pathways

Direct soil and dust ingestion	☒
Consumption of homegrown produce	☐
Soil attached to homegrown produce	☐

Dermal contact with indoor dust	☒
Dermal contact with soil	☒

Inhalation of indoor dust	☒
Inhalation of soil dust	☒
Inhalation of indoor vapour	☒
Inhalation of outdoor vapour	☒

**Land Use** Residential without homegrown produce

Age Class	Exposure Frequencies (days yr ⁻¹)						Occupation Periods (hr day ⁻¹)		Soil to skin adherence factors (mg cm ²)		Direct soil ingestion rate (g day ⁻¹)
	Direct soil ingestion	Consumption of homegrown produce	Dermal contact with indoor dust	Dermal contact with soil	Inhalation of dust and vapour, indoor	Inhalation of dust and vapour, outdoor	Indoors	Outdoors	Indoor	Outdoor	
1	180	0	180	180	365	365	23.0	1.0	0.06	1.00	0.10
2	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10
3	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10
4	365	0	365	365	365	365	23.0	1.0	0.06	1.00	0.10
5	365	0	365	365	365	365	19.0	1.0	0.06	1.00	0.10
6	365	0	365	365	365	365	19.0	1.0	0.06	1.00	0.10
7	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
8	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
9	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
10	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
11	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
12	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
13	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
14	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
15	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
16	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
17	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00
18	0	0	0	0	0	0	0.0	0.0	0.00	0.00	0.00



Receptor Female (res)

Age Class	Body weight (kg)	Body height (m)	Inhalation rate (m ³ day ⁻¹)	Max exposed skin factor			Consumption rates (g FW kg ⁻¹ BW day ⁻¹)					
				Indoor (m ² m ⁻²)	Outdoor (m ² m ⁻²)	Total skin area (m ²)	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
1	5.60	0.7	8.5	0.32	0.26	3.43E-01	7.12	10.69	16.03	1.83	2.23	3.82
2	9.80	0.8	13.3	0.33	0.26	4.84E-01	6.85	3.30	5.46	3.96	0.54	11.96
3	12.70	0.9	12.7	0.32	0.25	5.82E-01	6.85	3.30	5.46	3.96	0.54	11.96
4	15.10	0.9	12.2	0.35	0.28	6.36E-01	6.85	3.30	5.46	3.96	0.54	11.96
5	16.90	1.0	12.2	0.35	0.28	7.04E-01	3.74	1.77	3.38	1.85	0.16	4.26
6	19.70	1.1	12.2	0.33	0.26	7.94E-01	3.74	1.77	3.38	1.85	0.16	4.26
7	22.10	1.2	12.4	0.22	0.15	8.73E-01	3.74	1.77	3.38	1.85	0.16	4.26
8	25.30	1.2	12.4	0.22	0.15	9.36E-01	3.74	1.77	3.38	1.85	0.16	4.26
9	27.50	1.3	12.4	0.22	0.15	1.01E+00	3.74	1.77	3.38	1.85	0.16	4.26
10	31.40	1.3	12.4	0.22	0.15	1.08E+00	3.74	1.77	3.38	1.85	0.16	4.26
11	35.70	1.4	12.4	0.22	0.14	1.19E+00	3.74	1.77	3.38	1.85	0.16	4.26
12	41.30	1.4	13.4	0.22	0.14	1.29E+00	3.74	1.77	3.38	1.85	0.16	4.26
13	47.20	1.5	13.4	0.22	0.14	1.42E+00	3.74	1.77	3.38	1.85	0.16	4.26
14	51.20	1.6	13.4	0.22	0.14	1.52E+00	3.74	1.77	3.38	1.85	0.16	4.26
15	56.70	1.6	13.4	0.21	0.14	1.60E+00	3.74	1.77	3.38	1.85	0.16	4.26
16	59.00	1.6	13.4	0.21	0.14	1.63E+00	3.74	1.77	3.38	1.85	0.16	4.26
17	70.00	1.6	14.8	0.33	0.27	1.78E+00	2.94	1.40	1.79	1.61	0.22	2.97
18	70.90	1.6	12.0	0.33	0.27	1.80E+00	2.94	1.40	1.79	1.61	0.22	2.97

**Building** Small terraced house

Building footprint (m ²)	2.80E+01
Living space air exchange rate (hr ⁻¹)	5.00E-01
Living space height (above ground, m)	4.80E+00
Living space height (below ground, m)	0.00E+00
Pressure difference (soil to enclosed space, Pa)	3.10E+00
Foundation thickness (m)	1.50E-01
Floor crack area (cm ²)	4.23E+02
Dust loading factor (µg m ⁻³)	5.00E+01

Soil Sandy loam

Porosity, Total (cm ³ cm ⁻³)	5.30E-01
Porosity, Air-Filled (cm ³ cm ⁻³)	2.00E-01
Porosity, Water-Filled (cm ³ cm ⁻³)	3.30E-01
Residual soil water content (cm ³ cm ⁻³)	1.20E-01
Saturated hydraulic conductivity (cm s ⁻¹)	3.56E-03
van Genuchten shape parameter <i>m</i> (dimensionless)	3.20E-01
Bulk density (g cm ⁻³)	1.21E+00
Threshold value of wind speed at 10m (m s ⁻¹)	7.20E+00
Empirical function (<i>F_x</i>) for dust model (dimensionless)	1.22E+00
Ambient soil temperature (K)	2.83E+02
Soil pH	8.22E+00
Soil Organic Matter content (%)	1.90E+00
Fraction of organic carbon (g g ⁻¹)	1.10E-02
Effective total fluid saturation (unitless)	5.12E-01
Intrinsic soil permeability (cm ²)	4.75E-08
Relative soil air permeability (unitless)	6.42E-01
Effective air permeability (cm ²)	3.05E-08

**Soil - Vapour Model**

Depth to top of source (no building) (cm)	0
Depth to top of source (beneath building) (cm)	65
Default soil gas ingress rate?	Yes
Soil gas ingress rate ($\text{cm}^3 \text{s}^{-1}$)	2.50E+01
Building ventilation rate ($\text{cm}^3 \text{s}^{-1}$)	1.87E+04
Averaging time surface emissions (yr)	6
Finite vapour source model?	No
Thickness of contaminated layer (cm)	200

Air Dispersion Model

Mean annual windspeed at 10m (m s^{-1})	5.00
Air dispersion factor at height of 0.8m *	2400.00
Air dispersion factor at height of 1.6m *	0.00
Fraction of site cover ($\text{m}^2 \text{m}^{-2}$)	0.75

* Air dispersion factor in $\text{g m}^{-2} \text{s}^{-1}$ per kg m^{-3} **Soil - Plant Model**

	Dry weight conversion factor	Homegrown fraction		Soil loading factor	Preparation correction factor
	g DW g^{-1} FW	Average	High	g g^{-1} DW	dimensionless
Green vegetables	0.096	0.05	0.33	1.00E-03	2.00E-01
Root vegetables	0.103	0.06	0.40	1.00E-03	1.00E+00
Tuber vegetables	0.210	0.02	0.13	1.00E-03	1.00E+00
Herbaceous fruit	0.058	0.06	0.40	1.00E-03	6.00E-01
Shrub fruit	0.166	0.09	0.60	1.00E-03	6.00E-01
Tree fruit	0.157	0.04	0.27	1.00E-03	6.00E-01

Gardener type None

CLEA Software Version 1.06

Page 1 of 11

Report generated 07-Mar-11

Report title Purple Hayes

Created by AC at RPS HSE



RESULTS



		Assessment Criterion (mg kg ⁻¹)			Ratio of ADE to HCV			Saturation Limit (mg kg ⁻¹)	50% rule?	
		oral	inhalation	combined	oral	inhalation	combined		Oral	Inhal
1	Aliphatics (C5-C6)	2.23E+05	4.47E+01	4.47E+01	0.00	1.00	1.00	4.56E+02 (sol)	Yes	Yes
2	Aliphatics (>C6-C8)	2.23E+05	1.26E+02	1.26E+02	0.00	1.00	1.00	2.51E+02 (sol)	Yes	Yes
3	Aliphatics (>C8-C10)	4.45E+03	3.51E+01	3.51E+01	0.00	1.00	1.00	1.45E+02 (vap)	Yes	Yes
4	Aliphatics (>C10-C12)	4.45E+03	1.77E+02	1.75E+02	0.02	0.98	1.00	9.00E+01 (vap)	Yes	Yes
5	Aliphatics (>C12-C16)	4.45E+03	1.48E+03	1.34E+03	0.18	0.82	1.00	4.49E+01 (sol)	Yes	Yes
6	Aliphatics (>C16-C35)	5.90E+04	NR	NR	1.00	NR	NR	1.61E+01 (sol)	Yes	No
7	Aromatics (EC5-EC7)	1.98E+04	4.04E+02	3.96E+02	0.02	0.98	1.00	1.85E+03 (sol)	No	No
8	Aromatics (>EC7-EC8)	1.98E+04	1.08E+03	1.02E+03	0.05	0.95	1.00	1.50E+03 (vap)	No	No
9	Aromatics (>EC8-EC10)	1.78E+03	6.23E+01	6.17E+01	0.02	0.98	1.00	1.15E+03 (vap)	Yes	Yes
10	Aliphatics (>C10-C12)	4.45E+03	1.77E+02	1.75E+02	0.02	0.98	1.00	9.00E+01 (vap)	Yes	Yes
11	Aromatics (>EC12-EC16)	1.78E+03	3.78E+03	1.52E+03	0.75	0.25	1.00	3.19E+02 (sol)	Yes	Yes
12	Aromatics (>EC16-EC21)	1.31E+03	NR	NR	1.00	NR	NR	1.02E+02 (vap)	Yes	No
13	Aromatics (>EC21-EC35)	1.33E+03	NR	NR	1.00	NR	NR	9.17E+00 (sol)	Yes	No
14										
15	Benzene	2.58E+01	4.07E-01	4.01E-01	0.02	0.98	1.00	1.85E+03 (sol)	No	No
16	Ethylbenzene	8.88E+03	3.07E+02	2.97E+02	0.03	0.97	1.00	9.37E+02 (vap)	No	No
17	Toluene	1.98E+04	1.08E+03	1.02E+03	0.05	0.95	1.00	1.50E+03 (vap)	No	No
18	Xylene, m-	1.60E+04	1.01E+02	1.00E+02	0.01	0.99	1.00	1.13E+03 (vap)	No	No
19	Xylene, o-	1.60E+04	1.08E+02	1.07E+02	0.01	0.99	1.00	8.63E+02 (sol)	No	No
20	Xylene, p-	1.60E+04	9.67E+01	9.61E+01	0.01	0.99	1.00	1.04E+03 (sol)	No	No

[illegible]



		Soil Distribution				Media Concentrations													
		Sorbed	Dissolved	Vapour	Total	Soil	Soil gas	Indoor Dust	Outdoor dust at 0.8m	Outdoor dust at 1.6m	Indoor Vapour	Outdoor vapour at 0.8m	Outdoor vapour at 1.6m	Green vegetables	Root vegetables	Tuber vegetables	Herbaceous fruit	Shrub fruit	Tree fruit
		%	%	%	%	mg kg ⁻¹	mg m ⁻³	mg kg ⁻¹	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg m ⁻³	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW	mg kg ⁻¹ FW
1	Aliphatics (C5-C6)	70.5	2.1	27.3	100.0	4.47E+01	7.40E+04	2.24E+01	1.90E-08	0.00E+00	2.70E+00	8.85E-04	0.00E+00	NA	NA	NA	NA	NA	NA
2	Aliphatics (>C6-C8)	89.7	0.6	9.7	100.0	1.26E+02	7.40E+04	6.32E+01	5.38E-08	0.00E+00	2.70E+00	1.49E-03	0.00E+00	NA	NA	NA	NA	NA	NA
3	Aliphatics (>C8-C10)	97.9	0.1	2.0	100.0	3.51E+01	4.28E+03	1.75E+01	1.49E-08	0.00E+00	1.56E-01	1.89E-04	0.00E+00	NA	NA	NA	NA	NA	NA
4	Aliphatics (>C10-C12)	99.6	0.0	0.4	100.0	1.75E+02	4.25E+03	8.75E+01	7.45E-08	0.00E+00	1.55E-01	4.20E-04	0.00E+00	NA	NA	NA	NA	NA	NA
5	Aliphatics (>C12-C16)	100.0	0.0	0.0	100.0	1.34E+03	3.87E+03	6.70E+02	5.71E-07	0.00E+00	1.41E-01	1.11E-03	0.00E+00	NA	NA	NA	NA	NA	NA
6	Aliphatics (>C16-C35)	100.0	0.0	0.0	100.0	5.90E+04	9.95E+03	2.95E+04	2.51E-05	0.00E+00	3.63E-01	1.18E-02	0.00E+00	NA	NA	NA	NA	NA	NA
7	Aromatics (EC5-EC7)	71.8	26.3	1.8	100.0	3.96E+02	4.42E+04	1.98E+02	1.68E-07	0.00E+00	1.47E+00	1.91E-03	0.00E+00	NA	NA	NA	NA	NA	NA
8	Aromatics (>EC7-EC8)	88.5	10.7	0.7	100.0	1.02E+03	4.63E+04	5.11E+02	4.35E-07	0.00E+00	1.40E+00	2.96E-03	0.00E+00	NA	NA	NA	NA	NA	NA
9	Aromatics (>EC8-EC10)	98.2	1.5	0.2	100.0	6.17E+01	8.78E+02	3.09E+01	2.63E-08	0.00E+00	3.21E-02	1.13E-04	0.00E+00	NA	NA	NA	NA	NA	NA
10	Aliphatics (>C10-C12)	99.6	0.0	0.4	100.0	1.75E+02	4.25E+03	8.75E+01	7.45E-08	0.00E+00	1.55E-01	4.20E-04	0.00E+00	NA	NA	NA	NA	NA	NA
11	Aromatics (>EC12-EC16)	99.5	0.5	0.0	100.0	1.52E+03	3.46E+02	7.62E+02	6.49E-07	0.00E+00	1.30E-02	3.61E-04	0.00E+00	NA	NA	NA	NA	NA	NA
12	Aromatics (>EC16-EC21)	99.8	0.2	0.0	100.0	1.31E+03	5.83E+00	6.54E+02	5.56E-07	0.00E+00	3.11E-04	5.64E-05	0.00E+00	NA	NA	NA	NA	NA	NA
13	Aromatics (>EC21-EC35)	100.0	0.0	0.0	100.0	1.33E+03	2.38E-02	6.66E+02	5.67E-07	0.00E+00	2.85E-06	1.30E-05	0.00E+00	NA	NA	NA	NA	NA	NA
14																			
15	Benzene	71.8	26.3	1.8	100.0	4.01E-01	4.48E+01	2.00E-01	1.71E-10	0.00E+00	1.49E-03	1.93E-06	0.00E+00	NA	NA	NA	NA	NA	NA
16	Ethylbenzene	94.3	5.2	0.4	100.0	2.97E+02	7.90E+03	1.48E+02	1.26E-07	0.00E+00	2.22E-01	6.26E-04	0.00E+00	NA	NA	NA	NA	NA	NA
17	Toluene	88.5	10.7	0.7	100.0	1.02E+03	4.63E+04	5.11E+02	4.35E-07	0.00E+00	1.40E+00	2.96E-03	0.00E+00	NA	NA	NA	NA	NA	NA
18	Xylene, m-	94.9	4.8	0.3	100.0	1.00E+02	1.97E+03	5.01E+01	4.27E-08	0.00E+00	5.53E-02	1.82E-04	0.00E+00	NA	NA	NA	NA	NA	NA
19	Xylene, o-	94.2	5.5	0.3	100.0	1.07E+02	1.98E+03	5.36E+01	4.56E-08	0.00E+00	5.53E-02	1.88E-04	0.00E+00	NA	NA	NA	NA	NA	NA
20	Xylene, p-	94.4	5.2	0.3	100.0	9.61E+01	1.97E+03	4.80E+01	4.09E-08	0.00E+00	5.53E-02	1.78E-04	0.00E+00	NA	NA	NA	NA	NA	NA

[illegible]



		Average Daily Exposure (mg kg ⁻¹ bw day ⁻¹)							Distribution by Pathway (%)							
		Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour	Background (oral)	Background (inhalation)	Direct soil ingestion	Consumption of homegrown produce and attached soil	Dermal contact with soil and dust	Inhalation of dust	Inhalation of vapour (indoor)	Inhalation of vapour (outdoor)	Background (oral)	Background (inhalation)
1	Aliphatics (C5-C6)	3.32E-04	0.00E+00	1.70E-04	1.05E-06	2.50E+00	5.62E+95	6.06E+95	0.01	0.00	0.00	0.00	49.99	0.00	0.01	49.99
2	Aliphatics (>C6-C8)	9.38E-04	0.00E+00	4.82E-04	2.98E-06	2.50E+00	5.62E+95	6.06E+95	0.02	0.00	0.01	0.00	49.97	0.00	0.03	49.97
3	Aliphatics (>C8-C10)	2.60E-04	0.00E+00	1.34E-04	8.26E-07	1.45E-01	5.62E+95	6.06E+95	0.09	0.00	0.05	0.00	49.86	0.00	0.14	49.86
4	Aliphatics (>C10-C12)	1.30E-03	0.00E+00	6.67E-04	4.12E-06	1.44E-01	5.62E+95	6.06E+95	0.45	0.00	0.23	0.00	49.32	0.01	0.68	49.32
5	Aliphatics (>C12-C16)	9.94E-03	0.00E+00	5.11E-03	3.16E-05	1.31E-01	5.62E+95	6.06E+95	3.41	0.00	1.75	0.01	44.82	0.02	5.16	44.84
6	Aliphatics (>C16-C35)	4.37E-01	0.00E+00	2.25E-01	1.39E-03	3.37E-01	5.62E+95	0.00E+00	21.87	0.00	11.23	0.07	16.81	0.02	50.00	0.00
7	Aromatics (EC5-EC7)	2.93E-03	0.00E+00	1.51E-03	9.31E-06	1.36E+00	1.69E-04	1.21E-02	0.21	0.00	0.11	0.00	98.78	0.01	0.01	0.88
8	Aromatics (>EC7-EC8)	7.58E-03	0.00E+00	3.90E-03	2.41E-05	1.30E+00	5.63E-04	3.15E-02	0.57	0.00	0.29	0.00	96.74	0.01	0.04	2.35
9	Aromatics (>EC8-EC10)	4.58E-04	0.00E+00	2.35E-04	1.45E-06	2.97E-02	5.62E+95	6.06E+95	0.75	0.00	0.39	0.00	48.85	0.01	1.14	48.86
10	Aliphatics (>C10-C12)	1.30E-03	0.00E+00	6.67E-04	4.12E-06	1.44E-01	5.62E+95	6.06E+95	0.45	0.00	0.23	0.00	49.32	0.01	0.68	49.32
11	Aromatics (>EC12-EC16)	1.13E-02	0.00E+00	5.81E-03	3.59E-05	1.21E-02	5.62E+95	6.06E+95	19.35	0.00	9.94	0.06	20.62	0.03	29.29	20.71
12	Aromatics (>EC16-EC21)	9.70E-03	0.00E+00	4.98E-03	3.08E-05	2.90E-04	5.62E+95	0.00E+00	32.33	0.00	16.61	0.10	0.96	0.01	50.00	0.00
13	Aromatics (>EC21-EC35)	9.89E-03	0.00E+00	5.08E-03	3.14E-05	3.18E-06	5.62E+95	0.00E+00	32.95	0.00	16.93	0.10	0.01	0.00	50.00	0.00
14																
15	Benzene	2.97E-06	0.00E+00	1.53E-06	9.43E-09	1.38E-03	0.00E+00	0.00E+00	0.21	0.00	0.11	0.00	99.67	0.01	0.00	0.00
16	Ethylbenzene	2.20E-03	0.00E+00	1.13E-03	6.98E-06	2.05E-01	2.81E-04	7.88E-03	1.02	0.00	0.52	0.00	94.68	0.01	0.13	3.64
17	Toluene	7.58E-03	0.00E+00	3.90E-03	2.41E-05	1.30E+00	5.63E-04	3.15E-02	0.57	0.00	0.29	0.00	96.74	0.01	0.04	2.35
18	Xylene, m-	7.44E-04	0.00E+00	3.82E-04	2.36E-06	5.12E-02	6.19E-04	8.49E-03	1.21	0.00	0.62	0.00	83.33	0.01	1.01	13.82
19	Xylene, o-	7.95E-04	0.00E+00	4.08E-04	2.52E-06	5.12E-02	6.19E-04	8.49E-03	1.29	0.00	0.66	0.00	83.21	0.01	1.01	13.80
20	Xylene, p-	7.13E-04	0.00E+00	3.66E-04	2.26E-06	5.12E-02	6.19E-04	8.49E-03	1.16	0.00	0.60	0.00	83.39	0.01	1.01	13.82

[illegible]



		Oral Health Criteria Value ($\mu\text{g kg}^{-1}$ BW day $^{-1}$)		Inhalation Health Criteria Value ($\mu\text{g kg}^{-1}$ BW day $^{-1}$)		Oral Mean Daily Intake ($\mu\text{g day}^{-1}$)	Inhalation Mean Daily Intake ($\mu\text{g day}^{-1}$)	Air-water partition coefficient (K_{aw}) ($\text{cm}^3 \text{cm}^{-3}$)	Coefficient of Diffusion in Air ($\text{m}^2 \text{s}^{-1}$)	Coefficient of Diffusion in Water ($\text{m}^2 \text{s}^{-1}$)	$\log K_{oc}$ ($\text{cm}^3 \text{g}^{-1}$)	$\log K_{ow}$ (dimensionless)	Dermal Absorption Fraction (dimensionless)	Soil-to-dust transport factor (g g^{-1} DW)	Sub-surface soil to indoor air correction factor (dimensionless)	Relative bioavailability via soil ingestion (unitless)	Relative bioavailability via dust inhalation (unitless)
1	Aliphatics (C5-C6)	TDI	5000	TDI	5000	9.99E+99	9.99E+99	2.10E+01	1.00E-05	1.00E-09	2.91	3.31	0.1	0.5	10	1	1
2	Aliphatics (>C6-C8)	TDI	5000	TDI	5000	9.99E+99	9.99E+99	2.73E+01	1.00E-05	1.00E-09	3.58	4.13	0.1	0.5	10	1	1
3	Aliphatics (>C8-C10)	TDI	100	TDI	290	9.99E+99	9.99E+99	4.15E+01	1.00E-05	1.00E-09	4.48	5.22	0.1	0.5	10	1	1
4	Aliphatics (>C10-C12)	TDI	100	TDI	290	9.99E+99	9.99E+99	6.44E+01	1.00E-05	1.00E-09	5.38	6.3	0.1	0.5	10	1	1
5	Aliphatics (>C12-C16)	TDI	100	TDI	290	9.99E+99	9.99E+99	1.71E+02	1.00E-05	1.00E-09	6.73	7.94	0.1	0.5	10	1	1
6	Aliphatics (>C16-C35)	TDI	2000	NR	0	9.99E+99	NR	1.07E+03	1.00E-05	1.00E-09	8.76	10.39	0.1	0.5	10	1	1
7	Aromatics (EC5-EC7)	TDI	223	TDI	1400	3	200	1.16E-01	8.77E-06	6.64E-10	1.83	2.13	0.1	0.5	10	1	1
8	Aromatics (>EC7-EC8)	TDI	223	TDI	1400	10	520	1.15E-01	7.78E-06	5.88E-10	2.31	2.73	0.1	0.5	10	1	1
9	Aromatics (>EC8-EC10)	TDI	40	TDI	60	9.99E+99	9.99E+99	2.53E-01	1.00E-05	1.00E-09	3.2	3.69	0.1	0.5	10	1	1
10	Aliphatics (>C10-C12)	TDI	100	TDI	290	9.99E+99	9.99E+99	6.44E+01	1.00E-05	1.00E-09	5.38	6.3	0.1	0.5	10	1	1
11	Aromatics (>EC12-EC16)	TDI	40	TDI	60	9.99E+99	9.99E+99	1.26E-02	1.00E-05	1.00E-09	3.7	4.29	0.1	0.5	10	1	1
12	Aromatics (>EC16-EC21)	TDI	30	NR	NR	9.99E+99	NR	6.95E-04	1.00E-05	1.00E-09	4.15	4.82	0.1	0.5	10	1	1
13	Aromatics (>EC21-EC35)	TDI	30	NR	NR	9.99E+99	NR	2.48E-05	1.00E-05	1.00E-09	5.1	5.95	0.1	0.5	10	1	1
14																	
15	Benzene	ID	0.29	ID	1.4	NR	NR	1.16E-01	8.77E-06	6.64E-10	1.83	2.13	0.1	0.5	10	1	1
16	Ethylbenzene	TDI	100	TDI	220	5	130	1.39E-01	7.04E-06	5.31E-10	2.65	3.15	0.1	0.5	10	1	1
17	Toluene	TDI	223	TDI	1400	10	520	1.15E-01	7.78E-06	5.88E-10	2.31	2.73	0.1	0.5	10	1	1
18	Xylene, m-	TDI	180	TDI	60	11	140	1.12E-01	7.03E-06	5.31E-10	2.69	3.2	0.1	0.5	10	1	1
19	Xylene, o-	TDI	180	TDI	60	11	140	9.20E-02	7.01E-06	5.31E-10	2.63	3.12	0.1	0.5	10	1	1
20	Xylene, p-	TDI	180	TDI	60	11	140	1.07E-01	7.04E-06	5.31E-10	2.65	3.15	0.1	0.5	10	1	1

[illegible]

Environment
Agency

		Soil-to-water partition coefficient (cm ³ g ⁻¹)	Vapour pressure (Pa)	Water solubility (mg L ⁻¹)	Soil-to-plant concentration factor for green vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for root vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for tuber vegetables (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for herbaceous fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for shrub fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)	Soil-to-plant concentration factor for tree fruit (mg g ⁻¹ plant DW or FW basis over mg g ⁻¹ DW soil)
1	Aliphatics (C5-C6)	8.96E+00	2.19E+04	3.59E+01	model	model	model	model	model	model
2	Aliphatics (>C6-C8)	4.19E+01	3.45E+03	5.37E+00	model	model	model	model	model	model
3	Aliphatics (>C8-C10)	3.33E+02	3.20E+02	4.27E-01	model	model	model	model	model	model
4	Aliphatics (>C10-C12)	2.64E+03	3.21E+01	3.39E-02	model	model	model	model	model	model
5	Aliphatics (>C12-C16)	5.92E+04	1.53E+00	7.59E-04	model	model	model	model	model	model
6	Aliphatics (>C16-C35)	6.34E+06	2.38E-02	2.54E-06	model	model	model	model	model	model
7	Aromatics (EC5-EC7)	7.45E-01	6.24E+03	1.78E+03	model	model	model	model	model	model
8	Aromatics (>EC7-EC8)	2.25E+00	1.73E+03	5.90E+02	model	model	model	model	model	model
9	Aromatics (>EC8-EC10)	1.75E+01	3.20E+02	6.46E+01	model	model	model	model	model	model
10	Aliphatics (>C10-C12)	2.64E+03	3.21E+01	3.39E-02	model	model	model	model	model	model
11	Aromatics (>EC12-EC16)	5.52E+01	1.14E+00	5.75E+00	model	model	model	model	model	model
12	Aromatics (>EC16-EC21)	1.56E+02	5.62E-03	6.53E-01	model	model	model	model	model	model
13	Aromatics (>EC21-EC35)	1.39E+03	1.61E-06	6.61E-03	model	model	model	model	model	model
14										
15	Benzene	7.45E-01	6.24E+03	1.78E+03	model	model	model	0.00E+00	0.00E+00	model
16	Ethylbenzene	4.92E+00	5.53E+02	1.80E+02	model	model	model	0.00E+00	0.00E+00	model
17	Toluene	2.25E+00	1.73E+03	5.90E+02	model	model	model	0.00E+00	0.00E+00	model
18	Xylene, m-	5.40E+00	4.95E+02	2.00E+02	model	model	model	0.00E+00	0.00E+00	model
19	Xylene, o-	4.70E+00	3.86E+02	1.73E+02	model	model	model	0.00E+00	0.00E+00	model
20	Xylene, p-	4.92E+00	4.75E+02	2.00E+02	model	model	model	0.00E+00	0.00E+00	model

[illegible]

Appendix D

Field Monitoring Data

Ground Gas Monitoring Data

Ground Gas Concentrations on 17 September 2010

BH ID	Flow Rate (l/hr)		Methane (% vol)		Carbon Dioxide (% vol)		Oxygen (% vol)
	Peak	Steady	Peak	Steady	Peak	Steady	
BH03	0.1	ND	0.1	ND	ND	ND	20.7
<i>BH07</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>ND</i>	<i>20.4</i>
BH08	0.1	ND	ND	ND	ND	ND	20.7
BH11	0.2	ND	0.1	ND	ND	ND	20.1
BH13	0.1	ND	0.1	0.1	0.2	0.2	20.0
BH15	0.2	ND	2.1	ND	0.8	0.6	18.6

Atmospheric pressure – 1011mb.

ND – None detected.

BH07 – Data impacted by presence of volatile groundwater contaminants.

Ground Gas Concentrations on 22 September 2010

BH ID	Flow Rate (l/hr)		Methane (% vol)		Carbon Dioxide (% vol)		Oxygen (% vol)
	Peak	Steady	Peak	Steady	Peak	Steady	
BH03	ND	ND	ND	ND	1.8	1.8	18.3
<i>BH07</i>	<i>ND</i>	<i>ND</i>	<i>30.4</i>	<i>13.2</i>	<i>3.1</i>	<i>2.1</i>	<i>11.9</i>
BH08	0.2	0.2	ND	ND	2.3	2.2	10.7
BH11	0.1	ND	ND	ND	ND	ND	19.8
BH13	0.2	0.1	ND	ND	0.2	0.2	19.5
BH15	0.1	0.1	0.1	ND	ND	ND	19.9

Atmospheric pressure – falling from 1011 to 1009mb.

ND – None detected.

BH07 – Data impacted by presence of volatile groundwater contaminants.

Ground Gas Concentrations on 21 February 2011

BH ID	Flow Rate (l/hr)		Methane (% vol)		Carbon Dioxide (% vol)		Oxygen (% vol)
	Peak	Steady	Peak	Steady	Peak	Steady	
BH03	0.1	ND	0.2	0.2	0.1	0.1	20.1
<i>BH07</i>	<i>0.3</i>	<i>ND</i>	<i>88.8</i>	<i>40.1</i>	<i>3.3</i>	<i>2.9</i>	<i>7.3</i>
BH08	0.1	0.1	0.1	0.1	3.0	0.3	15.8
BH11	-0.1	ND	0.2	0.2	0.1	0.1	20.0
BH13	0.1	0.1	0.2	0.2	0.2	0.2	19.8
BH15	-0.2	ND	0.2	0.2	1.6	0.1	17.4

Atmospheric pressure – 1011 falling to 1010mb.

ND – None detected.

BH07 – Data impacted by presence of volatile groundwater contaminants.

Ground Gas Concentrations on 23 February 2011

BH ID	Flow Rate (l/hr)		Methane (% vol)		Carbon Dioxide (% vol)		Oxygen (% vol)
	Peak	Steady	Peak	Steady	Peak	Steady	
BH03	0.2	0.2	0.2	0.2	0.7	0.2	19.3
<i>BH07</i>	<i>0.2</i>	<i>0.2</i>	<i>>100</i>	<i>>100</i>	<i>4.5</i>	<i>0.3</i>	<i>4.7</i>
BH08	0.2	0.2	0.2	0.2	2.3	0.1	16.3
BH11	ND	ND	0.2	0.2	0.1	0.1	19.9
BH13	0.1	0.1	0.2	0.2	0.2	0.2	20.0
BH15	0.1	0.1	0.2	0.2	0.1	0.1	20.0
<i>BH103</i>	<i>0.3</i>	<i>0.1</i>	<i>0.4</i>	<i>0.2</i>	<i>7.3</i>	<i>2.1</i>	<i>4.4</i>
<i>BH104</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>	<i>0.2</i>	<i>5.6</i>	<i>1.2</i>	<i>0.7</i>

Atmospheric pressure – 1011.

ND – None detected.

BH07 – Data impacted by presence of volatile groundwater contaminants.