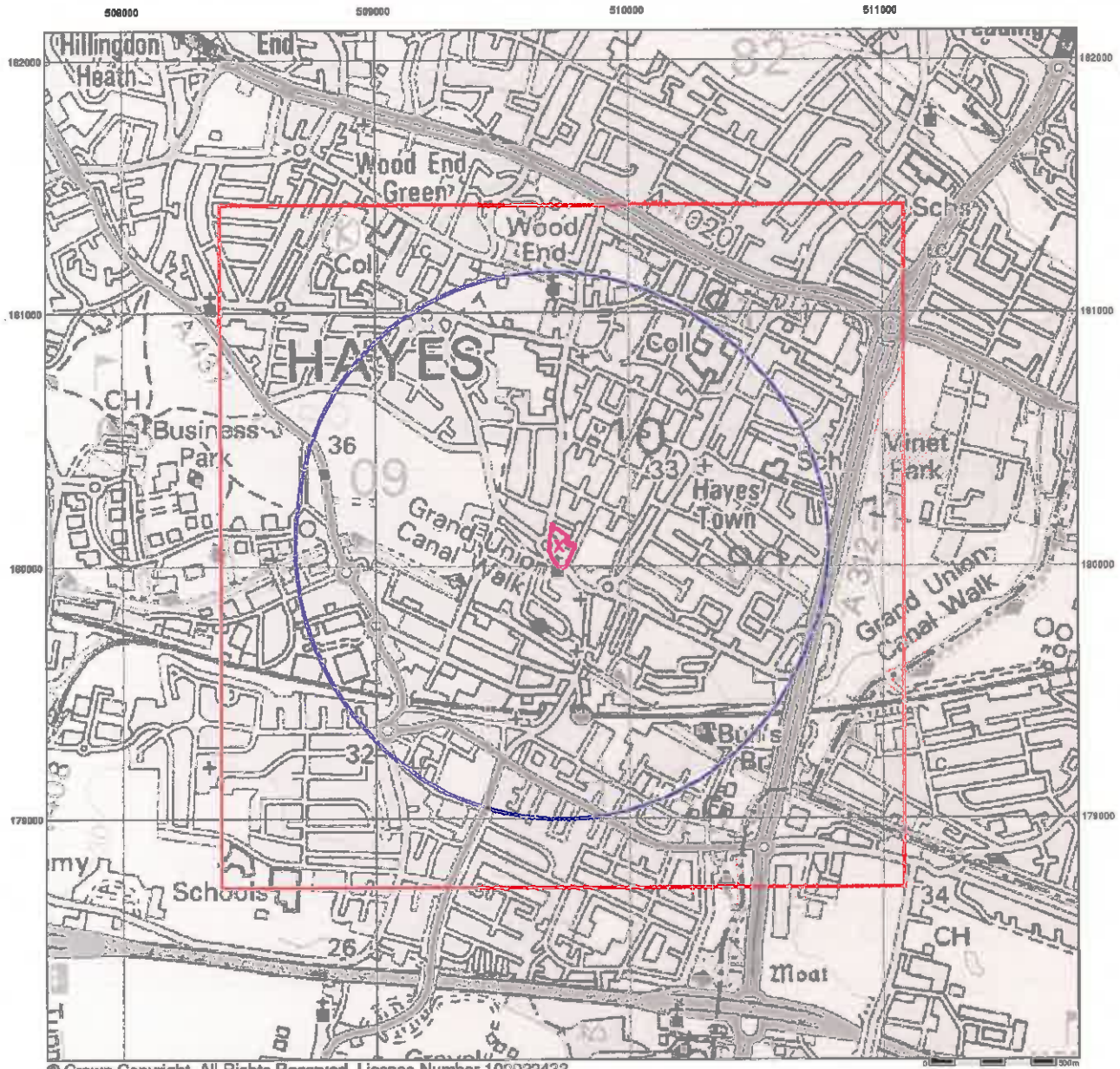


OPUS

Bedrock and Faults

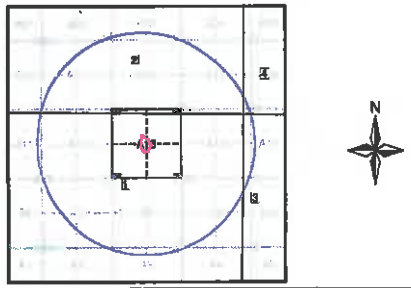
Bedrock geology is a term used for the main mass of rocks forming the Earth and are present everywhere, whether exposed at the surface in outcrops or concealed beneath superficial deposits or water.

The bedrock has formed over vast lengths of geological time ranging from ancient and highly altered rocks of the Proterozoic, some 2500 million years ago, or older, up to the relatively young Pliocene, 1.8 million years ago.

The bedrock geology includes many lithologies, often classified into three types based on origin: igneous, metamorphic and sedimentary.

The BGS Faults and Rock Segments dataset includes geological faults (e.g. normal, thrust), and thin beds mapped as lines (e.g. coal seam, gypsum bed). Some of these are linked to other particular 1:50,000 Geology datasets, for example, coal seams are part of the bedrock sequence, most faults and mineral veins primarily affect the bedrock but cut across the strata and post date its deposition.

Bedrock and Faults Map - Slice A



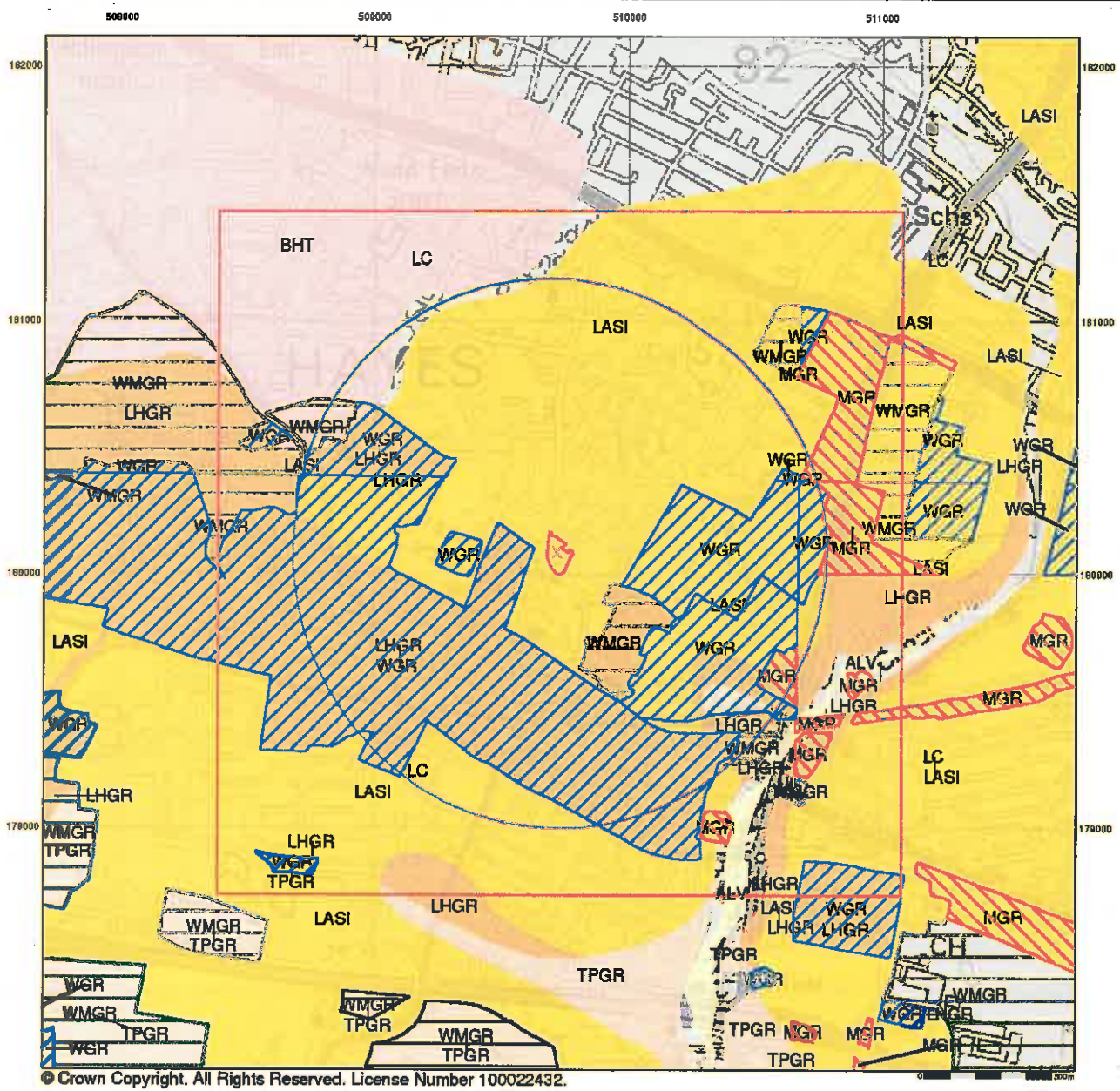
Order Details:

Order Number:	46303056_1_1
Customer Reference:	J-M0167.00/MK001
National Grid Reference:	509730, 180080
Slice:	A
Site Area (Ha):	1.01
Search Buffer (m):	1000

Site Details:

Hayes Swimming Pool, Botwell Lane, HAYES, Middlesex, UB3 2BG

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk



OPUS

Combined Surface Geology

The Combined Surface Geology map combines all the previous maps into one combined geological overview of your site.

Please consult the legends to the previous maps to interpret the Combined "Surface Geology" map.

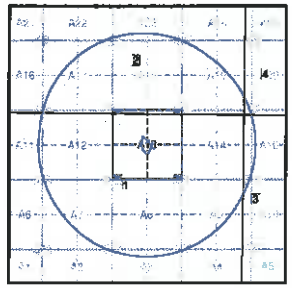
Additional Information

More information on 1:50,000 Geological mapping and explanations of rock classifications can be found on the BGS website. Using the LEX Codes in this report, further descriptions of rock types can be obtained by interrogating the 'BGS Lexicon of Named Rock Units'. This database can be accessed by following the 'Information and Data' link on the BGS website.

Contact

British Geological Survey
Kingsley Dunham Centre
Keyworth
Nottingham
NG12 5GG
Telephone: 0115 936 3143
Fax: 0115 936 3276
email: enquiries@bgs.ac.uk
website: www.bgs.ac.uk

Combined Geology Map - Slice A

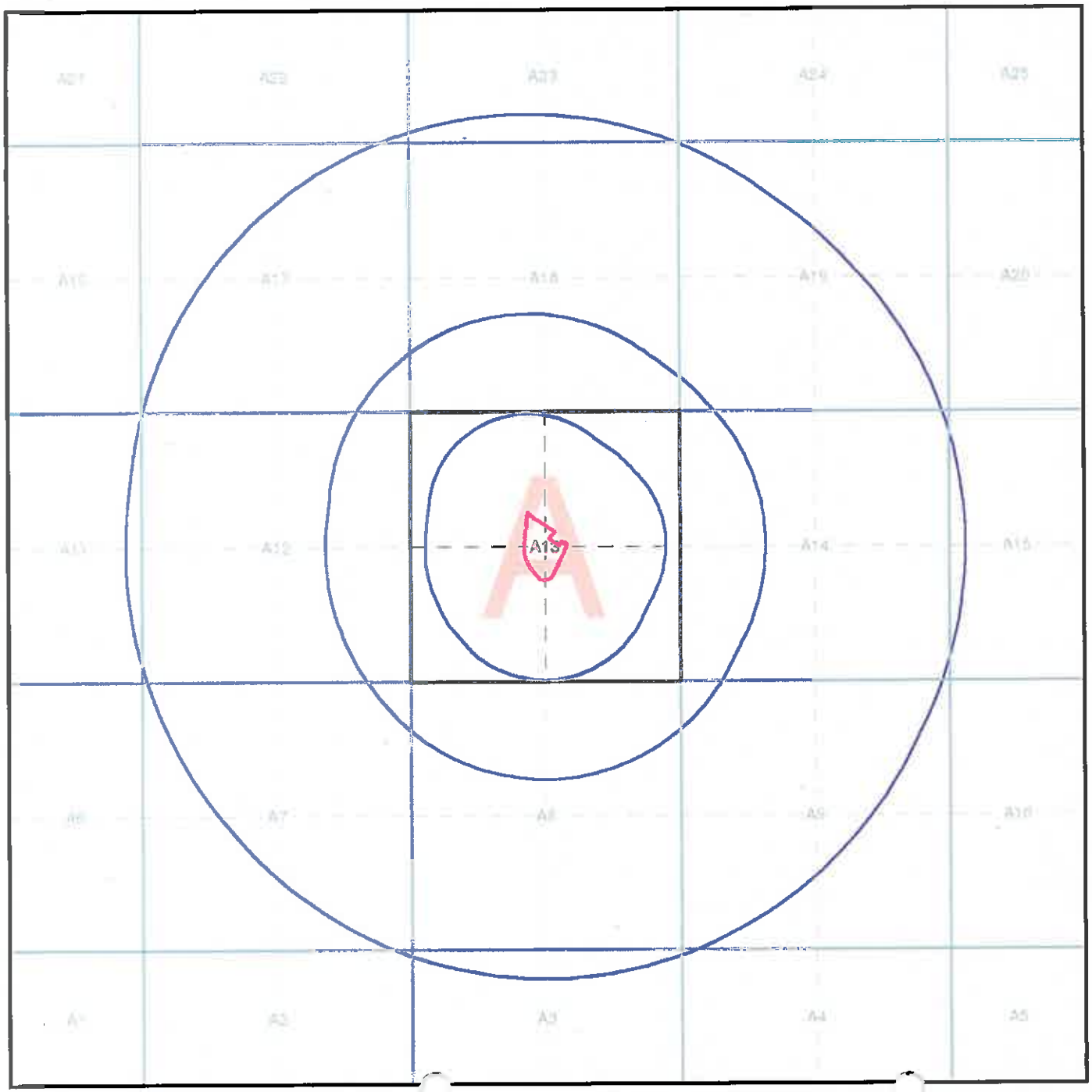


Order Details:

Order Number:	46303058_1_1
Customer Reference:	J-M0167.00/MK001
National Grid Reference:	509730, 180080
Slice:	A
Site Area (Ha):	1.01
Search Buffer (m):	1000

Site Details:

Hayes Swimming Pool, Botwell Lane, HAYES, Middlesex, UB3 2BG



OPUS

Index Map

For ease of identification, your site and buffer have been split into Slices, Segments and Quadrants. These are illustrated on the Index Map opposite and explained further below.

Slice
Each slice represents a 1:10,000 plot area (2.7km x 2.7km) for your site and buffer. A large site and buffer may be made up of several slices (represented by a red outline), that are referenced by letters of the alphabet, starting from the bottom left corner of the slice "grid". This grid does not relate to National Grid lines but is designed to give best fit over the site and buffer.

Segment
A segment represents a 1:2,500 plot area. Segments that have plot files associated with them are shown in dark green, others in light blue. These are numbered from the bottom left hand corner within each slice.

Quadrant
A quadrant is a quarter of a segment. These are labelled as NW, NE, SW, SE and are referenced in the datasheet to allow features to be quickly located on plots. Therefore a feature that has a quadrant reference of A7NW will be in Slice A, Segment 7 and the NW Quadrant.

A selection of organisations who provide data within this report:

Ordnance Survey Licensed Partner

British Geological Survey

Environment Agency

ENGLAND

Envirocheck reports are compiled from 136 different sources of data.

Client Details

MR M Grant, Opus International Consultants (UK) Ltd, Modulus House, Salterns Lane, Fareham, Hampshire, PO16 0QS

Order Details

Order Number:	46303056_1_1
Customer Ref:	J-M0167.00/MK001
National Grid Reference:	509730, 180070
Site Area (Ha):	1.01
Search Buffer (m):	1000

Site Details

Hayes Swimming Pool, Botwell Lane, HAYES, Middlesex, UB3 2BG

Full Terms and Conditions can be found on the following link:
http://www.landmarkinfo.co.uk/Terms/Show/430

Landmark
Tel: 0844 844 9952
Fax: 0844 844 9951
Web: www.envirocheck.co.uk

APPENDIX C

Exploratory Hole Records

Exploratory Hole ID:	Client:	OPUS
TP1	Lidl UK GmbH	www.opusinternational.co.uk
Job No: J-M0167	Site: Botwell Lane, Hayes	Start Date: 24/05/2013 — End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013 — Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.10			D1	0.05			
MADE GROUND comprising brown clayey, sandy gravel. Gravel is fine to coarse, angular to rounded brick, flint and concrete.	0.60			D2	0.30			
MADE GROUND comprising light brown sandy gravel. Gravel is fine to coarse, angular concrete, brick, flint, wood, metal, plastic, slate. Frequent concrete cobbles.				D3	1.00			
				D4	2.20			
Concrete boulder at 2.5m. 0.75m x 0.3m x 0.4m							3.00 ▽	
End of Exploratory Hole at 3.20 m	3.20							

Remarks:
1. Groundwater encountered at 3.00m bgl, inflow rate fast. Groundwater level on completion 3.00m bgl.
2. Slight sidewall collapse from ground level to the base of the trial pit.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP2	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown clayey sand with frequent rootlets.	0.15			D1	0.10			
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coasre, angular concrete, brick, metal and plactis. Occasional cobbles and boulders, becoming more frequent with depth.				D2	1.50			
Orange brown and grey slightly clayey SAND and GRAVEL. Gravel is fine to coarse angular to rounded flint. (Lynch Hill Gravel)	2.10			D3	2.20			
				D4	2.60			
End of Exploratory Hole at 3.00 m	3.00							

Remarks:
1. Trial pit dry during and on completion of excavation.
2. Sidewall collapse.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
TP3	Lidl UK GmbH	www.opusinternational.co.uk
Job No: J-M0167	Site: Botwell Lane, Hayes	Start Date: 24/05/2013 — End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013 — Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.15			D1	0.10			
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coarse, angular concrete, brick, metal, plastic and wood. Frequent cobbles and boulders of brick and concrete.	0.90			D2	0.80			
Firm consistency, high strength light grey and orange brown mottled slightly gravelly CLAY. Gravel is fine to coarse, angular flint. (Lynch Hill Gravel)	1.30			D3	1.00	V= 77 kPa		
Brown, orange brown and grey sandy GRAVEL. Gravel is fine to coasre, angular to rounded flint. (Lynch Hill Gravel)	2.00			D4	1.60			
End of Exploratory Hole at 2.00 m								

Remarks:
1. Trial pit dry during and on completion of excavation.
2. Trial pit unstable from ground level to 0.90m bgl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP4	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 25/05/2013	End Date: 25/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 25/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown slightly clayey sand with frequent rootlets.	0.20							
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coarse, angular concrete, brick, tile, flint, plastic and metal.	1.20							
MADE GROUND comprising light brown and grey clayey sandy gravel with occasional pockets of firm grey clay. Gravel is fine to coase, angular brick, concrete, tile, flint, plastic and metal.	1.50							
Orange brown and brown sandy GRAVEL. Gravel is fine to coarse, angular to rounded flint. (Lynch Hill Gravel)	1.60							
End of Exploratory Hole at 1.60 m								

Remarks:
1. Trial pit dry during and on completion of excavation.
2. Slight sidewall collapse from ground level to 1.2m bgl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
TP5	Lidl UK GmbH	www.opusinternational.co.uk
Job No: J-M0167	Site: Botwell Lane, Hayes	Start Date: 25/05/2013 — End Date: 25/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 25/05/2013 — Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown sandy clay with frequent rootlets.	0.05			D1	0.30			
MADE GROUND comprising brown a d orange brown sandy gravel. Gravel is fine to coarse, angular brick, concrete, tile, plastic and metal. Frequent cobbles and boulders of concrete. Occasional pockets of firm consistency grey clay.	0.70			D2	1.00	V= 81 kPa		
Firm consistency, high strength brown and greymottled slightly gravelly, slightly sandy CLAY. Gravel is fine to coarse, angular flint. (Lynch Hill Gravel)	1.30			D3	1.50			
Orange brown sandy GRAVEL. Gravel is fine to coarse angular to rounded flint. (Lynch Hill Gravel)							2.50 ▽	
				D4	3.00			
End of Exploratory Hole at 3.30 m	3.30							

Remarks:
1. Groundwater encountered at 2.50m bgl, fast inlfow rate. Groundwater level on completion 3.0m bgl.
2. Sidewall collapsing from groun level to 0.7m bgl.
3. Continous collapse from 2.5m to base of trial pit, running sand and gravel conditions encountered.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
TP6	Lidl UK GmbH	www.opusinternational.co.uk
	Site: Botwell Lane, Hayes	
Job No: J-M0167		Start Date: 25/05/2013 — End Date: 25/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 25/05/2013 — Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.15			D1	0.10			
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coarse angular concrete, brick, metal, flint. Occasional cobbles of concrete.	0.80			D2	0.50			
Firm consistency, high strength grey and orange brown mottled slightly gravelly, slightly sandy CLAY. Gravel is fine to coarse, angular to rounded flint. (Lynch Hill Gravel)				D3	1.00	V= 80 kPa V= 89 kPa		
Orange brown and grey mottled sandy GRAVEL. Gravel is fine to coase, angular to rounded flint. (Lynch Hill Gravel)	1.70 1.90							
End of Exploratory Hole at 1.90 m								

Remarks:
1. Trial pit dry during and on completion of excavation.
2. Trial pit unstable from ground level to 0.80m bgl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP7	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.10							
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coarse angular concrete, brick, flint, plastic andmetal. Frequent concrete cobbles and boulders. Becomes clayey with depth.	1.00							
MADE GROUND comprising firm consistency brown sandy very gravelly clay. Gravel is fine to coarse, anglar concrete, brick, metal, plastic, tile and pipe. Frequent concrete cobbles and boulders.	1.70					V= 67 kPa		
Firm consistency orange brown and grey mottled slightly sandy, slightly gravelly CLAY. Gravel is fine to coarse, angular flint. (Lynch Hill Gravel)	1.90							
Orange brown and grey slightly clayey sandy GRAVEL. Gravel is fine to coarse, anglar to rounded flint. (Lynch Hill Gravel)	2.00							
End of Exploratory Hole at 2.00 m								

Remarks:
1. Groundwater strike at 1.80m bgl, groundwater level on completion at 1.80m bgl.
2. Sidewall collapse.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP8	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown slightly clayey sand with frequent rootlets.	0.10			D1	0.05			
MADE GROUND comprising firm consistency, medium strength grey and light brown sandy gravelly clay. Gravel is fine to coarse, angular concrete and brick.	0.70			D2	0.30	V= 65 kPa		
Firm consistency grey, orange brown and brown mottled slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, angular flint. (Lynch Hill Gravel)	1.10			D3	0.80			
Orange brown and brown sandy GRAVEL. Gravel is fine to coarse, angular flint. (Lynch Hill Gravel)	1.30							
End of Exploratory Hole at 1.30 m								

Remarks:
1. Ceramic pipe broken at 0.50m bgl, contaned water. Sealed off using clay.
2. No groundwater encountered during and on completion of excavation.
3. Trial pit unstable from ground level to 0.7m bgl.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
TP9	Lidl UK GmbH	www.opusinternational.co.uk
Job No: J-M0167	Site: Botwell Lane, Hayes	Start Date: 24/05/2013 — End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013 — Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with freqent rootlets.	0.15			D1	0.30			
MADE GROUND comprising firm consistency brown sandy, very gravelly clay. Gravel is fine to coarse angular brick and concrete. Roots to 0.50m bgl. Asphalt layer at 0.65m bgl.	0.90					V= 76 kPa		
Firm consistency , high strength orange brown slightly sandy slightly gravelly CLAY. Gravel is fine to coarse, angular flint. (Lynch Hill Gravel)	1.30							
Orange brown clayey sandy GRAVEL. Gravel is fine to coarse, angular to rounded flint. (Lynch Hill Gravel)	1.40							
End of Exploratory Hole at 1.40 m								

Remarks:
1. Trial pit dry druing and on completion of excavation.
2. Trial pit stable during and on completion of excavation.
3. 6 inch yellow plastic gas pipe encountered at 1.2m bgl. No damage. Not on service plans provided.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP10	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.05			D1	0.30			
MADE GROUND comprising brown clayey, slightly gravelly sand. Gravel is fine to coarse, angular brick and concrete.	0.70							
MADE GROUND comprising light grey and brown sandy gravel. Gravel is fine to coarse, angular concrete, brick, metal and plastic. Frequent cobbles and boulders of concrete.				D2	2.30		2.80 ▽	
End of Exploratory Hole at 3.30 m	3.30							

Remarks:
1. Groundwater encountered at 2.80m bgl, fast inflow rate. Groundwater level on completion 2.80m bgl.
2. Trial pit collapsing from ground level to base of pit.
3. Trial pit abandoned at 3.30m bgl due to sidewall collapse preventing further progress.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP11	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND comprising light brown, orange brown, grey and brown clayey sandy gravel with frequent rootlets to 0.15m bgl. Gravel is fine to coarse, angular concrete, brick and metal. Frequent concrete cobbles and boulders.								
MADE GROUNDcomprising light grey and brown slightly sandy gravel. Gravel is fine to coarse, angular concrete, metal, bricks and wood. Occasional concrete cobbles.	1.00							
End of Exploratory Hole at 2.50 m	2.50							

Remarks:
1. Trial pit dry during and on compeltion of excavation.
2. Trial pit collapsing from ground level to the base of the pit.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP12	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.15			D1	0.10			
MADE GROUND comprising light grey and brown sandy gravel. Gravel is fine to coarse anuglar concrete, brick, wood and metal. Occasional concrete cobbles.				D2	1.20			
Orange brown sandy GRAVEL. Gravel is fine to coarse, angular to rounded flint. (Lynch Hill Gravel)	2.40							
End of Exploratory Hole at 2.50 m	2.50							

Remarks:
1. Groundwater strike at 2.30m bgl, groundwater level on completion 2.30m bgl.
2. Continous sidewall collapse.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
TP13	Lidl UK GmbH	www.opusinternational.co.uk
Job No: J-M0167	Site: Botwell Lane, Hayes	Start Date: 24/05/2013 — End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013 — Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.10							
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coarse angular concrete, brick, metal, wood and flint. Occasional concrete cobbles and boulders.								
Orange brown and brown sandy GRAVEL. Gravel is fine to coarse, angular to rounded flint. (Lynch Hill Gravel)	2.20 2.30							
End of Exploratory Hole at 2.30 m								

Remarks:
1. Groundwater strick at 1.50m bgl, groundwater level on compeltion 2.10m bgl.
2. Continous sidewall collapse.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
TP14	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: JCB 3CX	Co-ords:	Backfill Date: 24/05/2013	Field Records: ES.FB.TP.03
	Ground Level (mAOD):	Logged: ES	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising brown clayey sand with frequent rootlets.	0.15			D1	0.10			
MADE GROUND comprising light brown and grey sandy gravel. Gravel is fine to coarse angular concrete, brick, metal, wood and plastic. Occasional concrete cobbles and boulders.				D2	1.50			
End of Exploratory Hole at 2.60 m	2.60							

Remarks:
1. Groundwater strike at 2.30m bgl, groundwater level on completion 2.30m bgl.
2. Sidewall collapse.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
WS1	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.60							
MADE GROUND comprising sandy subangular to subrounded, fine to coarse concrete gravel and cobble sized fragments of concrete. Sand is fine to coarse grained.	1.30			ES1	0.80-1.00	N=22(C)		
Medium dense becoming very dense dark orange slightly clayey, fine to coarse grained SAND with occasional subangular, fine to coarse flint gravel. (Lynch Hill Gravel)						N=68(C)		
End of Exploratory Hole at 2.40 m	2.40							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.4m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
WS2	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.18			ES1	0.40-0.50			
MADE GROUND comprising light brown grey, slightly clayey, gravelly, fine to coarse sand with boulders of concrete conglomerate. Gravel is subangular to subrounded, fine to coarse of concrete, red brick, flint and chalk.	1.00					N=17(C)		
Firm to stiff consistency, light blue and orange brown, sandy CLAY. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.42			D2	1.60-1.80			
Soft to firm consistency, light orange brown, black and grey, very sandy, gravelly CLAY. Sand is fine to coarse grained. Gravel is subangular, fine to coarse of flint and chalk. (Lynch Hill Gravel)						N=46(C)		
End of Exploratory Hole at 2.36 m	2.36							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.36m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
WS3	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.15			ES1	0.30-0.40			
MADE GROUND comprising light brown grey, slightly clayey, gravelly, fine to coarse sand with boulders of concrete conglomerate. Gravel is subangular to subrounded, fine to coarse of concrete, red brick, flint and chalk.	1.00					N=19(C)		
Soft to firm consistency, yellow brown grey, sandy CLAY. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.20							
Medium dense becoming very dense orange brown slighty clayey, very gravelly, fine coarse grained SAND. Gravel is subangular to subrounded, fine to coarse flint. (Lynch Hill Gravel)	2.18					N=68(C)		
End of Exploratory Hole at 2.18 m								

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.18m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
WS4	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.15			ES1	0.30-0.40			
MADE GROUND comprising light brown grey, slightly clayey, gravelly, fine to coarse sand with boulders of concrete conglomerate. Gravel is subangular to subrounded, fine to coarse of concrete, red brick, flint and chalk.	0.80			ES2	1.10-1.20	N=18(C)		
Soft to firm consistency orange brown and black grey, slightly sandy CLAY with rare subangular to subrounded, fine to coarse flint gravel. (Lynch Hill Gravel)	1.30							
Medium dense becoming very dense orange brown slightly clayey, very gravelly, fine to coarse grained SAND. Gravel is subangular to subrounded, fine to coarse flint. (Lynch Hill Gravel)	2.22					N=68(C)		
End of Exploratory Hole at 2.22 m								

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.22m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:	OPUS
WS5	Lidl UK GmbH	www.opusinternational.co.uk
	Site: Botwell Lane, Hayes	
Job No: J-M0167		Start Date: 23/05/2013 — End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013 — Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising light brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.05			ES1	0.10-0.40			
MADE GROUND comprising light grey brown, slightly sandy, gravelly silt with occasional roots. Sand is fine to coarse grained. Gravel is subangular, fine to coarse of clinker.	0.60					N=25(C)		
Soft to firm consistency, light brown silty, sandy CLAY with occasional subangular to subrounded, flint gravel. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.10			ES2	1.50-1.70	N=68(C)		
Medium dense becoming very dense buff and orange brown, sandy, angular to subrounded, fine to coarse flint GRAVEL with pockets of black sand. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.90							
End of Exploratory Hole at 1.90 m								

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 1.9m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
WS6	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND comprising light grey brown, sandy, silt with frequent roots and rootlets and occasional gravel. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint, rare brick and clinker.	0.20			ES1	0.20-0.50			
MADE GROUND comprising soft to firm consistency, orange brown and sandy, silty clay with occasional subangular to subrounded, fine to coarse gravel of flint, red brick and rare clinker. Sand is fine to coarse grained.	0.80					N=22(C)		
Soft to firm consistency, light yellow brown mottled orange, slightly silty, slightly sandy CLAY. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.40							
Very dense buff and orange brown, sandy angular to subrounded, fine to coarse flint GRAVEL with pockets of black fine to coarse sand. (Lynch Hill Gravel)	2.31					N=68(C)		
End of Exploratory Hole at 2.31 m								

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.31m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
WS7	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, slightly clayey, sandy silt with frequent roots and rootlets and occasional gravel. Sand is fine to coarse grained. Gravel is rounded, fine to medium of flint and chalk.	0.10			ES1	0.10-0.40			
MADE GROUND comprising buff sandy, subangular to subrounded, fine to coarse concrete and red brick gravel.	0.90					N=31(C)		
Dense becoming very dense red orange and light orange brown, grey, slightly clayey, gravelly, fine to coarse grained SAND. Gravel is subangular to subrounded, fine to coarse of flint. (Lynch Hill Gravel)				ES2	1.60-1.80	N=68(C)		
End of Exploratory Hole at 2.42 m	2.42							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2420m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
WS8	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 23/05/2013	End Date: 23/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 23/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.05							
MADE GROUND comprising dark brown firm to stiff consistency, very gravelly, sandy clay. Sand is fine to coarse grained. Gravel is subangular to rounded, fine to coarse of brick, concrete and flint.	0.40					N=25(C)		
MADE GROUND comprising concrete and brick backfill including pockets of clinker.						N=22(C)		
						N=17(C)		
Very dense buff yellow, very sandy, slightly silty, angular to subangular, fine to coarse flint GRAVEL. Sand is fine to coarse grained. (Lynch Hill Gravel)	3.80					N=50(C)		
End of Exploratory Hole at 4.40 m	4.40							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 4.4m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
WS9	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND comprising black asphalt and black asphalt gravel.	0.20							
MADE GROUND comprising concrete gravel.	0.40			ES1	0.40-0.50			
Firm to stiff consistency, dark brown orange, sandy, very gravelly CLAY. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint. (Lynch Hill Gravel)	0.50			ES2	0.50-0.90			
Stiff to firm consistency, medium brown, sandy CLAY with rare subangular to subrounded, fine to coarse flint gravel. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.10					N=48(C)		
Very dense dark grey and yellow brown, silty, fine to coarse grained SAND. (Lynch Hill Gravel)	1.40							
Very dense dark orange brown, gravelly, fine to coarse grained SAND. Gravel is subangular to subrounded, fine to coarse flint. (Lynch Hill Gravel)						N=68(C)		
End of Exploratory Hole at 2.40 m	2.40							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.4m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key
D - Disturbed Representative
B - Bulk Representative
S - Spot Non-Representative
W - Water
U - Undisturbed Representative
J - Jar Sample

Test Type Key
(C) - Cone SPT
(S) - Spoon SPT
P - Pocket Pentrometer Reading
PID - PID Reading
V - Hand Shear Vane Reading

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Exploratory Hole ID:	Client:		
WS10	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP / Chkd: / Appr:	

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND comprising black asphalt and black asphalt gravel.	0.10							
MADE GROUND comprising concrete gravel.	0.40							
Firm to stiff consistency, dark brown orange, sandy, very gravelly CLAY. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint. (Lynch Hill Gravel)	0.60			ES1	0.50-0.60			
				ES2	0.80-1.00			
Soft to firm consistency, silty, sandy CLAY with red orange veining throughout and partings of black organic matter. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.10					N=5(C)		
Firm to stiff consistency, orange brown and blue grey, sandy, silty CLAY with layers of soft to firm grey brown, silty, sandy CLAY with red orange veining and black organic matter. Sand is fine to coarse grained. (Lynch Hill Gravel)	2.10					N=23(C)		
Medium dense buff and light brown, silty, slightly gravelly, fine to coarse grained SAND. Gravel is subangular to subrounded, fine to coarse flint. (Lynch Hill Gravel)	2.80							
Soft to firm consistency, red orange brown, sandy CLAY. Sand is fine to coarse grained. (Lynch Hill Gravel)	3.00					N=13(C)		
Medium dense buff and light brown, silty, slightly gravelly, fine to coarse SAND. Gravel is subangular to subrounded, fine to coarse flint. (Lynch Hill Gravel)	3.50							
Soft consistency, light yellow orange brown, very sandy CLAY. Sand is fine to coarse grained. (Lynch Hill Gravel) Arisings becoming light yellow grey from 3.8m bgl.						N=46(C)		
End of Exploratory Hole at 4.44 m	4.44							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 4.44m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

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Exploratory Hole ID:	Client:		
WS11	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND comprising black asphalt and black asphalt gravel.	0.10							
MADE GROUND comprising buff sandy, angular to subangular, fine to coarse concrete gravel. Sand is fine to coarse grained.	0.35			ES1	0.50-0.60			
MADE GROUND comprising dark brown orange sandy, silty, very clayey subangular to subrounded, fine to coarse gravel of flint and rare red brick, clinker and cobble sized fragments of flint. Sand is fine to coarse grained.	0.75							
Soft to firm consistency, yellow brown, silty, sandy CLAY. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.00					N=8(C)		
Loose dark grey brown, sandy, subangular to subrounded, fine to coarse GRAVEL with pockets of firm to stiff, sandy clay. (Lynch Hill Gravel)	1.40					N=9(C)		
Firm to stiff consistency, orange brown mottled light grey, sandy CLAY with black organic partings. (Lynch Hill Gravel)	2.50							
Orange brown, clayey, gravelly, fine to coarse grained SAND with cobble sized flint fragments. Gravel is subangular to subrounded, fine to coarse flint. (Lynch Hill Gravel)	2.90 3.00 3.05					N=8(C)		
Firm to stiff dark orange brown, sandy CLAY. Sand is fine to coarse grained. (London Clay Formation)								
Very soft consistency brown yellow sandy CLAY. Sand is fine to coarse grained.	3.95					N=6(C)		
Firm to stiff consistency brown yellow sandy CLAY. Sand is fine to coarse grained. (London Clay Formation)								
Firm to stiff consistency dark purple brown slightly sandy CLAY. Sand is fine to coarse grained. (London Clay Formation)						N=11(C)		
End of Exploratory Hole at 5.45 m	5.45							

Remarks:
1. Groundwater not encountered.
2. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
WS12	Lidl UK GmbH	www.opusinternational.co.uk
	Site: Botwell Lane, Hayes	

Job No:	Start Date:	End Date:
J-M0167	24/05/2013	24/05/2013

Drilling Equipment/ Excavation Method:	Co-ords:	Backfill Date:	Field Records:
Tracked window sampling rig.		24/05/2013	LJP.FB

Ground Level (mAOD):	Logged:	Chkd:	Appr:
	LJP		

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.15			ES1	0.40-0.50			
MADE GROUND comprising dark brown and orange, silty, sandy, clayey, subangular to subrounded, fine to coarse gravel of flint, occasional clinker and rare red brick. Sand is fine to coarse grained.	0.70					N=13(C)		
Soft to firm consistency, yellow brown mottled orange, silty, sandy CLAY with pockets and partings of black organic matter and rare subangular to rounded, fine to coarse flint gravel. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.20							
Firm to stiff light grey blue mottled orange brown, sandy CLAY with rare subangular to subrounded, fine to coarse flint gravel. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.70					N=46(C)		
Firm to stiff consistency, light grey blue mottled orange brown, sandy, very gravelly CLAY. Gravel is subangular to subrounded, fine to coarse of flint. (Lynch Hill Gravel)	2.39							
End of Exploratory Hole at 2.39 m								

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.39m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Pentrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
WS13	Lidl UK GmbH	www.opusinternational.co.uk
	Site: Botwell Lane, Hayes	
Job No: J-M0167		Start Date: 24/05/2013 — End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013 — Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.15			ES1	0.40-0.50			
MADE GROUND comprising sandy, gravelly concrete fill.	0.45							
MADE GROUND comprising dark grey black asphalt gravel.						N=34(C)		
Firm to stiff consistency dark orange brown mottled pale yellow brown silty, sandy CLAY with occasional subangular to subrounded, fine to coarse flint gravel. Sand is fine to coarse grained. (Lynch Hill Gravel)	1.20					N=7(C)		
Very dense orange brown silty, gravelly fine to coarse grained SAND. Gravel is angular to subrounded, fine to coarse flint. (Lynch Hill Gravel)	2.30					N=58(C)		
End of Exploratory Hole at 3.42 m	3.42							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 3.42m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
WS14	Lidl UK GmbH	OPUS	
Job No:	Site:	www.opusinternational.co.uk	
J-M0167	Botwell Lane, Hayes	Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
MADE GROUND comprising black asphalt and black asphalt gravel.	0.10							
Light yellow buff, sandy, subangular to subrounded, fine to coarse flint GRAVEL with occasional flint cobbles. (Lynch Hill Gravel)	0.40							
Orange brown, clayey, sandy flint GRAVEL and COBBLES. (Lynch Hill Gravel)	0.70			ES1	0.70-0.80			
Firm to stiff consistency, blue grey and orange brown sandy, slightly gravelly CLAY. (Lynch Hill Gravel)	1.00			ES2	1.00-1.10	N=5(C)		
Black staining and possible slight weathered hydrocarbon odour.	1.60			D3	1.50-1.90			
Firm to stiff consistency light blue grey sandy, gravelly CLAY. (Lynch Hill Gravel)	1.90					N=68(C)		
Soft consistency orange brown, slightly sandy, very gravelly CLAY. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint. (Lynch Hill Gravel)	2.24							
Very dense orange brown sandy, subangular to subrounded, fine to coarse flint GRAVEL. (Lynch Hill Gravel)								
End of Exploratory Hole at 2.24 m								

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.24m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penetrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:	OPUS
WS15	Lidl UK GmbH	www.opusinternational.co.uk
	Site: Botwell Lane, Hayes	
Job No: J-M0167		Start Date: 24/05/2013 — End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013 — Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP — Chkd: — Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.10							
	0.40			ES1	0.40-0.60			
MADE GROUND comprising dark brown silty, sandy, clayey, subangular to subrounded, fine to coarse flint gravel. Sand is fine to coarse grained.								
	1.00					N=30(C)		
MADE GROUND comprising firm to stiff consistency dark brown sandy, silty, gravelly clay. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint and brick and rare piece of rusted metal.								
Dense becoming very dense orange brown black, sandy, subangular to subrounded, fine to coarse flint GRAVEL. Sand is fine to coarse grained. (Lynch Hill Gravel)						N=68(C)		
End of Exploratory Hole at 2.35 m	2.35							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.35m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

Exploratory Hole ID:	Client:		
WS16	Lidl UK GmbH	OPUS	
	Site: Botwell Lane, Hayes	www.opusinternational.co.uk	
Job No: J-M0167		Start Date: 24/05/2013	End Date: 24/05/2013
Drilling Equipment/ Excavation Method: Tracked window sampling rig.	Co-ords:	Backfill Date: 24/05/2013	Field Records: LJP.FB
	Ground Level (mAOD):	Logged: LJP	Chkd: / Appr:

Strata Description	Depth (m)	Level (m)	Legend	Sample Type	Sample Depth (m)	Tests	Groundwater Records	Backfill Details
TOPSOIL comprising dark brown, clayey, sandy, slightly gravelly silt with frequent roots and rootlets. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint.	0.20			ES1	0.30-0.40			
MADE GROUND comprising friable brown and black sandy, silty, gravelly clay. Sand is fine to coarse grained. Gravel is subangular to subrounded, fine to coarse of flint, clinker, ash and red brick.	0.70			ES2	0.80-0.90			
Soft to firm consistency, light yellow brown, silty, sandy CLAY with pockets and partings of black silt. (Lynch Hill Gravel)	1.00					N=34(C)		
Dense becoming very dense orange brown black, sandy, subangular to subrounded, fine to coarse flint GRAVEL. Sand is fine to coarse grained. (Lynch Hill Gravel)						N=68(C)		
End of Exploratory Hole at 2.37 m	2.37							

Remarks:
1. Groundwater not encountered.
2. Hole terminated at 2.37m bgl due to refusal of equipment.
3. Correct SPT N values N60 shown in accordance with BS EN 22476 Part 3.

Sample Type Key	Test Type Key
D - Disturbed Representative	(C) - Cone SPT
B - Bulk Representative	(S) - Spoon SPT
S - Spot Non-Representative	P - Pocket Penrometer Reading
W - Water	PID - PID Reading
U - Undisturbed Representative	V - Hand Shear Vane Reading
J - Jar Sample	

Sheet: Sheet 1 of 1

APPENDIX D

Contamination Test Results and Assessment Criteria

Mean Value Test

J-M0167.00
Made Ground
Metals
pH - 9

Key:	
	exceeds screen and is potential outlier
	Does not exceed screen but may be outlier
	Exceeds screen but is not an outlier

To enter results into this table, click on column G and click the Insert Columns button, entering the number of columns needed. Then either type in the results or paste them in. DO NOT try the Insert Copied Cells option as this loses the formatting links

CAS REG No	Determinand	Units	*Screening Value	*Source of screening value	TP1	TP2	TP5	TP6	TP10	TP14	WS1	WS2	WS3	WS5	WS11	WS12	WS13	WS16
				Depth	0.05	1.5	0.3	0.5	0.3	0.1	0.8-1.0	0.4-0.5	0.3-0.4	0.1-0.4	0.5-0.6	0.4-0.5	0.4-0.5	0.3-0.4
	Arsenic	mg/kg	32	[illegible]	6.00	5.00	5.00	4.00	7.00	5.00	3.00	6.00	6.00	7.00	4.00	8.00	2.00	11.00
	Cadmium	mg/kg	10	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Chromium	mg/kg	38	[illegible]	15.00	21.00	24.00	16.00	17.00	13.00	29.00	20.00	21.00	22.00	24.00	23.00	19.00	21.00
	Lead	mg/kg	450	[illegible]	51.00	23.00	45.00	19.00	28.00	49.00	13.00	65.00	20.00	137.00	16.00	129.00	6.00	71.00
	Mercury	mg/kg	170	[illegible]	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	[illegible]	1.00	1.00	1.00	1.00
	Nickel	mg/kg	130	[illegible]	13.00	16.00	16.00	15.00	10.00	13.00	22.00	16.00	17.00	19.00	20.00	18.00	8.00	26.00
	Selenium	mg/kg	350	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	Copper	mg/kg	8340	[illegible]	25.00	11.00	13.00	9.00	8.00	20.00	10.00	18.00	20.00	37.00	16.00	32.00	5.00	26.00
	Zinc	mg/kg	3800	[illegible]	92.00	72.00	65.00	41.00	55.00	80.00	50.00	62.00	49.00	98.00	51.00	84.00	16.00	67.00
	Boron	mg/kg	59	[illegible]	[illegible]	1.00	1.00	1.00	1.00	2.90	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

LEVEL 1 CHECK

Determinand	No of samples in the averaging area	Degrees of freedom	Arithmetic Mean	Standard deviation	Coefficient of Variation	confidence bound required (%)	t-value	normalised upper bound on confidence limit of mean	Normalised upper bound (95% UCL of mean)	[illegible]	Source for SGV	[illegible]	Action ... if no further action indicated at 95 maximum value test
Arsenic	14	13	5.64	2.24	[illegible]	95	1.771	1.186	6.70	32	CLP In house V2009.2	YES	No action warranted
Cadmium	14	13	0.50	0.00	0.00	95	1.771	1.000	0.60	10	CLP In house V2009.2	YES	No action warranted
Chromium	14	13	20.36	4.16	0.05	95	1.771	1.097	22.34	38	CLP In house V2009.2	YES	No action warranted
Lead	14	13	34.04	41.12	0.32	95	1.771	1.572	53.50	450	CLP In house V2009.2	YES	No action warranted
Mercury	14	13	[illegible]	0.32	0.06	95	1.771	1.140	1.24	170	CLP In house V2009.2	YES	No action warranted
Nickel	14	13	16.36	4.67	0.06	95	1.771	1.135	18.57	130	CLP In house V2009.2	YES	No action warranted
Selenium	14	13	3.00	0.00	0.00	95	1.771	1.000	3.00	350	CLP In house V2009.2	YES	No action warranted
Copper	14	13	[illegible]	9.49	0.14	95	1.771	1.251	22.35	8340	CLP In house V2009.2	YES	No action warranted
Zinc	14	13	63.00	21.76	0.09	95	1.771	1.164	73.31	3800	CLP In house V2009.2	YES	No action warranted
Boron	14	13	1.27	0.69	0.15	95	1.771	1.257	1.60	59	CLP In house V2009.2	[illegible]	No action warranted

Mean Value Test

J-M0167.00
Made Ground
PAH
Organics - 3% SOM Scenario

Key:
exceeds screen and is potential outlier
Does not exceed screen but may be outlier
Exceeds screen but is not an outlier

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CAS NO. No	Determinand	Units	*Screening Value	*Source of screening value	Sample Ref								LEVEL 1 GMKK											
					trial pit / borehole no	TP5	TP14	WS1	WS2	WS3	WS11	WS15	WS16	No of samples in the averaging area	Degrees of freedom	Arithmetic Mean	standard deviation	Coefficient of variation	confidence bound required (%)	t value	normalised upper bound on confidence limit of population	Normalised upper bound (95% UCL of mean)		Source for SGV		Action - note if no further action indicated still do maximum value test
					Depth	0.3	0.1	0.8-1	0.4-0.5	0.3-0.4	0.5-0.6	0.4-0.5	0.3-0.4												
	Naphthalene	mg/kg	4.4	OJP In House - V2009.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	7	0.10	0.00	0.00	95	1.895	1.000	0.10	4.4	OJP In House - V2009.2	YES	No action warranted
	Acenaphthene	mg/kg	92	OJP In House - V2009.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	7	0.10	0.00	0.00	95	1.895	1.000	0.10	92	OJP In House - V2009.2	YES	No action warranted
	Fluorene	mg/kg	23400	OJP In House - V2009.2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	7	0.10	0.00	0.00	95	1.895	1.000	0.10	23400	OJP In House - V2009.2	YES	No action warranted
	Anthracene	mg/kg	5860	OJP In House - V2009.2	0.100	0.100	0.100	[illegible]	0.220	0.100	0.110	0.100	8	7	0.15	0.09	0.22	95	1.895	1.417	0.21	5860	OJP In House - V2009.2	YES	No action warranted
	Fluoranthene	mg/kg	1630	OJP In House - V2009.2	0.270	0.600	0.700	2.740	1.670	0.100	0.680	1.580	8	7	1.04	0.89	0.86	95	1.895	1.569	1.84	1630	OJP In House - V2009.2	YES	No action warranted
	Pyrene	mg/kg	1150	OJP In House - V2009.2	0.230	1.060	0.560	2.480	1.490	0.100	0.500	1.350	8	7	0.87	0.79	0.91	95	1.895	1.545	1.50	1150	OJP In House - V2009.2	YES	No action warranted
	Benzo(a)anthracene	mg/kg	7.2	OJP In House - V2009.2	0.130	0.560	0.500	1.520	0.890	0.100	0.310	0.760	8	7	0.60	0.47	0.78	95	1.895	1.524	0.91	7.2	OJP In House - V2009.2	YES	No action warranted
	Chrysene	mg/kg	840	OJP In House - V2009.2	0.170	0.580	0.560	1.540	0.920	0.100	0.320	0.840	8	7	0.63	0.47	0.75	95	1.895	1.502	0.94	840	OJP In House - V2009.2	YES	No action warranted
	Benzo(b)fluoranthene	mg/kg	9.4	OJP In House - V2009.2	0.180	0.680	0.990	1.980	1.240	0.100	0.400	1.060	8	7	0.83	0.62	0.77	95	1.895	1.505	1.25	9.4	OJP In House - V2009.2	YES	No action warranted
	Benzo(k)fluoranthene	mg/kg	97	OJP In House - V2009.2	0.100	0.270	0.350	0.730	0.450	0.100	0.130	0.480	8	7	0.33	0.22	0.24	95	1.895	1.457	0.48	97	OJP In House - V2009.2	YES	No action warranted
	Benzo(a)pyrene	mg/kg	0.96	OJP In House - V2009.2	0.140	0.530	0.740	1.620	1.000	0.100	0.230	0.820	8	7	0.65	0.51	0.26	95	1.895	1.532	0.96	0.96	OJP In House - V2009.2	Ask	Remediation or further testing required
	Indeno(123cd)pyrene	mg/kg	9.2	OJP In House - V2009.2	0.100	0.250	0.470	0.880	0.530	0.100	0.150	0.430	8	7	0.37	0.27	0.26	95	1.895	1.484	0.86	9.2	OJP In House - V2009.2	YES	No action warranted
	Dibenzo(ah)anthracene	mg/kg	0.97	OJP In House - V2009.2	0.100	0.100	0.100	[illegible]	0.100	0.100	0.100	0.100	8	7	0.11	0.01	0.05	95	1.895	1.390	0.11	0.97	OJP In House - V2009.2	YES	No action warranted

Mean Value Test

J-M0167.00
Natural
Metals
pH - 9

Key:	
	exceeds screen and is potential outlier
	Does not exceed screen but may be outlier
	Exceeds screen but is not an outlier

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CAS REG No	Determinand	Units	*Screening Value	*Source of screening value	Sample Ref							LEVEL 1 CHECK											
					trial pit / borehole ref	TP6	WS4	WS7	WS9	WS10	WS14	WS15	No of samples in the investigation area	Degrees of freedom	Arithmetic Mean	standard deviation	Coefficient of variation	confidence bound required (%)	t value	normalised upper bound on confidence limit of population	Normalised upper bound (95% UCL of mean)		Source for SCV		Action - note if no further action indicated still do minimum value test
					Depth	1	0.1-0.4	1.6-1.8	0.4-0.5	0.5-0.6	0.7-0.8	0.4-0.5												
	Arsenic	mg/kg	32	OJP In house V2009.2		6.00	7.00	8.00	9.00	4.00	6.00	2.00	7	6	5.00	2.38	0.18	95	1.943	1.350	6.75	32	OJP In house V2009.2		No action warranted
	Cadmium	mg/kg	10	OJP In house V2009.2		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	7	6	0.50	0.00	0.00	95	1.943	1.000	0.50	10	OJP In house V2009.2		No action warranted
	Chromium	mg/kg	38	OJP In house V2009.2		37.00	33.00	16.00	11.00	14.00	19.00	19.00	7	6	21.29	9.84	0.17	95	1.943	1.340	28.52	38	OJP In house V2009.2		No action warranted
	Lead	mg/kg	450	OJP In house V2009.2		1.00	19.00	8.00	15.00	15.00	59.00	6.00	7	6	10.28	19.29	0.71	95	1.943	2.378	24.44	450	OJP In house V2009.2		No action warranted
	Mercury	mg/kg	170	OJP In house V2009.2		2.00	1.00	1.00	1.00	1.00	1.00	1.00	7	6	4.71	9.83	0.79	95	1.943	2.531	11.93	170	OJP In house V2009.2		No action warranted
	Nickel	mg/kg	130	OJP In house V2009.2		3.00	30.00	19.00	9.00	12.00	31.00	8.00	7	6	16.00	11.02	0.26	95	1.943	1.506	24.09	130	OJP In house V2009.2		No action warranted
	Selenium	mg/kg	350	OJP In house V2009.2		3.00	3.00	3.00	3.00	3.00	3.00	3.00	7	6	3.00	0.00	0.00	95	1.943	1.000	3.00	350	OJP In house V2009.2		No action warranted
	Copper	mg/kg	8340	OJP In house V2009.2		17.00	15.00	12.00	8.00	10.00	50.00	5.00	7	6	16.86	15.59	0.35	95	1.943	1.679	28.31	8340	OJP In house V2009.2		No action warranted
	Zinc	mg/kg	38000	OJP In house V2009.2		62.00	52.00	27.00	19.00	27.00	72.00	16.00	7	6	39.29	22.37	0.22	95	1.943	1.418	55.72	38000	OJP In house V2009.2		No action warranted
	Boron	mg/kg	59	OJP In house V2009.2		1.00	1.00	1.00	1.00	1.00	1.00	1.00	7	6	1.00	0.00	0.00	95	1.943	1.000	1.00	59	OJP In house V2009.2		No action warranted

Mean Value Test

J-M0167.00
Natural
PAH
Organics - 3% SOM Scenario

Key:
exceeds screen and is potential outlier
Does not exceed screen but may be outlier
Exceeds screen but is not an outlier

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				Sample Ref			LEVEL 1 CHECK											
				trial pit / borehole ref	TP6	WS14	No of samples in the averaging area	Degrees of freedom	Arithmetic Mean	standard deviation	Coefficient of variation	*confidence bound required (%)	t value	normalised upper bound on confidence limit of population	Normalised upper bound (95% UCL of mean)	[illegible]	Source for SGV	[illegible]	Action - note if no further action indicated still do maximum value test
CAS REG No	Determinand	Units	*Screening Value	Depth	1.0	0.7-0.8													
				*Source of screening value															
	Naphthalene	mg/kg	4.4	OJP In House - V2009.2	0.100	0.110	2	1	0.11	0.01	0.05	95	6.314	1.301	0.14	4.4	OJP In House - V2009.2	YES	No action warranted
	Acenaphthene	mg/kg	9.2	OJP In House - V2009.2	0.100	0.100	2	1	0.10	0.00	0.00	95	6.314	1.000	0.10	9.2	OJP In House - V2009.2	YES	No action warranted
	Fluorene	mg/kg	23400	OJP In House - V2009.2	0.100	0.100	2	1	0.10	0.00	0.00	95	6.314	1.000	0.10	23400	OJP In House - V2009.2	YES	No action warranted
	Anthracene	mg/kg	5860	OJP In House - V2009.2	0.130	0.100	2	1	0.12	0.02	0.13	95	6.314	1.824	0.21	5860	OJP In House - V2009.2	YES	No action warranted
	Fluoranthene	mg/kg	1630	OJP In House - V2009.2	1.200	1.110	2	1	1.16	0.06	0.04	95	6.314	1.246	1.44	1630	OJP In House - V2009.2	YES	No action warranted
	Pyrene	mg/kg	1150	OJP In House - V2009.2	1.080	0.990	2	1	1.04	0.06	0.04	95	6.314	1.275	1.32	1150	OJP In House - V2009.2	YES	No action warranted
	Benzo(a)anthracene	mg/kg	7.2	OJP In House - V2009.2	0.560	0.740	2	1	0.65	0.13	0.14	95	6.314	1.874	1.22	7.2	OJP In House - V2009.2	YES	No action warranted
	Chrysene	mg/kg	840	OJP In House - V2009.2	0.580	0.720	2	1	0.65	0.10	0.11	95	6.314	1.680	1.09	840	OJP In House - V2009.2	YES	No action warranted
	Benzo(b)fluoranthene	mg/kg	9.4	OJP In House - V2009.2	0.680	0.840	2	1	0.76	0.11	0.11	95	6.314	1.865	1.27	9.4	OJP In House - V2009.2	YES	No action warranted
	Benzo(k)fluoranthene	mg/kg	97	OJP In House - V2009.2	0.270	0.280	2	1	0.28	0.01	0.02	95	6.314	1 115	0.31	97	OJP In House - V2009.2	YES	No action warranted
	Benzo(a)pyrene	mg/kg	0.96	OJP In House - V2009.2	0.530	0.700	2	1	0.62	0.12	0.14	95	6.314	1.873	1.16	0.96	OJP In House - V2009.2	NO	Remediation or further testing required
	Indeno(123cd)pyrene	mg/kg	9.2	OJP In House - V2009.2	0.250	0.350	2	1	0.30	0.07	0.17	95	6.314	2.052	0.62	9.2	OJP In House - V2009.2	YES	No action warranted
	Dibenzo(ah)anthracene	mg/kg	0.97	OJP In House - V2009.2	0.100	0.100	2	1	0.10	0.00	0.00	95	6.314	1.000	0.10	0.97	OJP In House - V2009.2	YES	No action warranted

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QTS Environmental Report No: 13-14777

Site Reference:	Hayes
Project / Job Ref:	J-M0167.00
Order No:	MK 04529
Sample Receipt Date:	28/05/2013
Sample Scheduled Date:	29/05/2013
Report Issue Number:	1
Reporting Date:	04/06/2013

Authorised by:

Russell Jarvis
Director
On behalf of QTS Environmental Ltd

Authorised by:

Kevin Old
Director
On behalf of QTS Environmental Ltd

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	TP1	TP1	TP1	TP2	TP2
Project / Job Ref: J-M0167.00	Additional Refs	D1	D3	D4	D2	D4
Order No: MK 04529	Depth (m)	0.05	1.00	2.20	1.50	2.60
Reporting Date: 04/06/2013	QTSE Sample No	70214	70215	70216	70217	70218

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025		None Detected			
pH	pH Units	N / a	MCERTS	7.4		11.7	12.0	9.8
Total Cyanide	mg/kg	< 2	NONE					
Total Sulphate as SO_4	mg/kg	< 200	NONE			5912		285
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE			0.03		0.05
Total Sulphur	mg/kg	< 200	NONE			2075		< 200
Sulphide	mg/kg	< 5	NONE					
Total Organic Carbon (TOC)	%	< 0.1	NONE	6.9				
Arsenic (As)	mg/kg	< 2	MCERTS	6			5	
W/S Boron	mg/kg	< 1	NONE	2.9			< 1	
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5			< 0.5	
Chromium (Cr)	mg/kg	< 2	MCERTS	15			21	
Copper (Cu)	mg/kg	< 4	MCERTS	25			11	
Lead (Pb)	mg/kg	< 3	MCERTS	51			23	
Mercury (Hg)	mg/kg	< 1	NONE	< 1			< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS	13			16	
Selenium (Se)	mg/kg	< 3	NONE	< 3			< 3	
Zinc (Zn)	mg/kg	< 3	MCERTS	92			72	
Total Phenols (monohydric)	mg/kg	< 2	NONE					

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C
Analysis carried out on the dried sample is corrected for the stone content
Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	TP3	TP5	TP6	TP6	TP9
Project / Job Ref: J-M0167.00	Additional Refs	D2	D1	D2	D3	D1
Order No: MK 04529	Depth (m)	0.60	0.30	0.50	1.00	0.30
Reporting Date: 04/06/2013	QTSE Sample No	70219	70220	70221	70222	70223

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025	None Detected		None Detected		None Detected
pH	pH Units	N / a	MCERTS		8.9	11.8	11.2	
Total Cyanide	mg/kg	< 2	NONE		< 2		< 2	
Total Sulphate as SO_4	mg/kg	< 200	NONE		801		1575	
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE		0.16		0.36	
Total Sulphur	mg/kg	< 200	NONE				524	
Sulphide	mg/kg	< 5	NONE		< 5		< 5	
Total Organic Carbon (TOC)	%	< 0.1	NONE		1.2		0.5	
Arsenic (As)	mg/kg	< 2	MCERTS		5	4	6	
W/S Boron	mg/kg	< 1	NONE		< 1	< 1	< 1	
Cadmium (Cd)	mg/kg	< 0.5	MCERTS		< 0.5	< 0.5	< 0.5	
Chromium (Cr)	mg/kg	< 2	MCERTS		24	16	37	
Copper (Cu)	mg/kg	< 4	MCERTS		13	9	17	
Lead (Pb)	mg/kg	< 3	MCERTS		45	19	19	
Mercury (Hg)	mg/kg	< 1	NONE		< 1	< 1	< 1	
Nickel (Ni)	mg/kg	< 3	MCERTS		16	15	27	
Selenium (Se)	mg/kg	< 3	NONE		< 3	< 3	< 3	
Zinc (Zn)	mg/kg	< 3	MCERTS		65	41	62	
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2		< 2	

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Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	TP10	TP12	TP14	TP14	WS1
Project / Job Ref: J-M0167.00	Additional Refs	D1	D2	D1	D2	ES1
Order No: MK 04529	Depth (m)	0.30	1.20	0.10	1.50	0.80 - 1.00
Reporting Date: 04/06/2013	QTSE Sample No	70224	70225	70226	70227	70228

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025		None Detected		None Detected	
pH	pH Units	N / a	MCERTS	8.7	11.7	8.6		8.0
Total Cyanide	mg/kg	< 2	NONE			< 2		< 2
Total Sulphate as SO_4	mg/kg	< 200	NONE		6945	1492		429
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE		0.07	0.19		0.10
Total Sulphur	mg/kg	< 200	NONE		2317			
Sulphide	mg/kg	< 5	NONE			< 5		< 5
Total Organic Carbon (TOC)	%	< 0.1	NONE	0.8		5.8		
Arsenic (As)	mg/kg	< 2	MCERTS	7		5		3
W/S Boron	mg/kg	< 1	NONE	< 1		2.9		< 1
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5		< 0.5		< 0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	17		13		29
Copper (Cu)	mg/kg	< 4	MCERTS	8		20		10
Lead (Pb)	mg/kg	< 3	MCERTS	28		49		13
Mercury (Hg)	mg/kg	< 1	NONE	< 1		< 1		< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	10		13		22
Selenium (Se)	mg/kg	< 3	NONE	< 3		< 3		< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	55		80		50
Total Phenols (monohydric)	mg/kg	< 2	NONE			< 2		< 2

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Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	WS2	WS3	WS4	WS5	WS5
Project / Job Ref: J-M0167.00	Additional Refs	ES1	ES1	ES2	ES1	ES2
Order No: MK 04529	Depth (m)	0.40 - 0.50	0.30 - 0.40	1.10 - 1.20	0.10 - 0.40	1.50 - 1.70
Reporting Date: 04/06/2013	QTSE Sample No	70229	70230	70231	70232	70233

Determinand	Unit	MDL	Accreditation					
Asbestos Screen (S)	N/a	N/a	ISO17025	None Detected				
pH	pH Units	N / a	MCERTS	12.1	12.0	10.1	6.6	6.9
Total Cyanide	mg/kg	< 2	NONE	< 2	< 2			
Total Sulphate as SO_4	mg/kg	< 200	NONE	8345	5697			< 200
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	0.02	0.04			0.0
Total Sulphur	mg/kg	< 200	NONE					< 2
Sulphide	mg/kg	< 5	NONE	< 5	< 5			
Total Organic Carbon (TOC)	%	< 0.1	NONE				1.4	
Arsenic (As)	mg/kg	< 2	MCERTS	6	6	7	7	
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5	< 0.5	
Chromium (Cr)	mg/kg	< 2	MCERTS	20	21	33	22	
Copper (Cu)	mg/kg	< 4	MCERTS	18	12	15	37	
Lead (Pb)	mg/kg	< 3	MCERTS	65	20	19	137	
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1	2.2	
Nickel (Ni)	mg/kg	< 3	MCERTS	16	17	30	19	
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3	< 3	
Zinc (Zn)	mg/kg	< 3	MCERTS	62	49	52	98	
Total Phenols (monohydric)	mg/kg	< 2	NONE	< 2	< 2			

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Subcontracted analysis (S)

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	WS7	WS9	WS10	WS10	WS11
Project / Job Ref: J-M0167.00	Additional Refs	ES2	ES1	ES1	ES2	ES1
Order No: MK 04529	Depth (m)	1.60 - 1.80	0.40 - 0.50	0.50 - 0.60	0.80 - 1.00	0.50 - 0.60
Reporting Date: 04/06/2013	QTSE Sample No	70234	70235	70236	70237	70238

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025					
pH	pH Units	N / a	MCERTS	9.4	9.2	9.8	8.5	7.5
Total Cyanide	mg/kg	< 2	NONE					< 2
Total Sulphate as SO_4	mg/kg	< 200	NONE	303			364	422
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	0.06			0.07	0.12
Total Sulphur	mg/kg	< 200	NONE	< 200			< 200	
Sulphide	mg/kg	< 5	NONE					< 5
Total Organic Carbon (TOC)	%	< 0.1	NONE					0.6
Arsenic (As)	mg/kg	< 2	MCERTS	8	2	4		4
W/S Boron	mg/kg	< 1	NONE	< 1	< 1	< 1		< 1
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5	< 0.5		< 0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	16	11	14		24
Copper (Cu)	mg/kg	< 4	MCERTS	12	8	10		9
Lead (Pb)	mg/kg	< 3	MCERTS	8	15	15		16
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1	< 1		< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	19	9	12		20
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3	< 3		< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	27	19	27		51
Total Phenols (monohydric)	mg/kg	< 2	NONE					< 2

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Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	WS12	WS14	WS14	WS15	WS16
Project / Job Ref: J-M0167.00	Additional Refs	WS1	ES1	ES2	ES1	ES1
Order No: MK 04529	Depth (m)	0.40 - 0.50	0.70 - 0.80	1.00 - 1.10	0.40 - 0.50	0.30 - 0.40
Reporting Date: 04/06/2013	QTSE Sample No	70239	70241	70242	70243	70244

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025		None Detected			None Detected
pH	pH Units	N / a	MCERTS	7.9	9.9	7.1	7.1	7.8
Total Cyanide	mg/kg	< 2	NONE		< 2		< 2	< 2
Total Sulphate as SO_4	mg/kg	< 200	NONE		5650	277	< 200	413
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE		0.09	0.05	0.02	0.0
Total Sulphur	mg/kg	< 200	NONE			< 200		
Sulphide	mg/kg	< 5	NONE		< 5		< 5	< 5
Total Organic Carbon (TOC)	%	< 0.1	NONE	1.6			0.3	
Arsenic (As)	mg/kg	< 2	MCERTS	8	6		< 2	11
W/S Boron	mg/kg	< 1	NONE	< 1	< 1		< 1	< 1
Cadmium (Cd)	mg/kg	< 0.5	MCERTS	< 0.5	< 0.5		< 0.5	< 0.5
Chromium (Cr)	mg/kg	< 2	MCERTS	23	19		19	21
Copper (Cu)	mg/kg	< 4	MCERTS	32	51		5	26
Lead (Pb)	mg/kg	< 3	MCERTS	129	59		6	71
Mercury (Hg)	mg/kg	< 1	NONE	< 1	< 1		< 1	< 1
Nickel (Ni)	mg/kg	< 3	MCERTS	18	31		8	26
Selenium (Se)	mg/kg	< 3	NONE	< 3	< 3		< 3	< 3
Zinc (Zn)	mg/kg	< 3	MCERTS	84	72		16	67
Total Phenols (monohydric)	mg/kg	< 2	NONE		< 2		< 2	< 2

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Subcontracted analysis [S]

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Soil Analysis Certificate						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied				
Opus International	Time Sampled	None Supplied				
Site Reference: Hayes	TP / BH No	WS16				
Project / Job Ref: J-M0167.00	Additional Refs	ES2				
Order No: MK 04529	Depth (m)	0.80 - 0.90				
Reporting Date: 04/06/2013	QTSE Sample No	70245				

Determinand	Unit	MDL	Accreditation					
Asbestos Screen [S]	N/a	N/a	ISO17025					
pH	pH Units	N / a	MCERTS	7.0				
Total Cyanide	mg/kg	< 2	NONE					
Total Sulphate as SO_4	mg/kg	< 200	NONE	616				
W/S Sulphate as SO_4 (2:1)	g/l	< 0.01	NONE	0.01				
Total Sulphur	mg/kg	< 200	NONE	281				
Sulphide	mg/kg	< 5	NONE					
Total Organic Carbon (TOC)	%	< 0.1	NONE					
Arsenic (As)	mg/kg	< 2	MCERTS					
W/S Boron	mg/kg	< 1	NONE					
Cadmium (Cd)	mg/kg	< 0.5	MCERTS					
Chromium (Cr)	mg/kg	< 2	MCERTS					
Copper (Cu)	mg/kg	< 4	MCERTS					
Lead (Pb)	mg/kg	< 3	MCERTS					
Mercury (Hg)	mg/kg	< 1	NONE					
Nickel (Ni)	mg/kg	< 3	MCERTS					
Selenium (Se)	mg/kg	< 3	NONE					
Zinc (Zn)	mg/kg	< 3	MCERTS					
Total Phenols (monohydric)	mg/kg	< 2	NONE					

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Subcontracted analysis [S]

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Soil Analysis Certificate - Speciated PAHs							
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	TP5	TP6	TP14	WS1	WS2
Project / Job Ref: J-M0167.00	Additional Refs	D1	D3	D1	ES1	ES1
Order No: MK 04529	Depth (m)	0.30	1.00	0.10	0.80 - 1.00	0.40 - 0.50
Reporting Date: 04/06/2013	QTSE Sample No	70220	70222	70226	70228	70229

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.18
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.15	0.66	< 0.1	0.32	1.48
Anthracene	mg/kg	< 0.1	MCERTS	< 0.1	0.13	< 0.1	< 0.1	0.35
Fluoranthene	mg/kg	< 0.1	MCERTS	0.27	1.20	0.60	0.70	2.74
Pyrene	mg/kg	< 0.1	MCERTS	0.23	1.08	0.52	0.56	2.48
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.13	0.56	0.28	0.50	1.52
Chrysene	mg/kg	< 0.1	MCERTS	0.17	0.58	0.33	0.56	1.54
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	0.18	0.68	0.44	0.99	1.98
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	< 0.1	0.27	0.15	0.35	0.73
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	0.14	0.53	0.27	0.74	1.62
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	< 0.1	0.25	0.18	0.47	0.88
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	0.14
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	< 0.1	0.20	0.14	0.38	0.71
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	< 1.6	6.1	2.9	5.6	16.4

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Soil Analysis Certificate - Speciated PAHs						
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	WS3	WS11	WS14	WS15	WS16
Project / Job Ref: J-M0167.00	Additional Refs	ES1	ES1	ES1	ES1	ES1
Order No: MK 04529	Depth (m)	0.30 - 0.40	0.50 - 0.60	0.70 - 0.80	0.40 - 0.50	0.30 - 0.40
Reporting Date: 04/06/2013	QTSE Sample No	70230	70238	70241	70243	70244

Determinand	Unit	MDL	Accreditation					
Naphthalene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	0.11	< 0.1	< 0.1
Acenaphthylene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	mg/kg	< 0.1	MCERTS	0.90	< 0.1	0.74	0.39	0.55
Anthracene	mg/kg	< 0.1	MCERTS	0.22	< 0.1	0.22	0.11	< 0.1
Fluoranthene	mg/kg	< 0.1	MCERTS	1.67	< 0.1	1.11	0.68	1.58
Pyrene	mg/kg	< 0.1	MCERTS	1.49	< 0.1	0.99	0.50	1.35
Benzo(a)anthracene	mg/kg	< 0.1	MCERTS	0.89	< 0.1	0.74	0.31	0.76
Chrysene	mg/kg	< 0.1	MCERTS	0.92	< 0.1	0.72	0.32	0.84
Benzo(b)fluoranthene	mg/kg	< 0.1	MCERTS	1.24	< 0.1	0.84	0.40	1.06
Benzo(k)fluoranthene	mg/kg	< 0.1	MCERTS	0.45	< 0.1	0.28	0.13	0.48
Benzo(a)pyrene	mg/kg	< 0.1	MCERTS	1	< 0.1	0.70	0.23	0.82
Indeno(1,2,3-cd)pyrene	mg/kg	< 0.1	MCERTS	0.53	< 0.1	0.35	0.15	0.45
Dibenz(a,h)anthracene	mg/kg	< 0.1	MCERTS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo(ghi)perylene	mg/kg	< 0.1	MCERTS	0.42	< 0.1	0.27	0.11	0.38
Total EPA-16 PAHs	mg/kg	< 1.6	MCERTS	9.7	< 1.6	7.1	3.3	8.3

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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Soil Analysis Certificate - TPH CWG Banded							
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	TP6	TP9	WS12	WS13	WS14
Project / Job Ref: J-M0167.00	Additional Refs	D3	D1	WS1	ES1	ES2
Order No: MK 04529	Depth (m)	1.00	0.30	0.40 - 0.50	0.40 - 0.50	1.00 - 1.10
Reporting Date: 04/06/2013	QTSE Sample No	70222	70223	70239	70240	70242

Determinand	Unit	MDL	Accreditation					
Aliphatic >C5 - C6	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aliphatic >C6 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aliphatic >C8 - C10	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aliphatic >C10 - C12	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aliphatic >C12 - C16	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aliphatic >C16 - C21	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aliphatic >C21 - C34	mg/kg	< 6	NONE	< 6	< 6	< 6	8	< 6
Aliphatic (C5 - C34)	mg/kg	< 12	NONE	< 12	< 12	< 12	< 12	< 12
Aromatic >C5 - C7	mg/kg	< 0.01	NONE	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Aromatic >C7 - C8	mg/kg	< 0.05	NONE	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Aromatic >C8 - C10	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aromatic >C10 - C12	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aromatic >C12 - C16	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aromatic >C16 - C21	mg/kg	< 1	NONE	< 1	< 1	< 1	< 1	< 1
Aromatic >C21 - C35	mg/kg	< 6	NONE	9	8	7	10	< 6
Aromatic (C5 - C35)	mg/kg	< 12	NONE	< 12	< 12	< 12	< 12	< 12
Total >C5 - C35	mg/kg	< 24	NONE	< 24	< 24	< 24	< 24	< 24

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Soil Analysis Certificate - BTEX / MTBE							
QTS Environmental Report No: 13-14777	Date Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Opus International	Time Sampled	None Supplied	None Supplied	None Supplied	None Supplied	None Supplied
Site Reference: Hayes	TP / BH No	TP6	TP9	WS12	WS13	WS14
Project / Job Ref: J-M0167.00	Additional Refs	D3	D1	WS1	ES1	ES2
Order No: MK 04529	Depth (m)	1.00	0.30	0.40 - 0.50	0.40 - 0.50	1.00 - 1.10
Reporting Date: 04/06/2013	QTSE Sample No	70222	70223	70239	70240	70242

Determinand	Unit	MDL	Accreditation					
Benzene	ug/kg	< 2	MCERTS	< 2	< 2	< 2	< 2	< 2
Toluene	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5
Ethylbenzene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
p & m-xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
o-xylene	ug/kg	< 10	MCERTS	< 10	< 10	< 10	< 10	< 10
MTBE	ug/kg	< 5	MCERTS	< 5	< 5	< 5	< 5	< 5

Analytical results are expressed on a dry weight basis where samples are dried at less than 30°C

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Soil Analysis Certificate - Sample Descriptions	
QTS Environmental Report No: 13-14777	
Opus International	
Site Reference: Hayes	
Project / Job Ref: J-M0167.00	
Order No: MK 04529	
Reporting Date: 04/06/2013	

QTSE Sample No	TP / BH No	Additional Refs	Depth (m)	Moisture Content (%)	Sample Matrix Description
70214	TP1	D1	0.05	21.4	Grey sandy loam with vegetation
70216	TP1	D4	2.20	4.7	Beige gravelly sand with concrete and vegetation
70217	TP2	D2	1.50	15.9	Beige gravelly sand with concrete and vegetation
70218	TP2	D4	2.60	7.9	Beige gravelly sand with concrete
70220	TP5	D1	0.30	14	Orange sandy gravel with stones
70221	TP6	D2	0.50	8.9	Light grey gravelly sand with concrete
70222	TP6	D3	1.00	18.7	Light brown sandy clay with concrete
70223	TP9	D1	0.30	14.3	Light grey gravelly sand with concrete
70224	TP10	D1	0.30	10.8	Light brown clay
70225	TP12	D2	1.20	11	Brown clayey loam with vegetation and brick
70226	TP14	D1	0.10	18.6	Brown sandy loam with vegetation and stones
70228	WS1	ES1	0.80 - 1.00	14	Light grey clay with stones
70229	WS2	ES1	0.40 - 0.50	10.2	Light grey gravelly sand with concrete
70230	WS3	ES1	0.30 - 0.40	11.3	Light brown gravelly sand with concrete
70231	WS4	ES2	1.10 - 1.20	15.8	Light grey clay with stones
70232	WS5	ES1	0.10 - 0.40	10.4	Brown clayey loam with stones
70233	WS5	ES2	1.50 - 1.70	5.8	Orange gravelly clay with stones
70234	WS7	ES2	1.60 - 1.80	9.9	Orange sandy gravel with stones
70235	WS9	ES1	0.40 - 0.50	4.8	Light grey loamy gravel with rubble and stones
70236	WS10	ES1	0.50 - 0.60	5.6	Light grey clay with concrete and stones
70237	WS10	ES2	0.80 - 1.00	8.1	Brown sandy clay with concrete and stones
70238	WS11	ES1	0.50 - 0.60	15	Light brown sandy clay
70239	WS12	WS1	0.40 - 0.50	10.8	Brown sandy clay with concrete and stones
70240	WS13	ES1	0.40 - 0.50	11.9	Brown clayey loam with stones and brick
70241	WS14	ES1	0.70 - 0.80	9.5	Black clayey gravel with rubble and concrete
70242	WS14	ES2	1.00 - 1.10	17.5	Light grey clay with stones
70243	WS15	ES1	0.40 - 0.50	8.3	Light grey clayey gravel with chalk and stones
70244	WS16	ES1	0.30 - 0.40	10.7	Brown clayey loam with stones and vegetation
70245	WS16	ES2	0.80 - 0.90	8	Black sandy gravel with rubble

Insufficient sample [I/S]
Unsuitable Sample [U/S]

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Soil Analysis Certificate - Methodology & Miscellaneous Information
QTS Environmental Report No: 13-14777
Opus International
Site Reference: Hayes
Project / Job Ref: J-M0167.00
Order No: MK 04529
Reporting Date: 04/06/2013

Matrix	Analysed On	Determinand	Brief Method Description	Method No
Soil	D	Metals	Determination of metals by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Cations	Determination of cations in soil by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Boron - Water Soluble	Determination of water soluble boron in soil by 2:1 hot water extract followed by ICP-OES	E012
Soil	AR	Chromium - Hexavalent	Determination of hexavalent chromium in soil by extraction in water then by acidification, addition of 1,5 diphenylcarbazide followed by colorimetry	E016
Soil	D	Magnesium - Water Soluble	Determination of water soluble magnesium by extraction with water followed by ICP-OES	E025
Soil	D	Chloride - Water Soluble (2:1)	Determination of chloride by extraction with water & analysed by ion chromatography	E021
Soil	AR	Cyanide - Total	Determination of total cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Complex	Determination of complex cyanide by distillation followed by colorimetry	E015
Soil	AR	Cyanide - Free	Determination of free cyanide by distillation followed by colorimetry	E015
Soil	AR	Electrical Conductivity	Determination of electrical conductivity by addition of saturated calcium sulphate followed by electrometric measurement	E022
Soil	D	Elemental Sulphur	Determination of elemental sulphur by solvent extraction followed by turbidimeter	E020
Soil	D	Fluoride - Water Soluble	Determination of Fluoride by extraction with water & analysed by ion chromatography	E023
Soil	D	FOC (Fraction Organic Carbon)	Determination of fraction of organic carbon by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	D	Loss on Ignition @ 450°C	Determination of loss on ignition in soil by gravimetrically with the sample being ignited in a muffle furnace	E019
Soil	AR	Moisture Content	Moisture content; determined gravimetrically	E003
Soil	D	Organic Matter	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	pH	Determination of pH by addition of water followed by electrometric measurement	E007
Soil	D	Phosphorus	Determination of phosphorus by aqua-regia digestion followed by ICP-OES	E002
Soil	D	Sulphate (as SO4) - Water Soluble (2:1)	Determination of water soluble sulphate by extraction with water followed by ICP-OES	E014
Soil	D	Sulphate (as SO4) - Total	Determination of total sulphate by extraction with 10% HCl followed by ICP-OES	E013
Soil	AR	Sulphide	Determination of sulphide by acidification and heating to liberate hydrogen sulphide, trapped in an alkaline solution then assayed by ion selective electrode	E018
Soil	D	Sulphur - Total	Determination of total sulphur by extraction with aqua-regia, potassium iodide/iodate followed by ICP-OES	E002
Soil	AR	Thiocyanate (as SCN)	Determination of thiocyanate by extraction in caustic soda followed by acidification followed by addition of ferric nitrate followed by colorimetry	E017
Soil	D	Total Organic Carbon (TOC)	Determination of organic matter by oxidising with potassium dichromate followed by titration with iron (II) sulphate	E011
Soil	AR	BTEX	Determination of BTEX by headspace GC-MS	E001
Soil	D	Cyclohexane Extractable Matter (CEM)	Gravimetrically determined through extraction with cyclohexane	E009
Soil	AR	Diesel Range Organics (C10 - C24)	Determination of hexane/acetone extractable hydrocarbons by GC-FID	E004
Soil	AR	Mineral Oil (C10 - C40)	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	PAH - Speciated (EPA 16)	Determination of PAH compounds by extraction in acetone and hexane followed by GC-MS with the use of surrogate and internal standards	E005
Soil	AR	PCB - 7 Congeners	Determination of PCB by extraction with acetone and hexane followed by GC-MS	E008
Soil	D	Petroleum Ether Extract (PEE)	Gravimetrically determined through extraction with petroleum ether	E009
Soil	AR	Phenols - Total (monohydric)	Determination of phenols by distillation followed by colorimetry	E010
Soil	AR	SVOC	Determination of semi-volatile organic compounds by extraction in acetone and hexane followed by GC-MS	E006
Soil	D	Toluene Extractable Matter (TEM)	Gravimetrically determined through extraction with toluene	E009
Soil	AR	EPH (C10 – C40)	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VPH (C6 - C10)	Determination of hydrocarbons C6-C10 by headspace GC-MS	E001
Soil	AR	EPH TEXAS	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	TPH CWG	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	TPH LQM	Determination of hexane/acetone extractable hydrocarbons by GC-FID fractionating with SPE cartridge	E004
Soil	AR	EPH (with florisil cleanup)	Determination of acetone/hexane extractable hydrocarbons with florisil cleanup step by GC-FID	E004
Soil	AR	EPH Product ID	Determination of acetone/hexane extractable hydrocarbons by GC-FID	E004
Soil	AR	VOCs	Determination of volatile organic compounds by headspace GC-MS	E001

Key

D Dried
AR As Received

2343

CERTIFICATE OF ANALYSIS

AMS Management LLP (South)
Unit 1
9, Cannon Lane
Tonbridge
Kent TN9 1PP
Tel: 01732 368359
Email: pete.everard@ams-holdings.com

Report Number: TN53770v0 **Other Ref:** J-M0167.00-14824 **Report Date:** 30/05/2013

Company: QTS Environmental Ltd
Unit 1 Rose Lane Industrial Estate
Rose Lane
Lenham Heath
Kent ME17 2JN

Site: Hayes

AMS Sample Ref	Client Sample No	Sample Location	Material Type	Asbestos Type	Content
AMS/PE/240310	ASB	70490	Insulation board	Asbestos not detected	Nor

..... END .....

Key to fibre content: Trace = Trace asbestos identified (1 or 2 fibres present) Positive = Asbestos identified (more than 2 fibres present).

Sampled: Externally Number of samples: 1 Date samples received: 30/05/2013 Name of analyst: Pete Everard Date of analysis: 30/05/2013

Quantitive Fibre Content is not covered by our UKAS accreditation and is not reported. However guidance on the percentages of asbestos used in various products is available in HSG 264. Material types are visually assessed and are outside the scope of UKAS accreditation. The analysis has been performed using the AMS 'In House' method of transmitted/polarised light microscopy and centre stop dispersion staining, based on the HSG 248. AMS do not accept responsibility for any descrepancy or inaccuracy arising from samples labelled or collected by clients or third parties. This certificate of analysis shall not be reproduced except in full, without written approval of the laboratory.

For and on behalf of AMS Management (GB) LLP

Pete Everard
Lab Manager

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Registered office: Unit 1, 9 Cannon Lane, Tonbridge, Kent, TN9 1PP
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APPENDIX E

Geotechnical Test Results

Project Name:	Hayes	**Samples Received:**	24/05/2013
		Project Started:	29/05/2013
Client:	Opus International Consultants (UK) Ltd	**Testing Started:**	03/06/2013
Project No:	J-M0167.00 **Our job/report no:** 14677	**Date Reported:**	04/06/2013

K4 SOILS

Borehole No:	Sample No:	Depth (m)	Description	Moisture content (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Passing 0.425 mm (%)	Remarks
TP3	D3	1.00	Pale grey and orange slightly gravelly CLAY with sandy clay pockets (gravel is fine and sub-angular)	24	52	19	33	80	
TP5	D2	1.00	Brown and orangey brown slightly sandy slightly gravelly CLAY with occasional roots (gravel is fm and sub-angular)	23	52	20	32	90	
TP8	D3	0.80	Brown, orangey brown and grey slightly sandy slightly gravelly CLAY (gravel is fm and sub-angular)	27	60	22	38	86	
WS9	D1	0.50 - 0.90	Brown, grey and occasional orange gravelly CLAY with occasional sandy clay pockets, roots and rootlets (gravel is fmc and sub-angular)	23	57	22	35	54	
WS14	D2	1.50 - 1.90	Brown, pale grey and occasional orange gravelly CLAY with sandy clay pockets (gravel is fmc and angular to rounded)	28	67	22	45	42	

UKAS TESTING 2519

Summary of Test Results

BS 1377 : Part 2 : Clause 4.4 : 1990 Determination of the liquid limit by the cone penetrometer method.
BS 1377 : Part 2 : Clause 5 : 1990 Determination of the plastic limit and plasticity index.
BS 1377 : Part 2 : Clause 3.2 : 1990 Determination of the moisture content by the oven-drying method.

Checked and Approved
Initials: K.P
Date: 04/06/2013

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