VERIFICATION REPORT
of
ELECTRICITY SUB-STATION AT REAR OF 110 AND 112 PRIORY ROAD, HORNSEY
for
SWAN CONTRACTORS LIMITED

Contaminated Land Solutions

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Project No 0684
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1 EXECUTIVE SUMMARY

A phase 1 environmental report has been undertaken by VNS Consultants. A phase 2 environmental investigation and contamination tests and phase 3 remediation strategy have been undertaken by GO Contaminated Land Solutions Ltd. This report provides verification in order to demonstrate that remediation measures have been completed.

In accordance with the Remediation Strategy the following remedial actions were required:

Demonstrate that the level of contamination does not represent a significant risk to any off site receptors.

Provide a barrier in order to remove the pathway between any residual contamination and site users or residents.

Demonstrate that all imported soils are validated.

Contaminated soil has been removed and where required an appropriate barrier of topsoil has been placed. Four samples were taken following placement of the imported soils, and all results were well below the relevant soil screening values, and no asbestos was identified.

The completion of these remediation measures has ensured that the identified risks are reduced such that the development does not pose an increased risk to human health.

Risk Summary

Very Low	Low	Moderate / Low	Moderate	High

		RECEPTORS					
		Residents & Site Users	Construction & Maintenance Operatives	Neighbours	Proposed Building	Aquifer	Watercourse
SOURCES	Site Use as electrical sub-station						

2 BRIEF

Mr Paresh Parekh of Swan Contractors Limited, requested GO Contaminated Land Solutions complete a verification report for the site.

This report should be read in conjunction with the following report:

- VNS Consultants, Phase 1 desktop study report, Former EDF Energy Site Rear of 110-116 Priory Road, Hornsey N8 7PH, issued February 2015,

and GO Contaminated Land Solutions reports:

- 0684-P2E-ScopeOfWorks, issued July 2015,
- Phase 2 environmental investigation, ref: 0684P2E-1, issued October 2015
- Remediation Strategy, ref 0684-P3E-1, issued November 2015

3 PREVIOUS CONTAMINATION TESTING

The previous intrusive environmental investigation by VNS Consultants Limited identified elevated levels of mercury, lead and benzo(a)pyrene within the made ground and natural ground.

Soil samples were collected by GO Contaminated Land Solutions from locations BH1, S2 and S3 and a water sample was collected from BH1. All samples were placed immediately in cool boxes with ice packs and collected by courier for transport. On site screening using a Photo-Ionisation Detector (PID) was undertaken at various depths during the investigation. No visual or olfactory evidence of contamination (such as vapours) was identified during sampling.

On site screening using a Photo-Ionisation Detector (PID) was undertaken at various depths during the site works.

The chemical testing was carried out in accordance with standard industry methods in a UKAS approved laboratory which is also currently accredited in accordance with MCERTS for the majority of its testing. Further information regarding this accreditation is available on request together with a full list of test methods if required.

The water sample from location BH1 was analysed for heavy metals, pH, banded hydrocarbons, speciated PAHs, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), PolyChlorinated Biphenyls (PCBs) and banded hydrocarbons.

The soil samples from locations BH1, S2 and S3 were screened in the laboratory for the presence of asbestos fibres.

The results of the groundwater analysis have been compared to the UK Drinking Water Standards/ World Health Organisation (WHO) drinking water quality guidelines and LQM/ CIEH intake water requirements.

TEST RESULTS ABOVE SCREENING VALUES				
Determinand	**Reference**	**Depth (mbgl)**	**Value (ug/l)**	**Screening value (ug/l**
Zinc	BH1	n/a	36.0	5
Naphthalene	BH1	n/a	0.11	0.1
Acenaphthylene	BH1	n/a	0.2	0.1
Phenanthrene	BH1	n/a	1.23	0.1
Anthracene	BH1	n/a	0.4	0.1
Fluoranthene	BH1	n/a	2.44	0.1
Pyrene	BH1	n/a	2.05	0.1
Benz(a)anthracene	BH1	n/a	1.03	0.1
Chrysene	BH1	n/a	1.18	0.1
Benzo(k)fluoranthene	BH1	n/a	0.73	0.01
Benzo(b)fluoranthene	BH1	n/a	0.32	0.01
Indeno(123-cd)pyrene	BH1	n/a	0.64	0.1
Dibenz(ah)anthracene	BH1	n/a	0.12	0.1
Aromatic Hydrocarbons >C21-C35	BH1	n/a	98.5	90

The soil samples were screened in the laboratory for the presence of asbestos fibres and the results are as follows:

Reference	Depth (mbgl)	Result
BH1	0.0 to 0.6	Chrysotile (white) asbestos
S2	0.0 to 0.6	Chrysotile (white) asbestos
S3	0.0 to 0.6	No asbestos detected

In this investigation one round of groundwater sampling was undertaken on 14th August 2015. No visual or olfactory evidence of contamination was identified during the sampling. The sample was analysed for heavy metals, pH, banded hydrocarbons, speciated PAHs, Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs), PolyChlorinated Biphenyls (PCBs) and banded hydrocarbons.

The results of the laboratory analysis were compared against screening values derived from the UK Drinking Water Standards, the World Health Organisation Drinking Water Quality Guidelines and the LQM Intake Water guidelines. The results have identified the following contaminants which have exceeded the screening values:

- Zinc
- Naphthalene
- Acenaphthylene
- Phenanthrene
- Anthracene
- Fluoranthene
- Pyrene
- Benz(a)anthracene
- Chrysene
- Benzo(k)fluoranthene
- Benzo(b)fluoranthene
- Indeno(123-cd)pyrene
- Dibenz(ah)anthracene
- Aromatic Hydrocarbons >C21-C35

The level of the exceedance is not considered likely to give rise to significant vapours. As the site is not underlain by an aquifer the exceedances found are not considered a significant risk to groundwater.

Soil samples were collected from locations BH1, S2 and S3 on 20th July. No visual or olfactory evidence of contamination was identified during the sampling. The samples were screened in the laboratory for the presence of asbestos. Chrysotile (white) asbestos was detected in the samples from BH1 and S2. No asbestos was detected in the sample collected from S3.
On site screening using a Photo-Ionisation Detector (PID) was undertaken at various depths during the investigation. Readings of zero were recorded in all instances.

Geological records show that there are no superficial deposits and the site is underlain by London Clay. Therefore, the potential for contaminants to be transported either to or from site in the groundwater is not considered to be significant. The removal of the ground in the proposed soft landscaped areas will reduce the risk of potential leaching into any perched groundwater.

4 REMEDIAL SITE WORKS

4.1 Communal Soft Landscaping

Asbestos and exceedance of mercury, lead and benzo(a)pyrene, identified on the phase 2 environmental investigation, pose a risk to on-site and off-site receptors.

A barrier has been placed on the communal areas in the form of a minimum of 300mm of topsoil.

BRE report recommends a minimum cover thickness of 300mm to a maximum of 600mm, refer to Appendix I. In terms of human health for residents, provision of a simple cover system should be sufficient to provide a reduction of the hazard.

4.2 Private Garden

Most and possibly all the made ground in the private garden has been removed and geotextile and 200mm-thick topsoil layer has been placed on the area.

Validation testing has confirmed that the soil remaining below the imported topsoil and geotextile complies with the screening criteria for private gardens with plant uptake. Therefore exposure to the rear garden soil does not represent a significant risk to future on-site and off-site receptors.

5 RISK ASSESSMENT

The potentially significant risks identified in previous reports have been reviewed in the following table.

Following placement of the imported soils, further testing has been undertaken and no asbestos has been identified. Therefore, potential risk to human health due to asbestos fibres within soil is not considered further.

SOURCES	POTENTIAL POLLUTANT	RECEPTOR	PATHWAY	HAZARD SEVERITY	LIKELIHOOD OF OCCURRENCE	RISK/ SIGNIFICANCE	COMMENT & CONTROL MEASURES
Electrical sub-station	Mercury Lead PAHs	Residents & Site Users	Dermal contact	Medium	Unlikely	Low Risk	Appropriate barrier has been installed. No further action required.
			Soil Ingestion and Home Produce Consumption	Medium			
		Residents, Site Users & neighbours post construction	Inhalation of contaminated dust	Medium			
			Drinking of water from supply impacted by contaminated soil	Medium			Protectaline water supply pipe installed.

SOURCES	POTENTIAL POLLUTANT	RECEPTOR	PATHWAY	HAZARD SEVERITY	LIKELIHOOD OF OCCURRENCE	RISK/ SIGNIFICANCE	COMMENT & CONTROL MEASURES
Electrical sub-station	Mercury Lead PAHs	Construction operatives	Dermal contact	Medium	Unlikely	Low Risk	Information to be contained in site Health & Safety Plan. Use of appropriate ppe and normal good hygiene measures.
			Soil Ingestion	Medium			
			Inhalation of contaminated dust	Medium			
		Neighbours during construction		Medium			Appropriate dust control measures during construction.
		Maintenance Operatives	Dermal contact, soil ingestion	Medium			Information to be contained in site Health & Safety Plan. All services should be laid in clean imported fill material.

6 VERIFICATION TESTING

In order to demonstrate that the made ground within the soft landscaped areas has been removed and replaced with clean fill, photographs were taken of the areas following removal of made ground (Refer to Appendix F).

After placing of the topsoil, four verification samples were taken and tested. One sample has been taken from the rear garden, below the new capping layer, the other samples from the imported fill material. Verification test results for the samples are attached in Appendix D. The samples were tested for a range of commonly occurring contaminants and indicators of contamination including those given by the Contaminated Land Exposure Assessment (CLEA). These include, heavy metals, aromatic and aliphatic hydrocarbons, in accordance with Environment Agency guidelines, and speciated PolyAromatic Hydrocarbon (PAH) and asbestos.

The results have been compared to soil guideline values and where none are available to Atkins ATRISKsoil Soil Screening Values, assessment levels used are for residential with plant uptake. The assessment levels used for Lead and Hexavalent Chromium have been compared to the recently published Category 4 Screening Levels published by DEFRA.

Three verification pits were excavated to natural strata to confirm the thickness of the capping layer.

A plan of the sample locations and validation pits is contained in Appendix B.

6.1 Sampling and Testing Regime

Verification Sampling:

LOCATION	RATIONALE FOR LOCATION	DEPTH (m)	SAMPLING, IN-SITU TESTING & MONITORING
S1	TP1 - Communal area in front of the property entrance, along the external pavement.	0.15 – 0.35	Heavy metals, aromatic and aliphatic hydrocarbons, in accordance with Environment Agency guidelines, and speciated PolyAromatic Hydrocarbon (PAH) and asbestos.
S2	TP2 - Rear garden on the south eastern corner of the property. Within and below the new topsoil layer.	0.05 – 0.20	
S3		0.20 – 0.30	
S4	TP3 - Communal area on the east side	0.12 – 0.35	

6.2 Test Results

The validation samples have been compared to Atkins ATRISKsoil Soil Screening Values derived using CLEA for 1% SOM for samples location TP2 and CLEA for 6% SOM for sample locations TP1 and TP3. Assessment levels used are for residential with plant uptake.

The assessment levels used for Lead and Hexavalent Chromium have been compared to the recently published Category 4 Screening Levels published by DEFRA.

No test results returned above screening values in the additional verification testing.

7 DUTY OF CARE DOCUMENTATION

The material removed was taken to an appropriate landfill facility, following Waste

Acceptance Criteria (WAC) testing.

A full record of “Duty of Care” documentation, waste transfer notes and tickets confirming receipt at the landfill is contained in Appendix G.

Documentation must be provided to demonstrate compliance of imported fill with the criteria in Appendix H.

8 CONCLUSIONS

The previous reports identified residual risks to site residents, neighbours, and construction and maintenance workers from on-site contaminated soil. Appropriate remediation measures have been described in the Remediation Strategy.

Made ground in the communal areas has been removed and a capping layer has been placed in the form of a minimum of 300mm of topsoil. Based upon the validation test results it has been concluded that the imported fill is suitable. Removal of made ground and placing of the clean fill is therefore considered to have removed the source-pathway-receptor link.

Most if not all of the made ground in the private garden has been removed and geotextile and 200mm-thick topsoil layer has been placed on the area. Validation testing has confirmed that the soil remaining below the imported topsoil and geotextile complies with the screening criteria for private gardens with plant uptake. Therefore exposure to the rear garden soil does not represent a significant risk to future on-site and off-site receptors.

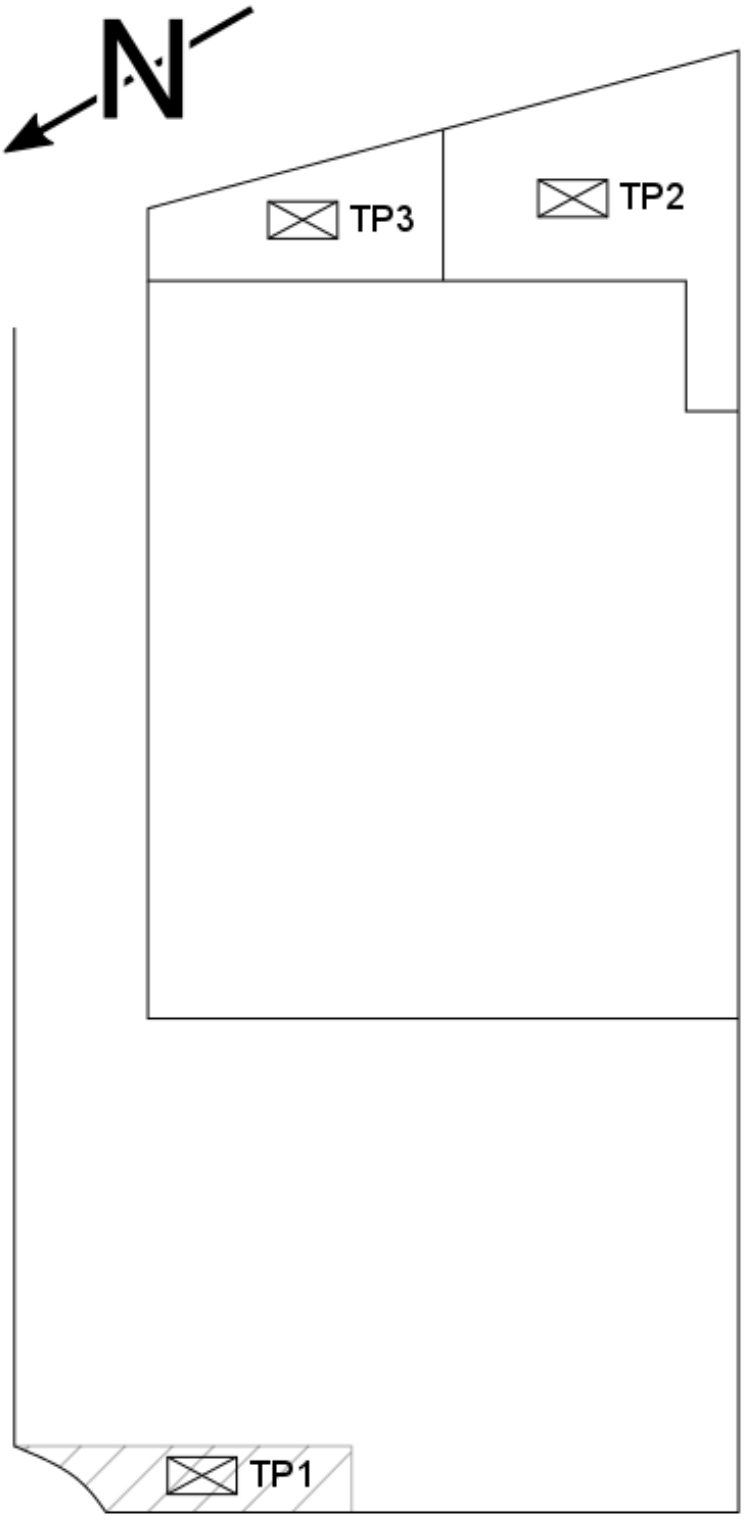
It has been concluded that the remedial site works have been successful in ensuring that the development does not pose an increased risk to human health.

This document has been prepared for the titled project and should not be relied upon or used for any other project without an independent check being carried out as to its suitability and the prior written authority of GO Contaminated Land Solutions Ltd being obtained. No responsibility or liability is accepted for the consequences of this document being used for a purpose other than that for which it was commissioned. Any person using or relying on this document for such other purpose will by such use or reliance be taken to confirm his agreement to indemnify GO Contaminated Land Solutions Ltd for all loss or damage resulting therefrom. GO Contaminated Land Solutions Ltd accepts no responsibility or liability for this document to any party other than Swan Contractors Limited by whom it was commissioned.

Appendix A – Site Location Plan


SAFESTORE BUILDING
ALEXANDRAPALACE WAY
PRIORY ROAD
PCs
LB
TCB
116
114
112
110
13
21
7
5
3
1

Appendix B – Sample Location Plan


N
TP3
TP2
TP1

Appendix C – Previous Contamination Testing and Gas Monitoring

Determinand		Unit	Drinking Water values	Concentration		Number of Tests	Number of Exceedences
				Min	Max		
Arsenic		µg/l	10	n/a	5.0	1	0
Cadmium		µg/l	5	n/a	<1	1	0
Copper		µg/l	2000	n/a	<5	1	0
Lead		µg/l	10	n/a	<1	1	0
Mercury		µg/l	1	n/a	<0.1	1	0
Nickel		µg/l	20	n/a	12	1	0
Selenium		µg/l	10	n/a	<5	1	0
Zinc		µg/l	5	n/a	36.0	1	1
pH Value		units	-	n/a	6.6	1	NA
Naphthalene		µg/l	0.1	n/a	0.11	1	1
Acenaphthylene		µg/l	0.1	n/a	0.2	1	1
Acenaphthene		µg/l	0.1	n/a	0.08	1	0
Fluorene		µg/l	0.1	n/a	0.1	1	0
Phenanthrene		µg/l	0.1	n/a	1.23	1	1
Anthracene		µg/l	0.1	n/a	0.4	1	1
Fluoranthene		µg/l	0.1	n/a	2.44	1	1
Pyrene		µg/l	0.1	n/a	2.05	1	1
Benz(a)anthracene		µg/l	0.1	n/a	1.03	1	1
Chrysene		µg/l	0.1	n/a	1.18	1	1
Benzo(b)fluoranthene		µg/l	0.01	n/a	1.32	1	1
Benzo(k)fluoranthene		µg/l	0.01	n/a	0.73	1	1
Benzo(a)pyrene		µg/l	0.01	n/a	1.19	1	1
Indeno(123-cd)pyrene		µg/l	0.1	n/a	0.64	1	1
Dibenz(ah)anthracene		µg/l	0.1	n/a	0.12	1	1
Aliphatic Hydrocarbons	>C_5-C_6	µg/l	15000	n/a	<1.0	1	0
	>C_6-C_8	µg/l	15000	n/a	<1.0	1	0
	>C_8-C_{10}	µg/l	300	n/a	<5.0	1	0
	>C_{10}-C_{12}	µg/l	300	n/a	<5.0	1	0
	>C_{12}-C_{16}	µg/l	300	n/a	<5.0	1	0
	>C_{16}-C_{21}	µg/l	300	n/a	<5.0	1	0
	>C_{21}-C_{35}	µg/l	300	n/a	138	1	0
Aromatic Hydrocarbons	>C_5-C_7	µg/l	10	n/a	<1.0	1	0
	>C_7-C_8	µg/l	700	n/a	<1.0	1	0
	>C_8-C_{10}	µg/l	300	n/a	<5.0	1	0
	>C_{10}-C_{12}	µg/l	100	n/a	<5.0	1	0
	>C_{12}-C_{16}	µg/l	100	n/a	<5.0	1	0
	>C_{16}-C_{21}	µg/l	90	n/a	<5.0	1	0
	>C_{21}-C_{35}	µg/l	90	n/a	98.5	1	1
				n/a			
Phenol		µg/l	0.5	n/a	<1.0	1	0
2-Chlorophenol		µg/l	1	n/a	<1.0	1	0
2,4-Dichlorophenol		µg/l	1	n/a	<1.0	1	0
Hexachloro-1,3-butadiene		µg/l	0.6	n/a	<1.0	1	0
2,4,6-Trichlorophenol		µg/l	1	n/a	<1.0	1	0
2,4,5-Trichlorophenol		µg/l	1	n/a	<1.0	1	0
2,3,5,6-Tetrachlorophenol		µg/l	0.5	n/a	<1.0	1	0
2,3,4,6-Tetrachlorophenol		µg/l	0.5	n/a	<1.0	1	0
Hexachlorobenzene		µg/l	0.1	n/a	<1.0	1	0
MTBE		µg/l	15	n/a	<1.0	1	0
Benzene		µg/l	1	n/a	<1.0	1	0
Toluene		µg/l	50	n/a	<1.0	1	0
Ethylbenzene		µg/l	20	n/a	<1.0	1	0
m-xylene		µg/l	30	n/a	<1.0	1	0
p-xylene		µg/l	30	n/a	<1.0	1	0
o-xylene		µg/l	30	n/a	<1.0	1	0
Chloroform		µg/l	100	n/a	<1.0	1	0
Tetrachloromethane		µg/l	3	n/a	<1.0	1	0
1,1,1-Trichloroethane*		µg/l	2000	n/a	<1.0	1	0
Trichloroethylene		µg/l	10	n/a	<1.0	1	0
1,1,1,2-Tetrachloroethane		µg/l	0.2	n/a	<1.0	1	0
1,1,2,2-Tetrachloroetha		µg/l	0.2	n/a	<1.0	1	0
Chlorobenzene		µg/l	300	n/a	<1.0	1	0
Bromodichloromethane		µg/l	100	n/a	<1.0	1	0
1,2-Dichloroethane		µg/l	3	n/a	<1.0	1	0
Dibromochloromethane		µg/l	100	n/a	<1.0	1	0
1,3-Dichlorobenzene		µg/l	3	n/a	<1.0	1	0
Hexachlorobutadiene		µg/l	0.6	n/a	<1.0	1	0
1,2,3-Trichlorobenzene		µg/l	1.2	n/a	<1.0	1	0
1,2,4-Trichlorobenzene		µg/l	1.2	n/a	<1.0	1	0
1,4-Dichlorobenzene		µg/l	300	n/a	<1.0	1	0
1,2-Dichlorobenzene		µg/l	1000	n/a	<1.0	1	0
Bromoform		µg/l	100	n/a	<1.0	1	0
PCB28		µg/l		n/a	<1.0	1	
PCB52		µg/l		n/a	<1.0	1	
PCB101		µg/l		n/a	<1.0	1	
PCB118		µg/l		n/a	<1.0	1	
PCB153		µg/l		n/a	<1.0	1	
PCB138		µg/l		n/a	<1.0	1	
PCB180		µg/l		n/a	<1.0	1	
PCB (7 Congeners)		µg/l		n/a	<1.0	1	

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UKAS TESTING 2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-02961
Issue:	1
Date of Issue:	22/07/2015
Contact:	Peter George
Customer Details:	GO Contaminated Land Solutions Ltd 4 De Frene Road Sydenham London
Quotation No:	Q14-00029
Order No:	0684
Customer Reference:	0684
Date Received:	20/07/2015
Date Approved:	22/07/2015
Details:	Priory Road, Hornsey
Approved by:	

Naomi Williams, Customer services officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

ELAB

Sample Summary

Report No.: 15-02961

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
34208	S2 0.00 - 0.60	17/07/2015	20/07/2015	Clayey loam	
34209	S3 0.00 - 0.60	17/07/2015	20/07/2015	Clayey loam	
34210	BH1 0.00 - 0.60	17/07/2015	20/07/2015	Clayey loam	

ELAB
UKAS TESTING
2683

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 15-02961

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
34208	0.00 - 0.60	S2	Clayey loam	Chrysotile
34209	0.00 - 0.60	S3	Clayey loam	No asbestos detected
34210	0.00 - 0.60	BH1	Clayey loam	Chrysotile

ELAB

UKAS TESTING
2683

Method Summary

Report No.: 15-02961

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Asbestos identification	U	As submitted sample	22/07/2015	PMAN	Microscopy

2683

Report Information

Report No.: 15-02961

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

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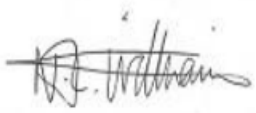
UKAS TESTING 2683

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	15-03379
Issue:	1
Date of Issue:	24/08/2015
Contact:	Peter George
Customer Details:	GO Contaminated Land Solutions Ltd 4 De Frene Road Sydenham London
Quotation No:	Q14-00029
Order No:	0684
Customer Reference:	0684
Date Received:	17/08/2015
Date Approved:	24/08/2015
Details:	Priory Road, Hornsey
Approved by:	

Naomi Williams, Customer services officer

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

ELAB

Sample Summary

Report No.: 15-03379

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
36945	BH1 1.47	14/08/2015	17/08/2015		

ELAB

UKAS TESTING 2683

Results Summary

Report No.: 15-03379

ELAB Reference	36945
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	BH1
Sample Depth (m)	1.47
Sampling Date	14/08/2015

Determinand	Codes	Units	LOD	
Dissolved Metals				
Arsenic	U	ug/l	5	< 5
Cadmium	U	ug/l	1	< 1
Chromium	U	ug/l	5	< 5
Copper	U	ug/l	5	< 5
Mercury	U	ug/l	0.1	< 0.1
Nickel	U	ug/l	5	12
Lead	U	ug/l	1	< 1
Selenium	U	ug/l	5	< 5
Zinc	U	ug/l	5	36
Inorganics				
Hexavalent Chromium	U	ug/l	100	< 100
Miscellaneous				
pH	U	units	0.1	6.6
Phenols				
Phenol	N	ug/l	1	< 1
M,P-Cresol	N	ug/l	1	< 1
O-Cresol	N	ug/l	1	< 1
3,4-Dimethylphenol	N	ug/l	1	< 1
2,3-Dimethylphenol	N	ug/l	1	< 1
Trimethylphenol	N	ug/l	1	< 1
Total Monohydric Phenols	N	ug/l	1	< 1
Polyaromatic hydrocarbons				
Naphthalene GCMS	N	ug/l	0.01	0.11
Acenaphthylene GCMS	N	ug/l	0.01	0.20
Acenaphthene GCMS	N	ug/l	0.01	0.08
Fluorene GCMS	N	ug/l	0.01	0.10
Phenanthrene GCMS	N	ug/l	0.01	1.23
Anthracene GCMS	N	ug/l	0.01	0.40
Fluoranthene GCMS	N	ug/l	0.01	2.44
Pyrene GCMS	N	ug/l	0.01	2.05
Benzo (a) anthracene GCMS	N	ug/l	0.01	1.03
Chrysene GCMS	N	ug/l	0.01	1.18
Benzo (b) fluoranthene GCMS	N	ug/l	0.01	1.32
Benzo (k) fluoranthene GCMS	N	ug/l	0.01	0.73
Benzo (a) pyrene GCMS	N	ug/l	0.01	1.19
Indeno (1,2,3-cd) pyrene GCMS	N	ug/l	0.01	0.64
Dibenzo(a,h)anthracene GCMS	N	ug/l	0.01	0.12
Benzo(ghi)perylene GCMS	N	ug/l	0.01	0.92
Total PAH(16) GCMS	N	ug/l	0.01	13.8
TPH CWG				
>C5-C6 Aliphatic	N	ug/L	1	< 1.0
>C6-C8 Aliphatic	N	ug/L	1	< 1.0
>C8-C10 Aliphatic	N	ug/l	5	< 5.0
>C10-C12 Aliphatic	N	ug/l	5	< 5.0
>C12-C16 Aliphatic	N	ug/l	5	< 5.0
>C16-C21 Aliphatic	N	ug/l	5	< 5.0
>C21-C35 Aliphatic	N	ug/l	5	138
>C35-C40 Aliphatic	N	ug/l	5	< 5.0
Total (>C5-C40) Aliphatic	N	ug/l	5	138
>C5-C7 Aromatic	N	ug/L	1	< 1.0
>C7-C8 Aromatic	N	ug/L	1	< 1.0

Tests marked N are not UKAS accredited.

The Environmental Laboratory Ltd. Reg. No. 3882193

ELAB

UKAS TESTING 2683

Results Summary

Report No.: 15-03379

ELAB Reference	36945
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	BH1
Sample Depth (m)	1.47
Sampling Date	14/08/2015

Determinand	Codes	Units	LOD	
>C8-C10 Aromatic	N	ug/l	5	< 5.0
>C10-C12 Aromatic	N	ug/l	5	< 5.0
>C12-C16 Aromatic	N	ug/l	5	< 5.0
>C16-C21 Aromatic	N	ug/l	5	< 5.0
>C21-C35 Aromatic	N	ug/l	5	98.5
>C35-C40 Aromatic	N	ug/l	5	< 5.0
Total (>C5-C40) Aromatic	N	ug/l	5	98.5
Total (>C5-C40) Ali/Aro	N	ug/l	5	237
PCB (ICES 7 congeners)				
PCB 28	N	ug/l	0.1	< 0.1
PCB 52	N	ug/l	0.1	< 0.1
PCB 101	N	ug/l	0.1	< 0.1
PCB118	N	ug/l	0.1	< 0.1
PCB 153	N	ug/l	0.1	< 0.1
PCB 138	N	ug/l	0.1	< 0.1
PCB 180	N	ug/l	0.1	< 0.1
PCB (7 Congeners)	N	ug/l	0.1	< 0.1

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The Environmental Laboratory Ltd. Reg. No. 3882193

ELAB

UKAS TESTING 2683

Results Summary

Report No.: 15-03379

ELAB Reference	36945
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	BH1
Sample Depth (m)	1.47
Sampling Date	14/08/2015

Determinand	Codes	Units	LOD	
VOC				
MTBE	U	ug/l	1	< 1
Heptane	N	ug/l	1	< 1
Octane	N	ug/l	1	< 1
Nonane	N	ug/l	1	< 1
Benzene	U	ug/l	1	< 1
Toluene	U	ug/l	1	< 1
Ethylbenzene	U	ug/l	1	< 1
m+p-xylene	U	ug/l	1	< 1
o-xylene	U	ug/l	1	< 1
cis-1,2-dichloroethene	U	ug/l	1	< 1
1,1-Dichloroethane	U	ug/l	1	< 1
Chloroform	U	ug/l	1	< 1
Tetrachloromethane	U	ug/l	1	< 1
1,1,1-Trichloroethane	U	ug/l	1	< 1
Trichloroethylene	N	ug/l	1	< 1
Tetrachloroethylene	U	ug/l	1	< 1
1,1,1,2-Tetrachloroethane	U	ug/l	1	< 1
1,1,2,2-Tetrachloroetha	N	ug/l	1	< 1
Chlorobenzene	U	ug/l	1	< 1
Bromobenzene	U	ug/l	1	< 1
Bromodichloromethane	U	ug/l	1	< 1
Methylethylbenzene	U	ug/l	1	< 1
1,1-Dichloro-1-propene	U	ug/l	1	< 1
Trans - 1-2 -dichloroethylene	U	ug/l	1	< 1
2,2-Dichloropropane	N	ug/l	1	< 1
Bromochloromethane	N	ug/l	1	< 1
1,2-Dichloroethane	U	ug/l	1	< 1
Dibromomethane	U	ug/l	1	< 1
1,2-Dichloropropane	U	ug/l	1	< 1
cis-1,3-Dichloro-1-propene	U	ug/l	1	< 1
trans-1,3-Dichloro-1-propene	U	ug/l	1	< 1
1,1,2-Trichloroethane	U	ug/l	1	< 1
Dibromochloromethane	U	ug/l	1	< 1
1,3-Dichloropropane	U	ug/l	1	< 1
Dibromoethane	U	ug/l	1	< 1
Styrene	U	ug/l	1	< 1
Propylbenzene	U	ug/l	1	< 1
2-Chlorotoluene	U	ug/l	1	< 1
1,2,4-Trimethylbenzene	U	ug/l	1	< 1
4-Chlorotoluene	U	ug/l	1	< 1
t-butylbenzene	U	ug/l	1	< 1
1,3,5-Trimethylbenzene	U	ug/l	1	< 1
1-methylpropylbenzene	U	ug/l	1	< 1
o-cymene	U	ug/l	1	< 1
1,3-Dichlorobenzene	U	ug/l	1	< 1
Butylbenzene	U	ug/l	1	< 1
1,2-Dibromo-3-chloropropane	U	ug/l	1	< 1
Hexachlorobutadiene	U	ug/l	1	< 1
1,2,3-Trichlorobenzene	U	ug/l	1	< 1
Naphthalene	U	ug/l	1	< 1
1,2,4-Trichlorobenzene	U	ug/l	1	< 1
1,4-Dichlorobenzene	U	ug/l	1	< 1
1,2-Dichlorobenzene	U	ug/l	1	< 1

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The Environmental Laboratory Ltd. Reg. No. 3882193

ELAB

UKAS TESTING 2683

Results Summary

Report No.: 15-03379

ELAB Reference	36945
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	BH1
Sample Depth (m)	1.47
Sampling Date	14/08/2015

Determinand	Codes	Units	LOD	
VOC				
Bromoform	U	ug/l	1	< 1

Tests marked N are not UKAS accredited.
The Environmental Laboratory Ltd. Reg. No. 3882193

ELAB

UKAS TESTING 2683

Results Summary

Report No.: 15-03379

ELAB Reference	36945
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	BH1
Sample Depth (m)	1.47
Sampling Date	14/08/2015

Determinand	Codes	Units	LOD	
SVOC				
Phenol	N	ug/l	1	< 1.00
Aniline	N	ug/l	1	< 1.00
Bis(2-chloroethyl)ether	N	ug/l	1	< 1.00
2-Chlorophenol	N	ug/l	1	< 1.00
1,3-Dichlorobenzene	N	ug/l	1	< 1.00
1,4-Dichlorobenzene	N	ug/l	1	< 1.00
Benzyl Alcohol	N	ug/l	1	< 1.00
1,2-Dichlorobenzene	N	ug/l	1	< 1.00
2-Methylphenol	N	ug/l	1	< 1.00
Bis(2-chloroisopropyl)ether	N	ug/l	1	< 1.00
3 and 4-methylphenol	N	ug/l	1	< 1.00
N-Nitrosodi-n-propylamine	N	ug/l	1	< 1.00
Hexachloroethane	N	ug/l	1	< 1.00
Nitrobenzene	N	ug/l	1	< 1.00
Isophorone	N	ug/l	1	< 1.00
2-Nitrophenol	N	ug/l	1	< 1.00
2,4-Dimethylphenol	N	ug/l	1	< 1.00
Bis(2-chloroethoxy)methane	N	ug/l	1	< 1.00
2,4-Dichlorophenol	N	ug/l	1	< 1.00
1,3,5-Trichlorobenzene	N	ug/l	1	< 1.00
Naphthalene	N	ug/l	0.01	0.10
3-Chloroaniline	N	ug/l	1	< 1.00
Hexachloro-1,3-butadiene	N	ug/l	1	< 1.00
4-Chloro-3-methylphenol	N	ug/l	1	< 1.00
2-Methynaphthalene	N	ug/l	1	< 1.00
1-Methylnaphthalene	N	ug/l	1	< 1.00
Hexachlorocyclopentadiene	N	ug/l	1	< 1.00
2,4,6-Trichlorophenol	N	ug/l	1	< 1.00
2,4,5-Trichlorophenol	N	ug/l	1	< 1.00
1-Chloronaphthalene	N	ug/l	1	< 1.00
2-Nitroaniline	N	ug/l	1	< 1.00
1,4-Dinitrobenzene	N	ug/l	1	< 1.00
Dimethyl phthalate	N	ug/l	1	< 1.00
1-3-dinitrobenzene	N	ug/l	1	< 1.00
2-6-dinitrotoluene	N	ug/l	1	< 1.00
Acenaphthylene	N	ug/l	0.01	0.17
1,2-Dinitrobenzene	N	ug/l	1	< 1.00
3-Nitroaniline	N	ug/l	1	< 1.00
Acenaphthene	N	ug/l	0.01	0.06
4-nitrophenol	N	ug/l	1	< 1.00
Dibenzofuran	N	ug/l	1	< 1.00
2,3,5,6-Tetrachlorophenol	N	ug/l	1	< 1.00
2,3,4,6-Tetrachlorophenol	N	ug/l	1	< 1.00
Diethyl phthalate	N	ug/l	1	< 1.00
1-chloro-4-phenoxybenzene	N	ug/l	1	< 1.00
Fluorene	N	ug/l	0.01	0.07
4-Nitroaniline	N	ug/l	1	< 1.00
Dinitro-o-cresol	N	ug/l	1	< 1.00
Diphenylamine	N	ug/l	1	< 1.00
Azobenzene	N	ug/l	1	< 1.00
1-bromo-4-phenoxybenzene	N	ug/l	1	< 1.00
Hexachlorobenzene	N	ug/l	1	< 1.00
Pentachlorophenol	N	ug/l	1	< 1.00

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The Environmental Laboratory Ltd. Reg. No. 3882193

ELAB

UKAS TESTING 2683

Results Summary

Report No.: 15-03379

ELAB Reference	36945
Customer Reference	
Sample ID	
Sample Type	WATER
Sample Location	BH1
Sample Depth (m)	1.47
Sampling Date	14/08/2015

Determinand	Codes	Units	LOD	
SVOC				
Phenanthrene	N	ug/l	0.01	0.94
Anthracene	N	ug/l	0.01	0.29
Carbazole	N	ug/l	1	< 1.00
Dibutyl phthalate	N	ug/l	1	< 1.00
Fluoranthene	N	ug/l	0.01	2.01
Pyrene	N	ug/l	0.01	1.69
Butyl benzyl phthalate	N	ug/l	1	< 1.00
Bis-2-ethylhexyladipate	N	ug/l	1	< 1.00
Butyl benzyl phthalate	N	ug/l	1	< 1.00
Benzo(a)anthracene	N	ug/l	0.01	0.94
Chrysene	N	ug/l	0.01	0.82
Bis(2-ethylhexyl)phthalate	N	ug/l	1	< 1.00
Benzo(b)fluoranthene	N	ug/l	0.01	0.84
Benzo(k)fluoranthene	N	ug/l	0.01	0.62
Benzo(a)pyrene	N	ug/l	0.01	0.74
Indeno(1,2,3-CD)pyrene	N	ug/l	0.01	0.51
Dibenz(ah)anthracene	N	ug/l	0.01	0.09
Benzo(ghi)perylene	N	ug/l	0.01	0.63

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UKAS TESTING 2683

Method Summary

Report No.: 15-03379

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Water					
Aliphatic/Aromatic hydrocarbons in water	N		24/08/2015		GC-FID
Aromatic hydrocarbons in water	N		24/08/2015		GC-FID
Phenols in waters	N		19/08/2015		HPLC
Dissolved metals by ICP in waters	U		19/08/2015	101	ICPMS
pH of waters	U		18/08/2015	113	Electromeric
Chromium Hexavalent in waters	U		24/08/2015	123	Colorimetry
PAHs and/or PCBs in waters	N		21/08/2015	135	GC-MS
SVOC in waters	N		21/08/2015	167	GC-MS
PAHs and/or PCBs in waters	N		21/08/2015	170	GC-MS
VOC in waters	U		18/08/2015	200	GC-MS
Aliphatic hydrocarbons in water	N		21/08/2015	215	GC-FID
Aromatic hydrocarbons in water	N		21/08/2015	215	GC-FID
Low range Aliphatic hydrocarbons water	N		21/08/2015	215	GC-MS
Low range Aromatic hydrocarbons water	N		21/08/2015	215	GC-MS

Tests marked N are not UKAS accredited

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Report Information

Report No.: 15-03379

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

Appendix D – Verification Test Results

Unit A2
Windmill Road
Ponswood Industrial Estate
St Leonards on Sea
East Sussex
TN38 9BY
Telephone: (01424) 718618
Facsimile: (01424) 729911
info@elab-uk.co.uk

UKAS TESTING 2683

mCERTS

THE ENVIRONMENTAL LABORATORY LTD

Analytical Report Number:	16-06731
Issue:	1
Date of Issue:	11/05/2016
Contact:	Peter George
Customer Details:	GO Contaminated Land Solutions Ltd 4 De Frene Road Sydenham London SE26 4AB
Quotation No:	Q14-00029
Order No:	Not Supplied
Customer Reference:	0684
Date Received:	06/05/2016
Date Approved:	11/05/2016
Details:	Priory Road, Hornsey
Approved by:	

John Wilson, Operations Manager

Any comments, opinions or interpretations expressed herein are outside the scope of UKAS accreditation (Accreditation Number 2683

ELAB

Sample Summary

Report No.: 16-06731

Elab No.	Client's Ref.	Date Sampled	Date Scheduled	Description	Deviations
61557	TP1 0.15 - 0.35	04/05/2016	06/05/2016	Silty loam	
61558	TP2 0.05 - 0.20	04/05/2016	06/05/2016	Silty loam	
61559	TP2 0.20 - 0.30	04/05/2016	06/05/2016	Sandy clayey loam	
61560	TP3 0.15 - 0.35	04/05/2016	06/05/2016	Silty loam	

ELAB UKAS TESTING 2683 mCERTS

Results Summary

Report No.: 16-06731

			ELAB Reference	61557	61558	61559	61560
			Customer Reference				
			Sample ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP1	TP2	TP2	TP3
			Sample Depth (m)	0.15 - 0.35	0.05 - 0.20	0.20 - 0.30	0.15 - 0.35
			Sampling Date	04/05/2016	04/05/2016	04/05/2016	04/05/2016
Determinand	**Codes**	**Units**	**LOD**				
Metals							
Arsenic	M	mg/kg	1	6.8	6.7	17.1	7.9
Cadmium	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	M	mg/kg	5	27.9	27.8	66.0	28.2
Copper	M	mg/kg	5	11.8	12.1	51.7	16.1
Lead	M	mg/kg	5	24.6	26.1	200	33.2
Mercury	M	mg/kg	0.5	< 0.5	< 0.5	< 0.5	< 0.5
Nickel	M	mg/kg	5	9.4	9.6	47.6	10.2
Selenium	M	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Zinc	M	mg/kg	5	51.4	56.2	188	63.6
Inorganics							
Free Cyanide	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
Hexavalent Chromium	N	mg/kg	0.8	< 0.8	< 0.8	< 0.8	< 0.8
Miscellaneous							
Moisture Content	N	%	0.1	21.0	28.5	27.9	23.7
pH	M	pH units	0.1	8.0	8.0	10.2	7.8
Soil Organic Matter	U	%	0.1	5.7	3.9	0.9	5.7
Stones Content	N	%	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenols							
Total Monohydric Phenols	N	mg/kg	5	< 5	< 5	< 5	< 5
Polyaromatic hydrocarbons							
Naphthalene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Acenaphthene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluorene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Phenanthrene	M	mg/kg	0.1	< 0.1	0.1	0.2	< 0.1
Anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Fluoranthene	M	mg/kg	0.1	0.6	0.5	0.3	0.4
Pyrene	M	mg/kg	0.1	0.2	< 0.1	0.2	0.1
Benzo(a)anthracene	M	mg/kg	0.1	0.3	0.5	0.1	0.2
Chrysene	M	mg/kg	0.1	0.2	0.2	0.2	0.2
Benzo (b) fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.1	< 0.1
Benzo(k)fluoranthene	M	mg/kg	0.1	< 0.1	< 0.1	0.2	< 0.1
Benzo (a) pyrene	M	mg/kg	0.1	0.2	0.2	0.1	0.2
Indeno (1,2,3-cd) pyrene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Dibenzo(a,h)anthracene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Benzo[g,h,i]perylene	M	mg/kg	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Total PAH(16)	M	mg/kg	0.4	1.5	1.7	1.5	1.3

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The Environmental Laboratory Ltd. Reg. No. 3882193

ELAB

UKAS TESTING 2683

MCERTS

Results Summary

Report No.: 16-06731

			ELAB Reference	61557	61558	61559	61560
			Customer Reference				
			Sample ID				
			Sample Type	SOIL	SOIL	SOIL	SOIL
			Sample Location	TP1	TP2	TP2	TP3
			Sample Depth (m)	0.15 - 0.35	0.05 - 0.20	0.20 - 0.30	0.15 - 0.35
			Sampling Date	04/05/2016	04/05/2016	04/05/2016	04/05/2016
Determinand	**Codes**	**Units**	**LOD**				
TPH CWG							
>C5-C6 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C6-C8 Aliphatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	5.9	< 1.0
>C21-C35 Aliphatic	N	mg/kg	1	11.3	6.6	5.0	12.2
>C35-C40 Aliphatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C5-C7 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C7-C8 Aromatic	N	mg/kg	0.01	< 0.01	< 0.01	< 0.01	< 0.01
>C8-C10 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C10-C12 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C12-C16 Aromatic	N	mg/kg	1	< 1.0	< 1.0	< 1.0	< 1.0
>C16-C21 Aromatic	N	mg/kg	1	< 1.0	< 1.0	2.8	< 1.0
>C21-C35 Aromatic	N	mg/kg	1	12.5	4.3	3.4	8.1
>C35-C40 Aromatic	N	mg/kg	1	1.8	< 1.0	< 1.0	< 1.0
Total (>C5-C40) Ali/Aro	N	mg/kg	1	25.5	11.0	17.0	20.3

Tests marked N are not UKAS accredited.
The Environmental Laboratory Ltd. Reg. No. 3882193

2683

Unit A2, Windmill Road, Ponswood Industrial Estate, St Leonards on Sea, East Sussex, TN38 9BY
Tel: +44 (0)1424 718618, Email: info@elab-uk.co.uk, Web: www.elab-uk.co.uk

Results Summary

Report No.: 16-06731

Asbestos Qualitative Results

Analytical result only applies to the sample as submitted by the client. Any comments, opinions or interpretations (marked #) in this report are outside UKAS accreditation (Accreditation No2683). They are subjective comments only which must be verified by the client.

Elab No	Depth (m)	Clients Reference	Description of Sample Matrix #	Result
61557	0.15 - 0.35	TP1	Silty loam	No asbestos detected
61558	0.05 - 0.20	TP2	Silty loam	No asbestos detected
61559	0.20 - 0.30	TP2	Sandy clayey loam	No asbestos detected
61560	0.15 - 0.35	TP3	Silty loam	No asbestos detected

ELAB UKAS TESTING 2683 MCERTS

Method Summary

Report No.: 16-06731

Parameter	Codes	Analysis Undertaken On	Date Tested	Method Number	Technique
Soil					
Free cyanide	N	As submitted sample	09/05/2016	107	Colorimetry
Hexavalent chromium	N	As submitted sample	09/05/2016	110	Colorimetry
pH	M	Air dried sample	10/05/2016	113	Electromeric
Aqua regia extractable metals	M	Air dried sample	10/05/2016	118	ICPMS
Phenols in solids	M	As submitted sample	09/05/2016	121	HPLC
PAH (GC-FID)	M	As submitted sample	09/05/2016	133	GC-FID
Aliphatic hydrocarbons in soil	N	As submitted sample	09/05/2016	214	GC-FID
Aliphatic/Aromatic hydrocarbons in soil	N	As submitted sample	11/05/2016	214	GC-FID
Aromatic hydrocarbons in soil	N	As submitted sample	09/05/2016	214	GC-FID
Low range Aliphatic hydrocarbons soil	N	As submitted sample	09/05/2016	214	GC-MS
Low range Aromatic hydrocarbons soil	N	As submitted sample	09/05/2016	214	GC-MS
Soil organic matter	U	Air dried sample	10/05/2016	BS1377:P3	Titrimetry
Asbestos identification	U	As submitted sample	09/05/2016	PMAN	Microscopy

Tests marked N are not UKAS accredited

ELAB UKAS TESTING 2683 MCERTS

Report Information

Report No.: 16-06731

Key

U	hold UKAS accreditation
M	hold MCERTS and UKAS accreditation
N	do not currently hold UKAS accreditation
^	MCERTS accreditation not applicable for sample matrix
*	UKAS accreditation not applicable for sample matrix
S	Subcontracted to approved laboratory UKAS Accredited for the test
SM	Subcontracted to approved laboratory MCERTS/UKAS Accredited for the test
I/S	Insufficient Sample
U/S	Unsuitable sample
n/t	Not tested
<	means "less than"
>	means "greater than"

Soil sample results are expressed on an air dried basis
Comments or interpretations are beyond the scope of UKAS accreditation
The results relate only to the items tested
PCB congener results may include any coeluting PCBs
Uncertainty of measurement for the determinands tested are available upon request

Deviation Codes

a	No date of sampling supplied
b	No time of sampling supplied (Waters Only)
c	Sample not received in appropriate containers
d	Sample not received in cooled condition
e	The container has been incorrectly filled
f	Sample age exceeds stability time (sampling to receipt)
g	Sample age exceeds stability time (sampling to analysis)

Where a sample has a deviation code, the applicable test result may be invalid.

Sample Retention and Disposal

All soil samples will be retained for a period of one month
All water samples will be retained for 7 days following the date of the test report
Charges may apply to extended sample storage

Appendix E – Photographs of Remediation



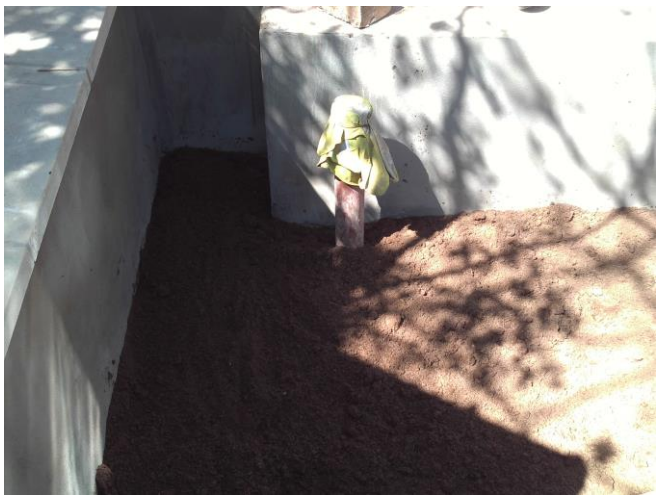


Communal area, property frontage.





Communal area, rear of property.





Rear private garden





Rear private garden and communal area beyond

Appendix F – Photographs of Verification Pits

VERIFICATION PIT 1







VERIFICATION PIT 2





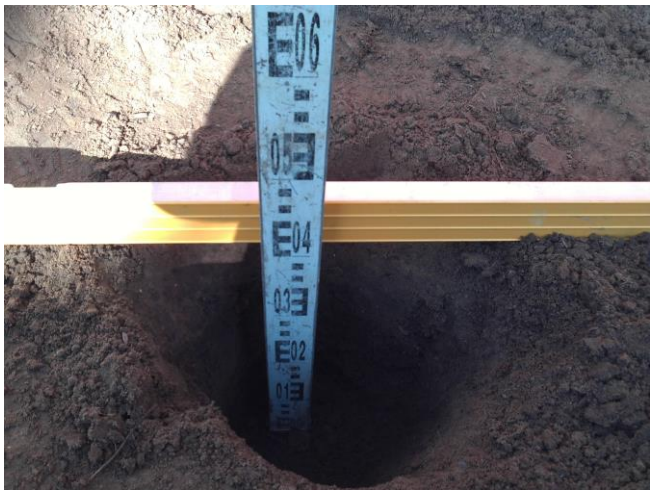
VERIFICATION PIT 2



VERIFICATION PIT 3







Appendix G – Duty of Care Documentation

Topsoil Analysis Report

Soil & Land Consultants

Freeland Horticulture Ltd
Rosedale Nursery
College Road
Hextable
Kent
BR8 7LT

Attention: Philippa Lambourne

Our Ref: SLC-13-AN-00404-SA

21 December 2015

Dear Philippa

Topsoil Analysis Report : Rainham Topsoil – December 2015

We have completed the analysis of the topsoil sample recently taken from the above site and have the pleasure of reporting our findings. The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes.

SOIL SAMPLING & EXAMINATION

At the time of our sampling visit the topsoil was stored in a stockpile. A series of 10 hand augered trial holes were constructed across the stockpile for the purpose of soil examination and sample collection. As the soil examination confirmed a consistent topsoil composition, the ten samples were combined together to form one composite sample for analysis purposes. The soil was described as a dark brown, slightly moist, friable sandy loam with a well developed, fine to medium granular structure. The soil contained some small stones (rounded flint) and no deleterious materials (eg. building waste materials, glass, roots or rhizomes of pernicious weeds) or unusual odours (eg. hydrocarbons) were recorded.

LABORATORY ANALYSIS

The topsoil sample was submitted to a UKAS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil. The following parameters were determined:

- pH & electrical conductivity values;
- major plant nutrients (N, P, K, Mg) & organic matter content;
- particle size distribution and stone content;
- heavy metals & potentially toxic elements (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- sulphate, sulphur, sulphide;
- total cyanide and total (mono) phenols;
- speciated PAHs (US EPA16);
- banded aromatic and aliphatic petroleum hydrocarbons (C_5-C_{35}).

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below.

Freeland Horticulture - 01322619161

Phone: 01322665669 Fax: 01322619190 Email: enquiries@soil-land.com

Soil & Land Consultants Ltd. Registered in England: Coppards Land, Northiam, East Sussex TN31 6QP
Company Registration No: 4293320

COMMENTS

pH & Electrical Conductivity (salinity) Values

The sample was slightly alkaline in nature (pH 8.5) with a pH value that would be considered suitable for general landscaping purposes.

The electrical conductivity value using the soil:water extract was moderate (816µS/cm) indicating that soluble salts are not present at levels that would be harmful to plants.

Organic Matter & Nutrient Status

The sample was rich in organic matter and all major plant nutrients. No further additions of compost or

In some cases, high potassium levels could be associated with saline soils that could inhibit healthy plant development. However, this topsoil was shown by the electrical conductivity test not to be excessively saline. Therefore, we would not anticipate that the high potassium levels found here will be problematic in any way.

Particle Size Distribution & Stone Content

The sample contained 77% sand and fell into the *sandy loam* texture class. This particle size distribution is considered suitable for a broad range of landscape applications, including tree and shrub planting, turfing and seeding.

The sample was free from stones of 20 mm and upwards in diameter and contained a slight fraction (5.0%) of smaller stones. As such, stones will not restrict the use of the soil for the majority of landscaping purposes.

Freeland Horticulture - 01322619161

Potential Contaminants

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil so the following comments are based on the Soil Guideline Values (SGVs) for residential end-use presented in the Contaminated Land Exposure Assessment (CLEA) Model (EA/DEFRA:2002). The SGVs currently only consider a limited range of parameters so where a potential contaminant is not covered by the CLEA Model other relevant schedules for contamination assessment, such as the Dutch Guidelines, and professional judgement have been used.

Of the potential contaminants determined, none was found at levels that would indicate significant contamination.

CONCLUSION

The purpose of the analysis was to determine the suitability of the topsoil for general landscaping purposes. From the soil examination and laboratory analysis, the soil is described as an alkaline, non-saline, sandy loam. The organic matter and nutrient levels are acceptable and no significant contamination was found with respect to the parameters determined. The high level of potassium determined does not indicate salinity and therefore will not adversely affect the performance of the soil in any way. This soil would adhere to all other aspects of the current BS3882 specification for 'multipurpose grade'.

To conclude, based on our findings, the topsoil would be considered well-suited to general landscaping purposes provided the physical condition of the soil is maintained.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

Freeland Horticulture - 01372 461161

SLC Soil & Land Consultants

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Rainham, Essex
Month/Year	December 15
Our Ref	SLC-15-AN-0410-SA
Date	21 December 2015

		Composite sample
pH Value & Salinity		
pH value (1:2.5 soil/water ext)	units	8.5
Electrical Conductivity (1:2.5 soil/water ext)	µS/cm	816
Organic Matter & Nutrient Status		
Organic Matter (LOI)	%	6.4
Organic Carbon (Derived)	%	3.7
Total Nitrogen	%	0.29
Carbon:Nitrogen Ratio	:1	13
Available Phosphorus	mg/l	71.4
Available Potassium	mg/l	1088
Available Magnesium	mg/l	195
Particle Size Analysis & Stones		
Clay (<0.002mm)	%	8
Silt (0.063-0.002mm)	%	13
Sand (2.0-0.063mm)	%	79
Texture Class	UK Class	LoamySand
Stones 2-20mm	% by DW	4.4
Stones 20-50mm	% by DW	0.6
Stones >50mm	% by DW	0.0
Potential Contaminants		
Total Arsenic (As)	mg/kg	6.1
Total Cadmium (Cd)	mg/kg	0.11
Total Chromium (Cr)	mg/kg	22.8
Hexavalent Chromium (CR^{VI})	mg/kg	<0.1
Total Copper (Cu)	mg/kg	15.9
Total Lead (Pb)	mg/kg	29.7
Total Mercury (Hg)	mg/kg	0.08
Total Nickel (Ni)	mg/kg	<10
Total Selenium (Se)	mg/kg	0.15
Total Zinc (Zn)	mg/kg	62.2
Total Beryllium (Be)	mg/kg	<1
Total Barium (Ba)	mg/kg	36.7
Total Vanadium (V)	mg/kg	21.3
Hot Water Soluble Boron (B)	mg/kg	1.7
Total Cyanide (CN)	mg/kg	<1
Elemental Sulphur (S)	mg/kg	<5
Easily Liberated Sulphide (S^{2-})	mg/kg	1.5
Water Soluble Sulphate (SO_4^{2-})	mg/l	77.7
Total Phenols Index	mg/kg	<1
Asbestos Screen	-	N.D.

Chain of Custody requires a Freeland Horticulture Delivery Ticket-01322 619161

Soil Land Consultants, Ltd, 96 High Street, Tunbridge Wells, Kent TN1 1YF. Phone: 01322 667076
Fax: 01322 619135 Email: enquiries@soil-land.com

SLC Soil & Land Consultants

Client	Freeland Horticulture Ltd
Job Name	Topsoil Analysis
Site	Rainham, Essex
Month/Year	December 15
Our Ref	SLC-15-AN-0410-SA
Date	21 December 2015

Polyaromatic Hydrocarbons

Naphthalene	mg/kg	<0.05
Acenaphthylene	mg/kg	<0.05
Acenaphthene	mg/kg	<0.05
Fluorene	mg/kg	<0.05
Phenanthrene	mg/kg	<0.1
Anthracene	mg/kg	<0.05
Fluoranthene	mg/kg	0.2
Pyrene	mg/kg	0.1
Benzo[a]anthracene	mg/kg	<0.1
Chrysene	mg/kg	0.1
Benzo[b]fluoranthene	mg/kg	<0.1
Benzo[k]fluoranthene	mg/kg	<0.1
Benzo[a]pyrene	mg/kg	<0.1
Indeno[1,2,3-cd]pyrene	mg/kg	<0.1
Dibenzo[a,h]anthracene	mg/kg	<0.1
Benzo[g,h,i]perylene	mg/kg	<0.1
Total PAHs sum US EPA 16	mg/kg	<1

Banded Petroleum Hydrocarbons

Aliphatic TPH >C_5-C_6	mg/kg	<0.2
Aliphatic TPH >C_6-C_8	mg/kg	<0.4
Aliphatic TPH >C_8-C_{10}	mg/kg	<4
Aliphatic TPH >C_{10}-C_{12}	mg/kg	<4
Aliphatic TPH >C_{12}-C_{16}	mg/kg	<4
Aliphatic TPH >C_{16}-C_{21}	mg/kg	<4
Aliphatic TPH >C_{21}-C_{35}	mg/kg	18.0
Aliphatic TPH >C_{35}-C_{44}	mg/kg	<1
Aromatic TPH >C_5-C_7	mg/kg	<0.02
Aromatic TPH >C_7-C_8	mg/kg	<0.02
Aromatic TPH >C_8-C_{10}	mg/kg	<0.02
Aromatic TPH >C_{10}-C_{12}	mg/kg	<4
Aromatic TPH >C_{12}-C_{16}	mg/kg	<4
Aromatic TPH >C_{16}-C_{21}	mg/kg	<4
Aromatic TPH >C_{21}-C_{35}	mg/kg	13.0
Aromatic TPH >C_{35}-C_{44}	mg/kg	<1
Total Petroleum Hydrocarbons (C_5-C_{44})	mg/kg	31.0

BTEX

Benzene	mg/kg	<0.02
Toluene	mg/kg	<0.2
Ethyl Benzene	mg/kg	<0.04
m- & p-Xylene	mg/kg	<0.2
o-Xylene	mg/kg	<0.1

Chain of Custody requires a Freeland Horticulture Delivery Ticket-01322 619161

Contaminated Disposal Tickets

Biffa

BIFFA WASTE SERVICES LIMITED
CORONATION ROAD, CRESSEX
HIGH WYCOMBE
BUCKS. HP12 3TZ
TELEPHONE : 01494 521221
FACSIMILE : 01494 463368
VAT No. 537 9116 27 Company Reg. No. 946107 Landfill Tax Reg. No. 01010102373000

SITE 833 REDHILL LANDFILL SITE
LIC. No. BU8126
LICENSING AUTHORITY Thames - South East
LICENCE HOLDER BIFFA WASTE SERVICES LTD

TICKET No. L712991
DATE 19/01/2016

CUSTOMER
TRANSFER NOTE No. -
LOAD REF. SA00749
ORDER REF. HAZARDOUS SOIL
SOURCE L160 Harrow

CUSTOMER SWAN CONTRACTORS LTD
CODE S49519*1*1
ADDRESS 53 LYNTON ROAD
HARROW
POSTCODE HA2 9NJ SIC 43.12
HAULIER P LEONARD T/A PJ LEONARD HAULA
CARRIER REG. No. CB/EM3781BM
REGISTRATION AUTHORITY NATIONAL
VEHICLE RX06HZE BULK ROAD VEHICLES
CONTAINER
C.U.M 14.00

WASTE DESCRIPTION
(HAZ SOIL) Hazardous Asbestos Cont Soi
1
CODE 170503
DESTINATION DIS DISPOSAL
CONTRACT 138662*1/1
EWC CODE 170503
PRE-TREATED NO
CONSIGNMENT CODE ORR080/10000
LANDFILL TAX EXEMPTION REF. No. Standard rate

DEPOSIT THIS LOAD AT WORKING AREA
PHASE 1 LIFT 1 CELL 7

	WEIGHT	DATE	TIME	TALLY No.
GROSS	28380 Kg	19/01/2016	08:40	B465826
TARE	15580 Kg	19/01/2016	09:19	A152440
NET	12800 Kg			
QTY. CHARGED	** 12.80 TONNE **			

THIS IS NOT A VAT INVOICE
NET COST **********
VAT @ ****% **********
TOTAL COST **********

BY SIGNING THIS WASTE TRANSFER NOTE THE HOLDER / CUSTOMER IS CONFIRMING THAT THEY HAVE FULFILLED THEIR DUTY TO APPLY THE W.F.D. WASTE HIERARCHY.

FOR BIFFA WASTE SERVICES
NAME CHRIS.SLINEY

DRIVERS SIGNATURE
FOR P LEONARD T/A PJ LEONARD HAULA
NAME JOHN NEVILLE

By signing above, I the driver / waste holder confirm that I have fulfilled my duty to apply the WFD Waste Hierarchy
Haulier's Registration expires today

THIS DOCUMENT IS A WASTE TRANSFER NOTE AS PROVIDED FOR BY ENVIRONMENTAL PROTECTION (DUTY OF CARE) REGULATIONS 1991. A TALLY RECORD OF THIS TRANSACTION IS AVAILABLE FOR 6 MONTHS.
WHERE WASTE MATERIALS ARE FOUND ON DISCHARGE TO BE INCONSISTENT WITH THE DESCRIPTION, BIFFA WASTE SERVICES RESERVE THE RIGHT TO RECOVER THE APPROPRIATE CHARGE AND ASSOCIATED TAX FROM THE CUSTOMER.
BIFFA WASTE SERVICES AS OPERATORS OF THE SITE ARE AUTHORISED BY THE HOLDER OF THE APPROPRIATE PERMIT TO ACCEPT WASTE FOR DISPOSAL.

Form HWCN01v111

The Hazardous Waste Regulations 2005: Consignment Note

Environment Agency

CARRIER'S COPY

PART A Notification details

1 Consignment note code: QRR0801/1

2 The waste described below is to be removed from (name, address, postcode, telephone, e-mail, facsimile): REAR OF 110-116 PRIORY ROAD N8 7HP

3 Premises code (where applicable): QRR080

4 The waste will be taken to (name, address and postcode): REDHILL LANDFILL SITE COMMONERS LANE RH1 4ER NUTFIELD NR REDHILL SURREY

5 The waste producer was (if different from 2) (name, address, postcode, telephone, e-mail, facsimile): SWAN CONTRACTORS 59 LYNTON ROAD HARROW HA2 9NJ

PART B Description of the waste

If continuation sheet used, tick here ☐

1 The process giving rise to the waste(s) was:

2 SIC for the process giving rise to the waste: 43.121

3 WASTE DETAILS (where more than one waste type is collected all of the information given below must be completed for each EWC identified)

Description of waste	List of wastes (EWC code)(6 digits)	Quantity (kg)	The chemical/biological components in the waste and their concentrations are: Component	Concentration (% or mg/kg)	Physical form (gas, liquid, solid, powder, sludge or mixed)	Hazard code(s)	Container type, number and size
CONTAMINATED SOIL	170503		ASBESTOS	MAX 0.3	SOLID	HP 7	16 TONNE LORRY

The information given below is to be completed for each EWC identified

EWC code	UN identification number(s)	Proper shipping name(s)	UN class(es)	Packing group(s)	Special handling requirements
170503					APPROPRIATE P.A.E

PART C Carrier's certificate

(If more than one carrier is used, please attach schedule for subsequent carriers. If schedule of carriers is attached tick here. ☐)

I certify that I today collected the consignment and that the details in A2, A4 and B3 are correct and I have been advised of any specific handling requirements.

Where this note comprises part of a multiple collection the round number and collection number are: /

1 Carrier name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile): R. LEONARD LTD. UNIT 8 STATION APPROACH GREENFORD MIDDX. UB6 0AL TEL: 02085753780

2 Carrier registration no./reason for exemption: WASTE CARRIERS LICENCE NO. GTL/372374

3 Vehicle registration no. (or mode of transport, if not road): RX 06 HZE

Signature

Date 19012016 Time

PART D Consignor's certificate

I certify that the information in A, B and C has been completed and is correct, that the carrier is registered or exempt and was advised of the appropriate precautionary measures. All of the waste is packaged and labelled correctly and the carrier has been advised of any special handling requirements.

I confirm that I have fulfilled my duty to apply the waste hierarchy as required by Regulation 12 of the Waste (England and Wales) Regulations 2011.

1 Consignor name:

On behalf of (name, address, postcode, telephone, e-mail, facsimile): SWAN CONTRACTORS LTD. 59 LYNTON ROAD HARROW HA2 9NJ

Signature

Date 19012016 Time

PART E Consignee's certificate (where more than one waste type is collected all of the information given below must be completed for each EWC)

Individual EWC code(s) received	Quantity of each EWC code received (kg)	EWC code accepted/rejected	Waste management operation (R or D code)
170503	12800	ALL	D5

1 I received this waste at the address given in A4 on: Date 19/01/16 Time 09:10

2 Vehicle registration no. (or mode of transport if not road): RX 06 HZE

3 Where waste is rejected please provide details:

I certify that waste permit/exempt waste operation number: BU8126TT

authorises the management of the waste described in B at the address given in A4.

Where the consignment forms part of a multiple collection, as identified in Part C, I certify that the total number of

Name: C SLATER

On behalf of (name, address, postcode, telephone, e-mail, facsimile):

364 REDHILL LANDFILL BIFFA WASTE SERVICES LTD B CONMONERS LANE REDHILL SURREY RH1 4ER

Signature

Date 19/01/16 Time 09:10

Contaminated Soil Invoice and Receipt

P.J LEONARD HAULAGE LTD

Units 41-43 Cumberland Business Park, Cumberland Avenue, Park Royal, London, NW10 7RT
Tel: 020 8575 3780 Fax: 020 8575 3350
Vat No: 899538931

BILL TO
SWAN CONTRACTORS
59 LYNTON ROAD
HARROW
MIDDLESEX
HA8 9NJ

INVOICE NOTE:	7250
DATE:	02/07/2015
Order No.	

DESCRIPTION	LOADS	UNIT PRICE	TOTAL
CONTAMINATED LOAD AWAY FROM ALEXANDRA PALACE, N.8	1	450.00	450.00

Subtotal	450.00
20.0%	90.00
BALANCE DUE	**540.00**

Terms: 30 DAYS NETT FROM DATE OF INVOICE
Please be advised any queries should be raised in written form within 14 days of Invoice date.

REMITTANCE

INVOICE:	7250
Order No.	
Date	01/07/2015
Amount Enclosed	£540.00

P.J L HAULAGE

Units 41-43
Cumberland
Business Park,
Cumberland
Avenue, Park Royal,
London, NW10 7RT

TEL 020 8575 3780
FAX 020 8575 3350
MOBILE 07770 505 443

CORY
environmental

Cory Environmental Limited Registered in England No. 00049722
Registered Office 2, Coldbath Square, London EC1R5HL
VAT Reg. No. 577 3648 93 LFT Reg. No. 01682 0175 43000
Tel 01785 251555 Fax 01785 251666

Mucking Landfill Facility
Mucking Wharf Rd
Stanford-le-Hope
Essex

TICKET : MU131892
DATE : 01/07/2015
TIME : 08:52
Incoming

Telephone / Fax : 01375 654 240/
Site Licence : BV3782IM

Tally	Date	Time	Weight	
215502	01/07/2015	08:55	28460kg	Gross Wt
140488	01/07/2015	09:10	15300kg	Tare Wt
			13160kg	NET Wt

Measure : 13.16 TONNES

Haulier : PJ Leonard Haulage Ltd
Carrier Reg. : GTL372374

Customer : PJ Leonard Haulage Ltd
(PJLEONAR) ICG House
Station Approach
Greenford

Vehicle Reg : RX06HZE
Vehicle Type : Rolonoff

DA Number : MK150048 Clean Soils for Restoration
EWC Code : 17 05 04

Origin : GREATE Greater London
Transfer No. : 20878
Order Number :
Comments :
Driver :

Weighbridge Operator :

SCOLE

A record of weights is retained for a period of Eight Years.

VAT is at the Standard Rate, Landfill Tax (LFT) is not recoverable as input VAT.
This transaction is subject to Cory Environmental Limited Conditions of Disposal copies of which were made available to the Customers Representative on arrival at the site.

By signing this document, the customer confirms that the waste as described has been subject to the waste hierarchy as required by Regulation 12 of the Waste (England & Wales) regulations 2011 and all other current / relevant guidance.

P. J. LEONARD HAULAGE LTD

Unit 41-43 Cumberland Business Park, Cumberland Avenue, Park Royal, London NW10 7RT
Tel: 020 8575 3780 · Fax: 020 8575 3350
Email: leonardhaulagep@aol.com

FORS

Duty of Care Conveyance/Waste Transfer Note

(FORM C Combined Weight and Volume) Environmental Protection Act, 1990 • Weights & Measures Act, 1985, Schedule 4, Paragraph 7

Waste Carrier No. GTL 372374

20877

PRODUCER i.e. Company Loading
FULL NAME: SWAN CONSTRUCTION

ADDRESS OF TRANSACTION POINT: ALEXANDRA PALACE

NAME & ADDRESS OF BROKER WHO ARRANGED THIS WASTE TRANSFER: (IF APPLICABLE)

DATE & TIME OF TRANSFER: 30.6.15

HAULIER
Waste Carrier No. if not P.J. LEONARD HAULAGE LTD:.....

VEHICLE REG.No: KX06 HZC ..... Time on Site: 15.30

DRIVER: D. MCLINTE ..... Time off Site: 16.40

SIC CODE:..... ORDER NO:.....

DESCRIPTION OF MATERIAL
CONTAMINATED MUK

✓	EWC
	17.05.04 Inert
	17.09.04 Mixed Construction
	Other .....

	Tonnes	KG
GROSS		
TARE		
NETT		

Quantity of Material:..... M³ or..... Tonnes

DISPOSAL FACILITY
1 SITE OPERATOR:

2 ADDRESS:

3 SITE LICENCE No:

4 ISSUED BY:

DISPOSAL SIGNATURE:..... PRINT NAME:.....

PRODUCER SIGNATURE:..... PRINT NAME:.....

N.B. To Customers, Authorised Agents, Representativesor Responsible Persons signing this Conveyance Note. This is in your interest. Please read this Conveyance Note carefully and inspect the material, agreeing quantity, quality and that everything is to your satisfaction before finally signing this receipt note. We regret we cannot under any circumstances entertain any claim concerning quantity, quality or anything else once the vehicle has left the site, and a clear signature has been given. Customers are also reminded that ordering vehicles of the public road is done entirely at their own risk. We cannot accept responsibility for damage caused by our vehicles whilst delivering to your site.

I, the driver agree to fulfil the terms of this Transfer Note.

..... Pink Copy - File Yellow Copy - Haulier

ASHFORD PRINT: 020 8866 3541 / 07508 721208

Appendix H – Imported Fill Material Criteria

1% SOM

Determinand		Unit	ATRISK Soil SSV
Arsenic		mg/kg	32
Cadmium		mg/kg	10
Copper		mg/kg	3970
Lead		mg/kg	200*
Mercury		mg/kg	170
Nickel		mg/kg	130
Selenium		mg/kg	350
Zinc		mg/kg	16900
Free Cyanide		mg/kg	34
Hexavalent Chromium		mg/kg	21*
pH Value		units	-
Naphthalene		mg/kg	0.585
Acenaphthylene		mg/kg	-
Acenaphthene		mg/kg	588
Fluorene		mg/kg	615
Phenanthrene		mg/kg	-
Anthracene		mg/kg	8270
Fluoranthene		mg/kg	822
Pyrene		mg/kg	563
Benzo(a)anthracene		mg/kg	4.52
Chrysene		mg/kg	585
Benzo(b)fluoranthene		mg/kg	7.72
Benzo(k)fluoranthene		mg/kg	84.4
Benzo(a)pyrene		mg/kg	0.818
Indeno(123-cd)pyrene		mg/kg	7.31
Dibenzo(ah)anthracene		mg/kg	0.838
Benzo(ghi)perylene		mg/kg	96.2
Aliphatic Hydrocarbons	**$>C_5$-C_6**	mg/kg	30.1
	$>C_6$-C_8	mg/kg	69.8
	$>C_8$-C_{10}	mg/kg	9.79
	$>C_{10}$-C_{12}	mg/kg	1390
	$>C_{12}$-C_{16}	mg/kg	5100
	$>C_{16}$-C_{35}	mg/kg	145000
Aromatic Hydrocarbons	**$>C_5$-C_7**	mg/kg	0.0493
	$>C_7$-C_8	mg/kg	86.9
	$>C_8$-C_{10}	mg/kg	14.8
	$>C_{10}$-C_{12}	mg/kg	57.3
	$>C_{12}$-C_{16}	mg/kg	142
	$>C_{16}$-C_{21}	mg/kg	272
	$>C_{21}$-C_{35}	mg/kg	888
No Asbestos			

* Screening value used is for Residential use (with homegrown produce) from the Category Screening Levels (C4SLs)

Appendix I – Simple Cover Systems

The following was concluded in the BRE report, *Cover systems for land regeneration*:

"• The main earthworm activity is likely to be in the top 300mm of topsoil.

• Burrowing animals such as moles, rats and mice generally cause greatest disturbance in the top 500mm, however, rabbits and badgers should be considered separately, particularly for areas of public open space (see Section 5.2.2).

• Roots are likely to remain within soils that contain sufficient nutrients and moisture and in addition penetration of plant roots is inhibited within compacted soils. Therefore, provided cover system soil conditions are suitable and the underlying contaminated material is suitably compacted, plant roots are likely to remain within the cover, although this is more likely the greater the thickness of cover provided.

• Double digging of gardens is unlikely to exceed 600mm depth.

• The average depth to undisturbed ground in the gardens investigated was 460mm.
Therefore, it is considered a reasonable assumption that any disturbance or intermixing of soils is unlikely to exceed 600mm depth. A conservative estimate assumes complete intermixing. Hence, for this research it has been assumed that the material used for the cover system will eventually intermix completely with the underlying material to a maximum depth of 600mm."