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ATKINS 16/11/12

Memo

Project:	Egremont, Cumbria – River Retaining Wall Repairs and Replacement Ground Contamination Preliminary Risk Assessment	To:	Tom Fitzpatrick (Atkins Rivers and Coastal)
Subject:	Geo-Environmental Report	From:	Richard Colin (Atkins Land and Development (L&D))
Date:	6th March 2013	cc:	Jo Driffield (Atkins Rivers and Coastal) Liz Pearce (Atkins L&D)

1. Introduction

Atkins is currently preparing a Project Appraisal Report (PAR) for proposed repair / replacement works on a length of wall bordering the River Ehen at Egremont in Cumbria. The wall is not continuous, comprising three sections approximately 40m, 8m and 58m in length.

The site is located on the southern bank of the River Ehen, approximately 150m southeast of the centre of Egremont, at approximate National Grid Reference NY 011 103.

The site comprises three sections of wall that retain the left hand bank of the River Ehen.

The three sections are indicated on Figure EGR-001 Rev: AA appended to this memo, and for the purpose of this assessment will be referred to as sections 1, 2 and 3. The table below presents details of the wall and Figure EGR-001 Rev: AA shows the adjacent landuses.

Table 1 – Site Description

Section	NGR (from east to west)		Length (Approx.)	Description
1	NY 01190 10376	NY 01142 10388	58m	Section 1 is generally aligned in a northwest-southeast orientation and connects a funeral services to what was formerly No 3 Vale View (which has recently been demolished). At its mid-point, the wall deviates southwards away from the river where it meets with the north-western corner of a garage.
2	NY 01123 10388	NY 01115 10388	8m	Section 2 connects the western corner of the funeral services building to Egremont Bridge.
3	NY 01109 10377	NY 01072 10375	40m	Section 3 runs from Egremont Bridge in a straight alignment in a westerly direction.

The surrounding land use to the north of the wall is the right hand river bank and the River Ehen, beyond this are residential properties and their associated gardens. To the east lies residential housing on Vale View. Immediately to the south lies a funeral home and old hardstanding, a former garage (all demolished) with Vale View (road) and Bridge End (road) running in an east - west orientation beyond this area.
To the west lies the open river bank of the River Ehen, which meanders to the southwest away from the site. A bridge that crosses the River Ehen is located immediately to the west of the former funeral home area.

A desk study has been completed previously by Atkins for the site. This concluded that there was a medium to high risk of widespread contamination at the site due to the current and historical use of the adjacent land as a tannery, saw mill, funeral services & garage. However this is subject to confirmation via ground investigation, sampling and appropriate environmental laboratory analysis

A ground investigation was recommended to inform the design of works and assess the material for its suitability for re-use within the final scheme design.

The aims and objectives of the investigation were:

- Provide sufficient data to carry out a generic quantitative risk assessment (GQRA) , screening soil and soil leachate data against generic criteria to give a preliminary indication of re-use potential of materials to help avoid off-site disposal.
- Provide sufficient data to carryout preliminary waste characterisation by screening data using CATWASTE^{SOIL} to indicate whether materials are likely to be hazardous or not.
- Determine the geochemical nature of soils on site.

2. Recent Ground Investigation

The ground investigation was carried out on the 22nd January 2013 by Resource and Environmental Consultants (REC) and supervised by Volker Stevin, following instruction by Atkins. The ground investigation comprised the following:

- Six hand excavated trial pits (TPA, TPB, TPC, TPD, TPF & TPG) to a maximum depth of 1.20m below ground level (bgl);
- Use of a PID to screen environmental samples taken during the site investigation to inform environmental laboratory analysis; and;
- Recovery of soil and water samples for environmental laboratory analysis.

Details of the ground investigation logs were provided by Volker Stevin, in order for Atkins L&D to schedule the appropriate analysis. Ground Investigation logs, survey drawing, and laboratory analysis results are included in the Volker Stevin report which is attached as Appendix A. Environmental laboratory testing was undertaken as part of this investigation, the results of which are discussed in the following sections.

Atkins accepts no responsibility of whatsoever nature to third parties to whom this report, or any part thereof, is made known other than within the terms of the contract.

2.1. Environmental Sampling and Laboratory Analysis

Environmental soil samples were recovered from exploratory holes by the contractor's site Engineer. All soil samples were placed into clearly labelled jars and tubs provided by the testing laboratory, Scientific Analysis Laboratories Limited (SAL Ltd), a UKAS and MCERTS accredited laboratory to undertake chemical analysis. Sample jars were temporarily secured in cool boxes prior to transfer to the laboratory, in accordance with chain of custody procedures.

Soil samples were submitted for analysis for one or more of the following suites of contaminants of concern (CoC):

- metals / metalloids (arsenic, water soluble boron, cadmium, total and hexavalent chromium, copper, lead, mercury, nickel, selenium and zinc);
- pH;
- 2:1 soluble sulphate,
- total and free cyanide;
- PAHs – 16 speciated polycyclic aromatic hydrocarbons (PAHs);
- TPH CWG and BTEX – Total Petroleum Hydrocarbons showing Criteria Working group Speciation;
- total phenols;
- asbestos screen (quantification if ACM detected);

- volatile organic compounds (VOCs);
- semi-volatile organic compounds (SVOCs); and;
- soil organic matter (SOM).

VOCs and SVOCS were only to be analysed on samples that recorded elevated PID readings or had odours noted during recovery / excavation.

In addition, soil-derived leachate tests were carried out on selected soil samples for the same analysis as above (with the exception of SOM, VOCs, SVOCs and asbestos screening).

Two samples of water from the adjacent River Ehen were taken and analysed for the same analysis suite as the leachate samples, with the addition of hardness analysis.

Results of laboratory analysis carried out on samples of soil and soil leachate are presented in Appendix A.

2.2. Ground & Groundwater Conditions

The ground conditions are summarised in the tables below.

For detailed descriptions of the site specific geology, please refer to the logs in Appendix A.

Table 1.3: Summary of Ground Conditions

Stratum	Range of Depths of Stratum Encountered (m bgl)	Proven Thickness Range (m)
Granular Made Ground – sandy clayey gravel	GL – 1.20#	0.40 – 1.20
Cohesive Made Ground – sandy gravelly clay	GL – 1.20*	0.05 – 1.20
Gravel – Alluvium (TPC only)	1.10 – 1.20	0.10

extended total depth (1.20m) in TPB only

extended total depth (1.20m) in TPG only

Groundwater was not encountered in any of the exploratory holes during excavation.

The Made Ground encountered on the site predominantly consisted of sandy gravelly clay, or sandy clayey gravel with glass, wood, plastic, brick, timber, ceramic, asphalt, concrete and fabric fragments.

In TPC only, Alluvium was encountered below the Made Ground. The Alluvium comprised sandy clayey gravel with occasional bands of peat. The remainder of the trial pits terminated in the Made Ground strata.

2.3. Visual and Olfactory Indicators of Soil Contamination

The majority of the PID readings taken by the REC site engineer were recorded as 0ppm, with the exception of a sample recovered from TPD at 0.05m bgl which had a PID reading of 8.9ppm and at 0.30m bgl which had a reading of 0.10ppm. These two samples were scheduled for VOC and SVOC analysis to try and determine the source of the elevated PID readings.

The Made Ground encountered in all the trial pits included gravel sized fragments of glass, wood, plastic, brick, timber, ceramic, asphalt and fabric, along with a black colouring. No odours were recorded on the logs.

No other visual or olfactory indicators of potential contamination were observed during the ground investigation.

The contractor's logs do not indicate any evidence of the presence of asbestos being encountered during the site works. This was confirmed by the laboratory analysis screening which did not encounter any asbestos containing materials in the fourteen samples submitted.

3. Generic Quantitative Risk Assessment (Re-use of Site Won Materials Assessment)

3.1. Introduction

Atkins have used the information obtained during the ground investigation to assess the potential risk from contaminant source-pathway-receptors identified in the conceptual site model (CSM) developed during the desk study. Contaminant concentrations in soil and soil-derived leachate from the exploratory holes have been screened against appropriate generic assessment criteria (GAC).

The GQRA will enable the risk posed by potential contamination to be identified and provide an indication of re-use potential. The results of the GQRA screen are attached to this memo in Appendix B.

3.2. Human Health GQRA

The GAC selected for the site are the Atkins'-derived Soil Screening Values (SSVs). SSVs are selected on the most likely scenario for the end-use of the site, which in this case includes former commercial areas / predominantly hardstanding areas. Therefore the SSV's for Commercial have been used. Based on the observed ground conditions and the reported soil organic matter (SOM) values, the 6% SOM SSVs (sandy loam soils) have been adopted.

Potential short term risks to construction workers / future maintenance contractors (excavating) are not considered in this assessment as health and safety risk assessments by the contractor will be required for this purpose to establish appropriate safe systems of work, which would also include the use of appropriate PPE.

Of the eleven samples scheduled for laboratory analysis one exceedance of benzo(a)pyrene was reported above the SSV from 1.20m bgl in TPB. The recorded concentration was 17 mg/kg, which is above the SSV of 14.4 mg/kg.

The remaining CoC's analysed were below the SSVs and therefore will not be considered further in this assessment.

The material tested is unlikely to be pose a potential risk to human health if it is re-used in an area which is planned to be a commercial land use, i.e. buried under hardstanding. The assessment is based on the assumption that commercial land use will continue at the site. If this is not the case then this risk assessment may not be appropriate and the risks will need to be considered further and a re-assessment of the soil sample data may be required.

3.3. Controlled Water GQRA

The primary controlled waters receptor is considered to be the adjacent River Ehen and the underlying Principal Aquifer (St Bees Sandstone).

Detected concentrations in soil-derived leachate give an indication of the concentration at which contaminants might leach from the Made Ground. The GACs selected are freshwater / inland values applicable under the Water Framework Directive (WFD) to allow assessment of risk posed to the River Ehen. In the absence of a WFD value, a Drinking Water Standard (DWS) has been selected. Hardness (as $CaCO_3$) was tested in two water samples taken from the River to inform the GAC selection (as some water standards are hardness dependent). The resulting hardness was an average of 84.5mg/l $CaCO_3$. The water samples were also analysed for the same CoCs as the soils and soil-derived leachate in order to determine if the river was being significantly impacted by any of the contaminants identified in the Made Ground at the site.

The following contaminants were recorded at concentrations that exceed their respective GAC:

Table 2.2 – Leachate concentrations in excess of GAC

CoC	Freshwater EQS (µg/l)	DWS (µg/l)	Minimum Concentration (µg/l)	Maximum Concentration (µg/l)	Number of samples tested	Exceedances
Dissolved Lead	7.2	10	<0.3	10.0	8	1 (EQS – TPA@0.5m)
Fluoranthene	0.1	-	<0.01	0.23	8	1 (EQS – TPB @ 0.5m)
Benzo(b/k)Fluoranthene	0.03	-	<0.01	0.29	8	1 (EQS – TPB @ 0.5m)
Benzo(a)Pyrene	0.05	0.01	<0.01	0.23	8	2 (EQS & DWS – TPB @ 0.5m)
Indeno(123-cd)Pyrene & Benzo(ghi)Perylene	0.002	-	<0.01	0.27	8	1 (EQS – TPB @ 0.5m)
SUM of 4 PAHs*	-	0.1	<0.30	0.62	8	1 (DWS – TPB @ 0.5m)
Total Phenols	7.7	0.5	<0.5	3.4	8	5 (DWS – TPA@ 0.5m, TPB @ 0.5m, TPC @ 0.3m, TPD @ 0.3m, TPG @ 1.2m

* Sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, indeno(1,2,3cd)pyrene

The results indicate an exceedance of the total PAH assessment criteria in TPB. Ground condition descriptions on the logs do not give any indication to the origin of the elevated PAHs. However, fragments of coal were recorded in the Made Ground material, which could be a potential source of the PAH. No other olfactory of visual indications were noted.

The elevated lead and phenols concentrations recorded could be due to the historical use of the adjacent area as a garage and / or funeral home and prior to that a tannery in the 1800's. Again, the logs do not indicate a specific reason why this material contains elevated concentrations of the respected CoCs and no other olfactory of visual indications of contamination were noted from the ground investigation.

The soil-derived leachate sample results for lead marginally exceed the EQS value (and is equal to the DWS value). It is likely that natural dilution within the alluvium and Secondary A Aquifer would reduce these concentrations further and as such lead is unlikely to pose an unacceptable risk to the controlled water receptor.

SSVs are not available for TPH, however where they have been detected above method detection limit (MDL) they have been considered in this assessment. TPHs in soil-derived leachate were recorded above MDL in TPF at 0.5m bgl in the following TPH bands - aliphatic – C16 to 21, C21 to 35 and C35 to 44 and aromatics C1 to 21 and C21 to 35. Ground condition descriptions in the logs do not give any indication to the origin of these heavy end fractions. However a layer of asphalt is noted as being present between 0.65m and 1.20m bgl in TPF, which could be the source of the elevated TPH fractions. The soil results for TPF did not indicate any exceedences or elevated concentrations in TPH.

All other compounds analysed for soil-derived leachate were either below the selected GAC or below MDL.

The generic screen indicates the re-use of site won materials (Made Ground), primarily from TPB, may pose an unacceptable risk to controlled waters, primarily the River Ehen (surface water receptor). The remaining material should not pose a significant risk to controlled waters.

Results of the two surface water samples obtained from the River Ehen do not exceed EQS or DWS GACs. This suggests that potential leachable contaminants from the site are not migrating to, or significantly impacting the River Ehen (controlled waters receptor). The EA should be consulted to determine whether etc etc then feed into below

However, without undertaking a detailed quantitative risk assessment (DQRA) the level of risk cannot be robustly eliminated. This could comprise statistical analysis of a larger data set and / or modelling contaminant transportation (which considers the affects of dispersion and attenuation of contaminants during its movement through the ground). Whereas the generic screening exercise undertaken herein necessarily assumes that the leachate is already present in the watercourse at risk, a DQRA would consider the flow path that the leachate would move along before reaching the receptor, and may also incorporate additional considerations to apply pragmatism.

3.4. Waste Classification

Working in partnership with the McArdle Group, Atkins has developed the Waste Soils Characterisation Assessment Tool (CAT-WASTE^{SOIL}). The tool follows current regulations / guidance and provides an indication or whether or not soils are likely to be hazardous waste.

Reported concentrations of contaminants from the nine soil samples analysed were entered into the CAT-WASTE^{SOIL} tool. The results indicate the majority of samples tested would not be classified as hazardous.

Two samples, TPA at 0.5m bgl and TPB at 1.2m bgl, are classified as being hazardous. The CAT-WASTE^{SOIL} tool based this on the concentrations of lead and zinc, making the sample ecotoxic. i.e. very toxic to aquatic organism and may cause long-term effects to the aquatic environment.

It should be noted that the CAT-WASTE^{SOIL} tool assessment only provides an indication of the likely classification of soils for off-site disposal based on the chemical laboratory analysis results. It should be noted that the tool does not provide an assessment based on the presence or content of asbestos in the soil. Further testing and assessment of spoil generated during the excavation phase of the construction works, including waste acceptance criteria (WAC) tests, are required to fully characterise the soils for the purposes of removing soils off-site to appropriately permitted facilities for treatment or disposal.

The results of the CAT-WASTE^{SOIL} assessment are provided in Appendix C.

4. Summary and Recommendations

The key findings of the preliminary materials re-use assessment and waste characterisation are:

RE-USE:

The majority of site won Made Ground material may be suitable for re-use, with the exception of the material from TPB, as the GQRA indicates the potential for unacceptable risk to receptors in this location.

The human health and controlled water GQRA indicates that the majority of the site material could be re-used. However, the material form TPB might pose an unacceptable risk to controlled waters and to human health due to the recorded exceedences.

The level of risk cannot be robustly eliminated without carrying out further investigation and detailed assessment (DQRA). However, it is likely that it would be more cost effective to dispose of the material from this area, rather than re-use at the site.

DISPOSAL:

CAT-WASTE^{SOIL} indicates the majority of the material tested is unlikely to be classed as hazardous waste, with the exception of samples from TPA at 0.5m bgl and TPB at 1.2m bgl, which were classed as hazardous waste. This is due to the recorded levels of lead and zinc in the material analysed. Further sampling will be required once materials have been excavated to confirm their waste classification (this could include WAC tests and asbestos quantification if appropriate based upon the composition of the excavated materials).

Egremont Bridge

SECTION 2

Funeral Services

SECTION 1

SECTION 3

Provision for flood gate

0 20.00
metres

Legend:

Existing Walls

High Ground

Existing Building

Works required will include:

1. Visual inspection
2. Topo survey
3. Recomendations for intrusive survey (ie. coring, etc.)
4. Appraisal of structural stability of existing structures to act as formal flood defences
5. If not, outline design options to appraisal level or simple repairs/ strengthening if appropriate
6. Outline design for flood gate based on Cockermouth

Project Title:

NW ASSET RECONDITIONING EA
EGREMONT BRIDGE

Figure Title:

SCOPE OF WORKS FOR STRUCTURAL ASSESSMENT

Document Reference:

5113352

Figure Number:

EGR - 001 Rev A8

ATKINS

Environment Agency

VolkerStevin

Memo

We trust that this report meets with your current requirements. If you have any queries, please do not hesitate to contact us.

Originator	Checker	Reviewer	Authoriser
Richard Colin Geo-Environmental Engineer	**Tom Fairweather** Graduate Environmental Consultant	**Liz Pearce** Senior Geoenvironmental Consultant	**Brad Balmer** Associate Director

Enc:

Figure EGR-001 Rev: AA

Appendix A: REC Draft Report (Egremont- 44788)

Appendix B: GQRA screen

Appendix C: CAT-WASTE^{SOIL} assessment

APPENDIX A

REC Ltd
Osprey House
Pacific Quay
Broadway
Machester
M50 2UE

Ref: 01c44788

Date: 24th January 2013

Simon Barton
VolkerStevin Ltd.
The Lancashire Hub,
Preston City Park
Bluebell Way,
Preston,
PR2 5PE

BY Email and Post

Dear Mr Barton,

Environmental Sampling
River Ehen – Egremont

Background

REC Ltd has recently been commissioned to undertake a phase of sampling located on the southern side of the River Ehen in Egremont. Atkins were acting as site supervisor to ensure that the methodologies outlined in the Technical Note dated 7th January 2013. Volker Stevin were the appointed site works contractor, responsible for the advancement of the trial pits to the specific depths as per the Atkins specification.

Environmental Sampling

An REC engineer attended site on 22nd January 2013 to retrieve soil samples, carry out on-site PID screening, and log all exploratory locations. A total of 6 No. trial pits were excavated by Volker Stevin. Atkins specified the trial pit locations, names and sample depths. REC were also instructed to retrieve water samples from both up-stream and down-stream of the site.

All excavation activities were be supervised each day by an REC engineer, with the logging of samples in accordance with BS EN ISO 14688 -1 Identification of Soil and BS EN ISO 14688 -2 Classification of Soil. Exploratory logs and REC drawing 44788-01-001 (Exploratory Location Plan) are attached to this letter.

On-site PID analysis was undertaken within all of the soil samples collected to ascertain the extent of any potentially volatile compounds. The results of all PID headspace analysis are presented in Table 1 overleaf.

The PID headspace analysis was carried out using the following methodology:

- For every soil sample taken, an additional sample container was half filled, immediately covered over with aluminium foil and the lid screwed tightly on to ensure a good seal;
- Headspace development was allowed for approximately 20 minutes within a warm environment;
- Subsequent to headspace development, the lid was removed and the foil punctured with the instrument probe to circa halfway into the headspace development and the maximum concentration recorded. Using this method, the maximum concentration should occur within 2-5 seconds; and,
- Prior to analysis the PID field instrument was calibrated in accordance with the manufacturer's specifications.

Table 1 – On-site PID Data

Sample Location	Depth (m bgl)	PID (ppm)
TP-A	0.05	<0.10
TP-A	0.30	<0.10
TP-A	0.50	<0.10
TP-A	1.20	<0.10
TP-B	0.05	<0.10
TP-B	0.30	<0.10
TP-B	0.50	<0.10
TP-B	1.20	<0.10
TP-C	0.30	<0.10
TP-C	0.50	<0.10
TP-C	1.20	<0.10
TP-D	0.05	8.90
TP-D	0.30	0.10
TP-D	0.50	<0.10
TP-D	1.20	<0.10
TP-F	0.30	<0.10
TP-F	0.50	<0.10
TP-F	1.20	<0.10
TP-G	0.30	<0.10
TP-G	0.50	<0.10
TP-G	1.20	<0.10

Samples were also submitted to SAL Ltd of Manchester for chemical analysis in accordance with their UKAS accreditation where. Completed Chain of Custody forms are enclosed for subsequent scheduling of samples by Atkins.

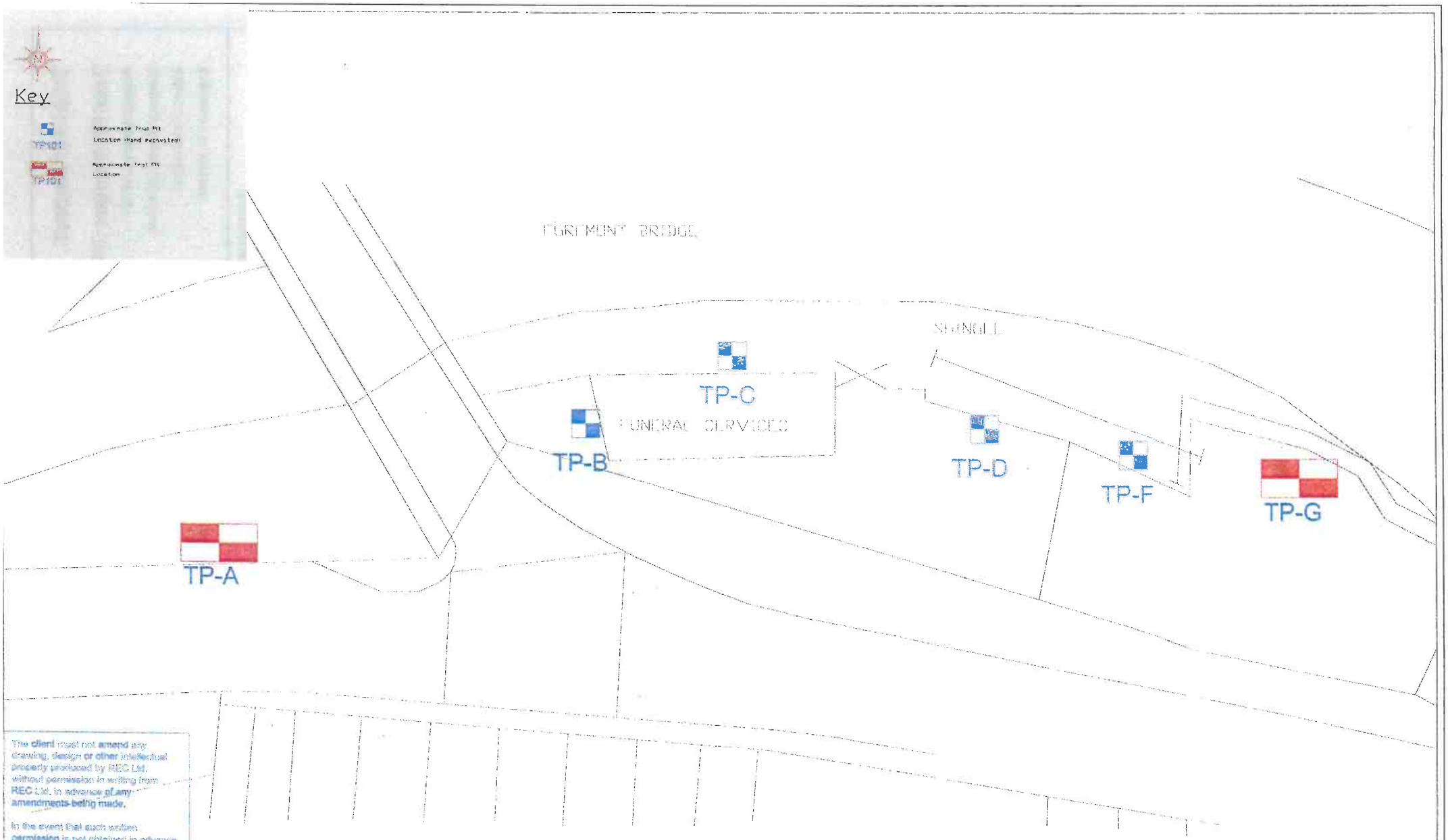
I trust that the information outlined above is sufficient to allay any concerns, and should you have any queries please do not hesitate to contact me.

Yours sincerely,
For and on behalf of REC Ltd

Daniel Cox
Senior Consultant
REC Geoenvironmental

Enc:

Exploratory Location Plan 44788-01-001
Exploratory Logs
Sample Chain of Custody



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Job Title: Egremont

Client: VolkerStevin

Job No: 44788

Drawn by: R. Willoughby

Approved by: D. Co

Scale: NTS

Date: 24/1/13

Notes:

Drawing Title: 44788-01-001 Exploratory Hole Location Plan

Trial Pit Record

Trial Pit Number: TP-A

Project Number: 44788
Contract Name: Egremont
Client: Volker Stevin
Engineer: N. Modawi

Date Started: 23/01/2013
Date Completed: 23/01/2013
Elevation AOD (m): N/A
Co-ordinates: N/A
Excavation Method: JCB 3CX

REC Resource & Environmental Consultants
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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING				
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	Water Level (mbgl)	P.I.D (ppm) 0 25 50 75 100	Field / Laboratory Testing
		MADE GROUND: Soft to firm dark brown mottled yellow / black sandy gravelly clay. Gravel is fine to medium, sub-angular to sub-rounded of sandstone, mudstone, ceramic, plastic and glass.	0.35	ES	0.05		0	
				ES	0.30		0	
				ES	0.50		0	
1.0		MADE GROUND: Soft to firm dark brown mottled yellow / black sandy gravelly clay. Gravel is fine to medium, sub-angular to sub-rounded of sandstone, mudstone, ceramic, plastic, asphalt and glass.	1.15	ES	1.20		0	
2.0		MADE GROUND: Yellow brown slightly sandy gravel. Gravel is fine to medium, sub-angular to sub-rounded of sandstone, mudstone and occasional brick.						
		Trial Pit complete at 1.20m bgl.						
3.0								
4.0								
5.0								
6.0								

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
ES. Environmental Sample

Notes

Dimensions: 2.00m bgl
Services: Prior to excavation the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Stability: Stable
Groundwater: Not encountered

Date: 24/1/2013
Status: Final

Trial Pit Record

Trial Pit Number: TP-B

Project Number: 44788
Contract Name: Egremont
Client: Volker Stevin
Engineer: N. Modawi

Date Started: 22/01/2013
Date Completed: 22/01/2013
Elevation AOD (m): N/A
Co-ordinates: N/A
Excavation Method: Hand Excavated

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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING				
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	Water Level (mbgl)	P.I.D (ppm) 0 25 50 75 100	Field / Laboratory Testing
0		MADE GROUND: Black brown mottled white gravelly clay. Gravel is fine to coarse, sub-angular to sub-rounded of brick, siltstone, sandstone, ceramic, plastic, glass and occasional coal fragments.	0.60	ES	0.05		0	
				ES	0.30		0	
				ES	0.50		0	
1.0		MADE GROUND: Black brown mottled white slightly sandy gravelly clay. Gravel is fine to coarse, sub-angular to sub-rounded of brick, siltstone, sandstone and occasional coal fragments	1.20	ES	1.20		0	
		Trial Pit complete at 1.20m bgl.						
2.0								
3.0								
4.0								
5.0								
6.0								

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
ES. Environmental Sample

Notes

Dimensions: 1.20m bgl
Services: Prior to excavation the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Stability: Stable
Groundwater: Not encountered

Date: 24/1/2013
Status: Final

Trial Pit Record

Trial Pit Number: TP-C

Project Number: 44788
Contract Name: Egremont
Client: Volker Stevin
Engineer: N. Modawi

Date Started: 22/01/2013
Date Completed: 22/01/2013
Elevation AOD (m): N/A
Co-ordinates: N/A
Excavation Method: Hand Excavated

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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING				
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	Water Level (mbgl)	P.I.D (ppm) 0 25 50 75 100	Field / Laboratory Testing
0		MADE GROUND: Black brown mottled white/orange slightly sandy clayey gravel. Gravel is fine to coarse, sub-angular to sub-rounded of siltstone, sandstone, plastic, ceramic and concrete. Occasional sandstone cobbles present.		ES	0.30		0	
				ES	0.50		0	
1.0			1.10					
		Black brown sandy clayey GRAVEL. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, shale and siltstone. Occasional bands of peat present.		ES	1.20		0	
		Trial Pit complete at 1.20m bgl.						
2.0								
3.0								
4.0								
5.0								
6.0								

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
ES. Environmental Sample

Notes

Dimensions: 1.20m bgl
Services: Prior to excavation the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Stability: Stable
Groundwater: Not encountered

Date: 24/1/2013
Status: Final

Trial Pit Record

Trial Pit Number: TP-D

Project Number: 44788
Contract Name: Egremont
Client: Volker Stevin
Engineer: N. Modawi

Date Started: 23/01/2013
Date Completed: 23/01/2013
Elevation AOD (m): N/A
Co-ordinates: N/A
Excavation Method: Hand excavated

REC Resource & Environmental Consultants
Osprey House
Pacific Quay
Broadway
Manchester, M50 2UE
Tel: 0161 868 1300 / Fax: 0161 868 1301
www.recltd.co.uk

SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING				
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	Water Level (mbgl)	P.I.D (ppm) 0 25 50 75 100	Field / Laboratory Testing
		MADE GROUND: Grey brown mottled orange sandy gravelly clay. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, mudstone, asphalt and concrete.	0.40	ES	0.05		0	
				ES	0.30		0	
				ES	0.50		9	
1.0		MADE GROUND: Orange brown mottled black slightly silty sandy gravel. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, ash and brick.	1.20	ES	1.20		0	
		Trial Pit complete at 1.20m bgl.						
2.0								
3.0								
4.0								
5.0								
6.0								

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test

D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial

T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
ES. Environmental Sample

Notes

Dimensions: 1.20m bgl
Services: Prior to excavation the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Stability: Stable
Groundwater: Not encountered

Date: 24/1/2013
Status: Final

Trial Pit Record

Trial Pit Number: TP-F

Project Number: 44788
Contract Name: Egremont
Client: Volker Stevin
Engineer: N. Modawi

Date Started: 23/01/2013
Date Completed: 23/01/2013
Elevation AOD (m): N/A
Co-ordinates: N/A
Excavation Method: Hand excavated

REC Resource & Environmental Consultants
Osprey House
Pacific Quay
Broadway
Manchester, M50 2UE
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Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	Water Level (mbgl)	P.I.D (ppm) 0 25 50 75 100	Field / Laboratory Testing
		MADE GROUND: Black brown mottled white slightly sandy gravelly clay. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone and mudstone.	0.15					
				ES	0.30		0	
				ES	0.50		0	
			0.65					
1.0		MADE GROUND: Dark brown slightly sandy gravelly clay. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, glass, wood and plastic.	1.20	ES	1.20		0	
		MADE GROUND: Asphalt.						
2.0		MADE GROUND: grey brown with occasional black staining sandy clayey gravel. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, ceramin, glass, timber, brick and plastic.						
		Trial Pit complete at 1.20m bgl.						
3.0								
4.0								
5.0								
6.0								

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
ES. Environmental Sample

Notes

Dimensions: 1.20m bgl
Services: Prior to excavation the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Stability: Stable
Groundwater: Not encountered

Date: 24/1/2013
Status: Final

Trial Pit Record

Trial Pit Number: TP-G

Project Number: 44788
Contract Name: Egremont
Client: Volker Stevin
Engineer: N. Modawi

Date Started: 22/01/2013
Date Completed: 22/01/2013
Elevation AOD (m): N/A
Co-ordinates: N/A
Excavation Method: JCB 3CX

REC Resource & Environmental Consultants
Osprey House
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Tel: 0161 868 1300 / Fax: 0161 868 1301
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SUBSURFACE PROFILE				SAMPLES AND IN-SITU TESTING				
Depth (mbgl)	Legend	Description	Depth of Strata (mbgl)	Type	Depth (mbgl)	Water Level (mbgl)	P.I.D (ppm) 0 25 50 75 100	Field / Laboratory Testing
		MADE GROUND: Red brown slightly sandy slightly silty gravel. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, mudstone and brick.	0.20	ES	0.30		0	
			0.50	ES	0.50		0	
1.0		MADE GROUND: Red brown mottled white slightly silty sandy gravel. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, mudstone, brick, plastic, glass and asphalt.	1.20	ES	1.20		0	
2.0		MADE GROUND: Dark brown clayey sandy gravel. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, mudstone, brick, plastic, glass and asphalt.	2.00					
3.0		MADE GROUND: Red brown mottled white clayey sandy gravel. Gravel is fine to coarse, sub-angular to sub-rounded of sandstone, siltstone, mudstone, brick, plastic, glass, asphalt, fabric and ceramic.						
4.0		Trial Pit complete at 2.00m bgl.						
5.0								
6.0								

Key

B. Bulk (Bag)
W. Water
U100. 100mm Undisturbed
U38. 38mm Undisturbed Sample
SPT. Standard Penetration Test
D. Disturbed
G. Amber Glass Jar / Bottle
CPT. Cone Penetration Test
U100. Blows (Recovery mm)
V. 40ml Glass Vial
T. Plastic Tub
N. 'N' Value
HV. Hand Shear Vane
PID. Photo Ionisation Detector
ES. Environmental Sample

Notes

Dimensions: 2.00m bgl
Services: Prior to excavation the trial pit location was scanned with a Cable Avoidance Tool (CAT).
Stability: Stable
Groundwater: Not encountered

Date: 24/1/2013
Status: Final

Scientific Analysis Laboratories Ltd.

Sampling and chain of custody record

SAL Ltd
Hadfield House,
Hadfield Street,
Old Trafford,
Manchester M16 9FE

Tel: 0161 874 2400
Fax: 0161 874 2444

CUSTOMER NAME	PROJECT CODE:
REC MANCHESTER	44758
ADDRESS	ORDER NUMBER:
	PROJECT MANAGER:
	TEL NUMBER:

Matrix: Soil / Water / Other

Analysis requested

Comments	Sampiers Signature

Date	Customer ID	SAL Ref

Customer Details

Relinquished:	Name:	Time:	Date:	Sign:

For SAL use only

Received at Lab (Signature) (Date) (Time)

Scientific Analysis Laboratories Ltd.

Sampling and chain of custody record

SAL Ltd
Hadfield House,
Hadfield Street,
Old Trafford,
Manchester M16 9FE

Tel: 0161 874 2400
Fax: 0161 874 2444

CUSTOMER NAME: REC MANCHESTER	PROJECT CODE: 44780
ADDRESS	ORDER NUMBER:
	PROJECT MANAGER: DAN COX
	TEL NUMBER: 07764431515

Date	Customer ID	SAL Ref	Matrix (Soil / Water / Other)	Analysis requested	Comments	Samplers Signature
22/01/13	TP-B at 0.05		Soil X3			
22/01/13	TP-B at 0.30m		Soil X3			
22/01/13	TP-B at 0.50m		Soil X3			
22/01/13	TP-B at 1.20m		Soil X3			
22/01/13	TP-C at 0.30m		Soil X3			
22/01/13	TP-C at 0.50m		Soil X3			
22/01/13	TP-C at 1.20m		Soil X3			
22/01/13	TP-F at 0.30m		Soil X3			
22/01/13	TP-F at 0.50m		Soil X3			
22/01/13	TP-F at 1.20m		Soil X3			
22/01/13	TP-G at 1.20m		Soil X3			
22/01/13	TP-G at 0.50m		Soil X3			
22/01/13	TP-G at 0.30m		Soil X3			
[illegible]	TP-[illegible] at [illegible]		Soil x3			
[illegible]	TP-[illegible] at [illegible]		Soil x3			
[illegible]	TP-A at [illegible]		Soil x3			
[illegible]	TP-[illegible] at 1.20m		Soil x3			
[illegible]	TP-[illegible] at [illegible]		Soil x3			
[illegible]	[illegible]		[illegible]			
[illegible]	TP-[illegible] at 0.50m		Soil x2			

Customer Details

Relinquished:	Name:	Time:	Date:	Sign:
	N. Moonet	1:30pm	23/01/2013	[signature]

For SAL use only

Received at Lab (Signature)	(Date)	(Time)

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limited company registered in England and
Wales (No 2514788) whose address is at
Hadfield House, Hadfield Street, Manchester M16 9FE

Scientific Analysis Laboratories Ltd

Certificate of Analysis

Hadfield House
Hadfield Street
Combrook
Manchester
M16 9FE
Tel : 0161 874 2400
Fax : 0161 874 2468

Report Number: Supplement to 313601-1

Date of Report: 25-Feb-2013

Customer: VolkerStevin Ltd
Cockermouth Site Office
Egremont

Customer Contact: Mr Simon Barton

Customer Job Reference: 44788
Customer Purchase Order: 2652/C10765/SB
Customer Site Reference: River Ehen, Egremont, Cumbria
Date Job Received at SAL: 24-Jan-2013
Date Analysis Started: 29-Jan-2013
Date Analysis Completed: 08-Feb-2013

The results reported relate to samples received in the laboratory
Opinions and interpretations expressed herein are outside the scope of UKAS accreditation
This report should not be reproduced except in full without the written approval of the laboratory
Tests covered by this certificate were conducted in accordance with SAL SOPs
All results have been reviewed in accordance with QP22

UKAS TESTING
1549

mCERTS
THE ENVIRONMENT AGENCY'S MONITORING CERTIFICATION SCHEME

Report checked
and authorised by :
Mr Ross Walker
Customer Services Manager
(Land)

Issued by :
Annie Hennis
Project Manager

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
MCERTS Preparation

	SAL Reference	313601 002	313601 004	313601 005	313601 009	313601 010	313601 011
	Customer Sample Reference	TP-B at 0.30	TP-B at 1.20	TP-C at 0.30	TP-F at 0.50	TP-F at 1.20	TP-G at 1.20
	Depth	0.30	1.20	0.30	0.50	1.20	1.20
	Date Sampled	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013
	Type	Sandy Soil	Sandy Soil	Sandy Soil	Clay	Sandy Soil	Sandy Soil
Determinand	Method / Test Sample / LOD / Units						
Moisture	T277 / AR / 0.1 / %	11	15	15	22	13	12
Moisture @ 105 C	T162 / AR / 0.1 / %	11	18	17	25	14	11

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
MCERTS Preparation

	SAL Reference	313601 012	313601 014	313601 016	313601 018	313601 019
	Customer Sample Reference	TP-G at 0.50	TP-A at 0.05	TP-A at 0.50	TP-D at 0.05	TP-D at 0.30
	Depth	0.50	0.05	0.50	0.05	0.30
	Date Sampled	22-JAN-2013	23-JAN-2013	23-JAN-2013	23-JAN-2013	23-JAN-2013
	Type	Sandy Soil	Topsoil	Topsoil	Sandy Soil	Clay
Determinand	Method / Test Sample / LOD / Units					
Moisture	T277 / AR / 0.1 / %	6.7	24	20	25	24
Moisture @ 105 C	T162 / AR / 0.1 / %	6.4	30	23	32	26

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
Metals

	SAL Reference	313601 002	313601 004	313601 005	313601 009	313601 010	313601 011
	Customer Sample Reference	TP-B at 0.30	TP-B at 1.20	TP-C at 0.30	TP-F at 0.50	TP-F at 1.20	TP-G at 1.20
	Depth	0.30	1.20	0.30	0.50	1.20	1.20
	Date Sampled	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013
	Type	Sandy Soil	Sandy Soil	Sandy Soil	Clay	Sandy Soil	Sandy Soil
Determinand	Method / Test Sample / LOD / Units						
Arsenic	T6 / M40 / 2 / mg/kg	24	34	17	18	18	21
Boron (water-soluble)	T6 / AR / 1 / mg/kg	<1	<1	<1	<1	<1	<1
Cadmium	T6 / M40 / 1 / mg/kg	<1	<1	<1	<1	<1	<1
Chromium	T6 / M40 / 1 / mg/kg	23	25	18	22	17	19
Chromium VI	T6 / AR / 1 / mg/kg	<1	<1	<1	<1	<1	<1
Copper	T6 / M40 / 1 / mg/kg	84	120	53	55	83	70
Lead	T6 / M40 / 1 / mg/kg	700	2200	410	98	150	190
Mercury	T6 / M40 / 1 / mg/kg	<1	1	<1	<1	<1	<1
Nickel	T6 / M40 / 1 / mg/kg	34	40	23	22	23	27
Selenium	T6 / M40 / 3 / mg/kg	<3	<3	<3	<3	<3	<3
Zinc	T6 / M40 / 1 / mg/kg	440	420	250	120	120	130

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
Metals

				SAL Reference	313601 012	313601 014	313601 016	313601 018	313601 019
				Customer Sample Reference	TP-G at 0.50	TP-A at 0.05	TP-A at 0.50	TP-D at 0.05	TP-D at 0.30
				Depth	0.50	0.05	0.50	0.05	0.30
				Date Sampled	22-JAN-2013	23-JAN-2013	23-JAN-2013	23-JAN-2013	23-JAN-2013
				Type	Sandy Soil	Topsoil	Topsoil	Sandy Soil	Clay
Determinand	Method	Test Sample	LOD	Units					
Arsenic	T6	M40	2	mg/kg	22	16	55	17	20
Boron (water-soluble)	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Cadmium	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Chromium	T6	M40	1	mg/kg	18	15	35	19	20
Chromium VI	T6	AR	1	mg/kg	<1	<1	<1	<1	<1
Copper	T6	M40	1	mg/kg	50	37	130	35	39
Lead	T6	M40	1	mg/kg	290	160	2100	140	140
Mercury	T6	M40	1	mg/kg	<1	<1	<1	<1	<1
Nickel	T6	M40	1	mg/kg	26	23	110	23	27
Selenium	T6	M40	3	mg/kg	<3	<3	<3	<3	<3
Zinc	T6	M40	1	mg/kg	120	140	410	120	150

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
Miscellaneous

				SAL Reference	313601 002	313601 004	313601 005	313601 009	313601 010	313601 011
				Customer Sample Reference	TP-B at 0.30	TP-B at 1.20	TP-C at 0.30	TP-F at 0.50	TP-F at 1.20	TP-G at 1.20
				Depth	0.30	1.20	0.30	0.50	1.20	1.20
				Date Sampled	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013
				Type	Sandy Soil	Sandy Soil	Sandy Soil	Clay	Sandy Soil	Sandy Soil
Determinand	Method	Test Sample	LOD	Units						
Cyanide(Total)	T546	AR	1	mg/kg	<1	1	<1	1	1	<1
Cyanide(free)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1	<1
pH	T7	AR			7.9	8.1	8.1	7.8	8.3	8.3
Soil Organic Matter	T287	M40	0.1	%	10	10	5.5	4.4	5.9	3.9
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
Miscellaneous

				SAL Reference	313601 012	313601 014	313601 016	313601 018	313601 019
				Customer Sample Reference	TP-G at 0.50	TP-A at 0.05	TP-A at 0.50	TP-D at 0.05	TP-D at 0.30
				Depth	0.50	0.05	0.50	0.05	0.30
				Date Sampled	22-JAN-2013	23-JAN-2013	23-JAN-2013	23-JAN-2013	23-JAN-2013
				Type	Sandy Soil	Topsoil	Topsoil	Sandy Soil	Clay
Determinand	Method	Test Sample	LOD	Units					
Cyanide(Total)	T546	AR	1	mg/kg	<1	<1	1	<1	<1
Cyanide(free)	T546	AR	1	mg/kg	<1	<1	<1	<1	<1
pH	T7	AR			8.5	7.4	8.1	7.5	7.8
Soil Organic Matter	T287	M40	0.1	%	3.3	7.1	17	6.6	7.4
SO4(2:1)	T6	AR	0.1	g/l	<0.1	<0.1	<0.1	<0.1	<0.1

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil

Volatile Organic Compounds (USEPA 624) (MCERTS)

				SAL Reference	313601 018	313601 019
				Customer Sample Reference	TP-D at 0.05	TP-D at 0.30
				Depth	0.05	0.30
				Date Sampled	23-JAN-2013	23-JAN-2013
				Type	Sandy Soil	Clay
Determinand	Method	Test Sample	LOD	Units		
1,1,1,2-Tetrachloroethane	T209	M105	50	µg/kg	<50	<50
1,1,1-Trichloroethane	T209	M105	50	µg/kg	<50	<50
1,1,2,2-Tetrachloroethane	T209	M105	50	µg/kg	<50	<50
1,1,2-Trichloroethane	T209	M105	50	µg/kg	<50	<50
1,1-Dichloroethane	T209	M105	50	µg/kg	<50	<50
1,1-Dichloroethylene	T209	M105	50	µg/kg	<50	<50
1,1-Dichloropropene	T209	M105	50	µg/kg	<50	<50
1,2,3-Trichloropropane	T209	M105	50	µg/kg	<50	<50
1,2,4-Trimethylbenzene	T209	M105	50	µg/kg	<50	<50
1,2-dibromoethane	T209	M105	50	µg/kg	<50	<50
1,2-Dichlorobenzene	T209	M105	50	µg/kg	<50	<50
1,2-Dichloroethane	T209	M105	50	µg/kg	<50	<50
1,2-Dichloropropane	T209	M105	50	µg/kg	<50	<50
1,3,5-Trimethylbenzene	T209	M105	50	µg/kg	<50	<50
1,3-Dichlorobenzene	T209	M105	50	µg/kg	<50	<50
1,3-Dichloropropane	T209	M105	50	µg/kg	<50	<50
1,4-Dichlorobenzene	T209	M105	50	µg/kg	<50	<50
2,2-Dichloropropane	T209	M105	50	µg/kg	<50	<50
2-Chlorotoluene	T209	M105	50	µg/kg	<50	<50
4-Chlorotoluene	T209	M105	50	µg/kg	<50	<50
Benzene	T209	M105	10	µg/kg	<10	<10
Bromobenzene	T209	M105	50	µg/kg	<50	<50
Bromochloromethane	T209	M105	50	µg/kg	<50	<50
Bromodichloromethane	T209	M105	50	µg/kg	<50	<50
Bromoform	T209	M105	50	µg/kg	<50	<50
Bromomethane	T209	M105	50	µg/kg	<50	<50
Carbon tetrachloride	T209	M105	50	µg/kg	<50	<50
Chlorobenzene	T209	M105	50	µg/kg	<50	<50
Chlorodibromomethane	T209	M105	50	µg/kg	<50	<50
Chloroethane	T209	M105	50	µg/kg	<50	<50
Chloroform	T209	M105	50	µg/kg	<50	<50
Chloromethane	T209	M105	50	µg/kg	<50	<50
Cis-1,2-Dichloroethylene	T209	M105	50	µg/kg	<50	<50
Cis-1,3-Dichloropropene	T209	M105	50	µg/kg	<50	<50
Dibromomethane	T209	M105	50	µg/kg	<50	<50
Dichlorodifluoromethane	T209	M105	50	µg/kg	<50	<50
Dichloromethane	T209	M105	50	µg/kg	<50	<50
EthylBenzene	T209	M105	10	µg/kg	<10	<10
Isopropyl benzene	T209	M105	50	µg/kg	<50	<50
M/P Xylene	T209	M105	10	µg/kg	<10	<10
n-Propylbenzene	T209	M105	50	µg/kg	<50	<50
O Xylene	T209	M105	10	µg/kg	<10	<10
p-Isopropyltoluene	T209	M105	50	µg/kg	<50	<50
S-Butylbenzene	T209	M105	50	µg/kg	<50	<50
Styrene	T209	M105	50	µg/kg	<50	<50
T-Butylbenzene	T209	M105	50	µg/kg	<50	<50
Tetrachloroethene	T209	M105	50	µg/kg	<50	<50
Toluene	T209	M105	10	µg/kg	<10	<10
Trans-1,2-Dichloroethene	T209	M105	50	µg/kg	<50	<50
Trans-1,3-Dichloropropene	T209	M105	50	µg/kg	<50	<50
Trichloroethene	T209	M105	50	µg/kg	<50	<50
Trichlorofluoromethane	T209	M105	50	µg/kg	<50	<50
Vinyl chloride	T209	M105	50	µg/kg	<50	<50

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil Analysed as Soil
Semi-Volatile Organic Compounds (USEPA 625)

SAL Reference	313601 018	313601 019
Customer Sample Reference	TP-D at 0.05	TP-D at 0.30
Depth	0.05	0.30
Date Sampled	23-JAN-2013	23-JAN-2013
Type	Sandy Soil	Clay

Determinand	Method	Test Sample	LOD	Units		
1,2,4-Trichlorobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
1,2-Dichlorobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
1,3-Dichlorobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
1,4-Dichlorobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
2,4,5-Trichlorophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2,4,6-Trichlorophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2,4-Dichlorophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2,4-Dimethylphenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2,4-Dinitrophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2,4-Dinitrotoluene	T207	M105	0.1	mg/kg	<0.1	<0.1
2,6-Dinitrotoluene	T207	M105	0.1	mg/kg	<0.1	<0.1
2-Chloronaphthalene	T207	M105	0.1	mg/kg	<0.1	<0.1
2-Chlorophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2-methyl phenol	T207	M105	0.1	mg/kg	<0.1	<0.1
2-Methylnaphthalene	T207	M105	0.1	mg/kg	<0.1	0.2
2-Nitroaniline	T207	M105	0.1	mg/kg	<0.1	<0.1
2-Nitrophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
3-Nitroaniline	T207	M105	0.1	mg/kg	<0.1	<0.1
3/4-Methylphenol	T207	M105	0.1	mg/kg	<0.1	<0.1
4-Bromophenyl phenylether	T207	M105	0.1	mg/kg	<0.1	<0.1
4-Chloro-3-methylphenol	T207	M105	0.1	mg/kg	<0.1	<0.1
4-Chloroaniline	T207	M105	0.1	mg/kg	<0.1	<0.1
4-Chlorophenyl phenylether	T207	M105	0.1	mg/kg	<0.1	<0.1
4-Nitroaniline	T207	M105	0.1	mg/kg	<0.1	<0.1
4-Nitrophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthene	T207	M105	0.1	mg/kg	<0.1	<0.1
Acenaphthylene	T207	M105	0.1	mg/kg	<0.1	<0.1
Anthracene	T207	M105	0.1	mg/kg	0.3	0.3
Azobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	0.9	1.3
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	0.9	1.3
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	1.9	2.6
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	0.5	1.3
Bis (2-chloroethoxy) methane	T207	M105	0.1	mg/kg	<0.1	<0.1
Bis (2-chloroethyl) ether	T207	M105	0.1	mg/kg	<0.1	<0.1
Bis (2-chloroisopropyl) ether	T207	M105	0.1	mg/kg	<0.1	<0.1
Bis (2-ethylthexyl)phthalate	T207	M105	0.1	mg/kg	<0.1	<0.1
Butyl benzylphthalate	T207	M105	0.1	mg/kg	<0.1	<0.1
Carbazole	T207	M105	0.1	mg/kg	<0.1	<0.1
Chrysene	T207	M105	0.1	mg/kg	1.0	1.2
Di-n-butylphthalate	T207	M105	0.1	mg/kg	<0.1	<0.1
Di-n-octylphthalate	T207	M105	0.1	mg/kg	<0.1	<0.1
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	<0.1	0.2
Dibenzofuran	T207	M105	0.1	mg/kg	<0.1	<0.1
Diethyl phthalate	T207	M105	0.1	mg/kg	<0.1	<0.1
Dimethyl phthalate	T207	M105	0.1	mg/kg	<0.1	<0.1
Fluoranthene	T207	M105	0.1	mg/kg	2.1	2.6
Fluorene	T207	M105	0.1	mg/kg	<0.1	<0.1
Hexachlorobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
Hexachlorobutadiene	T207	M105	0.1	mg/kg	<0.1	<0.1
Hexachlorocyclopentadiene	T207	M105	0.1	mg/kg	<0.1	<0.1
Hexachloroethane	T207	M105	0.1	mg/kg	<0.1	<0.1
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	0.4	0.9
Isophorone	T207	M105	0.1	mg/kg	<0.1	<0.1
Naphthalene	T207	M105	0.1	mg/kg	<0.1	0.2
Nitrobenzene	T207	M105	0.1	mg/kg	<0.1	<0.1
Pentachlorophenol	T207	M105	0.1	mg/kg	<0.1	<0.1
Phenanthrene	T207	M105	0.1	mg/kg	1.0	1.0

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Soil — Analysed as Soil
Semi-Volatile Organic Compounds (USEPA 625)

				SAL Reference	313601 018	313601 019
				Customer Sample Reference	TP-D at 0.05	TP-D at 0.30
				Depth	0.05	0.30
				Date Sampled	23-JAN-2013	23-JAN-2013
				Type	Sandy Soil	Clay
Determinand	Method	Test Sample	LOD	Units		
Phenol	T207	M105	0.1	mg/kg	<0.1	<0.1
Pyrene	T207	M105	0.1	mg/kg	1.8	2.3

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Water, Leachate — Analysed as Water
Miscellaneous

				SAL Reference	313601 002	313601 005	313601 009	313601 011	313601 016	313601 019
				Customer Sample Reference	TP-B at 0.30	TP-C at 0.30	TP-F at 0.50	TP-G at 1.20	TP-A at 0.50	TP-D at 0.30
				Depth	0.30	0.30	0.50	1.20	0.50	0.30
				Date Sampled	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	23-JAN-2013	23-JAN-2013
				Type	Sandy Soil	Sandy Soil	Clay	Sandy Soil	Topsoil	Clay
Determinand	Method	Test Sample	LOD	Units						
Cd (Dissolved)	T281	10:1	0.02	µg/l	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide(Total)	T4	10:1	0.05	mg/l	<0.05	0.09	<0.05	<0.05	<0.05	<0.05
Cyanide(free)	T4	10:1	0.05	mg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH	T7	10:1			7.9	8.2	7.7	8.6	7.6	7.8

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Water, Leachate — Analysed as Water
Miscellaneous

				SAL Reference	313601 025	313601 026
				Customer Sample Reference	Upstream south of the wall	Downstream TP-A
				Depth		
				Date Sampled	23-JAN-2013	23-JAN-2013
				Type		
Determinand	Method	Test Sample	LOD	Units		
Hardness expressed as CaCO3	T6	AR	10	mg/l	86	83
Cd (Dissolved)	T281	AR	0.02	µg/l	<0.02	<0.02
Cyanide(Total)	T4	AR	0.05	mg/l	<0.05	<0.05
Cyanide(free)	T4	AR	0.05	mg/l	<0.05	<0.05
pH	T7	AR			7.7	7.3

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Leachate, Water — Analysed as Water
Metals

SAL Reference					313601 002	313601 005	313601 009	313601 011	313601 016	313601 019
Customer Sample Reference					TP-B at 0.30	TP-C at 0.30	TP-F at 0.50	TP-G at 1.20	TP-A at 0.50	TP-D at 0.30
Depth					0.30	0.30	0.50	1.20	0.50	0.30
Date Sampled					22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	23-JAN-2013	23-JAN-2013
Type					Sandy Soil	Sandy Soil	Clay	Sandy Soil	Topsoil	Clay
Determinand	Method	Test Sample	LOD	Units						
As (Dissolved)	T281	10:1	0.2	µg/l	2.1	1.6	0.7	1.5	4.2	1.4
Boron	T6	10:1	0.01	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cr (Dissolved)	T281	10:1	1	µg/l	<1	<1	<1	<1	4	<1
Chromium VI	T686	10:1	0.003	mg/l	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cu (Dissolved)	T281	10:1	0.5	µg/l	1.4	0.8	<0.5	<0.5	1.2	0.8
Pb (Dissolved)	T281	10:1	0.3	µg/l	3.3	1.4	0.4	0.4	10	1.8
Hg (Dissolved)	T281	10:1	0.05	µg/l	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ni (Dissolved)	T281	10:1	1	µg/l	<1	<1	<1	<1	<1	<1
Se (Dissolved)	T281	10:1	0.5	µg/l	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Sulphate	T686	10:1	0.1	mg/l	160	11	0.8	<0.1	<0.1	<0.1
Zn (Dissolved)	T281	10:1	2	µg/l	<2	<2	<2	<2	<2	<2

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Leachate, Water — Analysed as Water
Metals

SAL Reference					313601 025	313601 026
Customer Sample Reference					Upstream south of the wall	Downstream TP-A
Depth						
Date Sampled					23-JAN-2013	23-JAN-2013
Type						
Determinand	Method	Test Sample	LOD	Units		
As (Dissolved)	T281	AR	0.2	µg/l	1.4	1.3
Boron	T6	AR	0.01	mg/l	<0.01	<0.01
Cr (Dissolved)	T281	AR	1	µg/l	<1	<1
Chromium VI	T686	AR	0.003	mg/l	<0.003	<0.003
Cu (Dissolved)	T281	AR	0.5	µg/l	<0.5	0.5
Pb (Dissolved)	T281	AR	0.3	µg/l	1.1	<0.3
Hg (Dissolved)	T281	AR	0.05	µg/l	<0.05	<0.05
Ni (Dissolved)	T281	AR	1	µg/l	<1	<1
Se (Dissolved)	T281	AR	0.5	µg/l	0.6	0.5
Sulphate	T686	AR	0.1	mg/l	13	13
Zn (Dissolved)	T281	AR	2	µg/l	7	3

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Leachate, Water Analysed as Water
Total and Speciated USEPA16 PAH

	SAL Reference	313601 002	313601 005	313601 009	313601 011	313601 016	313601 019
	Customer Sample Reference	TP-B at 0.30	TP-C at 0.30	TP-F at 0.50	TP-G at 1.20	TP-A at 0.50	TP-D at 0.30
	Depth	0.30	0.30	0.50	1.20	0.50	0.30
	Date Sampled	22-JAN-2013	22-JAN-2013	22-JAN-2013	22-JAN-2013	23-JAN-2013	23-JAN-2013
	Type	Sandy Soil	Sandy Soil	Clay	Sandy Soil	Topsoil	Clay
Determinand	Method / Test Sample / LOD / Units						
Naphthalene	T149 / 10:1 / 0.01 / µg/l	0.02	0.01	<0.01	<0.01	0.01	0.03
Acenaphthylene	T149 / 10:1 / 0.01 / µg/l	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	T149 / 10:1 / 0.01 / µg/l	0.06	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	T149 / 10:1 / 0.01 / µg/l	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	T149 / 10:1 / 0.01 / µg/l	0.07	0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	T149 / 10:1 / 0.01 / µg/l	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	T149 / 10:1 / 0.01 / µg/l	0.23	0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	T149 / 10:1 / 0.01 / µg/l	0.19	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	T149 / 10:1 / 0.01 / µg/l	0.11	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	T149 / 10:1 / 0.01 / µg/l	0.14	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b/k)Fluoranthene	T149 / 10:1 / 0.01 / µg/l	0.29	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10
Benzo(a)Pyrene	T149 / 10:1 / 0.01 / µg/l	0.23	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10
Indeno(123-cd)Pyrene	T149 / 10:1 / 0.01 / µg/l	0.27	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10
Dibenzo(ah)Anthracene	T149 / 10:1 / 0.01 / µg/l	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10
Benzo(ghi)Perylene	T149 / 10:1 / 0.01 / µg/l	0.19	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10
PAH(total)	T149 / 10:1 / 0.01 / µg/l	1.9	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10	(110) <0.10

SAL Reference: 313601
Project Site: River Ehen, Egremont, Cumbria
Customer Reference: 44788

Leachate, Water Analysed as Water
Total and Speciated USEPA16 PAH

	SAL Reference	313601 025	313601 026
	Customer Sample Reference	Upstream south of the wall	Downstream TP-A
	Depth		
	Date Sampled	23-JAN-2013	23-JAN-2013
	Type		
Determinand	Method / Test Sample / LOD / Units		
Naphthalene	T149 / AR / 0.01 / µg/l	0.05	0.08
Acenaphthylene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Acenaphthene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Fluorene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Phenanthrene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Anthracene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Fluoranthene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Pyrene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Benzo(a)Anthracene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Chrysene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Benzo(b/k)Fluoranthene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Benzo(a)Pyrene	T149 / AR / 0.01 / µg/l	<0.01	<0.01
Indeno(123-cd)Pyrene	T149 / AR / 0.01 / µg/l	(110) <0.10	(110) <0.10
Dibenzo(ah)Anthracene	T149 / AR / 0.01 / µg/l	(110) <0.10	(110) <0.10
Benzo(ghi)Perylene	T149 / AR / 0.01 / µg/l	(110) <0.10	(110) <0.10
PAH(total)	T149 / AR / 0.01 / µg/l	0.05	0.08

Index to symbols used in Supplement to 313601-1

Value	Description
M105	Analysis conducted on an "as received" aliquot. Results are reported on a dry weight basis where moisture content was determined by assisted drying of sample at 105C
AR	As Received
10:1	Leachate

M40	Analysis conducted on sample assisted dried at no more than 40C. Results are reported on a dry weight basis.
110	LOD raised due to low internal standard recovery.
M	Analysis is MCERTS accredited
U	Analysis is UKAS accredited
N	Analysis is not UKAS accredited

Notes

Supplemental report issued to amend pH result

Method Index

Value	Description
T209	GC/MS(Head Space)(MCERTS)
T277	Grav (1 Dec) (40 C)
T686	Discrete Analyser
T149	GC/MS (SIR)
T287	Calc TOC/0.58
T162	Grav (1 Dec) (105 C)
T4	Colorimetry
T281	ICP/MS (Filtered)
T6	ICP/OES
T207	GC/MS(MCERTS)
T546	Colorimetry (CF)
T7	Probe

Accreditation Summary

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Cyanide(Total)	T546	AR	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Cyanide(free)	T546	AR	1	mg/kg	M	002,004-005,009-012,014,016,018-019
pH	T7	AR			M	002,004-005,009-012,014,016,018-019
Soil Organic Matter	T287	M40	0.1	%	N	002,004-005,009-012,014,016,018-019
SO4(2:1)	T6	AR	0.1	g/l	N	002,004-005,009-012,014,016,018-019
Arsenic	T6	M40	2	mg/kg	M	002,004-005,009-012,014,016,018-019
Boron (water-soluble)	T6	AR	1	mg/kg	N	002,004-005,009-012,014,016,018-019
Cadmium	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Chromium	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Chromium VI	T6	AR	1	mg/kg	N	002,004-005,009-012,014,016,018-019
Copper	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Lead	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Mercury	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Nickel	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
Selenium	T6	M40	3	mg/kg	M	002,004-005,009-012,014,016,018-019
Zinc	T6	M40	1	mg/kg	M	002,004-005,009-012,014,016,018-019
As (Dissolved)	T281	10:1	0.2	µg/l	U	002,005,009,011,016,019
As (Dissolved)	T281	AR	0.2	µg/l	U	025-026
Boron	T6	10:1	0.01	mg/l	N	002,005,009,011,016,019
Boron	T6	AR	0.01	mg/l	N	025-026
Cr (Dissolved)	T281	10:1	1	µg/l	U	002,005,009,011,016,019
Cr (Dissolved)	T281	AR	1	µg/l	U	025-026
Chromium VI	T686	10:1	0.003	mg/l	U	002,005,009,011,016,019
Chromium VI	T686	AR	0.003	mg/l	U	025-026
Cu (Dissolved)	T281	10:1	0.5	µg/l	U	002,005,009,011,016,019
Cu (Dissolved)	T281	AR	0.5	µg/l	U	025-026
Pb (Dissolved)	T281	10:1	0.3	µg/l	U	002,005,009,011,016,019
Pb (Dissolved)	T281	AR	0.3	µg/l	U	025-026
Hg (Dissolved)	T281	10:1	0.05	µg/l	U	002,005,009,011,016,019
Hg (Dissolved)	T281	AR	0.05	µg/l	U	025-026
Ni (Dissolved)	T281	10:1	1	µg/l	U	002,005,009,011,016,019
Ni (Dissolved)	T281	AR	1	µg/l	U	025-026
Se (Dissolved)	T281	10:1	0.5	µg/l	U	002,005,009,011,016,019
Se (Dissolved)	T281	AR	0.5	µg/l	U	025-026
Sulphate	T686	10:1	0.1	mg/l	U	002,005,009,011,016,019
Sulphate	T686	AR	0.1	mg/l	U	025-026
Zn (Dissolved)	T281	10:1	2	µg/l	U	002,005,009,011,016,019
Zn (Dissolved)	T281	AR	2	µg/l	U	025-026

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
1,2,4-Trichlorobenzene	T207	M105	0.1	mg/kg	M	018-019
1,2-Dichlorobenzene	T207	M105	0.1	mg/kg	M	018-019
1,3-Dichlorobenzene	T207	M105	0.1	mg/kg	M	018-019
1,4-Dichlorobenzene	T207	M105	0.1	mg/kg	M	018-019
2,4,5-Trichlorophenol	T207	M105	0.1	mg/kg	U	018-019
2,4,6-Trichlorophenol	T207	M105	0.1	mg/kg	U	018-019
2,4-Dichlorophenol	T207	M105	0.1	mg/kg	U	018-019
2,4-Dimethylphenol	T207	M105	0.1	mg/kg	U	018-019
2,4-Dinitrophenol	T207	M105	0.1	mg/kg	U	018-019
2,4-Dinitrotoluene	T207	M105	0.1	mg/kg	M	018-019
2,6-Dinitrotoluene	T207	M105	0.1	mg/kg	U	018-019
2-Chloronaphthalene	T207	M105	0.1	mg/kg	M	018-019
2-Chlorophenol	T207	M105	0.1	mg/kg	M	018-019
2-methyl phenol	T207	M105	0.1	mg/kg	M	018-019
2-Methylnaphthalene	T207	M105	0.1	mg/kg	M	018-019
2-Nitroaniline	T207	M105	0.1	mg/kg	M	018-019
2-Nitrophenol	T207	M105	0.1	mg/kg	U	018-019
3-Nitroaniline	T207	M105	0.1	mg/kg	U	018-019
3/4-Methylphenol	T207	M105	0.1	mg/kg	M	018-019
4-Bromophenyl phenylether	T207	M105	0.1	mg/kg	M	018-019
4-Chloro-3-methylphenol	T207	M105	0.1	mg/kg	M	018-019
4-Chloroaniline	T207	M105	0.1	mg/kg	U	018-019
4-Chlorophenyl phenylether	T207	M105	0.1	mg/kg	M	018-019
4-Nitroaniline	T207	M105	0.1	mg/kg	U	018-019
4-Nitrophenol	T207	M105	0.1	mg/kg	U	018-019
Acenaphthene	T207	M105	0.1	mg/kg	M	018-019
Acenaphthylene	T207	M105	0.1	mg/kg	U	018-019
Anthracene	T207	M105	0.1	mg/kg	U	018-019
Azobenzene	T207	M105	0.1	mg/kg	M	018-019
Benzo(a)Anthracene	T207	M105	0.1	mg/kg	M	018-019
Benzo(a)Pyrene	T207	M105	0.1	mg/kg	M	018-019
Benzo(b/k)Fluoranthene	T207	M105	0.1	mg/kg	M	018-019
Benzo(ghi)Perylene	T207	M105	0.1	mg/kg	M	018-019
Bis (2-chloroethoxy) methane	T207	M105	0.1	mg/kg	M	018-019
Bis (2-chloroethyl) ether	T207	M105	0.1	mg/kg	M	018-019
Bis (2-chloroisopropyl) ether	T207	M105	0.1	mg/kg	M	018-019
Bis (2-ethylhexyl)phthalate	T207	M105	0.1	mg/kg	M	018-019
Butyl benzylphthalate	T207	M105	0.1	mg/kg	U	018-019
Carbazole	T207	M105	0.1	mg/kg	U	018-019
Chrysene	T207	M105	0.1	mg/kg	M	018-019
Di-n-butylphthalate	T207	M105	0.1	mg/kg	M	018-019
Di-n-octylphthalate	T207	M105	0.1	mg/kg	M	018-019
Dibenzo(ah)Anthracene	T207	M105	0.1	mg/kg	M	018-019
Dibenzofuran	T207	M105	0.1	mg/kg	M	018-019
Diethyl phthalate	T207	M105	0.1	mg/kg	U	018-019
Dimethyl phthalate	T207	M105	0.1	mg/kg	U	018-019
Fluoranthene	T207	M105	0.1	mg/kg	M	018-019
Fluorene	T207	M105	0.1	mg/kg	M	018-019
Hexachlorobenzene	T207	M105	0.1	mg/kg	M	018-019
Hexachlorobutadiene	T207	M105	0.1	mg/kg	M	018-019
Hexachlorocyclopentadiene	T207	M105	0.1	mg/kg	U	018-019
Hexachloroethane	T207	M105	0.1	mg/kg	U	018-019
Indeno(123-cd)Pyrene	T207	M105	0.1	mg/kg	M	018-019
Isophorone	T207	M105	0.1	mg/kg	U	018-019
Naphthalene	T207	M105	0.1	mg/kg	M	018-019
Nitrobenzene	T207	M105	0.1	mg/kg	M	018-019
Pentachlorophenol	T207	M105	0.1	mg/kg	U	018-019
Phenanthrene	T207	M105	0.1	mg/kg	M	018-019
Phenol	T207	M105	0.1	mg/kg	M	018-019
Pyrene	T207	M105	0.1	mg/kg	M	018-019
Hardness expressed as CaCO3	T6	AR	10	mg/l	N	025-026
Cd (Dissolved)	T281	10:1	0.02	µg/l	U	002,005,009,011,016,019
Cd (Dissolved)	T281	AR	0.02	µg/l	U	025-026
Cyanide(Total)	T4	10:1	0.05	mg/l	U	002,005,009,011,016,019
Cyanide(Total)	T4	AR	0.05	mg/l	U	025-026
Cyanide(free)	T4	10:1	0.05	mg/l	U	002,005,009,011,016,019
Cyanide(free)	T4	AR	0.05	mg/l	U	025-026
pH	T7	10:1			U	002,005,009,011,016,019
pH	T7	AR			U	025-026
1,1,1,2-Tetrachloroethane	T209	M105	50	µg/kg	M	018-019

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
1,1,1-Trichloroethane	T209	M105	50	µg/kg	M	018-019
1,1,2,2-Tetrachloroethane	T209	M105	50	µg/kg	U	018-019
1,1,2-Trichloroethane	T209	M105	50	µg/kg	M	018-019
1,1-Dichloroethane	T209	M105	50	µg/kg	M	018-019
1,1-Dichloroethylene	T209	M105	50	µg/kg	M	018-019
1,1-Dichloropropene	T209	M105	50	µg/kg	M	018-019
1,2,3-Trichloropropane	T209	M105	50	µg/kg	U	018-019
1,2,4-Trimethylbenzene	T209	M105	50	µg/kg	M	018-019
1,2-dibromoethane	T209	M105	50	µg/kg	M	018-019
1,2-Dichlorobenzene	T209	M105	50	µg/kg	M	018-019
1,2-Dichloroethane	T209	M105	50	µg/kg	M	018-019
1,2-Dichloropropane	T209	M105	50	µg/kg	M	018-019
1,3,5-Trimethylbenzene	T209	M105	50	µg/kg	M	018-019
1,3-Dichlorobenzene	T209	M105	50	µg/kg	M	018-019
1,3-Dichloropropane	T209	M105	50	µg/kg	M	018-019
1,4-Dichlorobenzene	T209	M105	50	µg/kg	M	018-019
2,2-Dichloropropane	T209	M105	50	µg/kg	U	018-019
2-Chlorotoluene	T209	M105	50	µg/kg	U	018-019
4-Chlorotoluene	T209	M105	50	µg/kg	U	018-019
Benzene	T209	M105	10	µg/kg	M	018-019
Bromobenzene	T209	M105	50	µg/kg	M	018-019
Bromochloromethane	T209	M105	50	µg/kg	M	018-019
Bromodichloromethane	T209	M105	50	µg/kg	M	018-019
Bromoform	T209	M105	50	µg/kg	M	018-019
Bromomethane	T209	M105	50	µg/kg	U	018-019
Carbon tetrachloride	T209	M105	50	µg/kg	M	018-019
Chlorobenzene	T209	M105	50	µg/kg	M	018-019
Chlorodibromomethane	T209	M105	50	µg/kg	M	018-019
Chloroethane	T209	M105	50	µg/kg	M	018-019
Chloroform	T209	M105	50	µg/kg	M	018-019
Chloromethane	T209	M105	50	µg/kg	U	018-019
Cis-1,2-Dichloroethylene	T209	M105	50	µg/kg	M	018-019
Cis-1,3-Dichloropropene	T209	M105	50	µg/kg	M	018-019
Dibromomethane	T209	M105	50	µg/kg	M	018-019
Dichlorodifluoromethane	T209	M105	50	µg/kg	M	018-019
Dichloromethane	T209	M105	50	µg/kg	U	018-019
EthylBenzene	T209	M105	10	µg/kg	M	018-019
Isopropyl benzene	T209	M105	50	µg/kg	M	018-019
M/P Xylene	T209	M105	10	µg/kg	M	018-019
n-Propylbenzene	T209	M105	50	µg/kg	M	018-019
O Xylene	T209	M105	10	µg/kg	M	018-019
p-Isopropyltoluene	T209	M105	50	µg/kg	M	018-019
S-Butylbenzene	T209	M105	50	µg/kg	M	018-019
Styrene	T209	M105	50	µg/kg	U	018-019
T-Butylbenzene	T209	M105	50	µg/kg	M	018-019
Tetrachloroethene	T209	M105	50	µg/kg	M	018-019
Toluene	T209	M105	10	µg/kg	M	018-019
Trans-1,2-Dichloroethene	T209	M105	50	µg/kg	M	018-019
Trans-1,3-Dichloropropene	T209	M105	50	µg/kg	M	018-019
Trichloroethene	T209	M105	50	µg/kg	M	018-019
Trichlorofluoromethane	T209	M105	50	µg/kg	M	018-019
Vinyl chloride	T209	M105	50	µg/kg	M	018-019
Naphthalene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Naphthalene	T149	AR	0.01	µg/l	U	025-026
Acenaphthylene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Acenaphthylene	T149	AR	0.01	µg/l	U	025-026
Acenaphthene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Acenaphthene	T149	AR	0.01	µg/l	U	025-026
Fluorene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Fluorene	T149	AR	0.01	µg/l	U	025-026
Phenanthrene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Phenanthrene	T149	AR	0.01	µg/l	U	025-026
Anthracene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Anthracene	T149	AR	0.01	µg/l	U	025-026
Fluoranthene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Fluoranthene	T149	AR	0.01	µg/l	U	025-026
Pyrene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Pyrene	T149	AR	0.01	µg/l	U	025-026
Benzo(a)Anthracene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Benzo(a)Anthracene	T149	AR	0.01	µg/l	U	025-026

Memo

ATKINS

APPENDIX B

Determinand	Method	Test Sample	LOD	Units	Symbol	SAL References
Chrysene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Chrysene	T149	AR	0.01	µg/l	U	025-026
Benzo(b/k)Fluoranthene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Benzo(b/k)Fluoranthene	T149	AR	0.01	µg/l	U	025-026
Benzo(a)Pyrene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Benzo(a)Pyrene	T149	AR	0.01	µg/l	U	025-026
Indeno(123-cd)Pyrene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Indeno(123-cd)Pyrene	T149	AR	0.01	µg/l	U	025-026
Dibenzo(ah)Anthracene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Dibenzo(ah)Anthracene	T149	AR	0.01	µg/l	U	025-026
Benzo(ghi)Perylene	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
Benzo(ghi)Perylene	T149	AR	0.01	µg/l	U	025-026
PAH(total)	T149	10:1	0.01	µg/l	U	002,005,009,011,016,019
PAH(total)	T149	AR	0.01	µg/l	U	025-026
Moisture	T277	AR	0.1	%	N	002,004-005,009-012,014,016,018-019
Moisture @ 105 C	T162	AR	0.1	%	N	002,004-005,009-012,014,016,018-019

Egremont Soil Screening

	Commercial GAC		Sample Ref	TPB	TPB	TPC	TPF	TPF	TPG	TPG	TPA	TPA	TPD	TPD
Determinand	Screening Value		Depth	0.3	1.2	0.3	0.5	1.2	1.2	0.5	0.05	0.5	0.05	0.3
	using 6% SOM	Units	MDL											
Asbestos	-			N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
Soil Organic Matter	-	%	0.1	10	10	5.5	4.4	5.9	3.9	3.3	7.1	17	6.6	7.4
Arsenic	640	mg/kg	2	24	34	17	18	18	21	22	16	55	17	20
Boron (water-soluble)	-	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Cadmium	230	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Chromium	213000	mg/kg	1	23	25	18	22	17	19	18	15	35	19	20
Chromium VI	320	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Copper	105000	mg/kg	1	84	120	53	55	83	70	50	37	130	35	39
Lead	6490	mg/kg	1	700	2200	410	98	150	190	290	160	2100	140	140
Mercury	3600	mg/kg	1	<1	1	<1	<1	<1	<1	<1	<1	<1	<1	<1
Nickel	1800	mg/kg	1	34	40	23	22	23	27	26	23	110	23	27
Selenium	13000	mg/kg	3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3
Zinc	<1 kg/kg	mg/kg	1	440	420	250	120	120	130	120	140	410	120	150
Cyanide (Total)	34	mg/kg	1	<1	1	<1	1	1	<1	<1	<1	1	<1	<1
Cyanide (free)	34	mg/kg	1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1	<1
pH	-			7.9	8.1	8.1	7.8	8.3	8.3	8.5	7.4	8.1	7.5	7.8
Sulfate (2:1 water soluble) as SO4	-	g/l	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Benzene	95	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<2	<5	<2	<1
Toluene	430000	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<2	<5	<2	<1
Ethylbenzene	185000	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<2	<5	<2	<1
m/p-Xylene	623000	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<2	<5	<2	<1
O-Xylene	370000	ug/kg	1	<1	<1	<1	<1	<1	<1	<1	<2	<5	<2	<1
Aliphatics >C5-C6	1349000	mg/kg	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.020	<0.010
Aliphatics >C6-C8	1000000	mg/kg	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.020	<0.010
Aliphatics >C8-C10	170000	mg/kg	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.020	<0.010
Aliphatics >C10-C12	171000	mg/kg	1	<10	<10	<10	<1	<10	<1	<1	<10	<10	<1	<1
Aliphatics >C12-C16	171000	mg/kg	1	<10	<10	<10	<1	<10	<1	<1	500	<10	<1	<1
Aliphatics >C16-C21	1000000	mg/kg	1	<10	<10	<10	<1	<10	<1	<1	9000	<10	<1	5
Aliphatics >C21-C35	1000000	mg/kg	1	19	<10	17	2	130	1	<1	7200	<10	7	40
Aromatics >C5-EC7	95	mg/kg	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.020	<0.010
Aromatics >EC7-EC8	420000	mg/kg	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.020	<0.010
Aromatics >EC8-EC10	64300	mg/kg	0.01	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.020	<0.050	<0.020	<0.010
Aromatics >EC10-EC12	68300	mg/kg	1	<10	<10	<10	<1	<10	<1	<1	<10	<10	<1	<1
Aromatics >EC12-EC16	65600	mg/kg	1	<10	<10	<10	<1	<10	<1	<1	<10	<10	<1	<1
Aromatics >EC16-EC21	28400	mg/kg	1	160	43	<10	1	<10	<1	<1	14	16	3	5
Aromatics >EC21-EC35	28400	mg/kg	1	390	180	43	5	19	3	3	37	55	20	24
Naphthalene	22700	mg/kg	0.1	0.3	0.6	<0.1	<0.1	<0.1	2.8	<0.1	0.6	0.8	<0.1	0.2
Acenaphthylene	-	mg/kg	0.1	0.4	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	0.1	0.2	<0.1	<0.1
Acenaphthene	100000	mg/kg	0.1	0.3	4.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.3	0.2	<0.1	<0.1
Fluorene	77100	mg/kg	0.1	0.6	5.9	<0.1	<0.1	<0.1	0.1	<0.1	0.4	0.4	<0.1	<0.1
Phenanthrene		mg/kg	0.1	8.4	53	1.1	0.1	0.4	1.4	0.4	6.2	6.8	1.2	1.3
Anthracene	545000	mg/kg	0.1	1.8	20	0.2	<0.1	<0.1	0.2	0.4	1.4	1.8	0.2	0.3
Fluoranthene	72700	mg/kg	0.1	21	79	2.1	0.3	0.7	1.1	1.1	14	18	2.6	2.6
Pyrene	54500	mg/kg	0.1	18	67	1.7	0.3	0.6	0.9	0.9	11	15	2.2	2.2
Benzo(a)Anthracene	143	mg/kg	0.1	8.4	32	0.7	<0.1	0.3	0.5	0.3	5.3	7.4	1	1.4
Chrysene	14300	mg/kg	0.1	10	33	0.8	<0.1	0.3	0.5	0.3	5.5	9.5	1	1.7
Benzo(bk)Fluoranthene	1584	mg/kg	0.1	11	34	0.9	<0.1	0.5	0.5	0.4	6.1	9.3	1.4	2.4
Benzo(a)Pyrene	14.4	mg/kg	0.1	5.8	17	0.5	<0.1	0.3	0.3	0.2	3	4.7	0.7	1.3
Indeno(123-cd)Pyrene	144	mg/kg	0.1	3.1	8.4	0.3	<0.1	0.2	0.1	<0.1	1.5	2.4	0.4	0.8
Dibenzo(a,h)anthracene	14.4	mg/kg	0.1	1.2	4.4	0.1	<0.1	<0.1	<0.1	<0.1	0.6	1.2	<0.1	0.3
Benzo(g,h,i)perylene	1450	mg/kg	0.1	3.7	9.7	0.3	<0.1	0.2	0.2	0.1	1.7	2.7	0.4	1
PAH(total)	-	mg/kg	0.1	94	370	8.7	0.7	3.5	8.6	4.1	58	80	11	16
Phenol	3290	mg/kg	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
1,1,1,2-Tetrachloroethane	521	ug/kg	50										<50	<50
1,1,1-Trichloroethane	3130	ug/kg	50										<50	<50
1,1,2,2-Tetrachloroethane	1190	ug/kg	50										<50	<50
1,1,2-Trichloroethane	-	ug/kg	50										<50	<50
1,1-Dichloroethane	-	ug/kg	50										<50	<50
1,1-Dichloroethylene	-	ug/kg	50										<50	<50
1,1-Dichloropropene	-	ug/kg	50										<50	<50
1,2,3-Trichloropropane	-	ug/kg	50										<50	<50
1,2,4-Trimethylbenzene	1060	ug/kg	50										<50	<50
1,2-dibromoethane	-	ug/kg	50										<50	<50
1,2-Dichlorobenzene	-	ug/kg	50										<50	<50
1,2-Dichloroethane	1.75	ug/kg	50										<50	<50
1,2-Dichloropropane	-	ug/kg	50										<50	<50
1,3,5-Trimethylbenzene	-	ug/kg	50										<50	<50
1,3-Dichlorobenzene	-	ug/kg	50										<50	<50
1,3-Dichloropropane	-	ug/kg	50										<50	<50
1,4-Dichlorobenzene	-	ug/kg	50										<50	<50
2,2-Dichloropropane	-	ug/kg	50										<50	<50
2-Chlorotoluene	-	ug/kg	50										<50	<50
4-Chlorotoluene	-	ug/kg	50										<50	<50
Benzene	95	ug/kg	10										<10	<10
Bromobenzene	-	ug/kg	50										<50	<50
Bromochloromethane	-	ug/kg	50										<50	<50
Bromodichloromethane	-	ug/kg	50										<50	<50
Bromoform	-	ug/kg	50										<50	<50
Bromomethane	-	ug/kg	50										<50	<50
Carbon tetrachloride	15	ug/kg	50										<50	<50
Chlorobenzene	62400	ug/kg	50										<50	<50
Chlorodibromomethane	-	ug/kg	50										<50	<50
Chloroethane	-	ug/kg	50										<50	<50
Chloroform	379	ug/kg	50										<50	<50
Chloromethane	-	ug/kg	50										<50	<50
Cis-1,2-Dichloroethylene	-	ug/kg	50										<50	<50
Cis-1,3-Dichloropropene	-	ug/kg	50										<50	<50
Dibromomethane	-	ug/kg	50										<50	<50
Dichlorodifluoromethane	-	ug/kg	50										<50	<50
Dichloromethane	-	ug/kg	50										<50	<50
Ethylbenzene	185000	ug/kg	10										<10	<10
Isopropyl benzene	-	ug/kg	50										<50	<50

Egremont Leachate and Surface Water Screening Assessment

Sample ID			Screening Values		TP-B	TP-C	TP-F	TP-G	TP-A	TP-D	Upstream	Downstream
					0.3	0.3	0.5	1.2	0.5	0.3	south of wall	TP-A
Depth			EQS FW	DWS								
	LOD	Units	in ug/l	in ug/l								
Hardness expressed as CaCO3	10	mg/l	-	-	-	-	-	-	-	-	86	83
Cd (Dissolved)	0.02	ug/l	0.09^	5	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Cyanide(Total)	0.05	mg/l	-	50	<0.05	0.09	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Cyanide(free)	0.05	mg/l	1~	-	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
pH			6-9*	-	7.9	8.2	7.7	8.6	7.6	7.8	7.7	7.3
As (Dissolved)	0.2	ug/l	50~	10	2.1	1.6	0.7	1.5	4.2	1.4	1.4	1.3
Boron	0.01	mg/l	-	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cr (Dissolved)	1	ug/l	4.7~	50	<1	<1	<1	<1	4	<1	<1	<1
Chromium VI	0.003	mg/l	3.4~	50	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003
Cu (Dissolved)	0.5	ug/l	6~	2000	1.4	0.8	<0.5	<0.5	1.2	0.8	<0.5	0.5
Pb (Dissolved)	0.3	ug/l	7.2^	10	3.3	1.4	0.4	0.4	10	1.8	1.1	<0.3
Hg (Dissolved)	0.05	ug/l	0.05~	1	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Ni (Dissolved)	1	ug/l	100~	20	<1	<1	<1	<1	<1	<1	<1	<1
Se (Dissolved)	0.5	ug/l	-	10	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	0.6	0.5
Sulphate	0.1	mg/l	-	250	160	11	0.8	<0.1	<0.1	<0.1	13	13
Zn (Dissolved)	2	ug/l	50~	-	<2	<2	<2	<2	<2	<2	7	3
Naphthalene	0.01	ug/l	2.4^	-	0.02	0.01	<0.01	<0.01	0.01	0.03	0.05	0.08
Acenaphthylene	0.01	ug/l	-	-	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthene	0.01	ug/l	-	-	0.06	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluorene	0.01	ug/l	-	-	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.01	ug/l	-	-	0.07	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	0.01	ug/l	0.1^	-	0.02	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoranthene	0.01	ug/l	0.1^	-	0.23	0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Pyrene	0.01	ug/l	-	-	0.19	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Anthracene	0.01	ug/l	-	-	0.11	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chrysene	0.01	ug/l	-	-	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(b/k)Fluoranthene	0.01	ug/l	0.03^	-	0.29	<0.10	<0.10	<0.10	<0.10	<0.10	<0.01	<0.01
Benzo(a)Pyrene	0.01	ug/l	0.05^	0.01	0.23	<0.10	<0.10	<0.10	<0.10	<0.10	<0.01	<0.01
Indeno(123-cd)Pyrene	0.01	ug/l	0.002^	-	0.27	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Benzo(ghi)Perylene	0.01	ug/l		-	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Dibenzo(ah)Anthracene	0.01	ug/l	-	-	0.19	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
PAH(total)	0.01	ug/l			1.9	<0.10	<0.10	<0.10	<0.10	<0.10	0.05	0.08
SUM of 4 PAHs "	-	ug/l		0.1	0.63	<0.30	<0.30	<0.30	<0.30	<0.30	<0.21	<0.21
Benzene	1	ug/l	10^	1	<1	<1	<1	<1	<1	<1	<1	<1
EthylBenzene	1	ug/l	20*	-	<1	<1	<1	<1	<1	<1	<1	<1
M/P Xylene	1	ug/l	-	30~	<1	<1	<1	<1	<1	<1	<1	<1
O Xylene	1	ug/l	-		<1	<1	<1	<1	<1	<1	<1	<1
Toluene	1	ug/l	50~		<1	<1	<1	<1	<1	<1	<1	<1
TPH (C5-C6 aliphatic)	0.01	mg/l	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C6-C8 aliphatic)	0.01	mg/l	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aliphatic)	0.01	mg/l	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH DW(C10-C12 aliphatic)	0.01	mg/l	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH DW(C12-C16 aliphatic)	0.01	mg/l	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH DW(C16-C21 aliphatic)	0.01	mg/l	-	-	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
TPH DW(C21-C35 aliphatic)	0.01	mg/l	-	-	<0.01	<0.01	0.26	<0.01	<0.01	<0.01	<0.01	<0.01
TPH (C35-C44 aliphatic)	0.01	mg/l	-	-	<0.01	<0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
TPH (C6-C7 aromatic)	0.01	mg/l	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C7-C8 aromatic)	0.01	mg/l	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH (C8-C10 aromatic)	0.01	mg/l	-	-	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TPH DW(C10-C12 aromatic)	0.01	mg/l	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH DW(C12-C16 aromatic)	0.01	mg/l	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH DW(C16-C21 aromatic)	0.01	mg/l	-	-	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
TPH DW(C21-C35 aromatic)	0.01	mg/l	-	-	<0.01	<0.01	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
TPH (C35-C44 aromatic)	0.01	mg/l	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Total Phenols	0.5	ug/l	7.7~	0.5	2.4	2.3	<0.9	3.4	1	2.5	<0.5	<0.5

Average harness = 84.5
* EQS Freshwater
^Inland Surface Waters
~ Good standards for rivers & FW Lakes (part IV pollutants)
" Sum of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, indeno(1,2,3cd)pyrene

Memo

APPENDIX C

M/P Xylene	-	ug/kg	10										<10	<10
	Commercial GAC		Sample Ref	TPB	TPB	TPC	TPF	TPF	TPG	TPG	TPA	TPA	TPD	TPD
Determinand	Screening Value		Depth	0.3	1.2	0.3	0.5	1.2	1.2	0.5	0.05	0.5	0.05	0.3
		Units	MDL											
n-Propylbenzene	-	ug/kg	50										<50	<50
O-Xylene	320000	ug/kg	10										<10	<10
p-Isopropyltoluene	-	ug/kg	50										<50	<50
S-Butylbenzene	-	ug/kg	50										<50	<50
Styrene	22500	ug/kg	50										<50	<50
T-Butylbenzene	-	ug/kg	50										<50	<50
Tetrachloroethene	823	ug/kg	50										<50	<50
Toluene	420000	ug/kg	10										<10	<10
Trans-1,2-Dichloroethene	-	ug/kg	50										<50	<50
Trans-1,3-Dichloropropene	-	ug/kg	50										<50	<50
Trichloroethene	55	ug/kg	50										<50	<50
Trichlorofluoromethane	-	ug/kg	50										<50	<50
Vinyl chloride	0.124	ug/kg	50										<50	<50
1,2,4-Trichlorobenzene	-	mg/kg	0.1										<0.1	<0.1
1,2-Dichlorobenzene	-	mg/kg	0.1										<0.1	<0.1
1,3-Dichlorobenzene	-	mg/kg	0.1										<0.1	<0.1
1,4-Dichlorobenzene	-	mg/kg	0.1										<0.1	<0.1
2,4,5-Trichlorophenol	-	mg/kg	0.1										<0.1	<0.1
2,4,6-Trichlorophenol	-	mg/kg	0.1										<0.1	<0.1
2,4-Dichlorophenol	-	mg/kg	0.1										<0.1	<0.1
2,4-Dimethylphenol	-	mg/kg	0.1										<0.1	<0.1
2,4-Dinitrophenol	-	mg/kg	0.1										<0.1	<0.1
2,4-Dinitrotoluene	-	mg/kg	0.1										<0.1	<0.1
2,6-Dinitrotoluene	-	mg/kg	0.1										<0.1	<0.1
2-Chloronaphthalene	-	mg/kg	0.1										<0.1	<0.1
2-Chlorophenol	-	mg/kg	0.1										<0.1	<0.1
2-methyl phenol	-	mg/kg	0.1										<0.1	<0.1
2-Methylnaphthalene	-	mg/kg	0.1										<0.1	0.2
2-Nitroaniline	-	mg/kg	0.1										<0.1	<0.1
2-Nitrophenol	-	mg/kg	0.1										<0.1	<0.1
3-Nitroaniline	-	mg/kg	0.1										<0.1	<0.1
3/4-Methylphenol	-	mg/kg	0.1										<0.1	<0.1
4-Bromophenyl phenylether	-	mg/kg	0.1										<0.1	<0.1
4-Chloro-3-methylphenol	-	mg/kg	0.1										<0.1	<0.1
4-Chloroaniline	-	mg/kg	0.1										<0.1	<0.1
4-Chlorophenyl phenylether	-	mg/kg	0.1										<0.1	<0.1
4-Nitroaniline	-	mg/kg	0.1										<0.1	<0.1
4-Nitrophenol	-	mg/kg	0.1										<0.1	<0.1
Acenaphthene	106000	mg/kg	0.1										<0.1	<0.1
Acenaphthylene	-	mg/kg	0.1										<0.1	<0.1
Anthracene	545800	mg/kg	0.1										0.3	0.3
Azobenzene	-	mg/kg	0.1										<0.1	<0.1
Benzo(a)Anthracene	14.2	mg/kg	0.1										0.9	1.3
Benzo(a)Pyrene	14.4	mg/kg	0.1										0.9	1.3
Benzo(b,k)Fluoranthene	-	mg/kg	0.1										1.9	2.6
Benzo(g,h,i)perylene	1450	mg/kg	0.1										0.5	1.3
Bis (2-chloroethoxy) methane	-	mg/kg	0.1										<0.1	<0.1
Bis (2-chloroethyl) ether	-	mg/kg	0.1										<0.1	<0.1
Bis (2-chloroisopropyl) ether	-	mg/kg	0.1										<0.1	<0.1
bis(2-Ethylhexyl)phthalate	-	mg/kg	0.1										<0.1	<0.1
Butylbenzylphthalate	-	mg/kg	0.1										<0.1	<0.1
Carbazole	-	mg/kg	0.1										<0.1	<0.1
Chrysene	14300	mg/kg	0.1										1	1.2
Di-n-butylphthalate	-	mg/kg	0.1										<0.1	<0.1
Di-n-octylphthalate	-	mg/kg	0.1										<0.1	<0.1
Dibenzo(a,h)Anthracene	14.4	mg/kg	0.1										<0.1	0.2
Dibenzofuran	-	mg/kg	0.1										<0.1	<0.1
Diethyl phthalate	-	mg/kg	0.1										<0.1	<0.1
Dimethyl phthalate	-	mg/kg	0.1										<0.1	<0.1
Fluoranthene	22760	mg/kg	0.1										2.1	2.6
Fluorene	72100	mg/kg	0.1										<0.1	<0.1
Hexachlorobenzene	-	mg/kg	0.1										<0.1	<0.1
Hexachlorobutadiene	-	mg/kg	0.1										<0.1	<0.1
Hexachlorocyclopentadiene	-	mg/kg	0.1										<0.1	<0.1
Hexachloroethane	-	mg/kg	0.1										<0.1	<0.1
Indeno(123-cd)Pyrene	144	mg/kg	0.1										0.4	0.9
Isophorone	-	mg/kg	0.1										<0.1	<0.1
Naphthalene	22700	mg/kg	0.1										<0.1	0.2
Nitrobenzene	-	mg/kg	0.1										<0.1	<0.1
Pentachlorophenol	-	mg/kg	0.1										<0.1	<0.1
Phenanthrene	-	mg/kg	0.1										1	1
Phenol	3300	mg/kg	0.1										<0.1	<0.1
Pyrene	54500	mg/kg	0.1										1.8	2.3

CAT-WASTE

Classification Assessment Tool of Soil Wastes - Hazard Summary Sheet

McArdle ATKINS

Site Name	Egremont
Location	Egremont, cumbria
Site ID	F1
Job Number	5113352#033
Date	2/21/2013 3:22:17 PM
User Name	richard.colin@atkinsglobal.com
Company Name	Atkins

Hole ID	Sample Depth	Hazardous Waste Y/N	H1	H2	H3A	H3B	H4	H5	H6	H7	H8	H9	H10	H11	H12	H13	H14	H15
TPB	0.3m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPB	1.2m	[redacted]	No	No	No	No	No	No	No	No	No	No	No	No	No	No	[redacted]	No
TPC	0.3m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPF	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPF	1.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPG	1.2m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPG	0.5m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPA	0.05m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPA	0.5m	[redacted]	No	No	No	No	No	No	No	No	No	No	No	No	No	No	[redacted]	No
TPD	0.05m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No
TPD	0.3m	N	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No	No