# **Cannock Chase District** Council

**Environmental Protection Act** 1990, Part 2A: Exploratory Site Investigation

Infilled Land off Blake Close and Burgoyne Street, Chadsmoor, Cannock

August 2011

#### Prepared for:

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# 1 INTRODUCTION

#### 1.1 Terms of Reference

In January 2010, Grontmij Limited (Grontmij) was appointed by Cannock Chase District Council (the Council) to assist in the implementation of the Council's Part 2A Contaminated Land inspection strategy. Part 2A of the Environmental Protection Act 1990 (Part 2A) requires each local authority to inspect areas of land which it believes may constitute Part 2A Contaminated Land.

Contaminated Land is defined in Section 78(2) of Part 2A of the Environmental Protection Act 1990 as:

"any land which appears to the local authority in whose area the land is situated to be in such a condition, by reason of substances in, on or under the land, that

- significant harm is being caused or there is a significant possibility of such harm being caused; or
- pollution of controlled waters is being, or is likely to be, caused.

Further information is provided in the Act and associated statutory guidance (DEFRA Circular 01/2006 – EPA 1990, Part 2A: Contaminated Land).

Grontmij assisted the Council to prioritise a list of sites which could constitute Part 2A contaminated land for inspection, on the basis of the Council's Part 2A Inspection Strategy. This site, which comprises the southern half of Blake Close, part of Burgoyne Street and open ground to the south of Burgoyne Street in Chadsmoor, Cannock, (hereafter referred to as 'the site') was identified as a priority for inspection as:

- The site is considered to be sensitive; 40 residential properties with gardens and public open space overly a former landfill, understood to have accepted inert and household waste
- The site is also underlain by a principal aquifer.

Following the completion of a desktop study (see Appendix A) and a successful application for funding from DEFRA, Grontmij was subsequently appointed by the Council to implement an initial exploratory investigation, which was undertaken in December 2010. Following a review of the investigation findings, supplementary fieldwork was undertaken in May 2011, as described in Section 3.

This report presents the findings of the exploratory investigation, assesses the significance of the contaminant concentrations detected, and makes recommendations for further work.

This report is subject to the limitations presented in Appendix B.



# 2 BACKGROUND INFORMATION

#### 2.1 Site Setting

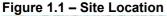
The site's setting and location are summarised in Table 2.1 and Figure 2.1. The site setting is also shown on Drawing 1.

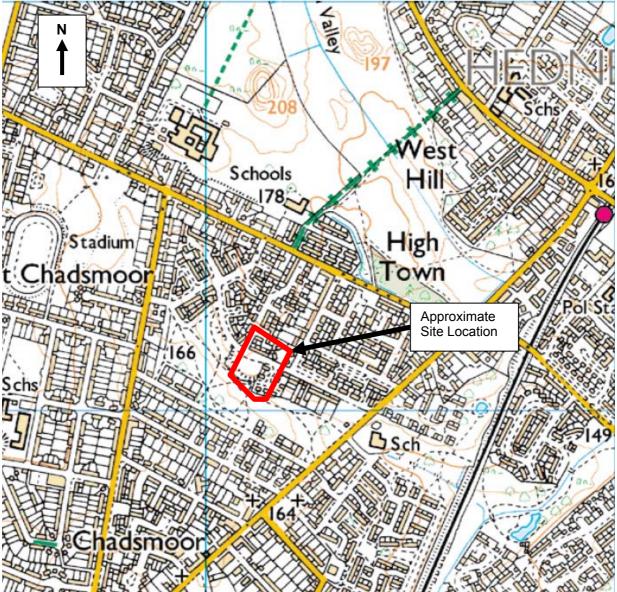
Table 2.1 - Site Setting

Data	Information
Address	Blake Close / Burgoyne St, Chadsmoor, Cannock, Staffordshire, WS11 5TZ
Current site use:	Residential houses and gardens with public open space at the southern end of the site
Grid Reference:	Centre of site is located at approximate NGR 399130,312185
Site Area:	The site is approximately 1.3Ha
Topography:	Site slopes gently down towards the south
Surrounding land use	Residential properties surround the site sites with two schools approximately 450m to the east and west of the site
Mapped Geology	British Geological Survey (BGS) mapping indicates the site is underlain by superficial deposits of Devensian Till over solid geology of the Kidderminster Formation (Sherwood Sandstone Group)
Hydrogeology	The Environment Agency website indicates the sandstone as a principal aquifer.
	Principal Aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.
Source Protection Zones (SPZs)	The Environment Agency website indicates that the site does not lie within a SPZ
Surface Waters	Streams indicated 530m north east and 700m east of the site
Historical Land Use	On site: Environment Agency data provided to the council indicates that the site was formerly operated as a landfill site. Environment Agency "What's In Your Back Yard" (WIYBY) website indicates the site was operational between 1948 and 1952. The landfill is recorded to have received inert and household waste from dwellings of various types including houses, caravans, houseboats, campsites, prisons and wastes from schools, colleges and universities. The site pre-dates the Control of Pollution Act 1974 and thus is unlikely to have operated under a formal license.
	Surrounding land use: information supplied by the council indicates that further areas immediately to the south-west and approximately 100m to the north-east of the study site may also have been subject to landfilling operations. No further data provided on WIYBY.
Ecologically designated sites <sup>1</sup>	Multi Agency Geographic Information for the Countryside (MAGIC) search indicates none within 500m of site boundary
Archaeological sites	Pastscape website indicates no scheduled monuments beneath or in proximity of the site

<sup>&</sup>lt;sup>1</sup> Includes sites designated as Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Special Area of Conservation (SAC, including candidate sites), Special Protection Area (SPA including potential sites), listed Wetlands of International Importance (Ramsar site) and Local Nature Reserves (LNR).







Reproduced from Ordnance Survey Map under licence AL549878 with permission from the Controller of HMSO, © Crown Copyright Plan is not to scale.

#### 2.2 Previous Reports

Grontmij has previously completed a desktop assessment of the site, as presented as Appendix A.

The assessment included the review of on-line data resources, in-house mapping and records provided by the council, and a site walkover.

The desk study report included an initial Conceptual Site Model (CSM) of potential pollutant linkages, developed in accordance with the model procedures<sup>2</sup> and statutory guidance<sup>3</sup>. The CSM is re-presented as Table 2.2 overleaf.

<sup>&</sup>lt;sup>3</sup> DEFRA Circular 02/2006, Environmental Protection Act 1990: Part IIA Contaminated Land, September 2006.



<sup>&</sup>lt;sup>2</sup> CLR11 Model Procedures for the Management of Land Contamination (EA & DEFRA September 2004)

#### Table 2.2 - Potential Pollutant Linkages

No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage <sup>1</sup>	Probability Of Linkage Occuring <sup>1</sup>	Overall Risk <sup>1</sup>	Comments
1	Residents of properties above infilled ground (including children playing in gardens)	Contaminants potentially including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) and asbestos within landfill material	Dermal contact and direct ingestion, inhalation of dust/vapours, consumption of home-grown vegetables	Medium	Likely	Moderate	Grass and/or topsoil coverage likely to mitigate risk to an extent – risk is greatest where possibly impacted soils are exposed or could be encountered, for example, when digging a vegetable patch or when children play outdoors. Properties are constructed directly above a potentially significant contamination source. Sample collection and analysis required to refine conclusion on risk
2	Residents of properties above infilled ground	Methane $(CH_4)$ /carbon dioxide $(CO_2)$ / carbon monoxide $(CO)$ / hydrogen sulphide $(H_2S)$ from decomposition of waste elements of landfill material	Movement into buildings, subsequent asphyxiation (CO2), explosion and oxygen depletion (CH4) and toxicity (CO, H2S) risks	Severe	Low to likely	Moderate to high	Elapsed timeframe since end of landfiling dictates risks are likely to be lower, i.e. decomposition gases have probably been slowly released over time. Nonetheless, installation and monitoring of wells for gases and flow rates is required to refine conclusion on risk
3	Subsurface services serving the buildings (principally water supply)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) within landfill material.	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM
4	Property (Structures) – residential buildings on site	Decomposable or compressible elements of infill	Differential settlement of infill, causing structural failure of buildings	Medium	Low to likely	Moderate	Make preliminary inspection of structures during site investigation



No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage <sup>1</sup>	Probability Of Linkage Occuring <sup>1</sup>	Overall Risk <sup>1</sup>	Comments
5	Property - building foundations	Sulphate and pH	Contact between sulphate (as a contaminant) and concrete	Medium	Low to Likely	Low to moderate	Examine sulphate concentrations as a preliminary step
6	Principal aquifer (Sherwood Sandstone) beneath site	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material.	Leaching of soil contaminants to aquifer – no aquiclude is indicated on BGS mapping	Medium	Likely	Moderate	Risk will depend upon depth and concentration of contaminants, confirmation of whether low permeability drift deposits are present beneath Made Ground and the leaching potential of contaminants. Investigation required to determine risk.

<sup>1</sup> Taken from Table 6.3, CIRIA report 552 (Contaminated Land Risk Assessment – A Guide to Good Practice. Severity classified as minor, mild, medium or severe. Probability classified as unlikely, low, likely or high. Overall risk considers both the severity and probability of the linkage (very low, low, moderate, high or very high). See extract in Appendix B



# 3 EXPLORATORY INVESTIGATION

In order to further examine the potential pollutant linkages identified in Table 2.2, and following a successful application for DEFRA funding, an exploratory site investigation was undertaken on the 6<sup>th</sup> and 10<sup>th</sup> of December 2010. This section describes the site investigation undertaken and results obtained.

# 3.1 Scope and Methodology

The intrusive site investigation included the following:

- A consultation exercise with residents living at the site, including a mailshot and a public open evening;
- Obtaining plans of underground services and CAT-scanning proposed drilling locations, using a Radiodetection CAT1 and signal generator;
- Drilling four hand held window sample holes (WS1 WS4) to a maximum depth of 3.0m bgl, at the locations shown on Drawing 1. The window sample holes, which were drilled by Sherwood Drilling Services, were positioned in the rear gardens of housing located above the extent of infill, as indicated on historical mapping and by anecdotal evidence. Window sample hole positions were selected on the basis of achieving representative coverage of the site. The purpose of the window sample holes was to examine shallow and deeper soil conditions, enable the retention of soil samples for laboratory testing, and facilitate the installation of 50mm diameter dedicated gas monitoring wells in each borehole;
- Completion of five hand dug pits (PSWHP01 to PSWHP05) which were advanced to a maximum depth of 0.7m, to examine shallow soil conditions and supplement the coverage of the site provided by the above window sample holes;
- Logging soil arisings in accordance with BS5930:1999, and additionally noting any visual or olfactory evidence of potential contamination;
- Retaining representative soil samples of the strata encountered, which were selected on the basis of field observations of potential contamination and achieving good spatial and depth coverage of the site, in accordance with BS10175:2001 (since updated in 2011)
- Submitting retained samples to Alcontrol Geochem in cooled coolboxes and under chain of custody documentation, and instructing the analysis of samples, and;
- Undertaking four ground gas monitoring rounds, using a Gas Data Ltd GFM435 gas analyser with integral flow pod.

#### 3.2 Results

#### 3.2.1 Ground Conditions

The ground conditions encountered at the site generally comprised clayey topsoil (where present) over predominantly granular Made Ground, over residual soils (encountered either as sand, or as sand and gravel).

#### Made Ground

Made Ground was encountered as "fill" in exploratory holes – WS1, WS3 and WS4, and in hand dug pit locations PSWHP02 and PSWHP05. The Made Ground was encountered primarily in the east and south of the site, to a maximum depth of 1.9m bgl (in WS4) and was predominantly granular in nature, comprising silty sand and gravel grading to cobbles, occasionally clayey. The



gravel content of the Made Ground was variable, including fine to coarse quartz and sandstone, with occasional brick and concrete.

Made Ground was encountered as topsoil in WS2 and PSWHP01, PSWHP03 and PSWHP04, to a maximum depth of 0.4m bgl.

Municipal waste was not encountered.

#### Devensian Till /Kidderminster Formation

Weathered residual soils of the solid geology, comprising silty, clayey sands and gravels were encountered beneath the Made Ground (where present) or from 0.05m bgl, to exploratory hole termination at 3.0m bgl.

#### Groundwater

No groundwater entries were observed.

The above findings are discussed further in Section 4 (updated CSM). Window sample hole logs, providing full details of the strata encountered, are included within Appendix C.

#### 3.2.2 Adequacy of Investigation Depth and Extent

Weathered residual soils (i.e. natural ground) were proven in all window sample holes drilled with the exception of WS3, which was terminated at the shallowest depth of the four window sample locations. Natural ground was also encountered in all hand dug pit locations, which were advanced to a maximum of 0.7m bgl, with the exception of PSWHP02.

While further exploratory holes would always be desirable in most investigations, the exploratory investigation is deemed to have provided reasonable spatial and depth coverage of the site.

#### 3.2.3 Field Evidence of Contamination

The drilling arisings were inspected for visual and olfactory evidence of potential contamination. A summary of field observations recorded is presented in Table 3.1:

Exploratory Hole	Visual and Olfactory Evidence of Contamination
WS3	1.0-1.5m bgl: Made Ground contains ash
WS4	0.11-1.79m bgl: Made Ground contains ash 1.79-1.9m bgl: Made Ground contains ash

 Table 3.1 – Field Evidence of Potential Contamination

#### 3.2.4 Soil Analysis Results

Twelve samples were submitted for laboratory analysis, under chain of custody documentation and within chilled coolboxes, to ALcontrol Geochem of Deeside. ALcontrol is UKAS accredited and holds MCERTS accreditation for most analyses performed. The samples were selected for analysis on the basis of the observations of potential contamination made in the field, and to achieve good spatial coverage of the site.

Table 3.2 presents a summary of the analysis results. The results have been compared to screening values protective of human health, assuming the receptor is a residential property where plant uptake of contaminants occurs, and the plants (vegetables) are subsequently ingested by humans. The screening values used in preference comprise:



- 2009 Soil Guideline Values (SGVs) published by the Environment Agency / DEFRA, generated using the Contaminated Land Exposure Assessment (CLEA) model, version 1.04 (now available as V1.06)
- Generic Assessment Criteria (GAC) published by Land Quality Management Limited<sup>4</sup> (LQM) and the Environmental Industries Commission<sup>5</sup> (EIC), or calculated by Grontmij, all using CLEA<sup>6</sup>
- SGVs published by the Environment Agency / DEFRA between 2002 and 2007, calculated using prior versions of the CLEA model. This only applies to lead.

Full analytical testing results are included as Appendix D.

<sup>&</sup>lt;sup>6</sup> EIC used CLEA V1.06, LQM and Grontmij used CLEA 1.04



<sup>&</sup>lt;sup>4</sup> The LQM/CIEH Generic Assessment Criteria for Human Health Risk Assessment (2<sup>nd</sup> Edition). Land Quality Press, 2009

<sup>&</sup>lt;sup>5</sup> Soil Generic Acceptance Criteria for Human Health Risk Assessment. Environmental Industries Commission / AGS / CL:AIRE, January 2010

Table 3.1 – Soli Analysis Rest					
Determinand	No. of Samples Tested	Minimum Value	Maximum Value	SGV / GAC (using 2.5% SOM where	Locations where SGV or GAC are exceeded
				SOM-	
				dependant) <sup>1</sup>	
Arsenic	11	2.5	7.1	32	-
Beryllium	11	0.22	0.97	51	-
Boron (water-soluble)	11	<1.0	<1.0	291	-
Cadmium	11	<0.02	0.53	10	-
Chromium, hexavalent	11	<0.60	<1.2	4.3	-
Chromium, total	11	5.6	13	3000 <sup>2</sup>	-
Copper	11	8.6	40	2330	-
Lead	11	4.2	35	450 <sup>3</sup>	-
Mercury <sup>4</sup>	11	<0.14	<0.14	170	-
Nickel	11	5.3	14	130	-
Selenium	11	<1.0	<1.0	350	-
Vanadium	11	9.2	17	75	-
Zinc	11	21	96	3750	-
Asbestos screen	6		No fibres detec	ted	-
BTEX and TPH-CWG <sup>5</sup>	3	TPH-CWG BTEX, we	he banded aliph screening criter ere exceeded. I ire presented in	-	
Polycyclic Aromatic Hydrocarbons (PAHs)	7			AC for individual of result below:	-
Benzo(a)pyrene	7	<0.02	3.6	0.94	WS3 @ 0.7m bgl; WS4, 0.3m, 0.7m and 1.5m bgl
Volatile Organic Compounds and Semi-Volatile Organic Compounds (excl results above)	3	Below laboratory detection limit, with exception of results below:			-
Dichloromethane	3	<0.01	0.013	0.98	-
Carbazole	3	<0.10	0.34	None <sup>6</sup>	-

Table 3.1 – Soil Analysis Results Summary

Values presented in mg/kg, correct to two significant figures (screening values presented without any rounding). **Bold values** indicate locations where observed concentrations exceed the screening value.

<sup>1</sup> Eleven samples were tested for Soil Organic Matter (%SOM) content. A minimum value of 0.9% and a maximum of 3.4% were recorded, with a mean of 2.3% and median of 2.4%. It is therefore justified, where SGVs or GAC are influenced by SOM, to use the SGVs and GAC generated using a 2.5% SOM value in CLEA in an initial screen.

<sup>2</sup> Value is for trivalent chromium; a screening value for total chromium has not been published. Screening a total chromium laboratory result against a trivalent chromium screening value is a conservative measure. Hexavalent chromium, the form considered to be of greater toxicity, was not detected at a concentration above the detection limit of the laboratory.

<sup>3</sup> Earlier (2002) SGV published by DEFRA. An updated SGV may be published once the EA has evaluated a recent European Food Safety Authority toxicology report and confirmed the approach to be adopted for lead (CLEA may not be used). <sup>4</sup> Testing results presented represent total mercury, whereas SGV presented is for increasis mercury. Although the

<sup>4</sup> Testing results presented represent total mercury, whereas SGV presented is for inorganic mercury. Although the most stringent of the SGVs is for elemental Mercury, the Environment Agency SGV for mercury in soil science report SC050021/Mercury SGV indicates that in cases where preliminary risk assessment has not identified a mercury issue at the site or conditions such as peaty or flooded soils then '*For general surface contamination and to simplify the assessment, the SGVs for inorganic mercury can normally be compared with chemical analysis for total mercury content because the equilibrium concentrations of elemental and methylmercury compounds are likely to be very low*'

<sup>5</sup> Benzene, toluene ethyl benzene and xylenes, and Total Petroleum Hydrocarbon Criteria Working Group

<sup>6</sup> GAC not published / calculated. The EIC (2010) considered calculating a GAC for carbazole but concluded that insufficient toxicological data was available at the time to derive a Heath Criteria Value (HCV), which is fundamental in the derivation of GAC in CLEA.



# 3.2.5 Soil Leachate Analysis Results

Three soil samples were submitted for soil leachate analysis (BS12457 2:1 single stage test, which supersedes the older NRA leachate test) at Alcontrol. The samples comprised the most likely soils to contain elevated contaminant concentrations, based upon field observations (and included a sample from WS1, 2.3m to 2.5m, from which elevated concentrations of metals were detected in the solid phase analysis). Table 3.2 presents a summary of the analysis results.

Where such threshold values have been published, the testing results have been compared to groundwater threshold values quoted in the River Basin Districts Typology, Standards and Groundwater Threshold Values (Water Framework Directive) (England and Wales) Directions 2010 ("WFD values") and, where no WFD standard exists, UK Drinking Water Standards listed in the Water Supply (Water Quality) Regulations 2000 (as amended).

Full analytical testing results are included in Appendix D.

Contaminant	No of Samples Tested	Minimum Value	Maximum Value	Groundwater Thresholds
Arsenic	3	1.1	1.2	7.5
Boron	3	19	22	750
Cadmium	3	<0.01	<0.01	3.75
Chromium	3	3.7	4.0	50
Copper	3	2.9	4.1	1500
Lead	3	0.37	0.45	10
Nickel	3	0.92	1.1	15
Vanadium	3	1.7	1.9	n/s
Zinc	3	1.2	2.0	3750
Mercury	3	0.01	0.03	0.75
Benzene	3	< 1.0	< 1.0	0.75
Toluene	3	< 1.0	< 1.0	n/s
Xylene	3	<2.5	<2.5	n/s
Naphthalene	3	<3.5	<3.5	n/s
Benzo(a)pyrene	3	<1.0	<1.0	0.01
Sum of Benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, indeno(1,2,3- cd)pyrene*	3	<4.0	<4.0	0.10
Volatile Organic Compounds and Semi-Volatile Organic Compounds (excluding above)	3	All concentrations detecti	Various	

#### Table 3.2 - Soil Leachate Analysis Results Summary

Values are presented as ug/l and are rounded as applicable to the screening values used.

n/s – no standard

\*There are no screening values in the WSWQ Regulations 2000 (as amended) for the remaining commonly analysed 16 PAH compounds



The concentrations of analytes in leachate were all below the adopted groundwater quality standards and/or below the laboratory method detection limit, indicating minimal leaching of contaminants.

#### 3.2.6 Ground Gas Monitoring

Four rounds of ground gas monitoring were undertaken, using a Gas Data GFM435 gas analyser with internal flow pod. A summary of the maximum gas monitoring results recorded in each well is presented in Table 3.3, with full monitoring data in Appendix E.

Well	Maxim	imum Values Recorded During Monitoring Events:			Gas Screening Value <sup>1</sup> (l/hr)	Situation "A" Characteristic		
	Peak CH₄ (%)	Steady CO <sub>2</sub> (%)	Steady CO (ppm)	Steady H₂S (ppm)	Flow (l/hr)		Situation <sup>1</sup>	
WS1	0.1	1.7	0	0	0.6	0.01	1	
WS2	0.1	1.4	0	0	0.7	0.01	1	
WS3	0.1	3.0	0	0	0.1	<0.01	1	
WS4	0.1	0.9	0	0	1.4	0.01	1	
A	tmospheric	;	28/01/2011 1009mb (Steady)					
	Pressure:		11/02/2	011		995mb (fa	alling trend)	
	25/02/2011						o(steady)	
			11/03/2	011		998mb (fa	alling trend)	

Table 3.3 - Summary	v of Gas	Monitoring	Data
Table 3.3 - Summar	y UI Uas	wontoning	Data

Readings obtained within a 3 minute measurement period, obtained with a Gas Data 435 gas analyser with internal flow pod.  $CH_4$  – methane;  $O_2$  – oxygen;  $CO_2$  carbon dioxide; CO – carbon monoxide;

 $H_2S$  – hydrogen sulphide; mbgl – metres below ground level mb – millibars l/hr – litres per hour.

<sup>1</sup>Gas Screening Value and Characteristic Situation based on methodology presented in CIRIA Report C665, Assessing Risks Posed by Hazardous Gases to Buildings. Where the flow rate recorded in the field is zero or negative, a flow of 0.01 l/hr is assumed

The summary data presented above indicates that, in regard to methane and carbon dioxide, CIRIA characteristic situation CS1 applies to all of the wells. This is the lowest risk category (of six) presented in CIRIA report 665, and indicates that no special gas precautions would be required in the construction of new buildings.

Additionally, carbon monoxide and hydrogen sulphide were not detected at concentrations in excess of the gas analyser detection limit. This dataset indicates that the inhalation risk posed by these gases is negligible.

#### 3.2.7 Safety of Water Supply Pipes

As a preliminary assessment, soil quality data was screened against WRAS guidelines<sup>7</sup> (current at the time of the initial investigation, but now superseded) and UKWIR parameters<sup>8</sup>. This preliminary assessment, included as Appendix G, indicated that the concentration of contaminants in soil could potentially permeate into water supply pipes. The WRAS and UKWIR guidelines are conservative and are normally used for the selection of materials when laying new pipes.

To confirm whether the concentrations of contaminants in the shallow Made Ground pose a risk to drinking water quality at the site, samples of drinking water were collected from taps from two properties (Numbers 3A and 83 Blake Close) on 18<sup>th</sup> May 2011. The samples were taken from

<sup>&</sup>lt;sup>8</sup> 10/WM/03/21 Guidance for the Selection of Water Supply Pipes to be Used in Brownfield Sites. UK Water Industry Research, 2010 (as re-issued)





<sup>&</sup>lt;sup>7</sup> 9-04-03 The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land. Water Regulations Advisory Scheme, October 2002.

properties where the highest concentrations of contaminants were encountered in soil, i.e. at locations where the greatest risk to drinking water quality may be posed.

As agreed with Cannock Chase Council, samples were obtained after allowing the tap to run for one minute. The samples were submitted to Alcontrol Laboratories for chemical analysis for metals, BTEX and PAHs as commonly occurring contaminants and parameters for which drinking water standards can be applied. The results of the analyses are summarised in Table 3.4, along with a comparison to UK Drinking Water Standards (UKDWS) taken from the Water Supply (Water Quality) Regulations 2000 (as amended). Full testing results are included in Appendix D:

Contaminant	No of Samples Tested	Minimum Value µg/l	Maximum Value µg/l	UKDWS µg/l
Arsenic	2	1.4	2.1	10
Boron	2	86	130	1000
Cadmium	2	0.12	0.20	5.0
Chromium	2	8.0	13	50
Copper	2	25	740	2000
Lead	2	0.17	0.31	10
Nickel	2	0.99	4.3	20
Zinc	2	15	610	5000
Mercury	2	<0.01	<0.01	1.0
Sum of Benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, indeno(1,2,3- cd)pyrene*	2	<0.08	<0.08	0.10
Benzo(a)pyrene*	2	<0.009	<0.009	0.01

Table 3	4- Tar	) Water	<b>Analys</b>	is Results
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\*There are no screening values in the WSWQ Regulations 2000 (as amended) for the remaining commonly analysed 16 PAH compounds

The maximum recorded metal and PAH concentrations within tap water did not exceed the corresponding UK Drinking Water Standards, where standards exist.

#### 3.2.8 Concrete Attack

As a preliminary screen, soil samples were retained and analysed for pH (11 no) and water soluble sulphate to the BRE 2:1 extract method (3 no) at Alcontrol Laboratories. The range of results obtained were as follows:

- pH ranged from 7.1 to 8.6
- water soluble sulphate ranged from <0.008 g/l to 0.02 g/l

With reference to BRE Special Digest 1:2005 "Concrete in Aggressive Ground", these preliminary results suggest that the ground conditions at the site are unlikely to be particularly aggressive to subsurface concrete.



# 4 FURTHER ASSESSMENT OF HUMAN HEALTH RISK

The site investigation has established that the concentration of benzo(a)pyrene in four samples (of seven tested) exceeds the generic screening value applicable to the generic residential housing scenario, where plants are grown for human consumption. The remaining three samples obtained at <0.7m bgl depth and analysed at the laboratory did not contain benzo(a)pyrene concentrations in excess of the SGV.

Generic SGVs and generic acceptance criteria (GAC) represent concentrations of contaminants, above which unacceptable impacts <u>may</u> occur and further assessment is generally required. Exceedance of SGVs or GAC does not necessarily mean that a significant possibility of significant harm ("SPOSH" - i.e. unacceptable risk to human health or the environment) is posed to human health. The SGVs and GAC have been derived using the CLEA model by various parties (see Section 3.2.3), using conservative input parameter values to generate screening values applicable, theoretically, to all UK sites. Therefore, an exceedance of a SGV or GAC does not necessarily mean that SPOSH exists - only that a generic, conservative screening value has been exceeded, and further assessment is required.

# 4.1 Statistical Analysis Approach

Guidance regarding how data collection, data review and statistical testing interact to produce defensible conclusions regarding the condition of land is provided within Part 2A of the Environmental Protection Act 1990 and Guidance on Comparing Soil Contamination Data with a Critical Concentration<sup>9</sup> ("the guidance").

In order for statistical analysis to be applied, the dataset under inspection should strictly be the result of an unbiased sampling strategy. While there are a number of reasons why the sampling strategy could be viewed as biased, we conclude that the strategy was as close to being unbiased as possible, as discussed below:

- Parts of the site, such as areas beneath houses and roads, were not accessible, thus some soils were much less likely to be sampled than others. However, it would be unreasonable to attempt to sample such soils in an initial investigation, and samples taken from garden areas are likely to be representative of infill material beneath the site as a whole (while acknowledging that recent additional made ground may have been placed to form structures)
- Residents were, in some cases, reluctant for some parts of their gardens to be disturbed, meaning that some soils were unlikely to be tested but again, it is likely that the area available for sampling is likely to be representative of garden areas across the site as a whole
- Within each exploratory hole, contaminated land practitioners typically sample and analyse
  a "representative worst case" sample of the soil encountered so, while a very small
  pocket of ash within otherwise "clean" soil may not be analysed, samples would typically
  be taken of a 0.2m wide band of ash, rather than from the "clean" soil above or below such
  a band. Such sampling and testing is desirable, as it gives an indication of "representative
  worst case" conditions. Thus, while such sampling is arguably biased, the bias is towards
  over-estimating typical concentrations of contaminants in the soil across the site. Thus, if
  the average concentration of such "representative worst case" samples is below the SGV
  or GAC, it follows that soil conditions across the site as a whole are also likely to be below
  the relevant SGV or GAC.

<sup>&</sup>lt;sup>9</sup> The Chartered Institute of Environmental Health, CL:AIRE and The Soil and Groundwater Technology Association; May 2008.





Statistical analysis of the dataset has therefore been undertaken, as described below.

# 4.2 Averaging Areas

The first step of statistical analysis is to define the "averaging area" over which data would be examined. An averaging area is an area of soil which, when sampled, is considered to provide a representative indicator of how much contaminant a receptor is exposed to.

Based on the history of the site (i.e. all the site is thought to be underlain by infill) and current use of the site (i.e. residential housing, with minor areas of lower sensitivity), the entire site was defined as a single averaging area, and all recorded benzo(a)pyrene concentrations in the soil obtained at <0.7m bgl depth were examined as a single dataset.

It could be argued that each residential property should be defined as a single averaging area, based upon the exposure of each individual receptor. However, as the goal of the investigation is to examine whether there is a significant possibility of significant harm (SPOSH) to sensitive receptors at the site *as a whole* (as characterised by the samples obtained and tested), and given that it was excessively intrusive to residents to obtain and test multiple samples from each garden during an initial investigation, such an approach was rejected.

#### 4.3 Outlier Test

The second stage of statistical analysis requires a test to identify whether any outliers, potentially indicative of laboratory error or a separate population of data (for which a separate averaging area should be defined), are present.

The Guidance indicates that an outlier should only be excluded from a population of data if

<u>The outlier is obviously and demonstrably the result of an error that can be identified and explained</u> - in which case the correct value should be identified and the dataset amended, where possible, or the erroneous value excluded with justification, or

The outlier clearly indicates that more than one soil population exists within the dataset and this can be justified by (or informs the further development of) the conceptual model - in which case the different population expressed by the outlier(s) should be explored in more detail either by reviewing and refining zoning decisions and treating outlier values as a separate population or even individually or, if necessary, by undertaking further site sampling to verify conditions in the vicinity of outlier values.

# In all other cases, outlying data should be assumed to be genuine and reflective of the full range of soil concentrations to which receptors may be exposed.

The ESI Limited Statistical Calculator has been used to test for outliers. The Calculator applies Grubb's Test to the entire dataset, but first requires the user to manually check that the dataset (excluding maximum value) is normally distributed, otherwise the test is not applicable. The dataset excluding maximum value was therefore checked, and was identified to be normally distributed.

The Calculator subsequently confirmed that there are no outliers within the dataset, which indicates that there are not "hotspots" of contamination, potentially representative of a separate data population, which could require further and separate assessment.



## 4.4 Hypothesis Testing

The second stage of statistical analysis is to define a null and alternative hypothesis and examine whether the null hypothesis should be rejected.

In a Part 2A scenario, the null  $(H_0)$  and alternative  $(H_1)$  hypothesis to be tested is:

'Is there sufficient evidence that the true mean concentration of the contaminant ( $\mu$ ) is greater than the critical concentration (Cc)?'.

The Null Hypothesis (H<sub>0</sub>) and the Alternative Hypothesis (H<sub>1</sub>) are therefore:

- $H_0 \quad \mu \leq C_c$  i.e. the true mean concentration is equal to or less than the critical concentration
- $H_1 \quad \mu > C_c$  i.e. the true mean concentration is greater than the critical concentration

The "critical concentration" is the adopted benzo(a)pyrene residential SGV at 2.5% SOM of 0.94mg/kg.

The Guidance provides a detailed explanation of the hypothesis testing procedure, which includes comparison of the lower confidence limit of the (estimated) mean value with the critical concentration, to provide additional assurance that the (true) mean is also below the critical concentration at a defined level of confidence (conventionally 95%; this value has been adopted in this case).

The guidance also states that in the Part 2A scenario, if the sample mean is less than the critical concentration (C<sub>c</sub>), the lower confidence limit of the sample mean must also be below the critical concentration, and the Null Hypothesis cannot be rejected.

The ESI Calculator has been used to calculate the mean of the recorded benzo(a)pyrene concentrations across the averaging area (the site), which is **1.21mg/kg**. This value is above the critical concentration of 0.94mg/kg, so the lower confidence limit (LCL) of the sample mean is now considered. The LCL has been calculated to be 0.29mg/kg, i.e. less than the critical concentration.

On the basis of the above data, the null hypothesis cannot be rejected at a 95% level of confidence, as the LCL is less than the critical concentration. In this scenario, the Guidance indicates that the hypothesis test should be repeated on a "balance of probabilities" approach, whereby the null hypothesis should be rejected if the level of confidence against the null hypothesis is greater than 51%. The ESI calculator has been used to assess the level of confidence against the null hypothesis, which is reported to be **70%**.

On this basis, the null hypothesis is rejected, i.e. the statistical analysis indicates that with an 70% level of confidence, the true mean concentration of benzo(a)pyrene beneath the averaging area (whole site) is likely to exceed the adopted GAC of 0.94mg/kg. This finding theoretically indicates that further assessment of benzo(a)pyrene concentrations at the site, or possibly remediation, is necessary. However, remediation is unlikely to be necessary, as discussed in Section 4.5.



## 4.5 Discussion

While the above section indicates that the likely true average concentration of benzo(a)pyrene beneath the site may pose a risk to the health of residents at the site, it is important to consider the wider context of the assessment, as outlined below

- 1. The above assessment indicates that the true average concentration of benzo(a)pyrene at the site is likely to be around 1.2mg/kg. This value exceeds, slightly, the adopted GAC of 0.94mg/kg.
- 2. A GAC is a general screening value, applicable to all UK soils. Concentrations of contaminants below the GAC are highly unlikely to pose a health risk. Concentrations slightly above a GAC do not necessarily mean that the health of residents could be adversely affected; only that a conservative generic value has been exceeded.
- 3. GAC are calculated on the basis of a number of conservative assumptions in regard to human exposure to contaminants. GAC also draw upon the findings of high-dose experiments on laboratory animals, to extrapolate the effects of low doses of contaminants on humans. Given this uncertainty, a degree of conservatism is built into the GAC.
- 4. It is generally accepted within the industry that GAC for some compounds, including benzo(a)pyrene, are particularly conservative. Grontmij is aware of studies, using a "Margin of Exposure" assessment route, where benzo(a)pyrene residential screening values of 3.6mg/kg and 14mg/kg have been proposed by researchers or accepted by regulators. The Margin of Exposure assessment method involves, briefly:
  - a. Examination of the results of toxicological studies to determine a "point of departure" (PoD) concentration, above which adverse health effects are observed
  - b. Comparison of the point of departure to the estimated human exposure to the contaminant (i.e. probably the mean concentration observed at the site), to calculate Margin of Exposure (MoE), i.e. MoE = PoD / estimated exposure
  - c. MoE > 100,000 is considered to be acceptable, i.e. if excess lifetime risk of cancer is less than 1 in 100,000, risk is tolerable.

On the basis of the above points, it seems unlikely that a mean benzo(a)pyrene concentration of 1.2mg/kg poses a significant possibility of significant harm (SPOSH) to the health of residents at the site.

#### 4.6 Conclusion

The objective of this Part 2A assessment is to determine whether a significant possibility of significant harm (SPOSH) to sensitive receptors could be caused by contaminants beneath the site. It is unlikely that a SPOSH to human health could be caused by the likely average concentration of benzo(a)pyrene beneath the site. Therefore, the available evidence does not indicate that the site constitutes Contaminated Land with respect to the benzo(a)pyrene concentrations recorded in soil.



# 5 UPDATED CONCEPTUAL SITE MODEL

The CSM presented in the earlier Grontmij desk study report (Appendix A) was updated, using the findings of the site investigation, as presented overleaf.



Table 5.1 – Pollutant Linkages, Post-Site Investigation
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No	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage <sup>1</sup>	Probability of Linkage Occuring <sup>1</sup>	Overall Risk <sup>1</sup>	Comments
1	Residents of properties above infilled ground – inc. children playing in gardens	Contaminants potentially including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) and asbestos within landfill material	Direct ingestion/dermal contact/inhalation of dust/inhalation of vapours/consumption of home-grown vegetables	Medium	Unlikely	Low	Benzo(a)pyrene was detected in shallow soils at concentrations of up to 3.6mg/kg, but statistical analysis indicates average b(a)p concentrations unlikely to pose a significant possibility of significant harm to human health. All other contaminant concentrations below SGVs / GAC. No further assessment required
2	Residents of properties above infilled ground	Methane (CH <sub>4</sub> ) /carbon dioxide (CO <sub>2</sub> ) / carbon monoxide (CO) / hydrogen sulphide (H <sub>2</sub> S) from decomposition of waste elements of landfill material	Movement into buildings, subsequent asphyxiation (CO2), explosion and oxygen depletion (CH4) and toxicity (CO, H2S) risks	Severe	Unlikely	Low/moderate	Low gas concentrations and flow rates identified. No further assessment required (risk level of "low/moderate" is the lowest possible rating where the potential severity of the hazard is considered "severe")
3	Subsurface services serving the buildings (principally water supply)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) within landfill material.	Chemical attack and tainting of water supply could occur at severe pH levels	Medium	Low	Low / Moderate	Although contaminant concentrations in shallow soils exceed guidelines, samples from taps indicate dissolved contaminant concentrations below drinking water standards No further assessment proposed



No	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage <sup>1</sup>	Probability of Linkage Occuring <sup>1</sup>	Overall Risk <sup>1</sup>	Comments
4	Property (Structures) – residential buildings on site	Decomposable or compressible elements of infill	Differential settlement of infill, causing structural failure of buildings	Medium	Low	Low / moderate	Although a detailed inspection of buildings has not been undertaken, no obvious evidence of structural failure was noted and all properties at the site appear to be currently occupied. As buildings appear to be fit for occupancy, it is unlikely that significant harm to the building has been caused or is being caused (ref: DEFRA Circular 01/2006 p86 – this is statutory guidance accompanying the Environmental Protection Act 190.
5	Property - building foundations	Sulphate and pH	Contact with foundations	Medium	Unlikely	Low	Preliminary testing suggests conditions are unlikely to be particularly aggressive to concrete. No further assessment proposed
6	Principal aquifer (Sherwood Sandstone) beneath the site	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material.	Vertical contaminant migration within unsaturated zone (Made Ground and superficial deposits)	Medium	Unlikely	Low	Leachable concentrations of contaminants examined in preliminary analysis all less than adopted groundwater quality standards and/or below laboratory detection limit. No further assessment proposed

1 Taken from Table 6.3, CIRIA report 552 (Contaminated Land Risk Assessment – A Guide to Good Practice. Severity classified as minor, mild, medium or severe. Probability classified as unlikely, low, likely or high. Overall risk considers both the severity and probability of the linkage (very low, low, moderate, high or very high). See Appendix F for further details



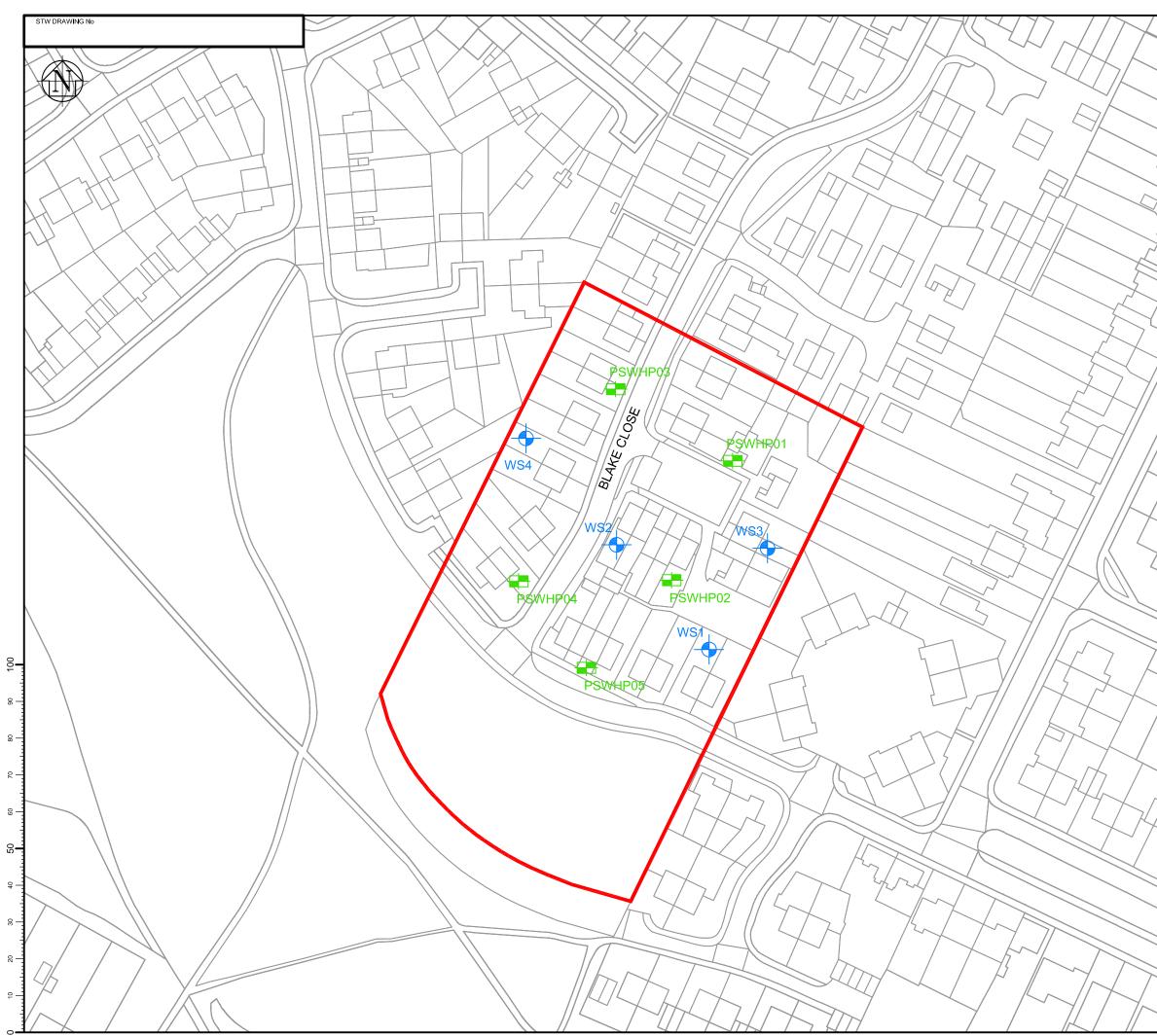
# 6 SUMMARY AND CONCLUSION

- Review of historical mapping and EA records provided to Cannock District Council, plus anecdotal evidence obtained during public consultation, identified that land at Blake Close / Burgoyne Street, Chadsmoor, Staffordshire was infilled with inert and household waste prior to 1974 (i.e. within an unregulated regime). The waste material potentially posed a risk to human health, water supply pipes and controlled waters.
- An exploratory investigation encountered a maximum of 1.9m of infill material, which was noted to contain ash within two of the nine exploratory holes advanced.
- Chemical analysis identified that concentrations of contaminants in Made Ground generally did not exceeded generic human health screening criteria. Further analysis of benzo(a)pyrene data suggested that the concentrations of this chemical beneath the site are unlikely to pose a significant health risk. It is therefore considered that land beneath the site is unlikely to pose a significant risk of significant harm to human health.
- Concentrations of several chemicals in the soil exceeded conservative screening criteria adopted for the protection of water pipework. Sampling of drinking water quality at consumers' taps identified that dissolved contaminant concentrations were all below UK drinking water standards. No further assessment is proposed.
- Gas monitoring has identified that the concentrations and flow rates of hazardous gases beneath the site are unlikely to pose a human health or explosion risk to the housing at the site. No further assessment in regard to gas is proposed.
- The concentrations of contaminants that may leach from Made Ground to the underlying aquifer are all below screening criteria protective of the aquifer and/or the laboratory's detection limit. No further assessment is proposed.

On the basis of the preceding assessment and the limitations listed in Appendix B, we consider that the site is unlikely to meet the definition of Contaminated Land under Part 2A of the Environmental Protection Act 1990. No further assessment is proposed.



# DRAWINGS



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# APPENDIX A

Cannock Chase District Council

Environmental Protection Act 1990, Part IIa: Initial Desktop Study and Walkover

Site termed "Land Fronting John Street and Moreton Street", located at:

Blake Close, Chadsmoor, Cannock, Staffordshire

#### Prepared for:

Cannock Chase Council PO Box 28 Beecroft Road Cannock Staffordshire WS11 1BG

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#### **Document Control**

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Report Reference	Issue Date	Reason for Issue		Prepared by	Checked by	Approved by
R472/103912/V1/2010	10/08/10	First Issue	Signature			
			Name	Richard Swayne	Gareth Taylor	Gareth Taylor
			Position	Senior Consultant	Principal Consultant	Principal Consultant

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#### DRAWINGS

Drawing 1 – Site Location

#### APPENDICES

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#### 1 INTRODUCTION

#### 1.1 Terms of Reference

In January 2010, Grontmij Limited (Grontmij) was appointed by Cannock Chase District Council (the Council) to assist in the implementation of the Council's Contaminated Land inspection strategy. Part IIa of the Environmental Protection Act 1990 (Part IIa) requires each local authority to inspect areas of land which it believes may comprise Part IIa Contaminated Land.

The scope of work agreed between Grontmij and the Council included:

- Prioritisation of an initial list of potentially contaminated sites for intrusive investigation work, based upon the sensitivity of each site, using existing limited desktop study data provided by the Council, and
- Undertaking desktop reviews and walkovers, culminating in the production of reports for each priority site to improve the understanding of the sites and inform the planning of intrusive site investigations.

The prioritisation exercise identified an initial 12 sites requiring detailed desktop study and walkovers, including the subject of this desk study. The site comprises the southern half of Blake Close, part of Burgoyne Street and open ground to the south of Burgoyne Street in Chadsmoor, Cannock. The site consists of approximately 40 residential properties with gardens and public open space, occupying an area of approximately 1.3ha. The site is considered to be sensitive as the residential properties and public open space overly a former landfill which is recorded to contain inert and household waste of various types and which was operational between 1948 and 1952. The site is also underlain by a principal aquifer.

Note that the site is termed "landfill fronting John St and Moreton St" on Environment Agency records. This appears to be a typographical error, as the site is located at Blake Close and Burgoyne Street. Note that there is an further former landfill site at Moreton Street, termed "landfill south of sites 41 and 37, Moreton St", which is not the subject of this desk study.

For the purpose of clarity, we have referenced the site in regard to Blake Close in the remainder of the report.

This report is subject to the limitations presented in Appendix A.



#### 1.2 Site Setting

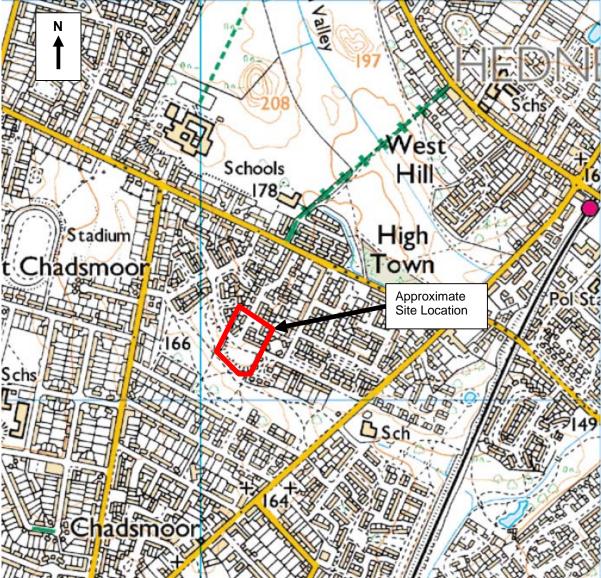
The site's setting and location are summarised in Table 2.1 and Figure 2.1. The site setting is also shown on Drawing 1.

Гаble 1.1 – Site Setting				
Data	Information			
Address	Blake Close Chadsmoor, Cannock, Staffordshire WS11 5TZ			
Current site use:	Residential houses and gardens and rough public open space at the southern end of the site			
Grid Reference:	Centre of site is located at approximate NGR 399130,312185			
Site Area:	The site is approximately 1.3ha			
Topography:	Generally flat			
Surrounding land use	d Residential properties surround the site sites with two schools approximately 450m to the east and west of the site			
Mapped Geology	British Geological Survey (BGS) mapping indicates the site is underlain by superficial deposits Devensian Till over solid geology of the Kidderminster Formation (Sherwood Sandstone Group)			
Hydrogeology	The Environment Agency website indicates the sandstone as a principal aquifer. Principal Aquifers are layers of rock or drift deposits that have high inter-granular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.			
Source Protection Zones (SPZs)	The Environment Agency website indicates that the sites do not lie within a SPZ			
Surface Waters	Streams indicated 530m north east and 700m east of the site			
Historical Land Use Environment Agency data provided to the council indicates that the site formerly operated as a landfill site; Environment Agency "What's In Your Yard" website indicates the site was operational between 1948 and 1952. Iandfill is recorded to have received inert and household waste from dwellin various types including houses, caravans, houseboats, campsites, prisons wastes from schools, colleges and universities. The site pre-dates the Control Pollution Act 1974 and thus is unlikely to have operated under a formal licenter of the state of t				
Ecologically designated sites <sup>1</sup>	MAGIC search indicates none within 500m of site boundary			

<sup>&</sup>lt;sup>1</sup> Includes sites designated as Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Special Area of Conservation (SAC, including candidate sites), Special Protection Area (SPA including potential sites), listed Wetlands of International Importance (Ramsar site) and Local Nature Reserves (LNR).







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#### **1.3** Summary of available site investigation information

At the time of writing this report no ground or site investigation information is available for the site.

#### 1.4 Walkover

The site has been subject of a walkover, carried out from the public highway. . No obvious evidence of contamination was identified during the inspection, but such evidence is unlikely to be uncovered by a visual inspection of land occupied by residential properties.



#### 2.1 Introduction

This section of the report presents a preliminary contaminated land assessment, on the basis of the available desktop data. The assessment presents an evaluation of the potential risks posed, should contaminants be present in the soil or groundwater beneath the site.

In the context of the Environmental Protection Act 1990 (EPA90), the Water Act 2003 and associated guidance<sup>2,3</sup>, a preliminary (contaminated land) risk assessment should focus on whether the land at a subject site meets the statutory definition of Contaminated Land. Part IIA of the EPA90, as amended by the Water Act 2003, defines Contaminated Land as:

- "any land which appears to the local authority in whose area it is situated to be in such condition by reason of substances in, on or under the land, that:
- significant harm is being caused or there is a significant possibility of significant harm being caused; or
- significant pollution of controlled waters is being caused or there is significant possibility of such pollution being caused

The procedure for assessing contaminated land involves the development of a Conceptual Site Model (CSM) comprising the assessment of potential Contaminants, Pathways and Receptors.

#### 2.1.1 Sources of Contaminants

The "contaminants" term in the conceptual model has been evaluated by inspection of existing desktop study data provided by Cannock Chase District Council, and a preliminary site walkover. The following potential sources of contaminants have been identified:

- Landfill, which could contain contaminants including (but not limited to) metals, hydrocarbons, polyaromatic hydrocarbons (PAHs), volatile and semi-volatile organic compounds (VOCs and SVOCs).
- Methane and carbon dioxide gas, from the decomposition of any deleterious material within the made ground.

<sup>&</sup>lt;sup>3</sup> DEFRA Circular 02/2006, Environmental Protection Act 1990: Part IIA Contaminated Land:, September 2006.



<sup>&</sup>lt;sup>2</sup> CLR11 Model Procedures for the Management of Land Contamination (EA & DEFRA September 2004)

# 2.1.2 Receptors

DEFRA Circular 02/2006 defines a Receptor as:

• "either (a) a living organism, a group of organisms, an ecological system or a piece of property which (i) is in a category listed in Table A as a type of receptor, and (ii) is being, or could be, harmed, by a contaminant; or (b) controlled waters which are being, or could be, polluted by a contaminant".

Table 2.1 lists all of the receptors to be considered by a Part IIA or PPS23<sup>4</sup> assessment, and assesses whether the receptors are likely to be present at the site.

Receptor Type	Receptors	Present (√ /≭)	Notes
Humans	On-site residents	<b>v</b>	Residential properties (houses and gardens) and public open space above indicative extent of landfill. Assumed to have vegetable patches.
	Construction staff and SI personnel.	X	No known redevelopment proposed
	Future occupants of the site	~	(Level of risk same as current residents so not considered further)
	Off site commercial workers or residents	✓	Possibly exposed to gases migrating off- site through permeable strata. Level of risk likely to be same, or lower, than on-site residents, and is not considered further
Ecosystems	Any designated ecological system <sup>5</sup> , or living organism forming part of such a system	x	Inspection of MAGIC website has identified that the site does not lie within, or within 500m of, an ecologically designated site
Property (Flora and Fauna)	Crops, including timber	X	Not present
	Produce grown domestically, or on allotments for consumption	~	Gardens assumed to be used for growing food crops. Risk posed is considered to be covered by human health (residential with gardens) pathway and is not considered further.
	Livestock	Х	Not present.
	Other owned or domesticated animals	•	Pets in residential properties. Risk posed is considered to be similar to that posed to on-site residents, and is not examined further
	Wild animals which are the subject of shooting or fishing rights	x	Not present
Property (Buildings & Structures)	A 'building' means any structure, including any part below ground level, but does	✓	Residential houses (and in particular, water service pipes and foundations) above

#### Table 2.1 - Potential Receptors

<sup>4</sup> Planning Policy Statement (PPS) 23: Planning and Pollution Control, Annex 2: Development on Land Affected by Contamination <sup>5</sup> Includes sites designated as Sites of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Special Area of Conservation (SAC, including candidate sites), Special Protection Area (SPA including potential sites), listed Wetlands of International Importance (Ramsar site) and Local Nature Reserves (LNR).



Receptor Type	Receptors	Present (√ /≭)	Notes
	not include plant or machinery within a building		indicative extent of landfill
Controlled	Territorial waters	×	None feasibly close enough to be impacted
Waters <sup>1</sup>	Coastal waters	×	None feasibly close enough to be impacted
	Inland Freshwaters	×	The streams 530m to the north east and 700m to the east of the site are unlikely to be impacted by leachate originating from the subject site due to their distance from the site
	Groundwater	~	Principal aquifer beneath site

<sup>1</sup> as defined in the Water Resources Act Section 104. Generally includes most surface water bodies excluding drains which discharge into sewers.

#### 2.1.3 Pathways

DEFRA Circular 02/2006 defines a Pathway as:

• "one or more routes or means by, or through, which a receptor: (a) is being exposed to, or affected by, a contaminant; or (b) could be exposed or affected"

Pathways are examined as part of Table 2.2, overleaf.

#### 2.1.4 Potential Pollutant Linkages

The pollutant linkages identified are also presented in Table 2.2.



No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage <sup>1</sup>	Probability Of Linkage Occuring <sup>1</sup>	Overall Risk <sup>1</sup>	Comments
1	Residents of properties above infilled ground (including children playing in gardens)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) and asbestos within landfill material	Dermal contact and direct ingestion, inhalation of dust/vapours, consumption of home-grown vegetables	Medium	Likely	Moderate	Grass and/or topsoil coverage likely to mitigate risk to an extent – risk is greatest where possibly impacted soils are exposed or could be encountered, for example, when digging a vegetable patch or when children play outdoors. Properties are constructed directly above a potentially significant contamination source. Sample collection and analysis required to refine conclusion on risk
2	Residents of properties above infilled ground	Methane and carbon dioxide from decomposition of deleterious elements of landfill material	Movement into buildings, subsequent asphyxiation and explosion risk	Medium	Likely	Moderate	Installation and monitoring of wells for gases and flow rates is required to refine conclusion on risk
3	Subsurface services serving the buildings (principally water supply)	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs) within landfill material.	Chemical attack and tainting of water supply could occur at high contaminant concentrations / severe pH levels	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM
4	Property (Structures) – sub-surface concrete	Sulphate and pH	Contact between contaminants and concrete	Mild	Likely	Low to moderate	Further investigation data needed to refine assessment/CSM



No.	Receptor	Contaminant(s)	Pathway(s)	Potential Severity of Linkage <sup>1</sup>	Probability Of Linkage Occuring <sup>1</sup>	Overall Risk <sup>1</sup>	Comments
5	Principal aquifer (Sherwood Sandstone) beneath site	Contaminants including (but not limited to) metals, hydrocarbons, (including PAHs), VOCs and SVOCs within landfill material.	Leaching of soil contaminants to aquifer – no aquiclude is indicated on BGS mapping	Medium	Likely	Moderate	Risk will depend upon depth and concentration of contaminants, confirmation that an aquiclude is absent, ,leaching potential of contaminants. Investigation required to determine risk.

<sup>1</sup> Taken from Table 6.3, CIRIA report 552 (Contaminated Land Risk Assessment – A Guide to Good Practice. Severity classified as minor, mild, medium or severe. Probability classified as unlikely, low, likely or high. Overall risk considers both the severity and probability of the linkage (very low, low, moderate, high or very high). See extract in Appendix B



## 3 CLOSING REMARKS

Potential pollutant linkages affecting the health of residents, controlled waters and property have been identified, and therefore an initial intrusive investigation should be undertaken to examine the likelihood of pollutant linkages existing at the site.



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## Appendix A (of desk study): Limitations Statement

- 1. This report has been prepared for the exclusive use of Cannock Chase District Council and copyright subsists with Grontmij Limited. Prior written permission must be obtained to reproduce all or part of the report.
- 2. This report and/or opinions have been prepared for the specific purpose stated in the document. The recommendations should not be used for other schemes on or adjacent to the site without further reference to Grontmij Limited.
- 3. Observations were made of the site and of structures on the site as indicated within the report.
- 4. Grontmij has relied upon the existing data provided by Cannock Chase District Council to be accurate, and has not taken steps to independently check the accuracy of the data provided.
- 5. Our interpretation of any regulatory database information (including the MAGIC, the Environment Agency and British Geological Survey websites) assumes that the data provided is accurate. A disclaimer provided by database search companies is as follows: '...the data is derived from historical sources or information available in public records or from third parties and is supplied to us without warranty by data suppliers and we cannot warrant the accuracy or completeness of the data or the reports.' We cannot therefore accept any responsibility for the accuracy of the data used in this study, only that its interpretation has been carried out with due skill, care and diligence.
- 6. The scope of this study, as agreed with Cannock Chase Council, comprised a review of available information, and data was not purchased from a proprietary database.



# Appendix B (of desk study): Severity and Probability of Risk in Conceptual Site Models (after CIRIA552, Tables 6.3 to 6.5)

This report draws on guidance presented in CIRIA report 552, "Contaminated Land Risk Assessment, A Guide for Good Practice", wherein the "severity" term in the Conceptual Site Model is classified with reference to the sensitivity of the hazard and the receptor, as follows:

Situation	Severity Category	Description	Examples
ACUTE PROBLEM	Severe	Acute risk to human health likely to result in "significant harm" as defined in EPA90, catastrophic damage to buildings or property, acute risk of major pollution of controlled waters, acute risk of harm to ecosystems (as defined in Contaminated Land Regulations 2006)	High cyanide concentrations at the surface of a recreation area Major spillage into controlled waters Explosion, causing building collapse
SIGNIFICANT HARM TO SENSITIVE RECEPTOR	Medium	Chronic risk to human health likely to result in "significant harm" as defined in EPA90, chronic pollution of sensitive controlled waters, significant change at a sensitive ecosystems or species, significant damage to buildings or structures	Contaminant concentrations at a site in excess of SGVs, GAC or similar screening values Leaching of contaminants to sensitive aquifer Death of a species within a nature reserve
SIGNIFICANT HARM TO LESS SENSITIVE RECEPTOR	Mild	Pollution of non-sensitive waters, significant damage to buildings, structures, services or crops, damage to sensitive buildings, structures, services or the environment, which nonetheless result in "significant harm"	Pollution to (former) non- aquifer or to non-controlled surface watercourse. Damage to building rendering it unsafe to occupy (e.g. foundation or structural damage)
NON- SIGNIFICANT HARM	Minor	Harm, not necessarily resulting in "significant harm" but probably requiring expenditure to resolve or financial loss. Non-permanent risks to human health that are easily mitigated, e.g. by wearing PPE. Easily-repairable damage to structures or services	Contaminant concentrations requiring the wearing of PPE during site work, but no other long-term mitigation. Discolouration of concrete

The likelihood of an event (probability) takes into account both the presence of hazard and receptor and the integrity of the pathway between hazard and receptor, and is assessed as follows:

Category	There is a pollution linkage and:
High	Event is likely in the short term and almost inevitable over the long term. Or
-	there is evidence of actual harm at/to the receptor
Likely	Event is possible in the short term and likely over the long term
Low	Event is unlikely in the short term and possible over the long term
Unlikely	Event is unlikely, even in the long term



an overall risk rating:

	Severity										
Probability	Severe	Medium	Mild	Minor							
High	Very high	High	Moderate	Low/moderate							
Likely	High	Moderate	Low/moderate	Low							
Low	Moderate	Low/moderate	Low	Very low							
Unlikely	Low/moderate	Low	Very low	Very low							

The above risk categories are likely to result in the following actions:

- Very high: urgent intervention / investigation needed, remediation likely to be required
- High: urgent intervention / investigation needed, remediation possibly required in short term and probably required in long term
- Moderate: investigation needed to clarify and refine risk; remediation may be required over the long term
- Low: it is possible that harm could arise to a receptor, but if realised, such harm is likely to be, at worst, mild
- Very low: it is possible that harm could arise to a receptor, but if realised, such harm is unlikely to be severe.





# APPENDIX B

### **Appendix B: Limitations Statement**

- 1. This report has been prepared for the exclusive use of Cannock Chase District Council and copyright subsists with Grontmij Limited. Prior written permission must be obtained to reproduce all or part of the report.
- 2. This report and/or opinions have been prepared for the specific purpose stated in the document. The recommendations should not be used for other purposes or adjacent sites without further reference to Grontmij Limited.
- 3. Observations were made of the site and soil arisings as indicated within the report. Where access to portions of the site was unavailable or limited, Grontmij Limited renders no opinion as to the environmental status of such parts of the site.
- 4. Grontmij has relied upon the existing desktop study data provided by Cannock Chase District Council to be accurate, and has not taken steps to independently check the accuracy of the data provided.
- 5. Our interpretation of any regulatory database information (including the MAGIC and British Geological Survey websites) within an earlier report, and relied upon in this report, assumes that the data provided is accurate. A disclaimer provided by database search companies is as follows: ' the data is derived from historical sources or information available in public records or from third parties and is supplied to us without warranty by data suppliers and we cannot warrant the accuracy or completeness of the data or the reports.' We cannot therefore accept any responsibility for the accuracy of the data used in this study, only that its interpretation has been carried out with due skill, care and diligence.
- 6. The conclusions and recommendations submitted in this report are based in part upon the data obtained from soil samples from exploratory holes. The nature and extent of variations between the exploratory holes is inferred in the report and could only be confirmed by further investigation. If variations or other latent conditions become evident, it will be necessary to re-evaluate the recommendations of this report.
- 7. The generalised soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealised and have been developed in interpretations of widely spaced explorations and samples; actual soil transitions may be more gradual. For specific information, refer to the exploration logs.
- 8. Water levels and/or gas readings have been taken in the borings and/or observation wells at times and under conditions stated on the exploration logs. These data have been reviewed and interpretations have been made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater or gas may occur due to variations in rainfall, atmospheric pressure and other factors different from those prevailing at the time the measurements were made.
- 9. The conclusions and recommendations of this report are based in part upon various types of chemical analysis of soil, water or gases, and are contingent upon their validity. These data have been reviewed and interpretations made in the report. Variations in the types and concentrations of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past disposal practices, the passage of time and other factors. Should additional analytical or monitoring data



become available in the future, these data should be reviewed and conclusions and recommendations presented herein modified accordingly.

10. Chemical analyses have been performed for specific parameters during the course of this study, as detailed in the text. It must be noted that additional constituents not searched for during the current study may be present in soil, groundwater and soil voids at the site.



# APPENDIX C

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Project							Client		Logge	
Blake Clos	se	Det				Cround	Cannock Ch		Chaol	MJH
Job No 106	270	Dat	00	6-12-10 6-12-10		Ground	Level (m)	Co-ordinates	Cneck	GVT
SAMPLE	ES &	TESTS	л Б					STRATA		Instrument
Depth	Туре	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTIO	N	nstrur
0.10	ES		-		<u>x 1, 1, .</u>	0.14	MADE GRO	UND: Grass over brown ve and rootlets. (Topsoil)	ery clayey fine grained S	
0.30	ES				$\bigotimes$	€ <	POSSIBLE N	MADE GROUND: Orange	brown very silty coarse	grained
0.70	ES				$\bigotimes$	€ (0.98)	SAND.			
. 1.00	ES				$\bigotimes$	} ↓ 1.12				
						_ _ (0.38)	Firm orange	brown slightly sandy slight rounded to rounded quart	tly gravelly CLAY. Grave z. (Glacial Till)	I is fine to
					× × ×	(0.50)	Light brown sub angular	very silty very sandy GRAV to sub rounded quartz. (GI	/EL. Gravel is medium t acio - Fluvial Deposits)	el is fine to
- 					<u>×2 ~~</u> 2	<u>} 2.00</u>	End of Hole	at 2m bol.		<u> ··</u> E
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		Groundwater			Gei	L neral Ren	narks			Final Depth
Strike Depth: (m) R		(m) Groundwa		narks	Loca	ation: Back gard	den of 44 Burgoyne Stre	eet in lawn. No groundwater encountered		2m bgl
Contractor S					M	ethod/				
			5		PI	ant Used	Hand he	ld window sampling	All dimensions in m	netres Scale 1:50 Sheet 1 of 1

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Project							Client			ogged By
Blake Close							Cannock C	hase DC		MJH
lah Na Data Crau						Ground L		Co-ordinates	С	hecked By
	106270 Date 06-12-10 06-12-10									GVT
SAMPL	ES &		er					STRATA		nent
Depth	Туре	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTIO	N	Instrument
0.10	ES							estone GRAVEL over plast		
0.30	ES				0	1 <u>0.17</u>	\many roots	DUND: Grass over brown ve and rootlets. (Topsoil)		/
0.70	ES					<u>d</u>	Brown very	clayey very gravelly coarse rounded to rounded quartz	grained SAND. Gr	avel is fine to eposits
1.00	ES					(1.33)				
					-خ. ب					
-					a o	1.50		e at 1.5m bgl.		<u>i:</u> ]
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Strike Depth: (m)	Rising to:		ter	narks		neral Rem				Final Depth
					Loca	ation: Back gard	en of 90 Blake Close	in gravel patio area. No groundwater enco	untered	1.5m bgl
Strike Depth: (m) F	Sherv	vood Dri	lling			lethod/ lant Used		Hand tools	All dimensio	ns in metres Scale 1:50
										Sheet 1 of 1

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Project						Client Cannock Ch	asa DC	Logge	d By MJH	
Blake Close	Dete						r	Chaol	ked By	
Job No 106270	Date	00	6-12-10 6-12-10		Ground L	₋evei (m)	Co-ordinates	Cneck	GVT	
SAMPLES &	TESTS	ž					STRATA			fill
Depth Type	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTION	١		Instrument Backfill
0.10 ES 0.30 ES					× × × × (1.00)	MADE GROU SAND. Grave	UND: Orange brown clayey el is fine to coarse sub rout	y gravelly fine to coarse nded to rounded quartz	grained	
0.70 ES				$\bigotimes$	×`´					
1.00 ES					× 1.00 × (0.50) × 1.50	MADE GROU with occasior	JND: Dark brown silty very nal cobbles. Gravel is fine to bal. Cobbles are angular b	to coarse brick, concret	d SAND e, ash,	
						End of Hole a				
G	roundwater			Ge	<u>t</u> neral Rem	l narks			Final De	l pth
Strike Depth: (m) Rising to: (	(m) Groundwate	er Ren	narks				gravel patio area. No groundwater encou	ntered	1.5m k	
Contractor Sherw	ood Drillin	ng			lethod/ lant Used		Hand tools	All dimensions in m	netres Scale 1:50 Sheet	1 of 1

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Project							Client			Logged By	
Blake Clo	ose						Cannock Cl	hase DC		MJH	
Job No 106	6270	Da		6-12-10 6-12-10		Ground L	.evel (m)	Co-ordinates		Checked By GVT	
SAMPL		TESTS						STRATA			ti _
Depth	Туре	Test	Water		Legend	Depth (Thickness)		DESCRIPTIO	N		Instrument Backfill
	_	Result	>	Level	N 14. N 14.	(Inickness)		UND: Grass over brown ve	eny clavey fine are	ained SAND with	Ë
0.10 0.30	ES ES					₹ <u> </u>	∖many roots a	and rootlets. (Topsoil)		/	
0.50	ES					< -	MADE GRO	UND: Orange brown very occasional cobbles. Gravel	silty very gravelly	coarse grained	
0.70	ES					- -	rounded qua	artz, brick, ash and occasio			
- _ 1.00	ES				$\bigotimes$	<b>(</b> 1.68)	brick				
1.20	ES					¢					
1.50	ES					4 4					
e F					$\bigotimes$	<ul><li>1.79</li><li>1.90</li></ul>		UND: Firm brown slightly s	and colicity area		-1:目:
Ē					0.000	2.12	∖Gravel is fin	e to coarse quartz, brick ar	nd ash	. /	作目:
r r					0	4 - -	Orange brow	vn silty coarse grained SAI b rounded to well rounded	ND & GRAVEL. G	ravel is medium	信言
-					·	(0.70)	Reddish bro	wn very clayey gravelly co	arse grained SAN		
-					° 0	2.82		rounded quartz. (Glacial - I Idish brown slightly sandy			-1:1
-					<u></u>	- 3.00	End of Hole		to sandy CLAT. (C		- <u>   </u>
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	G	roundwate	er		Gei	L neral Rem	arks			Final De	 epth
Strike Depth: (m)				narks	Loca	ation: Back garde	en of 3a Blake Close i	n lawn. No groundwater encountered			
1	None E	ncountered	d							3m b	91
Strike Depth: (m)	Sherw	ood Drill	ing			ethod/ ant Used	Hand be	ld window sampling	All dimer	nsions in metres Scale 1:50	
								na winaow samping		Sheet	t1 of 1

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# **TRIAL PIT LOG**

Drojact							Client		Lanac - L	D. (
Project	~~						Client Cannock Cl	hase Council	Logged E	GT
Blake Clo Job No	se	Dat	to to			Ground I	Level (m)	Co-ordinates	Checked	
	6270	Da	10	0-12-10 0-12-10		Ground		CO-ordinates	Checked	
SAMPLE	ES & TI	ESTS						STRATA		
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth (Thickness)		DESCRIPTIC	NN .	Backfill
0.10	ES						TOPSOIL: E Gravel is of	Brown, soft, slightly silty, sl	ightly gravelly, sandy CLAY ninanlty guartz, sub angula	• to
0.30	ES				$\frac{ \underline{b} }{ \underline{b} } \frac{\underline{b} }{\underline{b} } \frac{\underline{b} }\underline{b} } \underline{b} } \frac{\underline{b} }\underline{b} } \underline{b} }$	- (0.40) - - 0.40				
-						(0.30)	Orange brow rounded to r occasionally	wn, slightly clayey SAND a ounded, fine to coarse gra grading to cobbles.	ind GRAVEL. Gravel is sub ained, of quartz and sandsto	one,
- 0.70 -	ES					-	End of Trial	Pit at 0.7m bgl.		
Shoring Strike Depth: (m) F N Contractor	Gro Rising to: (m)		ter Rer	narks	Ger	ability neral Ren 9 Blake Close	narks			Final Depth 0.7m bgl
Contractor						ethod/ ant Used			All dimensions in metres	Scale 1:6.25 Sheet 1 of 1

🦨 Gr	ontr	nij		TR		L PI	T LOG	TRIAL PIT NO	-
Project						Client		Logged By	
Blake Clos	se						Chase Council	GT	
Job No 106	270	Dat	10	-12-10 -12-10	Ground	Level (m)	Co-ordinates	Checked By	
SAMPLE		ESTS		-			STRATA		
Depth	Type No	Test Result	Water	ReducedLeger Level	nd Depth	;)	DESCRIPTIC	DN Ba	ackfill
<sup>-</sup> 0.10	ES				(0.10) 0.1(	MADE GR	OUND: Recreational bark o OUND: Brown, slightly clay r to sub rounded, fine to co		
- 0.30 -	ES				(0.60)				
0.70	ES				0.70		l Pit at 0.7m bgl.		(
-					-				
Shoring					Stability				
	Gro	undwate	r		eneral Rer	narks		Final Dep	th
Strike Depth: (m) R	tising to: (m)	Groundwa	ter Rema		o 86 Blake Close			0.7m b	
Contractor					Method/ Plant Used			All dimensions in metres Scale 1:6.25	

GRONTMIJ TP LOG BASIC BLAKE CLOSE PART 2A GPJ AGS3 ALL GDT 2/22/11

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# TRIAL PIT LOG

Project							Client		Logg	led By
Blake Clo	se							Chase Council		GT
Job No		Da	te 1	0-12-10		Ground I	Level (m)	Co-ordinates	Cheo	cked By
106	6270			0-12-10						
SAMPL	ES & TE	ESTS						STRATA		
Depth	Type No	Test Result	Water	Reduced Level	Legend	Depth	)	DESCRIPTIO	N	Backfill
0.10	ES					(0.25)	Gravel is o	Brown, soft, slightly silty, sli f various lithologies, predon ne to coarse, occasional roo	ghtly gravelly, sandy C ninanlty guartz, sub and	LAY. gular to
0.30	ES					(- -	Red brown rounded, fi	n, slightly silty, gravelly SANI ne to coarse of quartz and s	D. Gravel is sub-rounde sandstone.	ed to
					0     X     1     X     0     X     1     X     0     X     1     0     X <td>0.45)</td> <td></td> <td></td> <td></td> <td></td>	0.45)				
0.70	ES					-		al Pit at 0.7m bgl.		
Shoring Strike Depth: (m) f	Gro Rising to: (m)	undwate Groundwa	۲ ater Rer	narks	Ge	tability neral Ren 5 Blake Close	narks			Final Depth
	None Enc	ountered								0.7m bgl
Contractor						ethod/ lant Used			All dimensions in	metres Scale 1:6.25 Sheet 1 of 1

Gr Gr	ontn	nij		TR	IAI	L PIT LOG	TRIAL PIT	
Project						Client	Logged By	
Blake Clos	se					Cannock Chase Council	GT	
Job No		Dat	e ,	0 10 10	Ground L	_evel (m) Co-ordinates	Checked By	
106	270			0-12-10 0-12-10				
SAMPLE	S & TE	STS				STRATA	4	
Depth	Туре	Test Result	Water	ReducedLegend	Depth (Thickness)		TION	Back
0.10	ES			$\begin{array}{ c c c c c c c c c c c c c c c c c c c$		TOPSOIL Soft brown slightly sand	dy, gravelly CLAY. Gravel is sub rse, of various lithologies.	
0.10	ES				(0.65)			
0.70	ES				0.70			
					-	End of Trial Pit at 0.7m bgl.		
Shoring	Grou ising to: (m)	undwater Groundwat	ter Rer	Ge	tability neral Rem	narks	Final D	
No Contractor	one Enco	ountered			lethod/		0.7m	bg

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Project							Client	Logged By	
Blake Clo	se						Cannock Chase Council	GT	
Job No	270	Da	1	0-12-10 0-12-10		Ground L	Level (m) Co-ordinates	Checked By	
				0-12-10					
SAMPLE Depth	Type	Test	Water	Reduced	egend	Depth	STRATA		Backfil
	No	Result	Š	Level		(Thickness)	DESCRIPTION MADE BROWN: Yellow brown decorati		Васкії
						(0.05) 0.05	membrane.		(·····
					$\bigotimes$	(0.05) 0.10	MADE GROUND: Brown, slightly clayed angular to sub rounded, fine to medium	y, gravelly SAND. Gravel is sub grained of various lithologies.	
0.10	ES					- (0.60)	Red brown, slightly silty, gravelly SAND sub-rounded to rounded, fine to coarse	(possibly reworked). Gravel is	
					×.  	0.70			
0.70	ES				· · · · · ·	0.70	End of Trial Pit at 0.7m bgl.		
						-			
Shoring Strike Depth: (m) F			ater Rei	marks	Gen	ability neral Rem 2 Burgoyne Stre			Depth n bgl
Contractor						ethod/			
						ant Used		All dimensions in metres Scale 1:6.2	25 Sheet 1 of 1

# APPENDIX D



Grontmij 41 Corn Street Bristol Avon BS1 1HS

Attention: Gareth Taylor

# **CERTIFICATE OF ANALYSIS**

Date: Customer: Sample Delivery Group (SDG): Your Reference: Location: Report No: 05 January 2011 H\_GRONTMIJ\_BRI 101230-12

Blake Close 109820

We received 15 samples on Saturday December 11, 2010 and 5 of these samples were scheduled for analysis which was completed on Wednesday January 05, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Sonia McWhan Laboratory Manager





#### **CERTIFICATE OF ANALYSIS**

Validated

SDG:	101230-12	Location:	Blake Close	Order Number:
Job:	H_GRONTMIJ_BRI-6	Customer:	Grontmij	Report Number: 109820
Client Reference:		Attention:	Gareth Taylor	Superseded Report:

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2573497	PSWHP01		0.10	
2573498	PSWHP01		0.30	
2573501	PSWHP01		0.70	
2573502	PSWHP02		0.10	
2573503	PSWHP02		0.30	
2573504	PSWHP02		0.70	
2573506	PSWHP03		0.10	
2573507	PSWHP03		0.30	
2573508	PSWHP03		0.70	
2573509	PSWHP04		0.10	
2573510	PSWHP04		0.30	
2573511	PSWHP04		0.70	
2573512	PSWHP05		0.10	
2573513	PSWHP05		0.30	
2573514	PSWHP05		0.70	

Only received samples which have had analysis scheduled will be shown on the following pages.

	30-12 RONTMIJ_BRI-6	Location: Custome Attention	r:	Gro	onti		se aylor		Order Number: Report Number Superseded Re
				Т	es	st	So	ch	nedule
SOLID						•			
Results Legend	Lab Samp	ole No(s)	2573498		2573504	2573507	2573511		257
X Test			3498		3504	3507	3511		2573512
					_				-
No Determination Possible	Quete		υ	,	P	Ρ	<b>τ</b>	,	σ
	Custo Sample R	-	PSWHP01		PSWHP02	PSWHP03	PSWHP04		PSWHP05
			101		02	03	04		06
					_			-	_
	AGS Ret	ference							
	Accina								
	Depth	n (m)	0.30		0.70	0.30	0.70	10	0.10
						_			
			250g	250g	4	250a	250g	250g	4
	Conta	ainer	D0g Tu Ambe	Ambe	00g Tu	00g Tu Ambé	Ambe	Ambe	Dog Tr
			400g Tub 250g Amber Jar	er Jar	up dr	ub Br Jar	400g Tub 250g Amber Jar	er Jar	P D
Boron Water Soluble	All	NDPs: 0 Tests: 5							
Hexavalent Chromium (s)	All	NDPs: 0	X	X		X	X	X	
	Americ	Tests: 5	x		x	X	X	(	<mark>x</mark>
Metals by iCap-OES (Soil)	Arsenic	NDPs: 0 Tests: 5	x	x		x	x	X	
	Barium	NDPs: 0 Tests: 5							
	Beryllium	NDPs: 0	X	X		X	X	X	
		Tests: 5	x	x		x	x	x	
	Cadmium	NDPs: 0 Tests: 5	X	X		x	X	X	
	Chromium	NDPs: 0	^	<u>^</u>	•	^	<u>^</u>	<u>^</u>	
	Conner	Tests: 5	x	X		x	x	X	
	Copper	NDPs: 0 Tests: 5	x	X		x	x	X	
	Lead	NDPs: 0 Tests: 5							
	Mercury	NDPs: 0	X	X		X	X	X	
	NEAL	Tests: 5	x	x		x	x	X	
	Nickel	NDPs: 0 Tests: 5	x	X		x	x	X	
	Selenium	NDPs: 0 Tests: 5							
	Vanadium	NDPs: 0	X	X		X	X	X	
		Tests: 5	x	x		x	x	x	
	Zinc	NDPs: 0 Tests: 5	X	x		x	X	X	
pH	All	NDPs: 0							
Sample description	All	Tests: 5 NDPs: 0	X		x	X	X	(	<mark>X</mark>
		Tests: 5	x	x		x	x	X	
Total Organic Carbon	All	NDPs: 0 Tests: 5	X	X				x	

109820

## **CERTIFICATE OF ANALYSIS**

Validated

SD	G:	101230-12	Location:	Blake Close	Order Number:	
Jol	b:	H_GRONTMIJ_BRI-6	Customer:	Grontmij	Report Number:	109820
Cli	ent Reference:		Attention:	Gareth Taylor	Superseded Report:	

## **Sample Descriptions**

rain Sizes							
very fine <0.0	063mm fine 0.0	63mm - 0.1mm m	edium 0.1mm	- 2mm coai	rse 2mm - 10	Omm very coa	arse >10mr
Lab Sample No(s)	Customer Sample Ref.	Depth (m)	Colour	Description	Grain size	Inclusions	Inclusions 2
2573498	PSWHP01	0.30	Dark Brown	Sandy Clay	<0.063 mm	Vegetation	Stones
2573504	PSWHP02	0.70	Dark Brown	Silty Sand	0.063 - 0.1 mm	Vegetation	Stones
2573507	PSWHP03	0.30	Dark Brown	Sand	<0.063 mm	Vegetation	N/A
2573511	PSWHP04	0.70	Dark Brown	Sandy Clay	<0.063 mm	Stones	N/A
2573512	PSWHP05	0.10	Dark Brown	Silty Clay Loam	<0.063 mm	Stones	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

### **CERTIFICATE OF ANALYSIS**

Validated

SDG: 10123 Job: H_GF Client Reference:	30-12 RONTMIJ_BI	રા-6	Location: Customer: Attention:	Bla Gr	ake Close ontmij ireth Taylor				Order Number: Report Number: Superseded Repo	109820 rt:	
Results Legend	Cu	stomer Sample R	PSWHP01		PSWHP02		PSWHP03	_	PSWHP04	PSWHP05	
# ISO17025 accredited. M mCERTS accredited.			FSWIIFUI		F3WIIFUZ		FSWIF03		F3WIF04	F3WIF05	
§ Non-conforming work. aq Aqueous / settled sample.		Depth (m)	0.30		0.70		0.30		0.70	0.10	
diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample.		Sample Type Date Sampled	Soil/Solid		Soil/Solid -		Soil/Solid -		Soil/Solid	Soil/Solid	
<ul> <li>* subcontracted test.</li> <li>** % recovery of the surrogate standa</li> </ul>	ard to	Date Received	11/12/2010		11/12/2010		11/12/2010		11/12/2010	11/12/2010	
check the efficiency of the method. results of the individual compound	. The	SDG Ref ab Sample No.(s)	101230-12 2573498		101230-12 2573504		101230-12 2573507		101230-12 2573511	101230-12 2573512	
within the samples are not correcte this recovery.		AGS Reference									
Component	LOD/Units	Method									
Soil Organic Matter (SOM)	<0.35 %	TM132	2.47		3.41		1.98		<0.35	2.52	
рН	1 pH	TM133	7.05	#	8.47	#	8.18	#	# 8.51	# 8.47	
pri	Units	111100	7.00	М	0.47	М		м	0.01 M	0.47 M	
Chromium, Hexavalent	<0.6	TM151	<0.6		<1.2		<0.6		<0.6	<0.6	
Arsenic	mg/kg <0.6	TM181	5.79	#	7.12	#	4.68	#	4.09	4.35	
Algeme	mg/kg	INITOT	0.70	М	1.12	М		м	4.00 M	4.00 M	
Barium	<0.6	TM181	60.5		72.1		59.1		34.4	51.8	
Beryllium	mg/kg <0.01	TM181	0.759	#	0.968	#	0.769	#	# 0.36	# 0.745	
	<0.01 mg/kg		0.759	М	0.300	М		м	0.36 M	0.745 M	
Cadmium	<0.02	TM181	0.0806		0.119		0.0956		<0.02	0.12	
Chromium	mg/kg	TM404		М	40.4	М		М	M	M	
Chromium	<0.9 mg/kg	TM181	11.4	М	10.1	м	8.71	м	10.1 M	8.63 M	
Copper	<1.4	TM181	22		31.1		38.3	-	16.4	22.2	
	mg/kg	THE		Μ	00.5	М		М	M	M	
Lead	<0.7 mg/kg	TM181	31.8	м	28.8	м	16.1	м	15.6 M	23.4 M	
Mercury	<0.14	TM181	<0.14	IVI	<0.14	101	<0.14		<0.14	<0.14	
-	mg/kg			М		М		М	М	М	
Nickel	<0.2	TM181	13.5	м	12.8	м	8.84	м	7.42 M	9.68 M	
Selenium	mg/kg <1 mg/kg	TM181	<1	М	<1	М	<1	M	M <1	<1	
				#		#		#	#	#	
Vanadium	<0.2	TM181	15.3	#	17	μ	12.4	#	10.1 #	12.5 #	
Zinc	mg/kg <1.9	TM181	95.6	#	84.8	#	51.5	#	27.3	53.1	
	mg/kg			М		М		М	M	M	
Boron, water soluble	<1 mg/kg	TM222	<1		<1		<1		<1	<1	
		++		М		М		M	M	M	
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CERTIFICATE	OF ANALYSIS

Validated

SDG: Job:	101230-12 H GRONTMIJ BRI-6	Location: Customer:	Blake Close Grontmii	Order Number: Report Number:	109820
Client Reference:		Attention:	Gareth Taylor	Superseded Report:	

# Table of Results - Appendix

REPOR	RT KEY						Resu	lts expressed as (	e.g.) 1.03E-07 is equivale	nt to 1.03x10-7
NDP	No Determination	Possible	#	ISO 17025 Accredited			Subcontracted Test	м	MCERTS Accred	lited
NFD	No Fibres Detecte	-	PFD	Possible Fibres Detected			Result previously reported (Incremental reports only)	EC	Equivalent Carb (Aromatics C8-0	
Note: Meth	od detection limits a	are not always achievable	due to vario	us circumstances beyond our c	ontrol					
N	lethod No		Refe	rence			Description		Wet/Dry Sample <sup>1</sup>	Surrogate Corrected
	PM001				Preparatio	on of San	ples for Metals Analysis			
	PM024 Modified BS 1377		Soil prepa soils for A							
	TM132	In - house Method			ELTRA C	S800 Op				
	TM133	BS 1377: Part 3 19	990;BS 60	068-2.5	Determina Meter	ation of p	H in Soil and Water using the Gl	₋рН рН		
	TM151	Method 3500D, AV	VWA/API	HA, 20th Ed., 1999	Determina	ation of H	exavalent Chromium using Kone	e analyser		
	TM181	US EPA Method 6	010B		Determina ICP-OES	ation of R	outine Metals in Soil by iCap 65	00 Duo		
	TM222	In-House Method					lot Water Soluble Boron in Soils Emission Spectrometer	(10:1		

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

101230-12

H\_GRONTMIJ\_BRI-6

SDG:

Job:

Client Reference:

## **CERTIFICATE OF ANALYSIS**

Blake Close

Gareth Taylor

Grontmij

Location:

Customer:

Attention:

Order Number: Report Number: . Superseded Report:

109820

# **Test Completion Dates**

Lab Sample No(s)	2573498	2573504	2573507	2573511	2573512
Customer Sample Ref.	PSWHP01	PSWHP02	PSWHP03	PSWHP04	PSWHP05
AGS Ref.					
Depth	0.30	0.70	0.30	0.70	0.10
Туре	SOLID	SOLID	SOLID	SOLID	SOLID
Boron Water Soluble	04-Jan-2011	04-Jan-2011	04-Jan-2011	04-Jan-2011	04-Jan-2011
Hexavalent Chromium (s)	04-Jan-2011	04-Jan-2011	04-Jan-2011	04-Jan-2011	04-Jan-2011
Metals by iCap-OES (Soil)	05-Jan-2011	05-Jan-2011	05-Jan-2011	05-Jan-2011	05-Jan-2011
pH	05-Jan-2011	05-Jan-2011	05-Jan-2011	05-Jan-2011	05-Jan-2011
Sample description	30-Dec-2010	30-Dec-2010	30-Dec-2010	30-Dec-2010	30-Dec-2010
Total Organic Carbon	04-Jan-2011	04-Jan-2011	04-Jan-2011	04-Jan-2011	04-Jan-2011

#### **CERTIFICATE OF ANALYSIS**

SDG:	101230-12	Location:	Blake Close
Job:	H_GRONTMIJ_BRI-6	Customer:	Grontmij
Client Reference:		Attention:	Gareth Taylor

## Appendix

 Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

12. Results relate only to the items tested

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

 Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.

19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

24. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Order Number: Report Number: 109820 Superseded Report:

#### SOLID MATRICES EXTRACTION SUMMARY

	-			
ANALYSIS	D/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DOM	SOXTHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DOM	SOXTHERM	IATROSCAN
ELEMENTALSUPHUR	D&C	DOM	SOXTHERM	HPLC
PHENOLSBYGONS	WET	DCM	SOXTHERM	GCMS
HERBICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS
PESTICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS
EPH (DRO)	D&C	HEXANEACETONE	END OVEREND	GCFD
EPH (MNOL)	D&C	HEXANEACETONE	END OVEREND	GCFD
EPH (CLEANED UP)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH CMG BYGC	D&C	HEXANEACETONE	END OVEREND	GCFID
POB TOT / POB CON	D&C	HEXANEACETONE	END OVEREND	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANEACETONE	MCROWAVE TM218.	GCMS
08-040(06-040)EZ FLASH	WET	HEXANEACETONE	SHAVER	GCEZ
POL VAROMATIC HYDROCARBONS RAPID GC	WET	HEXANEACETONE	SHAVER	900 EZ
SEM VOLATILEORGANIC COMFOUNDS	WET	DOMACETONE	SONICATE	GCMS

#### LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
EPH .	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID
EPHCWG	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID
MINERALOIL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID
POB 7 CONGENERS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
POB TOTAL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
SVOC	DOM	LIQUID/LIQUID SHAKE	GCMS
FREESULPHUR	DOM	SOLD PHASE EXTRACTION	HPLC
PEST 00P/0PP	DOM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERBS	DOM	LIQUID/LIQUID SHAKE	GCMS
PHENOLSMS	DOM	SOLID PHASE EXTRACTION	GCMS
TIH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERALOIL by R	TCE	LIQUID/LIQUID SHAKE	HFLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

#### Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysofile	WhiteAsbestos
Amosite	BrownAsbestos
Orodolite	Blue Asbestos
Fibrous Adindite	-
Florous Anthophylite	-
FibrousTrendile	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Grontmij Radcliffe House 3rd Floor Blenheim Court, Lode lane Solihull West Midlands B912AA

Attention: Gareth Taylor

# **CERTIFICATE OF ANALYSIS**

Date: Customer: Sample Delivery Group (SDG): Your Reference: Location: Report No: 13 January 2011 H\_GRONTMIJ\_SOL 101209-83

Blake Close 110764

We received 19 samples on Thursday December 09, 2010 and 7 of these samples were scheduled for analysis which was completed on Thursday January 13, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

Asbestos testing - we are not accredited for screening soil samples for asbestos fibres. We are only accredited to identify asbestos fibres in bulk material (ACM).

Approved By:

Sonia McWhan Laboratory Manager





### **CERTIFICATE OF ANALYSIS**

Validated

_						
	SDG:	101209-83	Location:	Blake Close	Order Number:	
	Job:	H_GRONTMIJ_SOL-40	Customer:	Grontmij	Report Number:	110764
	Client Reference:		Attention:	Gareth Taylor	Superseded Report:	

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
2554659	WS1		0.10	06/12/2010
2554661	WS1		0.30	06/12/2010
2554663	WS1		0.70	06/12/2010
2554660	WS1		1.00	06/12/2010
2554665	WS2		0.10	06/12/2010
2554664	WS2		0.30	06/12/2010
2554666	WS2		0.70	06/12/2010
2554667	WS2		1.00	06/12/2010
2554671	WS3		0.10	06/12/2010
2554669	WS3		0.30	06/12/2010
2554673	WS3		0.70	06/12/2010
2554668	WS3		1.00	06/12/2010
2554678	WS4		0.10	08/12/2010
2554674	WS4		0.30	08/12/2010
2554675	WS4		0.50	08/12/2010
2554676	WS4		0.70	08/12/2010
2554679	WS4		1.00	08/12/2010
2554680	WS4		1.20	08/12/2010
2554677	WS4		1.50	08/12/2010

Only received samples which have had analysis scheduled will be shown on the following pages.

SDG: Job: Client Reference	_	MIJ_SOL-40	Location: Custome Attention	r:	G	iror	ntm	Clos iij Tay									
					T	е	S	t S	S	cł	ne	d	u	le	)		
SOLID					N	N	5	1	5	N		N	,	2			Ν
Results Legend		Lab Sample		2554661	2004000	1000		0554668	2554673		2554674		2554676			2554677	
X Test					-	0	n	c	α	ω		4	•	6			7
No Deter Possible	mination																
- Possible		Custom	-		WS1	VV			N/S3	WS3		V		×		:	×
		Sample Refe	erence		51	WS1		č	2	33	WS4		WS4		WS4		S4
	-	AGS Refer	ence														_
	-			0.30		0.10		1.00		0			5	0.70			
		Depth (r	n)							0.70			s c		1 C		1.50
		Contain	er	250g Amber Jar	400g Tub	350g Amber la	250g Amber Jan	400g Tub	250g Amber Jar	400g Tub	250g Amber Jar		250g Amber Jar	400g Tub	250g Amber Jai	400g Tub	60g VOC
Anions by Kone (soil	l)	All	NDPs: 0	7	-	7	7		7		7		7		7		
		All	Tests: 3				x		1		x				x		
Asbestos Containing Screen			NDPs: 0 Tests: 6		x	>	<mark>(</mark>	x		x	2	x		x			
Boron Water Soluble	)	All	NDPs: 0 Tests: 6	x		x	x		X		x		X				
CEN Readings		All	NDPs: 0 Tests: 3								~						
Dissolved Metals by	ICP-MS	All	NDPs: 0					X						X		X	_
EPH CWG (Aliphatic	c) GC (S)	All	Tests: 3 NDPs: 0			+	+	X	+					X		X	
EPH CWG (Aromatio	c) GC (S)	All	Tests: 3 NDPs: 0				x		-		x				x		
			Tests: 3				x				x				x		
GRO by GC-FID (S)	· · · · · · · · · · · · · · · · · · ·	All	NDPs: 0 Tests: 3						x			X	< 1				x
Hexavalent Chromiu	m (s)	All	NDPs: 0 Tests: 6		x	)	,	x		X		x		x			
Mercury Dissolved		All	NDPs: 0 Tests: 3		^					×		<b>^</b>					_
Metals by iCap-OES	(Soil)	Arsenic	NDPs: 0			+	+	X	+			-		X		X	
	_	Barium	Tests: 6 NDPs: 0	x		x	X		X		x		x				_
			Tests: 6	x		x	x		x		x		x				_
		Beryllium	NDPs: 0 Tests: 6	x		x	x		X		x		X				
		Cadmium	NDPs: 0 Tests: 6	x		X	x		X		x		x				
		Chromium	NDPs: 0														_
	-	Copper	Tests: 6 NDPs: 0	X		X	X		X		X		X				
	-	Lead	Tests: 6 NDPs: 0	x		x	X		X		x		x				_
			Tests: 6	x		x	x		X		x		x				
		Mercury	NDPs: 0 Tests: 6	x		x	X		X		X		X				
		Nickel	NDPs: 0 Tests: 6	x		X	x		×		x		x				
	1	Selenium	NDPs: 0									+					-
		Vanadium	Tests: 6 NDPs: 0	X		×	X		X		X	+	X	-			
	-	Zinc	Tests: 6 NDPs: 0	x		x	X		X		x		X	$\square$			_
			Tests: 6	x	,	x	x		X		x		x				

110764

Order Number: Report Number: Superseded Report:

	1209-83 _GRONTMIJ_SOL-40	Location: Customer Attention:	: (	Gront	Close mij h Taylo	or				Order Number: Report Number: Superseded Report:	110764	
SOLID Results Legend X Test	Lab Samp	le No(s)	2554661	2554665	2554668	2554673	2554674	2554676	2554677			
No Determination Possible	n Custor Sample Re		WS1	WS2	WS3	WS3	WS4	WS4	WS4			
	AGS Refe	erence										
	Depth	(m)	0.30	0.10	1.00	0.70	0.30	0.70	1.50			
	Contai	iner	400g Tub 250g Amber Jar	400g Tub 250g Amber Jar	60g VOC 400g Tub 250g Amber Jar	400g Tub 250g Amber Jar	60g VOC 400g Tub 250g Amber Jar	400g Tub 250g Amber Jar	60g VOC 400g Tub 250g Amber Jar			
PAH by GCMS	All	NDPs: 0 Tests: 4	x	X		Y		<b>v</b>				
рН	All	NDPs: 0 Tests: 6	^ X	x	x	^ 	X	^ 				
Sample description	All	NDPs: 0 Tests: 7	X	X	X	X	X	X	x			
Semi Volatile Organic Compou	Inds All	NDPs: 0 Tests: 3			x		x		x			
SVOC MS (W) - Aqueous	All	NDPs: 0 Tests: 3			X			X	X			
Total Organic Carbon	All	NDPs: 0 Tests: 6	x	x	x	x	x	x				
TPH CWG GC (S)	All	NDPs: 0 Tests: 3			x		x		x			
VOC MS (S)	All	NDPs: 0 Tests: 3			X		×		x			
VOC MS (W)	All	NDPs: 0 Tests: 3			Y			v	×			

## **CERTIFICATE OF ANALYSIS**

Validated

SDG:	101209-83	Location:	Blake Close	Order Number:	110764
Job:	H_GRONTMIJ_SOL-40	Customer:	Grontmij	Report Number:	
Client Reference:		Attention:	Gareth Taylor	Superseded Report:	

## **Sample Descriptions**

Grain Sizes											
very fine	<0.063mm	fine	0.063mm - 0.1mm	medium	0.1mm	- 2mm	coars	e 2mm -	10mm	very coars	e >10mr
Lab Sample No	s) Custom	ner Sample Re	f. Depth (m)	Col	our	Descript	tion	Grain size	Incl	usions	Inclusions 2
2554661		WS1	0.30	Light I	Light Brown		Clay 0.063 - 0.1 mm		I	N/A	N/A
2554665		WS2	0.10	R	əd	Sand		0.1 - 2 mm	St	ones	N/A
2554668		WS3	1.00	Dark I	Dark Brown		and	0.1 - 2 mm	St	ones	N/A
2554673		WS3	0.70	Dark I	Brown	Silty Clay		0.063 - 0.1 mm		N/A	Stones
2554674		WS4	0.30	Light I	Brown	Loamy Sand		0.1 - 2 mm	St	ones	N/A
2554676		WS4	0.70	Light I	Light Brown		and	0.1 - 2 mm	St	ones	N/A
2554677		WS4	1.50	Dark I	Brown	Sand		0.1 - 2 mm	St	ones	N/A

These descriptions are only intended to act as a cross check if sample identities are questioned, and to provide a log of sample matrices with respect to MCERTS validation. They are not intended as full geological descriptions.

We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials - whether these are derived from naturally ocurring soil profiles, or from fill/made ground, as long as these materials constitute the major part of the sample.

Other coarse granular materials such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

## **CERTIFICATE OF ANALYSIS**

Validated

			CEI	RII	FICATE O		NALYSIS				
	09-83 RONTMIJ_SC	)L-40	Location: Customer: Attention:	Gr	ake Close ontmij areth Taylor				Order Number: Report Number: Superseded Repo	110764 ort:	
Results Legend           #         ISO17025 accredited.           M         mCERTS accredited.           §         Non-conforming work.	Cus	tomer Sample R Depth (m)	WS1 0.30		WS2 0.10		WS3 0.70		WS3 1.00	WS4 0.30	WS4
aq Aquecus / settide sample. diss.fiit Dissolved / filtered sample. totunfiit Total / unfiltered sample. * subcontracted test. * % recovery of the surrogate stand check the efficiency of the method		Sample Type Date Sampled Date Received SDG Ref	Soil/Solid 06/12/2010 09/12/2010 101209-83		Soil/Solid 06/12/2010 09/12/2010 101209-83		Soil/Solid 06/12/2010 09/12/2010 101209-83		Soil/Solid 06/12/2010 09/12/2010 101209-83	Soil/Solid 08/12/2010 09/12/2010 101209-83	Soil/Solid 08/12/2010 09/12/2010 101209-83
results of the individual compoun within the samples are not correct this recovery.	ds La	AGS Reference	2554661		2554665		2554673		2554668	2554674	2554676
Component Moisture	%	PM114							9.28		9.34
Moisture content ratio	%	PM114							10.2		10.3
Dry matter content ratio	%	PM114							90.7		90.7
Asbestos Containing Material Screen	-	TM001	No ACM Dete	cted	No ACM Dete	cted	No ACM Detec	cted	No ACM Detected	No ACM Detected	No ACM Detected
Soil Organic Matter (SOM)	<0.35 %	TM132	1.6	#	<0.35	#	2.74	#	2.36 #	0.914 #	1.88 #
рН	1 pH Units	TM133	7.29	М	8.63	М	7.59	м	7.84 M	8.19 M	8.36 M
Chromium, Hexavalent	<0.6 mg/kg	TM151	<0.6	#	<0.6	#	<0.6	#	<0.6 #	<0.6	<0.6
Arsenic	<0.6 mg/kg	TM181	2.53	М	3.52	М	4.07	М	3.94 M	5.01 M	4.9 M
Barium	<0.6 mg/kg	TM181	56.7	#	70.5	#	109	#	93.5 #	59.4 #	104 #
Beryllium	<0.01 mg/kg	TM181	0.498	М	0.798	М	0.486	М	0.497 M	0.222 M	0.278 M
Cadmium	<0.02 mg/kg	TM181	0.377	М	0.532	М	0.452	М	0.475 M	0.253 M	0.364 M
Chromium	<0.9 mg/kg	TM181	13.3	М	11.4	М	6.92	М	8 M	5.6 M	9.26 M
Copper	<1.4 mg/kg	TM181	11	М	29.2	М	39.5	М	28 M	8.64 M	11.3 M
Lead	<0.7 mg/kg	TM181	13.9	М	4.15	М	35.2	М	25.1 M	16.2 M	22.8
Mercury Nickel	<0.14 mg/kg <0.2	TM181 TM181	<0.14	М	<0.14 9.55	М	<0.14 8.73	М	<0.14 M 9.56	<0.14 M 5.33	<0.14 M 7.89
	mg/kg	TM181	<1	М	9.55 <1	Μ	<1	М	9.50 M	5.35 M	/.69 M
Selenium Vanadium	<1 mg/kg	TM181	14.5	#	12.8	#	15.9	#	12.1	9.21	14.8
Zinc	mg/kg <1.9	TM181	43.5	#		#	96	#	78.8	33.8	50.5
Boron, water soluble	mg/kg <1 mg/kg	TM222	<1	М	<1	Μ	<1	М	M	<1 00.0	
Water Soluble Sulphate as	<0.008	TM243		Μ		Μ		М	0.0119	M	
SO4 2:1 Extract	g/l								M		

	Laborat	01103		CEF	<b>TIFICATE OF</b>	ANALYSIS			Validated
SDG: Job: Client Reference:	101209- H_GRO	-83 NTMIJ_5	SOL-40	Location: Customer: Attention:	Blake Close Grontmij Gareth Taylor		Order Number: Report Number: Superseded Repo	110764 ort:	
Results Lege           #         ISO17025 accredited.           M         mCERTS accredited.           §         Non-conforming work, aq           Aqueous / settled sam diss.filt         Dissolved / filterod sam subcontracted test.           *         % recovery of the surr check the efficiency of results of the individuu within the samples are this recovery.	ple. nple. le. ogate standard to the method. The al compounds not corrected fo	o e or	Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	WS4 1.50 Soil/Solid 08/12/2010 09/12/2010 101209-83 2554677					
Component Moisture		LOD/Unit %	s Method PM114	10.6					
Moisture content ratio		%	PM114	11.8	_				
Dry matter content rat	io	%	PM114	89.4	_				
Water Soluble Sulpha SO4 2:1 Extract		<0.008 g/l		0.009	M				
									-

				RTIFICATE OF A	INAL 1 313		
	101209-83 H_GRONTMI	J SOL-40	Location: Customer:	Blake Close Grontmij		Order Number: Report Number:	110764
Client Reference:			Attention:	Gareth Taylor		Superseded Report:	
AH by GCMS							
Results Legend # ISO17025 accredited. M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sample.		Customer Sample R Depth (m)	WS1 0.30	WS2 0.10	WS3 0.70	WS4 0.70	
diss.filt Dissolved/filtered sample. . unfilt Total / unfiltered sample. . subcontracted test. * % recovery of the surrogat check the efficiency of the results of the individual co within the samples are not this recovery.	e standard to method. The mpounds	Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Soil/Solid 06/12/2010 09/12/2010 101209-83 2554661	Soil/Solid 06/12/2010 09/12/2010 101209-83 2554665	Soil/Solid 06/12/2010 09/12/2010 101209-83 2554673	Soil/Solid 08/12/2010 09/12/2010 101209-83 2554676	
Component Naphthalene-d8 %	LOD/U		95.4	96.4	94.9	94.7	
ecovery** Acenaphthene-d10 %	%		95.3	94.2	94.9	91.9	
recovery** Phenanthrene-d10 %	%	5 TM218	97.6	92.4	96.2	90.5	
ecovery**							
Chrysene-d12 % recovery**	%		92.2	90.4	95.1	90.9	
Perylene-d12 % recovery			88.1	94.3	102	91.1	
Naphthalene	<9 hi		<9	<9 M M	106 M	30 M	
Acenaphthylene	<1 µg/k		<12	<12 M M	18.6 M	73.9 M	
Acenaphthene	<8 hi		<8	<8 M M	635 M	75.7 M	
Fluorene	<1 µg/k		<10	<10 M M	609 M	140 M	
Phenanthrene	μg/i <1 μg/i	5 TM218	<15	<15 M M	4120 M	3150 M	
Anthracene	μ <u>g</u> ,ι <1 μg/k	6 TM218	<16	<16 M M	1040 M	1100 M	
Fluoranthene	μ <u>η</u> /r <1 μg/k	7 TM218	<17	M <17 M M	4190 M	6650 M	
Pyrene	<1	5 TM218	<15	M <15 M M	3160 M	5700 M	
Benz(a)anthracene	μg/k <1	4 TM218	<14	M <14 M M	1390 M	4160 M	
Chrysene	µg/k <1	0 TM218	<10	M <10 M M	1300 M	3610 M	
Benzo(b)fluoranthene	µg/k <1	5 TM218	<15	<15	1480	3940	
Benzo(k)fluoranthene	µg/k <1	4 TM218	<14	M M <	632	1640 M	
Benzo(a)pyrene	µg/k <1	5 TM218	<15	M M <15	M 1330	M 3610	
ndeno(1,2,3-cd)pyrene	µg/k <1	8 TM218	<18	M M <18	M 687	M	
Dibenzo(a,h)anthracene		3 TM218	<23	M M <23	M 179	555 M	
Benzo(g,h,i)perylene	μg/k <2		<24	M M <	M 817	M 2000	
Polyaromatic	µg/k <11		<118	M M <118	M 21700	M 38100	
hydrocarbons, Total	μg/k			<u>M</u> <u>M</u>	M	M	
	1	I					

#### **CERTIFICATE OF ANALYSIS**

Validated

SDG:	101209-83	Location:	Blake
Job:	H_GRONTMIJ_SOL-40	Customer:	Grontn
Client Reference:		Attention:	Gareth

SDG: Job: Clien		09-83 RONTMIJ_S	OL-40	Location: Customer: Attention:	Blake Close Grontmij Gareth Taylor		Order Number: Report Number: Superseded Repor	110764 ::	
Semi V	Volatile Organic C	ompound	ds						
#	Results Legend ISO17025 accredited.	C	ustomer Sample R	WS3	WS4	WS4			
	mCERTS accredited. Non-conforming work. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample.		Depth (m) Sample Type Date Sampled	1.00 Soil/Solid 06/12/2010	0.30 Soil/Solid 08/12/2010	1.50 Soil/Solid 08/12/2010			
tot.unfilt *	subcontracted test. % recovery of the surrogate stands	ard to	Date Received	09/12/2010	09/12/2010	09/12/2010			
	check the efficiency of the method results of the individual compound	l. The	SDG Ref Lab Sample No.(s)	101209-83 2554668	101209-83 2554674	101209-83 2554677			
	within the samples are not correct this recovery.	ed for	AGS Reference						
Compo		LOD/Units				100			
Pheno	1	<100 µg/kg	TM157	<100	<100	<100			
Pentac	chlorophenol	<100 µg/kg	TM157	<100	<100	<100			
n-Nitro	so-n-dipropylamine	<100 µg/kg	TM157	<100	<100	<100			
Nitrobe	enzene	<100 µg/kg	TM157	<100	<100	<100			
Isopho	orone	<100 µg/kg	TM157	<100	<100	<100			
Hexac	hloroethane	<100 µg/kg	TM157	<100	<100	<100			
	hlorocyclopentadien	<100	TM157	<100	<100	<100			
e Hexac	hlorobutadiene	μg/kg <100	TM157	<100	<100	<100			
Hexac	hlorobenzene	μg/kg <100 μg/kg	TM157	<100	<100	<100			
n-Dioc	tyl phthalate	<100 µg/kg	TM157	<100	<100	<100			
Dimeth	nyl phthalate	<100 µg/kg	TM157	<100	<100	<100			
Diethy	l phthalate	<100 µg/kg	TM157	<100	<100	<100			
n-Dibu	tyl phthalate	<100 µg/kg	TM157	<100	<100	<100			
Dibenz	zofuran	<100 µg/kg	TM157	<100	<100	<100			
Carbaz	zole	<100 µg/kg	TM157	<100	163	344			
Butylbe	enzyl phthalate	<100 µg/kg	TM157	<100	<100	<100			
bis(2-E	Ethylhexyl) phthalate	<100 µg/kg	TM157	<100	<100	<100			
bis(2-0 e	Chloroethoxy)methan	<100 µg/kg	TM157	<100	<100	<100			
bis(2-C	Chloroethyl)ether	<100 µg/kg	TM157	<100	<100	<100			
Azobe	nzene	<100 µg/kg	TM157	<100	<100	<100			
4-Nitro	phenol	<100 µg/kg	TM157	<100	<100	<100			
	aniline	<100 µg/kg	TM157	<100	<100	<100			
	nylphenol	<100 µg/kg	TM157	<100	<100	<100			
	rophenylphenylether	<100 µg/kg	TM157	<100	<100	<100			
	roaniline	<100 µg/kg	TM157	<100	<100	<100			
	ro-3-methylphenol	<100 µg/kg	TM157	<100	<100	<100			
	nophenylphenylether	<100 µg/kg	TM157	<100	<100	<100			
3-Nitro	aniline	<100 µg/kg	TM157	<100	<100	<100			
2-Nitro	phenol	<100 µg/kg	TM157	<100	<100	<100			
2-Nitro	aniline	<100 µg/kg	TM157	<100	<100	<100			
2-Meth	nylphenol	<100 µg/kg	TM157	<100	<100	<100			
1,2,4-1	Frichlorobenzene	<100 µg/kg	TM157	<100	<100	<100			
2-Chlo	rophenol	<100 µg/kg	TM157	<100	<100	<100			
2,6-Dir	nitrotoluene	<100 µg/kg	TM157	<100	<100	<100			
2,4-Dir	nitrotoluene	<100 µg/kg	TM157	<100	<100	<100			

#### **CERTIFICATE OF ANALYSIS**

Validated

SDG:	101209-83	Location:	Blake Close	Order Number:
Job:	H_GRONTMIJ_SOL-40	Customer:	Grontmij	Report Number: 110764
Client Reference:		Attention:	Gareth Taylor	Superseded Report:

#### Semi Volatile Organic Compounds

Jenn	Volatile Organic Co							
м	Results Legend ISO17025 accredited. mCERTS accredited. Non-conforming work.	C	ustomer Sample R	WS3	WS4	WS4		
aq	Aqueous / settled sample. Dissolved / filtered sample.		Depth (m) Sample Type	1.00 Soil/Solid	0.30 Soil/Solid	1.50 Soil/Solid		
	Dissolved / filtered sample. Total / unfiltered sample.		Date Sampled	06/12/2010	08/12/2010	08/12/2010		
•	subcontracted test.		Date Received	09/12/2010	09/12/2010	09/12/2010		
	% recovery of the surrogate standard check the efficiency of the method. T	The 🛛	SDG Ref	101209-83 2554668	101209-83 2554674	101209-83 2554677		
	results of the individual compounds within the samples are not corrected this recovery.		Lab Sample No.(s) AGS Reference	2004000	2004074	2004077		
Compo		LOD/Units	Method TM157	<100	<100	<100		
2,4-DII	nethylphenol	<100 µg/kg	11/157	<100	<100	<100		
	chlorophenol	<100 µg/kg	TM157	<100	<100	<100		
	richlorophenol	<100 µg/kg	TM157	<100	<100	<100		
	richlorophenol	<100 µg/kg	TM157	<100	<100	<100		
	chlorobenzene	<100 µg/kg	TM157	<100	<100	<100		
	chlorobenzene	<100 µg/kg	TM157	<100	<100	<100		
	chlorobenzene	<100 µg/kg	TM157	<100	<100	<100		
	ronaphthalene	<100 µg/kg	TM157	<100	<100	<100		
	lylnaphthalene	<100 µg/kg	TM157	<100	<100	<100		
	phthylene	<100 µg/kg	TM157	<100	<100	<100		
Acena	phthene	<100 µg/kg	TM157	<100	<100	<100		
Anthra	cene	<100 µg/kg	TM157	<100	754	874		
Benzo	(a)anthracene	<100 µg/kg	TM157	375	1970	1410		
Benzo	(b)fluoranthene	<100 µg/kg	TM157	328	1180	896		
Benzo	(k)fluoranthene	<100 µg/kg	TM157	327	1280	974		
Benzo	(a)pyrene	<100 µg/kg	TM157	451	1730	1310		
Benzo	(g,h,i)perylene	<100 µg/kg	TM157	254	932	797		
Chryse	ene	<100 µg/kg	TM157	374	1830	1370		
Fluora	nthene	<100 µg/kg	TM157	668	4110	3340		
Fluore		<100 µg/kg	TM157	<100	<100	141		
	(1,2,3-cd)pyrene	<100 µg/kg	TM157	233	857	706		
Phena	nthrene	<100 µg/kg	TM157	299	2280	3140		
Pyrene		<100 µg/kg	TM157	628	3670	2860		
Naphth	nalene	<100 µg/kg	TM157	<100	<100	<100		
Dibenz	co(a,h)anthracene	<100 µg/kg	TM157	<100	211	173		

<ul> <li>subcontracted test.</li> <li>% recovery of the surrogate stand. check the efficiency of the method results of the individual compound within the samples are not correct this recovery.</li> </ul>	l. The ds	Date Received SDG Ref Lab Sample No.(s) AGS Reference	09/12/2010 101209-83 2554668	09/12/2010 101209-83 2554674	09/12/2010 101209-83 2554677			
Component	LOD/Un	its Method						
GRO Surrogate % recovery**	%	TM089	64	133	130			
GRO >C5-C12	<44	TM089	<44	<44	<44			
Methyl tertiary butyl ether	μg/kg <5 μg/		<5	<5	<5			
(MTBE) Benzene	<10		# <10	# <10	<10	#		
Toluene	μg/kg <2 μg/		M <2	M <2	<2	M		
Ethylbenzene	<3 µg/	kg TM089	M 3.33	M <3	<3	M		
m,p-Xylene	<6 µg/		M <6	M <6	N <6	M		
o-Xylene	<3 µg/	-	M <3	M <3	N <3	M		
m,p,o-Xylene	<10	-	M <10	M <10	-	M		
BTEX, Total	μg/kg <10		<10		<10			
	µg/kg			<10		_		
Aliphatics >C5-C6	<10 µg/kg		<10	<10	<10			
Aliphatics >C6-C8	<10 µg/kg		<10	<10	<10			
Aliphatics >C8-C10	<10 µg/kg		<10	<10	<10			
Aliphatics >C10-C12	<10 µg/kg		<10	<10	<10			
Aliphatics >C12-C16	<100 µg/kg	) TM173	1040	1480	1610			
Aliphatics >C16-C21	<100 µg/kg	) TM173	1050	2000	1500			
Aliphatics >C21-C35	<100	) TM173	8270	5070	5870			
Aliphatics >C35-C44	μg/kg <100	) TM173	1660	<100	902			
Total Aliphatics >C12-C44	μg/kg <100	) TM173	12000	8550	9880	_		
Aromatics >EC5-EC7	µg/kg <10	TM089	<10	<10	<10			
Aromatics >EC7-EC8	µg/kg <10	TM089	<10	<10	<10			
Aromatics >EC8-EC10	µg/kg <10	TM089	<10	<10	<10	_		
Aromatics >EC10-EC12	µg/kg <10	TM089	<10	<10	<10			
Aromatics >EC12-EC16	µg/kg <100		4100	4640	601			
Aromatics >EC16-EC21	µg/kg <100		11600	25400	14900			
Aromatics >EC21-EC35	µg/kg <100		30700	51300	28600			
Aromatics >EC35-EC44	µg/kg <100		17100	22900	13300			
Aromatics >EC40-EC44	μg/kg <100		6600	8560	5800			
	µg/kg							
Total Aromatics >EC12-EC44	<100 µg/kg		63400	104000	57400			
Total Aliphatics & Aromatics >C5-C44	<100 µg/kg		75400	113000	67300			
Total Aliphatics >C5-35	<100 µg/kg	) TM173	10400	8550	8980			
Total Aromatics >C5-35	<100 µg/kg	) TM173	46300	81300	44100			
Total Aliphatics & Aromatics >C5-35	<100 µg/kg	) TM173	56700	89800	53100			
	Marria							
	1						I	
6.04.22 12/01/2011								

within the samples are not corrected this recovery.	i tor	AGS Reference							
Component	LOD/Uni	ts Method							
Dibromofluoromethane**	%	TM116	110	109		110			
Toluene-d8**	%	TM116	96.6	99.1		99.1			
4-Bromofluorobenzene**	%	TM116	134	108		112			
Dichlorodifluoromethane	<4 µg/	kg TM116	<4 M	<4	м	<4	М		
Chloromethane	<7 µg/	kg TM116	<7 #	<7	#	<7	#		
Vinyl Chloride	<10 µg/kg	TM116	<10 #	<10	#	<10	#		
Bromomethane	<13 µg/kg	TM116	<13 M	<13	м	<13	м		
Chloroethane	<14 µg/kg		<14 M	<14	м	<14	м		
Trichlorofluorormethane	<6 µg/	-	<6 M	<6	м	<6	м		
1.1-Dichloroethene	<10 µg/kg		<10 #	<10	#	<10	#		
Carbon Disulphide	<7 µg/	-	<7 M	<7	м	<7	м		
Dichloromethane	<10 µg/kg		13.2 #	<10	#	<10	#		
Methyl Tertiary Butyl Ether	<11 µg/kg	TM116 TM116	<11 M	<11	м	<11	м		
trans-1-2-Dichloroethene	<11 µg/kg		<11 M	<11	м	<11	м		
1.1-Dichloroethane	<8 µg/		<8 M <5	<8	м	<8	м		
cis-1-2-Dichloroethene	<5 µg/		M	<5	м	<5	м		
2.2-Dichloropropane Bromochloromethane	<12 µg/kg <14	TM116 TM116	<12 M <14	<12 <14	м	<12	м		
Chloroform	µg/kg <8 µg/		<14 M <8	<8	М	<8	м		
1.1.1-Trichloroethane	<0 μg/	<u> </u>	<8 M	<7	М	<7	м		
1.1-Dichloropropene	<11	TM116	<11 N	<11	м	<11	м		
Carbontetrachloride	µg/kg <14	TM116	M	<14	М	<14	м		
1.2-Dichloroethane	μg/kg <5 μg/		M	<5	М	<5	м		
Benzene	<9 µg/		M	<9	М	<9	М		
Trichloroethene	<9 µg/		M <9		М	<9	М		
1.2-Dichloropropane	<12	TM116	M <12	<12	М	<12	М		
Dibromomethane	μg/kg <9 μg/	kg TM116	M <9	<9	М	<9	М		
Bromodichloromethane	<7 µg/		M <7	<7	М	<7	М		
cis-1-3-Dichloropropene	<14	TM116	M <14	<14	М	<14	М		
Toluene	μg/kg <5 μg/		M 8.24	<5	М	<5	М		
trans-1-3-Dichloropropene	<14	TM116	M <14	<14	М	<14	М		
1.1.2-Trichloroethane	µg/kg <10	TM116	<10	<10		<10			
1.3-Dichloropropane	μg/kg <7 μg/		M <7	<7	M	<7	M		
Tetrachloroethene	<5 µg/	kg TM116	======================================	<5	#	<5	#		
Dibromochloromethane	<13	TM116	<13 M	<13	M	<13	M		
	µg/kg		Μ	I	M		М	 <u> </u>	

### **CERTIFICATE OF ANALYSIS**

Validated

#### VOC MS (S)

VOC N										
#	Results Legend ISO17025 accredited.	Ci	ustomer Sample R	WS3		WS4	WS4			
м	mCERTS accredited.									
§ aq	Non-conforming work. Aqueous / settled sample.		Depth (m)	1.00		0.30	1.50			
	Dissolved / filtered sample. Total / unfiltered sample.		Sample Type Date Sampled	Soil/Solid 06/12/2010		Soil/Solid 08/12/2010	Soil/Solid 08/12/2010			
·	subcontracted test. % recovery of the surrogate standa	rd to	Date Received	09/12/2010		09/12/2010	09/12/2010			
	check the efficiency of the method.	The	SDG Ref Lab Sample No.(s)	101209-83 2554668		101209-83 2554674	101209-83 2554677			
	results of the individual compounds within the samples are not corrected	• I	AGS Reference							
Compo	this recovery.	LOD/Units	Method							
	promoethane	<12	TM116	<12	-	<12	<12			
1.2 01	Joneounano	µg/kg	- Init To		М	M	12	М		
Chloro	benzene	<5 µg/kg	TM116	<5		<5	<5			
1.1.1.2	-Tetrachloroethane	<10	TM116	<10	М	M <10	<10	М		
		µg/kg			М	M		М		
Ethylbe	enzene	<4 µg/kg	TM116	12.8	м	<4 M	<4	м		
p/m-Xy	lene	<14	TM116	<14		<14	<14			
		µg/kg	T1440		#	#		#		
o-Xyle	ne	<10 µg/kg	TM116	<10	м	<10 M	<10	М		
Styren	е	<10	TM116	<10		<10	<10			
	-	µg/kg			М	M		М	 	
Bromo	torm	<10 µg/kg	TM116	<10	м	<10 M	<10	м		
Isopro	oylbenzene	<5 µg/kg	TM116	<5		<5	<5	191		1
					М	М		М		
1.1.2.2	-Tetrachloroethane	<10	TM116	<10	#	<10 #	<10	#		
1.2.3-1	richloropropane	μ <u>g/kg</u> <17	TM116	<17	#	# <17	<17	#		
		µg/kg			М	M		М		
Bromo	benzene	<10	TM116	<10		<10	<10			
Pronvl	benzene	μ <u>g/kg</u> <11	TM116	<11	M	M <11	<11	М		
i iopyn	00120110	µg/kg	- Init To		М	M		М		
2-Chlo	rotoluene	<9 µg/kg	TM116	<9		<9	<9			
1257		<0.ug//c	TM116	<8	М	M <8	<8	М		
1.3.3-1	rimethylbenzene	<8 µg/kg			#	~o #	~0	#		
4-Chlo	rotoluene	<12	TM116	<12		<12	<12			
	<i>с</i> п	µg/kg	<b>T</b> 14440		М	M	10	М		
tert-Bu	tylbenzene	<12 µg/kg	TM116	<12	#	<12 #	<12	#		
1.2.4-7	rimethylbenzene	<9 µg/kg	TM116	<9		<9	<9			
					#	#		#		
sec-Bu	itylbenzene	<10 µg/kg	TM116	<10	м	<10 M	<10	М		
4-Isopi	ropyltoluene	<11	TM116	<11		<11	<11	IVI		
		µg/kg			М	М		М		
1.3-Dio	chlorobenzene	<6 µg/kg	TM116	<6	м	<6 M	<6	М		
1.4-Dic	chlorobenzene	<5 µg/kg	TM116	<5		<5	<5	IVI		
					м	М		М		
n-Buty	lbenzene	<10	TM116	<10		<10	<10	N 4		
1.2-Dic	chlorobenzene	μ <u>g/kg</u> <12	TM116	<12	М	M <12	<12	М		
		µg/kg			м	М		М		
	promo-3-chloropropa	<14	TM116	<14		<14	<14			
ne Tert-ar	nyl methyl ether	μg/kg <15	TM116	<15	М	M <15	<15	М	 	
		µg/kg		-15			-10			
1.2.4-7	richlorobenzene	<6 µg/kg	TM116	<6	,	<6	<6			
Hever	hlorobutadiene	<12	TM116	<12	#	# <12	<12	#	 	
TICKaC		μg/kg		~1Z		-12	>12		 	
Naphth	nalene	<13	TM116	<13		<13	<13			
1007	richlorohanzast		TN4440	<6	М	M <6	<6	М		
1.2.3-1	richlorobenzene	<6 µg/kg	TM116		м	<6 M	<0	М		
										1
					-					

<b>SDG:</b> 101209-83		Location:	Blake Clo	ose		Order Number:		
Job: H_GRONTM Client Reference:	_	Customer: Attention:	Grontmij Gareth Ta	aylor		Report Number: Superseded Report:	110764	
		CEN		AGE BATCH	TEST			
VAC ANALYTICAL RES	ULIS							6 EN 1245
Client Reference				Site Location		Blake	Close	
lass Sample taken (kg)	0.193			Moisture Conte		10.2		
lass of dry sample (kg)	0.175			Dry Matter Con	tent Ratio (%)	) 90.7		
Particle Size <4mm	>95%							
Case								
DG	101209-83							
ab Sample Number(s)	2554668							
Sampled Date	06-Dec-2010							
	WS3							
Customer Sample Ref. Depth (m)	1.00							
	1.00							
Solid Waste Analysis	4.07							
otal Organic Carbon (%)	1.37					-	-	-
oss on Ignition (%) um of BTEX (mg/kg)	- <0.01					-	-	-
um of 7 PCBs (mg/kg)	-					-	-	-
lineral Oil (mg/kg)	-					-	-	-
AH Sum of 17 (mg/kg)	-					-	-	-
H (pH Units) NC to pH 6 (mol/kg)	7.84					-	-	-
NC to pH 4 (mol/kg)	-					-	-	-
	C	nc <sup>n</sup> in 2:1		2.1	conc <sup>n</sup>			
luate Analysis		ate (mg/l)			d (mg/kg)	Limit value	es for compliance le	eaching test
	Result		of Detection	Result	Limit of Detecti	on using B	S EN 12457-3 at L/	S 10 l/kg
rsenic	0.00124	<0	.00012	0.00248	<0.0012	0.5	2	25
arium	-		-	-	-	20	100	300
	< 0.0001		0.0001	<0.0002	< 0.001	0.04	1	5
Chromium Copper	0.004		.00022	0.008	< 0.0022	0.5	10	70
lercury Dissolved (CVAF)	0.00405		.00085 .00001	0.0081	<0.0085	2 0.01	50 0.2	100 2
lolybdenum	-		-	-	-	0.5	10	30
lickel	0.00106	<0	.00015	0.00212	<0.0015	0.4	10	40
ead	0.000366	<0	.00002	0.000732	<0.0002	0.5	10	50
Intimony	-		-	-	-	0.06	0.7	5
elenium inc	- 0.002		-	- 0.004	- <0.0041	0.1	0.5	7 200
hloride	- 0.002		.00041 -	- 0.004	-	800	15000	25000
luoride	-		-	-	-	10	150	500
ulphate (soluble)	-		-	-	-	1000	20000	50000
otal Dissolved Solids	-		-	-	-	4000	60000	100000
otal Monohydric Phenols (W) issolved Organic Carbon	-		-	-	-	1 500	800	1000
							000	1000
				1	1			

Date Prepared	06-Jan-2011
pH (pH Units)	8.13
Conductivity (µS/cm)	116.00
Temperature (°C)	13.50
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

			CEF	RTIFICA	TE OF ANAL	.YSIS			
	01209-83 I_GRONTMIJ_SC	DL-40	Location: Customer: Attention:	Blake Clo Grontmij Gareth T		1	Order Number: Report Number: Superseded Report:	110764	
VAC ANALYTICA	AL RESULT	S						REF :	BS EN 124
lient Reference					Site Location		Blake	Close	
Mass Sample taken (	kg)	0.193			Moisture Conte	nt Ratio (%)	10.2		
Mass of dry sample	(kg)	0.175			Dry Matter Con	tent Ratio (%	) 90.7		
Particle Size <4mm		>95%							
Case									
DG		101209-83							
ab Sample Number	(s)	2554668							
Sampled Date		06-Dec-2010	)						
Customer Sample Re	əf.	WS3							
Depth (m)		1.00							
Solid Waste Analysis	3								
otal Organic Carbon (%)		1.37					-	-	· -
oss on Ignition (%)		-					-	-	-
Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg)		<0.01					-	-	-
fineral Oil (mg/kg)		-					-	-	-
AH Sum of 17 (mg/kg)		-					-	-	-
H (pH Units)		7.84					-	-	-
NC to pH 6 (mol/kg)		-					-	-	-
(No to pri 4 (mol/kg)		-			1				
-lucto Analysia			onc <sup>n</sup> in 2:1 uate (mg/l)			conc <sup>n</sup> d (mg/kg)	Limit valu	es for complia	nce leaching test
Eluate Analysis				of Detection		Limit of Detect	using B		at L/S 10 l/kg
Boron		0.0201		).0094	Result 0.0402	< 0.094	-		-
/anadium		0.00186		.00024	0.00372	< 0.0024	-	-	-
VOC MS (W) - Aqueous									
,2,4-Trichlorobenzene		<0.0023		0.0023	<0.0046	<0.023			
,2-Dichlorobenzene ,3-Dichlorobenzene		< 0.0037		0.0037	< 0.0074	< 0.037		-	
,4-Dichlorobenzene		<0.0022 <0.0027		).0022 ).0027	<0.0044 <0.0054	<0.022 <0.027			
,4,5-Trichlorophenol		<0.0027		0.001	<0.0034	<0.027			
,4,6-Trichlorophenol		< 0.001		0.001	< 0.002	< 0.01	-	-	-
,4-Dichlorophenol		<0.001	<	0.001	<0.002	<0.01	-	-	-
,4-Dimethylphenol		<0.001		0.001	<0.002	<0.01	-	-	
,4-Dinitrotoluene		< 0.001		0.001	< 0.002	< 0.01		-	
-Chloronaphthalene		<0.001 <0.001	1	0.001 0.001	<0.002 <0.002	<0.01 <0.01	-	· · ·	
-Chlorophenol		<0.001		0.001	<0.002	<0.01			
-Methylnaphthalene		< 0.001		0.001	< 0.002	< 0.01	-	-	-
-Methylphenol		<0.001	<	0.001	<0.002	<0.01	-		
-Nitroaniline		<0.001		0.001	<0.002	< 0.01			
-Nitrophenol -Nitroaniline		< 0.001		0.001	< 0.002	< 0.01			
-Nitroannine -Bromophenylphenylether		<0.001 <0.001		0.001 0.001	<0.002 <0.002	<0.01 <0.01			<u>-</u>
-Chloro-3-methylphenol		<0.001		0.001	<0.002	<0.01			
-Chloroaniline		<0.001		0.001	<0.002	<0.01	-	-	-
each Test Informat	ion		_						
		06-Jan-2011							
ate Prepared		00-Jan-2011							
Date Prepared pH (pH Units) Conductivity (uS/cm)		8.13							

Conductivity (µS/cm) 116.00 Temperature (°C) 13.50 Volume Leachant (Litres) 0.332 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

ALcontrol Labor			CERTIFIC	CATE OF ANA			L	
	09-83 RONTMIJ_SOL-40	С	ustomer: Gronti	Close mij h Taylor	Re	der Number: port Number: perseded Report:	110764	
						<u>, , , , , , , , , , , , , , , , , , , </u>		
							DEE -	BS EN 12457/
	RESULIS			0'ta la satian		Diaka		D3 EN 1243//
Client Reference	0.400			Site Location		Blake	Close	
Mass Sample taken (kg)				Moisture Con		10.2		
Mass of dry sample (kg	-			Dry Matter Co	ontent Ratio (%)	90.7		
Particle Size <4mm	>95%							
Case			_					
SDG	10120	9-83						
Lab Sample Number(s)	25546	68					1	
Sampled Date	06-De	c-2010						
Customer Sample Ref.	WS3							
Depth (m)	1.00							
Solid Waste Analysis								
Total Organic Carbon (%)		1.37				-	-	-
Loss on Ignition (%)		-				-	-	-
Sum of BTEX (mg/kg)		<0.01				-	-	-
Sum of 7 PCBs (mg/kg) /lineral Oil (mg/kg)		-				-	-	-
PAH Sum of 17 (mg/kg)		-				-	-	-
oH (pH Units)		7.84				-	-	-
ANC to pH 6 (mol/kg)		-				-	-	-
ANC to pH 4 (mol/kg)				1		-		
			nc <sup>n</sup> in 2:1 2:1 conc <sup>n</sup> ate (mg/l) leached (mg/kg) Limit values for comp				o for complian	oo looching tost
Eluate Analysis		Result	Limit of Detection		Limit of Detection	usina B	S EN 12457-3 a	-
SVOC MS (W) - Aqueous								
4-Chlorophenylphenylether		<0.001	<0.001	<0.002	<0.01	-		
I-Methylphenol		<0.001	< 0.001	< 0.002	< 0.01			
I-Nitrophenol I-Nitroaniline		<0.001 <0.001	<0.001	<0.002	<0.01			
Azobenzene		<0.001	<0.001	<0.002	<0.01			
Acenaphthylene		<0.001	<0.001	<0.002	<0.01	-	-	<u> </u>
Acenaphthene		<0.001	< 0.001	<0.002	<0.01			
Anthracene Bis(2-chloroethyl)ether		< <u>0.001</u> <0.001	<0.001 <0.001	<0.002	<0.01		· · ·	
Bis(2-chloroethoxy)methane		<0.001	<0.001	<0.002	<0.01			
Bis(2-ethylhexyl) phthalate		<0.002	< 0.002	< 0.004	< 0.02	-		
Benzo(a)anthracene		<0.001	<0.001	<0.002	<0.01	-		
Butylbenzyl phthalate Benzo(b)fluoranthene		<0.001	<0.001	<0.002	<0.01	-		
Benzo(k)fluoranthene		< <u>0.001</u> <0.001	<0.001 <0.001	<0.002	<0.01			
Benzo(a)pyrene		<0.001	<0.001	<0.002	<0.01	-	<u> </u>	
Benzo(ghi)perylene		<0.001	<0.001	<0.002	<0.01	-		
Carbazole Chrysene		<0.001	< 0.001	<0.002	< 0.01			
Dibenzofuran		< <u>0.001</u> <0.001	<0.001 <0.001	<0.002	<u>&lt;0.01</u> <0.01			
Di-n-butyl phthalate		<0.001	<0.001	< 0.002	<0.01	-		
Diethyl phthalate		<0.001	<0.001	<0.002	<0.01	-	-	-
each Test Information								
Date Prepared	06-	Jan-2011						

Date Prepared	06-Jan-2011
pH (pH Units)	8.13
Conductivity (µS/cm)	116.00
Temperature (°C)	13.50
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

SDG:         101209-83           Job:         H_GRONTM	IIJ_SOL-40	Location: Customer:	Blake Clo Grontmij		Re	der Number: port Number:	110764	
Client Reference:		Attention:	Gareth T			perseded Report:		
		CEN	2:151	AGE BATCH	1531			
VAC ANALYTICAL RES	ULTS						REF :	BS EN 12457
Client Reference				Site Location		Blake	Close	
Mass Sample taken (kg)	0.193			Moisture Conte	ent Ratio (%)	10.2		
Mass of dry sample (kg)	0.175			Dry Matter Con	tent Ratio (%)	90.7		
Particle Size <4mm	>95%							
ase								
DG	101209-83							
ab Sample Number(s)	2554668							
Sampled Date	06-Dec-2010	)						
Customer Sample Ref.	WS3							
Depth (m)	1.00							
Solid Waste Analysis								
otal Organic Carbon (%)	1.37					-	-	-
oss on Ignition (%)	-					-	-	-
um of BTEX (mg/kg) um of 7 PCBs (mg/kg)	<0.01					-	-	-
lineral Oil (mg/kg)	-					-	-	-
AH Sum of 17 (mg/kg)	-					-	-	-
H (pH Units)	7.84					-	-	-
NC to pH 6 (mol/kg) NC to pH 4 (mol/kg)	-					-	-	-
		non in 214		2.4				
Eluate Analysis		Conc <sup>n</sup> in 2:1         2:1 conc <sup>n</sup> eluate (mg/l)         leached (mg/kg)			Limit value	Limit values for compliance leaching test		
	Result		f Detection	Result	Limit of Detection	using B	S EN 12457-3	at L/S 10 l/kg
VOC MS (W) - Aqueous								
Dibenzo(a,h)anthracene	<0.001		).001	<0.002	<0.01	-		
Vimethyl phthalate Vi-n-Octyl phthalate	<0.001		0.001	< 0.002	< 0.01	-		· · ·
luoranthene	<0.005		).005 ).001	<0.01 <0.002	<0.05	-		
luorene	< 0.001		0.001	< 0.002	< 0.01	-	-	
exachlorobenzene	<0.001		0.001	<0.002	<0.01	-		
lexachlorobutadiene entachlorophenol	<0.0025		.0025 ).001	<0.005 <0.002	<0.025 <0.01		· · ·	· · · ·
'henol	<0.001		).001 ).001	<0.002	<0.01	-		
I-nitrosodi-n-propylamine	< 0.001		0.001	< 0.002	<0.01	-		-
lexachloroethane	<0.001		0.001	<0.002	<0.01	-		
litrobenzene laphthalene	< 0.001		0.001	< 0.002	< 0.01	-	-	
sophorone	<0.0035		.0035 ).001	<0.007 <0.002	<0.035 <0.01			
lexachlorocyclopentadiene	<0.001		0.001	<0.002	<0.01	-	-	· -
henanthrene	< 0.001		0.001	<0.002	<0.01	-		<u> </u>
ndeno (1,2,3-cd) Pyrene	<0.001		).001 ).001	<0.002 <0.002	<0.01 <0.01	-		<u> </u>
OC MS (W)	<0.001	<		<u> </u>	<u> </u>	· · ·		
ibromofluoromethane	-		-	-	-	-		
oluene-d8	-		-	-	-	-		
-Bromofluorobenzene Dichlorodifluoromethane			-	-	-	-		
non ounituor officitane	<0.007	<(	0.007	<0.014	<0.07	-	-	-

Date Prepared	06-Jan-2011
pH (pH Units)	8.13
Conductivity (µS/cm)	116.00
Temperature (°C)	13.50
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

ALcontrol Lab			CEF	RTIFIC	ATE OF ANAL	YSIS			F	
	1209-83 _GRONTMIJ_SC	DL-40	Location: Customer: Attention:	Blake Cl Grontmij Gareth T		R	rder Number: eport Number: uperseded Report:	110764		
			CEN		AGE BATCH	TEST	· · · · ·			
VAC ANALYTICA	L RESULT	S						REF	: BS EN 12457	
Client Reference					Site Location		Blake	Close		
Mass Sample taken (k	(a)	0.193			Moisture Conte	ent Ratio (%)	10.2			
Mass of dry sample (k	0/	0.175			Dry Matter Con		90.7			
Particle Size <4mm	0/	>95%								
Case										
SDG		101209-83								
ab Sample Number(	s)	2554668								
Sampled Date		06-Dec-2010								
Customer Sample Ref	f.	WS3								
Depth (m)		1.00								
Solid Waste Analysis			_							
otal Organic Carbon (%)		1.37					-	-	-	
oss on Ignition (%)		-					-	-	-	
um of BTEX (mg/kg) um of 7 PCBs (mg/kg)		<0.01					-	-	-	
lineral Oil (mg/kg)		-					-	-	-	
PAH Sum of 17 (mg/kg)		-					-	-	-	
H (pH Units) NC to pH 6 (mol/kg)		7.84					-	-	-	
ANC to pH 4 (mol/kg)		-					-	-	-	
Elusta Anglusia			onc <sup>n</sup> in 2:1 late (mg/l)			conc <sup>n</sup> d (mg/kg)	Limit value	Limit values for compliance		
Eluate Analysis		Result				Limit of Detection	usina B	-	at L/S 10 l/kg	
VOC MS (W)		/								
Chloromethane /inyl Chloride		< 0.009		0.009	<0.018	< 0.09		· · ·		
Bromomethane		<0.0012 <0.002		.0012 ).002	<0.0024 <0.004	<0.012		· · · ·		
Chloroethane		< 0.0025		.0025	< 0.005	< 0.025	-		-	
Trichlorofluoromethane		<0.0013		.0013	<0.0026	<0.013	-			
,1-Dichloroethene		<0.0012 <0.0013		.0012	<0.0024 <0.0026	<0.012 <0.013				
Dichloromethane		< 0.0013		.0013	<0.0026	<0.013				
ert-butyl methyl ether		<0.0016		.0016	< 0.0032	<0.016	-	-	-	
rans-1,2-Dichloroethene		<0.0019		.0019	<0.0038	<0.019	-			
,1-Dichloroethane Sis-1,2-Dichloroethene		<0.0012		.0012	< 0.0024	< 0.012	-	-		
,2-Dichloropropane		<0.0023 <0.0038		.0023	<0.0046 <0.0076	<0.023 <0.038				
romochloromethane		< 0.0019		.0019	<0.0038	< 0.019	-	-		
Chloroform		<0.0018		.0018	< 0.0036	< 0.018	-			
,1,1-Trichloroethane ,1-Dichloropropene		<0.0013 <0.0013		.0013	<0.0026 <0.0026	<0.013 <0.013				
Carbontetrachloride		< 0.0013		.0013	<0.0028	<0.013	-			
,2-Dichloroethane		<0.0033		.0033	<0.0066	< 0.033	-		· · ·	
Benzene		< 0.0013		.0013	< 0.0026	< 0.013		-		
richloroethene ,2-Dichloropropane		<0.0025 <0.003		.0025 ).003	<0.005 <0.006	<0.025 <0.03				
each Test Informatio	<b></b>									
ate Prepared	110	06-Jan-2011								
		00-Jail-2011								

Date Prepared	06-Jan-2011
pH (pH Units)	8.13
Conductivity (µS/cm)	116.00
Temperature (°C)	13.50
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

Site Location         Blake Close           Mass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Dry Matter Content Ratio (%)         90.7           Particle Size <4mm	: BS EN 1245	
CEN 2:1 STAGE BATCH TEST           REF           Dilent Reference         Site Location         Blake Close           Mass Sample taken (kg)         0.193         Difference         Moisture Content Ratio (%)         10.2           Particle Size <4mm	: BS EN 1245	
NACA ANALYTICAL RESULTS         REF           Client Reference         Site Location         Blake Close           Mass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Particle Size <4mm         >95%         Dry Matter Content Ratio (%)         90.7           Particle Size <4mm         >95%         Dry Matter Content Ratio (%)         90.7           Case         50G         101209-83	: BS EN 1245	
Site Location         Blake Close           tass of dry sample (kg)         0.193         Moisture Content Ratio (%)         10.2           article Size <4mm	: BS EN 1245	
Iass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Iass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           aratice Size <4mm		
tass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           araticle Size <4mm		
Convertient         Sector         Sector         Sector           Sase         101209-83         3           aab Sample Number(s)         2554668         3           aampied Date         06-Dec-2010         3           Sustomer Sample Ref.         WS3         3           bepth (m)         1.00         -           solid Waste Analysis         -         -           out of PEK (mgkg)         -01         -           um of PEK (mgkg)         -001         -           wind of Tr (mgkg)         -         -           etal (mgkg)         -         -           out of PEK (mgkg)         -         -           wind of tr (mgkg)         -         -           etal (mgkg)         -         -           ot pt 4 (mmlkg)         -         -           son gamtion (%)         -         -           state Analysis         Conc* in 2:1         2:1 conc*           Blande Analysis         -         -           Bit of thomkg)         -         -           son gamtion (%)         -         -           sis-1.3-Dichloropropene         <0.0027		
Case         SDG         101209-83           sab Sample Number(s)         2554668           Sampled Date         06-Dec-2010           Customer Sample Ref.         WS3           Depth (m)         1.00           Solid Waste Analysis         -           oral Opanic Carbon (%)         1.37           oral Opanic Carbon (%)         -           With Oral Opanic Carbon (%)         -           oral Opanic Carbon (%)         -           Ark Sun Of 17 (mg/kg)         -           oral Opanic Carbon (%)         -           T         -           NC to pH 4 (molkg)         -           -         -           Diardon Opanic Carbon (%)         -           Stati 2-Dichloropropene		
BDG         101209-83           a.ab Sample Number(s)         2554668           Gample Date         06-Dec-2010           Sustomer Sample Ref.         WS3           Jopth (m)         1.00           Solid Waste Analysis         -           Solid Wig)         -           Lineard Oli (mgkg)         -           At Sun of 17 (mgkg)         -           At Sun of 17 (mgkg)         -           Solid Waste         -           Blueta (mgl)         -           Eluate Analysis         -           Blueta (mgl)         -           Solid W         -           Solid Waste Analysis         -           Bloomonethane         <-0.0027		
Last Sample Number(s)         2554668           ampled Date         06-Dec-2010           iustomer Sample Ref.         WS3           septh (m)         1.00           olid Waste Analysis         -           sex on gointon (%)        37           sex on gointon (%)        37           oild Waste Analysis		
Convertion         Convert		
sampled Date         06-Dec-2010           sustomer Sample Ref.         WS3           septh (m)         1.00           solid Waste Analysis         -           solid model         -           interal Oli (mgkg)         -           interal Oli (mgkg)         -           interal Oli (mgkg)         -           AH Sum of 17 (mgkg)         -           No to pH 4 (malkg)         -           Stuate Analysis         Eluate (mg/l)           Istuate Analysis         -           Ista Tichorepropene		
Concert Sample Ref.         WS3           hepth (m)         1.00           biolid Waste Analysis         -           stat Organic Carbon (%)         -           um of BTEX (mg/kg)         -           um of BTEX (mg/kg)         -           interal Oli (mg/kg)         - <td< td=""><td></td></td<>		
And Control Centry of the control of the co		
Solid Waste Analysis         1.37           olal Organic Carbon (%)         1.37           ose on gintion (%)         -           um of 7 FCR (mg/kg)         -           um of 7 FCR (mg/kg)         -           therad Oli (mg/kg)         -           the QH Units)         7.84           NC to pH 4 (mol/kg)         -           to pH 4 (mol/kg)         -           tormodichloromethane         <0.0027		
Construction         1.37           coss on lightion (%)         -           um of BTEX (mg/kg)         <0.01		
Concernmentance         Concernmen		
So diffyind (a)         -         -           um of 7 FC(ingkg)         <.	-	
um of 7 PCBs (mg/kg)         -	-	
Initial of https://         Image: Section of https://         Image:	-	
Arr Station I/ (https)         7.84           NC to pH 6 (mol/kg)         -           NC to pH 4 (mol/kg)         -           NC to pH 4 (mol/kg)         -           Iuate Analysis         Conc <sup>n</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>n</sup> leached (mg/kg)         Limit of Detection           OC MS (W)         -         -         -           or MS (W)         -         -         -           or MS (W)         -         -         -           or MS (W)         -         -         -           bibromorethane         <0.0027	-	
NC to pH 6 (mol/kg)	-	
NC to pH 4 (mol/kg)         -           Conc <sup>n</sup> in 2:1 eluate (mg/l)         Image: Second	-	
lease Analysis         lease (mg/k)         lease (mg/k)         Limit of Detection         Result         Limit of Detection           Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           OC MS (W)	-	
Eluate Analysiseluate (mg/l)leached (mg/kg)Limit values for complia using BS EN 12457-COC MS (W)rowspan="2">		
Result         Limit of Detection         Result         Limit of Detection           VOC MS (W)         -         -         -           Dibromomethane         <0.0027	s for compliance leaching test	
ibromomethane         <0.0027	at 2/5 10 1/kg	
0.0021         0.0001         0.0011         0.0011           romodichloromethane         <0.0009	-	
Cis-1,3-Dichloropropene         <0.0019         <0.0019         <0.0038         <0.019         -         -           oluene         <0.0014		
rans-1,3-Dichloropropene         0.0031         0.0035         0.007         c0.035         -         -           ,1,2-Trichloroethane         <0.0022		
1/2-Trichloroethane         0.0002         0.0002         0.0004         <0.002         -         -           ,3-Dichloropropane         <0.0022	-	
3-Dichloropropane         0.0022         0.0022         0.0044         0.022         -           etrachloroethene         <0.0015		
detrachloroethene         c0.0012         c0.0015         c0.0013         c0.015         -         -           hibromochloromethane         <0.0017		
bitromochloromethane         0.0010         0.00010         0.0000         0.0010         0.0000         0.0010         0.0010         0.0000         0.0010         0.0010         0.0000         0.0010         0.0010         0.0000         0.0010         0.0010         0.0010         0.0010         0.0010         0.0017         <0.0017         <0.0034         <0.017         - <td><u>-</u></td>	<u>-</u>	
2-Dibromoethane         <0.0023         <0.0023         <0.0046         <0.023         -         -           ihlorobenzene         <0.0035	-	
1,1,2-Tetrachloroethane         <0.0013         <0.0013         <0.0026         <0.013         -         -         -           thylbenzene         <0.0025	-	
No.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0016         0.0015         0.0025         0.0025         0.0025         0.0025         0.0025         0.0025         0.0025         0.0025         0.0025         -		
Im-Xylene         0.0025         0.0025         0.0025         0.0025         0.0025         0.0025         -         -           -Xylene         <0.0017		
-Xylene         <0.0017         <0.0017         <0.0034         <0.017         -           tyrene         <0.0012		
tyrene         <0.0012         <0.0012         <0.0024         <0.012         -           romoform         <0.003		
romoform         <0.003         <0.003         <0.006         <0.03         -         -           sopropylbenzene         <0.0014		
	-	
1,2,2-Tetrachloroethane <0.0052 <0.0052 <0.0104 <0.052		
,2,3-Trichloropropane         <0.0078         <0.0078         <0.0156         <0.078         -         -           irromobenzene         <0.002		
Introduction         CO.002         CO.002         CO.004         CO.02		
	-	
	-	
each Test Information	-	
ate Prepared 06-Jan-2011	-	

Date Prepared	06-Jan-2011
pH (pH Units)	8.13
Conductivity (µS/cm)	116.00
Temperature (°C)	13.50
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

Site Location         Blake Close           Mass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Mass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           Particle Size <4mm         >95%         Dry Matter Content Ratio (%)         90.7           Case	EF : BS EN 1245	
CEN 2:1 STAGE BATCH TEST           WAC ANALYTICAL RESULTS         R           Client Reference         Site Location         Blake Close           Wass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Particle Size <4mm		
Site Location         Blake Close           Mass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Mass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           Particle Size <4mm		
Site Location         Blake Close           Site Location         Blake Close           Moisture Content Ratio (%)         0.2           Dry Matter Content Ratio (%)         90.7           arrice Size <4mm         >95%           ase         DG         101209-83           ab Sample Number(s)         2554668           ampled Date         06-Dec-2010           sustomer Sample Ref.         WS3           bepth (m)         1.00           olidi Waste Analysis		
Rass Sample taken (kg)         0.193         Moisture Content Ratio (%)         10.2           Itass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           rarticle Size <4mm		
Aass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           Particle Size <4mm	 	
Particle Size <4mm         >95%           Case SDG         101209-83 (2554668) Sample Date         2554668 (2554668) Sample Date         06-Dec-2010 (2010) Customer Sample Ref.         WS3 (2010) WS3           Depth (m)         1.00         1.00         1.00           Solid Waste Analysis         -         -           old Organic Carbon (%)         1.37 (2010)         -         -           solid Waste Analysis         -         -         -           old Organic Carbon (%)         1.37 (2010)         -         -         -           More of ElS (mg/kg)         -         -         -         -           More of U(mg/kg)         -         -         -         -         -           More of He (molkg)         -         -         -         -         -         -           Not to pH 4 (molkg)         -	 	
SpG         101209-83           a.ab Sample Number(s)         2554668           sampled Date         06-Dec-2010           Customer Sample Ref.         WS3           Depth (m)         1.00           Solid Waste Analysis         -           otal Organic Carbon (%)         1.37           oss on Ignition (%)         -           um of BTEX (mg/kg)         -0.01           um of BTEX (mg/kg)         -           thereal Oil (mg/kg)         -           AH Sun of 17 (mg/kg)         -           NC to pH 6 (mol/kg)         7.84           NC to pH 4 (mol/kg)         -           State Analysis         -           Eluate Analysis         -           Eluate Analysis         -           Eluate Analysis         -           Conc <sup>m</sup> In 2:1 eluate (mg/l)         -           Eluate Analysis         -           Eluate Analysis         -           Control In 2:1 eluate (mg/l)         -           Control In 2:1 eluate (mg/l)         -           Control In 2:1 eluate (mg/l)         -           Eluate Analysis         -           Control In 2:1 eluate (mg/l)         -           Eluate Analysis         -	 	
Lab Sample Number(s)         2554668           aampled Date         06-Dec-2010           Customer Sample Ref.         WS3           bepth (m)         1.00           iolid Waste Analysis         -           otal Organic Carbon (%)         1.37           bass on lgnition (%)         -           our of BTEX (mg/kg)         -           um of 7 PCBs (mg/kg)         -           H (pH Units)         7.84           NC to pH 6 (mol/kg)         -           Chlorotoluene         <0.0019	 	
Concernance         One-Dec-2010           Sustained Date         06-Dec-2010           Sustainer Sample Ref.         WS3           Depth (m)         1.00           Solid Waste Analysis         -           otal Organic Carbon (%)         1.37           osa on lightion (%)         -           um of 7 FCR (mg/kg)         -           um of 7 FCR (mg/kg)         -           H (pH Units)         7.84           NC to pH 6 (mol/kg)         -           NC to pH 6 (mol/kg)         -           State (mg/l)         -           Eluate Analysis         -           Coc MS (W)         -           -Chlorotoluene         <0.0019	 	
Construction         WS3           Operation         1.00           Solid Waste Analysis	 	
Customer Sample Ref.         WS3           Depth (m)         1.00           Solid Waste Analysis	 	
Depth (m)         1.00           Solid Waste Analysis	 	
Cotal Organic Carbon (%)         1.37           .oss on Ignition (%)         -           Sum of BTEX (mg/kg)         <0.01	 	
Constraint outwork         Constra	 	
ium of BTEX (mg/kg)         <0.01           ium of 7 PCBs (mg/kg)         -           itineral Oil (mg/kg)         -           VAH Sum of 17 (mg/kg)         -           VAH Sum of 17 (mg/kg)         -           VAH Sum of 17 (mg/kg)         -           VIC to pH 6 (mol/kg)         -           NC to pH 6 (mol/kg)         -           VIC to pH 4 (mol/kg)         -           Eluate Analysis         Conc <sup>¬</sup> in 2:1 eluate (mg/l)         2:1 cm <sup>¬</sup> leached (mg/kg)         Limit values for cr           COC MS (W)         -         -         -         -           -Chlorotoluene         <0.0019	 	
um of 7 PCBs (mg/kg)         -           tineral Oil (mg/kg)         -           AH Sum of 17 (mg/kg)         -           H (pH Units)         7.84           NC to pH 6 (mol/kg)         -           NC to pH 6 (mol/kg)         -           NC to pH 6 (mol/kg)         -           Iterate Analysis         Conc <sup>+</sup> in 2:1 eluate (mg/l)         Classe           Eluate Analysis         -           Conc volume         -           -         -           Conc volume         Result         Limit of Detection           Result         Limit of Detection         Result         Limit of Detection           OC MS (W)         -         -         -           -Chlorotoluene         <0.0019		
Initial Sol (rigghg)         -           AH Sum of 17 (mg/kg)         -           H (pH Units)         7.84           NC to pH 6 (mol/kg)         -           NC to pH 4 (mol/kg)         -           INC to pH 4 (mol/kg)         -           Result         Limit of Detection           COC MS (W)         -           -Chlorotoluene         <0.0019		
Concerning         Conceri		
NC to pH 6 (mol/kg)         -		
$ \begin{array}{ c c c c c c c c c c c c c c c c c c c$		
eluate Analysis         eluate (mg/l)         leached (mg/kg)         Limit values for consigned BS EN 12           Result         Limit of Detection         Result         Limit values for consigned BS EN 12           CO MS (W)           -Chlorotoluene         <0.0019		
Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           /OC MS (W)	ompliance leaching test	
-Chlorotoluene         <0.0019	457-3 at L/S 10 l/kg	
3,5-Trimethylbenzene         0.0010         0.0010         0.0000         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0010         0.0018         <0.0018         <0.0018         <0.0018         <0.0018         <0.0019         <0.0018         <0.0019         <0.0019         <0.0019         <0.002         <0.0019         <0.002         <0.002         <0.002         <0.002         <0.002         <0.002         <0.002         <0.002         <0.002         <0.0017         <0.0034         <0.017         <0.0017         <0.0034         <0.017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0017         <0.0022         <0.0026         <0.0022         <0.0026         <0.0022         <0.0027         <0.0027         <0.0027         <0.0027         <0.0027         <0.0027         <0.0027         <0.0027         <0.0027		
-Chlorotoluene         <0.0019         <0.0019         <0.0038         <0.019         -           ert-Butylbenzene         <0.002		
ert-Butylbenzene         <0.002         <0.002         <0.004         <0.02         -           ,2,4-Trimethylbenzene         <0.0017	<u> </u>	
Bit         Bit <td></td>		
Isopropyltoluene         <0.0026         <0.0026         <0.0052         <0.026            ,3-Dichlorobenzene         <0.0022		
3-Dichlorobenzene         <0.0022         <0.0022         <0.0044         <0.022         -           4-Dichlorobenzene         <0.0027		
4-Dichlorobenzene         <0.0027         <0.0027         <0.0054         <0.027         -           -Butylbenzene         <0.002		
2-Dichlorobenzene         <0.0037         <0.0037         <0.0074         <0.037         -           ,2-Dibromo-3-Chloropropane         <0.0098		
2-Dibromo-3-Chloropropane <0.0098 <0.0098 <0.0196 <0.098 -		
lexachlorobutadiene <0.0025 <0.0025 <0.005 <0.025 -		
ert-amyl methyl ether <0.001 <0.002 <0.01 -		
laphthalene <0.0035 <0.0035 <0.007 <0.035 -		
,2,3-Trichlorobenzene         <0.0031         <0.0062         <0.031         -           3.5-Trichlorobenzene         <0.01		
1,3,5-Trichlorobenzene         <0.01         <0.02         <0.1         -		
each Test Information		
ate Prepared 06-Jan-2011		

Date Prepared	06-Jan-2011
pH (pH Units)	8.13
Conductivity (µS/cm)	116.00
Temperature (°C)	13.50
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

2:		Order Number:		
STAGE BATCI Site Location Moisture Cont Dry Matter Co Dry Matter Co 2: leach ion Result 0.0023 0.00748 0.00021 0.00748 0.000244 0.000748 0.000244 0.000244 0.00244 0.00244 0.00244 0.00244 0.00244 0.00244 0.00244 0.00026 0.00026 0.00026 0.00026 0.000026 0.000026 0.00026 0		Report Number:	110764	
Site Location Moisture Cont Dry Matter Co		Superseded Report:		
Moisture Cont         Dry Matter Co         Dry Matter Co         Ieach         tion         Result         0.0023         -         0.00021         0.00023         -         0.00024         0.00184         0.000244         -         0.00244         -         -         0.00244         -         -         -         0.00244	H IESI			
Moisture Cont         Dry Matter Co         Dry Matter Co         Ieach         tion         Result         0.0023         -         0.00021         0.00023         -         0.00024         0.00184         0.000244         -         0.00244         -         -         0.00244         -         -         -         0.00244			REF :	BS EN 1245
Dry Matter Co		Blake	Close	
2:         leach         tion       Result         0.0023       -         -       -         <0.0002	tent Ratio (%)	10.3		
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -	ontent Ratio (%)	90.7		
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -				
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -		-	-	-
leach           0.0023           -           0.00738           0.00636           0.000021           -           0.00184           0.000748           -           0.000244           -	1 conc <sup>n</sup>			
0.0023 - - - 0.00738 0.00636 0.000021 - - 0.00184 0.000748 - - - - - - - - - - - - - - - - - - -	n 2:1 2:1 conc <sup>n</sup> mg/l) leached (mg/kg)		es for complian IS EN 12457-3	nce leaching test at L/S 10 l/kg
 <	Limit of Detecti	on	_	
0.00738 0.00636 0.000021 - 0.00184 0.000748 - - - 0.00244 - - - - - - - -	<0.0012	0.5	2 100	25 300
0.00738 0.00636 0.000021 - 0.00184 0.000748 - - - 0.00244 - - - - - - - -	<0.001	0.04	1	5
0.000021 - 0.00184 0.000748 - - 0.00244 - - - - - - - -	< 0.0022	0.5	10	70
- 0.00184 0.000748 - - 0.00244 - - - - - - - -	<0.0085	2	50	100
0.00184 0.000748 - - 0.00244 - - - - - -	<0.0001	0.01	0.2	2
0.000748 - - 0.00244 - - - - - -	-	0.5	10	30
- - 0.00244 - - - - -	<0.0015 <0.0002	0.4	10 10	40 50
0.00244 - - - - - -	-	0.06	0.7	5
	-	0.1	0.5	7
	<0.0041	4	50	200
	-	800	15000	
-				500 50000
	-	4000		
-	-	1	-	-
	-	500	800	1000
			- 10 - 1000 - 4000 - 1	- 10 150 - 1000 20000 - 4000 60000 - 1 -

Date Prepared	06-Jan-2011
pH (pH Units)	8.28
Conductivity (µS/cm)	138.00
Temperature (°C)	13.90
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

Site Location         Blake Close           Mass Sample taken (kg)         0.192         Moisture Content Ratio (%)         10.3           Mass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           Particle Size <4mm         >95%         The second of the s			Number:	Order I	TE OF ANAL <sup>`</sup> <sup>3e</sup>	Blake Clos	Location:		101209-83	SDG:
VAC ANALYTICAL RESULTS         REF :           Itelant Reference         Site Location         Blake Close           Itass of dry sample (kg)         0.192         Moisture Content Ratio (%)         90.7           Itass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           itarticle Size <4mm         >95%         Provide Matter Content Ratio (%)         90.7           itarticle Size <4mm         >95%         Provide Matter Content Ratio (%)         90.7           itarticle Size <4mm         >95%         Provide Matter Content Ratio (%)         90.7           itarticle Size <4mm         >95%         Provide Matter Content Ratio (%)         90.7           itarticle Size <4mm         >95%         Provide Matter Content Ratio (%)         90.7           itarticle Size <4mm         >95%         Provide Matter Content Ratio (%)         90.7           itarticle Size <4mmy         2554676         Provide Matter Content Ratio (%)         -           itart Cambrid (%)         1.09         Provide Matter Content Ratio (%)         -         -           itart Cambrid (%)         1.09         Provide Matter Content Ratio (%)         -         -           itart Cambrid (%)         1.09         Provide Matter Content Ratio (%)         -         -		110764			ylor	-			H_GRONTMIJ_SC	
Site Location         Blake Close           lass Sample taken (kg)         0.192         Moisture Content Ratio (%)         10.3           article Size <4mm         >95%         Dry Matter Content Ratio (%)         90.7           asse         DG         101209-83         abs Sample Number(s)         2554676           ampled Date         08-Dec-2010         ustomer Sample Ref.         WS4           epth (m)         0.70         -         -           olid Waste Analysis         -         -         -           tual Organic Cation (%)         -         -         -         -           on of FCRe (mpkg)         -         -         -         -         -           of the Sign of (mpkg)         -				TEST	AGE BATCH	2:1 STA	CEN			
ass Sample taken (kg)         0.192         Moisture Content Ratio (%)         10.3           ass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           article Size <4mm	: BS EN 1245	REF :						S		
Itass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           article Size <4mm		Close	Blake (		Site Location	s				lient Reference
tass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         90.7           'article Size <4mm			10.3	nt Ratio (%)	Aoisture Conter	Ν		0.192	n (kg)	lass Sample take
Sparticle Size <4mm         >95%           asse         Intervention           igG         101209-83           ab Sample Number(s)         2554676           sampled Date         08-Dec-2010           justomer Sample Ref.         WS4           bepth (m)         0.70           solid Waste Analysis <ul> <li></li></ul>										-
DG         101209-83           ab Sample Number(s)         2554676           sample Date         08-Dec-2010           sustomer Sample Ref.         WS4           lepth (m)         0.70           biold Waste Analysis         -           stal Organic Carbon (%)         -           oniol (%)         -           um of TPCR (mg/kg)         -           more TPCR (mg/kg)         -           thera of (mg/kg)         -					ing matter cont	_			- (-3)	
DG         101209-83           ab Sample Number(s)         2554676           ampled Date         06-Dec-2010           ustomer Sample Ref.         WS4           epth (m)         0.70           olid Waste Analysis         -           wisit Organic Carbon (%)         -           on of ETEX (mgkg)         -           on of TEX (mgkg)         -           on of TEX (mgkg)         -           on of TEX (mgkg)         -           ot to pH 4 (molkg)         -           v(b to pH 4 (molkg)         -           v(b to pH 4 (molkg)         -           v(b to pH 4 (molkg)         -           v2 Conce" In 2:1         2:1 conce"           luate Analysis         E           VC to pH 4 (molkg)         -           v2         -           v2 Conce" In 2:1         2:1 conce"           graduin         0.0198         -           v2 Conce" In 2:1         2:1 conce"           graduin         0.0198         -           v2 Conce" In 2:1         2:1 conce"           graduin         0.0198         -           v2 concer         -         -           v2 concon         -										ase
ab Sample Number(s)         2554676           ampled Date         08-Dec-2010           ustomer Sample Ref.         WS4           septh (m)         0.70           olid Waste Analysis         -           olid Waste Analysis         -           ond Waste Analysis         -           on of STEX (mskg)         -           son genition (%)         -								101209-83		
Concert nample Date         08-Dec-2010           ustomer Sample Ref.         WS4           epth (m)         0.70           Old Waste Analysis			I					2554676	or(s)	
Concent Sample Ref.         WS4           epth (m)         0.70           olid Waste Analysis							)			-
Construction         Construction           olid Waste Analysis         -           bild Organic Carbon (%)         1.09           son ongstom (%)         -           um of PCBs (mgkg)         -           um of PCBs (mgkg)         -           um of PCBs (mgkg)         -           tH3 Um of 17 (mgkg)         -           VC to pH 6 (molfkg)         -           vC to pH 6 (molfkg)         -           vC to pH 4 (molfkg)         -           thuse Analysis         Conc^n In 2:1 eluate (mg/l)         Eached (mg/kg)           transmit         Limit of Detection         Resuit         Limit of Detection           rorn         0.0194         -0.0024         0.0037         -           vC to pH 4 (molfkg)         -         -         -         -           drandum         0.00168         -         -         -           vC MS (W) - Aqueous         -         -         -         -           22 Dichlorobenzene         -         -         -         -           2.1 Dichlorobenzene         -         -         -         -           2.2 Dichlorobenzene         -         -         -         -           2.4 Trinkl										-
Conci Waste Analysis         1.09           ball Organic Carbon (%)         1.09           ass on lightion (%)         -           um of 7 FC8k (mg/kg)         -           um of 7 FC8k (mg/kg)         -           etal Organic Carbon (%)         -           um of 7 FC8k (mg/kg)         -           etal Olignity)         8.36           VC to pH 6 (ms/kg)         -           to pH 4 (ms/kg)         -           to pH 4 (ms/kg)         -           to pH 4 (ms/kg)         -           ron         0.0194         <0.0094										-
Image: Carbon (%)         1.09           ass on ignition (%)         -           um of BTEX (mg/kg)         -           ineral Oli (mg/kg)         -           AH Sum of 17 (mg/kg)         -           (pH Units)         8.36           NC to pH 6 (mol/kg)         -           Ituate Analysis         Conc <sup>n</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>n</sup> leached (mg/kg)           Result         Limit of Detection         Result         Limit of Detection           Result         Limit of Detection         Result         Limit of Detection           anadium         0.00186         <0.0024								0.70		epth (m)
Base Board Control         Image Board Control									sis	olid Waste Analy
Sch di gnitoli (%)         -         -           um of 7 FC0s (mg/kg)         -	-	-	-					1.09		otal Organic Carbon (%)
um of 7 PCBs (mg/kg)         .           lineral Oli (mg/kg)         .           4 Sum of 17 (mg/kg)         .           4 PM Units)         8.36           NC to pH 6 (mol/kg)         .           Status M F (mg/kg)         .           Ko to pH 6 (mol/kg)         .           Status M F (mg/kg)	-									
ineral Oil (mg/kg)         -           AH Sum of 17 (mg/kg)         -           AH Sum of 17 (mg/kg)         -           NC to pH 6 (mol/kg)         -           NC to pH 6 (mol/kg)         -           NC to pH 4 (mol/kg)         -           Iluate Analysis         Eunit of Detection           Result         Limit of Detection           Result         Limit of Detection           Result         Limit of Detection           Oron         0.0194         <0.0094	-			_						
AH Sum of 17 (mg/kg)         .           4 (pH Units)         8.36           NC to pH 6 (mol/kg)         .           NC to pH 4 (mol/kg)         .           Ituate Analysis         Conc <sup>+</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>+</sup> leached (mg/kg)         Limit of Detection           Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           anadium         0.0194         <0.0094	-	-	-	_						
NC to pH 4 (mol/kg)         Conc <sup>+</sup> in 2:1 eluate (mg/kg)         Limit of Detection         Limit of Detection         Limit of Detection           anadium         0.0194         <0.0094	-	-	-					-		
No. to p10 (Indivig)         -           No. to p14 (mol/kg)         -           Eluate Analysis         Conc <sup>n</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>n</sup> leached (mg/kg)         Limit of Detection           oron         0.0194         <0.0094	-		-					8.36		H (pH Units)
Conc <sup>n</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>n</sup> leached (mg/kg)         Limit values for complia using BS EN 12457-3           oron         0.0194         <0.0094	-			_						
Bluate Analysiseluate AnalysisLimit of DetectionResultLimit of DetectionLimit of DetectionLimit of Detectionforon0.0194<0.00940.0388<0.094fanadium0.00186<0.00240.00372<0.0024fanadium0.00186<0.0023<0.00372<0.0024system<0.0023<0.0023<0.0046<0.0232.4-Trichlorobenzene<0.0027<0.0027<0.0044<0.0223.Dichlorobenzene<0.0027<0.0027<0.0024<0.002<0.011	-	-	-					-		NC to pH 4 (mol/kg)
Result         Limit of Detection         Result         Limit of Detection           ioron         0.0194         <0.0094         0.0388         <0.094         -           anadium         0.00186         <0.0024         0.00372         <0.0024         -           VOC MS (W) - Aqueous         -         -         -         -         -           2.4-Trichlorobenzene         <0.0023         <0.0023         <0.0046         <0.023         -         -           3.Dichlorobenzene         <0.0027         <0.0027         <0.0044         <0.022         -         -           4.Dichlorobenzene         <0.0027         <0.0027         <0.0044         <0.027         -         -           4.5-Trichlorophenol         <0.001         <0.001         <0.002         <0.01         -         -           4.4.6-Trichlorophenol         <0.001         <0.001         <0.002         <0.01         -         -           4.4.9-Initrobluene         <0.001         <0.001         <0.002         <0.01         -         -           4.9-Dinitrobluene         <0.001         <0.001         <0.002         <0.01         -         -           4-Dinitrobluene         <0.001         <0.001 <td< th=""><th></th><th colspan="2">ues for compliance leaching test</th><th></th><th></th><th></th><th></th><th></th><th></th><th>Eluate Analysis</th></td<>		ues for compliance leaching test								Eluate Analysis
fanadium         0.00186         0.00032         0.000372         0.00024         -         -           2.4-Trichlorobenzene         0.00186         0.00037         0.00372         0.0023         -	at L/S 10 l/kg	EN 12457-3	using BS	Limit of Detection	Result	of Detection	Limit o	Result		
VOC MS (W) - Aqueous         0.00011         0.00012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111         0.0012         0.00111			-					1		
2,4-Trichlorobenzene         <0.0023         <0.0023         <0.0046         <0.023         -         -           2-Dichlorobenzene         <0.0037	-	-	-	<0.0024	0.00372	00024	<0	0.00186		
2-Dichlorobenzene         <0.0037         <0.0037         <0.0074         <0.037         -         -           3-Dichlorobenzene         <0.0022				10.000	-0.0040	0000		-0.0000	15	
3-Dichlorobenzene         <0.0022         <0.0021         <0.0011         <0.0011         <0.0011           4-Dichlorobenzene         <0.0027			-					1		
4-Dichlorobenzene         <0.0027         <0.0027         <0.0054         <0.027         -         -           4,5-Trichlorophenol         <0.001	-									
4.6-Trichlorophenol         0.001         0.001         0.002         0.01         -         -         -           4-Dichlorophenol         <0.001	-	-	-							4-Dichlorobenzene
4-Dichlorophenol         0.001         0.001         0.002         0.01         -         -           4-Dimethylphenol         <0.001		-	-	<0.01	<0.002					
4-Dimethylphenol          0.001         0.001         0.002          0.01         -										
4-Dinitrotoluene         <0.001         <0.001         <0.002         <0.01             6-Dinitrotoluene         <0.001										
6-Dinitrotoluene         0.001         0.001         0.002         0.011         -         -           Chloronaphthalene         <0.001	<u>-</u>									
Chloronaphthalene         0.001         0.001         0.002         0.01         -         -         -           Chlorophenol         <0.001								1		
Chlorophenol         <0.001         <0.001         <0.002         <0.01         -         -           Methylnaphthalene         <0.001	-	-						1		
Methylphenol         <0.001         <0.001         <0.002         <0.01         -         -           Nitroaniline         <0.001	-	-	-							Chlorophenol
Nitroaniline         <0.001         <0.001         <0.002         <0.01			-		<0.002	0.001	<	<0.001		
Nitrophenol         <0.001         <0.001         <0.002         <0.01         -         -           Nitroaniline         <0.001										71
Nitroaniline         <0.001         <0.001         <0.002         <0.01         -         -           Bromophenylphenylether         <0.001										
Bromophenylphenylether         <0.001         <0.001         <0.002         <0.01         -         -           Chloro-3-methylphenol         <0.001	<u>-</u>							1		
Chloro-3-methylphenol         <0.001         <0.001         <0.002         <0.01         -         -	<u>-</u>					1	1	1	ther	
						1		1		
	-	-	-	<0.01	<0.002	0.001	<	<0.001		Chloroaniline
each Test Information									ation	each Test Inform

pH (pH Units) 8.28 Conductivity (µS/cm) 138.00 Temperature (°C) 13.90 Volume Leachant (Litres) 0.332 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

ALcontrol Labo	oratories		CEF	RTIFIC	ATE OF ANAL	YSIS			Validated
	1209-83 GRONTMIJ_SC	DL-40	Location: Customer: Attention:	Blake C Grontmi Gareth	ose	Ord Rep	er Number: ort Number: erseded Report:	110764	
			CEN		AGE BATCH	TEST			
WAC ANALYTICA	L RESULT	S						REF	: BS EN 12457
Client Reference					Site Location		Blake	Close	
Mass Sample taken (k	a)	0.192			Moisture Conter	nt Ratio (%)	10.3		
Mass of dry sample (k		0.175			Dry Matter Cont		90.7		
Particle Size <4mm	3/	>95%							
Case									
SDG		101209-83							
Lab Sample Number(s	;)	2554676							
Sampled Date		08-Dec-2010	)						
Customer Sample Ref	•	WS4							
Depth (m)		0.70							
Solid Waste Analysis							L		
Total Organic Carbon (%)		1.09					-	-	-
Loss on Ignition (%)		-					-	-	-
Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg)		-					-	-	-
Vineral Oil (mg/kg)		-					-	-	-
PAH Sum of 17 (mg/kg)		-					-	-	-
pH (pH Units)		8.36					-	-	-
ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg)		-					-		
· · · · · · · · · · · · · · · · · · ·									
Eluate Analysis			onc <sup>n</sup> in 2:1 uate (mg/l)		2:1 c leached	:onc"   (mg/kg)	Limit value	es for complia	nce leaching test
Liuale Analysis		Result		f Detection		Limit of Detection			at L/S 10 l/kg
SVOC MS (W) - Aqueous									
4-Chlorophenylphenylether 4-Methylphenol		< 0.001		0.001	< 0.002	< 0.01			· · ·
4-Nitrophenol		<0.001		).001 ).001	<0.002	<0.01 <0.01	-	· · ·	
4-Nitroaniline		< 0.001		0.001	< 0.002	<0.01	-	· .	-
Azobenzene		<0.001	1	0.001	<0.002	<0.01	-		-
Acenaphthylene		< 0.001		0.001	< 0.002	< 0.01	-		
Anthracene		<0.001 <0.001		).001 ).001	<0.002 <0.002	<0.01 <0.01	-	· ·	 
Bis(2-chloroethyl)ether		<0.001		0.001	<0.002	<0.01	-	· · ·	· · ·
Bis(2-chloroethoxy)methane		<0.001		0.001	<0.002	<0.01	-	-	-
Bis(2-ethylhexyl) phthalate Benzo(a)anthracene		< 0.002		0.002	< 0.004	< 0.02	-		· · ·
Butylbenzyl phthalate		<0.001 <0.001	1	).001 ).001	<0.002 <0.002	<0.01 <0.01	-		
Benzo(b)fluoranthene		<0.001		0.001	<0.002	<0.01		· · ·	
Benzo(k)fluoranthene		<0.001		0.001	<0.002	<0.01	-	-	
Benzo(a)pyrene		<0.001		0.001	< 0.002	<0.01	-		
Benzo(ghi)perylene Carbazole		< 0.001		).001	<0.002	<0.01 <0.01	-		
Chrysene		<0.001 <0.001		).001 ).001	<0.002	<0.01	-		
Dibenzofuran		<0.001	<(	0.001	<0.002	<0.01	-	-	· -
Di-n-butyl phthalate Diethyl phthalate		<0.001 <0.001		0.001	<0.002 <0.002	<0.01 <0.01	-		
		<b>\UU</b>		0.001	<b>~0.002</b>	<u><u> </u></u>	-	-	-
each Test Informatio	n								
Date Prepared		06-Jan-2011							

Date Prepared	06-Jan-2011
pH (pH Units)	8.28
Conductivity (µS/cm)	138.00
Temperature (°C)	13.90
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

Client Reference: WAC ANALYTICAL RES Client Reference Mass Sample taken (kg)	MIJ_SOL-40 SULTS 0.192	Customer: ( Attention: (	Blake Clos Grontmij Gareth Ta		Rep Sup	er Number: ort Number: erseded Report:	110764	
Client Reference Mass Sample taken (kg)		CEN 2	2:1 ST/	AGE BATCH				
Client Reference Mass Sample taken (kg)					TEST			
Mass Sample taken (kg)	0.192						REF	BS EN 12457
	0.192		\$	Site Location		Blake	Close	
			I	Moisture Conte	ent Ratio (%)	10.3		
Mass of dry sample (kg)	0.175		I	Dry Matter Con	tent Ratio (%)	90.7		
Particle Size <4mm	>95%							
Case								
SDG	101209-83							
Lab Sample Number(s)	2554676							
Sampled Date	08-Dec-2010	)						
Customer Sample Ref.	WS4							
Depth (m)	0.70							
Solid Waste Analysis		_						
Total Organic Carbon (%)	1.09					-	-	-
oss on Ignition (%)	-					-	-	-
Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg)	-					-	-	-
Mineral Oil (mg/kg)	-					-	-	-
PAH Sum of 17 (mg/kg)	-					-	-	-
bH (pH Units)	8.36					-	-	-
ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg)	-					-	-	-
	1							
		onc⁰ in 2:1 uate (mg/l)			conc <sup>n</sup> d (mg/kg)	Limit value	es for complia	nce leaching test
Eluate Analysis	Result	Limit of D	etection	Result	Limit of Detection			at L/S 10 l/kg
SVOC MS (W) - Aqueous	Result	Emiltore	election	Result	Emit of Detection			
Dibenzo(a,h)anthracene	<0.001	<0.0	01	<0.002	<0.01	-	-	-
Dimethyl phthalate	<0.001	<0.0		<0.002	<0.01	-	-	-
Di-n-Octyl phthalate	<0.005	<0.0	05	<0.01	<0.05	-		
	< 0.001	<0.0		<0.002	<0.01	-		
Fluorene Hexachlorobenzene	< 0.001	<0.0		< 0.002	< 0.01	-	-	
Hexachlorobutadiene	<0.001	<0.0		<0.002 <0.005	<0.01 <0.025	-		
Pentachlorophenol	<0.0023	<0.0		<0.003	<0.025			
Phenol	< 0.001	<0.0		< 0.002	<0.01	-	-	-
N-nitrosodi-n-propylamine	<0.001	<0.0		<0.002	<0.01	-	-	-
Hexachloroethane	<0.001	<0.0	01	<0.002	<0.01	-	-	
Nitrobenzene	<0.001	<0.0		<0.002	<0.01	-		
Naphthalene	< 0.0035	<0.00		<0.007	< 0.035	-	-	
sophorone Hexachlorocyclopentadiene	< 0.001	<0.0		< 0.002	< 0.01	-		
Phenanthrene	<0.001	<0.0		<0.002 <0.002	<0.01 <0.01	-		<u> </u>
ndeno (1,2,3-cd) Pyrene	<0.001	<0.0		<0.002	<0.01	-		
<sup>&gt;</sup> yrene	< 0.001	<0.0		< 0.002	< 0.01	-	-	
VOC MS (W)								
Dibromofluoromethane	-	-		-	-	-		
Toluene-d8	-	-		-	-	-		
4-Bromofluorobenzene	-	-		-	-	-		
Dichlorodifluoromethane	<0.007	<0.0	07	<0.014	<0.07	-	-	-
Leach Test Information								

Date Prepared	06-Jan-2011
pH (pH Units)	8.28
Conductivity (µS/cm)	138.00
Temperature (°C)	13.90
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

				TE OF ANAL				
SDG:         101209           Job:         H_GR0           Client Reference:         101209	)-83 ONTMIJ_SOL-40	Location: Customer: Attention:	Blake Cle Grontmij Gareth T		Re	der Number: port Number: perseded Report:	110764	
				AGE BATCH				
NAC ANALYTICAL R	RESULTS						REF	: BS EN 12457
Client Reference				Site Location		Blake	Close	
Mass Sample taken (kg)	0.192			Moisture Conte	nt Ratio (%)	10.3		
Mass of dry sample (kg)	0.175			Dry Matter Con	tent Ratio (%)	90.7		
Particle Size <4mm	>95%							
Case								
SDG	101209-83							
_ab Sample Number(s)	2554676							
Sampled Date	08-Dec-20	10						
Customer Sample Ref.	WS4							
Depth (m)	0.70							
Solid Waste Analysis								
otal Organic Carbon (%)	1.09					-	-	-
oss on Ignition (%)	-					-	-	-
Sum of BTEX (mg/kg) Sum of 7 PCBs (mg/kg)	-					-	-	-
/ineral Oil (mg/kg)	-					-	-	-
PAH Sum of 17 (mg/kg)	-					-	-	-
oH (pH Units)	8.36					-	-	-
ANC to pH 6 (mol/kg) ANC to pH 4 (mol/kg)	-					-	-	-
		Conc <sup>n</sup> in 2:1		2:1 (	conc <sup>n</sup>			
Eluate Analysis		eluate (mg/l)			l (mg/kg)		-	nce leaching test at L/S 10 l/kg
/OC MS (W)	Result	Limit o	f Detection	Result	Limit of Detection	1		,,.g
Chloromethane	<0.009	<	0.009	<0.018	<0.09		-	
/inyl Chloride	< 0.0012		.0012	< 0.0024	< 0.012	-	-	
Bromomethane	<0.002		0.002	<0.004	<0.02	-		
Chloroethane Frichlorofluoromethane	<0.0025		.0025 .0013	<0.005 <0.0026	<0.025 <0.013			
,1-Dichloroethene	<0.0012		.0013	<0.0028	<0.013			
Carbon Disulphide	<0.0013		.0013	<0.0026	<0.013	-	-	
Dichloromethane Fert-butyl methyl ether	< 0.0037		.0037	<0.0074	<0.037			
rans-1,2-Dichloroethene	<0.0016		.0016 .0019	<0.0032 <0.0038	<0.016 <0.019			<u> </u>
,1-Dichloroethane	<0.0012		.0013	< 0.0030	<0.013			
Cis-1,2-Dichloroethene	<0.0023	3 <0	.0023	<0.0046	<0.023	-	-	-
2,2-Dichloropropane Bromochloromethane	< 0.0038		.0038	< 0.0076	< 0.038			
Chloroform	<0.0019		.0019 .0018	<0.0038	<0.019 <0.018			
,1,1-Trichloroethane	<0.0013		.0013	<0.0030	<0.013			
,1-Dichloropropene	<0.0013		.0013	<0.0026	<0.013	-		
Carbontetrachloride ,2-Dichloroethane	<0.0014		.0014	<0.0028	<0.014			<u> </u>
Benzene	<0.0033		<u>.0033</u> .0013	<0.0066	<0.033 <0.013			
Frichloroethene	<0.0028		.0015	<0.0020	<0.025	-	-	
,2-Dichloropropane	<0.003	<(	).003	<0.006	<0.03	-	-	-
each Test Information		_						
Date Prepared	06-Jan-201	1						

Date Prepared	06-Jan-2011
pH (pH Units)	8.28
Conductivity (µS/cm)	138.00
Temperature (°C)	13.90
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

13/01/2011 06:04:32

### 06:04:22 13/01/2011

ALcontrol Labo			CEF	RTIFIC	ATE OF ANAL	YSIS			
	209-83 GRONTMIJ_SC	DL-40	Location: Customer: Attention:	Blake Cl Grontmij Gareth 1		R	rder Number: eport Number: uperseded Report:	110764	
Client Reference:							iperseded Report.		
			UEN	2.10					
VAC ANALYTICAI	RESULT	S						REF	: BS EN 12457
lient Reference					Site Location		Blake	Close	
/lass Sample taken (k	g)	0.192			Moisture Conte	nt Ratio (%)	10.3		
Mass of dry sample (k	g)	0.175			Dry Matter Cont	ent Ratio (%)	90.7		
Particle Size <4mm		>95%							
ase									
SDG		101209-83							
ab Sample Number(s	()	2554676							
Sampled Date		08-Dec-2010							
Customer Sample Ref		WS4							
Depth (m)	-	0.70							
Solid Waste Analysis									
otal Organic Carbon (%)		1.09					-	-	-
oss on Ignition (%)		-					-	-	-
um of BTEX (mg/kg) um of 7 PCBs (mg/kg)		-					-	-	-
lineral Oil (mg/kg)		-					-	-	-
AH Sum of 17 (mg/kg)		-					-	-	-
H (pH Units) .NC to pH 6 (mol/kg)		8.36					-	-	-
NC to pH 4 (mol/kg)		-					-	-	-
			onc <sup>n</sup> in 2:1			conc <sup>n</sup>	t insite on the		
Eluate Analysis		Result	late (mg/l)	f Detection		Limit of Detectio	usina B	-	nce leaching test at L/S 10 l/kg
OC MS (W)						1			
ibromomethane		<0.0027	<0	.0027	<0.0054	<0.027	-		
romodichloromethane		< 0.0009		.0009	<0.0018	< 0.009	-		
cis-1,3-Dichloropropene		<0.0019 <0.0014		.0019 .0014	<0.0038 <0.0028	<0.019 <0.014			<u>-</u>
rans-1,3-Dichloropropene		<0.0035		.0035	< 0.007	<0.035	-	-	-
,1,2-Trichloroethane		<0.0022		.0022	<0.0044	<0.022	-		
,3-Dichloropropane		< 0.0022		.0022	< 0.0044	< 0.022	-		
libromochloromethane		<0.0015 <0.0017		<u>.0015</u> .0017	<0.003 <0.0034	<0.015 <0.017		· · ·	
,2-Dibromoethane		< 0.0023		.0023	<0.0046	<0.023	-	-	-
Chlorobenzene		<0.0035		.0035	<0.007	<0.035	-	-	-
,1,1,2-Tetrachloroethane thylbenzene		< 0.0013	1	.0013	<0.0026	< 0.013			. <del>-</del>
/m-Xylene		<0.0025 <0.0025		.0025 .0025	<0.005 <0.005	<0.025 <0.025			
-Xylene		<0.0020		.0020	< 0.0034	<0.020	-	-	-
tyrene		<0.0012	<0	.0012	<0.0024	<0.012	-	-	-
romoform sopropylbenzene		< 0.003		0.003	<0.006	< 0.03			
,1,2,2-Tetrachloroethane		<0.0014 <0.0052		.0014 .0052	<0.0028	<0.014 <0.052			<u>-</u>
,2,3-Trichloropropane		< 0.0032		.0078	<0.0156	<0.002	-	-	
Bromobenzene Propylbenzene		< 0.002		0.002	<0.004	< 0.02			
Topyidenzene		<0.0026	<0	.0026	<0.0052	<0.026	-	-	-
each Test Informatio	n								
ate Prepared		06 los 2014							
		06-Jan-2011							

Date Prepared	06-Jan-2011
pH (pH Units)	8.28
Conductivity (µS/cm)	138.00
Temperature (°C)	13.90
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

SDG: 101209-83		ocation:	Blake Clo	ose		der Number:	440704	
Job: H_GRONT Client Reference:	-	Customer: Attention:	Grontmij Gareth Ta	aylor		port Number: perseded Report:	110764	
		CEN	2:1 ST	AGE BATCH	TEST			
VAC ANALYTICAL RES	SULTS						REF	: BS EN 12457
lient Reference				Site Location		Blake	Close	
/lass Sample taken (kg)	0.192			Moisture Conter	nt Ratio (%)	10.3		
lass of dry sample (kg)	0.175			Dry Matter Cont	ent Ratio (%)	90.7		
Particle Size <4mm	>95%							
ase								
DG	101209-83							
ab Sample Number(s)	2554676							
Sampled Date	08-Dec-2010							
Customer Sample Ref.	WS4							
Depth (m)	0.70							
Solid Waste Analysis		_						
otal Organic Carbon (%)	1.09					-	-	-
oss on Ignition (%) um of BTEX (mg/kg)	-					-	-	-
um of 7 PCBs (mg/kg)	-					-	-	-
lineral Oil (mg/kg)	-					-	-	-
AH Sum of 17 (mg/kg) H (pH Units)	- 8.36					-	-	-
NC to pH 6 (mol/kg)	-					-	-	-
NC to pH 4 (mol/kg)	-						-	-
Iuate Analysis		nc⁼ in 2:1 ate (mg/l)		2:1 c leached	oncʰ (mg/kg)			ance leaching test
	Result	Limit of	Detection	Result	Limit of Detection	using B	S EN 12457-3	3 at L/S 10 l/kg
OC MS (W)								
	-0.0040		2040	-0.0000	-0.040			
-Chlorotoluene	<0.0019 <0.0018		0019	<0.0038	<0.019 <0.018	 -		
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene	<0.0019 <0.0018 <0.0019	<0.0	0019 0018 0019	<0.0038 <0.0036 <0.0038	<0.019 <0.018 <0.019	-		-
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene	<0.0018 <0.0019 <0.002	<0.0 <0.0 <0.0	0018 0019 .002	<0.0036 <0.0038 <0.004	<0.018 <0.019 <0.02	-		-
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene	<pre>&lt;0.0018 &lt;0.0019 &lt;0.002 &lt;0.0017</pre>	<0.0 <0.0 <0.0 <0.0	0018 0019 002 0017	<0.0036 <0.0038 <0.004 <0.0034	<0.018 <0.019 <0.02 <0.017	- - - -	· · ·	
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene	<0.0018 <0.0019 <0.002 <0.0017 <0.0017	<ul> <li>&lt;0.0</li> <li>&lt;0.0</li> <li>&lt;0.0</li> <li>&lt;0.0</li> <li>&lt;0.0</li> <li>&lt;0.0</li> </ul>	0018 0019 002 0017 0017	<0.0036 <0.0038 <0.004 <0.0034 <0.0034	<0.018 <0.019 <0.02 <0.017 <0.017			-
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene ec-Butylbenzene -Isopropyltoluene ,3-Dichlorobenzene	<pre>&lt;0.0018 &lt;0.0019 &lt;0.002 &lt;0.0017 &lt;0.0017 &lt;0.0026 &lt;0.0026</pre>	<pre>&lt;0.0 <p>&lt;0.0</p>&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0&lt;0.0<p< td=""><td>0018 0019 002 0017 0017 0026 0022</td><td>&lt;0.0036 &lt;0.0038 &lt;0.004 &lt;0.0034 &lt;0.0034 &lt;0.0052 &lt;0.0044</td><td>&lt;0.018 &lt;0.019 &lt;0.02 &lt;0.017 &lt;0.017 &lt;0.026 &lt;0.022</td><td>- - - - - -</td><td>· · · · ·</td><td></td></p<></pre>	0018 0019 002 0017 0017 0026 0022	<0.0036 <0.0038 <0.004 <0.0034 <0.0034 <0.0052 <0.0044	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022	- - - - - -	· · · · ·	
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene ec-Butylbenzene -Isopropyltoluene ,3-Dichlorobenzene ,4-Dichlorobenzene	<pre>&lt;0.0018 &lt;0.0019 &lt;0.002 &lt;0.0017 &lt;0.0017 &lt;0.0026 &lt;0.0022 &lt;0.0022</pre>	<ul> <li>0.0</li> <li>0.0</li> <li>0.0</li> <li>0.0</li> <li>0.0</li> <li>0.0</li> <li>0.0</li> <li>0.0</li> <li>0.0</li> </ul>	0018       0019       002       0017       0017       0026       0022       0027	<0.0036 <0.0038 <0.004 <0.0034 <0.0034 <0.0052 <0.0044 <0.0054	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.022			- - - - - - - - - - - - - - - - -
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene ec-Butylbenzene -Isopropyltoluene ,3-Dichlorobenzene ,4-Dichlorobenzene -Butylbenzene	<ul> <li>&lt;0.0018</li> <li>&lt;0.0019</li> <li>&lt;0.002</li> <li>&lt;0.0017</li> <li>&lt;0.0017</li> <li>&lt;0.0026</li> <li>&lt;0.0022</li> <li>&lt;0.0027</li> <li>&lt;0.002</li> </ul>	<ul> <li>&lt;0.0</li> </ul>	0018       0019       002       0017       0016       0026       0022       0027       002	<0.0036 <0.0038 <0.004 <0.0034 <0.0034 <0.0052 <0.0044 <0.0054 <0.004	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.022 <0.027 <0.02			
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene ec-Butylbenzene -Isopropyltoluene ,3-Dichlorobenzene ,4-Dichlorobenzene	<0.0018	<ul> <li>&lt;0.0</li> </ul>	0018           0019           002           0017           0026           0022           0027           002037	<0.0036 <0.0038 <0.004 <0.0034 <0.0034 <0.0052 <0.0044 <0.0054 <0.004 <0.004	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.027 <0.02 <0.02 <0.037			
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene -Isopropyltoluene ,3-Dichlorobenzene ,4-Dichlorobenzene -Butylbenzene ,2-Dichlorobenzene	<ul> <li>&lt;0.0018</li> <li>&lt;0.0019</li> <li>&lt;0.002</li> <li>&lt;0.0017</li> <li>&lt;0.0017</li> <li>&lt;0.0026</li> <li>&lt;0.0022</li> <li>&lt;0.0027</li> <li>&lt;0.002</li> </ul>	<0.0	0018       0019       002       0017       0016       0026       0022       0027       002	<0.0036 <0.0038 <0.004 <0.0034 <0.0034 <0.0052 <0.0044 <0.0054 <0.004	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.022 <0.027 <0.02			
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene -Isopropyltoluene ,3-Dichlorobenzene -Butylbenzene -Butylbenzene -2-Dichlorobenzene ,2-Dichlorobenzene ,2-Tichlorobenzene ,2-Tirichlorobenzene (2,4-Trichlorobenzene (2,4-Trichlorobenzene	<0.0018	<0.0	0018       0019       002       0017       0026       0027       002       0037       0098       0025	<0.0036 <0.0038 <0.004 <0.0034 <0.0034 <0.0034 <0.0052 <0.0044 <0.0054 <0.004 <0.0074 <0.0074 <0.0196 <0.0046 <0.005	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.027 <0.02 <0.037 <0.098 <0.023 <0.025			
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ec-Butylbenzene -Isopropyltoluene ,3-Dichlorobenzene -Butylbenzene -Butylbenzene -Dichlorobenzene ,2-Dichlorobenzene ,2-Dibromo-3-Chloropropane ,2,4-Trichlorobenzene lexachlorobutadiene ert-amyl methyl ether	<0.0018	<0.0	0018       0019       002       0017       0026       0027       002       0037       0098       0023       0025       001	<ul> <li>&lt;0.0036</li> <li>&lt;0.0038</li> <li>&lt;0.004</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0052</li> <li>&lt;0.0044</li> <li>&lt;0.0054</li> <li>&lt;0.0074</li> <li>&lt;0.0196</li> <li>&lt;0.0046</li> <li>&lt;0.005</li> <li>&lt;0.002</li> </ul>	<0.018 <0.019 <0.02 <0.017 <0.026 <0.022 <0.022 <0.027 <0.02 <0.037 <0.098 <0.023 <0.025 <0.01			
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene -Isopropyltoluene ,3-Dichlorobenzene ,4-Dichlorobenzene Butylbenzene ,2-Dichlorobenzene ,2-Dichlorobenzene ,2-Trichlorobenzene lexachlorobutadiene ert-amyl methyl ether laphthalene	<0.0018	<0.0	D018       D019       D02       D017       D026       D027       D027       D027       D023       D023       D025       D017	<ul> <li>&lt;0.0036</li> <li>&lt;0.0038</li> <li>&lt;0.004</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0052</li> <li>&lt;0.0044</li> <li>&lt;0.0054</li> <li>&lt;0.0074</li> <li>&lt;0.0196</li> <li>&lt;0.0046</li> <li>&lt;0.002</li> <li>&lt;0.007</li> </ul>	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.027 <0.02 <0.037 <0.098 <0.023 <0.025 <0.01 <0.035			
Chlorotoluene 3,5-Trimethylbenzene Chlorotoluene ert-Butylbenzene 2,4-Trimethylbenzene ec-Butylbenzene Isopropyltoluene 3-Dichlorobenzene 4-Dichlorobenzene 2-Dichlorobenzene 2-Dibromo-3-Chloropropane 2,4-Trichlorobenzene exachlorobutadiene ert-amyl methyl ether aphthalene 2,3-Trichlorobenzene	<0.0018	<0.0	0018       0019       002       0017       0026       0027       002       0037       0098       0023       0025       001	<ul> <li>&lt;0.0036</li> <li>&lt;0.0038</li> <li>&lt;0.004</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0052</li> <li>&lt;0.0044</li> <li>&lt;0.0054</li> <li>&lt;0.0074</li> <li>&lt;0.0196</li> <li>&lt;0.0046</li> <li>&lt;0.005</li> <li>&lt;0.002</li> </ul>	<0.018 <0.019 <0.02 <0.017 <0.026 <0.022 <0.022 <0.027 <0.02 <0.037 <0.098 <0.023 <0.025 <0.01			
-Chlorotoluene ,3,5-Trimethylbenzene -Chlorotoluene ert-Butylbenzene ,2,4-Trimethylbenzene -Isopropyltoluene ,3-Dichlorobenzene ,4-Dichlorobenzene -Butylbenzene ,2-Dichlorobenzene ,2-Dichlorobenzene ,2-Trichlorobenzene (2,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene (3,4-Trichlorobenzene	<0.0018	<0.0	D018       D019       D02       D017       D026       D027       D027       D023       D023       D025       D017	<ul> <li>&lt;0.0036</li> <li>&lt;0.0038</li> <li>&lt;0.004</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0052</li> <li>&lt;0.0044</li> <li>&lt;0.0054</li> <li>&lt;0.0074</li> <li>&lt;0.0196</li> <li>&lt;0.0046</li> <li>&lt;0.005</li> <li>&lt;0.002</li> <li>&lt;0.007</li> <li>&lt;0.0062</li> </ul>	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.027 <0.02 <0.037 <0.098 <0.023 <0.025 <0.01 <0.035 <0.031			
Chlorotoluene 3,5-Trimethylbenzene Chlorotoluene ert-Butylbenzene 2,4-Trimethylbenzene ec-Butylbenzene -Isopropyltoluene 3-Dichlorobenzene 4-Dichlorobenzene 2-Dichlorobenzene 2-Dibromo-3-Chloropropane 2,4-Trichlorobenzene exachlorobutadiene ert-amyl methyl ether aphthalene 2,3-Trichlorobenzene	<0.0018	<0.0	D018       D019       D02       D017       D026       D027       D027       D023       D023       D025       D017	<ul> <li>&lt;0.0036</li> <li>&lt;0.0038</li> <li>&lt;0.004</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0052</li> <li>&lt;0.0044</li> <li>&lt;0.0054</li> <li>&lt;0.0074</li> <li>&lt;0.0196</li> <li>&lt;0.0046</li> <li>&lt;0.005</li> <li>&lt;0.002</li> <li>&lt;0.007</li> <li>&lt;0.0062</li> </ul>	<0.018 <0.019 <0.02 <0.017 <0.017 <0.026 <0.022 <0.027 <0.02 <0.037 <0.098 <0.023 <0.025 <0.01 <0.035 <0.031			

Date Prepared	06-Jan-2011
pH (pH Units)	8.28
Conductivity (µS/cm)	138.00
Temperature (°C)	13.90
Volume Leachant (Litres)	0.332
Volume of Eluate VE1 (Litres)	

Site Location         Blake Close           Mass Sample taken (kg)         0.196         Moisture Content Ratio (%)         11.8           Mass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         89.4           Particle Size <4mm	OL-00         Custome: Growtmij Attention: Gareth Taylor         Report Number: 110764           CEN 2:1 STAGE BATCH TEST           SEE SEEN 12457           D196         Blake Close           D197         Blake Close           OL-00         D110209-83           2554677         08-Dec-2010         WS4           OL-00         Conc" In 2:1							Onders Neural		
KEF : BS           Cilent Reference         Site Location         Blake Close           Mass Sample taken (kg)         0.196         Moisture Content Ratio (%)         Blake Close           Mass Sample taken (kg)         0.175         Dry Matter Content Ratio (%)         Blake Close           Particle Size <4mm	S         REF : BS EN 12457           0.196         Moisture Content Ratio (%)         11.8           0.175         Dry Matter Content Ratio (%)         11.8           0.175         Dry Matter Content Ratio (%)         39.4           95%         0         0           101209-83         2554677         08-Dec-2010           WS4         1.50         0           1.50         0         0           0.011         0         0           0.011         0         0           0.011         0         0           0.011         0         0           0.0011         0.00212         0.0021           0.00116         0.00012         0.0021           0.00116         0.00012         0.0021           0.00026         0.00012         0.0021           0.000377         0.00021         0.0013           0.000016         0.000021         0.0014           0.00016         0.000021         0.0015           0.00021         0.0054         0.0022           0.01         0.000021         0.0051           0.000216         0.00022         0.5         10           0.00015	Job: H_GRONTM	/IJ_SOL-40	Customer:	Grontmij		F	Report Number:	110764	
Site Location         Blake Close           Mass Sample taken (kg)         0.196         Moisture Content Ratio (%)         11.8           Mass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         89.4           Particle Size <4mm	Site Location         Blake Close           0.196         Moisture Content Ratio (%)         11.8           0.175         Dry Matter Content Ratio (%)         89.4           >95%         89.4         95.4           101209-83         2554677         89.4           08-Dec-2010         VS4         1.1           VS4         1.50         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1<			CEN 2	2:1 ST	AGE BATCH	TEST			
Site Location         Blake Close           tass Sample taken (kg)         0.196         Moisture Content Ratio (%)         11.8           tass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         89.4           article Size <4mm	Site Location         Blake Close           0.196         Moisture Content Ratio (%)         11.8           0.175         Dry Matter Content Ratio (%)         89.4           >95%         89.4         95.4           101209-83         2554677         89.4           08-Dec-2010         VS4         1.1           VS4         1.50         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1           1.50         1.1         1.1<									
Atass Sample taken (kg)         0.196         Moisture Content Ratio (%)         11.8           Atass of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         89.4           Particle Size <4mm	0.196         Moisture Content Ratio (%)         11.8           0.175         Dry Matter Content Ratio (%)         89.4           >95%         89.4           101209-83         2554677           08-Dec-2010         WS4           1.50		ULIS							5 EN 1245
Solid Ses of dry sample (kg)         0.175         Dry Matter Content Ratio (%)         89.4           Particle Size <4mm	0.175         Dry Matter Content Ratio (%)         89.4           >95%         89.4           101209-83         2554677           2654677         89.4           08-Dec-2010         WS4           1.50         -           -         -								Close	
Particle Size <4mm >95% Case SDG 101209-83	>95%           101209-83 2554677 08-Dec-2010 WS4 1.50         -	Mass Sample taken (kg)	0.196		l	Moisture Conte	ent Ratio (%)	11.8		
Case         101209-83           sab Sample Number(s)         2554677           Sample Date         08-Dec-2010           Customer Sample Ref.         WS4           Depth (m)         1.50           Solid Waste Analysis         -           Total Organic Carbon (%)         -           sam of BTEX (mg/kg)         -           sam of BTEX (mg/kg)         -           sam of BTEX (mg/kg)         -           sam of TPCBs (mg/kg)         -           sam of Tr (mg/kg	101209-83         2554677           08-Dec-2010         WS4           1.50	Mass of dry sample (kg)	0.175			Dry Matter Con	ntent Ratio (%)	) 89.4		
BG         101209-83           Lab Sample Number(s)         2554677           Sampled Date         08-Dec-2010           Customer Sample Ref.         WS4           Jepth (m)         1.50           Solid Waste Analysis         -           total Organic Carbon (%)         -           oss on Ignition (%)         -           um of BTEX (mg/kg)         -0.01           um of BTEX (mg/kg)         -           Mineral Oli (mg/kg)         -           H (pH Units)         -           NC to pH 4 (mol/kg)         -           Stolid Waste         -           Eluate Analysis         -           Tester (mg/kg)         -           NC to pH 4 (mol/kg)         -           Store (mg/kg)         -           Store (mg/kg)         -           Tester (mg/kg)         -           Store	2554677         08-Dec.2010           WS4         1.50           1.50         -           - <td>Particle Size &lt;4mm</td> <td>&gt;95%</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Particle Size <4mm	>95%							
BDG         101209-83           Lab Sample Number(s)         2554677           Sampled Date         08-Dec-2010           Customer Sample Ref.         WS4           Depth (m)         1.50           Solid Waste Analysis         -           total Organic Carbon (%)         -           oss on Ignition (%)         -           um of BTEX (mg/kg)         -0.01           um of BTEX (mg/kg)         -0.01           um of 17 (mg/kg)         -           H (pH Units)         -           NC to pH4 (mol/kg)         -           State Analysis         -           Eluate Analysis         -           State (mg/kg)         -           NC to pH4 (mol/kg)         -           State (mg/kg)         -           state Analysis         -           Tsrenic         0.00106         <0.00212	2554677         08-Dec.2010           WS4         1.50           1.50         -           - <td>Case</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>	Case								
Lab Sample Number(s)         2554677           Sampled Date         08-Dec-2010           Customer Sample Ref.         WS4           Depth (m)         1.50           Solid Waste Analysis         -           otal Organic Carbon (%)         -           coss on lignition (%)         -           um of BTEX (mg/kg)         <0.01	2554677         08-Dec-2010           WS4         1.50           1.50         -           -         -           <0.01		101209-83							
Concrete         08-Dec-2010           Solid Date         08-Dec-2010           Sustomer Sample Ref.         WS4           Depth (m)         1.50           Solid Waste Analysis         -           oral Organic Carbon (%)         -           wind PTE Carbon (%)         -           oral organic Carbon (%)         -           oral organicarbon (%)         - <t< td=""><td>08-Dec-2010         WS4           1.50        </td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>1</td><td>1</td></t<>	08-Dec-2010         WS4           1.50								1	1
Customer Sample Ref.         WS4           Jopth (m)         1.50           Solid Waste Analysis         -           otal Organic Carbon (%)         -           wind 7 PCBS (mg/kg)         -           threat Ol (mg/kg)         -           AB Sum of 17 (mg/kg)         -           thort Ol H4 (mol/kg)         -           senic         -           NC to pH 4 (mol/kg)         -           trainin         -           otal Carbon (mg/l)         -           trainin         -           otal Carbon (CVAF)         0.00016           otal Carbon (mg/l)         -      <	VIS4         1.50         Image: Constant of the second of	• • • • •		1						
Depth (m)         1.50           Solid Waste Analysis         -           otal Organic Carbon (%)         -           oss on Ignition (%)         -           oss on Ignition (%)         -           wind 7 PCBs (mg/sg)         -           Afferst Old (mg/sg)         -           Arrest Old (mg/sg)         -           VAH Sum of 17 (mg/kg)         -           VNC to pH 6 (mol/kg)         -           VNC to pH 6 (mol/kg)         -           Strend         Conc <sup>+</sup> In 2:1 eluate (mg/l)           Eluate Analysis         Conc <sup>+</sup> In 2:1 eluate (mg/l)           Eluate Analysis         -           Strend         Limit of Detection           Result         Limit of Detection           Result         Limit of Detection           Strend         -           Onool <	1.50         Image: constraint of constr									
Solid Waste Analysis           ford Organic Carbon (%)         -           oss on Ignition (%)         -           sum of BTEX (mg/kg)         <0.01	.         .	-								
Color         Conc <sup>1</sup> AC         Conc <sup>1</sup> AC           Jum of BTEX (mg/kg)         -0.01         - </td <td></td> <td>Depth (m)</td> <td>1.50</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>		Depth (m)	1.50							
coss on Ignition (%)            sum of BTEX (mg/kg)         <0.01		Solid Waste Analysis		_						
Concision         Concision <thconcision< th=""> <thconcision< th=""> <thc< td=""><td>-0.01       -<td>otal Organic Carbon (%)</td><td>-</td><td></td><td></td><td></td><td></td><td>-</td><td>-</td><td>-</td></td></thc<></thconcision<></thconcision<>	-0.01       - <td>otal Organic Carbon (%)</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>-</td> <td>-</td>	otal Organic Carbon (%)	-					-	-	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Image: Second							-		-
Interal Oil (mg/kg)         -           AH Sum of 17 (mg/kg)         -           H (pH Units)         -           NC to pH 6 (mol/kg)         -           NC to pH 4 (mol/kg)         -           It (pH 4 (mol/kg)         0.00016	Image: second									
H (pH Units)         - <t< td=""><td>Image: Conc<sup>h</sup> in 2:1         2:1 conc<sup>h</sup> leached (mg/kg)         Limit of Detection         Limit of Detection           Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           0.00106         &lt;0.00012</td>         0.00212         &lt;0.0012</t<>	Image: Conc <sup>h</sup> in 2:1         2:1 conc <sup>h</sup> leached (mg/kg)         Limit of Detection         Limit of Detection           Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           0.00106         <0.00012							-	-	-
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Image: Conc <sup>n</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>n</sup> leached (mg/kg)         Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 1/kg           Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           0.00106         <0.00012		-					-	-	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $	Conc <sup>n</sup> in 2:1 eluate (mg/l)         2:1 conc <sup>n</sup> leached (mg/kg)         Limit values for compliance leaching test using BS EN 12457-3 at L/S 10 1/kg           Result         Limit of Detection         Result         Limit of 0.0012         0.00212         <0.0012         0.5         2         25           -         -         -         20         100         300           <0.0010								-	
eluate Analysis         eluate (mg/l)         leached (mg/kg)         Limit values for compliance lead using BS FN 12457-3 at L/S           Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection         Limit of Detection           Arsenic         0.00106         <0.00012	$\begin{tabular}{ c c c c } \hline limit of Detection & Result & Limit of Detection & 0.0012 & 0.00212 & <0.0012 & 0.5 & 2 & 25 & 0.0001 & 0.00012 & 0.00212 & <0.001 & 0.5 & 2 & 25 & 0.0001 & <0.0001 & <0.0001 & <0.0002 & <0.001 & 0.04 & 1 & 5 & 0.0027 & 0.0022 & 0.00754 & <0.0022 & 0.5 & 10 & 70 & 0.00286 & <0.00052 & 0.00754 & <0.0022 & 0.5 & 10 & 70 & 0.000286 & <0.00021 & <0.0001 & 0.01 & 0.2 & 2 & 2 & 0.00010 & 0.000021 & <0.0001 & 0.01 & 0.2 & 2 & 2 & 0.00010 & 0.0000105 & 0.00015 & 0.00194 & <0.0015 & 0.01 & 0.2 & 2 & 2 & 0.00010 & 0.000021 & <0.00015 & 0.01 & 0.02 & 2 & 0.5 & 10 & 30 & 0.0000971 & <0.00015 & 0.00194 & <0.0015 & 0.4 & 10 & 400 & 0.000021 & <0.0002 & 0.5 & 10 & 50 & 0.00002 & 0.000896 & <0.0002 & 0.5 & 10 & 50 & 0.00002 & 0.000896 & <0.0002 & 0.5 & 10 & 50 & 0.000000 & 0.000021 & - & & & & & & & & & & & & & & & & & $								-	-
eluate Analysis         eluate (mg/l)         leached (mg/kg)         Limit values for compliance lead using BS FN 12457-3 at L/S           Result         Limit of Detection         Result         Limit of Detection           Arsenic $0.00106$ $<0.00012$ $0.0012$ $<0.0012$ $<0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0012$ $0.0011$ $0.0011$ $0.00112$ $0.0012$ $0.0011$ $0.002$ $0.0011$ $0.002$ $0.0011$ $0.0022$ $0.0012$ $0.0012$ $0.0022$ $0.0011$ $0.00112$ $0.00012$ <td><math display="block">\begin{tabular}{ c c c c } \hline limit of Detection &amp; Result &amp; Limit of Detection &amp; 0.0012 &amp; 0.00212 &amp; &lt;0.0012 &amp; 0.5 &amp; 2 &amp; 25 &amp; 0.0001 &amp; 0.00012 &amp; 0.00212 &amp; &lt;0.001 &amp; 0.5 &amp; 2 &amp; 25 &amp; 0.0001 &amp; &lt;0.0001 &amp; &lt;0.0001 &amp; &lt;0.0002 &amp; &lt;0.001 &amp; 0.04 &amp; 1 &amp; 5 &amp; 0.0027 &amp; 0.0022 &amp; 0.00754 &amp; &lt;0.0022 &amp; 0.5 &amp; 10 &amp; 70 &amp; 0.00286 &amp; &lt;0.00052 &amp; 0.00754 &amp; &lt;0.0022 &amp; 0.5 &amp; 10 &amp; 70 &amp; 0.000286 &amp; &lt;0.00021 &amp; &lt;0.0001 &amp; 0.01 &amp; 0.2 &amp; 2 &amp; 2 &amp; 0.00010 &amp; 0.000021 &amp; &lt;0.0001 &amp; 0.01 &amp; 0.2 &amp; 2 &amp; 2 &amp; 0.00010 &amp; 0.0000105 &amp; 0.00015 &amp; 0.00194 &amp; &lt;0.0015 &amp; 0.01 &amp; 0.2 &amp; 2 &amp; 2 &amp; 0.00010 &amp; 0.000021 &amp; &lt;0.00015 &amp; 0.01 &amp; 0.02 &amp; 2 &amp; 0.5 &amp; 10 &amp; 30 &amp; 0.0000971 &amp; &lt;0.00015 &amp; 0.00194 &amp; &lt;0.0015 &amp; 0.4 &amp; 10 &amp; 400 &amp; 0.000021 &amp; &lt;0.0002 &amp; 0.5 &amp; 10 &amp; 50 &amp; 0.00002 &amp; 0.000896 &amp; &lt;0.0002 &amp; 0.5 &amp; 10 &amp; 50 &amp; 0.00002 &amp; 0.000896 &amp; &lt;0.0002 &amp; 0.5 &amp; 10 &amp; 50 &amp; 0.000000 &amp; 0.000021 &amp; - &amp; </math></td> <td></td> <td>Co</td> <td>onc<sup>n</sup> in 2:1</td> <td></td> <td>2:1</td> <td>conc<sup>n</sup></td> <td></td> <td></td> <td></td>	$\begin{tabular}{ c c c c } \hline limit of Detection & Result & Limit of Detection & 0.0012 & 0.00212 & <0.0012 & 0.5 & 2 & 25 & 0.0001 & 0.00012 & 0.00212 & <0.001 & 0.5 & 2 & 25 & 0.0001 & <0.0001 & <0.0001 & <0.0002 & <0.001 & 0.04 & 1 & 5 & 0.0027 & 0.0022 & 0.00754 & <0.0022 & 0.5 & 10 & 70 & 0.00286 & <0.00052 & 0.00754 & <0.0022 & 0.5 & 10 & 70 & 0.000286 & <0.00021 & <0.0001 & 0.01 & 0.2 & 2 & 2 & 0.00010 & 0.000021 & <0.0001 & 0.01 & 0.2 & 2 & 2 & 0.00010 & 0.0000105 & 0.00015 & 0.00194 & <0.0015 & 0.01 & 0.2 & 2 & 2 & 0.00010 & 0.000021 & <0.00015 & 0.01 & 0.02 & 2 & 0.5 & 10 & 30 & 0.0000971 & <0.00015 & 0.00194 & <0.0015 & 0.4 & 10 & 400 & 0.000021 & <0.0002 & 0.5 & 10 & 50 & 0.00002 & 0.000896 & <0.0002 & 0.5 & 10 & 50 & 0.00002 & 0.000896 & <0.0002 & 0.5 & 10 & 50 & 0.000000 & 0.000021 & - & & & & & & & & & & & & & & & & & $		Co	onc <sup>n</sup> in 2:1		2:1	conc <sup>n</sup>			
Result         Limit of Detection         Result         Limit of Detection         Result         Limit of Detection           Arsenic         0.00106         <0.00012	Result         Limit of Detection         Result         Limit of Detection           0.00106         <0.00012	Eluate Analysis								
Sarium         0.00100         0.0012         0.0011         0.00         100           Cadmium         0.00377         <0.00022         0.00754         <0.0022         0.05         10           Copper         0.00286         <0.00085         0.00572         <0.0085         2         50           Mercury Dissolved (CVAF)         0.0000105         <0.00001         0.000021         <0.0001         0.01         0.2           Molybdenum         -         -         -         -         0.5         10           Lickel         0.000971         <0.00015         0.00194         <0.0015         0.4         10           ead         0.0000448         <0.00002         0.000896         <0.0002         0.5         10           wntimony         -         -         -         -         0.06         0.7           Selenium         -         -         -         0.1         0.5	-         -         -         20         100         300           <0.0001         <0.0001         <0.0002         <0.001         0.04         1         5           0.00377         <0.0022         0.00754         <0.0022         0.5         10         70           0.00286         <0.0085         0.00572         <0.0085         2         50         100           0.000105         <0.0001         0.00021         <0.001         0.01         0.2         2           -         -         -         0.5         10         30           0.000971         <0.00015         0.00194         <0.0015         0.4         10         40           0.000971         <0.0002         0.00896         <0.0002         0.5         10         50           0.000448         <0.0002         0.000896         <0.0002         0.5         10         50           -         -         -         -         0.1         0.5         7           0.00116         <0.0041         0.00232         <0.0041         4         50         200           -         -         -         -         10         1500         25000	-	Result	Limit of [	Detection	Result	Limit of Detecti	ion using B	S EN 12457-3 at L,	/S 10  /kg
Cadmium         <0.0001         <0.0001         <0.0002         <0.001         <0.001         <0.001           Chromium         0.00377         <0.00022	<0.0001         <0.0001         <0.0002         <0.001         0.04         1         5           0.00377         <0.00022		0.00106	<0.00	0012	0.00212	<0.0012			25
Chromium         O.0001         O.0002         O.0015         O.001         O.001         O.001           Copper         0.00286         <0.00085	0.00377         <0.00022         0.00754         <0.0022         0.5         10         70           0.00286         <0.00085		-	-	004	-	-			
Copper         0.00286         <0.00085         0.00572         <0.0085         2         50           Mercury Dissolved (CVAF)         0.000105         <0.00001	0.00286         <0.0085         0.00572         <0.0085         2         50         100           0.0000105         <0.0001			1						
tolybdenum         -         -         -         -         0.5         10           lickel         0.000971         <0.00015	0.0000105         <0.00001         0.000021         <0.0001         0.01         0.2         2           -         -         -         0.5         10         30           0.000971         <0.0015									
lickel         0.000971         <0.00015         0.00194         <0.0015         0.00194         <0.0015         0.4         10           ead         0.000448         <0.0002	0.000971         <0.00015         0.00194         <0.0015         0.4         10         40           0.000448         <0.0002	<b>,</b> ,	0.0000105	<0.00	0001	0.000021				
ead         0.000448         <0.0002         0.000896         <0.0002         0.0002         0.10         10           intimony         -         -         -         -         0.06         0.7           ielenium         -         -         -         -         0.1         0.5           inc         0.00116         <0.00041	0.000448         <0.0002         0.000896         <0.0002         0.5         10         50           -         -         -         0.06         0.7         5           -         -         -         0.06         0.7         5           -         -         -         0.1         0.5         7           0.00116         <0.0041			_	045					
Intimony         -         -         -         -         0.06         0.7           ielenium         -         -         -         -         0.1         0.5           inc         0.00116         <0.00041	0.06         0.7         5              0.1         0.5         7           0.00116         <0.00041									
inc 0.00116 <0.00041 0.00232 <0.0041 4 50	0.00116         <0.00041         0.00232         <0.0041         4         50         200           -         -         -         -         800         15000         25000           -         -         -         10         1500         25000           -         -         -         100         2000         5000           -         -         -         1000         20000         50000           -         -         -         4000         60000         100000           -         -         -         1         -         -									
	-         -         -         800         15000         25000           -         -         -         -         10         150         500           -         -         -         -         100         20000         50000           -         -         -         -         1000         20000         50000           -         -         -         -         4000         60000         100000           -         -         -         1         -         -									
	-         -         10         150         500           -         -         -         1000         20000         50000           -         -         -         -         4000         60000         100000           -         -         -         -         1         -         -				0041	1				
	-         -         1000         20000         50000           -         -         -         4000         60000         100000           -         -         -         1         -         -									
Sulphate (soluble) 1000 20000	· · · · · · 1 · ·		-	-			-			
			-			-				
			-							
			<u> </u>	-						
and Test Information										
Leach Test Information		Date Prepared	06-Jan-2011							

Date Prepared	06-Jan-2011
pH (pH Units)	8.21
Conductivity (µS/cm)	137.00
Temperature (°C)	12.00
Volume Leachant (Litres)	0.329
Volume of Eluate VE1 (Litres)	

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation Mcerts Certification does not apply to leachates

13/01/2011 06:04:32

### 06:04:22 13/01/2011

			CEI		TE OF ANAL	.1313					
	1209-83 _GRONTMIJ_SC	0L-40	Location: Customer: Attention:	Blake Clo Grontmij Gareth T		I	Order Number: Report Number: Superseded Report:	110764			
VAC ANALYTICA	L RESULT	S						REF :	BS EN 1245		
lient Reference					Site Location		Blake	Close			
/lass Sample taken (l	(g)	0.196			Moisture Conte	nt Ratio (%)	11.8				
lass of dry sample (	kg)	0.175			<b>Dry Matter Con</b>	tent Ratio (%	) 89.4				
Particle Size <4mm		>95%									
Case											
SDG		101209-83									
ab Sample Number(	s)	2554677						l			
Sampled Date	-	08-Dec-2010	)								
Customer Sample Re	f.	WS4									
Depth (m)		1.50									
Solid Waste Analysis											
otal Organic Carbon (%)		-					-	-	-		
oss on Ignition (%)		-					-	-	-		
Sum of BTEX (mg/kg)		<0.01					-	-	-		
um of 7 PCBs (mg/kg) lineral Oil (mg/kg)		-					-	-	-		
AH Sum of 17 (mg/kg)		-					-	-	-		
H (pH Units)		-					-	-	-		
NC to pH 6 (mol/kg)		-					-	-	-		
ANC to pH 4 (mol/kg)		-					-	-	-		
			onc <sup>n</sup> in 2:1			conc <sup>n</sup>					
Eluate Analysis			uate (mg/l)	(D.4. "	leached (mg/kg)		using B		ompliance leaching test 2457-3 at L/S 10 l/kg		
oron		Result 0.022		of Detection	0.044	Limit of Detect <0.094	ion _				
/anadium		0.022		.00024	0.00346	< 0.0094					
VOC MS (W) - Aqueous		0.00110			0.00010	0.0021					
,2,4-Trichlorobenzene		<0.0023	<(	0.0023	<0.0046	<0.023	-				
,2-Dichlorobenzene		<0.0037		0.0037	<0.0074	<0.037					
,3-Dichlorobenzene ,4-Dichlorobenzene		< 0.0022		0.0022	< 0.0044	< 0.022					
,4,5-Trichlorophenol		<0.0027 <0.001		0.0027 0.001	<0.0054 <0.002	<0.027 <0.01					
,4,6-Trichlorophenol		< 0.001		0.001	<0.002	<0.01		· · ·			
,4-Dichlorophenol		< 0.001		0.001	< 0.002	< 0.01	-				
,4-Dimethylphenol		<0.001	<	0.001	<0.002	<0.01	-	· ·	-		
,4-Dinitrotoluene		<0.001		0.001	<0.002	<0.01	-				
,6-Dinitrotoluene -Chloronaphthalene		< 0.001		0.001	< 0.002	< 0.01	-				
-Chlorophenol		<0.001 <0.001		0.001 0.001	<0.002	<0.01 <0.01					
-Methylnaphthalene		< 0.001		0.001	<0.002	<0.01	-				
-Methylphenol		<0.001		0.001	<0.002	< 0.01	-		-		
-Nitroaniline		<0.001	<	0.001	<0.002	<0.01	-		-		
2-Nitrophenol		<0.001		0.001	<0.002	<0.01					
-Nitroaniline -Bromophenylphenylether		< 0.001		0.001	< 0.002	< 0.01					
-Bromophenyiphenyiether -Chloro-3-methylphenol		<0.001 <0.001		0.001 0.001	<0.002	<0.01 <0.01					
-Chloroaniline		<0.001		0.001	<0.002	<0.01	-		-		
each Test Informati	on	1	- 1		1		l				
ate Prepared		06-Jan-2011									
Date Prepared pH (pH Units)		06-Jan-2011 8.21									

pH (pH Units) Conductivity (µS/cm) 137.00 Temperature (°C) 12.00 Volume Leachant (Litres) 0.329 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

13/01/2011 06:04:32

## 06:04:22 13/01/2011

SDG:         101209-83           Job:         H_GRONTMI           Client Reference:         Image: Client Reference	IJ_SOL-40	Location: Customer: Attention:	Blake Clo Grontmij	ose		der Number: port Number:	110764	
			Gareth Ta	avlor		perseded Report:		
		CEN		AGE BATCH				
VAC ANALYTICAL RESU	JLTS						REF :	BS EN 1245
Client Reference				Site Location		Blake	Close	
/lass Sample taken (kg)	0.196			Moisture Conte	ent Ratio (%)	11.8		
Mass of dry sample (kg)	0.175			Dry Matter Con	tent Ratio (%)	89.4		
Particle Size <4mm	>95%							
ase								
DG	101209-83							
ab Sample Number(s)	2554677							
Sampled Date	08-Dec-2010							
Customer Sample Ref.	WS4							
Depth (m)	1.50							
Solid Waste Analysis		_						
otal Organic Carbon (%)	-					-	-	-
oss on Ignition (%) Sum of BTEX (mg/kg)	- <0.01					-	-	-
um of 7 PCBs (mg/kg)	-					-	-	-
lineral Oil (mg/kg)	-					-	-	-
AH Sum of 17 (mg/kg) H (pH Units)	-					-	-	-
NC to pH 6 (mol/kg)	-					-	-	-
NC to pH 4 (mol/kg)	-					-	-	-
Eluate Analysis		nc⁰ in 2:1 ate (mg/l)			concʰ d (mg/kg)	Limit value	es for complia	nce leaching test
-	Result	Limit of	Detection	Result	Limit of Detection	า <b>using B</b>	S EN 12457-3	at L/S 10 l/kg
VOC MS (W) - Aqueous -Chlorophenylphenylether	10.001	10	004	10,000	10.01			
-Methylphenol	<0.001		.001 .001	<0.002 <0.002	<0.01 <0.01			 
-Nitrophenol	< 0.001		.001	< 0.002	<0.01	-	-	-
-Nitroaniline	<0.001		.001	<0.002	<0.01	-		
zobenzene cenaphthylene	<0.001		.001 .001	<0.002 <0.002	<0.01 <0.01			
cenaphthene	<0.001		.001	<0.002	<0.01	-		
nthracene	<0.001		.001	<0.002	<0.01	-		-
is(2-chloroethyl)ether	< 0.001		.001	<0.002	<0.01	-		
is(2-chloroethoxy)methane is(2-ethylhexyl) phthalate	<0.001		.001	<0.002 <0.004	<0.01 <0.02			
enzo(a)anthracene	<0.002		.002	<0.004	<0.02			
utylbenzyl phthalate	<0.001		.001	<0.002	<0.01	-	-	-
enzo(b)fluoranthene	< 0.001		.001	<0.002	< 0.01	-		
enzo(k)fluoranthene enzo(a)pyrene	<0.001 <0.001		.001	<0.002 <0.002	<0.01 <0.01			
enzo(ghi)perylene	<0.001		.001	<0.002	<0.01			
arbazole	<0.001	<0.	.001	<0.002	<0.01	-	-	-
Chrysene Dibenzofuran	<0.001		.001	< 0.002	< 0.01	-		
Di-n-butyl phthalate	<0.001 <0.001		.001 .001	<0.002 <0.002	<0.01 <0.01			
iethyl phthalate	<0.001		.001	<0.002	<0.01	-	-	-
each Test Information								

Date Prepared	06-Jan-2011
pH (pH Units)	8.21
Conductivity (µS/cm)	137.00
Temperature (°C)	12.00
Volume Leachant (Litres)	0.329
Volume of Eluate VE1 (Litres)	

<b>SDG:</b> 101209 <b>Job:</b> H GRC	-83 NTMIJ_SOL-40	Location: Customer:	Blake Clo Grontmij			er Number: ort Number:	110764		
Client Reference:		Attention:	Gareth T		•	erseded Report:	110704		
		CEI	N 2:1 ST	AGE BATCH	TEST				
VAC ANALYTICAL R	ESULTS						REF	: BS EN 124	
Client Reference				Site Location		Blake	Close		
Mass Sample taken (kg)	0.196			Moisture Conte	nt Ratio (%)	11.8			
Mass of dry sample (kg)	0.175			Dry Matter Con	tent Ratio (%)	89.4			
Particle Size <4mm	>95%								
Case									
SDG	101209-	83							
ab Sample Number(s)	2554677	,					I		
Sampled Date	08-Dec-	2010							
Customer Sample Ref.	WS4								
Depth (m)	1.50								
Solid Waste Analysis									
otal Organic Carbon (%)	-					-	-	- -	
oss on Ignition (%)	-					-	-	-	
Sum of BTEX (mg/kg)	<0.					-	-	-	
Sum of 7 PCBs (mg/kg) /ineral Oil (mg/kg)	-					-	-	-	
PAH Sum of 17 (mg/kg)	-					-	-	-	
oH (pH Units)	-					-	-	-	
ANC to pH 6 (mol/kg)	-					-	-	-	
ANC to pH 4 (mol/kg)	-					-	-	-	
		Conc <sup>n</sup> in 2:1			conc <sup>n</sup>				
Eluate Analysis		eluate (mg/l)	of Detection	leachee			iance leaching test -3 at L/S 10 l/kg		
SVOC MS (W) - Aqueous	Re	sult Limit	of Detection	Result	Limit of Detection				
Dibenzo(a,h)anthracene	<0.	001 .	<0.001	<0.002	<0.01	-	-	-	
Dimethyl phthalate	<0.		<0.001	<0.002	<0.01	-		-	
Di-n-Octyl phthalate	<0.		<0.005	<0.01	<0.05	-			
luoranthene	<0.	1	< 0.001	< 0.002	< 0.01	-			
lexachlorobenzene	<0.		<0.001 <0.001	<0.002	<0.01 <0.01				
lexachlorobutadiene	<0.0		0.001	<0.002	<0.01			<u>_</u>	
entachlorophenol	<0.0		<0.001	< 0.002	<0.01	-	· .	-	
henol	<0.	)01 ·	<0.001	<0.002	<0.01	-	-		
I-nitrosodi-n-propylamine	<0.		<0.001	<0.002	<0.01	-	-		
lexachloroethane	<0.		< 0.001	<0.002	< 0.01	-			
laphthalene	<0.0		<0.001 0.0035	<0.002 <0.007	<0.01 <0.035				
sophorone	<0.0		<0.0035	<0.007	<0.035				
lexachlorocyclopentadiene	<0.		<0.001	<0.002	<0.01				
Phenanthrene	<0.	001 ·	<0.001	<0.002	<0.01	-		-	
ndeno (1,2,3-cd) Pyrene	<0.		<0.001	<0.002	<0.01	-		-	
	<0.	001	<0.001	<0.002	<0.01	-	-		
/OC MS (W) Dibromofluoromethane									
oluene-d8			-	-	-		· · ·		
-Bromofluorobenzene			-		-		·		
Dichlorodifluoromethane	<0.		<0.007	<0.014	<0.07	-	-	-	

Date Prepared	06-Jan-2011
pH (pH Units)	8.21
Conductivity (µS/cm)	137.00
Temperature (°C)	12.00
Volume Leachant (Litres)	0.329
Volume of Eluate VE1 (Litres)	

SDG: 101209-83	411 001 40	Location:	Blake Cl		Or	der Number:	440704		
Job: H_GRONTM Client Reference:	MIJ_SOL-40	Customer: Attention:	Grontmij Gareth T			port Number: perseded Report:	110764		
		CEN	2:1 ST	AGE BATCH	TEST				
VAC ANALYTICAL RES	ULTS						REF	: BS EN 12457	
lient Reference				Site Location		Blake	Close		
lass Sample taken (kg)	0.196			Moisture Conte	nt Ratio (%)	11.8			
lass of dry sample (kg)	0.175			Dry Matter Con	tent Ratio (%)	89.4			
Particle Size <4mm	>95%								
ase									
DG	101209-83								
ab Sample Number(s)	2554677								
ampled Date	08-Dec-2010	)							
ustomer Sample Ref.	WS4								
Depth (m)	1.50								
olid Waste Analysis		_							
otal Organic Carbon (%)	-					-	-	-	
oss on Ignition (%)	- <0.01					-	-	-	
um of BTEX (mg/kg) um of 7 PCBs (mg/kg)	-					-	-	-	
lineral Oil (mg/kg)	-					-	-	-	
AH Sum of 17 (mg/kg)	-					-	-	-	
H (pH Units) NC to pH 6 (mol/kg)	-					-	-	-	
NC to pH 4 (mol/kg)	-					-	-	-	
		onc <sup>n</sup> in 2:1			conc <sup>n</sup>				
luate Analysis	Result	uate (mg/l)	f Detection	Result	d (mg/kg)	usina B	es for compliance leaching test S EN 12457-3 at L/S 10 l/kg		
OC MS (W)	Rooun			rtobult					
hloromethane	<0.009	<(	0.009	<0.018	<0.09	-			
inyl Chloride romomethane	< 0.0012		.0012	< 0.0024	< 0.012	-			
hloroethane	<0.002		).002 .0025	<0.004	<0.02				
richlorofluoromethane	< 0.0023		.0013	< 0.0026	< 0.013	-	-	-	
,1-Dichloroethene	<0.0012		.0012	<0.0024	<0.012	-	-		
arbon Disulphide	< 0.0013		.0013	< 0.0026	< 0.013				
ert-butyl methyl ether	<0.0037 <0.0016		.0037 .0016	<0.0074 <0.0032	<0.037 <0.016			· · ·	
rans-1,2-Dichloroethene	< 0.0019		.0019	<0.0038	< 0.019	-	· .		
,1-Dichloroethane	<0.0012		.0012	<0.0024	<0.012	-	-	-	
is-1,2-Dichloroethene ,2-Dichloropropane	< 0.0023		.0023	< 0.0046	< 0.023	-	-		
romochloromethane	<0.0038		<u>.0038</u> .0019	<0.0076 <0.0038	<0.038 <0.019				
hloroform	<0.0018		.0018	< 0.0036	<0.013				
,1,1-Trichloroethane	<0.0013	<0	.0013	<0.0026	<0.013	-	-	-	
,1-Dichloropropene	< 0.0013		.0013	<0.0026	<0.013	-			
arbontetrachloride 2-Dichloroethane	<0.0014 <0.0033		.0014 .0033	<0.0028 <0.0066	<0.014 <0.033		· · ·	. <u>-</u>	
enzene	<0.0033		.0033	<0.0086	<0.033				
richloroethene	<0.0025		.0025	< 0.005	< 0.025	-		-	
2-Dichloropropane	<0.003	<(	0.003	<0.006	<0.03		-	-	

Date Prepared	06-Jan-2011
pH (pH Units)	8.21
Conductivity (µS/cm)	137.00
Temperature (°C)	12.00
Volume Leachant (Litres)	0.329
Volume of Eluate VE1 (Litres)	

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## 06:04:22 13/01/2011

Job: H G	09-83 RONTMIJ_SOI		Location: Customer:	Blake Cl Grontmij			rder Number: eport Number:	110764			
Client Reference:	KONTINIJ_301		Attention:	Gareth T			uperseded Report:	110704			
			CEN	2:1 ST	AGE BATCH	TEST					
	RESULTS	3						REF	: BS EN 1245		
lient Reference					Site Location		Blake	Close			
lass Sample taken (kg	) (	0.196			Moisture Conte	nt Ratio (%)	11.8				
lass of dry sample (kg	,	0.175			Dry Matter Cont		89.4				
Particle Size <4mm	,	>95%			Dig matter com						
ase											
DG		101209-83									
ab Sample Number(s)	2	2554677						1			
ampled Date	(	08-Dec-2010									
Customer Sample Ref.		NS4									
-		-									
Depth (m)		1.50					-				
olid Waste Analysis											
otal Organic Carbon (%)		-					-	-	-		
oss on Ignition (%) um of BTEX (mg/kg)		- <0.01					-	-	-		
um of 7 PCBs (mg/kg)		-					-	-	-		
lineral Oil (mg/kg)		-					-	-	-		
AH Sum of 17 (mg/kg)		-					-	-	-		
H (pH Units) NC to pH 6 (mol/kg)		-					-	-	-		
NC to pH 4 (mol/kg)		-					-	-	-		
			nc <sup>n</sup> in 2:1		2:1 c	onc <sup>n</sup>					
Eluate Analysis		elu	ate (mg/l)		leached	(mg/kg)	Limit values for com using BS EN 1245				
							usina B	S EN 12457-3	3 at L/S 10 l/kg		
		Result	Limit o	f Detection	Result	Limit of Detection	n using B	S EN 12457-3	3 at L/S 10 l/kg		
						Limit of Detection	n	S EN 12457-3	3 at L/S 10 l/kg		
OC MS (W) Dibromomethane		<0.0027	<0	f Detection .0027 .0009	Result <a href="https://www.example.com"></a>		n using B	S EN 12457-3	3 at L/S 10 l/kg 		
ibromomethane romodichloromethane is-1,3-Dichloropropene			<0 <0	.0027	<0.0054	Limit of Detection	n 				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene		<0.0027 <0.0009 <0.0019 <0.0014	<0 <0 <0 <0 <0 <0	.0027 .0009 .0019 .0014	<0.0054 <0.0018 <0.0038 <0.0028	<ul> <li>Limit of Detection</li> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> </ul>	n 				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035	<0<0<0<0<0<0<0<0<0	.0027 .0009 .0019 .0014 .0035	<0.0054 <0.0018 <0.0038 <0.0028 <0.007	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022	<0 <0 <0 <0 <0 <0 <0 <0 <0 <0	.0027 .0009 .0019 .0014 .0035 .0022	<0.0054 <0.0018 <0.0038 <0.0028 <0.007 <0.0044	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022 <0.0022	<0 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0	.0027 .0009 .0019 .0014 .0035 .0022 .0022	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.0044</li> </ul>	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022 <0.022	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022	<0 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0 <0	.0027 .0009 .0019 .0014 .0035 .0022	<0.0054 <0.0018 <0.0038 <0.0028 <0.007 <0.0044	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022 <0.0022 <0.0015 <0.0017 <0.0023	<pre>&gt; &gt; &gt;</pre>	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> </ul>	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022 <0.022 <0.022 <0.015 <0.017 <0.023	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022 <0.0022 <0.0015 <0.0017 <0.0023 <0.0035	<pre>&gt; &gt; &gt;</pre>	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> </ul>	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022 <0.022 <0.022 <0.015 <0.017 <0.023 <0.035	n 				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene ,1,1,2-Tetrachloroethane		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022 <0.0022 <0.0015 <0.0017 <0.0023 <0.0035 <0.0013	<pre>&gt; &gt; &gt;</pre>	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> </ul>	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022 <0.022 <0.022 <0.015 <0.017 <0.023 <0.035 <0.035 <0.035	n 				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene ,1,1,2-Tetrachloroethane thylbenzene		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022 <0.0022 <0.0015 <0.0017 <0.0023 <0.0035 <0.0013 <0.0025	<pre>&gt; &gt; &gt;</pre>	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013 .0025	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> </ul>	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022 <0.022 <0.022 <0.015 <0.017 <0.023 <0.035 <0.035 <0.035 <0.013 <0.025	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene 1,2-Trichloroethane 3-Dichloropropane etrachloroethene ibromochloromethane 2-Dibromoethane hlorobenzene 1,1,2-Tetrachloroethane thylbenzene /m-Xylene		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0023</li> <li>&lt;0.0035</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0025</li> </ul>	<pre>&gt; &gt; &gt;</pre>	.0027 .0009 .0019 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013 .0025	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.025</li> </ul>	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene ,1,1,2-Tetrachloroethane thylbenzene /m-Xylene -Xylene		<0.0027 <0.0009 <0.0019 <0.0014 <0.0035 <0.0022 <0.0022 <0.0015 <0.0017 <0.0023 <0.0035 <0.0013 <0.0025	<pre>&gt; &gt; &gt;</pre>	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013 .0025	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> </ul>	Limit of Detection <0.027 <0.009 <0.019 <0.014 <0.035 <0.022 <0.022 <0.022 <0.015 <0.017 <0.023 <0.035 <0.035 <0.035 <0.013 <0.025	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene ,1,1,2-Tetrachloroethane thylbenzene /m-Xylene -Xylene tyrene romoform		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0023</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> </ul>	<0	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013 .0025 .0025 .0017	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> <li>&lt;0.0034</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.017</li> </ul>	n				
ibromomethane romodichloromethane oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene ,1,1,2-Tetrachloroethane thylbenzene /m-Xylene -Xylene tyrene romoform copropylbenzene		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0023</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0012</li> <li>&lt;0.003</li> <li>&lt;0.003</li> <li>&lt;0.0014</li> </ul>	>0 >0<	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013 .0025 .0017 .0012 .003 .0014	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0018</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0034</li> <li>&lt;0.0024</li> <li>&lt;0.006</li> <li>&lt;0.0028</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.012</li> <li>&lt;0.012</li> <li>&lt;0.014</li> </ul>	n				
ibromomethane romodichloromethane oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene ibromochloromethane ,2-Dibromoethane hlorobenzene ,1,1,2-Tetrachloroethane thylbenzene /m-Xylene -Xylene tyrene romoform sopropylbenzene ,1,2,2-Tetrachloroethane		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0023</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0012</li> <li>&lt;0.003</li> <li>&lt;0.0014</li> <li>&lt;0.0052</li> </ul>	>0 >0	.0027 .0009 .0019 .0014 .0035 .0022 .0015 .0017 .0023 .0035 .0013 .0025 .0017 .0025 .0017 .0012 .003 .0014 .0052	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0024</li> <li>&lt;0.006</li> <li>&lt;0.0028</li> <li>&lt;0.0104</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.012</li> <li>&lt;0.012</li> <li>&lt;0.014</li> <li>&lt;0.052</li> </ul>	n				
bibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene ,1,2-Trichloroethane ,3-Dichloropropane etrachloroethene bibromochloromethane ,2-Dibromoethane chlorobenzene ,1,1,2-Tetrachloroethane thylbenzene /m-Xylene Xylene tyrene romoform copropylbenzene ,1,2,2-Tetrachloroethane ,1,2,2-Tetrachloroethane ,2,3-Trichloropropane		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0023</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0012</li> <li>&lt;0.003</li> <li>&lt;0.0014</li> <li>&lt;0.0052</li> <li>&lt;0.0078</li> </ul>	>0 >0	.0027 .0009 .0019 .0014 .0035 .0022 .0015 .0017 .0023 .0035 .0013 .0025 .0017 .0025 .0017 .0012 .003 .0014 .0052 .0078	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0034</li> <li>&lt;0.0024</li> <li>&lt;0.006</li> <li>&lt;0.0028</li> <li>&lt;0.0104</li> <li>&lt;0.0156</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.014</li> <li>&lt;0.052</li> <li>&lt;0.078</li> </ul>	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene oluene rans-1,3-Dichloropropene 1,2-Trichloroethane 3-Dichloropropane etrachloroethene ibromochloromethane 2-Dibromoethane 1,1,2-Tetrachloroethane thylbenzene m-Xylene Xylene tyrene romoform opropylbenzene 1,2,2-Tetrachloroethane		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0023</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0012</li> <li>&lt;0.003</li> <li>&lt;0.0014</li> <li>&lt;0.0052</li> </ul>	>0 >0<	.0027 .0009 .0019 .0014 .0035 .0022 .0015 .0017 .0023 .0035 .0013 .0025 .0017 .0025 .0017 .0012 .003 .0014 .0052	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0038</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0034</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0024</li> <li>&lt;0.006</li> <li>&lt;0.0028</li> <li>&lt;0.0104</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.012</li> <li>&lt;0.012</li> <li>&lt;0.014</li> <li>&lt;0.052</li> </ul>	n				
ibromomethane romodichloromethane is-1,3-Dichloropropene bluene rans-1,3-Dichloropropene 1,2-Trichloroethane 3-Dichloropropane etrachloroethene ibromochloromethane 2-Dibromoethane hlorobenzene 1,1,2-Tetrachloroethane thylbenzene m-Xylene Xylene Xylene tyrene romoform opropylbenzene 1,2,2-Tetrachloroethane 2,3-Trichloropropane romobenzene		<ul> <li>&lt;0.0027</li> <li>&lt;0.0009</li> <li>&lt;0.0019</li> <li>&lt;0.0014</li> <li>&lt;0.0035</li> <li>&lt;0.0022</li> <li>&lt;0.0015</li> <li>&lt;0.0017</li> <li>&lt;0.0035</li> <li>&lt;0.0035</li> <li>&lt;0.0013</li> <li>&lt;0.0025</li> <li>&lt;0.0017</li> <li>&lt;0.0012</li> <li>&lt;0.0012</li> <li>&lt;0.0014</li> <li>&lt;0.0052</li> <li>&lt;0.0078</li> <li>&lt;0.002</li> </ul>	>0 >0<	.0027 .0009 .0019 .0014 .0035 .0022 .0022 .0015 .0017 .0023 .0035 .0013 .0025 .0017 .0025 .0017 .0012 .003 .0014 .0052 .0078	<ul> <li>&lt;0.0054</li> <li>&lt;0.0018</li> <li>&lt;0.0018</li> <li>&lt;0.0028</li> <li>&lt;0.007</li> <li>&lt;0.0044</li> <li>&lt;0.003</li> <li>&lt;0.0034</li> <li>&lt;0.0046</li> <li>&lt;0.007</li> <li>&lt;0.0026</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.005</li> <li>&lt;0.0034</li> <li>&lt;0.0024</li> <li>&lt;0.006</li> <li>&lt;0.0028</li> <li>&lt;0.0104</li> <li>&lt;0.0156</li> <li>&lt;0.004</li> </ul>	Limit of Detection <ul> <li>&lt;0.027</li> <li>&lt;0.009</li> <li>&lt;0.019</li> <li>&lt;0.014</li> <li>&lt;0.035</li> <li>&lt;0.022</li> <li>&lt;0.022</li> <li>&lt;0.015</li> <li>&lt;0.017</li> <li>&lt;0.023</li> <li>&lt;0.035</li> <li>&lt;0.013</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.025</li> <li>&lt;0.017</li> <li>&lt;0.012</li> <li>&lt;0.012</li> <li>&lt;0.014</li> <li>&lt;0.052</li> <li>&lt;0.078</li> <li>&lt;0.02</li> </ul>	n				

pH (pH Units) 8.21 Conductivity (µS/cm) 137.00 Temperature (°C) 12.00 Volume Leachant (Litres) 0.329 Volume of Eluate VE1 (Litres)

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

Mcerts Certification does not apply to leachates

EBATCH TEST Location ture Content Ratio (%) Matter Content Ratio (%) Matter Content Ratio (%)  M	11.8	REF : BS			
2:1 conc <sup>n</sup> leached (mg/kg)         Result         <0.0038       <0.019         <0.0036       <0.018	11.8 %) 89.4	Close			
2:1 conc <sup>n</sup> leached (mg/kg)         Result         <0.0038	11.8 %) 89.4				
2:1 conc <sup>n</sup> leached (mg/kg)         Result       Limit of Detection         <0.0038	%) 89.4 				
2:1 conc <sup>n</sup> leached (mg/kg)           Result         Limit of Detection           <0.0038					
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - - -				
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - - -	-			
leached (mg/kg)           Result         Limit of Detection           <0.0038	- - -		-		
leached (mg/kg)           Result         Limit of Detection           <0.0038	-	-	-		
leached (mg/kg)           Result         Limit of Detection           <0.0038	-		-		
leached (mg/kg)           Result         Limit of Detection           <0.0038		-	-		
leached (mg/kg)           Result         Limit of Detection           <0.0038		-	-		
leached (mg/kg)           Result         Limit of Detection           <0.0038		-	-		
<0.0038 <0.019 <0.0036 <0.018	Limit valu	es for compliance lea			
<0.0036 <0.018	ction using B	3S EN 12457-3 at L/S	10 l/kg		
<0.0036 <0.018					
<0.004 <0.02	-	-	-		
<0.0034 <0.017					
		-			
		· · ·	· · · ·		
<0.0054 <0.027	-				
<0.004 <0.02	-	-			
		-			
		-	-		
<0.0046 <0.023		-			
<0.0046	-		-		
<0.0046 <0.023 <0.005 <0.025		· · ·			
7     <0.0017	7         <0.0017         <0.0034         <0.017           6         <0.0026	7       <0.0017	7       <0.0017       <0.0034       <0.017       -       -         5       <0.0026		
		<0.0023 <0.0046 <0.023 -	<0.0023 <0.0046 <0.023		
	~0.0106 ~0.009	<0.0046 <0.023 - <0.005 <0.025 -	<0.0046 <0.023		
<0.0054 <0.004 <0.0074	<0.027 <0.02 <0.037	<0.027 - <0.02 - <0.037 - <0.098 -	<0.027		

pH (pH Units) 8.21 Conductivity (µS/cm) 137.00 Temperature (°C) 12.00 Volume Leachant (Litres) 0.329 Volume of Eluate VE1 (Litres)

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Mcerts Certification does not apply to leachates

101209-83

H\_GRONTMIJ\_SOL-40

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SDG:

Job:

Client Reference:

CERTIFICATE	<b>OF ANALYSIS</b>
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Location: Blake Close Customer: Grontmij

Gareth Taylor

Attention:

Order Number: Report Number: 110764

Superseded Report:

Validated

# Table of Results - Appendix

NDP	No Determination	n Possible	#	ISO 17025 Accredited		*	Subcontracted Test	м	MCERTS Accred	ited
NFD	No Fibres Detect	ted	PFD	Possible Fibres Detected		»	Result previously reported (Incremental reports only)	EC	Equivalent Carb (Aromatics C8-0	on
te: Meth	od detection limits	are not always achievable d	lue to vario	ous circumstances beyond our c	ontrol					<b>a</b> 4
N	lethod No		Refe	rence			Description		Wet/Dry Sample <sup>1</sup>	Surrogate Corrected
	PM001				Preparatio	on of Sar	nples for Metals Analysis			
	PM024	Modified BS 1377					cluding homogenisation, moistur Containing Material	e screens of		
	PM114				Leaching Cumulativ		re for CEN Two Stage BatchTes	t 2:1/8:1		
	PM115				Leaching 1 Step	Procedu	re for CEN One Stage Leach Te	st 2:1 & 10:1		
	TM001	In - house Method			Determina solids	ation of a	sbestos containing material by s	creening on		
	TM089	Modified: US EPA	Methods	8020 & 602			asoline Range Hydrocarbons (C npounds by Headspace GC-FID	,		
	TM116	Modified: US EPA 1 624, 610 & 602	Vethod	3260, 8120, 8020,	Determina GC-MS	ation of V	olatile Organic Compounds by F	leadspace /		
	TM132	In - house Method			ELTRA C	S800 Op	erators Guide			
	TM133	BS 1377: Part 3 19	90;BS 6	068-2.5	Determina Meter	ation of p	H in Soil and Water using the GI	_рН рН		
	TM151	Method 3500D, AWWA/APHA, 20th Ed., 1999			Determina	ation of ⊢	lexavalent Chromium using Kone	e analyser		
	TM152	Method 3125B, AW	/WA/AP	HA, 20th Ed., 1999	Analysis o	of Aqueo	us Samples by ICP-MS			
	TM157	HP 6890 Gas Chro HP 5973 Mass Sele	-	ph (GC) system and etector (MSD).	Determina sonicatior		VOC in Soils by GC-MS extracte /Acetone	ed by		
	TM173	Analysis of Petroleu Environmental Med Hydrocarbon Criter	lia – Ťot				peciated Extractable Petroleum oils by GC-FID			
	TM176	EPA 8270D Semi-V by Gas Chromatoge (GC/MS)		Organic Compounds ass Spectrometry	Determina	ation of S	VOCs in Water by GCMS			
	TM181	US EPA Method 60	)10B		Determina ICP-OES	ation of F	outine Metals in Soil by iCap 65	00 Duo		
	TM183	BS EN 23506:2002 0 580 38924 3	, (BS 60	68-2.74:2002) ISBN			race Level Mercury in Waters ar our Atomic Fluorescence Spectro			
	TM184	EPA Methods 325.	1 & 325.	2,			of Anions in Aqueous Matrices	using the		
	TM208	Modified: US EPA	Vethod	3260b & 624	Determina GC-MS in		olatile Organic Compounds by F	leadspace /		
	TM218	Microwave extraction	on – EP	A method 3546	Microwav	e extract	ion - EPA method 3546			
	TM222	In-House Method					Hot Water Soluble Boron in Soils Emission Spectrometer	(10:1		
	TM243						·			

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

#### **CERTIFICATE OF ANALYSIS**

 SDG:
 101209-83

 Job:
 H\_GRONTMIJ\_SOL-40

 Client Reference:

#### Location: Blake Close Customer: Grontmij

Gareth Taylor

Attention:

Order Number: Report Number: 110764 Superseded Report:

# **Test Completion Dates**

Lab Sample No(s)	2554661	2554665	2554668	2554673	2554674	2554676	2554677
Customer Sample Ref.	WS1	WS2	WS3	WS3	WS4	WS4	WS4
AGS Ref.							
Depth	0.30	0.10	1.00	0.70	0.30	0.70	1.50
Туре	SOLID						
Anions by Kone (soil)			10-Jan-2011		10-Jan-2011		06-Jan-2011
Asbestos Containing Material Screen	06-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	
Boron Water Soluble	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	
CEN 2:1 Leachate (1 Stage)			06-Jan-2011			06-Jan-2011	06-Jan-2011
CEN Readings			07-Jan-2011			07-Jan-2011	07-Jan-2011
Dissolved Metals by ICP-MS			10-Jan-2011			10-Jan-2011	10-Jan-2011
EPH CWG (Aliphatic) GC (S)			11-Jan-2011		11-Jan-2011		10-Jan-2011
EPH CWG (Aromatic) GC (S)			11-Jan-2011		11-Jan-2011		10-Jan-2011
GRO by GC-FID (S)			13-Jan-2011		12-Jan-2011		12-Jan-2011
Hexavalent Chromium (s)	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	
Mercury Dissolved			10-Jan-2011			10-Jan-2011	10-Jan-2011
Metals by iCap-OES (Soil)	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	
PAH by GCMS	09-Jan-2011	11-Jan-2011		09-Jan-2011		10-Jan-2011	
pH	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	
Sample description	06-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	06-Jan-2011	05-Jan-2011
Semi Volatile Organic Compounds			10-Jan-2011		10-Jan-2011		10-Jan-2011
SVOC MS (W) - Aqueous			11-Jan-2011			11-Jan-2011	11-Jan-2011
Total Organic Carbon	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	07-Jan-2011	
TPH CWG GC (S)			13-Jan-2011		12-Jan-2011		12-Jan-2011
VOC MS (S)			11-Jan-2011		11-Jan-2011		11-Jan-2011
VOC MS (W)			11-Jan-2011			11-Jan-2011	11-Jan-2011

#### **CERTIFICATE OF ANALYSIS**

SDG:	101209-83	Location:	Blake Close
Job:	H_GRONTMIJ_SOL-40	Customer:	Grontmij
Client Reference:		Attention:	Gareth Taylor

## Appendix

 Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. A table containing the date of analysis for each parameter is not routinely included with the report, but is available upon request.

12. Results relate only to the items tested

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenols monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 14).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

 Our MCERTS accreditation for PAHs by GCMS applies to all product types apart from Kerosene, where naphthalene only is not accredited.

19. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

20. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

21. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

22. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

23. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

24. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Order Number: Report Number: 110764 Superseded Report:

#### SOLID MATRICES EXTRACTION SUMMARY

ANALYSIS	d/C OR WET	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSS				
SOLVENT EXTRACTABLE MATTER	D&C	DOM	SOXTHERM	GRAVIMETRIC				
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC				
THIN LAYER CHROMATOGRAPHY	D&C	DCM	SOXTHERM	IATROSCAN				
ELEMENTALSULPHUR	D&C	DOM	SOXTHERM	HFLC				
PHENOLSBYGONS	WET	DOM	SOXTHERM	GCMS				
HERBICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS				
PESTICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS				
EPH (DRO)	D&C	HEXANEACETONE	END OVEREND	GCFD				
EPH (MINOL)	D&C	HEXANEACETONE	END OVEREND	GCFD				
EPH (CLEANED UP)	D&C	HEXANEACETONE	END OVEREND	GCFID				
EPH CMG BYGC	D&C	HEXANEACETONE	END OVEREND	GCFID				
POB TOT / POB CON	D&C	HEXANEACETONE	END OVEREND	GCMS				
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANEACETONE	MCROWAVE TM218.	GCMS				
C8-C40(C6-C40)EZ FLASH	WET	HEXANEACETONE	SHAVER	GCEZ				
POL VAROMATIC HYDROCARBONS RAPID GC	WET HEXANEACETONE		SHAVER	900 EZ				
SEM VOLATILEORGANIC COMFOUNDS	WET	DOMACETONE	SONICATE	GCMS				

#### LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS		
PAHMS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS		
EPH	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID		
EPH CWG	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID		
MNERALOIL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID		
POB 7 CONGENERS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS		
POB TOTAL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS		
SVOC	DOM	LIQUID/LIQUID SHAKE	GCMS		
FREESULPHUR	DOM	SOLD PHASE EXTRACTION	HPLC		
PEST 00P/0PP	DOM	LIQUID/LIQUID SHAKE	GCMS		
TRIAZINE HERBS	DOM	LIQUID/LIQUID SHAKE	GCMS		
PHENOLSMS	DOM	SOLID PHASE EXTRACTION	GCMS		
TIH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC		
MINERALOIL by R	TCE	LIQUID/LIQUID SHAKE	HPLC		
GLYCOLS	NONE	DIRECT INJECTION	GCMS		

#### Identification of Asbestos in Bulk Materials

The results for asbestos identification for soil samples are obtained from possible Asbestos Containing Material, removed during the 'Screening of soils for Asbestos Containing Materials', which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratories (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

Asbestos Type	Common Name
Chrysolile	WhiteAsbestos
Amosite	BrownAsbestos
Croddite	Blue Asbestos
Fibrous Adinalite	-
Florous Anthophylite	-
Fibrous Trendile	-

Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in MDHS 100.

The identification of asbestos containing materials falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.



Grontmij Radcliffe House 3rd Floor Blenheim Court, Lode lane Solihull West Midlands B912AA

Attention: Gareth Taylor

# **CERTIFICATE OF ANALYSIS**

Date: Customer: Sample Delivery Group (SDG): Your Reference: Location: Report No: 10 June 2011 H\_GRONTMIJ\_SOL 110602-58

Part 2a Assistance 133432

We received 29 samples on Thursday June 02, 2011 and 25 of these samples were scheduled for analysis which was completed on Friday June 10, 2011. Accredited laboratory tests are defined within the report, but opinions, interpretations and on-site data expressed herein are outside the scope of ISO 17025 accreditation.

Should this report require incorporation into client reports, it must be used in its entirety and not simply with the data sections alone.

All chemical testing (unless subcontracted) is performed at ALcontrol Hawarden Laboratories.

PLEASE NOTE: THIS CERTIFICATE CONTAINS RESULTS FOR MULTIPLE SITES. ONLY THE SAMPLES FROM 3A AND 83 BLAKE CLOSE ARE RELEVANT TO THIS REPORT.

Approved By:

Sonia McWhan Operations Manager



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#### **CERTIFICATE OF ANALYSIS**

Validated

SDG:	110602-58	Location:	Part 2a Assistance	Order Number:
Job:	H_GRONTMIJ_SOL-54	Customer:	Grontmij	Report Number: 133432
Client Reference:		Attention:	Gareth Taylor	Superseded Report:

# **Received Sample Overview**

Lab Sample No(s)	Customer Sample Ref.	AGS Ref.	Depth (m)	Sampled Date
3588820	1 NEWLANDS LANE FIVEWAYS		0.30	31/05/2011
3588809	10 WESTGATE			31/05/2011
3588808	11 GOODWOOD			31/05/2011
3588826	11 NEWLANDS COURT FIVEWAYS		0.30	31/05/2011
3588818	110 STAFFORD LANE			31/05/2011
3588805	121 ARMITAGE ROAD			31/05/2011
3588806	125 ARMITAGE ROAD			31/05/2011
3588811	2 SANDOWN			31/05/2011
3588819	21 HERONDALE			31/05/2011
3588807	3 SLADE VIEW RISE			31/05/2011
3588787	3A BLAKE CLOSE			31/05/2011
3588810	4 KEMPTON			31/05/2011
3588813	41 SWALLOWFIELDS			31/05/2011
3588822	5 NEWLANDS COURT FIVEWAYS		0.30	31/05/2011
3588814	73 STAGBOROUGH			31/05/2011
3588815	8 STAGBOROUGH WAY			31/05/2011
3588788	83 BLAKE CLOSE			31/05/2011
3588823	9 NEWLANDS COURT FIVEWAYS		0.30	31/05/2011
3588803	99 ARMITAGE ROAD			31/05/2011
3588802	FIVEWAYS 1 NEWLANDS LANE			31/05/2011
3588798	FIVEWAYS 11 NEWLANDS COURT			31/05/2011
3588799	FIVEWAYS 5 NEWLANDS COURT			31/05/2011
3588800	FIVEWAYS 9 NEWLANDS COURT			31/05/2011
3588795	VIEW ST. 32 FOSTERS AVE.			31/05/2011
3588793	VIEW ST. 53 VIEW ST.			31/05/2011
3588797	VIEW ST. 9 WARD ST.			31/05/2011
3588790	VIEW ST. WS2		1.20	31/05/2011
3588791	VIEW ST. WS3		1.10	31/05/2011
3588789	VIEW ST. WS4		1.60	31/05/2011

Only received samples which have had analysis scheduled will be shown on the following pages.

ALcontrol Laboratories										[	 Vali	idate															
	10602-58 _GRONTMIJ_SOL-54	Location Custome Attentior	: er:	Pa Gi	art 2 ront	a As	ssista		~	117						Re	po	rt I	um Nun edeo	nbe		t:	133	3432		 	
LIQUID Results Legend X Test	Lab Sample	No(s)	3588802	3588811	3588790	3588787	3588791	3588810	3588789	3588815	3588797 3588800	3588809	3588798	3588819	3588795	3588793	3588814	3588788	3588818	3588805	3588806						
No Determinatio Possible	n Custom Sample Refe		FIVEWAYS 1	2 SANDOWN	VIEW ST. WS2	3A BLAKE CLOSE	VIEW ST. WS3	4 KEMPTON	VIEW ST. WS4		FIVEWAYS 9	10 WESTGATE	11 GOODWOOD	21 HERONDALE	41 VIEW ST. 32	VIEW ST. 53 VIEW	73 STAGBOROUGH	83 RI AKE CI OSE	110 STAFFORD	121 ARMITAGE	125 ARMITAGE						
	AGS Refer	ence																									
	Depth (r	n)			1.20		1.10		1.60																		
	Containe	er	11 green glass bottle	11 green glass bottle	Vial	11 green glass bottle	Vial 1I green glass bottle	11 green glass bottle 11 green glass bottle	Vial	11 green glass bottle	11 green glass bottle 11 green glass bottle	11 green glass bottle	1l green glass bottle	11 green glass bottle													
Dissolved Metals by ICP-MS	All	NDPs: 0 Tests: 25		x x		x x		x x		x x																	
Mercury Dissolved	All	NDPs: 0 Tests: 25	x	x x	(	x x	x	x x	)	K X	x x	<b>x</b>	x x	<b>X</b>	x >	x	x	x )	< x	x	×						
PAH Spec MS - Aqueous (W)	All	NDPs: 0 Tests: 25	x	x x	(	x x	x	x x	)	<mark>k x</mark>	x x	<b>x</b> 2	x x	<b>x</b>	x )	( X	x	x )	< x	x	x						
VOC MS (W)	All	NDPs: 0 Tests: 3			x		x		x																		

#### **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 110602-58
 Location:
 Part 2a Assistance
 Order Number:

 Job:
 H\_GRONTMIJ\_SOL-54
 Customer:
 Grontmij
 Report Number:
 133432

 Client Reference:
 Attention:
 Gareth Taylor
 Superseded Report:
 13432

Results Legend # ISO17025 accredited. M mCERTS accredited.	Cu	ustomer Sample R	99 ARMITAGE ROA D	121 ARMITAGE RO AD	125 ARMITAGE RO AD	83 BLAKE CLOSE	3A BLAKE CLOSE	FIVEWAYS 5 NEWL ANDS COURT
Non-conforming work.     aq Aqueous / settled sample.     diss.fitt Dissolved / filtered sample.     tot.unfitt Total / unfiltered sample.     * Subcontracted test.     ** % recovery of the surrogate standa         check the efficiency of the method.         results of individual compounds wi         samples aren't corrected for the rec     (F) Trigger breach confirmed	The L thin L covery	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588803	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588805	31/05/2011 02/06/2011 110602-58 3588806	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588788	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588787	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588799
Component Antimony (diss.filt)	LOD/Units <0.16	Method TM152	0.367	0.327	0.881	0.297	0.301	2.25
Arsenic (diss.filt)	μ <u>q/l</u> <0.12	TM152	#	# 5.16	# 3.97	# 2.1	# 1.42	# 2.13
	µg/l		#	#	#	#	#	#
Boron (diss.filt)	<9.4 µg/l	TM152	58.5 #	57.7 #	66.9 #	125 #	85.7 #	102 #
Cadmium (diss.filt)	<0.1 µg/l	TM152	<0.1 #	<0.1 #	<0.1 #	0.117 #	0.201 #	0.165 #
Chromium (diss.filt)	<0.22 µg/l	TM152	12.4 #	12.2 #	13.7 #	13.4 #	7.95 #	16.5 #
Copper (diss.filt)	<0.85 μg/l	TM152	288 #	9.02 #	5.51 #		740 #	266 #
Lead (diss.filt)	<0.02	TM152	0.107	0.293 #	1.09	0.165	0.311 #	0.266
Nickel (diss.filt)	μ <u>g</u> /l <0.15	TM152	# 2.16	1.01	# 1.4	# 0.993	4.32	# 1.19
Zinc (diss.filt)	μg/l <0.41	TM152	# 74.4	# 7.67	# 29.2	# 14.5	# 606	# 94.9
Mercury (diss.filt)	μg/l <0.01	TM183	# <0.01	# <0.01	# <0.01	# <0.01	# <0.01	# <0.01
	µg/l		#	#	#	#	#	#
		+						

#### **CERTIFICATE OF ANALYSIS**

Validated

Results Legend # ISO17025 accredited.	Cı	istomer Sample R	11 GOODWOOD	21 HERONDALE	4 KEMPTON	FIVEWAYS 9 NEWL ANDS COURT	FIVEWAYS 11 NEW LANDS COURT	FIVEWAYS 1 NEWL ANDS LANE
M mCERTS accredited. § Non-conforming work. aq Aqueous / settide sample. diss.filt Dissolved / filtered sample. tot.unfilt Total / unfiltered sample. * Subcontracted test. * % recovery of the surrogate standar check the efficiency of the method. results of individual compounds wit samples aren't corrected for the rec (F) Trigger breach confirmed	The thin I	Depth (m) Sample Type Date Sampled Date Received SDG Ref ab Sample No.(s) AGS Reference	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588808	Water (GW/SW) 31/05/2011 02/06/2011 110602-58 3588819	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588810	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588800	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588798	ANDS LANE Water(GW/SW) 31/05/2011 02/06/2011 11/0602-58 3588802
Component	LOD/Units	Method						
Antimony (diss.filt)	<0.16	TM152	0.344 #	0.266 #	0.421	0.489	0.381 #	0.246
Arsenic (diss.filt)	μ <u>g/l</u> <0.12	TM152	1.85	2.08	2.03	2.22	1.94	2.06
Boron (diss.filt)	μ <u>g/l</u> <9.4 μg/l	TM152	# 96.5	# 114 "	# 88.8	# 92.2	# 113	# 80.7
Cadmium (diss.filt)	<0.1 µg/	TM152	# <0.1	# <0.1	# <0.1	# <0.1	# 0.101	# <0.1
Chromium (diss.filt)	<0.22	TM152	# 14.2	# 11.2	# 12.8	# 14.1	# 13.1	# 8.22
Copper (diss.filt)	μ <u>g/l</u> <0.85	TM152	# 49 "	# 96.6	# 32.7	# 176	# 48.5	# 73.3
Lead (diss.filt)	μg/l <0.02	TM152	# 0.109	# 0.184	# 0.093	# 0.048	# 0.057	# 0.231
Nickel (diss.filt)	μg/l <0.15	TM152	# 1.68	# 0.594	# 1.6	# 0.559	# 1.02	# 1.79
Zinc (diss.filt)	μg/l <0.41	TM152	# 21.6	# 18	# 7.11	# 6.25	# 9.53	# 8.76
Mercury (diss.filt)	μg/l <0.01 μg/l	TM183	# <0.01 #	# <0.01 #	# <0.01 #	# <0.01 #	# <0.01 #	# <0.01 #
L								

# **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 110602-58
 Location:
 Part 2a Assistance
 Order Number:

 Job:
 H\_GRONTMIJ\_SOL-54
 Customer:
 Grontmij
 Report Number:
 133432

 Client Reference:
 Attention:
 Gareth Taylor
 Superseded Report:
 13432

Results Legend	С	ustomer Sample R	2 SANDOWN	3 SLADE VIEW RI	110 STAFFORD LA	73 STAGBOROUGH	8 STAGBOROUGH W	41 SWALLOWFIELD
# ISO17025 accredited. M mCERTS accredited. § Non-conforming work. aq Aqueous / settled sample. diss.fit Dissolved / filtered sample.		Depth (m) Sample Type	Water(GW/SW)	SE Water(GW/SW)	NE Water(GW/SW)	Water(GW/SW)	AY Water(GW/SW)	S Water(GW/SW)
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled Date Received	31/05/2011 02/06/2011	31/05/2011 02/06/2011	31/05/2011 02/06/2011	31/05/2011 02/06/2011	31/05/2011 02/06/2011	31/05/2011 02/06/2011
** % recovery of the surrogate standa check the efficiency of the method.	The	SDG Ref Lab Sample No.(s)	110602-58 3588811	110602-58 3588807	110602-58 3588818	110602-58 3588814	110602-58 3588815	110602-58 3588813
results of individual compounds wi samples aren't corrected for the rec (F) Trigger breach confirmed		AGS Reference	000011	000007	000010	000014	000010	0000010
Component	LOD/Units	s Method						
Antimony (diss.filt)	<0.16 µg/l	TM152	0.202 #	0.426 #	0.303 #	0.246 #	0.239 #	0.298 #
Arsenic (diss.filt)	<0.12 µg/l	TM152	1.92 #	1.85 #	2.03	2.32 #	2.03 #	2.16 #
Boron (diss.filt)	<9.4 µg/	/I TM152	107 #	128 #	123 #	135 #	118 #	123 #
Cadmium (diss.filt)	<0.1 µg/	/I TM152	0.201 #	<0.1 #	0.179 #	0.142 #	0.276 #	0.108 #
Chromium (diss.filt)	<0.22 µg/l	TM152	12.5 #	13.3 #		13.5 #		11.3 #
Copper (diss.filt)	<0.85 μg/l	TM152	118 #		120 #	19.2 #	91.2 #	9.23 #
Lead (diss.filt)	<0.02 μg/l	TM152	0.862 #	0.042	0.329 #	0.121 #	0.398 #	0.126 #
Nickel (diss.filt)	<0.15 μg/l	TM152	4.46 #	#	1.06 #		15.3 #	0.697 #
Zinc (diss.filt)	<0.41 μg/l	TM152	295 #	#	29.9 #	#	356 #	2.69 #
Mercury (diss.filt)	<0.01 μg/l	TM183	<0.01 #	# <0.01 #	# <0.01 #	# <0.01 #		~0.01 #
	μg/i		#	#	#	#	<del></del>	#

# **CERTIFICATE OF ANALYSIS**

Validated

 SDG:
 110602-58
 Location:
 Part 2a Assistance
 Order Number:

 Job:
 H\_GRONTMIJ\_SOL-54
 Customer:
 Grontmij
 Report Number:
 133432

 Client Reference:
 Attention:
 Gareth Taylor
 Superseded Report:
 13432

Results Legend		untomos Comula D						
# ISO17025 accredited. M mCERTS accredited.		ustomer Sample R	VIEW ST. 32 FOS TERS AVE.	VIEW ST. 53 VIE W ST.	VIEW ST. 9 WARD ST.	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4
S Non-conforming work.     Aqueous / settled sample.		Depth (m)				1.20	1.10	1.60
diss.filt Dissolved / filtered sample.		Sample Type Date Sampled	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011
tot.unfilt Total / unfiltered sample. * Subcontracted test.		Date Sampled Date Received	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
** % recovery of the surrogate standar check the efficiency of the method.	The	SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
results of individual compounds wit samples aren't corrected for the rec		Lab Sample No.(s) AGS Reference	3588795	3588793	3588797	3588790	3588791	3588789
(F) Trigger breach confirmed								
Component	LOD/Units		0.440	0.007	0.020			
Antimony (diss.filt)	<0.16 µg/l	TM152	0.449 #	0.697 #	0.236			
Arsenic (diss.filt)	<0.12	TM152	1.71	1.88	3.17	0.535	1.1	0.912
	µg/l	_	#	#	#	#	#	#
Boron (diss.filt)	<9.4 µg/	I TM152	121 #	102 #	106	171 #	226 #	59.5 #
Cadmium (diss.filt)	<0.1 µg/	1 TM152	0.179	0.381	# 0.149	0.605	<0.1	0.167
			#	#	#	#	#	#
Chromium (diss.filt)	<0.22 µg/l	TM152	11.7 #	13.8 #	10 #	11.5 #	20.9 #	28.6 #
Copper (diss.filt)	<0.85	TM152	302	644	361	2.24	3.42	<0.85
Lood (diag filt)	µg/l	TM152	#	#	#	# 0.072	# 0.16	#
Lead (diss.filt)	<0.02 µg/l	1101152	4.37 #	0.103 #	0.23 #	0.072	0.16	0.05 #
Nickel (diss.filt)	<0.15	TM152	4.71	1.66	3.73	3.9	3.3	3.91
	µg/l	714450	#	#	#	#	#	#
Vanadium (diss.filt)	<0.24 µg/l	TM152				2.88 #	4.02 #	8.48 #
Zinc (diss.filt)	<0.41	TM152	175	661	293	15.9	4.05	<0.41
Marouny (diag filt)	µg/l	TM183	# <0.01	# <0.01	# <0.01	# <0.01	# <0.01	#
Mercury (diss.filt)	<0.01 µg/l	11/11/83	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01 #
	page.							

ALcontrol La			CER	TIFICATE OF A	NALYSIS			Validated
	110602-58 H_GRONTMI.	J_SOL-54	Location: Customer: Attention:	Part 2a Assistance Grontmij Gareth Taylor		Order Number: Report Number: Superseded Repor	133432 t:	
Results Legend		Customer Sample R	10 WESTGATE					
ISO17025 accredited.     MmCERTS accredited.     Son-conforming work.     aq Non-conforming work.     Aqueous / settled sample.     tiss.fit: Discolved / filtered sample.     turnifit Total / unfiltered sample.         subcontracted test.     * Subcontracted test.     * Creater of file surrogater         check the officiency of the         results of individual comp-         samples aren't corrected f     (F) Trigger breach confirmed	te standard to method. The ounds within	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water (GW/SW) 31/05/2011 02/06/2011 110602-58 3588809					
Component Antimony (diss.filt)	LOD/U <0.1		0.203					
	µg/	1		#				_
Arsenic (diss.filt)	<0.1 /µg	1	2.18	#				_
Boron (diss.filt)	<9.4		106	#				
Cadmium (diss.filt)	<0.1	µg/l TM152	<0.1	#				
Chromium (diss.filt)	<0.2 µg/		13.9	#				
Copper (diss.filt)	8.0> /pμ	35 TM152	27.6	#				
Lead (diss.filt)	μg/ <0.0 μg/	)2 TM152	0.066	#				
Nickel (diss.filt)	<0.1	15 TM152	1.47	#				
Zinc (diss.filt)	μg/ <0.4	11 TM152	9.15					
Mercury (diss.filt)	μ <u>q/</u> <0.0	)1 TM183	<0.01	#				
	µg/	1		#				
								1

# **CERTIFICATE OF ANALYSIS**

PAH S	H Spec MS - Aqueous (W) Results Legend Customer Sample R 99 ARMITAGE ROA 121 ARMITAGE RO 125 ARMITAGE RO 83 BLAKE CLOSE 3A BLAKE CLOSE FLVEWAYS 5 NEWL												
#	Results Legend ISO17025 accredited.		Customer Sample R	99 ARMITAGE ROA D	121 ARMITAGE RO AD	125 ARMITAGE RO AD	83 BLAKE CLOSE	3A BLAKE CLOSE	FIVEWAYS 5 NEWL ANDS COURT				
M § aq diss.filt tot.unfilt * **	mCERTS accredited. Non-conforming work. Aqueous / settled sample. Dissolved / filtered sample. Total / unfiltered sample. Subcontracted test. % recovery of the surrogate standar check the efficiency of the method. results of individual compounds wii samples aren't corrected for the rec Trigger breach confirmed	The thin	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference		Water (GW/SW) 31/05/2011 02/06/2011 110602-58 3588805	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588806	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588788	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588787	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588799				
Compo		LOD/Un		-0.1	-0.4	-0.4	0.44	<0.1	10.1				
Naphtr	halene (aq)	<0.1 µ	ıg/l TM178	<0.1 #	<0.1 #	<0.1 #	0.11 #	#	<0.1 #				
	phthene (aq)	0.01		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #				
Acena	phthylene (aq)	0.01> µg/l		<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #				
Fluora	nthene (aq)	<0.01 µg/l	7 TM178	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #				
Anthra	icene (aq)	0.01> µg/l		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #				
Phena	nthrene (aq)	<0.02 μg/l	2 TM178	<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #				
Fluore	ne (aq)	0.01> µg/l	4 TM178	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #				
Chryse	ene (aq)	<0.01 µg/l	3 TM178	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #				
Pyrene	e (aq)	0.01> µg/l	5 TM178	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #				
Benzo	(a)anthracene (aq)	0.0140.01µg/l		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #				
Benzo	(b)fluoranthene (aq)	<0.02 µg/l		<0.023 #	<0.023	<0.023 #	<0.023 #	<0.023	<0.023				
Benzo	(k)fluoranthene (aq)	0.0240.02µg/l		<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027	<0.027 #				
Benzo	(a)pyrene (aq)	μα/1 <0.00> μg/l		<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #	<0.009 #				
Dibenz (aq)	zo(a,h)anthracene	µg/1 0.01×µg/1	6 TM178	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #				
	(g,h,i)perylene (aq)	= <0.01 μg/l	6 TM178	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #				
Indenc (aq)	o(1,2,3-cd)pyrene	<0.01 µq/l	4 TM178	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #				
PAH, 1	Total Detected A 16 (aq)	µg/l	TM178	none detected	none detected	none detected	0.11	none detected	none detected				
			_										
			_										
			_										

## **CERTIFICATE OF ANALYSIS**

PAH Spec MS - Aqueous Results Legend		Sustamor Comple D	(1.000D)W00D					
# ISO17025 accredited. M mCERTS accredited.		Customer Sample R	11 GOODWOOD	21 HERONDALE	4 KEMPTON	FIVEWAYS 9 NEWL ANDS COURT	FIVEWAYS 11 NEW LANDS COURT	FIVEWAYS 1 NEWL ANDS LANE
S Non-conforming work.     aq Aqueous / settled sample.     diss.filt Dissolved / filtered sample.     tot.unfilt Total / unfiltered sample.     * Subcontracted test.     ** % recovery of the surrogate standal         check the efficiency of the method.         results of individual compounds will	The	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s)	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588808	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588819	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588810	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588800	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588798	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588802
samples aren't corrected for the rec (F) Trigger breach confirmed		AGS Reference						
Component	LOD/Unit							
Naphthalene (aq)	<0.1 µg	/I TM178	<0.1 #	<0.1 #	<0.1	<0.1 #	0.121 #	<0.1 #
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.015 #	<0.015 #	<0.015	<0.015 #	<0.015 #	<0.015 #
Acenaphthylene (aq)	<0.011 µg/l	TM178	<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #	<0.011 #
Fluoranthene (aq)	<0.017 µg/l		<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Anthracene (aq)	<0.015 µg/l		<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Phenanthrene (aq)	<0.022 µg/l		<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #	<0.022 #
Fluorene (aq)	<0.014 µg/l		<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
Chrysene (aq)	<0.013 µq/l	TM178	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #	<0.013 #
Pyrene (aq)	<0.015 µg/l	TM178	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #	<0.015 #
Benzo(a)anthracene (aq)	<0.017 µg/l	TM178	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #	<0.023 #
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #	<0.027 #
Benzo(a)pyrene (aq)	0.00940.009µg/l		<0.009 #	<0.009 #	<0.009	<0.009 #	<0.009 #	<0.009 #
Dibenzo(a,h)anthracene (aq)	<0.016 µg/l	TM178	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Benzo(g,h,i)perylene (aq)	<0.016 µg/l		<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #	<0.016 #
Indeno(1,2,3-cd)pyrene (aq)	<0.014 µg/l	TM178	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #
PAH, Total Detected USEPA 16 (aq)	µg/l	TM178	none detected	none detected	none detected	none detected	0.121	none detected

# **CERTIFICATE OF ANALYSIS**

			Auchtion. 60			Cuporobucu Rope		
PAH Spec MS - A Results Lee		Customer Sample R			110 07455000 1 4	72 074 000000000	9.074.0000000000	
# ISO17025 accredited	jond	Gustomer Sample R	2 SANDOWN	3 SLADE VIEW RI SE	110 STAFFORD LA NE	73 STAGBOROUGH	8 STAGBOROUGH W AY	41 SWALLOWFIELD S
M mCERTS accredited. § Non-conforming wor	r			02				Ŭ
aq Aqueous / settled sa		Depth (m)					·	
diss.filt Dissolved / filtered sa tot.unfilt Total / unfiltered sam		Sample Type Date Sampled		Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011	Water(GW/SW) 31/05/2011
* Subcontracted test.	pie.	Date Sampled		02/06/2011	02/06/2011	02/06/2011	02/06/2011	02/06/2011
** % recovery of the su check the efficiency		SDG Ref	110602-58	110602-58	110602-58	110602-58	110602-58	110602-58
results of individual		Lab Sample No.(s)		3588807	3588818	3588814	3588815	3588813
samples aren't correc (F) Trigger breach confir		AGS Reference						
Component	LOD/L	Inits Method						
Naphthalene (aq)	<0.1		<0.1	0.103	0.131	<0.1	<0.1	<0.1
		-3.	#	#	#	#	#	#
Acenaphthene (aq)	<0.0	)15 TM178	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
	μg	/I	#	#	#	#	#	#
Acenaphthylene (aq)	<0.0		<0.011	<0.011	<0.011	<0.011	<0.011	<0.011
	μg	/I	#	#	#	#	#	#
Fluoranthene (aq)	<0.0	017 TM178	<0.017	<0.017	<0.017	<0.017	<0.017	<0.017
	μg		#	#	#	#	#	#
Anthracene (aq)	<0.0	015 TM178	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015
	μġ		#	#	#	#	#	#
Phenanthrene (aq)	<0.0		<0.022	<0.022	<0.022	<0.022	<0.022	<0.022
	μg		#	#	#	#	#	#
Fluorene (aq)	<0.0		<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
	μg		#	#	#	#	#	#
Chrysene (aq)	<0.0		<0.013	<0.013	<0.013	<0.013	<0.013	<0.013
	μg.		#	#	#	#	#	#
Pyrene (aq)	<0.0		<0.015	<0.015 #	<0.015 #	<0.015	<0.015 #	<0.015 #
Ponzo(a)anthracena	μ <u>μ</u>		# <0.017	# <0.017	<0.017	# <0.017	# <0.017	<0.017
Benzo(a)anthracene	(aq) <0.0 μg		<0.017	<0.017 #	<0.017 #	<0.017 #	<0.017 #	<0.017 #
Benzo(b)fluoranthene			<0.023	<0.023	<0.023	<0.023	<0.023	<0.023
Denzo(b)ndorantinent	μg		=	<0.023 #	<0.025 #	<0.025 #	<0.023 #	40.025
Benzo(k)fluoranthene			<0.027	<0.027	<0.027	<0.027	<0.027	<0.027
Benzo(K)ndorantherk	μq.		#	40.027	40.027	40.027	-0.027	40.027
Benzo(a)pyrene (aq)	<0.0		<0.009	<0.009	<0.009	<0.009	<0.009	<0.009
(-),-,(,/	μg		#	#	#	#	#	#
Dibenzo(a,h)anthrace			<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
(aq)	μg		#	#	#	#	#	#
Benzo(g,h,i)perylene	(aq) <0.0	016 TM178	<0.016	<0.016	<0.016	<0.016	<0.016	<0.016
	μġ	/I	#	#	#	#	#	#
Indeno(1,2,3-cd)pyre	ne <0.0	)14 TM178	<0.014	<0.014	<0.014	<0.014	<0.014	<0.014
(aq)	μg		#	#	#	#	#	#
PAH, Total Detected	μg	g/I TM178	none detected	0.103	0.131	none detected	none detected	none detected
USEPA 16 (aq)								

# **CERTIFICATE OF ANALYSIS**

PAH Spec MS - Aqueous	AH Spec MS - Aqueous (W) Results Legend Customer Sample R VIEW ST 32 FOS VIEW ST 53 VIE VIEW ST 9 WARD VIEW ST WS2 VIEW ST WS3 VIEW ST WS4												
# ISO17025 accredited.	C	Customer Sample R	VIEW ST. 32 FOS TERS AVE.	VIEW ST. 53 VIE W ST.	VIEW ST. 9 WARD ST.	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4					
M         mCERTS accredited.           §         Non-conforming work.           aq         Aqueous / settled sample.           diss.filt         Dissolved / filtered sample.           tot.unfilt         Total / unfiltered sample.           *         Subcontracted test.           *         % recovery of the surrogate standa check the efficiency of the method.           results of individual compounds wi samples aren't corrected for the ref.           (F)         Trigger breach confirmed	. The ithin	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water (GW/SW) 31/05/2011 02/06/2011 110602-58 3588795	Water (GW/SW) 31/05/2011 02/06/2011 110602-58 3588793	Water (GW/SW) 31/05/2011 02/06/2011 110602-58 3588797	1.20 Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588790	1.10 Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588791	1.60 Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588789					
Component	LOD/Unit												
Naphthalene (aq)	<0.1 µg	/I TM178	0.104 #	<0.1 #	<0.1 #	<0.1 #	<0.1 #	<0.1					
Acenaphthene (aq)	<0.015 µg/l	TM178	<0.015 #	<0.015 #	<0.015 #	<0.015 #	0.0225 #	0.0156 #					
Acenaphthylene (aq)	<0.011 µg/l	TM178	<0.011 #	<0.011 #	<0.011 #	<0.011 #	0.0181 #	<0.011 #					
Fluoranthene (aq)	<0.017 µg/l	TM178	<0.017 #	<0.017 #	<0.017 #	<0.017 #	0.981 #	0.465 #					
Anthracene (aq)	<0.015 µg/l	TM178	<0.015 #	<0.015 #	<0.015 #	<0.015 #	0.0538 #	0.0302 #					
Phenanthrene (aq)	<0.022 µg/l	TM178	<0.022 #	<0.022 #	<0.022 #	<0.022 #	0.217 #	0.13 #					
Fluorene (aq)	<0.014 µg/l	TM178	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #	<0.014 #					
Chrysene (aq)	<0.013 µg/l	TM178	<0.013 #	<0.013 #	<0.013 #	<0.013 #	0.935	0.434 #					
Pyrene (aq)	<0.015 µg/l	TM178					" 1.11 #	0.559 #					
Benzo(a)anthracene (aq)	<0.017 μg/l	TM178	<0.017 #	# <0.017 #	# <0.017 #	<0.017 #	# 0.565 #	0.283 #					
Benzo(b)fluoranthene (aq)	<0.023 µg/l	TM178	<0.023 #	<0.023 #	<0.023 #	<0.023 #	0.625 #	0.279 #					
Benzo(k)fluoranthene (aq)	<0.027 µg/l	TM178	<0.027 #	<0.027 #	<0.027 #	<0.027 #	0.815 #	0.33 #					
Benzo(a)pyrene (aq)	<0.009 μg/l	TM178	<0.009	<0.009 #	<0.009 #	<0.009 #	0.916 #	0.352 #					
Dibenzo(a,h)anthracene (aq)	<0.016 μg/l	TM178	# <0.016 #	# <0.016 #	+ <0.016 #	~0.016 #	0.112 #	0.0359 #					
Benzo(g,h,i)perylene (aq)	<0.016 μg/l	TM178	~0.016 #	~0.016 #	* <0.016 #	~0.016 #	# 0.689 #	0.198 #					
Indeno(1,2,3-cd)pyrene	<0.014	TM178	<0.014	<0.014	<0.014	<0.014	0.54	0.164					
(aq) PAH, Total Detected USEPA 16 (aq)	µg/l µg/l	TM178	# 0.104	# none detected	# none detected	# none detected	# 7.6	# 3.28					

ALcontrol L			CER	TIFICATE OF	ANALYSIS		L	Validated
SDG: Job:	110602-58 H_GRONTMI	J_SOL-54	Location: Customer:	Part 2a Assistance Grontmij		Order Number: Report Number:	133432	
Client Reference:			Attention:	Gareth Taylor		Superseded Repor	t:	
PAH Spec MS - Aq Results Leger	ueous (W)	Customer Sample R	10 WESTGATE					
ISO17025 accredited.     M mCERTS accredited.     Mon-conforming work.     a Aqueous y actide 3 ample diss.filt Dissolved / filtered samp tot.unfilt Total / unfiltered samp tot.unfilt Total / unfiltered samp tot.unfilt Total / unfiltered samp check the efficiency of the results of individual con samples aren't correcte (F) Trigger breach confirme	ple. 9. gate standard to he method. The npounds within d for the recovery	Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588809					
Component	LOD/L	1						
Naphthalene (aq)	<0.1		<0.1	#				
Acenaphthene (aq)	0.0> پېر		<0.015	#				
Acenaphthylene (aq)	0.0> پير		<0.011	#				
Fluoranthene (aq)	<u>عم</u> 0.0> پر	017 TM178	<0.017	#				
Anthracene (aq)	<0.0	015 TM178	<0.015					
Phenanthrene (aq)	рц <0.0	)22 TM178	<0.022	#				
Fluorene (aq)	םַע 0.0>	014 TM178	<0.014	#				
Chrysene (aq)	<u>µ</u> д <0.0	013 TM178	<0.013	#				
Pyrene (aq)	μg <0.0		<0.015	#				
Benzo(a)anthracene (a	μg	/I	<0.017	#				
Benzo(b)fluoranthene (	рц	/I	<0.023	#				
	рц	/I		#				
Benzo(k)fluoranthene (	рц	/I	<0.027	#				
Benzo(a)pyrene (aq)	0.0> פע	/1	<0.009	#				
Dibenzo(a,h)anthracen (aq)	le <0.0 μg		<0.016	#				
Benzo(g,h,i)perylene (a		016 TM178	<0.016	#				
Indeno(1,2,3-cd)pyrene (aq)		014 TM178	<0.014	#				
PAH, Total Detected USEPA 16 (aq)	μί		none detected					
								+
				_				
		_						

ALcontrol I	aboratorie	S	CER	TI	FICATE OF	AI	NALYSIS				Validated
SDG: Job: Client Reference:	110602-58 H_GRONTMI	J_SOL-54	Location: Customer: Attention:	Gro	rt 2a Assistance ontmij reth Taylor				Order Number: Report Number: Superseded Report:	133432	
VOC MS (W)			Attention.	Ga					Superseueu Report.		
Results Logo           #         ISO17025 accredited.           M         mCERTS accredited.           §         Non-conforming work.           adqueous / settled samp diss.filt         Dissolved / filtered samp / Subcontracted test.           *         % recovery of the surre check the efficiency of results of individual co- samples aren't correct           (F)         Trigger breach confirm	ple. pple. e. ugate standard to the method. The mpounds within d for the recovery ed	Customer Sample R Depth (m) Sample Type Date Sampled Date Received SDG Ref Lab Sample No.(s) AGS Reference	VIEW ST. WS2 1.20 Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588790		VIEW ST. WS3 1.10 Water(GW/SW) 31/05/2011 02/06/2011 110602-58 3588791		1.60 Water(GW/SW 31/05/2011 02/06/2011 110602-58 3588789				
Component Toluene-d8**	LOD/L %		98.2		99		99.3				
Methyl tertiary butyl et	her <1.6	µg/l TM208	<1.6		<1.6		<1.6				
(MTBE) Benzene	<1.3		<1.3	#	<1.3	#	<1.3	#			
Toluene	<1.4		<1.4	#	<1.4	#	<1.4	#			
Ethylbenzene	<2.5		<2.5	#	<2.5	#	<2.5	#			
m,p-Xylene	<2.5		<2.5	#	<2.5	#	<2.5	#			
				#		#		#			
o-Xylene	<1.7	µg/l TM208	<1.7	#	<1.7	#	<1.7	#			
						_					

ALcontrol Laboratories Validated **CERTIFICATE OF ANALYSIS** 110602-58 SDG: Location: Part 2a Assistance Order Number: H\_GRONTMIJ\_SOL-54 133432 Job: Customer: Grontmij Report Number: Client Reference: Attention: Gareth Taylor Superseded Report:

# Table of Results - Appendix

REPOR	RT KEY						Res	ults expressed as (	e.g.) 1.03E-07 is equivale	nt to 1.03x10-7		
NDP	No Determination	n Possible	#	ISO 17025 Accredited			MCERTS Accredited					
NFD	No Fibres Detect	ed	PFD	Possible Fibres Detected			Equivalent Carbon (Aromatics C8-C35)					
Note: Meth	te: Method detection limits are not always achievable due to various circumstances beyond our control											
Μ	Method No         Reference         Description         Wet/Dry         Surrogate           Sample 1         Corrected         Sample 1         Corrected											
	TM152	Method 3125B, AW	/WA/APH	IA, 20th Ed., 1999	Analysis o	of Aqueou	is Samples by ICP-MS					
	TM178	Modified: US EPA	Method 8	100	Determina GC-MS in		olynuclear Aromatic Hydrocarbo	ons (PAH) by				
	TM183											
	TM208       Modified: US EPA Method 8260b & 624       Determination of Volatile Organic Compounds by Headspace /         GC-MS in Waters											

<sup>1</sup> Applies to Solid samples only. DRY indicates samples have been dried at 35°C. NA = not applicable.

(

SDG:

Job:

# **CERTIFICATE OF ANALYSIS**

110602-58 H\_GRONTMIJ\_SOL-54 Client Reference:

Location: Part 2a Assistance Customer: Grontmij Attention: Gareth Taylor

Order Number: 133432 Report Number: Superseded Report:

# **Test Completion Dates**

Lab Sample No(s)	3588803	3588805	3588806	3588788	3588808	3588787	3588799	3588800	3588798	3588802
Customer Sample Ref.	99 ARMITAGE ROA D	121 ARMITAGE RO AD	125 ARMITAGE RO AD	83 BLAKE CLOSE	11 GOODWOOD	3A BLAKE CLOSE	FIVEWAYS 5 NEWL ANDS COURT	FIVEWAYS 9 NEWL ANDS COURT	FIVEWAYS 11 NEW LANDS COURT	FIVEWAYS 1 NEWL ANDS LANE
AGS Ref.										
Depth										
Туре	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	07-Jun-2011	08-Jun-2011	09-Jun-2011	09-Jun-2011	08-Jun-2011	08-Jun-2011
Mercury Dissolved	07-Jun-2011	07-Jun-2011	08-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	07-Jun-2011	08-Jun-2011
PAH Spec MS - Aqueous (W)	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011

Lab Sample No(s)	3588819	3588810	3588811	3588807	3588818	3588814	3588815	3588813	3588795	3588793
Customer Sample Ref.	21 HERONDALE	4 KEMPTON	2 SANDOWN	3 SLADE VIEW RI SE	110 STAFFORD LA NE	73 STAGBOROUGH	3 STAGBOROUGH W AY	41 SWALLOWFIELD S	VIEW ST. 32 FOS TERS AVE.	VIEW ST. 53 VIE W ST.
AGS Ref.										
Depth										
Туре	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	08-Jun-2011	09-Jun-2011
Mercury Dissolved	07-Jun-2011	08-Jun-2011	08-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011	07-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011
PAH Spec MS - Aqueous (W)	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011

Lab Sample No(s)	3588809	3588797	3588790	3588791	3588789
Customer Sample Ref.	10 WESTGATE	VIEW ST. 9 WARD ST.	VIEW ST. WS2	VIEW ST. WS3	VIEW ST. WS4
AGS Ref.					
Depth			1.20	1.10	1.60
Туре	LIQUID	LIQUID	LIQUID	LIQUID	LIQUID
Dissolved Metals by ICP-MS	07-Jun-2011	10-Jun-2011	08-Jun-2011	08-Jun-2011	09-Jun-2011
Mercury Dissolved	07-Jun-2011	07-Jun-2011	07-Jun-2011	07-Jun-2011	08-Jun-2011
PAH Spec MS - Aqueous (W)	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011	09-Jun-2011
VOC MS (W)			09-Jun-2011	09-Jun-2011	09-Jun-2011

### **CERTIFICATE OF ANALYSIS**

SDG:	110602-58	Location:	Part 2a Assistance
Job:	H_GRONTMIJ_SOL-54	Customer:	Grontmij
Client Reference:		Attention:	Gareth Taylor

# Appendix

 Results are expressed on a dry weight basis (dried at 35°C) for all soil analyses except for the following: NRA Leach tests, flash point, ammonium as NH4 by the BRE method, VOC TICS, SVOC TICS, TOF-MS SCAN/SEARCH and TOF-MS TICS.

2. Samples will be run in duplicate upon request, but an additional charge may be incurred.

3. If sufficient sample is received a sub sample will be retained free of charge for 30 days after analysis is completed (e-mailed) for both soil jars, tubs and volatile jars. All waters and vials will be discarded 10 days after the analysis is completed (e-mailed). All material removed during an asbestos containing material screen and analysed for the presence of asbestos will be retained for a period of 6 months after the analysis date. All samples received and not scheduled will be disposed of one month after the date of receipt unless we are instructed to the contrary. Once the initial period has expired, a storage charge will be applied for each month or part thereof until the client cancels the request for sample storage. ALcontrol Laboratories reserve the right to charge for samples received and stored but not analysed.

4. With respect to turnaround, we will always endeavour to meet client requirements wherever possible, but turnaround times cannot be absolutely guaranteed due to so many variables beyond our control.

5. We take responsibility for any test performed by sub-contractors (marked with an asterisk). We endeavour to use UKAS/MCERTS Accredited Laboratories, who either complete a quality questionnaire or are audited by ourselves. For some determinands there are no UKAS/MCERTS Accredited Laboratories, in this instance a laboratory with a known track record will be utilised.

6. When requested, the individual sub sample scheduled will be screened in house for the presence of large asbestos containing material fragments/pieces. If no asbestos containing material is found this will be reported as 'no asbestos containing material detected'. If asbestos containing material is detected it will be removed and analysed by our documented in house method TM048 based on HSG 248 (2005), which is accredited to ISO17025. If asbestos containing material is present no further analysis will be undertaken. At no point is the fibre content of the soil sample determined.

7. If no separate volatile sample is supplied by the client, the integrity of the data may be compromised if the laboratory is required to create a sub-sample from the bulk sample -similarly, if a headspace or sediment is present in the volatile sample. This will be flagged up as an invalid VOC on the test schedule or recorded on the log sheet.

8. If appropriate preserved bottles are not received preservation will take place on receipt. However, the integrity of the data may be compromised.

9. NDP -No determination possible due to insufficient/unsuitable sample.

10. Metals in water are performed on a filtered sample, and therefore represent dissolved metals -total metals must be requested separately.

11. Results relate only to the items tested.

12. LODs for wet tests reported on a dry weight basis are not corrected for moisture content.

13. Surrogate recoveries -Most of our organic methods include surrogates, the recovery of which is monitored and reported. For EPH, MO, PAH, GRO and VOCs on soils the result is not surrogate corrected, but a percentage recovery is quoted. Acceptable limits for most organic methods are 70 -130 %.

14. Product analyses -Organic analyses on products can only be semi-quantitative due to the matrix effects and high dilution factors employed.

15. Phenois monohydric by HPLC include phenol, cresols (2-Methylphenol, 3-Methylphenol and 4-Methylphenol) and Xylenols (2,3 Dimethylphenol, 2,4 Dimethylphenol, 2,5 Dimethylphenol, 2,6 Dimethylphenol, 3,4 Dimethylphenol, 3,5 Dimethylphenol).

16. Total of 5 speciated phenols by HPLC includes Phenol, 2,3,5-Trimethyl Phenol, 2-Isopropylphenol, Cresols and Xylenols (as detailed in 15).

17. Stones/debris are not routinely removed. We always endeavour to take a representative sub sample from the received sample.

18. In certain circumstances the method detection limit may be elevated due to the sample being outside the calibration range. Other factors that may contribute to this include possible interferences. In both cases the sample would be diluted which would cause the method detection limit to be raised.

19. Mercury results quoted on soils will not include volatile mercury as the analysis is performed on a dried and crushed sample.

20. For the BSEN 12457-3 two batch process to allow the cumulative release to be calculated, the volume of the leachate produced is measured and filtered for all tests. We therefore cannot carry out any unfiltered analysis. The tests affected include volatiles GCFID/GCMS and all subcontracted analysis.

21. For all leachate preparations (NRA, DIN, TCLP, BSEN 12457-1, 2, 3) volatile loss may occur, as we do not employ zero headspace extraction.

22. We are accredited to MCERTS for sand, clay and loam/topsoil, or any of these materials -whether these are derived from naturally occurring soil profiles, or from fill/made ground, as long as these materials constitute themajor part of the sample. Other coarse granular material such as concrete, gravel and brick are not accredited if they comprise the major part of the sample.

23. Analysis and identification of specific compounds using GCFID is by retention time only, and we routinely calibrate and quantify for benzene, toluene, ethylbenzenes and xylenes (BTEX). For total volatiles in the C4 -C10 range, the total area of the chromatogram is integrated and expressed as ug/kg or ug/l. Although this analysis is commonly used for the quantification of gasoline range organics (GRO), the system will also detect other compounds such as chlorinated solvents, and this may lead to a falsely high result with respect to hydrocarbons only. It is not possible to specifically identify these non-hydrocarbons, as standards are not routinely run for any other compounds, and for more definitive identification, volatiles by GCMS should be utilised.

Order Number: Report Number: Superseded Report:

### SOLID MATRICES EXTRACTION SUMMARY

133432

ANALYSIS	dyc Or Wet	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
SOLVENT EXTRACTABLE MATTER	D&C	DOM	SOXTHERM	GRAVIMETRIC
CYCLOHEXANE EXT. MATTER	D&C	CYCLOHEXANE	SOXTHERM	GRAVIMETRIC
THIN LAYER CHROMATOGRAPHY	D&C	DOM	SOXTHERM	IATROSCAN
ELEMENTALSULPHUR	D&C	DOM	SOXTHERM	HPLC
PHENOLSBYGOMS	WET	DOM	SOXTHERM	GCMS
HERBICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS
PESTICIDES	D&C	HEXANEACETONE	SOXTHERM	GCMS
EPH (DRO)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH (MINOL)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH (CLEANED UP)	D&C	HEXANEACETONE	END OVEREND	GCFID
EPH ONG BYGC	D&C	HEXANEACETONE	ENDOWEREND	GCFID
PCB TOT / PCB CON	D&C	HEXANEACETONE	END OVEREND	GCMS
POLYAROMATIC HYDROCARBONS (MS)	WET	HEXANEACETONE	MCROWAVE TM218.	GCMS
08-040(06-040) EZ FLASH	WET	HEXANEACETONE	SHAVER	GCFEZ
POLYAROMATIC HYDROCARBONS RAPID GC	WET	HEXANEACETONE	SHAVER	9CEZ
SEM VOLATILE ORGANIC COMPOUNDS	WET	DOMAGETONE	SONICATE	GCMS

### LIQUID MATRICES EXTRACTION SUMMARY

ANALYSIS	EXTRACTION SOLVENT	EXTRACTION METHOD	ANALYSIS
PAHMS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
BH	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID
EPHONG	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID
MINERALOIL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCFID
POB 700NGENERS	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
POB TOTAL	HEXANE	STIRREDEXTRACTION(STIR-BAR)	GCMS
SVOC	DOM	LIQUID'LIQUID SHAKE	GCMS
FREESULPHUR	DOM	SOLD PHASE EXTRACTION	HPLC
PEST OCP/OPP	DOM	LIQUID/LIQUID SHAKE	GCMS
TRIAZINE HERES	DOM	LIQUID'LIQUID SHAKE	GCMS
PHENOLSMS	DOM	SOLID PHASE EXTRACTION	GCMS
TFH by INFRARED (IR)	TCE	LIQUID/LIQUID SHAKE	HPLC
MINERAL OIL by IR	TCE	LIQUID'LIQUID SHAKE	HPLC
GLYCOLS	NONE	DIRECT INJECTION	GCMS

#### Identification of Asbestos in Bulk Materials & Soils

The results for identification of asbestos in bulk materials are obtained from supplied bulk materials or those identified as potentially asbestos containing during sample description which have been examined to determine the presence of asbestos fibres using Alcontrol Laboratorice (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

The results for identification of asbestos in soils are obtained from a homogenised sub sample which has been examined to determine the presence of asbestos fibres using Alcontrol Laboratorices (Hawarden) in-house method of transmitted/polarised light microscopy and central stop dispersion staining, based on HSG 248 (2005).

#### Visual Estimation Of Fibre Content

Estimation of fibre content is not permitted as part of our UKAS accredited test other than: -Trace -Where only one or two asbestos fibres were identified.

Further guidance on typical asbestos fibre content of manufactured products can be found in HSG 264.

Asbestos Type

Chrysnile

Amosite

Orodolite

Fibrous Adinoite

Fibrous Anthophylite

Fibras Trendie

Common Name

White Ashestos

BrownAsbestos

Blue Asbestos

-

The identification of asbestos containing materials and soils falls within our schedule of tests for which we hold UKAS accreditation, however opinions, interpretations and all other information contained in the report are outside the scope of UKAS accreditation.

# APPENDIX E

Site:	Blake Clos	e															Job No.	106270	
Monito	oring Well S	-	g & Testi		ord														
ВН	Date	Pipe Internal Diameter mm	Monitored By	Gas Borehole Pressure pa	Flow I/h	CH₄ % v/v	CH₄ GSV	CO <sub>2</sub> % v/v	CO₂ GSV	O <sub>2</sub> % v/v	CO ppm	H2S ppm	PID CF ppm	HEX %	LEL %	Gas Analyser	Weather Atmospheric Pressure mbar	Conditions @ Monitoring	Ambient Temp °C
WS01	28/01/2011		RJH	-5.00	-1.2	0	0	1.4	-0.0168	16.5	-1	-10	1	0	0	GFM	1011	Clear	-5
WS01	11/02/2011		KS	NM	0.6	0.1	0.0006	1.7	0.0102	17.7	-1	-10	NM	NM	NM	GFM	996	Overcast	8.0
WS01	25/02/2011		KAS	1.00	(0.6) <0.1	0.1	0.0001	1.7	0.0017	16.2	-3	-10	1	0.0001	0	GFM	1006	Overcast	11
WS01	11/03/2011		KAS	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Sunny	
WS02	28/01/2011		RJH	-5.00	-1.2	0	0	0.3	-0.0036	19.4	-1	-10	1	0.001	0	GFM	1009	Clear	-5.0
WS02	11/02/2011		KS	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	Overcast	NM
WS02	25/02/2011		KAS	1.00	0.2	0.1	0.0002	1.4	0.0028	19.5	-1	-10	1	0.025	0	GFM	1006	Overcast	11.0
WS02	11/03/2011		KAS	1.00	(0.7) 0.1	0.1	0.0001	0.5	0.0005	19.5	0	-10	1	0	0	GFM	998	Sunny	
WS03	28/01/2011		RJH	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GFM	NM	Clear	-5
WS03	11/02/2011		KS	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	GFM	NM	Overcast	NM
WS03	25/02/2011		KAS	0.00	0.1	0.1	0.0001	3	0.003	16.7	-1	-10	0.9	0	0	GFM	1007	Overcast	11.0
WS03	11/03/2011		KAS	0.00	0.1	0.1	0.0001	2.9	0.0029	16.6	-1	-10	0.9	0	0	GFM	999	Sunny	
							0		0										
WS04	28/01/2011		RJH	-5.00	-1.2	0	0	0.9	-0.0108	19	-3	-10	1	0	0	GFM	1011	Clear	-5
WS04	11/02/2011		KS	NM	0.1	0.1	0.0001	0.1	0.0001	19.8	-1	-10	NM	NM	NM	GFM	996	Overcast	8
WS04	25/02/2011		KAS	1.00	(0.8) <0.1	0.1	0.0001	0.8	0.0008	19.3	-1	-10	1	0	0	GFM	1006	Overcast	11.0
WS04	11/03/2011		KAS	2.00	(1.4) 0.4	0.1	0.0004	0.9	0.0036	19.3	-1	-10	1	0	0	GFM	998	Sunny	

# APPENDIX F

# Appendix F: Severity and Probability of Risk in Conceptual Site Models (after CIRIA552, Tables 6.3 to 6.5)

This report draws on guidance presented in CIRIA report 552, "Contaminated Land Risk Assessment, A Guide for Good Practice", wherein the "severity" term in the Conceptual Site Model is classified with reference to the sensitivity of the hazard and the receptor, as follows:

Severity Category	Description	Examples
Severe	Acute risk to human health likely to result in "significant harm" as defined in EPA90, catastrophic damage to buildings or property, acute risk of major pollution of controlled waters, acute risk of harm to ecosystems (as defined in Contaminated Land Regulations 2006)	High cyanide concentrations at the surface of a recreation area Major spillage into controlled waters Explosion, causing building collapse
Medium	Chronic risk to human health likely to result in "significant harm" as defined in EPA90, chronic pollution of sensitive controlled waters, significant change at a sensitive ecosystems or species, significant damage to buildings or structures	Contaminant concentrations at a site in excess of SGVs, GAC or similar screening values Leaching of contaminants to sensitive aquifer Death of a species within a nature reserve
Mild	Pollution of non-sensitive waters, significant damage to buildings, structures, services or crops, damage to sensitive buildings, structures, services or the environment, which nonetheless result in "significant harm"	Pollution to (former) non-aquifer or to non-controlled surface watercourse. Damage to building rendering it unsafe to occupy (e.g. foundation or structural damage)
Minor	Harm, not necessarily resulting in "significant harm" but probably requiring expenditure to resolve or financial loss. Non-permanent risks to human health that are easily mitigated, e.g. by wearing PPE. Easily-repairable damage to structures or services	Contaminant concentrations requiring the wearing of PPE during site work, but no other long-term mitigation. Discolouration of concrete

The likelihood of an event (probability) takes into account both the presence of hazard and receptor and the integrity of the pathway between hazard and receptor, and is assessed as follows:

Category	There is a pollution linkage and:
High	Event is likely in the short term and almost inevitable over the long term. Or,
-	there is evidence of actual harm at/to the receptor
Likely	Event is possible in the short term and likely over the long term
Low	Event is unlikely in the short term and possible over the long term
Unlikely	Event is unlikely, even in the long term



Potential severity and probability have been assessed in the following matrix, to give an overall risk rating:

	Severity							
Probability	Severe	Medium	Mild	Minor				
High	Very high	High	Moderate	Low/moderate				
Likely	High	Moderate	Low/moderate	Low				
Low	Moderate	Low/moderate	Low	Very low				
Unlikely	Low/moderate	Low	Very low	Very low				

The above risk categories are likely to result in the following actions:

- Very high: urgent intervention / investigation needed, remediation likely to be required
- High: urgent intervention / investigation needed, remediation possibly required in short term and probably required in long term
- $\circ\,$  Moderate: investigation needed to clarify and refine risk; remediation may be required over the long term
- Low: it is possible that harm could arise to a receptor, but if realised, such harm is likely to be, at worst, mild
- Very low: it is possible that harm could arise to a receptor, but if realised, such harm is unlikely to be severe



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# APPENDIX G

# Appendix G: Initial Assessment of Risk of Permeation into Water Supply Pipes

This appendix presents the findings of an initial screen of soil contaminant concentrations in regard to permeation risk into water supply pipes.

Two publications have been reviewed in regard to potential risks to water supply pipes posed by contaminants in the ground:

- "Guidance for the Protection of Water Supply Pipes to be Used in Brownfield Sites" (UK Water Industry Research {UKWIR}, ref 10/WM/03/21, 2010 (re-issued version))
- The Selection of Materials for Water Supply Pipes to be Laid in Contaminated Land (Water Regulations Advisory Scheme {WRAS}, ref 9-04-03, October 2002)

Both reports present methodologies for the assessment of soil conditions and the specification of appropriate pipework materials to mitigate the presence of contaminants.

# WRAS Screen

A comparison between the chemical analysis results obtained from samples taken **from the top 1.2m of soil** at the site and the older WRAS screening values is presented in the table below. Only soils from the top 1.2m of the soil profile have been selected for comparison as 1.2m is the typical maximum depth at which water pipes are laid within the highway – with local service connections to properties typically much shallower. Note, the table below does not constitute a full screen against all WRAS parameters; e.g. sulphate, cyanide and coal tar have not been tested for.



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### WRAS Threshold Screen

Analyte	Test Result (mg/kg)	WRAS Threshold Value (mg/kg)
	max	
Sulphate	Not analysed	2000
Sulphur	Not analysed	5000
Sulphide	Not analysed	250
рН	7.05 to <b>8.63</b>	<5 or <b>&gt;8</b>
Antimony	Not analysed	10
Arsenic	7.1	10
Cadmium	0.53	3
Chromium (hexavalent)	<1.2	25
Chromium (total)	13	600
Cyanide (free)	Not analysed	25
Cyanide (complexed)	Not analysed	250
Lead	35	500
Mercury	<0.14	1
Selenium	<1.0	3
Thiocyanate	Not analysed	50
Coal Tar	Not analysed	50
Cyclohexane extractable	Not analysed	50
Phenol	Not analysed	5
Polyaromatic Hydrocarbons	38	50
Toluene extractable	<0.02	50
Petroleum Hydrocarbons	89	50

Bold values indicate exceedance of WRAS threshold value

The maximum concentration of petroleum hydrocarbons, and the maximum soil pH level recorded, exceed the WRAS threshold values.

# UKWIR Screen

The UKWIR approach is the most recent and reflects further studies undertaken since the WRAS document was published in 2002. Key features of the UKWIR report include:

- A pipework material-specific assessment procedure (Table 3.1 of the report). This allows chemical analysis results to be compared to various threshold criteria associated with six possible pipework material types
- The discounting of metallic pipework (other than copper or steel/ductile iron with protective wrapping) as a modern pipework material
- The specification of a different chemical testing suite to that recommended in the earlier WRAS document including the use of physio-chemical parameters and exclusion of analysis for metals (given the above discounting of metallic pipework).

The chemical analysis for the site was scheduled prior to the publication of the re-issued UKWIR report (despite a re-issue data of 2010, the report was not available until January 2011). Therefore, some of the parameters required for a UKWIR screen (as summarised in Appendix G) are not available. The available laboratory results from the top 1.2m of soil have been compared to the UKWIR thresholds. The screen indicates that:

- The total VOC (minus BTEX) concentrations recorded are acceptable
- Total BTEX concentrations are likely to be acceptable for PE pipe and PVC pipe



- Total SVOC (minus phenols and cresols) concentrations are unacceptable for PE or PVC pipe
- Concentrations of mineral oil C11-20 recorded are not acceptable for PE pipework
- Concentrations of mineral oil C21-40 recorded are acceptable for PE pipework.

# <u>Summary</u>

It was possible that the concentrations of contaminants at the site could adversely affect drinking water quality, depending on the materials used for water distribution (South Staffordshire Water pipes) and local connections to the South Staffordshire network (probably installed by the house builder). Further assessment, in the form of sampling of residents' taps, was undertaken, as outlined in report Section 3.2.7.



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