

J A Williams Ltd.

Building and Civil Engineering Contractors

J.C.B. & CAT
360 deg. Excavators

Cedar Bank
12 Rhyddyn Hill
Caergwrle, Nr Wrexham.
LL12 9EB

NHBC Registered

House Building
& Alterations
a Speciality

Roads & Sewers

Head Office: 01978 760297
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Factory Maintenance

V.A.T. No. 159 9674 96

Flintshire County Council
County Hall,
Mold.
Ch7 6NF

Tuesday, June 12, 2012

For the attention of Hannah Parish Senior Minerals and Waste Planning

Dear Hannah

With refer to restoration of the old sand and gravel quarry at Cefn y Beth **P/2011/0272**

I enclose a copy of the laboratories sample as requested from G T Roberts.

I also enclose a copy of a soil test that I had done for material to be taken from the Holly Bush Site Ref;
04613 when construction started.

Also could this dater be used on the in fill for a new access way at Gwern Alyn, Hawarden Road
Caergwrle Ref; **048478**, as the same companies will be tipping at this address while the above gets
approval.

We trust that this will meet your requirements.

Yours faithfully

Mr. J Williams.

Unit 1, Whitegate Industrial Estate
Whitegate Road
Wrexham, UK
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23 October 2009

Our Ref: CPB/09W5633R

FAO: John Williams
Moorbridge Construction
Cedar Bank
12 Rhyddyn Hill
Caegwrle
Wrexham
LL12 9EB

Dear Sir

Please find enclosed results for one top soil sample taken from the following site for testing:

Alyn Fields, Hope.

Sample No	Date Sampled	Tests Scheduled
09W5633	24/09/2009	Topsoil analysis to BS3882:2007 (with Interpretive Report), Contamination Screen (ICRCL)

This testing was sub-contracted to a specialist laboratory.

Please let me know if any additional information is required.

Yours faithfully



W H Gosling
Technical Director

Jacobs Engineering U.K. Limited
Registered Office: Jacobs House, 427 London Road, Reading, Berkshire, RG6 1BL, UK
Registered in England and Wales No. 2594504

Jacobs Engineering U.K. Cyf.
Swyddfa Cofrestredig: Ty Jacobs, 427 Heol Llundain, Reading, Berkshire, RG6 1BL, DU
Cofrestrwyd yng Nghymru a Lloegr Rhif 2594504

Our Reference: 29027c
Your Reference: CPB/09W5633



CL Voelcker

14 October 2009

Jacobs
Unit 1
Whitegate Industrial Estate
Whitegate Road
Wrexham
LL13 8UG

Glossop House
Hogwood Lane
Wokingham
Berkshire
RG40 4QW

Telephone: 0118 932 4453
Facsimile: 0118 932 8383
E-mail: voelcker@esgl.co.uk

FAO: Chris Bradley

Topsoll Compliance to BS3882: 2007: Alyn Fields, Hope

The following comments refer to the results in the attached Certificate of Analysis referenced 29027c and Laboratory Test Report number 57985 for one (1) topsoil sample supplied to CL Voelcker (Voelcker) on 1 October 2009.

Voelcker understand that the soil represented by the sample(s) is required to be of a suitable quality/fertility for general landscape usage in accordance with British Standards 3882: 2007 for Multipurpose topsoil. Where applicable we have included our own recommendations.

BS3882: 2007 – Soil Quality Grades

BS3882 specifies the performance requirements for specific purpose (e.g. acidic, calcareous, low fertility) and multipurpose topsoil. It is our understanding that the sample(s) submitted for analysis are to be considered under the requirements of the Multipurpose specification of BS3882: 2007.

"Multipurpose topsoil includes natural topsoil or manufactured topsoil. If correctly handled, placed over a non-compact subsoil and managed appropriately (including attention to drainage), it is capable of sustainably supporting grass, trees, shrubs, herbaceous plants and other plantings."

1.0 Sample Description

With the exception of soil texture, the sample was described in accordance with the Soil Survey of England and Wales Field Handbook (Technical Monograph No. 5: 1975). Soil texture has been described by hand texturing and classified using the UK soil texture classification system, as included in BS 3882: 2007.

The topsoil sample 09W5633 could be described as very dark greyish brown (Munsell colour 10YR 3/2), friable, slightly stony, sandy loam with a very well developed structure consisting of a range of fine (<2 mm), medium (2-5 mm) and coarse (6-15 mm) granular aggregates. The sample contained no deleterious material (brick, concrete, ash, glass etc) and no particular odours were noticed.

2.0 Analytical Results

The following parameters were determined in accordance with the British Standard 3882: 2007, which is appropriate for assessment of topsoils for general landscaping use.



BSI Registration Nos: FS 75748, EMS 511803
Member of The Association of Geotechnical and Geoenvironmental Specialists

CL Voelcker is a trading name of Environmental Services Group Limited.
Registered office: Askam Road, Carcroft, Doncaster, South Yorkshire DN6 8DG Registered in England no. 2880501





2.1 Particle Size Distribution

Sample 09W5633 was found to have a particle size distribution that fell into the sand loam textural range (UK Classification).

This is light in texture and soils of this textural range can conform the BS3882: 2007 Multipurpose Topsoil specification provided that the organic matter content is over 3%. Provided they are of sufficient structure with adequate organic matter, soils of this textural range have the potential to be suitable for a wide range of general landscaping purposes.

2.2 Stone Content

British Standards 3882: 2007 for Multipurpose topsoil outlines that a conforming sample shall contain no stones over 50 mm in size, no more than 10% stones over 20 mm in size, and no more than 30% over 2 mm in size.

The stone content was low, conforming to the requirements of BS3882: 2007 and as such stones should not prove a limitation to general landscaping use.

2.3 Soil Reaction (pH Value)

The 09W5633 topsoil sample was slightly alkaline in reaction (pH 7.0), conforming to the BS3882: 2007 specification for Multipurpose topsoil. The pH measured however, would not be suitable for acid demanding plants.

2.4 Electrical Conductivity (Salinity) Value

The electrical conductivity (salinity) value in the calcium sulphate extract was low, conforming to the requirements of BS3882: 2007, indicating that soluble salts were not present at levels that could impede plant growth.

2.5 Organic Matter & Major Plant Nutrients

The organic matter and major plant nutrient content of the samples (with reference to the requirements of BS3882: 2007 Multipurpose topsoil) have been summarised in the table below:

Sample Reference	Organic Matter*	Total Nitrogen	Carbon : Nitrogen Ratio	Phosphorus	Potassium	Magnesium
09W5633	✓	✓	✓	✓	X	✓

- ✓ Indicates parameter which conforms to BS3882 : 2007 Multipurpose
X Indicates parameter which does not conform to BS3882 : 2007 Multipurpose
* organic matter is dependant on soil texture

2.6 Phytotoxic Contaminants

None of the potentially phytotoxic contaminants (zinc, copper and nickel) were present above their respective MAFF, 1998 threshold trigger concentrations for plant growth for a soil with a pH of above 7 or above and thus should not prove restrictive to plant growth.

2.7 Zootoxic Contaminants

The topsoil sample 09W5633 was analysed for a range of contaminants which have the potential if present in significant quantities to pose a risk in the long term to the health of end users of the site. The analytical results are presented in the attached Laboratory Test Report referenced 57985.



When compared to generic assessment criteria (GAC) derived by Voelcker using the Environment Agency's contaminated land exposure assessment (CLEA) model, the concentration of lead (210 mg/kg) was found to exceed the GAC for a residential (with plant uptake) end use (185 mg/kg) scenario. However, the concentration of lead was below the GAC assuming a residential (without plant uptake) end use.

Of the remaining parameters for which a GAC has been derived, none were found to exceed their respective GAC assuming a residential (with plant uptake) end use.

Should a residential (with plant uptake) end use be proposed for the topsoil, we would recommend additional sampling, analysis and assessment to further characterise the lead concentration.

3.0 Summary

From our visual examination and subsequent laboratory analysis, the 09W5633 topsoil sample was found to be a friable, slightly alkaline, sandy loam with adequate structures and a low stone content. The sample contained levels of organic matter, total nitrogen, available phosphorus and magnesium that met the minimum requirements of the BS3882: 2007 specification, but was deficient in available potassium.

The sample had a slightly elevated concentration of lead with respect to a residential (with plant uptake) end use scenario. However, the topsoil represented by the sample would be considered free from significant contamination with respect to the tests performed, provided it is used within a residential (without plant uptake) or commercial / industrial end use scenario.

4.0 Discussion & Recommendations

The following comments are given to discuss important characteristics of the sample(s) in relation to the requirements of BS3882: 2007 Multipurpose topsoil, and to give recommendations for improvement where appropriate and if practically possible.

Based on our findings, with the exceptions to a deficiency in available potassium, the soil represented by the 09W5633 sample met the minimum requirements of the BS3882: 2007 Multipurpose topsoil specification.

The deficiency in available potassium could be remedied relatively easily with the addition of appropriate fertiliser.

4.1 Fertiliser Requirements

The deficiency of available potassium may be remedied by the application of 8 g/m² K₂O, for example by applying potassium sulphate (50% K₂O), at the rate of 16 g/m² (160 kg/ha).

4.2 Soil Handling

Voelcker recommend that great care be taken during soil handling and cultivation to avoid structural damage. In particular, the soil should not be worked when excessively wet, or tracked over by heavy plant. Ideally the soils should only be handled whilst in a friable condition, which basically equates to a moisture content at which the soil crumbles easily in the hand and does not smear.



CL Voelcker trust that this report meets your requirements, but please contact us should you require clarification on any of the matters raised. Thank you for your custom and we hope that we can be of further assistance to you in the future.

A handwritten signature in black ink, appearing to read 'Simon Mason'.

Simon Mason
BSc (Env), BForSc, Ml Soil Sci
Landscape Consultant
(for and on behalf of CL Voelcker)

References

- BSI 3882 : 2007 : Specification for Topsoil and Requirements for Use. British Standards Institution, London.
- EA : 2009a : Science Report SC050021/SR3. Updated technical background to the CLEA model. Environment Agency, Bristol.
- EA : 2009b : Science Report SC050021/SR2. Human health toxicological assessment of contaminants in soils. Environment Agency, Bristol.
- Hodgson, M. : 1976, Soil Survey Field Handbook. Soil Survey of England and Wales. Technical Monograph No. 5, Harpenden.
- MAFF : 1998, The Soil Code Revised 1998, Code of Good Practice for the Protection of Soil, Ministry of Agriculture Fisheries and Food, Welsh Office Agriculture Department, October 1998
- Munsell Color Company Inc. : 1973, Baltimore, Maryland 21218, USA.

Mechanical Analysis Soil Textural Classes

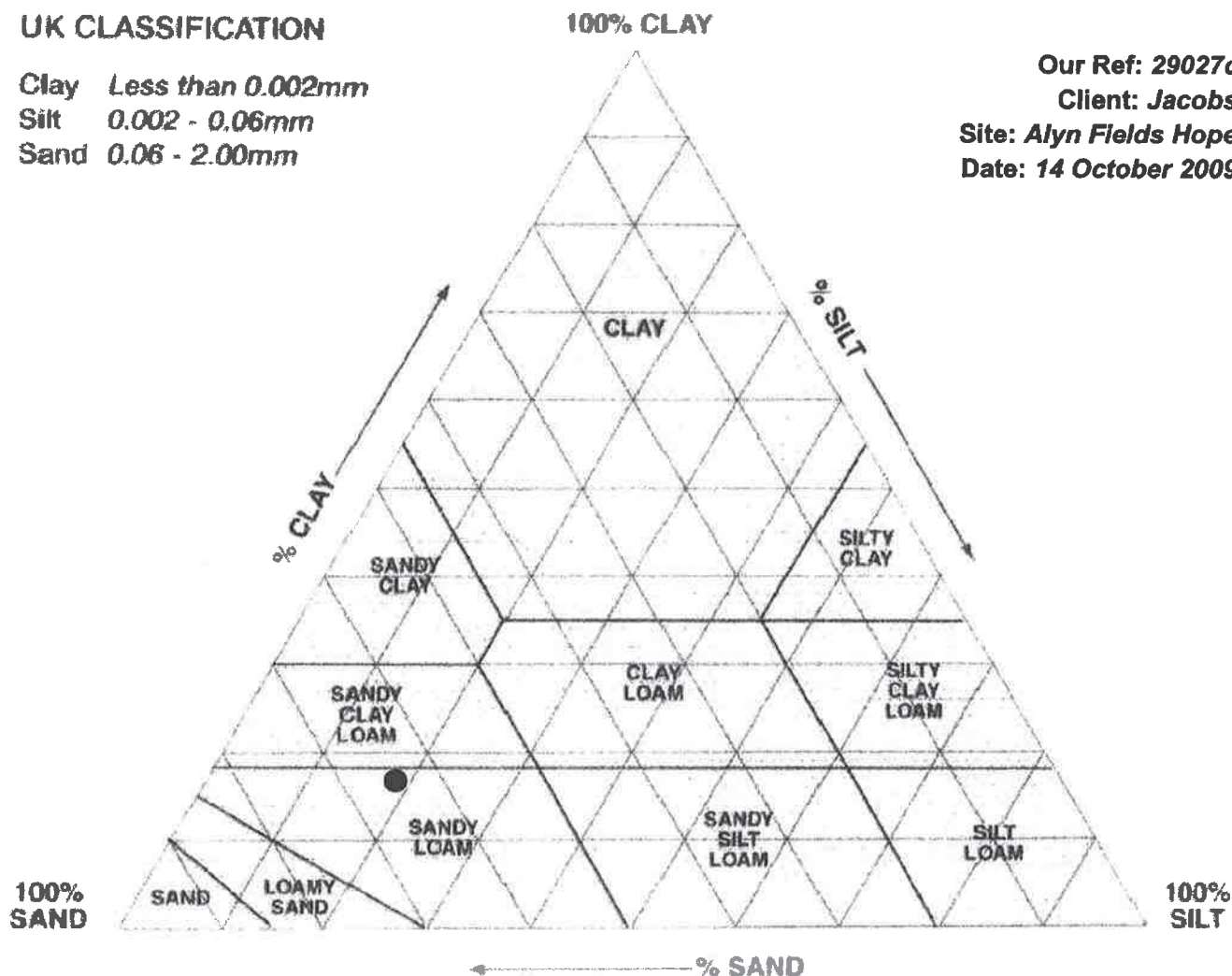


CL Voelcker

UK CLASSIFICATION

Clay Less than 0.002mm
Silt 0.002 - 0.06mm
Sand 0.06 - 2.00mm

Our Ref: 29027c
Client: Jacobs
Site: Alyn Fields Hope
Date: 14 October 2009



Sample Reference	09W5633								
Textural Class (UK)	SL	●							



CL Voelcker

Certificate of Analysis

Client :	JE Jacobs	Our Ref. :	29027c
Date Received :	01/10/2009	Date :	14/10/2009
Suite ID :	BS3882 : 2007 - Multipurpose Grade	Sampled by :	Client
Site Details :	Alyn Fields, Hope		

Soil Sample Reference : 09W5633

Particle Size Distribution* (UK Classification)

Clay (<0.002mm)	%	16	✓
Silt (0.002-0.06mm)	%	19	✓
Sand (0.06-2.0mm)	%	65	✓
Textural Class		SL	✓

Stone Content (Dry Weight Basis)

Stones 2-20mm	%w/w	8.3	✓
Stones 20-50mm	%w/w	0.2	✓
Stones >50mm	%w/w	0.0	✓

Soil Reaction & Soluble Salts

pH Value ‡	units	7.0	✓
Electrical Conductivity (CaSO ₄)†	µS/cm	2104	✓
≠ ESP±	%	ne	

Organic Matter & Nutrient Status

Organic Matter (WB [^])	%	8.4	✓
Total Nitrogen	%	0.31	✓
Carbon : Nitrogen Ratio		16:1	✓
Extractable Phosphorous	mg/l	24	✓
Extractable Potassium	mg/l	94	✗
Extractable Magnesium	mg/l	64	✓

Phytotoxic Metals'

Zinc (Zn)	mg/kg	83.2	✓
Copper (Cu)	mg/kg	24.1	✓
Nickel (Ni)	mg/kg	16.7	✓

Visible Contaminants (Dry Weight Basis)

Total foreign matter > 2 mm	%w/w	<0.5	✓
... of which plastics	%w/w	<0.25	✓
... of which sharps	%w/w	0	✓

Notes:

- ☒ Conforms to BS3882:2007 Multipurpose Grade
☐ Fails to conform to BS3882:2007 Multipurpose Grade

UK Soil Texture Classification

C	Clay	ZC	Silty Clay
SC	Sandy Clay	ZCL	Silty Clay Loam
CL	Clay Loam	SZL	Sandy Silt Loam
SL	Sandy Loam	ZL	Silt Loam
SCL	Sandy Clay Loam	S	Sand
LS	Loamy Sand		

* ADAS pipette
 ‡ 1:2.5 water extract
 † CaSO₄ extract
 ≠ dependent option
 ± Exchangeable Sodium Percentage
 ' Total metals
 ^ Walkley Black method
 ne not evaluated

Sample(s) were subcontracted to a UKAS accredited laboratory

Voelcker Consultants
Glossop House
Hogwood Lane
Wokingham
RG40 4QWFAO Simon Mason
12 October 2009

Dear Simon Mason

Test Report Number 57985
Your Project Reference Alyn Fields, Hope - 29027c

Please find enclosed the results of analysis for the samples received 2 October 2009.

All soil samples will be retained for a period of one month and all water samples will be retained for 7 days following the date of the test report. Should you require an extended retention period then please detail your requirements in an email to customerservices@chemtest.co.uk. Please be aware that charges may be applicable for extended sample storage.

If you require any further assistance, please do not hesitate to contact the Customer Services team.

Yours sincerely



Authorised Signatory

☐ Darrell Hall	Laboratory Manager
☒ Phil Hellier	Operations Director
☐ Keith Jones	Technical Development Manager
☐ John Crawford	Quality Manager
☐ Malcolm Avis	Technical Director



2183

Notes to accompany report:

- The sign < means 'less than'
- Tests marked 'U' hold UKAS accreditation
- Tests marked 'M' hold MCertS (and UKAS) accreditation
- Tests marked 'N' do not currently hold UKAS accreditation
- Tests marked 'S' were subcontracted to an approved laboratory
- n/e means 'not evaluated'
- i/s means 'insufficient sample'
- u/s means 'unsuitable sample'
- Comments or interpretations are beyond the scope of UKAS accreditation
- The results relate only to the items tested

Test Report 57985 Cover Sheet

Voelcker Consultants
Glossop House
Hogwood Lane
Wokingham
RG40 4QW
FAO Simon Mason

LABORATORY TEST REPORT



Report Date
12 October 2009

Results of analysis of 1 sample
received 02 October 2009
Alyn Fields, Hope - 29027c

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Depth

Matrix

57985

AE36428

09W5633

SOIL

Determinand↓	CAS No↓	Units↓	+	U	SOIL
2120 Boron (hot water soluble)	7440428	mg kg ⁻¹	M	0.1	1.7
2180 Sulfate (2:1 water soluble) as SO ₄	14808798	g l ⁻¹	M	8	0.1
2300 Sulfur (elemental)	7704349	mg kg ⁻¹	M	< 0.5	8
2300 Cyanide (free)	57125	mg kg ⁻¹	M	< 0.5	< 0.5
2300 Cyanide (total)	57125	mg kg ⁻¹	M	< 5.0	< 0.5
2325 Thiocyanate	302045	mg kg ⁻¹	M	9.2	9.2
2430 Sulfide	18496258	mg kg ⁻¹	M	0.25	0.25
2430 Sulfate (total)	14808798	%	M	12	12
2450 Arsenic	7440382	mg kg ⁻¹	M	0.65	0.65
Cadmium	7440439	mg kg ⁻¹	M	18	18
Chromium	7440473	mg kg ⁻¹	M	29	29
Copper	7440508	mg kg ⁻¹	M	0.19	0.19
Mercury	7439976	mg kg ⁻¹	M	21	21
Nickel	7440020	mg kg ⁻¹	M	210	210
Lead	7439921	mg kg ⁻¹	M	2.2	2.2
Selenium	7782492	mg kg ⁻¹	M	120	120
Zinc	7440666	mg kg ⁻¹	M	< 1	< 1
2670 TPH >C6-C10		mg kg ⁻¹	N	< 1	< 1
TPH >C10-C21		mg kg ⁻¹	N	< 1	< 1
TPH >C21-C40		mg kg ⁻¹	N	< 1	< 1
Total Petroleum Hydrocarbons		mg kg ⁻¹	M	< 10	< 10
2700 Naphthalene	91203	mg kg ⁻¹	M	< 0.1	< 0.1
Acenaphthylene	208968	mg kg ⁻¹	M	< 0.1	< 0.1
Acenaphthene	83329	mg kg ⁻¹	M	< 0.1	< 0.1
Fluorene	86737	mg kg ⁻¹	M	< 0.1	< 0.1
Phenanthrene	85018	mg kg ⁻¹	M	< 0.1	< 0.1
Anthracene	120127	mg kg ⁻¹	M	< 0.1	< 0.1
Fluoranthene	206440	mg kg ⁻¹	M	< 0.1	< 0.1
Pyrene	129000	mg kg ⁻¹	M	< 0.1	< 0.1
Benzo[a]anthracene	56553	mg kg ⁻¹	M	< 0.1	< 0.1
Chrysene	218019	mg kg ⁻¹	M	< 0.1	< 0.1

All tests undertaken between 05-Oct-2009 and 12-Oct-2009

* Accreditation status

This report should be interpreted in conjunction with the notes on the accompanying cover page

Column page 1

Report page 1 of 2

Report sample ID range AE36428 to AE36428

LABORATORY TEST REPORT

Report Date
12 October 2009

Results of analysis of 1 sample
received 02 October 2009

Alyn Fields, Hope - 29027c

FAO Simon Mason

57985
AF-36428
09W5633

SOIL

2700	Benzo[b]fluoranthene	205992	mg kg ⁻¹	M	< 0.1
	Benzo[k]fluoranthene	207089	mg kg ⁻¹	M	< 0.1
	Benzo[a]pyrene	50328	mg kg ⁻¹	M	< 0.1
	Dibenzo[a,h]anthracene	53703	mg kg ⁻¹	M	< 0.1
	Indeno[1,2,3-cd]pyrene	193395	mg kg ⁻¹	M	< 0.1
	Benzo[g,h,i]perylene	191242	mg kg ⁻¹	M	< 0.1
	Total (of 16) PAHs		mg kg ⁻¹	M	< 2
2920	Phenols (total)		mg kg ⁻¹	N	< 0.3
2010	pH		-	M	7.0
2610	Loss on ignition		%	N	13.4

ALcontrol Laboratories Analytical Services Sample Descriptions

Job Number: 09/04862/02/01

Client: Costain Geotechnical Services

Client Ref: 2480139

Grain sizes

<0.063mm **Very Fine**

0.1mm - 0.063mm Fine

0.1mm - 2mm Medium

2mm - 10mm Coarse

>10mm Very Coarse

[illegible]

* 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 occurring 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.

¹ Sample Description supplied by client

☒

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: SOLID

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

All results expressed on a dry weight basis.

Date 27.04.2009

☒

11

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: SOLID

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

All results expressed on a dry weight basis.

Date 27.04.2009

☒

1

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: SOLID

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

All results expressed on a dry weight basis.

Date 27.04.2009

☒[illegible]

ISO 17025 accredited
M MCERTS accredited
* Subcontracted test
» Shown on prev. report

Matrix: SOLID

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

All results expressed on a dry weight basis.

Date 27.04.2009

☒

1

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: SOLID

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

All results expressed on a dry weight basis.

Date 27.04.2009

☒

7

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: LEACHATE

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

Date 27.04.2009

Date 27.04.2009

☒

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: LEACHATE

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

Date 27.04.2009

Date 27.04.2009

☒

7

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: LEACHATE

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

Date 27.04.2009

Date 27.04.2009

☒

104

- # ISO 17025 accredited
- M MCERTS accredited
- * Subcontracted test
- » Shown on prev. report

Matrix: LEACHATE

Location: CHETWYN COURT, GRESFORD

Client Contact: Sharon Blackall

Date 27.04.2009

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

REF:CEN12457-3

Moisture Content Ratio (%) =	6.49
Dry Matter Content Ratio (%) =	93.91

Stated limits are for guidance only and ALcontrol cannot be held responsible for any discrepancies with current legislation

ALcontrol Laboratories Analytical Services

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

WAC ANALYTICAL RESULTS

REF:CEN12457-3

Mass Sample taken (kg) = 0.19027 Moisture Content Ratio (%) = 8.68
 Mass of dry sample (kg) = 0.175 Dry Matter Content Ratio (%) = 92.01
 Particle Size <4mm = >95%

Job Number		200904862				Landfill Waste Acceptance Criteria Limits		
Batch		1				Inert Waste Landfill	Stable Non- reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Sample Number(s)		5-8						
Sampled Date		11/03/09						
Sample Identity		SRG/03						
Depth (m)		1.00						
Solid Waste Analysis								
Total Organic Carbon (%)	<0.2					3	5	6
Loss on Ignition (%)	-					-	-	10
Sum of BTEX (mg/kg)	-					6	-	-
Sum of 7 PCBs (mg/kg)	<0.003					1	-	-
Mineral Oil (mg/kg)	19					500	-	-
PAH Sum of 17(mg/kg)	-					100	-	-
pH (pH Units)	8.55					-	>6	-
ANC to pH 6 (mol/kg)	0.06					-	to be evaluated	to be evaluated
ANC to pH 4 (mol/kg)	0.09					-	to be evaluated	to be evaluated
Eluate Analysis	Conc ^a in 2:1 eluate	Conc ^a in 8:1 eluate	2:1 conc ^a leached	Cumulative conc ^a leached	Limit values for compliance leaching test using BS			
	C ₂	C ₈	A ₂	A ₂₋₁₀	EN 12457-3 at L/S 10 l/kg			
	mg/l		mg/kg					
Arsenic	0.0032	<0.00075	0.0064	<0.0075	0.5	2	25	
Barium	0.26	<0.001	0.52	0.40	20	100	300	
Cadmium	<0.00022	<0.00022	<0.00044	<0.0022	0.04	1	5	
Chromium	<0.001	<0.001	<0.002	<0.01	0.5	10	70	
Copper	0.0043	<0.0016	0.009	<0.016	2	50	100	
Mercury	0.00001	<0.00001	<0.00002	<0.0001	0.01	0.2	2	
Molybdenum	0.006	<0.001	0.01	0.01	0.5	10	30	
Nickel	<0.0015	<0.0015	<0.003	<0.015	0.4	10	40	
Lead	0.0011	0.0007	0.002	0.008	0.5	10	50	
Antimony	0.00082	<0.00075	0.0016	<0.0075	0.06	0.7	5	
Selenium	0.002	0.001	<0.002	0.01	0.1	0.5	7	
Zinc	0.039	<0.005	0.08	0.06	4	50	200	
Chloride	54	2	110	99	800	15000	25000	
Fluoride	0.9	0.5	2	6	10	150	500	
Sulphate as SO ₄	14	<3	28	<30	1000	20000	50000	
Total Dissolved Solids	160	33	310	520	4000	60000	100000	
Phenols Monohydric	<0.01	0.01	<0.02	0.1	1	-	-	
Dissolved Organic Carbon	4	3	8	32	500	800	1000	
Leach Test Information								
Date Prepared	15/04/09	15/04/09						
pH (pH Units)	8.490	8.585						
Conductivity (µS/cm)	282.0	54.2						
Temperature (°C)	17.7	19.4						
Volume Leachant (Litres)	0.335	1.4						
Volume of Eluate VE1 (Litres)	0.265							

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

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

REF:CEN12457-3

Moisture Content Ratio (%) =	6.49
Dry Matter Content Ratio (%) =	93.91

Solid Results are expressed on a dry weight basis, after correction for moisture content where applicable

Supplemental Report

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

CEN 10:1 CUMULATIVE TWO STAGE BATCH TEST

REF:CEN12457-3

Moisture Content Ratio (%) =	8.68
Dry Matter Content Ratio (%) =	92.01

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

Supplemental Report

ALcontrol Laboratories Analytical Services

Table Of Results - Appendix

Job Number: 09/04862/02/01
Client: Costain Geotechnical Services
Client Ref. No.: 2480139

Report Key :

Results expressed as (e.g.) 1.03E-07 is equivalent to 1.03x10⁻⁷

NDP	No Determination Possible	*	Subcontracted test
ACM	Asbestos Containing Material	»	Result previously reported (Incremental reports only)
#	ISO 17025 accredited	M	MCERTS Accredited
		EC	Equivalent Carbon (Aromatics C8-C35)

Note: Method detection limits are not always achievable due to various circumstances beyond our control.

Summary of Method Codes contained within report :

Method No.	Reference	Description	ISO 17025 Accredited	MCERTS Accredited	Wet/Dry Sample ¹	Surrogate Corrected
LPH16.4	LPH METHOD 16.4	Loss on Ignition BG method			DRY	
TM001	In - house Method	Screening of Soils for Fibres			WET	
TM061	Method for the Determination of EPH, Massachusetts Dept. of EP, 1998	Determination of Extractable Petroleum Hydrocarbons by GC-FID (C10-C40)	✓		DRY	
TM062	MEWAM BOOK 124 1988. HMSO/ Method 17.7, Second Site property, March 2003	Determination of Phenolic compounds by HPLC with electro-chemical detection			NA	
TM072	Modified: US EPA Method 8141A	Determination of Phenols by GC-MS			WET	
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)			WET	
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	✓		WET	
TM089	Modified: US EPA Methods 8020 & 602	Determination of Gasoline Range Hydrocarbons (GRO) and BTEX (MTBE) compounds by Headspace GC-FID (C4-C12)	✓	✓	WET	
TM090	Method 5310, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 415.1 & 9060	Determination of Total Organic Carbon/Total Inorganic Carbon in Water and Waste Water			NA	
TM097	Modified: US EPA Method 325.1 & 325.2	Determination of Chloride using the Kone Analyser			NA	
TM097	Modified: US EPA Method 325.1 & 325.2	Determination of Chloride using the Kone Analyser	✓	✓	DRY	
TM098	Method 4500E, AWWA/APHA, 20th Ed., 1999	Determination of Sulphate using the Kone Analyser			NA	
TM098	Method 4500E, AWWA/APHA, 20th Ed., 1999	Determination of Sulphate using the Kone Analyser	✓	✓	DRY	
TM099	BS 2690: Part 7:1968 / BS 6068: Part 2.11:1984	Determination of Ammonium in Water Samples using the Kone Analyser			NA	

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TM101	Method 4500B & C, AWWA/APHA, 20th Ed., 1999	Determination of Sulphide in soil and water samples using the Kone Analyser			NA	
TM104	Method 4500F, AWWA/APHA, 20th Ed., 1999	Determination of Fluoride using the Kone Analyser			NA	
TM120	Method 2510B, AWWA/APHA, 20th Ed., 1999 / BS 2690: Part 9:1970	Determination of Electrical Conductivity using a Conductivity Meter			NA	
TM123	BS 2690: Part 121:1981	The Determination of Total Dissolved Solids in Water			NA	
TM129	Method 3120B, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 3050B	Determination of Metal Cations by IRIS Emission Spectrometer			DRY	
TM129	Method 3120B, AWWA/APHA, 20th Ed., 1999 / Modified: US EPA Method 3050B	Determination of Metal Cations by IRIS Emission Spectrometer	✓	✓	DRY	
TM132	In - house Method	ELTRA CS800 Operators Guide	✓		DRY	
TM132	In - house Method	ELTRA CS800 Operators Guide	✓	✓	DRY	
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter			NA	
TM133	BS 1377: Part 3 1990;BS 6068-2.5	Determination of pH in Soil and Water using the GLpH pH Meter	✓	✓	WET	
TM152	Method 3125B, AWWA/APHA, 20th Ed., 1999	Analysis of Aqueous Samples by ICP-MS			NA	
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser			NA	
TM153	Method 4500A,B,C, I, M AWWA/APHA, 20th Ed., 1999	Determination of Total Cyanide, Free (Easily Liberatable) Cyanide and Thiocyanate using the "Skalar SANS+ System" Segmented Flow Analyser	✓	✓	WET	
TM168		Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Soils	✓		DRY	

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Summary of Method Codes contained within report :

Method No.	Reference	Description	ISO 17025 Accredited	MCERTS Accredited	Wet/Dry Sample ¹	Surrogate Corrected
TM172		EPH in Waters			NA	
TM173		Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID			DRY	
TM173		Determination of Speciated Extractable Petroleum Hydrocarbons in Soils by GC-FID	✓		DRY	
TM178	Modified: US EPA Method 8100	Determination of Polynuclear Aromatic Hydrocarbons (PAH) by GC-MS in Waters			NA	
TM182		Determination of Acid Neutralisation Capacity (ANC) Using Autotitration	✓		DRY	
TM183	BS EN 23506:2002, (BS 6068-2.74:2002) ISBN 0 580 38924 3	Determination of Trace Level Mercury in Waters and Leachates by PSA Cold Vapour Atomic Fluorescence Spectrometry			NA	
TM197	Modified: US EPA Method 8082.EA Method 174 and 5109631	Determination of WHO12 and EC7 Polychlorinated Biphenyl Congeners by GC-MS in Waters			NA	
TM208	Modified: US EPA Method 8260b & 624	Determination of Volatile Organic Compounds by Headspace / GC-MS in Waters			NA	
TM213	In-house Method	Rapid Determination of PAHs by GC-FID			WET	
TM218		Microwave extraction - EPA method 3546	✓	✓	WET	
TM61/89		see TM061 and TM089 for details			WET	

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Job Number: 09/04862/02/01
Client: Costain Geotechnical Services
Client Ref. No.: 2480139

Summary of Coolbox temperatures

[illegible]

Phenanthrene	TM218	ug/kg	<15	280	<15
Anthracene	TM218	ug/kg	<16	130	<16
Fluoranthene	TM218	ug/kg	<17	980	<17
Pyrene	TM218	ug/kg	<15	1100	<15
Benz(a)anthracene	TM218	ug/kg	<14	550	<14
Chrysene	TM218	ug/kg	<10	660	<10
Benzo(b)fluoranthene	TM218	ug/kg	<15	810	<15
Benzo(k)fluoranthene	TM218	ug/kg	<14	540	<14
Benzo(a)pyrene	TM218	ug/kg	<15	860	<15
Indeno(123cd)pyrene	TM218	ug/kg	<18	630	<18
Dibenzo(ah)anthracene	TM218	ug/kg	<23	210	<23
Benzo(ghi)perylene	TM218	ug/kg	<24	840	<24
PAH 16 Total	TM218	ug/kg	<118	7800	<118
PCB 7 Congeners					
PCB congener 28	TM168	ug/kg	<3	<3	<3
PCB congener 52	TM168	ug/kg	<3	<3	<3
PCB congener 101	TM168	ug/kg	<3	<3	<3
PCB congener 118	TM168	ug/kg	<3	<3	<3
PCB congener 153	TM168	ug/kg	<3	<3	<3
PCB congener 138	TM168	ug/kg	<3	<3	<3
PCB congener 180	TM168	ug/kg	<3	<3	<3
Total of 7 Congener PCBs	TM168	ug/kg	<3	<3	<3
Phenol	TM072	ug/kg	<1	<100	<1
2-Chlorophenol	TM072	ug/kg	<1	<100	<1
2,4-Dimethylphenol	TM072	ug/kg	<1	<100	<1
4-Chloro-3-methylphenol	TM072	ug/kg	<1	<100	<1
2,4-Dichlorophenol	TM072	ug/kg	<1	<100	<1
2-Nitrophenol	TM072	ug/kg	<1	<100	<1
2,4,6-Trichlorophenol	TM072	ug/kg	<1	<100	<1
4-Nitrophenol	TM072	ug/kg	<1	<100	<1
Pentachlorophenol	TM072	ug/kg	<1	<100	<1
Phenols Total of 9 Speciated	TM072	ug/kg	<1	<100	<1

ALcontrol Laboratories - Table Of Results

Job Number: 09/04862/02/01

Client: Costain Geotechnical Services

Client Ref: 2480139

Matrix: SOLID

All results expressed on a dry weight basis.

		Sample Identity	SRG/01A	SRG/03
		Depth	1.00	1.00
		Sample Type	SOLID	SOLID
		Sample Received Date	10/04/2009	10/04/2009
		Sampled Date	10/03/2009	11/03/2009
		Batch	1	1
		Sample Number(s)	1-4	5-8
Method	Units	Method Detection Limit		
Boron Water Soluble	mg/kg	<3.5	<3.5	<3.5
Arsenic	mg/kg	<3.0	<3	<3
Cadmium	mg/kg	<0.2	1.1	<0.2
Chromium	mg/kg	<4.5	4.9	13
Copper	mg/kg	<6	<6	10
Lead	mg/kg	<2	45	13
Mercury	mg/kg	<0.4	<0.4	<0.4
Nickel	mg/kg	<0.9	5.7	16
Selenium	mg/kg	<3	<3	<3
Vanadium	mg/kg	<1.5	8.7	15
Zinc	mg/kg	<2.5	96	35
ANC at pH4	mol/kg	<0.03	6.7	0.09
ANC at pH6	mol/kg	<0.03	1.2	0.06
Water Soluble Sulphate as SO4 2:1 Extra	g/l	<0.003	0.065	0.010
Chloride (soluble)	mg/kg	<2	400	100
Total Organic Carbon	%	<0.2	0.6	<0.2
Total Cyanide	mg/kg	<1	<1	<1
Asbestos Containing Material Screen	NONE	No ACM Detec ACM Detected		
Loss on Ignition	%	<0.1	1.2	1.3
pH Value	pH Units	<1.00	7.97	8.55

Total Sulphur	TM132	%	<0.01	0.07	0.01
GRO (C4-C12)	TM089	ug/kg	<10	<10	<10
MTBE	TM089	ug/kg	<10	<10	<10
Benzene	TM089	ug/kg	<10	<10	<10
Toluene	TM089	ug/kg	<10	<10	<10
Ethyl benzene	TM089	ug/kg	<10	<10	<10
m & p Xylene	TM089	ug/kg	<10	<10	<10
o Xylene	TM089	ug/kg	<10	<10	<10
Aliphatics C5-C6	TM089	ug/kg	<10	<10	<10
Aliphatics >C6-C8	TM089	ug/kg	<10	<10	<10
Aliphatics >C8-C10	TM089	ug/kg	<10	<10	<10
Aliphatics >C10-C12	TM089	ug/kg	<10	<10	<10
Aliphatics >C12-C16	TM173	ug/kg	<100	2300	<100
Aliphatics >C16-C35	TM173	ug/kg	<100	170000	<100
Aliphatics >C35-C44	TM173	ug/kg	<100	60000	<100
Total Aliphatics C5-C44	TM61/89	ug/kg	<100	230000	<100
Aromatics C6-C7	TM089	ug/kg	<10	<10	<10
Aromatics >C7-C8	TM089	ug/kg	<10	<10	<10
Aromatics >EC8-EC10	TM089	ug/kg	<10	<10	<10
Aromatics >EC10-EC12	TM089	ug/kg	<10	<10	<10
Aromatics >EC12-EC16	TM173	ug/kg	<100	<100	<100
Aromatics >EC16-EC21	TM173	ug/kg	<100	6500	<100
Aromatics >EC21-EC35	TM173	ug/kg	<100	170000	<100
Aromatics >EC35-EC44	TM173	ug/kg	<100	97000	<100
Total Aromatics C6-C44	TM61/89	ug/kg	<100	270000	<100
TPH (Aliphatics and Aromatics C5-C44)	TM61/89	ug/kg	<100	500000	<100
Mineral Oil	TM061	mg/kg	<1	240	19
Mineral Oil % Surrogate Recovery	TM061	%		93	94
Coronene	TM213	mg/kg	<2	<2	<2

PAH by GCMS					
Naphthalene-d8 -Surrogate Recovery	TM218	%		88	86
Acenaphthene-d10 -Surrogate Recovery	TM218	%		84	83
Phenanthrene-d10 -Surrogate Recovery	TM218	%		83	82
Chrysene-d12 -Surrogate Recovery	TM218	%		84	77
Perylene-d12 -Surrogate Recovery	TM218	%		87	77
Naphthalene	TM218	ug/kg	<9	70	<9
Acenaphthylene	TM218	ug/kg	<12	41	<12
Acenaphthene	TM218	ug/kg	<8	40	<8
Fluorene	TM218	ug/kg	<10	39	<10