

Appendix B

Patel Tonra Waste Info

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MEHL WASTE LICENCE APPLICATION W0129-03

EPA Article 16 – Item 5.6 (PARTIAL)

EPA Query – Item 5.6 (Part)

More proposed-waste-streams-specific data should be obtained if possible (from say other similar sites or proposed source sites) to ensure the modelled suite of potential contaminants is comprehensive enough. Bench-scale testing of some of the more significant waste streams proposed may be appropriate to demonstrate that unacceptably high leaching is not going to happen.

PTL Response – Item 5.6 (Part)

1.0 BACKGROUND

PTL was requested by the hydrogeology team for MEHL to provide relevant information on potential input waste streams, for consideration as part of hydrogeological modelling and assessments.

As stated in the Waste Licence Application (Patel Tonra Ltd., Dec. 2010), Attachment H.2, all potential incoming waste streams will be subject to a rigorous Waste Acceptance Procedure, including Waste Acceptance Criteria (WAC) testing. Full WAC testing will be required¹ to demonstrate the composition of the waste and its leaching behaviour, prior to the waste being delivered to the MEHL facility.

2.0 WASTE ACCEPTANCE CRITERIA

The WAC Decision (2003/33/EC) outlines limit values for waste acceptable at landfills for:

- Inert waste
- Granular non-hazardous waste accepted in the same cell as stable, non-reactive hazardous waste ('granular non-hazardous waste')
- Granular hazardous waste acceptable at landfills for non-hazardous waste ('granular hazardous waste – non-hazardous landfill')
- Granular waste acceptable at landfills for hazardous waste ('granular hazardous waste')

Depending on the results of WAC analysis (and other Level 1 Basic Characterisation information, as appropriate), the input waste stream will be deemed appropriate for acceptance at the MEHL facility for one of the categories of landfill (inert, non-hazardous or hazardous), or may be rejected as an unsuitable input waste stream.

Under the terms of its existing Waste Licence, W0129-02 (previously W0129-01), MEHL has extensive experience in applying the WAC requirements stipulated under EU Council Decision 2003/33/EC. Under W0129-02, waste which complies with WAC criteria for inert waste is acceptable.

¹ Limited exemptions apply; as detailed in Attachment H.2 of the Waste Licence Application

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EPA Article 16 – Item 5.6 (PARTIAL)

3.0 SITE INVESTIGATION RESULTS FOR POTENTIAL SOURCE SITES

In the course of its operations, MEHL has retained site investigation data and laboratory results from various sites in Ireland, which were deemed to be in exceedance of inert WAC (and not acceptable under W0129-02), but which may be deemed acceptable under the regime of an integrated waste management facility, which has inert, non-hazardous and hazardous landfilling capabilities. Samples of two such datasets have been examined and laboratory results are attached herewith:

- Site A – find data attached in **Appendix 1**
- Site B – find data attached in **Appendix 2**

Site identification names have been removed to ensure the confidentiality of the client and the specific site concerned. The results and analysis represent an indicative sample from the specific site concerned.

3.1 Site A – Urban Inner City Development Site (approximately 18 miles south of MEHL site)

Table 1 lists the sample IDs for Site A and identifies each sample in terms of suitability at the proposed MEHL integrated waste management facility. Samples are categorised as suitable for: inert landfill, non-hazardous landfill or hazardous landfill. Samples which would not be acceptable at the facility are identified.

The limiting WAC parameter for this site was Total Organic Carbon.

Table 1: Site A Samples and Acceptability at Proposed MEHL Integrated Waste Management Facility

Sample No	Sample ID	Depth (m)	Compliant with WAC			Not acceptable
			Inert WAC	Non-haz. WAC ²	Haz. WAC	
SL001	TP136	0.5		✓		
SL003	TP136	1.5	✓			
SL004	TP137	0.8				✓
SL005	TP126					✓
SL007	TP124	0.5			✓	
SL009	TP123	0.65				✓
SL011	TP125	0.5				✓
SL012	TP125	0.8				✓
SL013	TP125	1.5				✓

² Stable non-reactive

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Sample No	Sample ID	Depth (m)	Compliant with WAC			Not acceptable
			Inert WAC	Non-haz. WAC ²	Haz. WAC	
SL014	TP122	0.5				✓
SL016	TP122	1.4	✓			
SL017	TP121	1.0	✓			
SL018	TP120	1.0	✓			
SL019	TP117	0.5				✓
SL021	TP117	1.3	✓			
SL022	TP115	0.5				✓
SL023	TP115	1.4	✓			
SL024	TP146	0.8				✓
SL025	TP146	1.4	✓			
SL026	TP112	0.5			✓	
SL027	TP112	1.3	✓			
SL027	TP113	0.4			✓	
SL028	TP113	1.0				✓
SL029	TP113	1.5				
SL030	TP106	0.6				✓
SL031	TP106	1.1	✓			
SL032	TP105	0.4		✓		
SL033	TP105	1.2		✓		
SL034	TP107	0.5			✓	
SL035	TP107	1.0			✓	
SL037	TP110	0.7			✓	
SL038	TP127	0.8				✓
SL039	TP127	1.5	✓			
SL040	TP135	0.3				✓
SL042	TP135	1.0	✓			
SL043	TP128	0.5				✓
SL044	TP128	1.3	✓			
SL045	TP130	0.5				✓
SL047	TP130	1.5	✓			
SL048	TP145					✓

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Sample No	Sample ID	Depth (m)	Compliant with WAC			Not acceptable
			Inert WAC	Non-haz. WAC ²	Haz. WAC	
SL049	TP145	1.5	✓			
SL050	TP131	0.5		✓		
SL051	TP131	1.9				✓
SL052	TP132	0.5			✓	

3.2 Site B – Regional Town Development Site (approximately 18 miles north from MEHL)

Table 2 lists the sample IDs for Site B and identifies those suitable for non-hazardous (stable non-reactive) landfill disposal. There were a number of additional samples acceptable under inert WAC. No samples conformed with WAC for hazardous landfill. A number of samples would be rejected as not acceptable under the Waste Acceptance Procedure at the MEHL Integrated Waste Management Facility.

Out of the total of 20 individual samples analysed for this site (TP7), 9 samples were suitable for non-hazardous (stable non-reactive) landfill disposal.

The critical limiting WAC parameters are listed in **Table 2**. The full results of Site B samples are available in **Appendix 2**.

Table 2: Site B Samples and Acceptability at Proposed MEHL Integrated Waste Management Facility

Sample No	Sample ID	Depth (m)	Key Parameter(s)
117654	TP7	0.5	<ul style="list-style-type: none"> ▪ Total Organic Carbon ▪ TPH C10-C40 (sum)
117654	TP7	1.0	<ul style="list-style-type: none"> ▪ Total organic carbon
117654	TP7a	0.5	<ul style="list-style-type: none"> ▪ Total organic carbon ▪ Nickel (Dissolved)
117654	TP7a	2.0	<ul style="list-style-type: none"> ▪ Sulphate ion
117654	TP7a	3.0	<ul style="list-style-type: none"> ▪ TPH C10-C40 (sum)
117654	TP7c	0.5	<ul style="list-style-type: none"> ▪ Sulphate ion
117654	TP7c	1.5	<ul style="list-style-type: none"> ▪ Chloride ▪ Sulphate ion ▪ Total Dissolved Solids
117654	TP7c	2.5	<ul style="list-style-type: none"> ▪ Antimony (Dissolved)

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Sample No	Sample ID	Depth (m)	Key Parameter(s)
1176564	TP7c	3.5	<ul style="list-style-type: none"> ▪ Total Organic Carbon ▪ Antimony (Dissolved) ▪ Chloride ▪ Sulphate ion

4.0 WAC ANALYSIS FOR INCINERATOR BOTTOM ASH

As per the Waste Licence Application (Patel Tonra Ltd., Dec. 2010), Table H.1.1, WAC analysis for bottom ash from a reference Waste-to-Energy plant was included, as follows:

Table 3: Compositional analysis of Bottom Ash from Reference Waste-to-Energy Plant

Measurement	Parameter	Unit	WAC for Non-Hazardous Landfill	WAC for Hazardous Landfill	Bottom Ash mg/kg	Bottom Ash # samples
Leaching L/S = 10	As	mg/kg	2	25	<0.1	80
	Ba	mg/kg	100	300	2.8+/-0.8	15
	Cd	mg/kg	1	5	<0.02	86
	Cr	mg/kg	10	10	0.1+/-0.1	80
	Cu	mg/kg	50	100	13.1+/-2.5	96
	Mo	mg/kg	10	30	3.5+/-2.6	80
	Ni	mg/kg	10	40	0.1	80
	Pb	mg/kg	10	50	0.6+/-0.5	80
	Sb ³	mg/kg	0.7	5	0.8+/-0.1	80
	Se	mg/kg	0.5	7	0.1	80
	Zn	mg/kg	50	200	0.5+/-0.4	80
	Cl	mg/kg	15000	25,000	5610+/-650	80
	F	mg/kg	150	500	8.0+/-4.0	96
	SO ₄ ²⁻	mg/kg	20000	50,000	4570 +/- 1190	80
CN ⁻	mg/kg	-	-	0	14	
NO ₂ ⁻	mg/kg	-	-	0	80	
Other	pH	pH Units	Minimum 5	-	11 +/- 1	100

Source: Indaver Waste-to-Energy Facility, Doel, Flanders, Belgium

³ The non hazardous WAC used for Sb (Antimony) is for non-hazardous waste deposited together with hazardous (B1b-art 2,2) and not for normal non-hazardous waste.

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Laboratory results for bottom ash sampled from the Indaver Carranstown facility (EPA licence W0167-02) for January, April and June 2013 are attached as **Appendix 3**.

5.0 ANALYSIS DATA FROM INDAVER ON SOLIDIFIED FLUE GAS TREATMENT RESIDUE

MEHL submitted information to the Agency under W0129-02 on 7th June 2012. Ref. Chapter 4 of the submission – attached in **Appendix 4**.

6.0 NOTE RE. HIGHER WAC LIMIT VALUES

MEHL wrote to the Agency under W0129-03 on 20th August 2012. The full submission is enclosed as **Appendix 5** and extracts are provided below:

1. *Section H.2.31 of the Waste Licence Application refers to higher limit values for inert waste [provision for which is made under Council Decision 2003/33/EC]. Under the W0129-03 proposal, the MEHL facility will offer co-located landfill disposal capacity for inert, non-hazardous and hazardous wastes, subject to strict Waste Acceptance Criteria. In light of this, MEHL **will no longer seek** to retain higher limit values for inert waste for future incoming wastes^{4 5}.*
2. *It is anticipated, based on international experience, that up to three times the limit values specified under 2003/33/EC may be required for certain parameters for solidified flue-gas treatment (FGT) residues.*
3. *As stated in Section H.1.16 of the Waste Licence Application (December 2010), the main environmental concern⁶ with respect to FGT residues is leaching of:*
 - *Easily soluble salts such as Cl and Na. Although not toxic for humans in typical concentration levels these components may significantly affect ecosystems and spoil drinking water resources.*
 - *Heavy metals such as Cd, Cr, Cu, Ni, Pb, and Zn. Heavy metals and trace elements can potentially be present in concentrations*

⁴ Limit value for 17-PAHs for inert waste (Soil & Stones, EWC Code 17 05 04) to be retained at 100mg/kg, as agreed under W0129-02 [Council Decision 2003/33/EC requires Member States to set limit value for PAHs for inert waste].

⁵ Limit values agreed with the Agency to be retained for previously-deposited waste.

⁶ ISWA-WG/Thomas Astrup, Technical University of Denmark (2008) Management of APC residues from W-t-E Plants: An overview of management options and treatment methods

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harmful for humans as well as for ecosystems. As such, leaching of these components has generally been the primary concern and has also received the greatest research focus.

- *Dioxins. Although dioxins and furans do not easily leach, release of these contaminants is of major concern because of their toxicity.*

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APPENDIX 1:

WAC ANALYSIS RESULTS - SITE A

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[Redacted]

Ireland

[Redacted]

20 November 2012

[Redacted]

Test Report Number

[Redacted]

Please find enclosed the results of analysis for the samples received 7 November 2012.

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



[Redacted] Technical Manager



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
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- None of the test results included in this report have been recovery corrected

Test Report 215868 Cover Sheet



Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Ireland

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92902 Soil: AH92879
Sample ID TP136
Sample No SL001
Sampling Date 02/11/2012
Depth 0.50m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill		Hazardous Waste Landfill
	Hazardous	Non-Hazardous	

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	4.7	3	5	6
Loss on Ignition	2610	N	%	3.16			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	4.5	0.045	0.5	2	25
Barium		N	µg l ⁻¹	13	0.13	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	5.2	0.052	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	4.6	0.046	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	2.7	0.027	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.2	0.012	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	3.2	0.032	4	50	200
Chloride	1220	N	mg l ⁻¹	2.7	27	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.61	6.1	10	150	500
Sulfate	1220	N	mg l ⁻¹	7.2	72	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	120	1200	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8.9	89	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LIMS sample ID range AH92879 to AH92918



Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

[Redacted]
Ireland

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92903 Soil: AH92881
Sample ID TP136
Sample No SL003
Sampling Date 02/11/2012
Depth 1.50m

**Landfill Waste Acceptance
Criteria Limits**

	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Inert Waste Landfill	3	6
	5	10

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	0.94	3	5	6
Loss on Ignition	2610	N	%	4.65			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	1	0.01	0.5	2	25
Barium		N	µg l ⁻¹	5.9	0.059	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	1.2	0.012	0.5	10	70
Copper	1450	N	µg l ⁻¹	2	0.02	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	15	0.15	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	1.1	0.011	0.5	10	50
Antimony	1450	N	µg l ⁻¹	<1.0	< 0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	1.4	0.014	4	50	200
Chloride	1220	N	mg l ⁻¹	1.5	15	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.3	3	10	150	500
Sulfate	1220	N	mg l ⁻¹	1.8	18	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	74	740	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	5.7	57	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92904 Soil: AH92882
Sample ID TP137
Sample No SL004
Sampling Date 02/11/2012
Depth 0.80m

Landfill Waste Acceptance Criteria Limits

	Stable	
	Non-reactive	
Inert Waste Landfill	Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%		1.1	3	5	6
Loss on Ignition	2610	N	%		10.3			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	2.6	0.026	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	1.4	0.014	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.7	0.017	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	20	0.2	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.4	0.014	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	3.4	0.034	4	50	200
Chloride	1220	N	mg l ⁻¹	1.2	12	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.19	1.9	10	150	500
Sulfate	1220	N	mg l ⁻¹	0.14	1.4	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	66	660	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	7.6	76	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012


* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
 Chemtest LIMS ID AH92905 Soil: AH92883
 Sample ID TP126
 Sample No SL005
 Sampling Date 02/11/2012
 Depth 0.50m

**Landfill Waste Acceptance
Criteria Limits**

	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Inert Waste Landfill	3	6
	5	10

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%	6.6	3	5	6	
Loss on Ignition	2610	N	%	10.8			10	

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	8	0.08	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	4	0.04	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	6.3	0.063	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	1.5	0.015	0.5	10	50
Antimony	1450	N	µg l ⁻¹	2.4	0.024	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	1.9	0.019	4	50	200
Chloride	1220	N	mg l ⁻¹	1.6	16	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.89	8.9	10	150	500
Sulfate	1220	N	mg l ⁻¹	8.2	82	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	110	1100	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8	80	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
 Chemtest LIMS ID AH92906 Soil: AH92885
 Sample ID TP124
 Sample No SL007
 Sampling Date 02/11/2012
 Depth 0.50m

Landfill Waste Acceptance Criteria Limits

	Stable	
	Non-reactive	
Inert Waste	Hazardous	Hazardous
Landfill	Waste in Non-	Waste Landfill
	Hazardous	
	Landfill	

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓			
Total Organic Carbon	2625	M	%	5.2	3	5
Loss on Ignition	2610	N	%	7.67		10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	14	0.14	0.5	2	25
Barium		N	µg l ⁻¹	7.2	0.072	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	1.2	0.012	0.5	10	70
Copper	1450	N	µg l ⁻¹	4	0.04	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	12	0.12	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1.5	0.015	0.4	10	40
Lead	1450	N	µg l ⁻¹	1.6	0.016	0.5	10	50
Antimony	1450	N	µg l ⁻¹	2.3	0.023	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	8.1	0.081	4	50	200
Chloride	1220	N	mg l ⁻¹	2.5	25	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.56	5.6	10	150	500
Sulfate	1220	N	mg l ⁻¹	2.7	27	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	100	1000	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	10	100	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92907 Soil: AH92887
Sample ID TP123
Sample No SL009
Sampling Date 02/11/2012
Depth 0.65m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable	Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
	Non-reactive		

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%		3	3	5	6
Loss on Ignition	2610	N	%		5.5			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	10	0.1	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	1.9	0.019	0.5	10	70
Copper	1450	N	µg l ⁻¹	2.9	0.029	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	13	0.13	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	1.5	0.015	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.1	0.011	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	1.8	0.018	4	50	200
Chloride	1220	N	mg l ⁻¹	1.9	19	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.96	9.6	10	150	500
Sulfate	1220	N	mg l ⁻¹	6.1	61	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	84	840	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8.6	86	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92908 Soil: AH92889
Sample ID TP125
Sample No SL011
Sampling Date 02/11/2012
Depth 0.50m

Landfill Waste Acceptance Criteria Limits

	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Inert Waste Landfill	3	5
Total Organic Carbon	19	6
Loss on Ignition	11.5	10

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%				
Loss on Ignition	2610	N	%				

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
						0.5	2	25
Arsenic	1450	N	µg l ⁻¹	11	0.11	0.5	2	25
Barium		N	µg l ⁻¹	11	0.11	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	7.7	0.077	0.5	10	70
Copper	1450	N	µg l ⁻¹	3.7	0.037	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	7.6	0.076	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1.4	0.014	0.4	10	40
Lead	1450	N	µg l ⁻¹	8.2	0.082	0.5	10	50
Antimony	1450	N	µg l ⁻¹	2.2	0.022	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	5.3	0.053	4	50	200
Chloride	1220	N	mg l ⁻¹	2.7	27	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.52	5.2	10	150	500
Sulfate	1220	N	mg l ⁻¹	10	100	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	96	960	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8.7	87	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

[Redacted]
Ireland

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92909 Soil: AH92890
Sample ID TP125
Sample No SL012
Sampling Date 02/11/2012
Depth 0.80m

**Landfill Waste Acceptance
Criteria Limits**

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
3	5	6
		10

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	8.4	3	5	6
Loss on Ignition	2610	N	%	24.7			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	11	0.11	0.5	2	25
Barium		N	µg l ⁻¹	11	0.11	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	1.8	0.018	0.5	10	70
Copper	1450	N	µg l ⁻¹	3.9	0.039	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	8.8	0.088	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1	0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	1.9	0.019	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.5	0.015	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	1.7	0.017	4	50	200
Chloride	1220	N	mg l ⁻¹	2	20	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.4	4	10	150	500
Sulfate	1220	N	mg l ⁻¹	5	50	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	100	1000	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8.5	85	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92910 Soil: AH92891
Sample ID TP125
Sample No SL013
Sampling Date 02/11/2012
Depth 1.50m

**Landfill Waste Acceptance
Criteria Limits**

	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
Inert Waste Landfill	3	6

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%	1.8	3	5	6	
Loss on Ignition	2610	N	%	12.3			10	

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	1.7	0.017	0.5	2	25
Barium		N	µg l ⁻¹	7	0.07	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.5	0.015	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	11	0.11	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	<1.0	< 0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.1	11	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.4	4	10	150	500
Sulfate	1220	N	mg l ⁻¹	2.5	25	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	76	760	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	6.1	61	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92911 Soil: AH92892
Sample ID TP122
Sample No SL014
Sampling Date 02/11/2012
Depth 0.50m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous	
	Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	17	3	5	6
Loss on Ignition	2610	N	%	2.38			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	25	0.25	0.5	2	25
Barium		N	µg l ⁻¹	9.5	0.095	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	68	0.68	0.5	10	70
Copper	1450	N	µg l ⁻¹	3.6	0.036	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	9.3	0.093	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1.4	0.014	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.5	0.015	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	1	0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	1.4	0.014	4	50	200
Chloride	1220	N	mg l ⁻¹	2.5	25	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.75	7.5	10	150	500
Sulfate	1220	N	mg l ⁻¹	6.1	61	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	83	830	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8.1	81	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
 Chemtest LIMS ID AH92912 Soil: AH92894
 Sample ID TP122
 Sample No SL016
 Sampling Date 02/11/2012
 Depth 1.40m

Landfill Waste Acceptance Criteria Limits

	Stable	
	Non-reactive	
Inert Waste	Hazardous	Hazardous
Landfill	Waste in Non-	Waste Landfill
	Hazardous	
	Landfill	

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓			
Total Organic Carbon	2625	M	%	0.53	3	5
Loss on Ignition	2610	N	%	5.91		10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	3.3	0.033	0.5	2	25
Barium		N	µg l ⁻¹	7.9	0.079	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	7.5	0.075	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.6	0.016	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	9.9	0.099	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	<1.0	< 0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	1.1	0.011	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	3	0.03	4	50	200
Chloride	1220	N	mg l ⁻¹	1.1	11	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.41	4.1	10	150	500
Sulfate	1220	N	mg l ⁻¹	5.7	57	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	71	710	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	6.4	64	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92913 Soil: AH92895
Sample ID TP121
Sample No SL017
Sampling Date 02/11/2012
Depth 1.00m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill		Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	2.2	3	5	6
Loss on Ignition	2610	N	%	2.39			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	4.9	0.049	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	2.3	0.023	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	23	0.23	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.1	0.011	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.1	11	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.35	3.5	10	150	500
Sulfate	1220	N	mg l ⁻¹	3	30	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	89	890	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	9.2	92	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92914 Soil: AH92896
Sample ID TP120
Sample No SL018
Sampling Date 02/11/2012
Depth 1.00m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	
	Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	0.4	3	5	6
Loss on Ignition	2610	N	%	11.1			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	1.1	0.011	0.5	10	70
Copper	1450	N	µg l ⁻¹	2.4	0.024	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	28	0.28	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1.4	0.014	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	<1.0	< 0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	4.3	0.043	4	50	200
Chloride	1220	N	mg l ⁻¹	0.95	9.5	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.47	4.7	10	150	500
Sulfate	1220	N	mg l ⁻¹	3.6	36	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	81	810	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	6.4	64	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92915 Soil: AH92897
Sample ID TP117
Sample No SL019
Sampling Date 02/11/2012
Depth 0.50m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive	
	Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%		13	3	5	6
Loss on Ignition	2610	N	%		2.76			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	2.1	0.021	0.5	2	25
Barium		N	µg l ⁻¹	13	0.13	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.9	0.019	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	15	0.15	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.8	0.018	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	3.1	0.031	4	50	200
Chloride	1220	N	mg l ⁻¹	2	20	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.17	1.7	10	150	500
Sulfate	1220	N	mg l ⁻¹	11	110	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	110	1100	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	8.7	87	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
 Chemtest LIMS ID AH92916 Soil: AH92899
 Sample ID TP117
 Sample No SL021
 Sampling Date 02/11/2012
 Depth 1.30m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	
	Hazardous Waste Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	0.58	3	5	6
Loss on Ignition	2610	N	%	11.7			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	2	25
Barium		N	µg l ⁻¹	11	0.11	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.9	0.019	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	12	0.12	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	<1.0	< 0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.2	12	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.53	5.3	10	150	500
Sulfate	1220	N	mg l ⁻¹	3.8	38	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	100	1000	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	7.5	75	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
Chemtest LIMS ID AH92917 Soil: AH92900
Sample ID TP115
Sample No SL022
Sampling Date 02/11/2012
Depth 0.50m

**Landfill Waste Acceptance
Criteria Limits**

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
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Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%	7.6	3	5	6	
Loss on Ignition	2610	N	%	3.37			10	

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	14	0.14	0.5	2	25
Barium		N	µg l ⁻¹	7.4	0.074	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	4	0.04	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	8.3	0.083	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1.6	0.016	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	2.7	0.027	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1	10	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.33	3.3	10	150	500
Sulfate	1220	N	mg l ⁻¹	3.3	33	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	98	980	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	9.8	98	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 40 samples
received 7 November 2012

Report Date
15 November 2012

Login Batch No 215868
 Chemtest LIMS ID AH92918 Soil: AH92901
 Sample ID TP115
 Sample No SL023
 Sampling Date 02/11/2012
 Depth 1.40m

**Landfill Waste Acceptance
Criteria Limits**

	Stable Non-reactive	
Inert Waste Landfill	Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	0.92	3	5	6
Loss on Ignition	2610	N	%	6.21			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	3	0.03	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.5	0.015	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	41	0.41	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1	0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.4	14	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.21	2.1	10	150	500
Sulfate	1220	N	mg l ⁻¹	4.1	41	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	79	790	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	7	70	500	800	1000

All tests undertaken between 7-Nov-2012 and 15-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT



Results of analysis of 17 samples
received 6 November 2012

Report Date
20 November 2012

FAO

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP ↓ Determinand ↓

CAS No ↓

Units ↓

*

215868

Sample ID	Sample No	Sampling Date	Depth	Matrix	SOP ↓	Determinand ↓	CAS No ↓	Units ↓	*	AH92902	AH92903	AH92904	AH92905	AH92906	AH92907
1040	Total Dissolved Solids				TDS		mg l ⁻¹	N		TP136	TP136	TP137	TP126	TP124	TP123
1610	Total Organic Carbon				TOC		mg l ⁻¹	N		SL001	SL003	SL004	SL005	SL007	SL009
1220	F (Fluoride)				16984488		mg l ⁻¹	N		2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012
	Cl (Chloride)				16887006		mg l ⁻¹	N		0.50m	1.50m	0.80m	0.50m	0.50m	0.65m
	SO4 (Sulfate)				14808798		mg l ⁻¹	N		LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE	LEACHATE
1450	Arsenic				7440382		µg l ⁻¹	U							
	Barium				7440393		µg l ⁻¹	U							
	Cadmium				7440439		µg l ⁻¹	U							
	Chromium				7440473		µg l ⁻¹	U							
	Copper				7440508		µg l ⁻¹	U							
	Mercury				7439976		µg l ⁻¹	U							
	Molybdenum				7439987		µg l ⁻¹	U							
	Nickel				7440020		µg l ⁻¹	U							
	Lead				7439921		µg l ⁻¹	U							
	Antimony				7440364		µg l ⁻¹	U							
	Selenium				7782492		µg l ⁻¹	U							
	Zinc				7440666		µg l ⁻¹	U							
1920	Phenols (total)						mg l ⁻¹	N							

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* Accreditation status

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

Column page 1

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LIMS sample ID range AH92879 to AH92918

LABORATORY TEST REPORT

Results of analysis of 17 samples
received 6 November 2012



Report Date
20 November 2012

FAO

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP ↓ Determinand ↓

CAS No ↓

Units ↓

*

215868

AH92910

TP125

SL013

2/11/2012

1.50m

LEACHATE

AH92911

TP122

SL014

2/11/2012

0.50m

LEACHATE

AH92912

TP122

SL016

2/11/2012

1.40m

LEACHATE

AH92913

TP121

SL017

2/11/2012

1.00m

LEACHATE

SOP ↓	Determinand ↓	CAS No ↓	Units ↓	*	AH92908	AH92909	AH92910	AH92911	AH92912	AH92913
1040	Total Dissolved Solids	TDS	mg l ⁻¹	N	96	100	76	83	71	89
1610	Total Organic Carbon	TOC	mg l ⁻¹	N	8.7	8.5	6.1	8.1	6.4	9.2
1220	F (Fluoride)	16984488	mg l ⁻¹	N	0.52	0.4	0.4	0.75	0.41	0.35
	Cl (Chloride)	16887006	mg l ⁻¹	N	2.7	2	1.1	2.5	1.1	1.1
	SO4 (Sulfate)	14808798	mg l ⁻¹	N	10	5	2.5	6.1	5.7	3
1450	Arsenic	7440382	µg l ⁻¹	U	11	11	1.7	25	3.3	4.9
	Barium	7440393	µg l ⁻¹	U	11	11	7.0	9.5	7.9	<5.0
	Cadmium	7440439	µg l ⁻¹	U	<0.080	<0.080	<0.080	<0.080	<0.080	<0.080
	Chromium	7440473	µg l ⁻¹	U	7.7	1.8	<1.0	68	7.5	<1.0
	Copper	7440508	µg l ⁻¹	U	3.7	3.9	1.5	3.6	1.6	2.3
	Mercury	7439976	µg l ⁻¹	U	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
	Molybdenum	7439987	µg l ⁻¹	U	7.6	8.8	11	9.3	9.9	23
	Nickel	7440020	µg l ⁻¹	U	1.4	1.0	<1.0	1.4	<1.0	<1.0
	Lead	7439921	µg l ⁻¹	U	8.2	1.9	<1.0	<1.0	<1.0	<1.0
	Antimony	7440364	µg l ⁻¹	U	2.2	1.5	<1.0	1.5	<1.0	1.1
	Selenium	7782492	µg l ⁻¹	U	<1.0	<1.0	<1.0	1.0	1.1	<1.0
	Zinc	7440666	µg l ⁻¹	U	5.3	1.7	<1.0	1.4	3.0	<1.0
1920	Phenols (total)		mg l ⁻¹	N	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03

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

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LIMS sample ID range AH92879 to AH92918

LABORATORY TEST REPORT

Results of analysis of 17 samples
received 6 November 2012



Report Date
20 November 2012

FAO

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP ↓ Determinand ↓

CAS No ↓

Units ↓

*

		215868				
		AH92914	AH92915	AH92916	AH92917	
		TP120	TP117	TP117	TP115	
		SL018	SL019	SL021	SL023	
		2/11/2012	2/11/2012	2/11/2012	2/11/2012	
		1.00m	0.50m	1.30m	1.40m	
		LEACHATE	LEACHATE	LEACHATE	LEACHATE	
1040	Total Dissolved Solids	81	110	100	98	79
1610	Total Organic Carbon	6.4	8.7	7.5	9.8	7.0
1220	F (Fluoride)	0.47	0.17	0.53	0.33	0.21
	Cl (Chloride)	0.95	2	1.2	1	1.4
	SO4 (Sulfate)	3.6	11	3.8	3.3	4.1
1450	Arsenic	<1.0	2.1	<1.0	14	3.0
	Barium	<5.0	13	11	7.4	<5.0
	Cadmium	<0.080	<0.080	<0.080	<0.080	<0.080
	Chromium	1.1	<1.0	<1.0	<1.0	<1.0
	Copper	2.4	1.9	1.9	4.0	1.5
	Mercury	<0.50	<0.50	<0.50	<0.50	<0.50
	Molybdenum	28	15	12	8.3	41
	Nickel	1.4	<1.0	<1.0	1.6	<1.0
	Lead	<1.0	<1.0	<1.0	<1.0	<1.0
	Antimony	<1.0	1.8	<1.0	2.7	1.0
	Selenium	<1.0	<1.0	<1.0	<1.0	<1.0
	Zinc	4.3	3.1	<1.0	<1.0	<1.0
1920	Phenols (total)	<0.03	<0.03	<0.03	<0.03	<0.03

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* Accreditation status

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

Column page 3

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LIMS sample ID range AH92879 to AH92918

LABORATORY TEST REPORT



Results of analysis of 34 samples
received 6 November 2012

Report Date
20 November 2012

Ireland

FAO

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP ↓ Determinand ↓

CAS No ↓

Units ↓

*

215868

Sample ID	Sample No	Sampling Date	Depth	Matrix	SOP ↓	Determinand ↓	CAS No ↓	Units ↓	*	AH92879	AH92881	AH92882	AH92883	AH92885	AH92887
2610					Loss on ignition			%	N	3.16	4.65	10.3	10.8	7.67	15.5
2625					Total Organic Carbon			%	M	4.7	0.94	1.1	6.6	5.2	3.0
2450	7440382	Arsenic						mg kg ⁻¹	M	32	24	19	41	50	22
	7440393	Barium						mg kg ⁻¹	M	120	81	110	130	160	100
	7440439	Cadmium						mg kg ⁻¹	M	1.1	1.9	1.7	1.5	2.0	1.4
	7440473	Chromium						mg kg ⁻¹	M	16	16	22	22	26	16
	7440508	Copper						mg kg ⁻¹	M	94	37	40	110	140	50
	7439976	Mercury						mg kg ⁻¹	M	1.1	0.13	0.18	1.00	1.4	0.38
	7439987	Molybdenum						mg kg ⁻¹	M	4.0	4.4	5.1	5.7	6.5	3.3
	7440020	Nickel						mg kg ⁻¹	M	51	47	46	61	78	43
	7439921	Lead						mg kg ⁻¹	M	280	71	71	320	480	120
	7440364	Antimony						mg kg ⁻¹	N	2.6	<2.0	<2.0	3.6	4.2	<2.0
	7782492	Selenium						mg kg ⁻¹	M	0.53	0.6	0.61	0.64	0.87	0.57
	7440666	Zinc						mg kg ⁻¹	M	160	110	150	210	260	130
2670		TPH >C6-C10						mg kg ⁻¹	N	<1	<1	<1	<1	<1	<1
		TPH >C10-C21						mg kg ⁻¹	N	<1	<1	<1	<1	<1	<1
		TPH >C21-C40						mg kg ⁻¹	N	<1	<1	<1	<1	<1	<1
		Total Petroleum Hydrocarbons						mg kg ⁻¹	M	<10	<10	<10	<10	<10	<10
2760	1634044	Methyl tert-butyl ether						µg kg ⁻¹	N	<1	<1	<1	<1	<1	<1
	71432	Benzene						µg kg ⁻¹	M	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	108883	Toluene						µg kg ⁻¹	M	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	100414	Ethylbenzene						µg kg ⁻¹	M	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	1330207	m- & p-Xylene						µg kg ⁻¹	U	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0

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

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LIMS sample ID range AH92879 to AH92918

LABORATORY TEST REPORT

Results of analysis of 34 samples
received 6 November 2012



Report Date
20 November 2012

FAO

Login Batch No
Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP ↓ Determinand ↓

CAS No ↓

Units ↓

*

215868

	AH92889	AH92890	AH92891	AH92892	AH92894	AH92895
2610 Loss on ignition	TP125	TP125	TP125	TP122	TP122	TP121
2625 Total Organic Carbon	SL011	SL012	SL013	SL014	SL016	SL017
2450 Arsenic	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012
Barium	0.50m	0.80m	1.50m	0.50m	1.40m	1.00m
Cadmium	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Chromium	11.5	24.7	12.3	2.38	5.91	2.39
Copper	19	8.4	1.8	17	0.53	2.2
Mercury	38	30	26	55	9.7	18
Molybdenum	210	130	94	370	70	130
Nickel	0.94	0.83	2.1	0.59	0.59	2.0
Lead	19	52	17	23	18	21
Antimony	210	120	49	120	20	49
Selenium	1.1	0.66	0.18	0.40	<0.10	0.28
Zinc	8.9	8.1	5.0	8.1	2.0	5.5
TPH >C6-C10	92	110	55	73	30	50
TPH >C10-C21	380	200	85	450	37	180
TPH >C21-C40	3.3	3.0	2.0	3.6	<2.0	<2.0
Total Petroleum Hydrocarbons	0.76	<0.20	0.40	3.3	<0.20	0.36
Methyl tert-butyl ether	310	150	140	190	110	150
Benzene	<1	<1	<1	<1	<1	<1
Toluene	11	6.0	<1	6.2	<1	<1
Ethylbenzene	5.6	6.1	<1	6.0	<1	<1
m- & p-Xylene	16	12	<10	12	<10	<10
	<1	<1	<1	<1	<1	<1
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
	U	<1.0	<1.0	<1.0	<1.0	<1.0

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* Accreditation status

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

Column page 2

Report page 2 of 4

LIMS sample ID range AH92879 to AH92918

LABORATORY TEST REPORT

Results of analysis of 34 samples
received 6 November 2012

FAO

Login Batch No

Chemtest LIMS ID

Sample ID

Sample No

Sampling Date

Depth

Matrix

SOP ↓ Determinand ↓

CAS No ↓

Units ↓

*

		215868		AH92897		AH92899		AH92900		AH92901	
2610	Loss on ignition			TP117	SL019	TP117	SL021	TP115	SL022	TP115	SL023
2625	Total Organic Carbon			2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012
2450	Arsenic	7440382	mg kg ⁻¹	0.50m	SOIL	1.30m	SOIL	0.50m	SOIL	1.40m	SOIL
	Barium	7440393	mg kg ⁻¹								
	Cadmium	7440439	mg kg ⁻¹								
	Chromium	7440473	mg kg ⁻¹								
	Copper	7440508	mg kg ⁻¹								
	Mercury	7439976	mg kg ⁻¹								
	Molybdenum	7439987	mg kg ⁻¹								
	Nickel	7440020	mg kg ⁻¹								
	Lead	7439921	mg kg ⁻¹								
	Antimony	7440364	mg kg ⁻¹								
	Selenium	7782492	mg kg ⁻¹								
	Zinc	7440666	mg kg ⁻¹								
2670	TPH >C6-C10		mg kg ⁻¹								
	TPH >C10-C21		mg kg ⁻¹								
	TPH >C21-C40		mg kg ⁻¹								
	Total Petroleum Hydrocarbons		mg kg ⁻¹								
2760	Methyl tert-butyl ether	1634044	µg kg ⁻¹								
	Benzene	71432	µg kg ⁻¹								
	Toluene	108883	µg kg ⁻¹								
	Ethylbenzene	100414	µg kg ⁻¹								
	m- & p-Xylene	1330207	µg kg ⁻¹								

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

LABORATORY TEST REPORT

Results of analysis of 34 samples
received 6 November 2012



Report Date
20 November 2012

FAO

		215868					
		AH92879	AH92881	AH92882	AH92883	AH92885	AH92887
2760	o-Xylene	TP136	TP136	TP137	TP126	TP124	TP123
2800	Naphthalene	SL001	SL003	SL004	SL005	SL007	SL009
	Acenaphthylene	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012
	Acenaphthene	0.50m	1.50m	0.80m	0.50m	0.50m	0.65m
	Fluorene	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	Phenanthrene	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0	< 1.0
	Anthracene	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
	Fluoranthene	0.21	< 0.10	< 0.10	0.19	0.11	0.13
	Pyrene	0.2	< 0.10	< 0.10	0.15	0.12	0.11
	Benzo[a]anthracene	0.14	< 0.10	< 0.10	0.17	0.12	0.1
	Chrysene	0.21	< 0.10	< 0.10	0.2	0.16	0.1
	Benzo[b]fluoranthene	0.23	< 0.10	< 0.10	0.22	0.18	0.13
	Benzo[k]fluoranthene	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
	Benzo[a]pyrene	0.18	< 0.10	< 0.10	0.13	< 0.10	< 0.10
	Dibenzo[a,h]anthracene	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
	Indeno[1,2,3-cd]pyrene	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
	Benzo[g,h,i]perylene	0.14	< 0.10	< 0.10	< 0.10	< 0.10	< 0.10
	Total (of 16) PAHs	2	< 2.0	< 2.0	2.3	< 2.0	< 2.0
	Coronene by MS	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
2815	PCB 101	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 118	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 138	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 153	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 180	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

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All tests undertaken between 07/11/2012 and 15/11/2012

* Accreditation status

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

Column page 1

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LIMS sample ID range AH92879 to AH92918

LABORATORY TEST REPORT

Results of analysis of 34 samples
received 6 November 2012

FAO

		215868			
		AH92896	AH92897	AH92899	AH92900
		TP120	TP117	TP117	TP115
		SL018	SL019	SL021	SL023
		2/11/2012	2/11/2012	2/11/2012	2/11/2012
		1.00m	0.50m	1.30m	1.40m
		SOIL	SOIL	SOIL	SOIL
2760	o-Xylene	< 1.0	< 1.0	< 1.0	< 1.0
2800	Naphthalene	< 0.10	< 0.10	< 0.10	< 0.10
	Acenaphthylene	< 0.10	< 0.10	< 0.10	< 0.10
	Acenaphthene	< 0.10	< 0.10	< 0.10	< 0.10
	Fluorene	< 0.10	< 0.10	< 0.10	< 0.10
	Phenanthrene	0.33	0.33	1.3	0.14
	Anthracene	< 0.10	< 0.10	0.17	< 0.10
	Fluoranthene	0.47	< 0.10	0.92	0.16
	Pyrene	0.35	< 0.10	0.91	0.13
	Benzo[a]anthracene	< 0.10	0.26	0.51	< 0.10
	Chrysene	< 0.10	0.32	0.61	< 0.10
	Benzo[b]fluoranthene	< 0.10	0.48	0.73	0.12
	Benzo[k]fluoranthene	< 0.10	0.16	0.18	< 0.10
	Benzo[a]pyrene	< 0.10	0.34	0.56	< 0.10
	Dibenzo[a,h]anthracene	< 0.10	< 0.10	< 0.10	< 0.10
	Indeno[1,2,3-cd]pyrene	< 0.10	0.15	0.22	< 0.10
	Benzo[g,h,i]perylene	< 0.10	0.24	0.34	< 0.10
	Total (of 16) PAHs	< 2.0	3.1	6.7	< 2.0
	Coronene by MS	< 0.1	< 0.1	< 0.1	< 0.1
2815	PCB 101	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 118	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 138	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 153	< 0.01	< 0.01	< 0.01	< 0.01
	PCB 180	< 0.01	< 0.01	< 0.01	< 0.01

Consent of client for inspection purposes only. No other use.

LABORATORY TEST REPORT



Results of analysis of 34 samples
received 6 November 2012

Report Date
20 November 2012

FAO

215868

AH92879	AH92881	AH92882	AH92883	AH92885	AH92887
TP136	TP136	TP137	TP126	TP124	TP123
SL001	SL003	SL004	SL005	SL007	SL009
2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012
0.50m	1.50m	0.80m	0.50m	0.50m	0.65m
SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
2815 PCB 28	7012375	<0.01	<0.01	<0.01	<0.01
PCB 52	35693993	<0.01	<0.01	<0.01	<0.01
		M	M		

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All tests undertaken between 07/11/2012 and 15/11/2012

* Accreditation status

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

Column page 1

Report page 4 of 4

LIMS sample ID range AH92879 to AH92918



LABORATORY TEST REPORT



Results of analysis of 34 samples
received 6 November 2012

Report Date
20 November 2012

FAO

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	AH92889	AH92890	AH92891	AH92892	AH92894	AH92895
2815 PCB 28	TP125	TP125	TP125	TP122	TP122	TP121
PCB 52	SL011	SL012	SL013	SL014	SL016	SL017
	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012
	0.50m	0.80m	1.50m	0.50m	1.40m	1.00m
	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
	M	M	M	M	M	M
	7012375	35693993				
	mg kg ⁻¹	mg kg ⁻¹				

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LABORATORY TEST REPORT

Results of analysis of 34 samples
received 6 November 2012



Report Date
20 November 2012

FAO

		215868					
		AH92896	AH92897	AH92899	AH92900	AH92901	
2815	PCB 28	TP120	TP117	TP117	TP115	TP115	
		SL018	SL019	SL021	SL022	SL023	
		2/11/2012	2/11/2012	2/11/2012	2/11/2012	2/11/2012	
		1.00m	0.50m	1.30m	0.50m	1.40m	
		SOIL	SOIL	SOIL	SOIL	SOIL	
		<0.01	<0.01	<0.01	<0.01	<0.01	
		<0.01	<0.01	<0.01	<0.01	<0.01	
		7012375					
		35693993					
		M					
		M					
		mg kg ⁻¹					
		mg kg ⁻¹					

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

[Redacted]

[Redacted]

20 November 2012

[Redacted]

Test Report Number [Redacted]

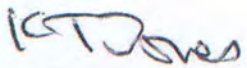
Your Project Reference [Redacted]

Please find enclosed the results of analysis for the samples received 9 November 2012.

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



[Redacted] Technical Manager



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
- All results are expressed on a dry weight basis
- The following tests were analysed on samples as received and the results subsequently corrected to a dry weight basis TPH, BTEX, VOCs, SVOCs, PCBs, phenols
- For all other tests the samples were dried at < 37°C prior to analysis
- Uncertainties of measurement for the determinands tested are available upon request
- None of the test results included in this report have been recovery corrected



Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 87 samples
received 9 November 2012

Report Date
19 November 2012

Login Batch No 215977
Chemtest LIMS ID AH93771 Soil: AH93725
Sample ID TP146
Sample No SL024
Sampling Date 07/11/2012
Depth 0.80m

**Landfill Waste Acceptance
Criteria Limits**

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
-------------------------	---	-----------------------------

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%		7.2	3	5	6
Loss on Ignition	2610	N	%		11.7			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	14	0.14	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	3.1	0.031	2	50	100
Mercury	1450	N	µg l ⁻¹	0.96	0.0096	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	9.3	0.093	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	3.6	0.036	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	1.8	0.018	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.1	11	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.21	2.1	10	150	500
Sulfate	1220	N	mg l ⁻¹	3.4	34	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	160	1600	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	6.5	65	500	800	1000

All tests undertaken between 9-Nov-2012 and 19-Nov-2012

* Accreditation status

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

Column page 1

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LIMS sample ID range AH93725 to AH93811

Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 87 samples
received 9 November 2012

Report Date
19 November 2012

Login Batch No 215977
Chemtest LIMS ID AH93772 Soil: AH93726
Sample ID TP146
Sample No SL025
Sampling Date 07/11/2012
Depth 1.40m

**Landfill Waste Acceptance
Criteria Limits**

	Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓		1	3	5	6
Total Organic Carbon	2625	M	%		1	3	5	6
Loss on Ignition	2610	N	%		8.49			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	3.9	0.039	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.3	0.013	2	50	100
Mercury	1450	N	µg l ⁻¹	0.69	0.0069	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	34	0.34	0.5	10	30
Nickel	1450	N	µg l ⁻¹	1	0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	1.5	0.015	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	1.2	0.012	4	50	200
Chloride	1220	N	mg l ⁻¹	0.97	9.7	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.14	1.4	10	150	500
Sulfate	1220	N	mg l ⁻¹	0.66	6.6	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	120	1200	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	6.8	68	500	800	1000

All tests undertaken between 9-Nov-2012 and 19-Nov-2012

* Accreditation status

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

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LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 87 samples
received 9 November 2012

Report Date
19 November 2012

Login Batch No **215977**
Chemtest LIMS ID AH93773 Soil: AH93727
Sample ID TP112
Sample No SL026
Sampling Date 07/11/2012
Depth 0.50m

Landfill Waste Acceptance Criteria Limits

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
-------------------------	---	-----------------------------

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓					
Total Organic Carbon	2625	M	%		5.2	3	5	6
Loss on Ignition	2610	N	%		10.1			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	7.2	0.072	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	2.7	0.027	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	4.7	0.047	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	2.2	0.022	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.3	13	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.31	3.1	10	150	500
Sulfate	1220	N	mg l ⁻¹	1.1	11	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	160	1600	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	11	110	500	800	1000

All tests undertaken between 9-Nov-2012 and 19-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

**Results of analysis of 87 samples
received 9 November 2012**

**Report Date
19 November 2012**

Login Batch No 215977
Chemtest LIMS ID AH93774 Soil: AH93728
Sample ID TP112
Sample No SL027
Sampling Date 07/11/2012
Depth 1.30m

**Landfill Waste Acceptance
Criteria Limits**

	Stable Non-reactive	
Inert Waste Landfill	Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓	0.9	3	5	6
Total Organic Carbon	2625	M	%	0.9	3	5	6
Loss on Ignition	2610	N	%	3.61			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	2	25
Barium		N	µg l ⁻¹	<5.0	< 0.05	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	5.5	0.055	0.5	10	70
Copper	1450	N	µg l ⁻¹	1.2	0.012	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	26	0.26	0.5	10	30
Nickel	1450	N	µg l ⁻¹	3.3	0.033	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	<1.0	< 0.01	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	2.3	0.023	4	50	200
Chloride	1220	N	mg l ⁻¹	1.2	12	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.25	2.5	10	150	500
Sulfate	1220	N	mg l ⁻¹	2.6	26	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	140	1400	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	7.5	75	500	800	1000

All tests undertaken between 9-Nov-2012 and 19-Nov-2012

* Accreditation status

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

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Chemtest

LABORATORY TEST REPORT

CEN 10:1 CUMULATIVE SINGLE STAGE BATCH TEST

Results of analysis of 87 samples
received 9 November 2012

Report Date
19 November 2012

Login Batch No 215977
 Chemtest LIMS ID AH93775 Soil: AH93729
 Sample ID TP113
 Sample No SL027
 Sampling Date 07/11/2012
 Depth 0.40m

**Landfill Waste Acceptance
Criteria Limits**

Inert Waste Landfill	Stable Non-reactive Hazardous Waste in Non- Hazardous Landfill	Hazardous Waste Landfill
-------------------------	---	-----------------------------

Solid Waste Analysis

Determinand ↓	SOP ↓	*	Units ↓				
Total Organic Carbon	2625	M	%	5.4	3	5	6
Loss on Ignition	2610	N	%	7.17			10

Eluate Analysis

Determinand ↓	SOP ↓	*	Units ↓	10:1 Eluate	Cumulative 10:1 Eluate mg kg ⁻¹	Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg		
Arsenic	1450	N	µg l ⁻¹	9.4	0.094	0.5	2	25
Barium		N	µg l ⁻¹	5.6	0.056	20	100	300
Cadmium	1450	N	µg l ⁻¹	<0.080	< 0.0008	0.04	1	5
Chromium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	70
Copper	1450	N	µg l ⁻¹	3.7	0.037	2	50	100
Mercury	1450	N	µg l ⁻¹	<0.50	< 0.005	0.01	0.2	2
Molybdenum	1450	N	µg l ⁻¹	8.9	0.089	0.5	10	30
Nickel	1450	N	µg l ⁻¹	<1.0	< 0.01	0.4	10	40
Lead	1450	N	µg l ⁻¹	<1.0	< 0.01	0.5	10	50
Antimony	1450	N	µg l ⁻¹	2.1	0.021	0.06	0.7	5
Selenium	1450	N	µg l ⁻¹	<1.0	< 0.01	0.1	0.5	7
Zinc	1450	N	µg l ⁻¹	<1.0	< 0.01	4	50	200
Chloride	1220	N	mg l ⁻¹	1.3	13	800	15000	25000
Fluoride	1220	N	mg l ⁻¹	0.47	4.7	10	150	500
Sulfate	1220	N	mg l ⁻¹	4.6	46	1000	20000	50000
Total Dissolved Solids	1040	N	mg l ⁻¹	96	960	4000	60000	100000
Phenol Index	1920	N	mg l ⁻¹	< 0.03	< 0.3	1		
Dissolved Organic Carbon	1610	N	mg l ⁻¹	6.1	61	500	800	1000

All tests undertaken between 9-Nov-2012 and 19-Nov-2012

* Accreditation status

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

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APPENDIX 2:

WAC ANALYSIS RESULTS - SITE B

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Scientific Analysis Laboratories

Certificate of Analysis

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

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

Supplement to Report Number: 117654-2

Date of Report: 21-Jan-2008

Customer: [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

Customer Contact: [REDACTED]
Customer Job Reference: [REDACTED]
Customer Site Reference: [REDACTED]

Date Job Recieved at SAL: 19-Nov-2007
Date Analysis Started: 21-Nov-2007
Date Analysis Completed: 11-Dec-2007

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

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Report checked
and authorised by :
Miss Pam Knott
Customer Services Manager

Index to symbols used in this report

Value	Description
AR	As Received
2:1	Leachate to BS EN 12457-3 (2:1)
8:1	Leachate to BS EN 12457-3 (8:1)
10:1	Data for BS EN 12457-3 (10:1)
2	LOD Raised Due to Matrix Interference
3	LOD Raised Due to Elevated Blank
9	LOD raised due to dilution of sample
13	Results have been blank corrected.
U	Analysis is UKAS accredited
N	Analysis is not accredited

Notes:
Supplemental report issued to include TPH(C10-C40)

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Waste Acceptance Criteria

Customer Sample Reference : TP7 0.5
 SAL Sample Reference : 117654 001
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	4.8	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.100	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	820	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	3.2	100.0		
pH	Probe	0.0		U	8.5		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.029	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.061	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.16	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00031	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	12	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.11	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.081	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	200	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	1.9	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.10	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.00063	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.032	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.041	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.011	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	99	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	930	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.089	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7 1m
 SAL Sample Reference : 117654 002
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	5.0	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.013	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	72	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	1.7	100.0		
pH	Probe	0.0		U	9.2		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.047	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.097	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.27	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00078	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	130	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.039	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.035	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	93	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	2.5	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.099	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.28	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.11	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.015	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	840	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	2300	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.071	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7 1.5m
 SAL Sample Reference : 117654 003
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	16	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.0036	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	300	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.77	100.0			
pH	Probe	0.0		U	8.1		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.017	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.14	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.11	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00028	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	2700	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.042	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.080	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	73	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	11	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.0045	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.040	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.020	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.082	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	600	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	6300	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.044	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7 2m
 SAL Sample Reference : 117654 004
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	21	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.0015	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	140	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.34	100.0		
pH	Probe	0.0		U	8.0		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.040	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.17	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.13	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00050	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	3100	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.034	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.079	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	72	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	9.7	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.0081	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.12	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.029	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.094	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	920	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	6900	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.057	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7 3m
 SAL Sample Reference : 117654 005
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	19	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.0016	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	210	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.78	100.0		
pH	Probe	0.0		U	8.1		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.21	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.15	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.33	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0030	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	4600	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.057	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.093	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	100	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	5.2	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.012	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.91	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.082	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.16	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	1800	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	10000	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.14	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7a 0.5m
 SAL Sample Reference : 117654 006
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	4.8	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	⁽⁹⁾ <0.0035	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	150	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	14	100.0			
pH	Probe	0.0		U	8.6		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.032	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.095	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.24	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00043	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	25	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.036	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.040	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	62	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	4.3	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.014	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.13	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.86	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.029	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	850	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	1700	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.091	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7a 1m
 SAL Sample Reference : 117654 007
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	31		3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	0.0050		6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035		1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	3100		500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.27		100.0		
pH	Probe	0.0		U	6.6			>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.086		0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.051		0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.50		20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0011		0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	480		800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.032		0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.014		2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	130		500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	1.8		10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.0041		0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050		0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.38		0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	1.3		0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0		1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.024		0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	5700		1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	7700		4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.35		4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7a 2m
 SAL Sample Reference : 117654 008
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	1.8	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.00035	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	490	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.05	100.0			
pH	Probe	0.0		U	7.8		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.049	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.047	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.34	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0012	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	110	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.030	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.013	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	100	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	1.9	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.42	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.14	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.015	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	1200	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	2600	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.065	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7a 3m
 SAL Sample Reference : 117654 009
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	2.2	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	1000	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.01	100.0			
pH	Probe	0.0		U	7.6		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.050	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.050	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.26	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00050	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	150	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.032	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.015	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	120	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	2.9	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.16	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.091	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.012	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	700	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	2700	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.065	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7a 4.2m
 SAL Sample Reference : 117654 010
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	0.5	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	18	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	<0.01	100.0		
pH	Probe	0.0		U	7.8		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.037	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.013	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.079	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00055	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	130	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.020	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.026	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	100	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	2.5	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	<0.0030	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.17	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.021	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.0079	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	720	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	1900	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.063	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7b 0.5m

SAL Sample Reference : 117654 011

SAL Reference : 117654

Project Site : ██████████

Customer Reference : ██████████

Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	1.6	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.026	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	16	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	8.0	100.0			
pH	Probe	0.0		U	8.2		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.012	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.033	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.23	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00032	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	3.0	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.026	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.031	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	81	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	1.7	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.033	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.00058	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.036	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.019	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.0052	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	230	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	950	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.074	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7b 1m
 SAL Sample Reference : 117654 012
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	32	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	81	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	1.3	100.0		
pH	Probe	0.0		U	6.9		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.021	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.021	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.56	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0016	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	1800	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.023	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.041	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	51	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	1.6	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.032	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.042	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.19	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.061	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	2500	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	7700	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.79	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7b 2m
 SAL Sample Reference : 117654 013
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	1.2	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	(13) 7.0	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.02	100.0		
pH	Probe	0.0		U	6.9		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.031	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.067	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.43	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0015	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	350	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.028	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.0100	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	75	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	3.9	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.013	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.57	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.066	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.021	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	740	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	3100	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.068	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7b 4m
 SAL Sample Reference : 117654 015
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	0.4	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	0.0050	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	(3) <7.0	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	<0.01	100.0		
pH	Probe	0.0		U	7.3		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.017	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.012	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.078	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00057	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	32	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.022	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.014	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	72	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	1.00	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.0035	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.17	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.023	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.0063	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	250	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	1700	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.056	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7c 0.5m
 SAL Sample Reference : 117654 016
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	1.7	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.013	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	43	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	1.5	100.0			
pH	Probe	0.0		U	7.8		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.016	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.063	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.24	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00036	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	110	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.025	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.028	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	71	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	4.0	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.019	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.051	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.029	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.0083	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	1400	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	2300	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.068	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7c 1m
 SAL Sample Reference : 117654 017
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	26	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	0.0080	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	30	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.82	100.0			
pH	Probe	0.0		U	8.3		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.012	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.058	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.13	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00046	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	13	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.034	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.037	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	69	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	2.7	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.060	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.00075	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.093	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.010	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.010	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	63	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	890	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.082	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7c 1.5m
 SAL Sample Reference : 117654 018
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Total Organic Carbon	OX/IR	0.1	%	N	1.7	3.0	5.0	6.0
BTEX (Sum)	Calc	0.0040	mg/kg	U	0.0070	6.0		
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0		
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	(13) 6.0	500.0		
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	1.1	100.0		
pH	Probe	0.0		U	7.2		>6.0	
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0			

10:1 Leachate					Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol				
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.049	0.06	0.7	5.0
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.024	0.5	2.0	25.0
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.61	20.0	100.0	300.0
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0015	0.04	1.0	5.0
Chloride	Calc / IC	0.50	mg/kg	N	1200	800.0	15000.0	25000.0
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.033	0.5	10.0	70.0
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.032	2.0	50.0	100.0
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	72	500.0	800.0	1000.0
Fluoride	Calc / IC	0.50	mg/kg	N	6.6	10.0	150.0	500.0
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.0063	0.5	10.0	50.0
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.14	0.5	10.0	30.0
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.37	0.4	10.0	40.0
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0		
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.046	0.1	0.5	7.0
Sulphate ion	Calc / IC	0.50	mg/kg	N	1800	1000.0	20000.0	50000.0
Total Dissolved Solids	Calc	100	mg/kg	N	5500	4000.0	60000.0	100000.0
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.11	4.0	50.0	200.0

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7c 2.5m
 SAL Sample Reference : 117654 019
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	2.7	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	(13) 4.0	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	<0.01	100.0			
pH	Probe	0.0		U	7.4		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.071	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.085	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.30	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00092	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	480	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.030	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.022	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	83	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	2.2	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.0078	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.28	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.072	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.033	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	860	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	3800	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.074	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7c 3.5m
 SAL Sample Reference : 117654 020
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	3.4	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	18	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	0.66	100.0			
pH	Probe	0.0		U	7.3		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.075	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.14	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.0100	mg/kg	N	0.21	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.0018	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	1000	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.053	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.017	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	64	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	6.5	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.024	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.66	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.083	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.038	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	1300	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	2800	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.091	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

Waste Acceptance Criteria

Customer Sample Reference : TP7c 4.4m
 SAL Sample Reference : 117654 021
 SAL Reference : 117654
 Project Site : ██████████
 Customer Reference : ██████████
 Test Portion Mass (g) : 175

Soil Summary						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Total Organic Carbon	OX/IR	0.1	%	N	0.3	3.0	5.0	6.0	
BTEX (Sum)	Calc	0.0040	mg/kg	U	<0.013	6.0			
PCB EC7 (Sum)	Calc	0.00035	mg/kg	U	<0.00035	1.0			
TPH C10-C40 (sum)	Calc	1.0	mg/kg	N	19	500.0			
PAH(total)	GC/MS (SIR)	0.01	mg/kg	U	<0.01	100.0			
pH	Probe	0.0		U	7.6		>6.0		
Acid Neutralising Capacity (pH 7)	Titration	2.0	Mol/kg	N	<2.0				

10:1 Leachate						Result	Inert waste landfill	Stable non-reactive	Hazardous waste landfill
Determinand	Technique	LOD	Units	Symbol					
Antimony (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.024	0.06	0.7	5.0	
Arsenic (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	0.054	0.5	2.0	25.0	
Barium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.15	20.0	100.0	300.0	
Cadmium (Dissolved)	Calc / ICP/MS (Filtered)	0.00020	mg/kg	N	0.00075	0.04	1.0	5.0	
Chloride	Calc / IC	0.50	mg/kg	N	220	800.0	15000.0	25000.0	
Chromium (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.034	0.5	10.0	70.0	
Copper (Dissolved)	Calc / ICP/MS (Filtered)	0.0050	mg/kg	N	0.017	2.0	50.0	100.0	
Dissolved Organic Carbon	Calc / OX/IR	10	mg/kg	N	82	500.0	800.0	1000.0	
Fluoride	Calc / IC	0.50	mg/kg	N	2.3	10.0	150.0	500.0	
Lead (Dissolved)	Calc / ICP/MS (Filtered)	0.0030	mg/kg	N	0.017	0.5	10.0	50.0	
Mercury (Dissolved)	Calc / ICP/MS (Filtered)	0.00050	mg/kg	N	<0.00050	0.01	0.2	2.0	
Molybdenum (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.17	0.5	10.0	30.0	
Nickel (Dissolved)	Calc / ICP/MS (Filtered)	0.010	mg/kg	N	0.023	0.4	10.0	40.0	
Phenols(Mono)	Calc / Colorimetry	1.0	mg/kg	N	<1.0	1.0			
Selenium (Dissolved)	Calc / ICP/MS (Filtered)	0.0020	mg/kg	N	0.011	0.1	0.5	7.0	
Sulphate ion	Calc / IC	0.50	mg/kg	N	580	1000.0	20000.0	50000.0	
Total Dissolved Solids	Calc	100	mg/kg	N	3800	4000.0	60000.0	100000.0	
Zinc (Dissolved)	Calc / ICP/MS (Filtered)	0.020	mg/kg	N	0.069	4.0	50.0	200.0	

From: EC Directive 99/31/EC and Landfill Regulations 2002 (as amended)

Notes:- Cumulative release at L/S=10 (mg/kg of dry matter) in accordance with BS EN 12457. Soil leaching procedure is not covered by our UKAS accreditation

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
BTEX										
SAL Reference					117654 001	117654 002	117654 003	117654 004	117654 005	
Customer Sample Reference					TP7 0.5	TP7 1m	TP7 1.5m	TP7 2m	TP7 3m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Benzene	GC/MS (Headspace)	1	µg/kg	U	(3) <5	(13) <5	(13) <5	(13) <5	(13) <5	
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1	
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1	
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1	
Toluene	GC/MS (Headspace)	1	µg/kg	U	(3) <5	(13) <5	(13) <5	(13) <5	(13) <5	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
BTEX										
SAL Reference					117654 006	117654 007	117654 008	117654 009	117654 010	
Customer Sample Reference					TP7a 0.5m	TP7a 1m	TP7a 2m	TP7a 3m	TP7a 4.2m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Benzene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5	
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	3	<1	<1	<1	
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	1	<1	<1	<1	
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	1	<1	<1	<1	
Toluene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
BTEX										
SAL Reference					117654 011	117654 012	117654 013	117654 015	117654 016	
Customer Sample Reference					TP7b 0.5m	TP7b 1m	TP7b 2m	TP7b 4m	TP7c 0.5m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Benzene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(2) <10	(2) <20	(13) <5	(13) <5	
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	(2) <10	(2) <20	<1	<1	
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	(2) <10	(2) <20	3	<1	
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	(2) <10	(2) <20	2	<1	
Toluene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(2) <10	(2) <20	(13) <5	(13) <5	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
BTEX										
SAL Reference					117654 017	117654 018	117654 019	117654 020	117654 021	
Customer Sample Reference					TP7c 1m	TP7c 1.5m	TP7c 2.5m	TP7c 3.5m	TP7c 4.4m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Benzene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5	
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1	
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	4	<1	<1	<1	
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	3	<1	<1	<1	
Toluene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
Miscellaneous										
SAL Reference					117654 001	117654 002	117654 003	117654 004	117654 005	
Customer Sample Reference					TP7 0.5	TP7 1m	TP7 1.5m	TP7 2m	TP7 3m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Gasoline Range Organics	GC/MS (Headspace)	100	µg/kg	N	-	<100	<100	490	6000	
DRO	GC/FID	1	mg/kg	U	-	(9) <10	10	53	39	
Mineral Range Organics	GC/FID	1	mg/kg	U	750	55	280	60	120	
Phenol	GC/MS	0.1	mg/kg	U	-	<0.1	<0.1	<0.1	<0.1	
Asbestos (Screen Only)	Visual			N	-	-	N.D.	-	-	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
Miscellaneous										
SAL Reference					117654 006	117654 007	117654 008	117654 009	117654 010	
Customer Sample Reference					TP7a 0.5m	TP7a 1m	TP7a 2m	TP7a 3m	TP7a 4.2m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Gasoline Range Organics	GC/MS (Headspace)	100	µg/kg	N	-	<100	4000	23000	-	
DRO	GC/FID	1	mg/kg	U	-	950	150	220	-	
Mineral Range Organics	GC/FID	1	mg/kg	U	71	2000	210	640	7	
Phenol	GC/MS	0.1	mg/kg	U	-	3.3	<0.1	<0.1	-	
Asbestos (Screen Only)	Visual			N	-	-	-	-	-	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
Miscellaneous										
SAL Reference					117654 011	117654 012	117654 013	117654 015	117654 016	
Customer Sample Reference					TP7b 0.5m	TP7b 1m	TP7b 2m	TP7b 4m	TP7c 0.5m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Gasoline Range Organics	GC/MS (Headspace)	100	µg/kg	N	-	(2) <200	(2) <400	-	-	
DRO	GC/FID	1	mg/kg	U	-	12	2	-	-	
Mineral Range Organics	GC/FID	1	mg/kg	U	6	67	(13) <1	(13) <1	30	
Phenol	GC/MS	0.1	mg/kg	U	-	<0.1	<0.1	-	-	
Asbestos (Screen Only)	Visual			N	-	-	-	-	-	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
Miscellaneous										
SAL Reference					117654 017	117654 018	117654 019	117654 020	117654 021	
Customer Sample Reference					TP7c 1m	TP7c 1.5m	TP7c 2.5m	TP7c 3.5m	TP7c 4.4m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Gasoline Range Organics	GC/MS (Headspace)	100	µg/kg	N	<100	<100	<100	-	-	
DRO	GC/FID	1	mg/kg	U	3	<1	<1	-	-	
Mineral Range Organics	GC/FID	1	mg/kg	U	26	(13) <1	(13) <1	7	9	
Phenol	GC/MS	0.1	mg/kg	U	<0.1	<0.1	<0.1	-	-	
Asbestos (Screen Only)	Visual			N	-	-	-	-	-	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
PCB EC7 and Total										
SAL Reference					117654 001	117654 002	117654 003	117654 004	117654 005	
Customer Sample Reference					TP7 0.5	TP7 1m	TP7 1.5m	TP7 2m	TP7 3m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Polychlorinated biphenyl BZ#101	GC/MS (HR)	0.05	µg/kg	U	14	1.4	0.49	0.18	0.23	
Polychlorinated biphenyl BZ#118	GC/MS (HR)	0.05	µg/kg	U	2.0	(9) <0.50	0.10	<0.05	0.05	
Polychlorinated biphenyl BZ#138	GC/MS (HR)	0.05	µg/kg	U	32	4.6	1.4	0.60	0.62	
Polychlorinated biphenyl BZ#153	GC/MS (HR)	0.05	µg/kg	U	32	4.3	1.0	0.42	0.46	
Polychlorinated biphenyl BZ#180	GC/MS (HR)	0.05	µg/kg	U	18	2.2	0.57	0.33	0.26	
Polychlorinated biphenyl BZ#28	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	(9) <0.50	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#52	GC/MS (HR)	0.05	µg/kg	U	1.5	(9) <0.50	<0.05	<0.05	<0.05	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
PCB EC7 and Total										
SAL Reference					117654 006	117654 007	117654 008	117654 009	117654 010	
Customer Sample Reference					TP7a 0.5m	TP7a 1m	TP7a 2m	TP7a 3m	TP7a 4.2m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Polychlorinated biphenyl BZ#101	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	<0.05	0.11	<0.05	<0.05	
Polychlorinated biphenyl BZ#118	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	<0.05	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#138	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	0.06	0.12	<0.05	<0.05	
Polychlorinated biphenyl BZ#153	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	0.06	0.12	0.06	<0.05	
Polychlorinated biphenyl BZ#180	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	<0.05	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#28	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	<0.05	<0.05	<0.05	<0.05	
Polychlorinated biphenyl BZ#52	GC/MS (HR)	0.05	µg/kg	U	(9) <0.50	<0.05	<0.05	<0.05	<0.05	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
PCB EC7 and Total										
SAL Reference					117654 011	117654 012	117654 013	117654 015	117654 016	
Customer Sample Reference					TP7b 0.5m	TP7b 1m	TP7b 2m	TP7b 4m	TP7c 0.5m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Polychlorinated biphenyl BZ#101	GC/MS (HR)	0.05	µg/kg	U	4.4	<0.05	<0.05	<0.05	2.4	
Polychlorinated biphenyl BZ#118	GC/MS (HR)	0.05	µg/kg	U	2.0	<0.05	<0.05	<0.05	0.80	
Polychlorinated biphenyl BZ#138	GC/MS (HR)	0.05	µg/kg	U	8.3	<0.05	<0.05	<0.05	4.0	
Polychlorinated biphenyl BZ#153	GC/MS (HR)	0.05	µg/kg	U	4.6	<0.05	<0.05	<0.05	2.4	
Polychlorinated biphenyl BZ#180	GC/MS (HR)	0.05	µg/kg	U	1.5	<0.05	<0.05	<0.05	1.1	
Polychlorinated biphenyl BZ#28	GC/MS (HR)	0.05	µg/kg	U	2.2	<0.05	<0.05	<0.05	1.0	
Polychlorinated biphenyl BZ#52	GC/MS (HR)	0.05	µg/kg	U	2.7	<0.05	<0.05	<0.05	1.6	

SAL Reference: 117654
 Project Site: ██████████
 Customer Reference: ████████

Soil
 Analysed as Soil
 PCB EC7 and Total

					SAL Reference	117654 017	117654 018	117654 019	117654 020	117654 021
					Customer Sample Reference	TP7c 1m	TP7c 1.5m	TP7c 2.5m	TP7c 3.5m	TP7c 4.4m
					Test Sample	AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol						
Polychlorinated biphenyl BZ#101	GC/MS (HR)	0.05	µg/kg	U	1.8	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#118	GC/MS (HR)	0.05	µg/kg	U	1.0	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#138	GC/MS (HR)	0.05	µg/kg	U	2.0	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#153	GC/MS (HR)	0.05	µg/kg	U	1.2	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#180	GC/MS (HR)	0.05	µg/kg	U	0.30	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#28	GC/MS (HR)	0.05	µg/kg	U	0.70	<0.05	<0.05	<0.05	<0.05	<0.05
Polychlorinated biphenyl BZ#52	GC/MS (HR)	0.05	µg/kg	U	1.0	<0.05	<0.05	<0.05	<0.05	<0.05

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SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
Total and Speciated USEPA16 PAH										
SAL Reference					117654 001	117654 002	117654 003	117654 004	117654 005	
Customer Sample Reference					TP7 0.5	TP7 1m	TP7 1.5m	TP7 2m	TP7 3m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Acenaphthene	GC/MS (SIR)	0.01	mg/kg	U	<0.01	<0.01	<0.01	<0.01	0.01	
Acenaphthylene	GC/MS (SIR)	0.01	mg/kg	U	0.06	0.02	0.01	<0.01	0.03	
Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.06	0.07	0.03	0.01	0.02	
Benzo(a)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.21	0.17	0.06	0.03	0.04	
Coronene	GC/MS (SIR)	0.01	mg/kg	N	0.04	<0.01	<0.01	<0.01	<0.01	
Benzo(a)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.40	0.12	0.06	0.02	0.05	
Benzo(b/k)Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	0.68	0.30	0.13	0.05	0.12	
Benzo(ghi)Perylene	GC/MS (SIR)	0.01	mg/kg	U	0.30	0.07	0.04	0.02	0.04	
Chrysene	GC/MS (SIR)	0.01	mg/kg	U	0.27	0.16	0.07	0.03	0.05	
Dibenzo(ah)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.10	0.02	0.01	<0.01	0.01	
Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	0.33	0.29	0.11	0.04	0.08	
Fluorene	GC/MS (SIR)	0.01	mg/kg	U	0.01	0.01	<0.01	<0.01	0.02	
Indeno(123-cd)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.27	0.07	0.04	0.02	0.04	
Naphthalene	GC/MS (SIR)	0.01	mg/kg	U	0.03	0.02	0.03	0.02	0.08	
Phenanthrene	GC/MS (SIR)	0.01	mg/kg	U	0.19	0.15	0.08	0.06	0.10	
Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.32	0.24	0.10	0.04	0.09	

SAL Reference: 117654										
Project Site: ██████████										
Customer Reference: ██████████										
Soil					Analysed as Soil					
Total and Speciated USEPA16 PAH										
SAL Reference					117654 006	117654 007	117654 008	117654 009	117654 010	
Customer Sample Reference					TP7a 0.5m	TP7a 1m	TP7a 2m	TP7a 3m	TP7a 4.2m	
Test Sample					AR	AR	AR	AR	AR	
Determinand	Technique	LOD	Units	Symbol						
Acenaphthene	GC/MS (SIR)	0.01	mg/kg	U	0.03	<0.01	<0.01	<0.01	<0.01	
Acenaphthylene	GC/MS (SIR)	0.01	mg/kg	U	0.18	<0.01	<0.01	<0.01	<0.01	
Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.23	0.01	<0.01	<0.01	<0.01	
Benzo(a)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	1.0	0.01	<0.01	<0.01	<0.01	
Coronene	GC/MS (SIR)	0.01	mg/kg	N	0.07	<0.01	<0.01	<0.01	<0.01	
Benzo(a)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.97	0.01	<0.01	<0.01	<0.01	
Benzo(b/k)Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	2.4	0.04	0.01	0.01	<0.01	
Benzo(ghi)Perylene	GC/MS (SIR)	0.01	mg/kg	U	0.60	0.01	<0.01	<0.01	<0.01	
Chrysene	GC/MS (SIR)	0.01	mg/kg	U	1.2	0.03	<0.01	<0.01	<0.01	
Dibenzo(ah)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.16	<0.01	<0.01	<0.01	<0.01	
Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	2.7	0.02	<0.01	<0.01	<0.01	
Fluorene	GC/MS (SIR)	0.01	mg/kg	U	0.06	<0.01	<0.01	<0.01	<0.01	
Indeno(123-cd)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.58	0.01	<0.01	<0.01	<0.01	
Naphthalene	GC/MS (SIR)	0.01	mg/kg	U	0.03	0.03	0.03	<0.01	<0.01	
Phenanthrene	GC/MS (SIR)	0.01	mg/kg	U	1.7	0.10	0.01	<0.01	<0.01	
Pyrene	GC/MS (SIR)	0.01	mg/kg	U	2.2	0.01	<0.01	<0.01	<0.01	

SAL Reference: 117654									
Project Site: ██████████									
Customer Reference: ██████████									
Soil					Analysed as Soil				
Total and Speciated USEPA16 PAH									
SAL Reference					117654 011	117654 012	117654 013	117654 015	117654 016
Customer Sample Reference					TP7b 0.5m	TP7b 1m	TP7b 2m	TP7b 4m	TP7c 0.5m
Test Sample					AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol					
Acenaphthene	GC/MS (SIR)	0.01	mg/kg	U	0.10	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	GC/MS (SIR)	0.01	mg/kg	U	0.03	0.01	<0.01	<0.01	0.01
Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.43	0.06	<0.01	<0.01	0.05
Benzo(a)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.66	0.16	<0.01	<0.01	0.15
Coronene	GC/MS (SIR)	0.01	mg/kg	N	0.03	<0.01	<0.01	<0.01	0.01
Benzo(a)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.54	0.12	<0.01	<0.01	0.12
Benzo(b/k)Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	1.4	0.25	0.02	<0.01	0.34
Benzo(ghi)Perylene	GC/MS (SIR)	0.01	mg/kg	U	0.27	0.07	<0.01	<0.01	0.09
Chrysene	GC/MS (SIR)	0.01	mg/kg	U	0.68	0.14	<0.01	<0.01	0.16
Dibenzo(ah)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.07	0.02	<0.01	<0.01	0.02
Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	1.4	0.15	<0.01	<0.01	0.26
Fluorene	GC/MS (SIR)	0.01	mg/kg	U	0.12	0.01	<0.01	<0.01	<0.01
Indeno(123-cd)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.25	0.05	<0.01	<0.01	0.08
Naphthalene	GC/MS (SIR)	0.01	mg/kg	U	0.11	0.04	<0.01	<0.01	0.02
Phenanthrene	GC/MS (SIR)	0.01	mg/kg	U	1.1	0.14	<0.01	<0.01	0.11
Pyrene	GC/MS (SIR)	0.01	mg/kg	U	1.1	0.17	<0.01	<0.01	0.21

SAL Reference: 117654									
Project Site: ██████████									
Customer Reference: ██████████									
Soil					Analysed as Soil				
Total and Speciated USEPA16 PAH									
SAL Reference					117654 017	117654 018	117654 019	117654 020	117654 021
Customer Sample Reference					TP7c 1m	TP7c 1.5m	TP7c 2.5m	TP7c 3.5m	TP7c 4.4m
Test Sample					AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol					
Acenaphthene	GC/MS (SIR)	0.01	mg/kg	U	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	GC/MS (SIR)	0.01	mg/kg	U	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.03	0.07	<0.01	0.05	<0.01
Benzo(a)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	0.07	0.11	<0.01	0.06	<0.01
Coronene	GC/MS (SIR)	0.01	mg/kg	N	<0.01	<0.01	<0.01	<0.01	<0.01
Benzo(a)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.05	0.05	<0.01	0.03	<0.01
Benzo(b/k)Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	0.15	0.16	<0.01	0.08	<0.01
Benzo(ghi)Perylene	GC/MS (SIR)	0.01	mg/kg	U	0.04	0.04	<0.01	0.02	<0.01
Chrysene	GC/MS (SIR)	0.01	mg/kg	U	0.08	0.09	<0.01	0.05	<0.01
Dibenzo(ah)Anthracene	GC/MS (SIR)	0.01	mg/kg	U	<0.01	0.01	<0.01	<0.01	<0.01
Fluoranthene	GC/MS (SIR)	0.01	mg/kg	U	0.14	0.20	<0.01	0.12	<0.01
Fluorene	GC/MS (SIR)	0.01	mg/kg	U	<0.01	0.02	<0.01	0.02	<0.01
Indeno(123-cd)Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.03	0.03	<0.01	0.02	<0.01
Naphthalene	GC/MS (SIR)	0.01	mg/kg	U	0.04	0.02	<0.01	0.03	<0.01
Phenanthrene	GC/MS (SIR)	0.01	mg/kg	U	0.11	0.16	<0.01	0.11	<0.01
Pyrene	GC/MS (SIR)	0.01	mg/kg	U	0.12	0.13	<0.01	0.09	<0.01

SAL Reference: 117654

Project Site: [REDACTED]

Customer Reference: [REDACTED]

Soil
Analysed as Soil
Volatile Organic Compounds (USEPA 624)

SAL Reference					117654 001	117654 002	117654 003	117654 004	117654 005
Customer Sample Reference					TP7 0.5	TP7 1m	TP7 1.5m	TP7 2m	TP7 3m
Test Sample					AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol					
1,1,1,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,1-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,2,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,2-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,2-Trichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2,3-Trichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2,4-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-dibromoethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,3,5-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,3-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,3-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,4-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
2,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
2-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
4-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Benzene	GC/MS (Headspace)	1	µg/kg	U	(3) <5	(13) <5	(3) <5	(13) <5	(13) <5
Bromobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromochloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromodichloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromoform	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Carbon tetrachloride	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chlorodibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chloroform	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
cis-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
cis-1,3-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Dibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1
Styrene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Tetrachloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Toluene	GC/MS (Headspace)	1	µg/kg	U	(3) <5	(13) <5	(13) <5	(13) <5	(13) <5
trans-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Trichlorofluoromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Vinyl chloride monomer	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-

SAL Reference: 117654

Project Site: ██████████

Customer Reference: ██████████

Soil
Analysed as Soil
Volatile Organic Compounds (USEPA 624)

SAL Reference					117654 006	117654 007	117654 008	117654 009	117654 010
Customer Sample Reference					TP7a 0.5m	TP7a 1m	TP7a 2m	TP7a 3m	TP7a 4.2m
Test Sample					AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol					
1,1,1,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1,1-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1,2,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1,2-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1,2-Trichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,1-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,2,3-Trichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,2,4-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,2-dibromoethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,2-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,2-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,3,5-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,3-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,3-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
1,4-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
2,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
2-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
4-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Benzene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	<5	(13) <5	(13) <5
Bromobenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Bromochloromethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Bromodichloromethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Bromoform	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Bromomethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Carbon tetrachloride	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Chlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Chlorodibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Chloroethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Chloroform	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Chloromethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
cis-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
cis-1,3-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Dibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	3	<1	<1	<1
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	1	<1	<1	<1
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	1	<1	<1	<1
Styrene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Tetrachloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Toluene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5
trans-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Trichlorofluoromethane	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-
Vinyl chloride monomer	GC/MS (Headspace)	5	µg/kg	U	-	<5	<5	<5	-

SAL Reference: 117654

Project Site: ██████████

Customer Reference: ██████████

Soil
Analysed as Soil
Volatile Organic Compounds (USEPA 624)

SAL Reference					117654 011	117654 012	117654 013	117654 015	117654 016
Customer Sample Reference					TP7b 0.5m	TP7b 1m	TP7b 2m	TP7b 4m	TP7c 0.5m
Test Sample					AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol					
1,1,1,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1,1-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1,2,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1,2-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1,2-Trichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,1-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,2,3-Trichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,2,4-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,2-dibromoethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,2-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,2-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,3,5-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,3-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,3-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
1,4-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
2,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
2-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
4-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Benzene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(2) <10	(2) <20	(13) <5	(13) <5
Bromobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Bromochloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Bromodichloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Bromoform	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Bromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Carbon tetrachloride	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Chlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Chlorodibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Chloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Chloroform	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Chloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
cis-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	110	-	-
cis-1,3-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Dibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	(2) <10	(2) <20	<1	<1
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	(2) <10	(2) <20	3	<1
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	(2) <10	(2) <20	2	<1
Styrene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Tetrachloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Toluene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(2) <10	(2) <20	(13) <5	(13) <5
trans-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Trichlorofluoromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-
Vinyl chloride monomer	GC/MS (Headspace)	5	µg/kg	U	-	-	(2) <50	-	-

SAL Reference: 117654

Project Site: [REDACTED]

Customer Reference: [REDACTED]

Soil
Analysed as Soil
Volatile Organic Compounds (USEPA 624)

SAL Reference					117654 017	117654 018	117654 019	117654 020	117654 021
Customer Sample Reference					TP7c 1m	TP7c 1.5m	TP7c 2.5m	TP7c 3.5m	TP7c 4.4m
Test Sample					AR	AR	AR	AR	AR
Determinand	Technique	LOD	Units	Symbol					
1,1,1,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,1-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,2,2-Tetrachloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,2-Trichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1,2-Trichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,1-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2,3-Trichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2,4-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-dibromoethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-Dichloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,3,5-Trimethylbenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,3-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,3-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
1,4-Dichlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
2,2-Dichloropropane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
2-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
4-Chlorotoluene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Benzene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5
Bromobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromochloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromodichloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromoform	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Bromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Carbon tetrachloride	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chlorobenzene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chlorodibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chloroethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chloroform	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Chloromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
cis-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
cis-1,3-Dichloropropene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Dibromomethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
EthylBenzene	GC/MS (Headspace)	1	µg/kg	U	<1	<1	<1	<1	<1
Meta/Para-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	4	<1	<1	<1
Ortho-Xylene	GC/MS (Headspace)	1	µg/kg	U	<1	3	<1	<1	<1
Styrene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Tetrachloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Toluene	GC/MS (Headspace)	1	µg/kg	U	(13) <5	(13) <5	(13) <5	(13) <5	(13) <5
trans-1,2-Dichloroethylene	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Trichlorofluoromethane	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-
Vinyl chloride monomer	GC/MS (Headspace)	5	µg/kg	U	-	-	-	-	-

APPENDIX 3:

**LABORATORY RESULTS FOR BOTTOM ASH FROM
INDAVER CARRANSTOWN (EPA LICENCE
W0167-02), JANUARY, APRIL AND JUNE 2013**

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 Postbus 78
 4430 AB 's-Gravenpolder
 Nederland
 Tel (0113)-319 200
 Fax (0113)-319 299

Indaver Ireland Limited
 Attn. Mrs. G. McCormack
 Carranstown
 DULEEK, COUNTY MEATH
 IRELAND

's-Gravenpolder, 07/02/2013

ANALYTICAL REPORT 201301000830

Customer : Indaver Ireland Limited
 Description : Bottom ash

Sampled by : Derden
 Reference : 2013-01-18-01

Sample descriptions : 1 : 2013-01-18-01 (UK-Vaste afvals)
 2 : 2013-01-18-01 (eluaat)

Sample code	1	2
Date of sampling	18/01/2013	18/01/2013
Laboratory receival date	22/01/2013	22/01/2013

Parameter	Unit	method		
PHYSICO-CHEMICAL ANALYSIS				
Q Dry substance	wt%	[acc. to CMA/2/II/A.1]	97.5	
WET CHEMICAL MEASUREMENTS				
Phenol index	µg/l	[acc. to NEN-EN-ISO 14402]		< 5.0
HEAVY METALS				
Aluminium	µg/l	[acc. to NEN 6966/C1]		95000
Beryllium	µg/l	[acc. to NEN 6966/C1]		< 1.0
Borium	µg/l	[acc. to NEN 6966/C1]		< 100
Iron	µg/l	[acc. to NEN 6966/C1]		22
Manganese	µg/l	[acc. to NEN 6966/C1]		< 10
ION SELECTIVE MEASUREMENTS				
Fluoride same as F	mg/l	[Equivalent to NEN 6483]		< 0.1
ION CHROMATOGRAPHIC MEASUREMENTS				
Chloride same as Cl	mg/l	[acc. to AP04-E-XVII]		170
Sulphate same as SO4	mg/l	[acc. to AP04-E-XVII]		67
LEACH TEST				
Q Shake test		[acc. to CMA/2/II/A.12]	x	
Q L/S-ratio	l/kgdb		10.0	
PHYSICO-CHEMICAL ANALYSIS				
pH		[acc. to ISO 10523]		11.4 *
Temperature pH-measurement	°C			20.6
WET CHEMICAL MEASUREMENTS (ELUATE)				
Chrome (VI) as Cr	mg/l	[acc. to CMA/2/II/C.7]		< 0.05
Total cyanide same as CN	µg/l	[acc. to NEN-ISO 14403]		< 1.0
HEAVY METALS (ELUATE)				
Tin	µg/l	[Acc. to AP04.E-XI]		< 2.0
Antimony	µg/l	[Acc. To AP04.E-XIII]		21
Selene	µg/l	[Acc. to AP04.E-XIV]		2.2
Arsene	µg/l	[acc. to NVN 7322]		< 10
Barium	µg/l	[acc. to NVN 7322]		160
Cadmium	µg/l	[acc. to NVN 7322]		< 0.70
Chrome	µg/l	[acc. to NVN 7322]		5.2
Cobalt	µg/l	[acc. to NVN 7322]		< 5.0
Copper	µg/l	[acc. to NVN 7322]		160
Lead	µg/l	[acc. to NVN 7322]		67
Molybdene	µg/l	[acc. to NVN 7322]		140
Nickel	µg/l	[acc. to NVN 7322]		< 20

(page: 1, see following page)

ANALYTICAL REPORT 201301000830

Customer : Indaver Ireland Limited
 Description : Bottom ash

Sampled by : Derden
 Reference : 2013-01-18-01

Sample descriptions : 1 : 2013-01-18-01 (UK-Vaste afvals)
 2 : 2013-01-18-01 (eluaat)

Sample code	1	2
Date of sampling	18/01/2013	18/01/2013
Laboratory receival date	22/01/2013	22/01/2013

Parameter	Unit	method	
Thallium	µg/l	[acc. to NVN 7322]	< 10
Vanadium	µg/l	[acc. to NVN 7322]	< 10
Zinc	µg/l	[acc. to NVN 7322]	38
Mercury	µg/l	[acc. to NVN 7324]	0.22

NON ROUTINE TEST

non-routine test

[Subcontracted]

ZIE
 BIJGEOEGD
 CERTIFICAAT



Marc Van Ryckeghem
 Laboratory manager

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All analyses marked with a "Q" ISO17025 accredited (BELAC 005-TEST)

In Appendix 1 information is given about the sample preservation and preservation times of the received samples.

Technical information about any in the report with * marked results is given in appendix 2.

The reports from possible external subcontracted analyses are attached as addendum in this report.



APPENDIX 1

ANALYTICAL REPORT 201301000830

's-Gravenpolder, 07/02/2013

Customer : Indaver Ireland Limited
Description : Bottom ash
Sampled by : Derden
Reference : 2013-01-18-01

Preservation & conservation remarks

All samples have been preserved and delivered in a correct way to the lab.

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(page: 1, last page)



APPENDIX 2

ANALYTICAL REPORT 201301000830

's Gravenpolder, 07/02/2013

Customer : Indaver Ireland Limited
Description : Bottom ash
Sampled by : Derden
Reference : 2013-01-18-01

Explanation of results of analysis

Sample description: 2 : 2013-01-18-01 (eluaat)

PHYSICO-CHEMICAL ANALYSIS

pH
- The result must be considered as semi-quantitative

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(page: 1, last page)



SGS NEDERLAND BV
Attn: afdeling Customer Services
Sporstraat 12, 4431 NK
Postbus 78
4430AB S'GRAVENPOLDER
Nederland

ANALYSERAPPORT : IAC13-00430

Uw referentie: 'S Gravenpolder - 201301000830
Aantal monsters: 1
Datum van ontvangst: 28/01/2013
Monsteridentificatie:
201301000830-1

Analyseresultaten:

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's
(HRGC/HRMS; ECO/AV/IAC/012)

Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)
(HRGC/HRMS; ECO/AV/IAC/015)

ANTWERPEN, 05/02/2013

I.A.C.
Een divisie van SGS Belgium NV

Marc Van Ryckeghem
Manager Environmental Laboratories

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Het analyserapport kan enkel en alleen aangewend worden binnen de specifieke context van de opdracht en is enkel geldig voor de geanalyseerde monsters.

Alle opdrachten worden opgesteld op naam en voor rekening van de opdrachtgever, die uitdrukkelijk aanvaardt dat deze rapporten slechts een momentopname vertegenwoordigen en steeds in hun geheel en in de context ervan dienen te worden voorgelegd en/of vermeld. Een beschrijving van de gebruikte analysemethoden, de identiteit van de externe laboratoria voor de gemerkte (E) analyses en de meetonzekerheid van de analyses zijn op aanvraag beschikbaar. Mogelijks vermelde normen of criteria zijn opgesteld en vermeld in samenspraak met de opdrachtgever.

SGS Belgium NV, opsteller van deze rapporten, kan niet aansprakelijk gesteld worden voor fouten of wijzigingen van resultaten ontstaan gedurende of n.a.v. elektronische of faxtransmissie. Enkel en uitsluitend het origineel getekend rapport is bindend.

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ANALYSERAPPORT : IAC13-00430

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's			
Monsteridentificatie : IAC13-00430.001 Uw referentie: 201301000830-1			
Component	Concentratie (ng/kg)	I-TEF	I-TEQ (ng/kg)
2,3,7,8-TCDF	<0,73	0,1	< 0,073
2,3,7,8-TCDD	<0,73	1	< 0,73
1,2,3,7,8-PeCDF	0,76	0,05	0,038
2,3,4,7,8-PeCDF	0,96	0,5	0,48
1,2,3,7,8-PeCDD	<0,73	0,5	< 0,36
1,2,3,4,7,8-HxCDF	1,7	0,1	0,17
1,2,3,6,7,8-HxCDF	1,7	0,1	0,17
2,3,4,6,7,8-HxCDF	2,0	0,1	0,20
1,2,3,7,8,9-HxCDF	<0,73	0,1	< 0,073
1,2,3,4,7,8-HxCDD	<0,73	0,1	< 0,073
1,2,3,6,7,8-HxCDD	<0,73	0,1	< 0,073
1,2,3,7,8,9-HxCDD	<0,73	0,1	< 0,073
1,2,3,4,6,7,8-HpCDF	9,8	0,01	0,098
1,2,3,4,7,8,9-HpCDF	2,1	0,01	0,021
1,2,3,4,6,7,8-HpCDD	5,1	0,01	0,051
OCDF	16	0,001	0,016
OCDD	22	0,001	0,022
Totaal			1,3 - 2,7
Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895). De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.			

ANALYSERAPPORT : IAC13-00430

Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)			
Monsteridentificatie : IAC13-00430.001 Uw referentie: 201301000830-1			
Component	Concentratie (ng/kg)	WHO-TEF	WHO-TEQ (ng/kg)
Non-ortho PCBs			
3,4,4',5-TeCB (PCB #81)	<4,9	0,0003	< 0,0015
3,3',4,4'-TeCB (PCB #77)	16	0,0001	0,0016
3,3',4,4',5-PeCB (PCB #126)	<2,4	0,1	< 0,24
3,3',4,4',5,5'-HxCB (PCB #169)	<2,4	0,03	< 0,073
Mono-ortho PCBs			
2',3,4,4',5-PeCB (PCB #123)	<9,7	0,00003	< 0,00029
2,3',4,4',5-PeCB (PCB #118)	160	0,00003	0,0047
2,3,4,4',5-PeCB (PCB #114)	<9,7	0,00003	< 0,00029
2,3,3',4,4'-PeCB (PCB #105)	<49	0,00003	< 0,0015
2,3',4,4',5,5'-HxCB (PCB #167)	<49	0,00003	< 0,0015
2,3,3',4,4',5-HxCB (PCB #156)	49	0,00003	0,0015
2,3,3',4,4',5'-HxCB (PCB #157)	<9,7	0,00003	< 0,00029
2,3,3',4,4',5,5'-HxCB (PCB #189)	<9,7	0,00003	< 0,00029
Totaal			0,0078 - 0,33
Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895). De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.			

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's	
Monsteridentificatie : IAC13-00430.001 Uw referentie: 201301000830-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
13C-2,3,7,8-TCDF	82,3
13C-2,3,7,8-TCDD	70,3
13C-1,2,3,7,8-PeCDF	71,4
13C-2,3,4,7,8-PeCDF	71,2
13C-1,2,3,7,8-PeCDD	69,1
13C-1,2,3,4,7,8-HxCDF	66,7
13C-1,2,3,6,7,8-HxCDF	67,8
13C-2,3,4,6,7,8-HxCDF	67,4
13C-1,2,3,7,8,9-HxCDF	75,0
13C-1,2,3,4,7,8-HxCDD	67,1
13C-1,2,3,6,7,8-HxCDD	68,5
13C-1,2,3,4,6,7,8-HpCDF	75,6
13C-1,2,3,4,7,8,9-HpCDF	60,5
13C-1,2,3,4,6,7,8-HpCDD	67,9
13C-OCDF	61,4
13C-OCDD	67,1

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Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)	
Monsteridentificatie : IAC13-00430.001 Uw referentie: 201301000830-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
Non-ortho PCBs	
13C-3,4,4',5-TeCB (PCB #81)	89,3
13C-3,3',4,4-TeCB (PCB #77)	88,9
13C-3,3',4,4',5-PeCB (PCB #126)	69,1
13C-3,3',4,4',5,5'-HxCB (PCB #169)	74,5
Mono-ortho PCBs	
13C-2',3,4,4',5-PeCB (PCB #123)	85,9
13C-2,3',4,4',5-PeCB (PCB #118)	81,5
13C-2,3,4,4',5-PeCB (PCB #114)	79,9
13C-2,3,3',4,4'-PeCB (PCB #105)	83,6
13C-2,3',4,4',5,5'-HxCB (PCB #167)	59,0
13C-2,3,3',4,4',5-HxCB (PCB #156)	65,7
13C-2,3,3',4,4',5-HxCB (PCB #157)	64,6
13C-2,3,3',4,4',5,5'-HxCB (PCB #189)	95,3

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Indaver Ireland Limited
Attn. Mrs. G. McCormack
Carranstown
DULEEK, COUNTY MEATH
IRELAND

's-Gravenpolder, 14/05/2013

ANALYTICAL REPORT 201304000338

Customer : Indaver Ireland Limited
Description : Bottom ash testing

Sampled by : Derden
Reference : 2013-04-16-01

Sample descriptions : 1 : 2013-04-16-01 (UK-Vaste afvals)
2 : 2013-04-16-01 (eluaat)

Sample code	1	2
Date of sampling	16/04/2013	16/04/2013
Laboratory receival date	17/04/2013	17/04/2013

Parameter	Unit	method
-----------	------	--------

PHYSICO-CHEMICAL ANALYSIS

Q Dry substance	wt%	[acc. to CMA/2/II/A.1]	99.3
-----------------	-----	------------------------	------

WET CHEMICAL MEASUREMENTS

Phenol index	µg/l	[acc. to NEN-EN-ISO 14402]	< 5.0
--------------	------	----------------------------	-------

HEAVY METALS

Aluminium	µg/l	[acc. to NEN 6966/C1]	99973
Beryllium	µg/l	[acc. to NEN 6966/C1]	< 1.0
Borium	µg/l	[acc. to NEN 6966/C1]	< 100
Iron	µg/l	[acc. to NEN 6966/C1]	16
Manganese	µg/l	[acc. to NEN 6966/C1]	< 10

ION SELECTIVE MEASUREMENTS

Fluoride same as F	mg/l	[Equivalent to NEN 6483]	0.22
--------------------	------	--------------------------	------

ION CHROMATOGRAPHIC MEASUREMENTS

Chloride same as Cl	mg/l	[acc. to AP04-E-XVII]	120
Sulphate same as SO4	mg/l	[acc. to AP04-E-XVII]	7.1

LEACH TEST

Q Shake test		[acc. to CMA/2/II/A.12]	x
Q L/S-ratio	l/kgdb		10.0

PHYSICO-CHEMICAL ANALYSIS

pH		[acc. to ISO 10523]	11.8
Temperature pH-measurement	°C		22.1

WET CHEMICAL MEASUREMENTS (ELUATE)

Chrome (VI) as Cr	mg/l	[acc. to CMA/2/I/C.7]	< 0.05
Total cyanide same as CN	µg/l	[acc. to NEN-ISO 14403]	< 1.0

HEAVY METALS (ELUATE)

Tin	µg/l	[Acc. to AP04.E-XI]	< 2.0
Antimony	µg/l	[Acc. To AP04.E-XIII]	6.5
Selene	µg/l	[Acc. to AP04.E-XIV]	< 0.90
Arsene	µg/l	[acc. to NVN 7322]	< 10
Barium	µg/l	[acc. to NVN 7322]	2500
Cadmium	µg/l	[acc. to NVN 7322]	< 0.70
Chrome	µg/l	[acc. to NVN 7322]	< 5.0
Cobalt	µg/l	[acc. to NVN 7322]	< 5.0
Copper	µg/l	[acc. to NVN 7322]	140
Lead	µg/l	[acc. to NVN 7322]	800
Molybdene	µg/l	[acc. to NVN 7322]	140
Nickel	µg/l	[acc. to NVN 7322]	< 20

(page: 1, see following page)

ANALYTICAL REPORT 201304000338

Customer : Indaver Ireland Limited
Description : Bottom ash testing

Sampled by : Derden
Reference : 2013-04-16-01

Sample descriptions : 1 : 2013-04-16-01 (UK-Vaste afvals)
2 : 2013-04-16-01 (eluaat)

Sample code	1	2
Date of sampling	16/04/2013	16/04/2013
Laboratory receival date	17/04/2013	17/04/2013

Parameter	Unit	method	
Thallium	µg/l	[acc. to NVN 7322]	< 10
Vanadium	µg/l	[acc. to NVN 7322]	< 10
Zinc	µg/l	[acc. to NVN 7322]	210
Mercury	µg/l	[acc. to NVN 7324]	< 0.20

NON ROUTINE TEST
non-routine test

[Subcontracted]

SEE
ANALYTICAL
REPORT
ATTACHED



Marc Van Ryckeghem
Laboratory manager

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All analyses marked with a "Q" ISO17025 accredited (BELAC 005-TEST)

In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.



APPENDIX 1

ANALYTICAL REPORT 201304000338

's-Gravenpolder, 14/05/2013

Customer : Indaver Ireland Limited
Description : Bottom ash testing

Sampled by : Derden
Reference : 2013-04-16-01

Preservation & conservation remarks

All samples have been preserved and delivered in a correct way to the lab.

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(page: 1, last page)

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Postbus 78
4430AB S'GRAVENPOLDER
Nederland

ANALYSERAPPORT : IAC13-02139

Uw referentie: 'S Gravenpolder - 201304000338-1
Aantal monsters: 1
Datum van ontvangst: 24/04/2013
Monsteridentificatie:
201304000338-1

Analyseresultaten:

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's
(HRGC/HRMS; ECO/AV/IAC/012)

Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)
(HRGC/HRMS; ECO/AV/IAC/015)

ANTWERPEN, 13/05/2013

I.A.C.
Een divisie van SGS Belgium NV

Marc Van Ryckeghem
Manager Environmental Laboratories

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Het analyserapport kan enkel en alleen aangewend worden binnen de specifieke context van de opdracht en is enkel geldig voor de geanalyseerde monsters.

Alle opdrachten worden opgesteld op naam en voor rekening van de opdrachtgever, die uitdrukkelijk aanvaardt dat deze rapporten slechts een momentopname vertegenwoordigen en steeds in hun geheel en in de context ervan dienen te worden voorgelegd en/of vermeld. Een beschrijving van de gebruikte analysemethoden, de identiteit van de externe laboratoria voor de gemerkte (E) analyses en de meetonzekerheid van de analyses zijn op aanvraag beschikbaar. Mogelijks vermelde normen of criteria zijn opgesteld en vermeld in samenspraak met de opdrachtgever.

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ANALYSERAPPORT : IAC13-02139

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's			
Monsteridentificatie : IAC13-02139.001			
Uw referentie: 201304000338-1			
Component	Concentratie (ng/kg)	I-TEF	I-TEQ (ng/kg)
2,3,7,8-TCDF	<0,73	0,1	< 0,073
2,3,7,8-TCDD	<0,73	1	< 0,73
1,2,3,7,8-PeCDF	<0,73	0,05	< 0,036
2,3,4,7,8-PeCDF	<0,73	0,5	< 0,36
1,2,3,7,8-PeCDD	<0,73	0,5	< 0,36
1,2,3,4,7,8-HxCDF	0,85	0,1	0,085
1,2,3,6,7,8-HxCDF	<0,73	0,1	< 0,073
2,3,4,6,7,8-HxCDF	0,79	0,1	0,079
1,2,3,7,8,9-HxCDF	<0,73	0,1	< 0,073
1,2,3,4,7,8-HxCDD	<0,73	0,1	< 0,073
1,2,3,6,7,8-HxCDD	<0,73	0,1	< 0,073
1,2,3,7,8,9-HxCDD	<0,73	0,1	< 0,073
1,2,3,4,6,7,8-HpCDF	5,3	0,01	0,053
1,2,3,4,7,8,9-HpCDF	0,12	0,01	< 0,012
1,2,3,4,6,7,8-HpCDD	3,5	0,01	0,035
OCDF	13	0,001	0,013
OCDD	18	0,001	0,018
Totaal			0,28 - 2,2
<p>Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895).</p> <p>De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.</p>			

ANALYSERAPPORT : IAC13-02139

Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)			
Monsteridentificatie : IAC13-02139.001 Uw referentie: 201304000338-1			
Component	Concentratie (ng/kg)	WHO-TEF	WHO-TEQ (ng/kg)
Non-ortho PCBs			
3,4,4',5-TeCB (PCB #81)	<4,9	0,0003	< 0,0015
3,3',4,4'-TeCB (PCB #77)	<9,7	0,0001	< 0,00097
3,3',4,4',5-PeCB (PCB #126)	<2,4	0,1	< 0,24
3,3',4,4',5,5'-HxCB (PCB #169)	<2,4	0,03	< 0,073
Mono-ortho PCBs			
2',3,4,4',5-PeCB (PCB #123)	<9,7	0,00003	< 0,00029
2,3',4,4',5-PeCB (PCB #118)	<97	0,00003	< 0,0029
2,3,4,4',5-PeCB (PCB #114)	<9,7	0,00003	< 0,00029
2,3,3',4,4'-PeCB (PCB #105)	<49	0,00003	< 0,0015
2,3',4,4',5,5'-HxCB (PCB #167)	<49	0,00003	< 0,0015
2,3,3',4,4',5-HxCB (PCB #156)	<49	0,00003	< 0,0015
2,3,3',4,4',5'-HxCB (PCB #157)	<9,7	0,00003	< 0,00029
2,3,3',4,4',5,5'-HxCB (PCB #189)	<9,7	0,00003	< 0,00029
Totaal			< 0,33
Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895). De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.			

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's	
Monsteridentificatie : IAC13-02139.001 Uw referentie: 201304000338-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
13C-2,3,7,8-TCDF	85,2
13C-2,3,7,8-TCDD	64,0
13C-1,2,3,7,8-PeCDF	78,5
13C-2,3,4,7,8-PeCDF	79,8
13C-1,2,3,7,8-PeCDD	72,9
13C-1,2,3,4,7,8-HxCDF	67,9
13C-1,2,3,6,7,8-HxCDF	78,6
13C-2,3,4,6,7,8-HxCDF	75,0
13C-1,2,3,7,8,9-HxCDF	77,7
13C-1,2,3,4,7,8-HxCDD	58,1
13C-1,2,3,6,7,8-HxCDD	74,9
13C-1,2,3,4,6,7,8-HpCDF	79,1
13C-1,2,3,4,7,8,9-HpCDF	68,0
13C-1,2,3,4,6,7,8-HpCDD	71,0
13C-OCDF	69,2
13C-OCDD	68,9

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Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)	
Monsteridentificatie : IAC13-02139.001 Uw referentie: 201304000338-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
Non-ortho PCBs	
13C-3,4,4',5-TeCB (PCB #81)	78,7
13C-3,3',4,4-TeCB (PCB #77)	54,6
13C-3,3',4,4',5-PeCB (PCB #126)	108
13C-3,3',4,4',5,5'-HxCB (PCB #169)	93,2
Mono-ortho PCBs	
13C-2',3,4,4',5-PeCB (PCB #123)	77,0
13C-2,3',4,4',5-PeCB (PCB #118)	70,8
13C-2,3,4,4',5-PeCB (PCB #114)	72,1
13C-2,3,3',4,4'-PeCB (PCB #105)	76,5
13C-2,3',4,4',5,5'-HxCB (PCB #167)	66,9
13C-2,3,3',4,4',5-HxCB (PCB #156)	79,8
13C-2,3,3',4,4',5-HxCB (PCB #157)	83,7
13C-2,3,3',4,4',5,5'-HxCB (PCB #189)	77,6

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Indaver Ireland Limited
Attn. Mrs. G. McCormack
Carranstown
DULEEK, COUNTY MEATH
IRELAND

's-Gravenpolder, 11/07/2013

ANALYTICAL REPORT 201306000146

Customer : Indaver Ireland Limited
Description : Bottom ash testing

Sampled by : Derden
Reference : 2013-06-18-01

Sample descriptions : 1 : 2013-06-18-01 (UK-Vaste afvals)
2 : 2013-06-18-01 (eluaat)

Sample code	1	2
Date of sampling	18/06/2013	18/06/2013
Laboratory receipt date	19/06/2013	19/06/2013

Parameter	Unit	method	
PHYSICO-CHEMICAL ANALYSIS			
Q Dry substance	wt%	[acc. to CMA/2/II.A.1]	99.5
WET CHEMICAL MEASUREMENTS			
Phenol index	µg/l	[acc. to NEN-EN-ISO 14402]	< 5.0
HEAVY METALS			
Beryllium	µg/l	[acc. to NEN 6966/C1/NENENISO 17294-2]	< 1.0
Aluminium	µg/l	[acc. to NEN 6966/C1]	< 100
Borium	µg/l	[acc. to NEN 6966/C1]	< 100
Iron	µg/l	[acc. to NEN 6966/C1]	< 10
Manganese	µg/l	[acc. to NEN 6966/C1]	< 10
ION SELECTIVE MEASUREMENTS			
Fluoride same as F	mg/l	[Equivalent to NEN 6483]	0.26
ION CHROMATOGRAPHIC MEASUREMENTS			
Chloride same as Cl	mg/l	[acc. to AP04-E-XVII]	190
Sulphate same as SO4	mg/l	[acc. to AP04-E-XVII]	50
LEACH TEST			
Q Shake test		[acc. to CMA/2/II.A.12]	x
Q L/S-ratio	l/kgdb		10.0
PHYSICO-CHEMICAL ANALYSIS			
pH		[acc. to ISO 10523]	12.4
Temperature pH-measurement	°C		22.0
WET CHEMICAL MEASUREMENTS (ELUATE)			
Chrome (VI) as Cr	mg/l	[acc. to CMA/2/II.C.7]	< 0.05
Total cyanide same as CN	µg/l	[acc. to NEN-ISO 14403]	< 1.0
HEAVY METALS (ELUATE)			
Tin	µg/l	[Acc. to AP04.E-XI]	< 2.0
Antimony	µg/l	[Acc. To AP04.E-XIII]	1.3
Selene	µg/l	[Acc. to AP04.E-XIV]	1.3
Arsene	µg/l	[acc. to NVN 7322]	< 10
Barium	µg/l	[acc. to NVN 7322]	960
Cadmium	µg/l	[acc. to NVN 7322]	< 0.70
Chrome	µg/l	[acc. to NVN 7322]	5.6
Cobalt	µg/l	[acc. to NVN 7322]	< 5.0
Copper	µg/l	[acc. to NVN 7322]	320
Lead	µg/l	[acc. to NVN 7322]	7200
Molybdene	µg/l	[acc. to NVN 7322]	81
Nickel	µg/l	[acc. to NVN 7322]	< 10

(page: 1, see following page)

ANALYTICAL REPORT 201306000146

Customer : Indaver Ireland Limited
 Description : Bottom ash testing

Sampled by : Derden
 Reference : 2013-06-18-01

Sample descriptions : 1 : 2013-06-18-01 (UK-Vaste afvals)
 2 : 2013-06-18-01 (eluaat)

Sample code	1	2
Date of sampling	18/06/2013	18/06/2013
Laboratory receival date	19/06/2013	19/06/2013

Parameter	Unit	method	
Thallium	µg/l	[acc. to NVN 7322]	< 10
Vanadium	µg/l	[acc. to NVN 7322]	< 10
Zinc	µg/l	[acc. to NVN 7322]	480
Mercury	µg/l	[acc. to NVN 7324]	< 0.20

NON ROUTINE TEST
 non-routine test

[Subcontracted]

ZIE
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Marc Van Ryckeghem
 Laboratory manager

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 All analyses marked with a "Q" ISO17025 accredited (BELAC 005-TEST)

In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.



APPENDIX 1

ANALYTICAL REPORT 201306000146

's-Gravenpolder, 11/07/2013

Customer : Indaver Ireland Limited
Description : Bottom ash testing

Sampled by : Derden
Reference : 2013-06-18-01

Preservation & conservation remarks

All samples have been preserved and delivered in a correct way to the lab.

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Nederland

ANALYSERAPPORT : IAC13-03429

Uw referentie: 'S Gravenpolder - 201306000146-1
Aantal monsters: 1
Datum van ontvangst: 26/06/2013
Monsteridentificatie:
201306000146-1

Analyseresultaten:

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's
(HRGC/HRMS; ECO/AV/IAC/012)

Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)
(HRGC/HRMS; ECO/AV/IAC/015)

ANTWERPEN, 04/07/2013

I.A.C.
Een divisie van SGS Belgium NV

Marc Van Ryckeghem
Manager Environmental Laboratories

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ANALYSERAPPORT : IAC13-03429
Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's

Monsteridentificatie : IAC13-03429.001

Uw referentie: 201306000146-1

Component	Concentratie (ng/kg)	I-TEF	I-TEQ (ng/kg)
2,3,7,8-TCDF	<0,78	0,1	< 0,078
2,3,7,8-TCDD	<0,78	1	< 0,78
1,2,3,7,8-PeCDF	<0,78	0,05	< 0,039
2,3,4,7,8-PeCDF	<0,78	0,5	< 0,39
1,2,3,7,8-PeCDD	<0,78	0,5	< 0,39
1,2,3,4,7,8-HxCDF	1,3	0,1	0,13
1,2,3,6,7,8-HxCDF	1,2	0,1	0,12
2,3,4,6,7,8-HxCDF	1,6	0,1	0,16
1,2,3,7,8,9-HxCDF	<0,78	0,1	< 0,078
1,2,3,4,7,8-HxCDD	<0,78	0,1	< 0,078
1,2,3,6,7,8-HxCDD	<0,78	0,1	< 0,078
1,2,3,7,8,9-HxCDD	<0,78	0,1	< 0,078
1,2,3,4,6,7,8-HpCDF	7,5	0,01	0,075
1,2,3,4,7,8,9-HpCDF	7,5	0,01	< 0,013
1,2,3,4,6,7,8-HpCDD	1,9	0,01	0,019
OCDF	6,5	0,001	0,0065
OCDD	6,0	0,001	0,0060

Totaal

0,52 - 2,5

Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895).

De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.

ANALYSERAPPORT : IAC13-03429

Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)			
Monsteridentificatie : IAC13-03429.001 Uw referentie: 201306000146-1			
Component	Concentratie (ng/kg)	WHO-TEF	WHO-TEQ (ng/kg)
Non-ortho PCBs			
3,4,4',5-TeCB (PCB #81)	<5,2	0,0003	< 0,0016
3,3',4,4'-TeCB (PCB #77)	<10	0,0001	< 0,0010
3,3',4,4',5-PeCB (PCB #126)	<2,6	0,1	< 0,26
3,3',4,4',5,5'-HxCB (PCB #169)	<2,6	0,03	< 0,078
Mono-ortho PCBs			
2',3,4,4',5-PeCB (PCB #123)	<10	0,00003	< 0,00031
2,3',4,4',5-PeCB (PCB #118)	<100	0,00003	< 0,0031
2,3,4,4',5-PeCB (PCB #114)	<10	0,00003	< 0,00031
2,3,3',4,4'-PeCB (PCB #105)	<52	0,00003	< 0,0016
2,3',4,4',5,5'-HxCB (PCB #167)	<52	0,00003	< 0,0016
2,3,3',4,4',5-HxCB (PCB #156)	<52	0,00003	< 0,0016
2,3,3',4,4',5'-HxCB (PCB #157)	<10	0,00003	< 0,00031
2,3,3',4,4',5,5'-HxCB (PCB #189)	<10	0,00003	< 0,00031
Totaal			< 0,35
Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895). De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.			

Bepaling van 2,3,7,8 gesubstitueerde PCDF's en PCDD's	
Monsteridentificatie : IAC13-03429.001 Uw referentie: 201306000146-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
13C-2,3,7,8-TCDF	97,9
13C-2,3,7,8-TCDD	78,9
13C-1,2,3,7,8-PeCDF	91,6
13C-2,3,4,7,8-PeCDF	89,7
13C-1,2,3,7,8-PeCDD	85,0
13C-1,2,3,4,7,8-HxCDF	40,7
13C-1,2,3,6,7,8-HxCDF	44,3
13C-2,3,4,6,7,8-HxCDF	90,6
13C-1,2,3,7,8,9-HxCDF	99,3
13C-1,2,3,4,7,8-HxCDD	80,5
13C-1,2,3,6,7,8-HxCDD	82,6
13C-1,2,3,4,6,7,8-HpCDF	68,1
13C-1,2,3,4,7,8,9-HpCDF	81,9
13C-1,2,3,4,6,7,8-HpCDD	91,8
13C-OCDF	89,5
13C-OCDD	94,1

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Bepaling van Dioxine-achtige Polygechloreerde Bifenyls (PCBs)	
Monsteridentificatie : IAC13-03429.001 Uw referentie: 201306000146-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
Non-ortho PCBs	
13C-3,4,4',5-TeCB (PCB #81)	80,8
13C-3,3',4,4-TeCB (PCB #77)	82,7
13C-3,3',4,4',5-PeCB (PCB #126)	88,5
13C-3,3',4,4',5,5'-HxCB (PCB #169)	109
Mono-ortho PCBs	
13C-2',3,4,4',5-PeCB (PCB #123)	81,2
13C-2,3',4,4',5-PeCB (PCB #118)	77,1
13C-2,3,4,4',5-PeCB (PCB #114)	80,0
13C-2,3,3',4,4'-PeCB (PCB #105)	81,4
13C-2,3',4,4',5,5'-HxCB (PCB #167)	88,3
13C-2,3,3',4,4',5-HxCB (PCB #156)	101
13C-2,3,3',4,4',5-HxCB (PCB #157)	102
13C-2,3,3',4,4',5,5'-HxCB (PCB #189)	106

**MEHL WASTE LICENCE APPLICATION W0129-03
EPA Article 16 – Item 5.6 (PARTIAL)**

APPENDIX 4:

**MEHL CORRESPONDENCE TO THE AGENCY,
W0129-03, 07/06/2012 (Extract: Chapter 4)**

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Murphy Environmental Hollywood Ltd

Hollywood Great, Nag's Head, Naul, County Dublin
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EPA Waste Licence W0129-02

For the Attention of
Administration
Environmental Licensing Programme
Office of Climate, Licensing & Resource Use
Environmental Protection Agency
Headquarters
PO Box 3000
Johnstown Castle Estate
Co. Wexford

Our Ref.: W0129-03/Art16_070612
Direct Dial: 01 8433744
Direct Fax: 01 8433747
Date: 7th June 2012

Dear Mr. Meaney,

**Re.: Murphy Environmental Hollywood Ltd. (MEHL), EPA Ref. W0129-03
Response to Notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations**

Please find enclosed our response to the Article 16(1) notice (one original, one copy and 16 CD-ROM copies. The content of the electronic files on the accompanying CD-ROM is a true copy of the original).

If you have any further queries in relation to this matter please do not hesitate to contact us at 01-8433744.

Yours sincerely,

Patricia Rooney
Director & General Manager, MEHL

EXTRACT



Directors: Seamus Murphy (Managing Director), Patricia Rooney, Rory Murphy, Emma Murphy
Reg. Office: Hollywood Great, Nag's Head, Naul, County Dublin
Reg. No. 448931 VAT No. IE 9677893C

4. Solidification Process

4.1 Operational experiences at reference plant

4.1.1 The following information is sourced from Indaver, with reference to their existing operations in Europe.

Mixing ratios, materials and curing periods

4.1.2 The optimum mixing ratios and materials requirements depends on

- the properties of flue gas treatment (FGT) residues and
- the landfill acceptance criteria.

4.1.3 Using this information, it is possible through experimental data and experience to determine the best mix to ensure that the acceptance criteria are met.

4.1.4 Indaver has conducted a large number of experiments to determine the most appropriate mix of residues, water, cement and additives based on the properties of Belgian residues and the acceptance criteria for landfill in Flanders (see **Table 4.1** below). An example of this experimental data is shown below. This demonstrates leaching results from 7-day old solidified flue gas treatment residue with different cement quantities. One of the objectives of this testing is to determine how to reduce the quantity of cement that is required, since this has a high carbon footprint and high material value.

Table 4.1: FGT analysis results

Results of DIN extraction tests (mg/kg dry matter) of a fly ash compared to limit values in Flanders, Germany and the EU

	Experiment					Flanders	Germany	EU
	No cement ^a	+10% cement	+20% cement	+30% cement	+40% cement	Cat. I landfill	Z ₅	Hazardous waste
As	4	2	03	0.4	0.2	10	10	25
Cd	163	49	0.1	0.1	<0.1	5	5	5
Cr	1	0.4	5	2	2	5 ^b	5 ^b	70
Cu	56	36	23	23	5	100	100	100
Hg	n.a.	n.a.	n.a.	n.a.	n.a.	1	1	2
Ni	14	2	<0.1	<0.1	<0.1	20	20	40
Pb	32	16	1	0.3	0.1	20	20	50
Zn	22,000	420	64	63	26	100	100	200
pH	6.8	8.1	11.6	12.1	12.4	4-13	4-13	-

n.a. = not analyzed.

^a Average of 2 tests.

^b This is Cr^{VI}.

4.1.5 This shows that (based on FGT residues from a facility in Flanders), 20% cement would be required to meet the acceptance criteria limits in Germany and Flanders. In this experiment acid was not used; other in-house experiments at Indaver (non-published) inform the acid / water mix that is added to meet the acceptance criteria.

4.1.6 As the properties of Irish flue gas treatment residue differ from those of Belgian residue, similar testing would be required in Ireland to determine the optimal mix, once the acceptance criteria are known; therefore, the actual results in the above are indicative but not necessarily meaningful in the Irish context.

Storage arrangements

4.1.7 In Belgium, the solidified residues are sent directly to landfill while still in liquid form, so that they solidify *in-situ*.

Testing

4.1.8 The incoming waste (raw residues) are tested twice a year. This gives an indication of whether the input material is stable and whether the output will therefore also be stable and compliant with the landfill acceptance criteria.

4.1.9 Residues after solidification are not sampled on a regular basis because the tests on incoming waste are considered sufficient to establish that the process is working.

Analysis of flue-gas treatment residues

4.1.10 Please see above (**Table 4.1**) results of leachate tests showing scenarios with no cement (before treatment) and incremental cement mixes (after treatment).

Landfill leachate

4.1.11 The properties of leachate from solidified residues are given above (**Table 4.1**). The leachate collected from hazardous waste landfills containing solidified residues is not representative of the residues since such landfills typically contain many other hazardous waste streams. Indaver's hazardous waste landfill in Antwerp is one such landfill. Therefore, it is not possible to utilise such information in any meaningful way.

4.1.12 As long as the leachate from solidified residues complies with landfill acceptance criteria as per above, the landfill should be designed to handle any such leachate.

4.2 Process tests - FGT residues generated in Ireland

4.2.1 Indaver has only one set of FGT residue results in line with its waste licence. Until more data is available, it is not possible to draw any parallels between the Belgian experience and the proposed activity.

4.3 Current guidance

- 4.3.1 In relation to 'curing' of concrete, the Irish Concrete Society references:
Concrete strength increases with time where moisture is available. However, it is accepted that around 80% of the strength is reached at an age of 28 days and so this is the length of time a concrete cube is stored, in controlled conditions before testing.

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**MEHL WASTE LICENCE APPLICATION W0129-03
EPA Article 16 – Item 5.6 (PARTIAL)**

APPENDIX 5:

**MEHL CORRESPONDENCE TO THE AGENCY,
W0129-03, 20/08/2012**

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Murphy Environmental Hollywood Ltd

Hollywood Great, Nag's Head, Naul, County Dublin
T: 01-8433744 F: 01-8433747 W: www.mehl.ie
EPA Waste Licence W0129-02

For the Attention of
Administration
Environmental Licensing Programme
Office of Climate, Licensing & Resource Use
Environmental Protection Agency
Headquarters
PO Box 3000
Johnstown Castle Estate
Co. Wexford

Our Ref.: W0129-03/AI_Art16_200813
Direct Dial: 01 8433744
Direct Fax: 01 8433747
Date: 20th August 2012

Dear Mr. Meaney,

**Re.: Murphy Environmental Hollywood Ltd. (MEHL), EPA Ref. W0129-03
Response to Notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations**

1. We refer to the Agency's notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations on 11th July 2012. MEHL hereby responds to queries relating to Waste Acceptance Criteria (WAC) (Item#2).
2. Section H.2.31 of the Waste Licence Application refers to higher limit values for inert waste [provision for which is made under Council Decision 2003/33/EC]. Under the W0129-03 proposal, the MEHL facility will offer co-located landfill disposal capacity for inert, non-hazardous and hazardous wastes, subject to strict Waste Acceptance Criteria. In light of this, MEHL **will no longer seek** to retain higher limit values for inert waste for future incoming wastes^{1 2}.
3. It is anticipated, based on international experience, that up to three times the limit values specified under 2003/33/EC may be required for certain parameters for solidified flue-gas treatment (FGT) residues.

¹ Limit value for 17-PAHs for inert waste (Soil & Stones, EWC Code 17 05 04) to be retained at 100mg/kg, as agreed under W0129-02 [Council Decision 2003/33/EC requires Member States to set limit value for PAHs for inert waste].

² Limit values agreed with the Agency to be retained for previously-deposited waste.



Directors: Seamus Murphy (Managing Director), Patricia Rooney, Rory Murphy, Emma Murphy
Reg. Office: Hollywood Great, Nag's Head, Naul, County Dublin
Reg. No. 448931 VAT No. IE 9677893C



Murphy Environmental Hollywood Ltd

4. As stated in Section H.1.16 of the Waste Licence Application (December 2010), the main environmental concern³ with respect to FGT residues is leaching of:
- Easily soluble salts such as Cl and Na. Although not toxic for humans in typical concentration levels these components may significantly affect ecosystems and spoil drinking water resources.
 - Heavy metals such as Cd, Cr, Cu, Ni, Pb, and Zn. Heavy metals and trace elements can potentially be present in concentrations harmful for humans as well as for ecosystems. As such, leaching of these components has generally been the primary concern and has also received the greatest research focus.
 - Dioxins. Although dioxins and furans do not easily leach, release of these contaminants is of major concern because of their toxicity.
5. Recent analysis results for FGT residue generated at the Carranstown waste-to-energy plant, Duleek, Co. Meath (EPA Licence W0167-01) are attached in **Appendix 1**.
6. As H.3.4-H.3.6 of the Waste Licence Application, stabilisation and solidification processes are commonly used for the treatment of combustion ashes and flue-gas cleaning residues. Cement solidification involves the mixing of wastes with cement (or alternative materials) and additives (to control the properties of the cement), and enough water to ensure that hydration reactions will take place to bind the cement. Both stabilisation and solidification processes take place. The wastes are thereby incorporated into the cement matrix.
7. Post-solidification, it is proposed to cure the solidified material. It is anticipated that, post-curing, higher WAC limits may be required for certain parameters. There is a lack of published WAC data for **solidified** FGT residue; however it is anticipated that WAC values up to 'three times' limits may be required for Lead, Chloride, Zinc, Sulphate and Total Dissolved Solids.
8. Due to uncertainties surrounding the nature and characteristics of the wastes to be presented at the MEHL integrated waste facility at this point in time, higher WAC limits are sought for all hazardous wastes and for all WAC parameters, as permissible under Council Decision 2003/33/EC (as described in H.2.27-H.2.33 of the Waste Licence Application).
9. Higher WAC limits **for hazardous waste only** are sought on the basis of a lack of published WAC analysis data for the targeted waste streams; and potential changes in waste characteristics over time, associated with different waste streams, waste processes and waste management techniques. The site is proven to be suitable [no additional risk to the environment associated with 'three times' WAC limit values] in terms of the Quantitative Risk Assessment hydrogeological model.

³ ISWA-WG/Thomas Astrup, Technical University of Denmark (2008) Management of APC residues from W-t-E Plants: An overview of management options and treatment methods



Murphy Environmental Hollywood Ltd

10. The following criteria will be applied to determine that incoming wastes are non-biodegradable:

- Waste Acceptance Procedure documentation will include a 'Query Questionnaire' form, which the waste producer/holder will be required to complete. The form will require a description of the type, source and origin of the waste and the EWC code. The form will also require the applicant user to confirm that the proposed waste may be described as a non-biodegradable waste.
- EWC codes with known biodegradable content will be refused, e.g. food waste, mixed municipal waste, wastes from municipal wastewater treatment facilities.
- Incoming wastes will be subject to laboratory testing for Total Organic Carbon (TOC) and Dissolved Organic Carbon (DOC), in line with WAC requirements. WAC limit values will apply. In addition, hazardous wastes will be subject to Loss on Ignition (LoI) testing.

The information contained herein is deemed not to impinge on the non-technical summary of the Waste Licence Application or EIS; no revisions to drawings arise from the information contained herein. The content of the electronic files on the accompanying CD-ROM is a true copy of the original.

If you have any further queries in relation to this matter please do not hesitate to contact us.

Yours sincerely,

Patricia Rooney
Director & General Manager, MEHL

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Appendix 1:

**FGT residue analysis results (pre-treated, unsolidified) for
Carranstown Waste-to-energy Facility
(EPA Licence W0167-01)**

Quarter 3, 2021

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Fax (0113)-319 299

Indaver Ireland Limited

Attn. Mrs. G. McCormack
Carranstown
DULEEK, COUNTY MEATH
IRELAND

's-Gravenpolder, 17/10/2011

ANALYTICAL REPORT 201110000330

Customer : Indaver Ireland Limited
Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : Flue gas residue 2011-09-28-2

(UK-Vaste afvals)

Sample code
Date of sampling

1
28/09/2011

Parameter Unit method

PHYSICO-CHEMICAL ANALYSIS

Total Organic Carbon wt%db [Contracted out external] 2.7

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K.J. Vuurmans
Laboratory manager

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In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.

(page: 1, last page)



APPENDIX 1

's-Gravenpolder, 17/10/2011

ANALYTICAL REPORT 201110000330

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Preservation & conservation remarks

All samples have been preserved in a correct way and have been transported to the lab within the maximum recommended preservation time.

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(page: 1, last page)

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AGROLAB
group



SGS NEDERLAND BV
Saridin Guillian
POSTBUS 200
3200 AE SPIJKENISSE

Datum 17.10.2011
Relatienr 35004018
Opdrachtnr. 272654
Blad 1 van 2

ANALYSERAPPORT

Opdracht 272654 Bodem / Eluaat

Opdrachtgever 35004018 SGS NEDERLAND BV
Referentie Offerte afspraken SGS
Opdrachtacceptatie 11.10.11
Monsternemer Opdrachtgever

Geachte heer, mevrouw,

Hierbij zenden wij u de resultaten van het door u aangevraagde laboratoriumonderzoek.
De analyses zijn erkend door de OVAM, tenzij aangegeven met een n (niet geaccrediteerd) bij toegepaste methoden. Wanneer een analyse niet erkend is door de OVAM, dan kan deze wel EN-ISO/IEC 17025 geaccrediteerd zijn. Of een analyse geaccrediteerd is, kunt u vinden in onze lijst van verrichtingen behorend tot ons accreditatiecertificaat nummer L005 van de Raad voor Accreditatie. Deze kunt u opvragen bij Klantenservice.

Indien u gegevens wenst over de meetonzekerheden van een methode, kunnen wij u deze op verzoek verstrekken.

Dit rapport mag alleen in zijn geheel worden gereproduceerd. Indien u nog vragen heeft of aanvullende informatie wenst, verzoeken wij u om contact op te nemen met Klantenservice.

Wij vertrouwen erop u met de toegezonden informatie van dienst te zijn.

Met vriendelijke groet,

AL-West B.V. Dhr. Rudie Leuverink, Tel. +31/570788112
Klantenservice

Distributeur

SGS NEDERLAND BV , Guillian Saridin

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Blad 2 van 2

Opdracht 272654 Bodem / Eluaat

Monsternr.	Monstername	Monsteromschrijving
534925	11.10.2011	201110000330-1

Eenheid 534925
201110000330-1

Algemene monstervoorbehandeling

Droge stof	%	99,6
------------	---	------

Klassiek Chemische Analyses

Totaal Organisch Koolstof (TOC)	% Ds	2,7
---------------------------------	------	-----

Begin van de analyses: 11.10.11

Einde van de analyses: 17.10.11

De onderzoeksresultaten hebben alleen betrekking op het aangeleverde monstermateriaal. Monsters met onbekende herkomst, kunnen slechts beperkt gecontroleerd worden op plausibiliteit.

AL-West B.V. Dhr. Rudie Leuverink, Tel. +31/570788112

Klantenservice

Dit elektronisch gegenereerde rapport is gecontroleerd en vrijgegeven. In overeenstemming met de vereisten van NEN EN ISO/IEC 17025:2005 voor eenvoudige rapportage is dit rapport zonder handtekening rechtsgeldig.

Distributeur

SGS NEDERLAND BV, Guillian Saridin

Toegepaste methoden**Grond**

conform ISO 10694 en conform NEN-EN 13137 (afval):Totaal Organisch Koolstof (TOC)

Giw. NEN-ISO 11465;cf. NEN-EN 12880; cf. AS3000:Droge stof

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Indaver Ireland Limited

Attn: Mrs. G. McCormack
 Carranstown
 DULEEK, COUNTY MEATH
 IRELAND

's-Gravenpolder, 19/10/2011

ANALYTICAL REPORT 201110000030

Customer : Indaver Ireland Limited
 Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : Flue gas residue 2011-09-28-2 (UK-Vaste afvals)
 2 : Flue gas residue 2011-09-28-2 (Eluates)

Sample code	1	2	
Date of sampling	28/09/2011	28/09/2011	
Parameter	Unit	method	
PHYSICO-CHEMICAL ANALYSIS			
Q Dry substance	wt%	[acc. to CMA/2/IIA.1]	99,9
WET CHEMICAL MEASUREMENTS			
Phenol index	µg/l	[acc. to NEN-EN ISO 14402]	670
HEAVY METALS			
Aluminium	µg/l	[acc. to NEN 6966/C1]	94
Beryllium	µg/l	[acc. to NEN 6966/C1]	< 1.0
Boron	µg/l	[acc. to NEN 6966/C1]	< 100
Iron	µg/l	[acc. to NEN 6966/C1]	< 10
Manganese	µg/l	[acc. to NEN 6966/C1]	< 10
ION SELECTIVE MEASUREMENTS			
Q Fluoride same as F	mg/l	[Equivalent to NEN 6483]	3,4 *
ION CHROMATOGRAPHIC MEASUREMENTS			
Q Chloride same as Cl	mg/l	[acc. to ISO 10304-1/2]	4600
Q Sulphate same as SO4	mg/l	[acc. to ISO 10304-1/2]	1100
LEACH TEST			
L/S-ratio	l/kgdb		10.0
Q Shake test		[acc. to CMA/2/IIA.12]	x
Q L/S-ratio	l/kgdb		10.0
PHYSICO-CHEMICAL ANALYSIS			
Q pH		[acc. to ISO 10523]	12.7
Temperature pH-measurement	°C		18.0
WET CHEMICAL MEASUREMENTS (ELUATE)			
Q Chrome (VI) as Cr	mg/l	[acc. to CMA/2/IC.7]	< 0.05
Q Total cyanide same as CN	µg/l	[acc. to NEN-ISO 14403]	65
HEAVY METALS (ELUATE)			
Q Arsenic	µg/l	[acc. to NVN 7322]	< 10
Q Barium	µg/l	[acc. to NVN 7322]	930
Q Cadmium	µg/l	[acc. to NVN 7322]	< 0.70
Q Chrome	µg/l	[acc. to NVN 7322]	79
Q Cobalt	µg/l	[acc. to NVN 7322]	< 5.0
Q Copper	µg/l	[acc. to NVN 7322]	62
Q Lead	µg/l	[acc. to NVN 7322]	3300
Q Molybdene	µg/l	[acc. to NVN 7322]	68
Q Nickel	µg/l	[acc. to NVN 7322]	< 20
Q Thallium	µg/l	[acc. to NVN 7322]	< 10
Q Vanadium	µg/l	[acc. to NVN 7322]	< 10

(page: 1, see following page)



's-Gravenpolder, 19/10/2011

ANALYTICAL REPORT 201110000030

Customer : Indaver Ireland Limited
Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : Flue gas residue 2011-09-28-2 (UK-Vaste afvals)
2 : Flue gas residue 2011-09-28-2 (Eluates)

Sample code : 1 2
Date of sampling : 28/09/2011 28/09/2011

Parameter	Unit	method	1	2
Q Zinc	µg/l	[acc. to NVN 7322]		3400
Q Mercury	µg/l	[acc. to NVN 7324]		0.23
Q Tin	µg/l	[Equivalent to NVN 7322]		< 2.0
Antimony	µg/l	[Equivalent to NVN 7323]		2.0
Selene	µg/l	[Equivalent to NVN 7323]		9.0

Comment: For inspection purposes only. Client signature required for any other use.

K.J. Vuurmans
Laboratory manager

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In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.



APPENDIX 1

's-Gravenpolder, 19/10/2011

ANALYTICAL REPORT 201110000030

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Preservation & conservation remarks

All samples have been preserved in a correct way and have been transported to the lab within the maximum recommended preservation time.

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APPENDIX 2

ANALYTICAL REPORT 201110000030

's Gravenpolder, 19/10/2011

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Explanation of results of analysis

Sample description: 2 : Flue gas residue 2011-09-28-2

ION SELECTIVE MEASUREMENTS (ELUATE)

- In contrast to the above norm the analysis was carried out in compliance with NEN-EN-ISO 10304

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Indaver Ireland Limited
Attn. Mrs. G. McCormack
Carranstown
DULEEK, COUNTY MEATH
IRELAND

's-Gravenpolder, 13/10/2011

ANALYTICAL REPORT 201110000329

Customer : Indaver Ireland Limited
Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 ; Flue gas residue 2011-09-28-2

(LJK-Vaste afval)

Sample code : 1
Date of sampling : 28/09/2011

Parameter	Unit	method	
PHYSICO-CHEMICAL ANALYSIS			
Dry substance	wt%	[acc. to NEN-ISO 11465]	99.4
SULPHUR COMPOUNDS			
Sulphur same as S	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	13000
HEAVY METALS			
Aluminium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	4100
Antimony	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	140
Arsene	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	7.6
Barium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	120
Cadmium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	46
Calcium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	410000
Chrom	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	19
Cobalt	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	< 4.0
Iron	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	2600
Potassium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	11000
Copper	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	130
Lead	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	390
Manganese	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	140
Molybdene	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	2.2
Nickel	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	13
Selene	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	< 10
Tin	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	95
Vanadium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	12
Zinc	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	2300
Mercury	mg/kgdb	[acc. to NEN6961/NEN-ISO16772]	2.5
Thallium	mg/kgdb	[SGS 2005-26]	< 6.0
Silicium	mg/kgdb	[subcontracted]	560
ION SELECTIVE MEASUREMENTS			
Fluoride same as F	mg/kgdb	[acc. VPR C88-03/NEN 6589]	33
ION CHROMATOGRAPHIC MEASUREMENTS			
Bromide same as Br	mg/kgdb	[acc. VPR C85-06/ISO 10304-2]	610
Sulphate same as SO4	mg/kgdb	[acc. VPR C85-06/ISO 10304-2]	11000
Chloride same as Cl	mg/kgdb	[cons. SIKB3001 ana. AS3040 pb.2]	260000

(page: 1, see following page)



's-Gravenpolder, 13/10/2011

ANALYTICAL REPORT 201110000329

Customer : Indaver Ireland Limited
Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 ; Flue gas residue 2011-09-28-2 (UK-Vaste afvals)

Sample code :
Date of sampling : 28/09/2011

Parameter	Unit	method
-----------	------	--------

K.J. Vuurmans
Laboratory manager

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APPENDIX 1

's-Gravenpolder, 13/10/2011

ANALYTICAL REPORT 201110000329

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Preservation & conservation remarks

Differences with the guidelines for the preservation and handling of samples have been observed and these may have influenced the reported analytical results.

Sample number: 1 Sample description: Flue gas residue 2011-09-28-2
- Dry substance
The maximum recommended preservation time has been exceeded

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Appendix 2:

**FGT residue analysis results (pre-treated, unsolidified) for
Carranstown Waste-to-energy Facility
(EPA Licence W0167-01)**

Quarter 1, 2012

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Aflever/bezoek adres
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Postbus 78
4430 AB 's-Gravenpolder
Nederland
Tel (0113)-319 200
Fax (0113)-319 299

Indaver Ireland Limited
Attn. Mrs. G. McCormack
Carranstown
DULEEK, COUNTY MEATH
IRELAND

's-Gravenpolder, 23/01/2012

ANALYTICAL REPORT 201201000477

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden
Sample descriptions : 1 : 2012-01-09-02


(UK-Vaste afvals)

Sample code
Date of sampling
Laboratory receival date

	T
	09/01/2012
	11/01/2012

Parameter	Unit	method	
PHYSICO-CHEMICAL ANALYSIS			
Total Organic Carbon	wt%db	[Contracted out externally]	1.7

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K.J. Vuurmans
Laboratory manager

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In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.

(page: 1, last page)



APPENDIX 1

's-Gravenpolder, 23/01/2012

ANALYTICAL REPORT 201201000477

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Preservation & conservation remarks

All samples have been preserved in a correct way and have been transported to the lab within the maximum recommended preservation time.

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AGROLAB
GROUP



SGS NEDERLAND BV
Saridin Guillian
POSTBUS 200
3200 AE SPIJKENISSE

Datum 19.01.2012
Relatienr 35004018
Opdrachtnr. 287857
Blad 1 van 2

ANALYSERAPPORT

Opdracht 287857 Overig afval

Opdrachtgever 35004018 SGS NEDERLAND BV
Referentie 201201000477
Opdrachtacceptatie 16.01.12
Monsternemer Opdrachtgever

Geachte heer, mevrouw,

Hierbij zenden wij u de resultaten van het door u aangevraagde laboratoriumonderzoek. De analyses zijn geaccrediteerd volgens NEN-EN-ISO/IEC 17025, tenzij anders vermeld bij toegepaste methoden en uitgevoerd overeenkomstig de onderzoeksmethoden die worden genoemd in de meest actuele versie van onze verrichtingenlijst van de Raad voor Accreditatie, accreditatienummer L005.

Indien u gegevens wenst over de meetonzekerheden van een methode, kunnen wij u deze op verzoek verstrekken.

Dit rapport mag alleen in zijn geheel worden gereproduceerd. Eventuele bijlagen zijn onderdeel van het rapport.

Indien u nog vragen heeft of aanvullende informatie wenst, verzoeken wij u om contact op te nemen met Klantenservice.

Wij vertrouwen erop u met de toegezonden informatie van dienst te zijn.

Met vriendelijke groet,

AL-West B.V. Dhr. Rudie Leuverink, Tel. +31/570788112
Klantenservice

Distributeur

SGS NEDERLAND BV , Guillian Saridin

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Blad 2 van 2

Opdracht 287857 Overig afval

Monsternr.	Monstername	Monsteromschrijving
623181	09.01.2012	201201000477-1

Eenheid 623181
201201000477-1

Algemene monstervoorbehandeling

Droge stof	%	99,6
------------	---	------

Klassiek Chemische Analyses

Totaal Organisch Koolstof (TOC)	% Ds	1,7
---------------------------------	------	-----

Begin van de analyses: 16.01.12

Einde van de analyses: 19.01.12

De onderzoeksresultaten hebben alleen betrekking op het aangeleverde monstermateriaal. Monsters met onbekende herkomst, kunnen slechts beperkt gecontroleerd worden op plausibiliteit.

AL-West B.V. Dhr. Rudie Leuverink, Tel. +31/570788112
Klantenservice

Dit elektronisch gegenereerde rapport is gecontroleerd en vrijgegeven. In overeenstemming met de vereisten van NEN EN ISO/IEC 17025:2005 voor eenvoudige rapportage is dit rapport zonder handtekening rechtsgeldig.

Distributeur

SGS NEDERLAND BV, Guillian Saridin

Toegepaste methoden

Grond

conform ISO 10694 en conform NEN-EN 13137 (afval):Totaal Organisch Koolstof (TOC)

Glw. NEN-ISO 11465;cf. NEN-EN 12880; cf. AS3000:Droge stof

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Bijlage bij Opdrachtnr. 287857

Blad 1 van 1

CONSERVERING, CONSERVERINGSTERMIJN EN VERPAKKING

Er zijn verschillen met de richtlijnen geconstateerd die mogelijk de betrouwbaarheid van de analyseresultaten beïnvloeden. De conserveringstermijn is voor volgende analyse overschreden:

Droge stof 623181

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Indaver Ireland Limited
 Attn. Mrs. G. McCormack
 Carranstown
 DULEEK, COUNTY MEATH
 IRELAND

's-Gravenpolder, 26/01/2012

ANALYTICAL REPORT 201201000478

Customer : Indaver Ireland Limited
 Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : 2012-01-09-02 (UK-Vaste afvals)
 2 : 2012-01-09-02 ()

Sample code	1	2
Date of sampling	09/01/2012	09/01/2012
Laboratory receive date	11/01/2012	11/01/2012

Parameter	Unit	method	
PHYSICO-CHEMICAL ANALYSIS			
Q Dry substance	wt%	[acc. to CMA/2/II/A]	99.4
WET CHEMICAL MEASUREMENTS			
Phenol index	µg/l	[acc. to NEN-ISO 14402]	< 5.0
HEAVY METALS			
Aluminium	µg/l	[acc. to NEN 6966/C1]	< 10
Beryllium	µg/l	[acc. to NEN 6966/C1]	< 1.0
Borium	µg/l	[acc. to NEN 6966/C1]	430
Iron	µg/l	[acc. to NEN 6966/C1]	< 10
Manganese	µg/l	[acc. to NEN 6966/C1]	< 10
ION SELECTIVE MEASUREMENTS			
Fluoride same as F	mg/l	[Equivalent to NEN 6483]	2.9
ION CHROMATOGRAPHIC MEASUREMENTS			
Chloride same as Cl	mg/l	[acc. to ISO 10304-1/2]	17000
Sulphate same as SO4	mg/l	[acc. to ISO 10304-1/2]	2000
LEACH TEST			
L/S-ratio	l/kgdb		10.0
Q Shake test		[acc. to CMA/2/II/A.12]	X
Q L/S-ratio	l/kgdb		10.0
PHYSICO-CHEMICAL ANALYSIS			
pH		[acc. to ISO 10523]	12.1
Temperature pH-measurement	°C		21.5
WET CHEMICAL MEASUREMENTS (ELUATE)			
Chrome (VI) as Cr	mg/l	[acc. to CMA/2/II/C.7]	< 0.05
Total cyanide same as CN	µg/l	[acc. to NEN-ISO 14403]	< 1.0
HEAVY METALS (ELUATE)			
Tin	µg/l	[Acc. to AP04.E-XI]	< 2.0
Antimony	µg/l	[Acc. To AP04.E-XIII]	1.3
Selene	µg/l	[Acc. to AP04.E-XIV]	14
Arsene	µg/l	[acc. to NVN 7322]	< 10
Barium	µg/l	[acc. to NVN 7322]	5600
Cadmium	µg/l	[acc. to NVN 7322]	< 0.70
Chrome	µg/l	[acc. to NVN 7322]	19
Cobalt	µg/l	[acc. to NVN 7322]	< 5.0
Copper	µg/l	[acc. to NVN 7322]	230
Lead	µg/l	[acc. to NVN 7322]	43000

(page: 1, see following page)

ANALYTICAL REPORT 201201000478

Customer : Indaver Ireland Limited
 Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : 2012-01-09-02 (UK-Vaste afvals)
 2 : 2012-01-09-02

Sample code	1	2
Date of sampling	09/01/2012	09/01/2012
Laboratory receival date	11/01/2012	11/01/2012


Parameter	Unit	method	
Molybdene	µg/l	[acc. to NVN 7322]	220
Nickel	µg/l	[acc. to NVN 7322]	< 20
Thallium	µg/l	[acc. to NVN 7322]	< 10
Vanadium	µg/l	[acc. to NVN 7322]	< 10
Zinc	µg/l	[acc. to NVN 7322]	8500
Mercury	µg/l	[acc. to NVN 7324]	< 0.20

NON ROUTINE TEST
 non-routine test

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[Subcontracted]

ZIE
 BIJGEVOEGD
 ANALYSECERTI
 FICAAAT


 K.J. Vuurmans
 Laboratory manager

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Tests marked with a "Q" are performed under RvA Accreditation (L092)

In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.



APPENDIX 1

ANALYTICAL REPORT 201201000478

's-Gravenpolder, 26/01/2012

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Preservation & conservation remarks

All samples have been preserved in a correct way and have been transported to the lab within the maximum recommended preservation time.

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SGS NEDERLAND BV
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Spoorstraat 12, 4431 NK
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4430AB S'GRAVENPOLDER
Nederland

ANALYSERAPPORT : IAC12-00246

Uw referentie: 'S Gravenpolder - 201201000478-1
Aantal monsters: 1
Datum van ontvangst: 16/01/2012
Monsteridentificatie:
201201000478-1

Analyseresultaten:

Determination of 2,3,7,8 substituted PCDF's and PCDD's
(HRGC/HRMS; ECO/AV/IAC/012)

^B Determination of Dioxin-like Polychlorinated Biphenyls (PCB)
(HRGC/HRMS; ECO/AV/IAC/015)

De analyses gemarkeerd met een B zijn Belac ISO17025 geaccrediteerd (N.005-TEST)

ANTWERPEN, 25/01/2012

I.A.C.
Een divisie van SGS Belgium NV

Marc Van Ryckeghem
Division Manager



ISO17025 (N.005-TEST)

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Het analyserapport kan enkel en alleen aangewend worden binnen de specifieke context van de opdracht en is enkel geldig voor de geanalyseerde monsters.

Alle opdrachten worden opgesteld op naam en voor rekening van de opdrachtgever, die uitdrukkelijk aanvaardt dat deze rapporten slechts een momentopname vertegenwoordigen en steeds in hun geheel en in de context ervan dienen te worden voorgelegd en/of vermeld. Een beschrijving van de gebruikte analysemethoden, de identiteit van de externe laboratoria voor de gemerkte (E) analyses en de meetonzekerheid van de analyses zijn op aanvraag beschikbaar. Mogelijks vermelde normen of criteria zijn opgesteld en vermeld in samenspraak met de opdrachtgever.

SGS Belgium NV, opsteller van deze rapporten, kan niet aansprakelijk gesteld worden voor fouten of wijzigingen van resultaten ontstaan gedurende of n.a.v. elektronische of faxtransmissie. Enkel en uitsluitend het origineel getekend rapport is bindend.

SGS Belgium NV Institute for Applied Chromatography Haven 407 Polderdijkweg 16 B-2030 Antwerpen
t +32 (0)3 545 85 90 f +32 (0)3 545 85 99 e be.iac@sgs.com url www.sgs.be

Determination of 2,3,7,8 substituted PCDF's and PCDD's			
Monsteridentificatie : IAC12-00246.001 Uw referentie: 201201000478-1			
Component	Concentratie (ng/kg)	I-TEF	I-TEQ (ng/kg)
2,3,7,8-TCDF	170	0,1	17
2,3,7,8-TCDD	36	1	36
1,2,3,7,8-PeCDF	290	0,05	14
2,3,4,7,8-PeCDF	400	0,5	200
1,2,3,7,8-PeCDD	110	0,5	56
1,2,3,4,7,8-HxCDF	370		37
1,2,3,6,7,8-HxCDF	470	0,1	47
2,3,4,6,7,8-HxCDF	1100 (*)	0,1	110
1,2,3,7,8,9-HxCDF	30	0,1	3,0
1,2,3,4,7,8-HxCDD	110	0,1	11
1,2,3,6,7,8-HxCDD	260	0,1	26
1,2,3,7,8,9-HxCDD	190	0,1	19
1,2,3,4,6,7,8-HpCDF	200 (*)	0,01	20
1,2,3,4,7,8,9-HpCDF	470	0,01	4,7
1,2,3,4,6,7,8-HpCDD	1700 (*)	0,01	17
OCDF	2300	0,001	2,3
OCDD	2700 (*)	0,001	2,7
Totaal			620

Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895).

De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.

(*) Resultaten vallen buiten het lineariteitsbereik van de analysemethode

Determination of Dioxin-like Polychlorinated Biphenyls (PCB)			
Monsteridentificatie : IAC12-00246.001 Uw referentie: 201201000478-1			
Component	Concentratie (ng/kgds)	WHO-TEF	WHO-TEQ (ng/kgds)
Non-ortho PCBs			
3,4,4',5'-TeCB (PCB #81)	59	0,0001	0,0059
3,3',4,4'-TeCB (PCB #77)	140	0,0001	0,014
3,3',4,4',5'-PeCB (PCB #126)	170	0,1	17
3,3',4,4',5,5'-HxCB (PCB #169)	90	0,01	0,90
Mono-ortho PCBs			
2',3,4,4',5'-PeCB (PCB #123)	20	0,0001	0,0020
2,3',4,4',5'-PeCB (PCB #118)	<110	0,0001	< 0,011
2,3,4,4',5'-PeCB (PCB #114)	19	0,0005	0,0096
2,3,3',4,4'-PeCB (PCB #105)		0,0001	0,0087
2,3',4,4',5,5'-HxCB (PCB #167)	<50	0,00001	< 0,00050
2,3,3',4,4',5'-HxCB (PCB #156)	<95	0,0005	< 0,048
2,3,3',4,4',5'-HxCB (PCB #157)	63	0,0005	0,031
2,3,3',4,4',5,5'-HxCB (PCB #189)	98	0,0001	0,0098
Totaal			18,2 - 18,3
Measurement Uncertainty			
Voor de berekening van de TEQ-waarden voor PCDD/F werden de toxiciteits-equivalentfactoren gehanteerd volgens J.A. van Zorge et al. (Chemosphere 19 (1989), 1991-1895). De meetonzekerheid werd bepaald en is beschikbaar in het laboratorium. Op eenvoudig verzoek kunnen deze gegevens overgemaakt worden. De RSD van het controlestaal is kleiner dan 10%.			

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Recovery standaarden - 2,3,7,8 substituted PCDF's and PCDD's	
Monsteridentificatie : IAC12-00246.001 Uw referentie: 201201000478-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
13C-2,3,7,8-TCDF	113
13C-2,3,7,8-TCDD	87,8
13C-1,2,3,7,8-PeCDF	106
13C-2,3,4,7,8-PeCDF	111
13C-1,2,3,7,8-PeCDD	98,0
13C-1,2,3,4,7,8-HxCDF	89,2
13C-1,2,3,6,7,8-HxCDF	88,7
13C-2,3,4,6,7,8-HxCDF	99,0
13C-1,2,3,7,8,9-HxCDF	98,4
13C-1,2,3,4,7,8-HxCDD	89,2
13C-1,2,3,6,7,8-HxCDD	92,1
13C-1,2,3,4,6,7,8-HpCDF	111
13C-1,2,3,4,7,8,9-HpCDF	96,7
13C-1,2,3,4,6,7,8-HpCDD	102
13C-OCDF	101
13C-OCDD	104

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Recovery standaarden - Dioxin-like Polychlorinated Biphenyls (PCB)	
Monsteridentificatie : IAC12-00246.001 Uw referentie: 201201000478-1	
Recovery extractie standaarden	
Component	Recovery 13C-extractie standaarden (%)
Non-ortho PCBs	
13C-3,4,4',5-TeCB (PCB #81)	104
13C-3,3',4,4-TeCB (PCB #77)	105
13C-3,3',4,4',5-PeCB (PCB #126)	91,2
13C-3,3',4,4',5,5'-HxCB (PCB #169)	91,6
Mono-ortho PCBs	
13C-2',3,4,4',5-PeCB (PCB #123)	87,3
13C-2,3',4,4',5-PeCB (PCB #118)	82,9
13C-2,3,4,4',5-PeCB (PCB #114)	84,1
13C-2,3,3',4,4'-PeCB (PCB #105)	90,4
13C-2,3',4,4',5,5'-HxCB (PCB #167)	75,5
13C-2,3,3',4,4',5-HxCB (PCB #156)	80,2
13C-2,3,3',4,4',5-HxCB (PCB #157)	82,6
13C-2,3,3',4,4',5,5'-HxCB (PCB #189)	94,9

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Indaver Ireland Limited
 Attn. Mrs. G. McCormack
 Carranstown
 DULEEK, COUNTY MEATH
 IRELAND

's-Gravenpolder, 17/01/2012

ANALYTICAL REPORT 201201000476

Customer : Indaver Ireland Limited
 Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : 2012-01-09-02

(UK-Vaste afvals)

Sample code : 1
 Date of sampling : 09/01/2012
 Laboratory receival date : 11/01/2012

Parameter Unit method

PHYSICO-CHEMICAL ANALYSIS

Dry substance wt% [acc. to NEN-ISO 11065] 99.7

HEAVY METALS

Aluminium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	9500
Antimony	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	280
Arsene	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	26
Barium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	250
Cadmium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	130
Calcium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	310000
Chrome	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	32
Cobalt	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	8.3
Iron	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	5200
Potassium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	32000
Copper	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	380
Lead	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	1700
Manganese	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	320
Molybdene	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	6.4
Nickel	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	32
Selene	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	< 10
Tin	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	400
Vanadium	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	47
Zinc	mg/kgdb	[acc. to NEN 6961/NEN 6966/C1]	6600
Mercury	mg/kgdb	[acc. to NEN6961/NEN-ISO16772]	6.2
Thallium	mg/kgdb	[SGS 2005-26]	< 6.0

ION SELECTIVE MEASUREMENTS

Fluoride same as F mg/kgdb [acc. VPR C88-03/NEN 6589] 12

ION CHROMATOGRAPHIC MEASUREMENTS

Bromide same as Br	mg/kgdb	[acc. VPR C85-06/ISO 10304-2]	1500
Sulphate same as SO4	mg/kgdb	[acc. VPR C85-06/ISO 10304-2]	17000
Chloride same as Cl	mg/kgdb	[cons. SIKB3001 ana. AS3040 pb.2]	170000

(page: 1, see following page)



's-Gravenpolder, 17/01/2012

ANALYTICAL REPORT 201201000476

Customer : Indaver Ireland Limited
Description : Flue gas residue

Sampled by : Derden

Sample descriptions : 1 : 2012-01-09-02

(UK-Vaste afvals)

Sample code	1
Date of sampling	09/01/2012
Laboratory receipt date	11/01/2012

Parameter	Unit	method
-----------	------	--------

K.J. Vuurmans
Laboratory manager

Reports are produced on behalf of and for the account of the customer. The customer acknowledges and accepts that these reports represent the situation at time of analysis and always should be taken and/or reported in their entirety and in context. SGS Nederland B.V., issuer of these reports cannot be held liable for errors or the modification of results during and/or after electronic/fax transmission. Only the original signed report is binding. Precision data in relation to the accredited analysis are available on request.

In Appendix 1 information is given about the sample preservation and preservation times of the received samples. Technical information about any in the report with * marked results is given in appendix 2. The reports from possible external subcontracted analyses are attached as addendum in this report.

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APPENDIX 1

's-Gravenpolder, 17/01/2012

ANALYTICAL REPORT 201201000476

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Preservation & conservation remarks

All samples have been preserved in a correct way and have been transported to the lab within the maximum recommended preservation time.

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(page: 1, last page)



APPENDIX 2

's Gravenpolder, 17/01/2012

ANALYTICAL REPORT 201201000476

Customer : Indaver Ireland Limited
Description : Flue gas residue
Sampled by : Derden

Explanation of results of analysis

Sample description: 1 : 2012-01-09-02

ION CHROMATOGRAPHIC MEASUREMENTS

Fluoride

- In contrast to the above norm the analysis was carried out in compliance with NEN-EN-ISO 10304

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Appendix C

Historic Borehole Logs

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REVIEW OF GROUNDWATER MONITORING BOREHOLES AT MEHL, HOLLYWOOD (EPA LICENCE APPLICATION W0129-03)

BH ID	EASTING	NORTHING	LOCATION	FINISHED DEPTH	DATE DRILLED	DATE DECOMMISSIONED	REFERENCE/ PURPOSE	LOG AVAILABLE
ICBH1	? ¹	?	Within site – north	34.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH2	?	?	Within site – north	34.0m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH3	?	?	Within site – north	32.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH4	?	?	Within site – north/centre	38.0m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH6	?	?	Within site – south	22.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH7	?	?	Within site – south	10.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH8	?	?	Within site – south	6.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH9	?	?	Within site – south	29.0m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>

¹ Location of IC boreholes shown on Fig. 3.6.2 of EIS 1999

REVIEW OF GROUNDWATER MONITORING BOREHOLES AT MEHL, HOLLYWOOD (EPA LICENCE APPLICATION W0129-03)

BH ID	EASTING	NORTHING	LOCATION	FINISHED DEPTH	DATE DRILLED	DATE DECOMMISSIONED	REFERENCE/ PURPOSE	LOG AVAILABLE
ICBH10	?	?	Within site – south	32.0m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH11	?	?	Within site – south	4.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
ICBH12	?	?	Within site – south	6.5m	May 1989	Not known; pre-1998	DeBritt – Quarry investigation for Irish Cement (referenced in EIS 1999)	<input checked="" type="checkbox"/>
BH-1	315448	257939	Within site - west	56m	03/09/1998	?	EIS 1999	<input checked="" type="checkbox"/>
BH-2	315561	257897	Within site - south	13.9m	06/07/1998	?	EIS 1999	<input checked="" type="checkbox"/>
BH-3	315624	258176	Within site – north/centre	10.9m	17/07/1998	?	EIS 1999	<input checked="" type="checkbox"/>
BH-4 ²	316105	257867	East of site – ca. 520m	9m	03/09/1998	2009	EIS 1999	<input checked="" type="checkbox"/>
BH-4A	316271.2	257891.03	East of site	12.19m	18/11/2008	ACTIVE	To replace BH-4 for ongoing monitoring as a licensed facility.	Drillers' log only
BH-5	315796	258328	Within site – north	35m	03/09/1998	ACTIVE	EIS 1999	<input checked="" type="checkbox"/>
BH-6	315644	258506	North of site – ca. 240m	19.5m	03/09/1998	ACTIVE	EIS 1999	<input checked="" type="checkbox"/>
BH-7	Not recorded on log	Not recorded on log	Within site - south	41m	07/09/1998	Abandoned 07/09/1998	EIS 1999	<input checked="" type="checkbox"/>

² Grid ref. stated as 316115, 257861 on some documents; however grid ref. in table is deemed accurate and is stated on original BH log.

REVIEW OF GROUNDWATER MONITORING BOREHOLES AT MEHL, HOLLYWOOD (EPA LICENCE APPLICATION W0129-03)

BH ID	EASTING	NORTHING	LOCATION	FINISHED DEPTH	DATE DRILLED	DATE DECOMMISSIONED	REFERENCE/ PURPOSE	LOG AVAILABLE
BH-8	315479	258069	Within site - west	27m	17/08/2001	ACTIVE	W0129-01 Application, Art. 16 (Oct. 2001)	<input checked="" type="checkbox"/>
BH-9	315560	258280	Within site - north west	50m	03/08/2001	ACTIVE	W0129-01 Application, Art. 16 (Oct. 2001)	<input checked="" type="checkbox"/>
BH-10	315442	257731	Within site - south west	84m	04/08/2001	Q3, 2007	W0129-01 Application, Art. 16 (Oct. 2001)	<input checked="" type="checkbox"/>
BH-10A	315522	257697	Within site - south west	68m	05/03/2007	ACTIVE	Application to Review Waste Licence W0129-01 (July 2007)	<input checked="" type="checkbox"/>
BH-11 ³	315932	258219	Within site - north east	50m	03/08/2001	Q4, 2007	W0129-01 Application, Art. 16	<input checked="" type="checkbox"/>
BH-11A	316112	258249	Within site - north east	30m	02/05/2007	ACTIVE	Application to Review Waste Licence W0129-01 (July 2007)	<input checked="" type="checkbox"/>
BH-12	315439	257925	Within site - west	65m	01/05/2007	ACTIVE	Application to Review Waste Licence W0129-01 (July 2007)	<input checked="" type="checkbox"/>
BH-13	315444	257925	Within site - west	48m	15/04/2007	ACTIVE	Application to Review Waste Licence W0129-01 (July 2007)	<input checked="" type="checkbox"/>
BH-14	315938	257631	Within site - south east	38m	02/03/2007	ACTIVE	Application to Review Waste Licence W0129-01 (July 2007)	<input checked="" type="checkbox"/>
BH-15A	315786.3	257849.6	Quarry Floor	30m	16-22/04/2010	ACTIVE	EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>

³ Grid ref. stated as 315823, 258182 on some documents; however grid ref. in table is deemed accurate and is stated in WLR Application, July 2007

REVIEW OF GROUNDWATER MONITORING BOREHOLES AT MEHL, HOLLYWOOD (EPA LICENCE APPLICATION W0129-03)

BH ID	EASTING	NORTHING	LOCATION	FINISHED DEPTH	DATE DRILLED	DATE DECOMMISSIONED	REFERENCE/ PURPOSE	LOG AVAILABLE
BH-16	315861.9	258218.2	Quarry Floor	24m	12-20/04/2010	ACTIVE	EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-17	315794.7	258003.1	Quarry Floor	54m	05/05/2010	ACTIVE	EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-18	315711	257996.4	Quarry Floor	21m	20-24/04/2010	ACTIVE	EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-19	315887.1	258059.1	Quarry Floor	18m	21-22/04/2010	ACTIVE	EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-20	315862.6	258102.3	Quarry Floor	52m	22-27/04/2010	ACTIVE	EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-21	316074.94	258199.63	NE corner of site	20m	14/04/2010	Backfilled as part of the SI works	Geotechnical shell and auger borehole for SI No.1 for EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-22A	315960.83	258090.71	Floor of quarry, in N of site	20.6m	12/04/2010	Backfilled as part of the SI works	Geotechnical shell and auger borehole for SI No.1 for EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-23	315960.42	257968.59	Floor of quarry, east of site	22.7m	07/04/2010	Backfilled as part of the SI works	Geotechnical shell and auger borehole for SI No.1 for EIS 2010/W0129-03 Application 2010	<input checked="" type="checkbox"/>
BH-24	315954.523	258209.452	Floor of quarry, in N of site	48.2m	10-13/06/13	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>
BH-25	315713.048	257875.541	Within site – south/centre	26m	21-22/05/2013	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>
BH-26	315881.349	258086.043	Within site – north/centre	24m	28/05/2013	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>

REVIEW OF GROUNDWATER MONITORING BOREHOLES AT MEHL, HOLLYWOOD (EPA LICENCE APPLICATION W0129-03)

BH ID	EASTING	NORTHING	LOCATION	FINISHED DEPTH	DATE DRILLED	DATE DECOMMISSIONED	REFERENCE/ PURPOSE	LOG AVAILABLE
BH-27	315756.699	258018.212	Within site - centre	14m	24-26/05/2013	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>
BH-28	258018.212	257915.730	Within site – centre/east	40m	22-24/05/2013	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>
BH-29	315985.929	258071.197	Within site – north-east	48m	29/05/2013	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>
BH-30	315970.402	258072.549	Within site – north-east	61.7m	05/06/2013	ACTIVE	SI No. 2, W0129-03 Application	<input checked="" type="checkbox"/>

Whilst every effort has been made to ensure the accuracy of this information, the reader is directed to reference the original well logs for definitive data.

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Monitoring Well Log

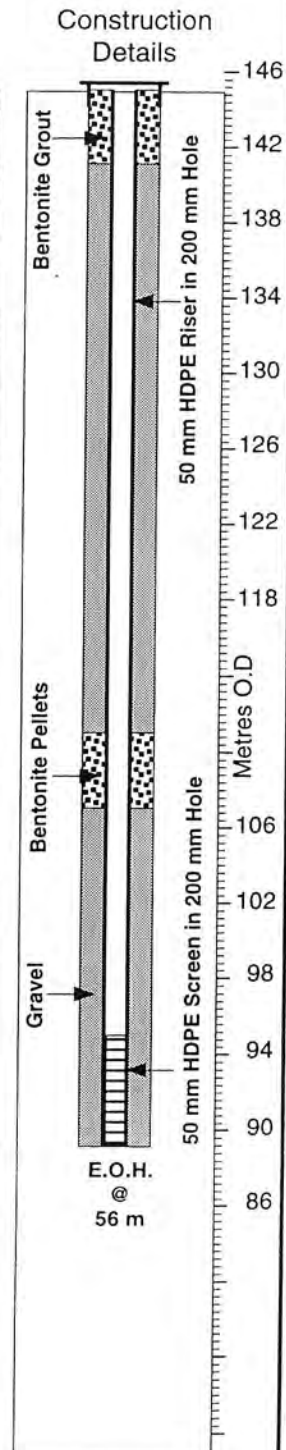
Monitoring Well BH 1

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315448 East 257939 North
Ground Surface Elev. : 145.9 m OD Malin Head
Logged by : Clare Glanville

Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head K(m/s)	Sample				
									Number	SPT	Type	Depth	
												From	To
0													
4													
8													
12													
16													
20													
24													
28													
32													
36													
40													
44													
48													
52													
56													
60													
64													
68													
72													

Drilling Notes and Strata Description	
0 - 4 m	Light brown silty clayey GRAVEL
4 - 8 m	Grey/Brown sand with GRAVEL and Silt
8 - 12 m	Orange/Brown Silt and Clay
12 - 20 m	Grey/Black Shale Rock Fragments with clay and silt
20 - 36 m	Brown/Grey Sandy silt with rock fragments
36 - 42 m	Brown Sandy silt with rock fragments (Weathered)
42 - 46 m	Grey shale chips with some brown silt
46 - 56 m	Black Shale chips with some brown silt



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 Hydrogeological & Environmental Consultants

Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

Monitoring Well Log

Monitoring Well BH 2

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 16/7/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315561 East 257897 North
Ground Surface Elev. : 103.3 m OD Malin Head
Logged by : John Mitchell

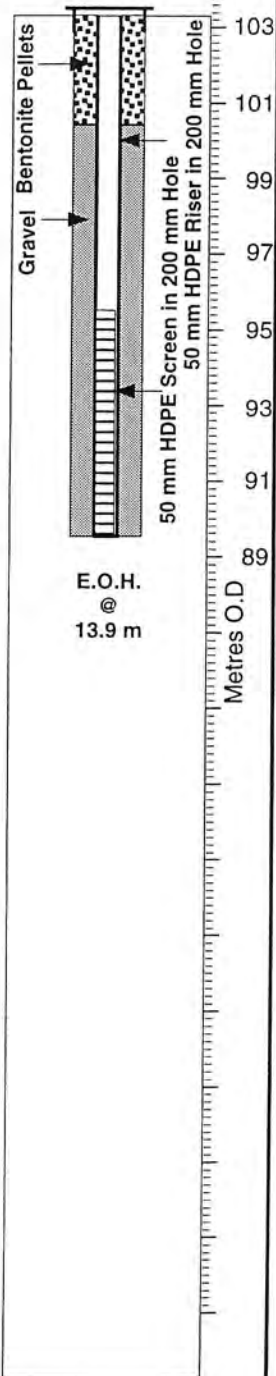
Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head K(m/s)	Sample				
									Number	SPT	Type	Depth	
												From	To
0													
2													
4													
6													
8													
10													
12													
14													
16													
20													
22													
24													
26													
28													
30													
32													
34													
36													

Drilling Notes and Strata Description

0-13.9m Limestone BEDROCK

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Construction Details



K.T.Cullen & Co. Ltd.
 Hydrogeological & Environmental Consultants

Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

Monitoring Well Log

Monitoring Well BH 3

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 17/7/98
Description : Monitoring Well

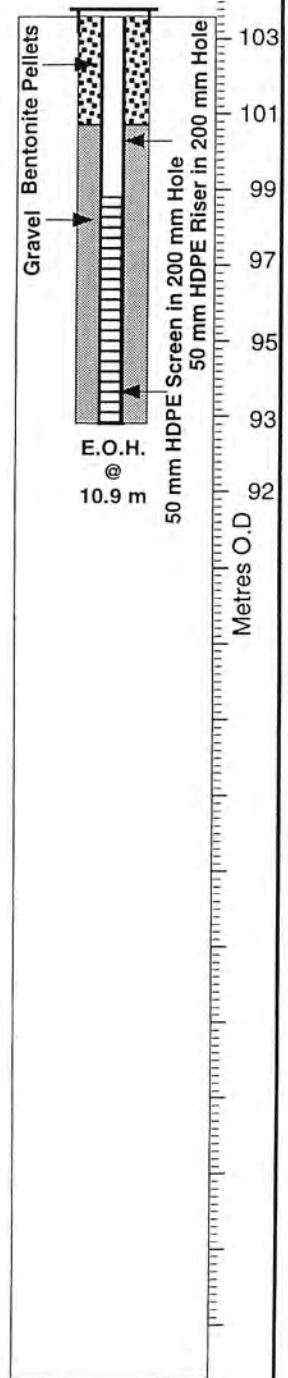
Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315624 East 258176 North
Ground Surface Elev. : 104.6 m OD Malin Head
Logged by : John Mitchell

Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head K(m/s)	Sample										
									Number	SPT	Type	Depth							
												From	To						
0																			
2																			
4																			
6																			
8																			
10																			
12																			
14																			
16																			
18																			
20																			
22																			
24																			
26																			
28																			
30																			
32																			
34																			
36																			

Drilling Notes and Strata Description

0-10.9m Shale BEDROCK

Construction Details



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 Hydrogeological & Environmental Consultants

Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

Monitoring Well Log

Monitoring Well BH 4

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 326044 East 257842 North
Ground Surface Elev. : 96.9 m OD Malin Head
Logged by : Clare Glanville

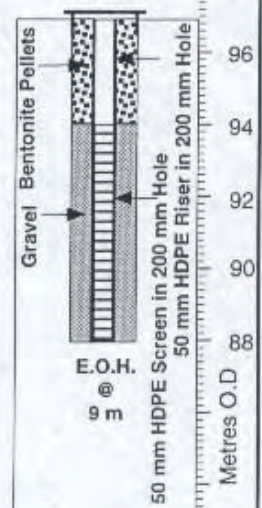
Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head K(m/s)	Sample											
									Number	S	Type	Depth								
												From	To							
0																				
2																				
4																				
6																				
8																				
10																				
12																				
14																				
16																				
18																				
20																				
22																				
24																				
26																				
28																				
30																				
32																				
34																				
36																				

Drilling Notes and Strata Description

0-3m TILL

3-10m Limestone BEDROCK

Construction Details



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Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

DUNNES DRILLING

No: 5668

DRILLERS LOG

Borehole for: Murphy Environmental Hollywood Ltd
at Hollywood Quarry

8" Monitoring Well

WELL DRILLING AND HORIZONTAL DRILLING ENGINEERS

Dublin Road, Dromiskin, Dundalk, Co. Louth.

E-Mail: info@dunnesdrilling.com website: www.dunnesdrilling.com

Tel: +353 42 9372188 Fax: +353 42 9372714

Date	Depth ft	Diam	Conditions
18.11.08	0 - 3	8"	Clay & stones
	3 - 14	8"	Sticky clay
	14 - 17	8"	Grey rock
	17 - 25	8"	Black rock - water at 25ft
	25 - 30	8"	Black rock
	30 - 40	8"	Black rock - water at 35ft

Total depth of well	40ft (12.19m)
Estimated yield	1000 gallons per hour
Depth to rock	14ft (4.27m)
Steel casing installed	17ft (5.18m) of 8" steel casing
PVC casing installed	7m of 2" PVC
Well screen	6m of 2" Screen
Other remarks	Install gravel pack from 40ft to 18ft. 6 bags of bentonite seal from 18ft to 3ft above ground level

Operator A Hoey

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Monitoring Well Log

Monitoring Well BH 5

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315796 East 258328 North
Ground Surface Elev. : 118.2 m OD Malin Head
Logged by : Clare Glanville

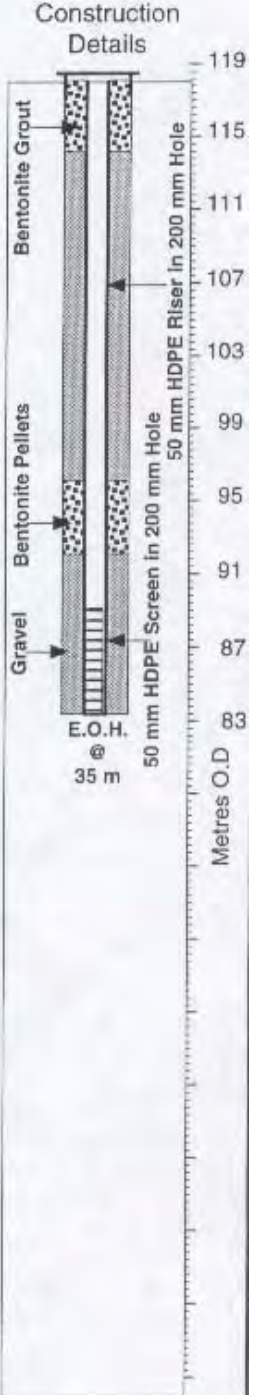
Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head (Kims)	Sample				
									Number	SPT	Type	Depth	
												From	To
0													
4													
8													
12													
16													
20													
24													
28													
32													
36													
40													
44													
48													
52													
56													
60													
64													
68													
72													

Drilling Notes and Strata Description

0 - 6 m Brown silty clayey matrixed TILL with gravel clasts

6 - 10 m Black Highly Weathered Shale, silty and clayey

10 - 35 m Black Weathered Shale



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 Hydrogeological & Environmental Consultants

Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

Monitoring Well Log

Monitoring Well BH 6

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 3/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : 315644 East 258506 North
Ground Surface Elev. : 117 m OD Malin Head
Logged by : Clare Glanville

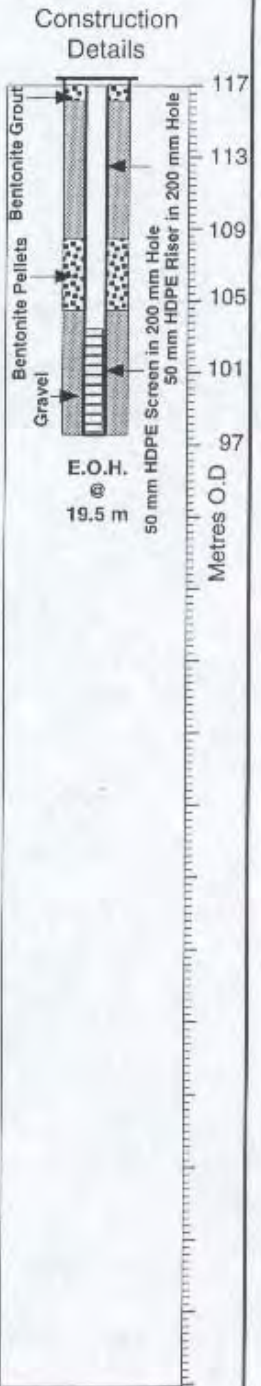
Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head K(m/s)	Sample										
									Number	S	Type	Depth							
												From	To						
0																			
4																			
8																			
12																			
16																			
20																			
24																			
28																			
32																			
40																			
44																			
48																			
52																			
56																			
60																			
64																			
68																			
72																			

Drilling Notes and Strata Description

0 - 4 m Brown/Grey Clayey TILL

4 - 12 m Black Silty Clay with WEATHERED ROCK

12 - 19.5 m Black Shale BEDROCK



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Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

Monitoring Well Log

Monitoring Well BH 7

Client : Seamus Murphy.
Location : Hollywood, Co. Dublin
Job No : 1698
Date : 7/9/98
Description : Monitoring Well

Drilling Company : Glovers Site Investigations Ltd.
Drilling Method : Air Rotary
Drillers Name :
National Grid Co. Ord. : East North
Ground Surface Elev. : 132 m OD Malin Head
Logged by : Clare Glanville

Metres	Shell & Auger	Air Rotary	250 mm Casing	200 mm Casing	150 mm Casing	Water Strike	Inflow m ³ /day	Falling Head K(m/s)	Sample				
									Number	SPT	Type	Depth	
												From	To
0													
4													
8													
12													
16													
20													
24													
28													
32													
40													
44													
48													
52													
56													
60													
64													
68													
72													

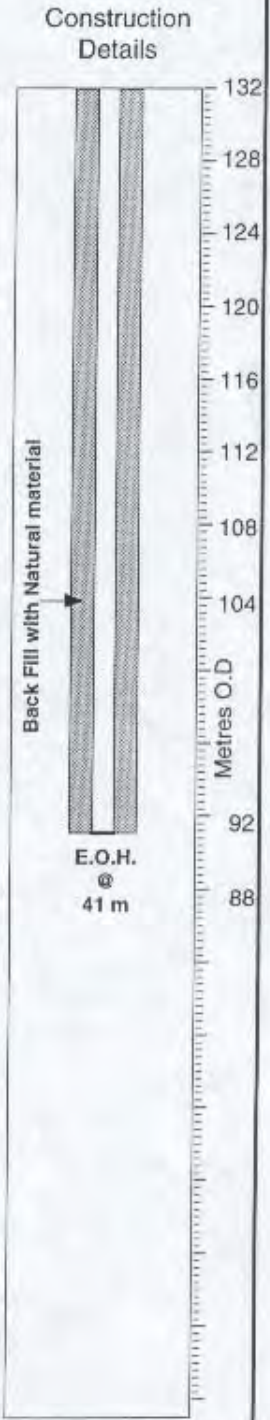
Drilling Notes and Strata Description

0 - 2 m Brown TILL with a silty to Clayey matrix

2 - 18 m Grey/Brown Silty weathered shale

18- 26 m Grey/Black weathered shale

No Further samples taken -Hole abandoned at 41 m



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Sample / Test Legend
 U - U100 Tubes
 SS - Silt Spoon
 SPT - Standard Penetration Test

Figure No.

Well Log

Well No. BH8 New

Grid Reference

Project No. 1698

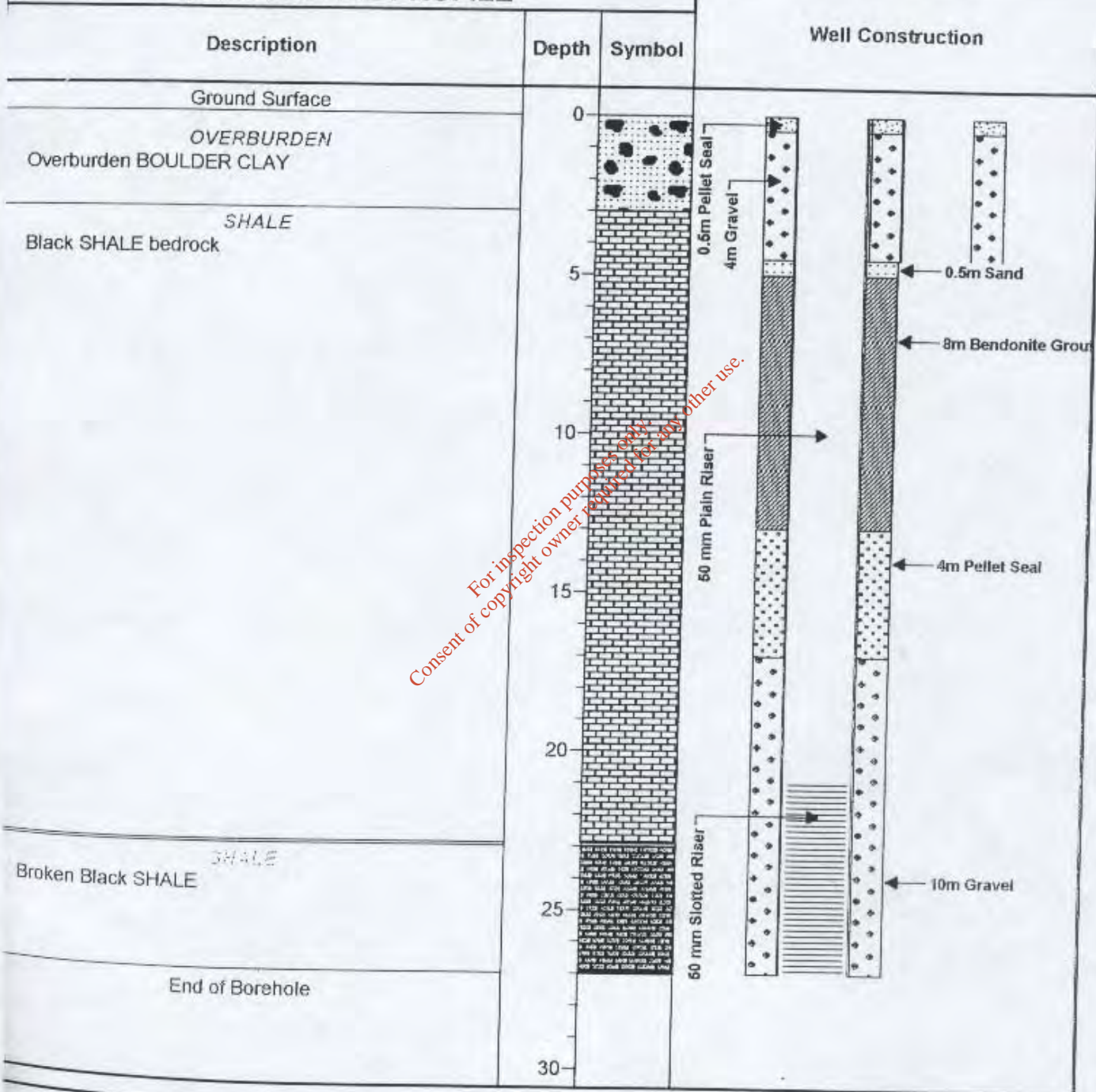
Client Seamus Murphy

Drill Date 17/08/01

Well Type Groundwater Monitoring Location Hollywood Great Quarry

Geologist F White

SUBSURFACE PROFILE



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Drill Method Air Rotary

Hole Size (mm)

Casing Length (m)

Ground Level (mOD)

Driller Glover Site Investigations

Static Water Level (bgl)

Well Log

Well No. BH9

Grid Reference

Project No. 1698

Client Seamus Murphy

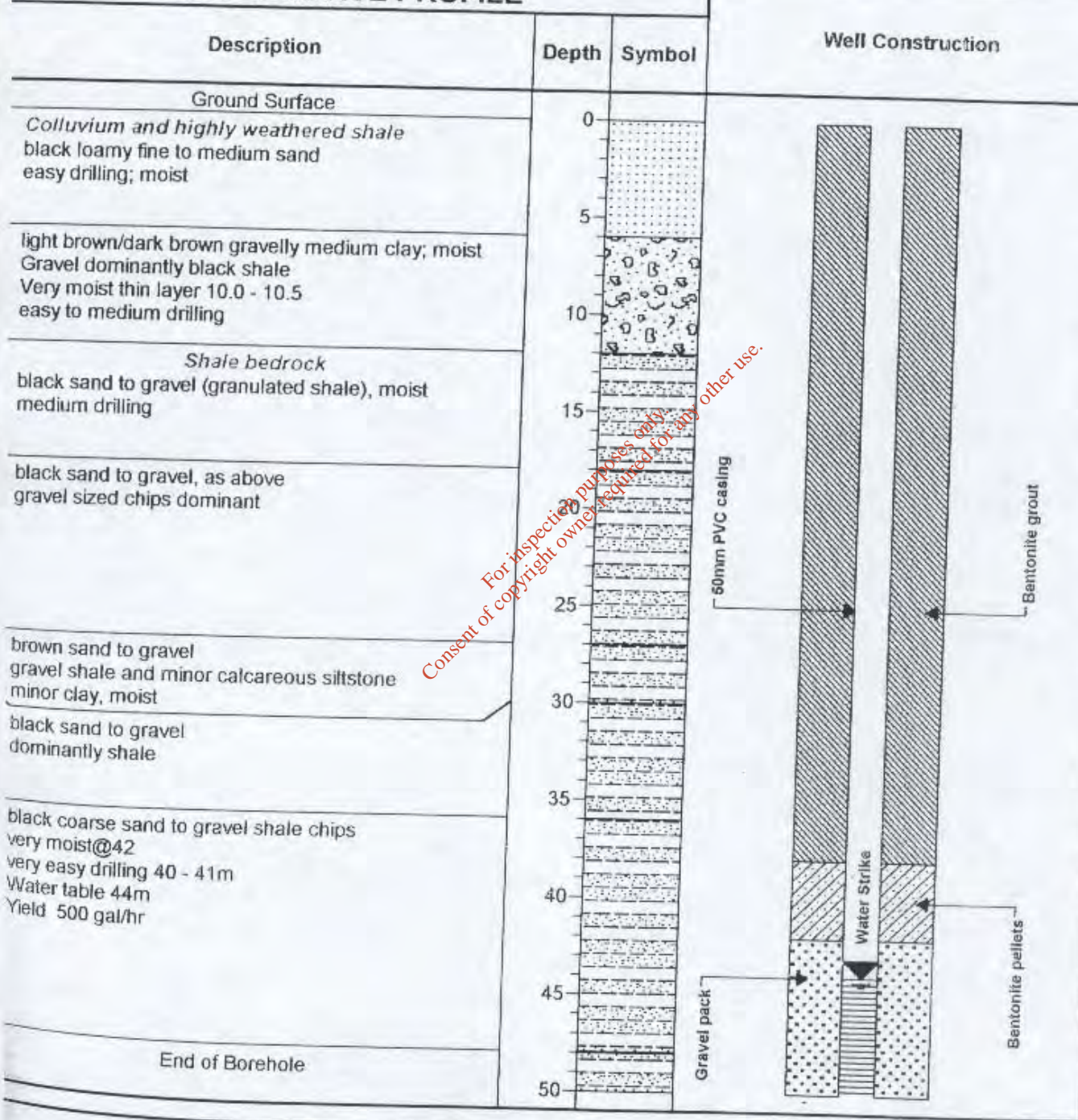
Drill Date 3/8/01

Well Type

Location Hollywood Great

Geologist Ben Whitfield

SUBSURFACE PROFILE



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Drill Method Air rotary
Casing Length (m) 50
Driller Glovers Site Investigations

Hole Size (mm) 200
Ground Level (mOD)
Static Water Level (bgl)

Well Log

Well No. BH10

Grid Reference

Project No. 1698

Client Seamus Murphy

Drill Date 4/8/01

Well Type

Location Hollywood Great

Geologist C Connery

SUBSURFACE PROFILE

Description	Depth	Symbol	Well Construction
Ground Surface	0		
<i>Boulder clay</i> stiff brown very sandy gravelly clay containing cobbles and boulders	5	[Symbol: Dotted pattern with black spots]	
<i>Limestone Bedrock</i>			
Limestone	10	[Symbol: Brick pattern]	
	15	[Symbol: Brick pattern]	
	20	[Symbol: Brick pattern]	
	25	[Symbol: Brick pattern]	
	30	[Symbol: Brick pattern]	
	35	[Symbol: Brick pattern]	
	40	[Symbol: Brick pattern]	
	45	[Symbol: Brick pattern]	
	50	[Symbol: Brick pattern]	
	55	[Symbol: Brick pattern]	
	60	[Symbol: Brick pattern]	
	65	[Symbol: Brick pattern]	
	70	[Symbol: Brick pattern]	
	75	[Symbol: Brick pattern]	
	80	[Symbol: Brick pattern]	
End of Borehole	85		

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Drill Method Air rotary

Hole Size (mm) 200

Casing Length (m) 84

Ground Level (mOD)

Driller Glovers Site Investigations

Static Water Level (bgl)

PROJECT: 07507190035 Murphy's Hollywood

RECORD OF MONITORING WELL BH10A

SHEET 1 OF 1

LOCATION: Murphy's Hollywood

BORING DATE: 5/3/2007

DATUM:

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	GEOTECHNO.	ENV NO.		TYPE	20	40	60	80	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴		
0		GROUND SURFACE Overburden-brown soil		0.00												Top of Pipe Elev. 137.140	
5																	
10		Weathered shale		10.00													
15																	
20		Limestone		21.00													
25																	
30																	
35	Monitoring Borehole Air Rotary																
40																	
45																	
50																	
55																	
60																	
65																	
68.00																	
70																	

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2 MURPHY HOLLYWOOD.GPJ GLDR_LDN.GDT 5/7/07 DATA INPUT:

DEPTH SCALE
1 : 350



LOGGED: CG
CHECKED: TVM

Well Log

Well No. BH11

Grid Reference

Project No. 1698

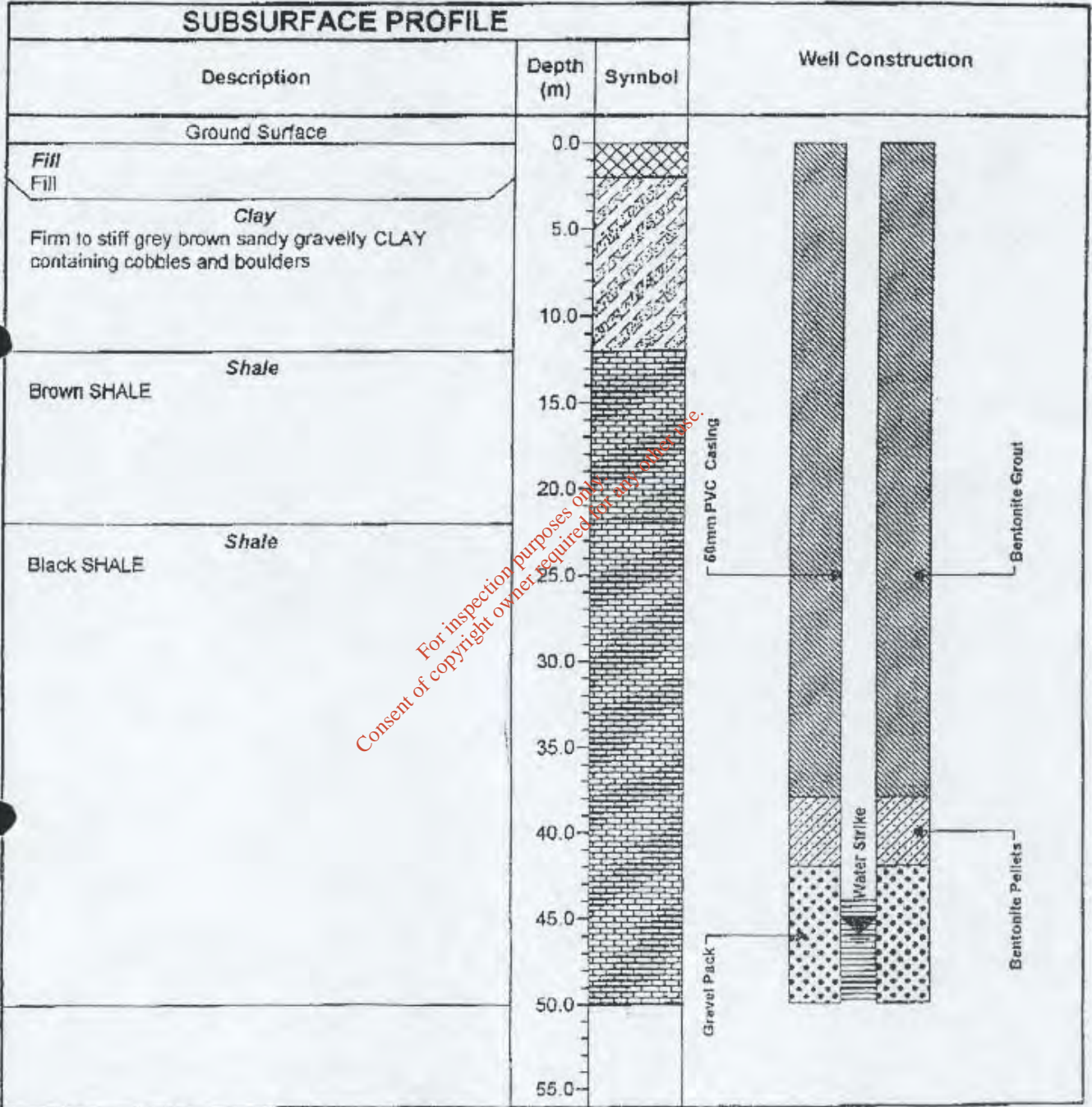
Client Seamus Murphy

Drill Date 3/8/01

Well Type

Location Hollywood Great

Geologist Ben Whitfield



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Drill Method Air Rotary

Hole Size (mm) 200

Casing Length (m) 50

TOC (mOD)

Driller Glovers Site Investigations

Static Water Level (bgl)

PROJECT: 07507190035 Murphy's Hollywood

RECORD OF MONITORING WELL BH11A

SHEET 1 OF 1

LOCATION: Murphy's Hollywood

BORING DATE: 2/5/07

DATUM:

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	GEOTECH. NO.		ENV. NO.	TYPE	20	40	60	80	10 ⁻⁶	10 ⁻⁵			10 ⁻⁴
0	Monitoring Borehole Air Rotary	GROUND SURFACE		0.00												Top of Pipe	
		Overburden/madeground															Elev. 100.01
		Weathered grey shale			2.00												Cement Backfill
5																	
		Fractured shale			8.00												Bentonite
10																	
		Shale			12.00												
15																	
	Heavily weathered shale			18.00													
20																Gravel pack	
	Grey sandy shale			21.00													
25																	
30				30.00												Screen and gravel pack	
35																	
40																	
45																	
50																	
55																	
60																	
65																	
70																	

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2 MURPHY HOLLYWOOD.GPJ GLDR_LDN.GDT 5/7/07 DATA INPUT:

DEPTH SCALE

1 : 350



LOGGED: AS

CHECKED: TVM

PROJECT: 07507190035 Murphy's Hollywood




RECORD OF MONITORING WELL BH12

SHEET 1 OF 1

LOCATION: Murphy's Hollywood

BORING DATE: 1/5/07

DATUM:

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES		ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	GEOTECH NO.	ENV NO.		TYPE	20	40	60	80	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴		
0		PAVEMENT SURFACE														Top of Pipe
		Concrete Overburden														Elev. 146.994
5		Shale														Concrete seal
10																
15																
20																
25																Backfill
30																
35																
40																
45		Limestone														Bentonite plug
50																Gravel Pack
55																
60																
65																Screen and gravel pack
70																

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2 MURPHY HOLLYWOOD.GPJ GLDR_LDN.GDT 177707 DATA INPUT:

DEPTH SCALE
1 : 350



LOGGED: AS
CHECKED: TVM

PROJECT: 07507190035 Murphy's Hollywood

RECORD OF MONITORING WELL BH13

SHEET 1 OF 1

LOCATION: Murphy's Hollywood

BORING DATE: 15/04/07

DATUM:

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	GEOTECH. NO.	ENV. NO.		TYPE	20	40	60	80	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴		
0		PAVEMENT SURFACE														Top of Pipe	
		Pavement Overburden		0.30												Elev. 146.922	
5		Shale		5.50												Concrete seal	
10																Riser	
15																	
20																	
25																	
30																Bentonite Plug	
35																Gravel Pack	
40																Gravel Pack, 50mm Screen	
45																Water Level 16/04/07	
46.00		Limestone		46.00												Bentonite Backfill	
48.00				48.00													
50																	
55																	
60																	
65																	
70																	

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2 MURPHY HOLLYWOOD.GPJ GLDR_LDN.GDT 5/7/07 DATA INPUT:

DEPTH SCALE
1 : 350



LOGGED: AS
CHECKED: TVM

PROJECT: 07507190035 Murphy's Hollywood

RECORD OF MONITORING WELL BH14

SHEET 1 OF 1

LOCATION: Murphy's Hollywood

BORING DATE: 2/3/2007

DATUM:

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE		SAMPLES			ELEVATION	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m				HYDRAULIC CONDUCTIVITY, k, cm/s				ADDITIONAL LAB. TESTING	INSTALLATION AND GROUNDWATER OBSERVATIONS	
		DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	GEOTECH. NO.	ENV. NO.		TYPE	20	40	60	80	10 ⁻⁶	10 ⁻⁵	10 ⁻⁴			10 ⁻³
0	Monitoring Well Air Rotary	GROUND SURFACE		0.00				20	40	60	80						Top of Pipe Elev. 125.064	
0		Topsoil															Bentonite	
5		Broken weathered shale		6.00														Backfill
30		Limestone		30.00														Bentonite
38				38.00													Gravel Pack	
38																	Screen and gravel pack	
40																	EOH 2000 gph est.	

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2 MURPHY HOLLYWOOD.GPJ GLDR_LDN.GDT 5/7/07 DATA INPUT:

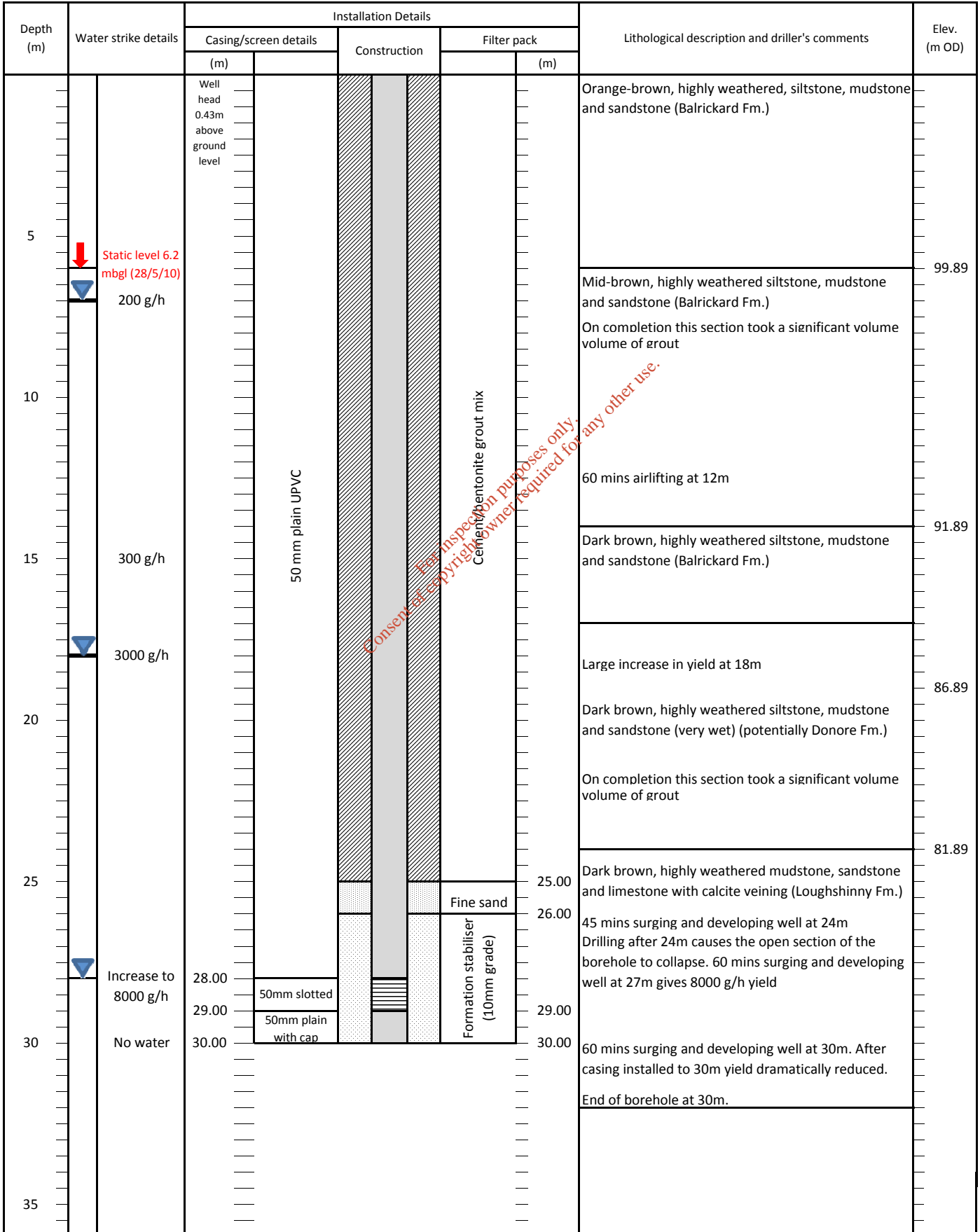
DEPTH SCALE
1 : 350



LOGGED: TVM
CHECKED: TVM


MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH15a	Sheet 1 of 1
Date Drilled 16-22/04/2010	Driller Briody & Sons Ltd.	Drill method: Rotary flush	X; 315786.3	
Date Logged 16-22/04/2010	Site Engineer/Geologist Sarah Blake	Flush: Air/mist	Y: 257849.6	
Comments: Descriptions of chippings from drilling		Borehole diameter: 0.25 m (10") & 0.1m (8")	Z (mOD): 105.89	



MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH16	Sheet 1 of 2
Date Drilled 12-20/04/2010	Driller S. Petersen	Drill method: Geobore 'S'	X; 315861.9	
Date Logged 20/04/2010	Site Engineer/Geologist D. O'Shea	Flush: Air/Polymer gel	Y: 258218.2	
Comments: Descriptions of cores from Geobore 'S' drilling		Borehole diameter 0.2 m (8")	Z (mOD): 104.79	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)						(m)
	 Static water level 3.09 mbgl (28/5/10)	Well head			0.00	Brown highly weathered, shaley mudstones	104.29	
		0.41m above ground level					Black, highly weathered fine-grained mudstone.	
5			50 mm plain UPVC		Cement/bentonite grout mix			97.79
10							Dark grey/black, moderately weathered interbedded sandstone and siltstone/mudstone. (Walshestown Fm.)	92.79
15							Orange/brown/black highly weathered, interbedded sandstone and mudstone. Fe-oxide staining. 30% flush loss to fm. between 12.2m and 19.6m	89.79
20							Orange/black/brown/grey, highly weathered interbedded sandstone and mudstone.	
							No recovery from 17.5 to 18m, probably highly weathered rock.	18.00
							30% flush loss to fm. between 12.2m and 19.6m	19.00
		20.00	50mm slotted UPVC		Fine sand		Grey/orange/brown, moderately weathered sandstone (Walshestown Fm.)	84.79
		22.00	50mm plain UPVC with cap		Formation stabiliser (10mm grade)		20% flush losses to fm. between 19.6m and 24.6m	23.00
		24.00			Fine sand			24.00
25							Dark grey/black/brown, interbedded sandstone and mudstone with large amounts of clay infill (Walshestown Fm.)	79.79
30								
35							Dark grey/black, largely fresh mudstone (Walshestown Fm.)	72.79
								36.00

MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH17	Sheet 1 of 2
Date Drilled 05/05/2010	Driller Briody & Sons Ltd.	Drill method: Rotary flush	X; 315794.7	
Date Logged 05/05/2010	Site Engineer/Geologist Catherine Buckley	Flush: Air/mist	Y: 258003.1	
Comments: Descriptions of chippings from drilling		Borehole diameter: 0.25 m (10")	Z (MOD): 105.4	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)						(m)
		Well head 0.29m above ground level				0.00	Orange/brown highly weathered siltstone/mudstone/sandstone with Fe-oxide staining. (Poss. Balrickard Fm.) Driller using non-ballistic bit from 0-27m.	
5	Static water level: 4.53 mbgl on 28/05/2010							100.4
10			127mm plain UPVC					94.4
15	Strike 15 mbgl, 500 g/h				Cement/bentonite grout mix			
20							Black highly weathered shaley siltstone and mudstone. (Poss. Balrickard Fm.)	
22.00							Fluid losses to fm. from 20m. Added polymer mud.	
23.00					Fine sand		Black highly weathered siltstone, mudstone and sandstone with slight Fe-oxide staining. (Namurian Deposits)	83.4
25.00	Increase to 5000 g/h							
27.00		127mm slotted UPVC						
30			127 mm plain UPVC				Large gravel losses to fm. at 27m. Switch to a ballistic drill bit from 28m	
32.00					Formation stabiliser (10mm grade)		Black/grey/brown highly weathered siltstone, mudstone and sandstone. (Poss. Namurian Deposits)	74.4
35	Increase to >15000 g/h		127mm slotted UPVC				Dark brown highly weathered mudstone/sandstone and limestone. (Poss. Loughshinny Fm.)	72.4
36.00							Large mud losses to fm. between 33 and 35m	

MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH17	Sheet 2 of 2
Date Drilled 05/05/2010	Driller Briody & Sons Ltd.	Drill method: Rotary flush	X; 315794.7	
Date Logged 05/05/2010	Site Engineer/Geologist Catherine Buckley	Flush: Air/mist	Y: 258003.1	
Comments: Descriptions of chippings from drilling		Borehole diameter: 0.25 m (10")	Z (mOD): 105.4	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)
		Casing/screen details		Construction	Filter pack		
		(m)					
36		36.00	50mm slotted	<p>Formation stabiliser (10mm grade)</p>	36.00	69.4	
		37.00	127 mm plain UPVC		37.00	68.4	
40		42.00	127mm slotted UPVC		38.00	Dark brown highly weathered mudstone, sandstone and limestone. (Poss. Loughshinny Fm.) Large mud losses to fm. between 37 and 40m	
45		48.00	127 mm plain UPVC with end cap		43.00		
50		53.00			48.00		
					54.00	End of borehole at 54m	
55							
60							
65							
70							

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MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH16	Sheet 2 of 2
Date Drilled 12-20/04/2010	Driller S. Petersen	Drill method: Geobore 'S'	X: 315861.9	
Date Logged 20/04/2010	Site Engineer/Geologist D. O'Shea	Flush: Air/Polymer gel	Y: 258218.2	
Comments: Descriptions of cores from Geobore 'S' drilling		Borehole diameter: 0.2 m (8")	Z (mOD): 104.79	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)
		Casing/screen details		Construction	Filter pack		
		(m)					
36				Cement/bentonite grout mix	36.00	Dark grey/black, largely fresh mudstone (Walshestown Fm.)	68.79
40							
45						10% flush losses to fm. between 48m and 55.5m	
50							
55							
60					60.00	Walshestown Fm. possibly grading into the Balrickard Fm. from approx. 58m 12cm limestone layer from 58.07m End of borehole at 60m	46.79
65							
70							

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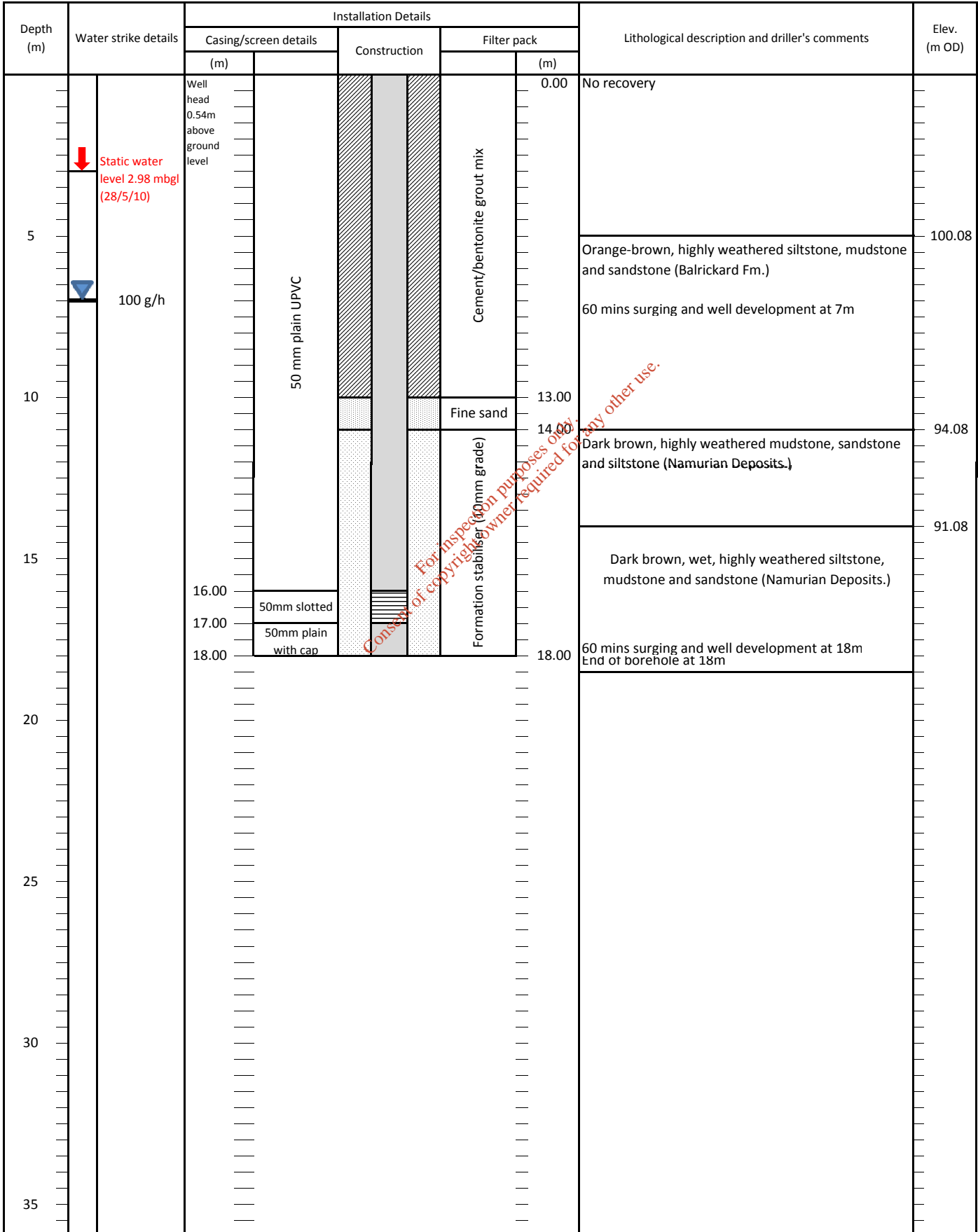
MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH18	Sheet 1 of 1
Date Drilled 20-24/04/2010	Driller S. Petersen	Drill method: Geobore 'S'	X; 315711	
Date Logged 24/04/2010	Site Engineer/Geologist D. O'Shea	Flush: Air/Polymer gel	Y: 257996.4	
Comments: Descriptions of cores from Geobore 'S' drilling		Borehole diameter: 0.2 m (8")	Z (mOD): 110.5	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)						(m)
		Well head				0.00	Brown highly weathered, shaley mudstones	110
		0.55m above ground level					Black/grey/brown moderately weathered, interbedded sandstone and mudstone with large amounts of clay infill. (Possibly Balrickard Fm.)	
5			50 mm plain UPVC		Cement/bentonite grout mix		Black/grey/dark-grey slightly weathered interbedded sandstone and mudstone (possibly Namurian Deposits.)	105.5
10	↓ Static water level 9.51 mbgl (28/5/10)							
15					Fine sand	15.00	100% flush losses to fm. from 14.80 m	95.5
						16.00	Palaeo-analysis indicate Namurian Deposits	
		50mm slotted UPVC			Formation stabiliser (10mm grade)	17.00	Grey/dark-grey/black, slightly to locally highly weathered, interbedded limestone and shaley mudstones (possibly Loughshinny Fm.)	
20		50mm plain with cap				19.00		
					Fine sand	20.00		
						21.00	End of borehole 21.2m	
25								
30								
35								





MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH19	Sheet 1 of 1
Date Drilled 21-22/04/2010	Driller Briody & Sons Ltd.	Drill method: Rotary flush	X; 315887.1	
Date Logged 21-22/04/2010	Site Engineer/Geologist Sarah Blake	Flush: Air/mist	Y: 258059.1	
Comments: Descriptions based on chippings from drilling		Borehole diameter: 0.25 m (10")	Z (mOD): 105.08	



MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH20	Sheet 1 of 2
Date Drilled 22-27/04/2010	Driller Briody & Sons Ltd.	Drill method: Rotary flush	X; 315862.6	
Date Logged 22-27/04/2010	Site Engineer/Geologist Marie Fleming	Flush: Air/mist	Y; 258102.3	
Comments: Descriptions of chippings from drilling		Borehole diameter: 0.25 m (10")	Z (MOD): 104.84	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)						
		Well head 0.45m above ground level				0.00	Grey/black/orange/brown highly weathered siltstone/mudstone. (Poss. Balrickard Fm.)	
5	 Static water level 3.52 mbgl (28/5/10)  Strike 6 mbgl, 100g/h							99.84
10							Dark brown/black highly weathered siltstone and mudstone. (Namurian Deposits)	97.84
15	 Increase to 500 g/h						Black, highly weathered siltstone, mudstone and sandstone. (Namurian Deposits)	
20			50 mm plain UPVC				Well developed for 30 mins. 500 g/h flow consistent	
25								
30	 Increase to 3500 g/h						Significant increase in yield to 3500 g/h. Surging and well development for 60 mins.	
35							Black, highly weathered siltstone, mudstone and sandstone. Very wet. (Namurian Deposits)	70.84
		36.00				36.00		

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MONITORING WELL LOG

Project title Integrated Waste Management Facility		Client MEHL	Well No. BH20	Sheet 2 of 2
Date Drilled 22-27/4/2010	Driller Briody & Sons Ltd.	Drill method: Rotary flush	X; 315862.6	
Date Logged 22-27/4/2010	Site Engineer/Geologist Marie Fleming	Flush: Air/mist	Y: 258102.3	
Comments: Descriptions of chippings from drilling		Borehole diameter: 0.25 m (10")	Z (MOD): 104.84	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)						(m)
36		36.00	50 mm plain UPVC		36.00	Grout	68.84	
					37.00	Fine sand	67.84	
40		40.00	50mm slotted UPVC		38.00	Formation stabiliser (10mm grade)		
		42.00	50mm plain with cap		43.00			
45	Large strike, >10,000 g/h	43.00		Cement/bentonite grout mix	43.00		61.84	
					48.00			
50					52.00			
55								
60								
65								
70								

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GEOTECHNICAL BORING RECORD

REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility				BOREHOLE NO. BH21	
				SHEET Sheet 1 of 2	
CO-ORDINATES 316,074.94 E 258,199.63 N		RIG TYPE Dando		DATE DRILLED 14/04/2010	
GROUND LEVEL (m AOD) 120.70		BOREHOLE DIAMETER (mm) 200		DATE LOGGED 14/04/2010	
		BOREHOLE DEPTH (m) 20.00			
CLIENT MEHL		SPT HAMMER REF. NO.		BORED BY J.Edwards	
ENGINEER WYG		ENERGY RATIO (%)		PROCESSED BY F.C	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details					
					Ref. Number	Sample Type	Depth (m)	Recovery							
0	MADE GROUND (Stockpile - Comprised of dark grey sandy gravelly clay)				R2005	B	0.50-0.50								
1					R2006	B	1.00-1.00								
					R2007	U	1.00-1.45			50%rec 12 blows					
					R2008	D	1.45-1.60								
2					R2009	B	2.00-2.00								
					R2010	D	2.50-2.50			50%rec 9 blows					
3					R2011	U	3.00-3.45								
					R2012	D	3.45-3.60								
4					R2013	B	4.00-4.00			60%rec 12 blows					
					R2014	D	4.50-4.50								
5					R2015	U	5.00-5.45								
					R2016	D	5.45-5.60			80%rec 29 blows					
6					R2017	B	6.00-6.00								
					R2018	D	6.50-6.50								
7					Light brown sandy gravelly CLAY with some cobbles (occasionally grading to clayey gravel)						R2019	B	6.70-6.70		
											R2020	U	7.00-7.45		
											R2021	D	7.45-7.60		
8											R2022	B	8.00-8.00		
	R2023	D	8.50-8.50												
9	R2024	U	9.00-9.45	60%rec 42 blows											
	R2025	D	9.45-9.60												
	Black/orange sandy very gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone														

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments

7.7	7.8	0.75							No water strike
11	11.05	0.5							

GROUNDWATER DETAILS				
Date	Hole Depth	Casing Depth	Depth to Water	Comments

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

REMARKS Hole located on top of clay stockpile	Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)	U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
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IGSL.BH.LOG 14695.GPJ IGSL.GDT 7/9/10

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GEOTECHNICAL BORING RECORD

REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility		BOREHOLE NO. BH21
		SHEET Sheet 2 of 2
CO-ORDINATES 316,074.94 E 258,199.63 N	RIG TYPE Dando	DATE DRILLED 14/04/2010
GROUND LEVEL (m AOD) 120.70	BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 20.00	DATE LOGGED 14/04/2010
CLIENT MEHL ENGINEER WYG	SPT HAMMER REF. NO. ENERGY RATIO (%)	BORED BY J.Edwards PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples			Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)		
10	Black/orange sandy very gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone (continued)		110.00	10.70	R2026	B	10.00-10.00		
					R2027	D	10.50-10.50		
11	Angular cobbly gravel of moderately weathered SILTSTONE/MUDSTONE		109.60	11.10	R2028	B	11.00-11.00		
					R2029	D	11.50-11.50		
12	Black/orange sandy gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone		108.00	12.70	R2030	U	12.00-12.45	80%rec 39 blows	
					R2031	D	12.45-12.60		
13	Dark brown/orange sandy gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone		108.00	12.70	R2032	B	13.00-13.00		
					R2033	D	13.50-13.50		
14			108.00	12.70	R2034	U	14.00-14.60	0%rec 43 blows	
					R2035	D	14.50-14.50		
15			108.00	12.70	R2036	B	15.00-15.00		
					R2037	D	15.50-15.50		
16			108.00	12.70	R2038	U	16.00-16.45	60%rec 44 blows	
					R2039	D	16.45-16.60		
17			108.00	12.70	R2040	B	17.00-17.00		
					R2041	D	17.50-17.50		
18			102.30	18.40	R2042	U	18.00-18.45	15%rec 72 blows	
					R2043	D	18.45-18.60		
19	Grey brown / green sandy gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone		101.10	19.60	R2044	B	19.00-19.00		
					R2045	U	19.40-19.85	100%rec 52 blows	
	Very stiff dark grey/grey sandy gravelly CLAY		100.70	20.00	R2046	D	19.85-20.00		

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HARD STRATA BORING CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
7.7	7.8	0.75							No water strike
11	11.05	0.5							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Hole located on top of clay stockpile	Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
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GEOTECHNICAL BORING RECORD

REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility		BOREHOLE NO. BH22
		SHEET Sheet 1 of 1
CO-ORDINATES 315,961.50 E 258,091.66 N	RIG TYPE Dando	DATE DRILLED 09/04/2010
GROUND LEVEL (m AOD) 123.83	BOREHOLE DIAMETER (mm) 200	DATE LOGGED 12/04/2010
	BOREHOLE DEPTH (m) 5.90	
CLIENT MEHL	SPT HAMMER REF. NO.	BORED BY J.Edwards
ENGINEER WYG	ENERGY RATIO (%)	PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND (Comprised of brown sandy gravelly clay with cobbles)				AJ6563	B	0.50-0.95		N = 12 (1, 3, 3, 3, 3, 3)	
1	Firm, dark brown slightly sandy gravelly SILT with angular cobbles of weathered siltstone / mudstone		122.83	1.00	AJ6564	D	1.00-1.00			
					AJ6565	U	1.50-2.10	0%rec		
2					AJ6566	D	2.00-2.00			
3					AJ6567	D	2.50-2.50			
					AJ6568	B	3.00-3.45			
					AJ6569	D	3.50-3.50		N = 14 (2, 3, 5, 3, 3, 3)	
4					AJ6570	U	4.50-4.95	60%rec 19 blows		
5					AJ6571	D	4.95-5.10			
					AJ6572	B	5.50-5.50			
6	Obstruction End of Borehole at 5.90 m		117.93	5.90	AJ6573	B	5.90-5.90			

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HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.7	2.75	0.75							No water strike
5.1	5.2	0.75							
5.8	5.9	1							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Obstruction at 5.90m . Moved 1m to BH22A and rebored

Sample Legend
 D - Small Disturbed (tub)
 B - Bulk Disturbed
 LB - Large Bulk Disturbed
 Env - Environmental Sample (Jar + Vial + Tub)
 U - Undisturbed 100mm Diameter Sample
 P - Undisturbed Piston Sample
 W - Water Sample

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REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility		BOREHOLE NO. BH22A
CO-ORDINATES 315,960.83 E 258,090.71 N		SHEET Sheet 1 of 3
GROUND LEVEL (m AOD) 123.73	RIG TYPE Dando	DATE DRILLED 12/04/2010
	BOREHOLE DIAMETER (mm) 200	DATE LOGGED 13/04/2010
	BOREHOLE DEPTH (m) 20.60	
CLIENT MEHL	SPT HAMMER REF. NO.	BORED BY J.Edwards
ENGINEER WYG	ENERGY RATIO (%)	PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND (Comprised of brown sandy gravelly clay with cobbles)									
1	Dark brown sandy very gravelly CLAY with occasional cobbles of weathered mudstone / siltstone		122.73	1.00						
2										
3										
4										
5										
6										
7	Dark brown slightly sandy gravelly CLAY with angular cobbles of weathered siltstone / mudstone.		117.23	6.50	AJ6574	D	6.50-6.50			
7	Firm to stiff, black/orange sandy very gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone		116.63	7.10	AJ6575	B	7.00-7.00			
8					AJ6576	U	7.50-7.95			
8					AJ6577	D	7.95-8.10			
8					AJ6578	B	8.00-8.00			
9					AJ6579	D	8.50-8.50			
9					AJ6580	D	9.00-9.45			
9					AJ6581	B	9.00-9.50			

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HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.45	2.5	0.5							No water strike
6.25	6.3	0.5							
10.1	10.15	0.5							
11.45	11.5	0.5							
15.3	15.4	1							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Chiselling also 17.45-17.50=0.5hr / Backfill with bentonite GL - 20.60m

Sample Legend
 D - Small Disturbed (tub)
 B - Bulk Disturbed
 LB - Large Bulk Disturbed
 Env - Environmental Sample (Jar + Vial + Tub)
 U - Undisturbed 100mm Diameter Sample
 P - Undisturbed Piston Sample
 W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility		BOREHOLE NO. BH22A
CO-ORDINATES 315,960.83 E 258,090.71 N		SHEET Sheet 2 of 3
GROUND LEVEL (m AOD) 123.73	RIG TYPE Dando	DATE DRILLED 12/04/2010
	BOREHOLE DIAMETER (mm) 200	DATE LOGGED 13/04/2010
	BOREHOLE DEPTH (m) 20.60	
CLIENT MEHL	SPT HAMMER REF. NO.	BORED BY J.Edwards
ENGINEER WYG	ENERGY RATIO (%)	PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples			Field Test Results	Standpipe Details	
					Ref. Number	Sample Type	Recovery			
10	Firm to stiff, black/orange sandy very gravelly CLAY with occasional angular cobbles of weathered mudstone / siltstone (continued)		112.73	11.00	AJ6582	B	10.00-10.00	N = 15 (1, 2, 3, 3, 4, 5)		
					AJ6583	U	10.50-10.95			40%rec 20 blows
11	Firm to stiff dark brown/orange slightly sandy gravelly SILT with occasional cobbles of weathered mudstone / siltstone.				AJ6584	D	10.95-11.10			
					AJ6585	B	11.00-11.00			
					AJ6586	D	11.50-11.50			
12					AJ6587	D	12.00-12.45			
					AJ6588	B	12.00-12.50			
13	Firm to stiff black /orange sandy gravelly CLAYSILT with occasional cobbles of weathered mudstone / siltstone		110.73	13.00	AJ6589	B	13.00-13.00			
					AJ6590	U	13.50-13.95			50%rec 20 blows
14					AJ6591	D	13.95-14.10			
					AJ6592	B	14.00-14.00			
15					AJ6593	D	14.50-14.50			
					AJ6594	B	15.00-15.45	N = 50/75 mm (2, 11, 50)		
					AJ6595	D	15.50-15.50			
16					AJ6596	B	16.50-16.95	N = 23 (3, 4, 6, 5, 5, 7)		
17	Grey/green sandy very gravelly CLAY		106.83	16.90	AJ6597	D	17.00-17.00			
					AJ6598	B	17.50-17.50			
18	Very stiff grey/brown/green slightly sandy slightly gravelly CLAY with occasional cobbles of weathered mudstone / siltstone		106.33	17.40	AJ6599	B	18.00-18.45	N = 49 (5, 7, 13, 12, 12, 12)		
					AJ6600	D	18.50-18.50			
19	Dark grey/green sandy very gravelly CLAY		105.13	18.60	AJ6601	B	19.00-19.00			
					AJ6602	U	19.50-19.95	90%rec 67 blows		
	Black dense clayey GRAVEL		104.23	19.50						

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HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.45	2.5	0.5							No water strike
6.25	6.3	0.5							
10.1	10.15	0.5							
11.45	11.5	0.5							
15.3	15.4	1							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Chiselling also 17.45-17.50=0.5hr / Backfill with bentonite GL - 20.60m	Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub)	U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
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14695

CONTRACT MEHL Integrated Waste Management Facility				BOREHOLE NO. BH22A	
				SHEET Sheet 3 of 3	
CO-ORDINATES 315,960.83 E 258,090.71 N		RIG TYPE Dando		DATE DRILLED 12/04/2010	
GROUND LEVEL (m AOD) 123.73		BOREHOLE DIAMETER (mm) 200		DATE LOGGED 13/04/2010	
		BOREHOLE DEPTH (m) 20.60			
CLIENT MEHL		SPT HAMMER REF. NO.		BORED BY J.Edwards	
ENGINEER WYG		ENERGY RATIO (%)		PROCESSED BY F.C	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples			Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)		
20	Black dense clayey GRAVEL (continued)		103.13	20.60	AJ6603 AJ6604	D B	19.95-20.10 20.10-20.55		
	End of Borehole at 20.60 m								
21									
22									
23									
24									
25									
26									
27									
28									
29									

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HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.45	2.5	0.5							No water strike
6.25	6.3	0.5							
10.1	10.15	0.5							
11.45	11.5	0.5							
15.3	15.4	1							
				GROUNDWATER DETAILS					
INSTALLATION DETAILS				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					

REMARKS Chiselling also 17.45-17.50=0.5hr / Backfill with bentonite GL - 20.60m

Sample Legend
 D - Small Disturbed (tub)
 B - Bulk Disturbed
 LB - Large Bulk Disturbed
 Env - Environmental Sample (Jar + Vial + Tub)
 U - Undisturbed 100mm Diameter Sample
 P - Undisturbed Piston Sample
 W - Water Sample

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GEOTECHNICAL BORING RECORD

REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility		BOREHOLE NO. BH23
CO-ORDINATES 315,960.42 E 257,968.59 N		SHEET Sheet 1 of 3
GROUND LEVEL (m AOD) 125.08	RIG TYPE Dando	DATE DRILLED 07/04/2010
	BOREHOLE DIAMETER (mm) 200	DATE LOGGED 08/04/2010
	BOREHOLE DEPTH (m) 22.70	
CLIENT MEHL	SPT HAMMER REF. NO.	BORED BY J.Edwards
ENGINEER WYG	ENERGY RATIO (%)	PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Firm to stiff brown sandy gravelly CLAY with occasional cobbles				AJ6528	B	0.50-0.50		N = 15 (1, 2, 5, 4, 3, 3)	
1					AJ6529 AJ6530	D B	1.00-1.45 1.00-1.50			
2					AJ6531 AJ6532	U D	2.00-2.45 2.45-2.60	70%rec 50 blows		
3					AJ6533 AJ6534	D B	3.00-3.45 3.00-3.50			
4	Dark brown sandy very gravelly CLAY with some cobbles of weathered mudstone / siltstone		120.98	4.10	AJ6535	D	4.00-4.00		N = 14 (2, 3, 5, 3, 3, 3)	
5	Firm to stiff dark brown slightly sandy gravelly CLAY with some cobbles and some bands of yellow/brown sand (grading in places to a clayey sandy gravel)				AJ6536 AJ6537	D B	5.00-5.45 5.00-5.50			
6					AJ6538 AJ6539	U D	6.00-6.45 6.45-6.60	80%rec 28 blows		
7					AJ6540 AJ6541	D B	7.00-7.45 7.00-7.50			
8					AJ6542	U	8.00-8.60	0%rec 57 blows	N = 12 (1, 2, 3, 3, 3, 3)	
9					AJ6543	B	9.00-9.45			
			115.08	10.00						

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HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.75	2.8	0.5							No water strike
3.85	3.9	0.5							
16.45	16.5	0.5							
20.4	20.5	0.75							
22.6	22.7	1							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Backfill with bentonite GL - 23.00m	Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
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REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility				BOREHOLE NO. BH23	
				SHEET Sheet 2 of 3	
CO-ORDINATES 315,960.42 E 257,968.59 N		RIG TYPE Dando		DATE DRILLED 07/04/2010	
GROUND LEVEL (m AOD) 125.08		BOREHOLE DIAMETER (mm) 200		DATE LOGGED 08/04/2010	
		BOREHOLE DEPTH (m) 22.70			
CLIENT MEHL		SPT HAMMER REF. NO.		BORED BY J.Edwards	
ENGINEER WYG		ENERGY RATIO (%)		PROCESSED BY F.C	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples			Field Test Results	Standpipe Details					
					Ref. Number	Sample Type	Depth (m)			Recovery				
10	Purplish brown / grey brown sightly sandy gravelly SILT/CLAY				AJ6544	D	10.00-10.00							
11					AJ6545 AJ6546	D B	11.00-11.45 11.00-11.50			N = 12 (1, 2, 4, 3, 2, 3)				
12					AJ6547	B	12.00-12.45			N = 29 (2, 5, 7, 7, 7, 8)				
13					AJ6548	D	13.00-13.00							
14					AJ6549 AJ6550	D B	14.00-14.45 14.00-14.50			N = 13 (1, 3, 3, 4, 3, 3)				
15					AJ6551	D	15.00-15.00							
16					AJ6552 AJ6553	D B	16.00-16.45 16.00-16.50			N = 48/225 mm (2, 2, 16, 16, 16)				
17					AJ6554	B	17.50-17.95			N = 24 (2, 3, 9, 7, 3, 5)				
18					Grey green very gravelly CLAY		107.08			18.00	AJ6555	D	18.00-18.00	
19					Yellow brown clayey GRAVEL / gravelly CLAY		106.58			18.50				
	Medium dense clayey GRAVEL / stiff very gravelly CLAY		105.68	19.40	AJ6556 AJ6557	B U	19.40-19.40 19.50-19.95	80%rec 32 blows						
			105.18	19.90										

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HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.75	2.8	0.5							No water strike
3.85	3.9	0.5							
16.45	16.5	0.5							
20.4	20.5	0.75							
22.6	22.7	1							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Backfill with bentonite GL - 23.00m

Sample Legend
 D - Small Disturbed (tub)
 B - Bulk Disturbed
 LB - Large Bulk Disturbed
 Env - Environmental Sample (Jar + Vial + Tub)
 U - Undisturbed 100mm Diameter Sample
 P - Undisturbed Piston Sample
 W - Water Sample

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REPORT NUMBER

14695

CONTRACT MEHL Integrated Waste Management Facility		BOREHOLE NO. BH23
		SHEET Sheet 3 of 3
CO-ORDINATES 315,960.42 E 257,968.59 N	RIG TYPE Dando	DATE DRILLED 07/04/2010
GROUND LEVEL (m AOD) 125.08	BOREHOLE DIAMETER (mm) 200 BOREHOLE DEPTH (m) 22.70	DATE LOGGED 08/04/2010
CLIENT MEHL ENGINEER WYG	SPT HAMMER REF. NO. ENERGY RATIO (%)	BORED BY J.Edwards PROCESSED BY F.C

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples			Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)		
20	Dark grey/ black slightly sandy slightly gravelly CLAY <i>(continued)</i>		102.38	22.70	AJ6558	D	19.95-20.10		
				AJ6559	B	20.50-20.50			
21				AJ6560	U	21.00-21.45	70%rec 61 blows		
				AJ6561	D	21.45-21.60			
22				AJ6562	B	22.50-22.70			
End of Borehole at 22.70 m									
23	For inspection purposes only. Consent of copyright owner required for any other use.								
24									
25									
26									
27									
28									
29									

HARD STRATA BORING/CHISELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
2.75	2.8	0.5							No water strike
3.85	3.9	0.5							
16.45	16.5	0.5							
20.4	20.5	0.75							
22.6	22.7	1							

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

REMARKS Backfill with bentonite GL - 23.00m	Sample Legend D - Small Disturbed (tub) B - Bulk Disturbed LB - Large Bulk Disturbed Env - Environmental Sample (Jar + Vial + Tub) U - Undisturbed 100mm Diameter Sample P - Undisturbed Piston Sample W - Water Sample
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Appendix D

New Monitoring Wells

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Appendix D: Monitoring wells

Introduction

Boreholes were drilled on at least five occasions prior to the work undertaken at the MEHL facility in May and June of 2013. As part of the hydrogeological site investigation at MEHL in 2013, seven new boreholes were installed to better define the geology and hydrogeology throughout the site. Four of the new boreholes namely BH24, BH26, BH27 and BH30 were cored using Geobore S technique with a drilling diameter of 146mm. The remaining three boreholes, BH25, BH28 and BH29 were developed by standard open hole drilling with an outer diameter of 120mm.

Both the new and pre-existing installations were utilized in pumping tests of the aquifer to gather groundwater level information throughout the site.

The geological information obtained during the drilling and installation of the new boreholes was used to improve the conceptual model of the complex geology and hydrogeology of the site.

Existing Monitoring Wells

The site has a network of monitoring points along the perimeter which has been expanding since 1998. This monitoring network was installed to fulfill a requirement of the EPA license for the MEHL facility (EPA waste license number W0129-02) and has been detailed in previous reports. The well logs for the newly drilled monitoring boreholes are available in **Appendix D1**. The borehole logs from previous site investigations are presented in **Appendix A** where available. Details of the drilling programmes undertaken to date at the MEHL site are also included in **Appendix C**.

New Monitoring Wells

Figure 1 shows the locations of the new monitoring boreholes as well as the historic monitoring locations. **Table D1** below outlines the rationale behind the selection of the locations. The locations were chosen by taking into account all available geological and hydrogeological information, and constrained by restrictions to site access. There were no changes between the proposed and final locations.

This phase of Site Investigation was designed to address the following:

- EPA Notice under Article 16(1) of the Waste Management (Licensing) Regulations issued on 23 March 2012 (EPA Ref: **W0129-03**);
- Clarification to notice in accordance with Article 16(1) of the Waste Management (Licensing) Regulations issued on 3 May 2012 (EPA Ref: **W0129-03**);

Subsequent meetings and communications with the EPA informed the SI design.

Table D1 Selection of new borehole locations

BH ID	Borehole depth (mbgl)	Response zone (mbgl)	Proposed location	Rationale	Final location	Monitoring installation	Comments
BH24	48.2	44.2-47.2	At the toe end of the proposed hazardous cell (north of the Apex mapped N-S fault)	To be located north of the Apex mapped N-S fault. To be screened with in the Loughshinny Fm only. To establish depth to the Loughshinny Fm in northern area.	As proposed	Yes	Progression of drilling extremely slow, due to the degree of vertical fracturing in the proximity of the S-N trending fault. Borehole terminated in Namurian deposits. Loughshinny Fm not reached.
BH25	26	20-24	In the south-western quadrant (non-hazardous landfill cell)	Further SI data required in south-western quadrant where the Loughshinny Fm is exposed. This is where the non hazardous cell is proposed.	As proposed	Yes	Ponding water located adjacent to this location. Vital to seal shallow part of borehole to avoid hydraulic connectivity with ponding water. Competent limestone encountered
BH26	24	20-23.5	In the vicinity of BH17 (pumping well) in north-western quadrant	Further SI data required in the north-western quadrant. To be screened in the Loughshinny Fm. Depth of Loughshinny Fm not established but estimated to be approx. 60mBGL.	As proposed	Yes	Borehole depth reduced owing to the ground conditions encountered. Borehole screened at a shallower depth than intended in the Namurian deposits.
BH27	14	10-13	Adjacent to BH18	Establish well pair adjacent to BH18 to be screened at the base of the Balrickard Fm where geophysics indicates an increase in shale (approx. 13m - 15m). This will also enable analysis of the vertical hydraulic gradient (if any).	As proposed	Yes	Borehole drilled slightly shallower than originally planned. Terminated in Namurian possibly at interface with Balrickard Fm. Clay infill encountered from 5m to the base of the borehole. Micropaleontology in BH18 (adjacent to BH27) indicated Namurian deposits. BH18 was drilled using the Geobore S method and there is also packer test data available for in this area.
BH28	40	36-39	Western side of Apex mapped fault adjacent to BH15a	To be rotary drilled to circa 40mBGL. To be screened at the base of the Balrickard Fm.	As proposed	Yes	Borehole drilled to and screened at planned depth. No Limestone contact encountered
BH29	58	34-39	Western side of fault adjacent to historic boreholes BH22/22a	EPA suggests well pair with BH30 in this location (adjacent BH22/22a).	As proposed	Yes	Originally intended to drill borehole to 60mBGL but the degree of weathering from ca. 44 – 54m BGL and consequent backfall during construction resulted in the borehole being secured with bentonite at depth to 40m BGL. The borehole was screened in the Namurian deposits only.

BH ID	Borehole depth (mbgl)	Response zone (mbgl)	Proposed location	Rationale	Final location	Monitoring installation	Comments
BH30	61.7	58.7-61.7	Western side of fault adjacent to boreholes BH22/22a	Partially cored hole to circa 60mBGL. To form a pair with BH29.	As proposed	Yes	Limestone was encountered at 55.70m BGL and confirmed with HCl testing. Borehole extended beyond the intended 60m depth to 61.7mBGL to ensure a securely sealed response zone within the Viséan deposits.

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The new groundwater monitoring installations were drilled by Petersen Drilling Services (PDS) using both an 'open-hole' drilling method with an air and water flush and a Geobore 'S' drilling method with a polymer gel and water flush. The PDS drill rig was able to change over to the Geobore 'S' method from the 'open-hole' method during the construction of a single installation, which facilitated the partial coring of certain wells whilst and kept the site investigation costs to a minimum.

The Geobore 'S' method employed by PDS uses a double core-barrel system and polymer fluid to produce high quality cores of the subsurface material, which is known to be highly weathered and broken. A log of these cores was made by a representative from Arup. The drill cores were then stored on site in core boxes.

The standard 'open-hole' method employed by PDS returned the subsurface material as a slurry of gravel sized chips and mud. These boreholes were sampled and logged on site by the onsite hydrogeologist from Arup. The slurry of gravel sized chips and mud were logged every metre and stored on site in chip boxes.

BH24 and BH26 were drilled to establish the depth below ground level of the Loughshinny and to increase the SI information in the northeastern quadrant of the site.

BH25 was drilled in the south-western quadrant – the site of the proposed new non-hazardous landfill cell- where the Loughshinny is exposed to gain more SI data for this area of the proposed development. It confirmed Visean deposits to surface and is used in hydraulic testing.

BH27, BH28, BH29 and BH30 were drilled to provide well pairs on the either side of the major faults. The intention was to screen BH27 and BH28 in the Balrickard Formation and BH29 and BH30 in the Loughshinny.

The borehole logs contain the standpipe installation details for all the new boreholes drilled at the MEHL site. These are presented in **Appendix D1**.

Borehole and well logging

A geotechnical borehole log describes the physical properties of the rock types encountered while a hydrogeological well log is a summary of the geology encountered during drilling, the installation details and any water strikes encountered. An interpretative hydrogeological well log was compiled by Arup for each of the new monitoring boreholes installed on site. These logs collate information from the driller's notes, the site hydrogeologist's observations, and a lithological interpretation of the subsurface material encountered. These interpretative logs are presented in **Appendix D1**. For the lithological interpretation, in some boreholes it was difficult to distinguish the contacts between the various formations. These have been grouped together as either Namurian (Walshestown, Balrickard, Donore) or Visean (Loughshinny formations). In the 2010 *'Report on the Geology of the Landfill Site, Hollywood, Naul, Co. Fingal'* by Gareth Jones, it is noted that where the mudstones, shales,

siltstones and sandstones are heavily weathered accurate identification is difficult. Thus palynology and micropaleontology was carried out during this investigation to help confirm the various lithologies encountered.

Monitoring Installations

All boreholes on site were grouted by PDS as their equipment includes a grouting plant that can be used to mix grout at the site of each borehole. It was critical that the boreholes were grouted to a high standard as otherwise they may have had the potential to act as pathways for contamination in future. Samples were taken of the grout used for each borehole and these were retained by MEHL for future testing as required.

An initial draft log of the geological profile was compiled on site. Upon completion the monitoring installation detail was designed on site by the site hydrogeologist. In this way, each monitoring installation was tailored to target areas of specific hydrogeological interest. A summary of the monitoring installation configurations from this phase of Site Investigation is laid out in **Table D2** below.

Table D2 Summary of monitoring well installation at the MEHL site in 2013.

Borehole ID	Slotted casing		Plain casing		Gravel pack		Fine sand		Bentonite	
	Depth (mbgl)	Length (m)	Depth (mbgl)	Length (m)	Depth (mbgl)	Length (m)	Depth (mbgl)	Length (m)	Depth (mbgl)	Length (m)
BH24	44.2-47.2	3	0-44.2	44.2	43.2-48.2	5	42.2-43.2	1	41.2-42.2	1
			47.2-48.2	1						
BH25	20-24	4	0-20	20	18-25	7	17-18	1	16-17	1
			24-25	1						
BH26	20-23.5	3.5	0-20	20	19-24	5	18-19	1	17-18	1
			23.5-24	0.5						
BH27	10-13	3	0-10	10	9-14	5	8-9	1	7-8	1
			13-14	1						
BH28	36-39	3	0-36	36	35-40	5	34-35	1	33-34	1
			39-40	1						
BH29	34-39	5	0-34	34	33-40	7	32-33	1	30.5-31.5	1
			39-40	1					40-47.8	7.8
BH30	58.7-61.7	3	0-58.7	58.77	57.7-61.7	4	57.2-57.7	0.5	56.2-57.2	1

The hydrogeological information gathered from each borehole including the bedrock geology, any water strikes, the static water level and the amount of water removed during the development of each monitoring well before sampling for laboratory analysis are summarised below in **Table D3**.

Table D3 Hydrogeological summary for each borehole drilled at the MEHL site in 2013

BH name	Geology		Water strike		Flush losses (Geobore 'S')		Static level (Jul 2013 ave.)
	Depth (mbgl)	Lithology	Depth (mbgl)	Estimated flow (m3/h)	Depth (mbgl)	% loss	Depth (mbgl)
BH24	0-10	Dublin Boulder Clay	9.8	-	40.0-48.2	-	3.08
	10-48.2	Possible Walshestown Fm					
BH25	0-25	Loughshinny Fm	3.6	-			3.08
			7.0	1.02			
			13.0	2.4			
			17.0	2.4			
			26.0	3.0			
BH26	0-24	Namurian Possible Balrickard Fm	4.0	-	16.0-24.0	-	1.97
BH27	0-14	Namurian Possible Balrickard Fm	3.5	-	5.0-14.0	-	4.04
BH28	0-12.5	Made Ground	24.5	-			24.41
	12.5-14.8	Dublin Boulder Clay					
	14.8-40	Namurian Possible Balrickard Fm					
BH29	0-10	Made Ground	24.5	-	44.0-46.0	Hole collapses	22.71
	10-24.7	Dublin Boulder Clay		-			
	24.7-52	Namurian Possible Balrickard Fm		-			
				58.0			
BH30	0-10	Made Ground	24.5	-	40.0-61.7	-	22.31
	10-24.7	Dublin Boulder Clay					
	24.7-55.7	Namurian Possible Balrickard Fm					
	55.7-61.7	Visean Possible Loughshinny Fm					

The details of the targeted zones of the new boreholes are presented below in **Table D4**.

Table D4: Hydrogeological summary for each borehole, highlighting targeted zones.

BH ID	Geology		Slotted casing		Gravel pack	
	Depth (mbgl)	Lithology	Depth (mbgl)	Length (m)	Depth (mbgl)	Length (m)
BH24	0-10	Dublin Boulder Clay	44.2-47.2	3	43.2-48.2	5
	10-48.2	Possible Walshestown Fm				
BH25	0-25	Loughshinny Fm	20-24	4	18-25	7
BH26	0-24	Namurian Possible Balrickard Fm	20-23.5	3.5	19-24	5
BH27	0-14	Namurian Possible Balrickard Fm	10-13	3	9-14	5
BH28	0-12.5	Made Ground	34-39	3	35-40	5
	12.5-14.8	Dublin Boulder Clay				
	14.8-40	Namurian Possible Balrickard Fm				
BH29	0-10	Made Ground	34-39	5	33-40	7
	10-24.7	Dublin Boulder Clay				
	24.7-52	Namurian Possible Balrickard Fm				
BH30	0-10	Made Ground	58.7-61.7	3	57.7-61.7	4
	10-24.7	Dublin Boulder Clay				
	24.7-55.7	Namurian Possible Balrickard Fm				
	55.7-61.7	Visean Possible Loughshinny Fm				

Site Notes

The following section contains a detailed summary of the drilling and installation process for each monitoring borehole. This information was collated from a combination of driller's logs and site notes from the supervising hydrogeologist. All monitoring installations were designed by Arup and Eugene Daly Associates. The site hydrogeologist was present for the drilling and development of all boreholes drilled in May and June of 2013. **Table D5** below summarises the response zones of the well screens in each monitoring installation.

Table D5: Summary of details of the well installation undertaken at the MEHL site in 2013.

BHID	Status	Depth to top and bottom of well screen (mbgl)	Geology of response zone	Reason for depth
BH24	New monitoring well	44.2-47.2	Namurian, possible Walshestown Fm.	BH did not reach targeted Loughshinny Fm. Screened at base of bore in Namurian, possibly Walshestown Fm
BH25	New monitoring well	20-24	Loughshinny Fm.	Screened in Loughshinny Fm
BH26	New monitoring well	20-23.5	Namurian, possible Balrickard Fm.	BH did not reach targeted Loughshinny Fm. Screened at base of bore in Balrickard Fm.
BH27	New monitoring well	10-13	Namurian, possible Balrickard Fm.	BH did not reach targeted Loughshinny Fm. for pairing with response zone in BH18. Screened at base of bore in Namurian, possibly Balrickard Fm.
BH28	New monitoring well	36-39	Namurian, possible Balrickard Fm.	BH did not reach targeted Loughshinny Fm. for pairing with response zone in BH15a. Screened at base of bore in Namurian, possibly Balrickard Fm.
BH29	New monitoring well	34-39	Namurian, possible Balrickard Fm.	BH did not reach targeted Loughshinny Fm. for pairing with response zone in BH30. Screened at base of bore in Namurian, possibly Balrickard Fm.
BH30	New monitoring well	58.7-61.7	Loughshinny Fm.	Screened in Loughshinny Fm for pairing with BH29

BH24

BH24 was installed to the north of the Apex mapped N-S fault line targeting the Loughshinny Fm, with a view to establish whether the fracture / faulting system is acting as a barrier or conduit to flow in the bedrock aquifer. It was anticipated that the Loughshinny Fm could be in excess of 75m deep at this location.

The borehole was drilled by PDS between the 10th and 13th June 2013 using a standard open-hole technique with a diameter of 8" OD to 1.5mbgl. The drill bit was then changed to a 6" OD bit and drilled to 40mbgl. The borehole was extended from 40mbgl to 48.2mbgl using the Geobore 'S' drilling system. Cores were extracted for these depths.

The hole was originally intended to be constructed to a depth of 60mbgl however, the hole became very unstable between depths 12-40mbgl and there was a complete collapse within the hole while switching over to the Geobore 'S' drilling system. Consequently, the hole was re-drilled to 40mbgl to carry out the intended coring. The rock was found to be highly

fractured and loose taking 9 hours to core a 2m length. The hole was terminated at 48.2mbgl with approximately 80% core recovery between 40 – 48.2mbgl.

The hole was grouted from 0.5 – 41.2mbgl. A bentonite seal was installed between 41.2-42.2mbgl and fine sand from 42.2 to 43.2 with (10mm) pea gravel to 48.2 mbgl. A 3-meter length of 50mm slotted uPVC well screen was installed from 44.2-47.2mbgl. The borehole was fitted with an end cap.

As it became clear that it would not be possible to extend the borehole into the Loughshinny Fm it was decided that the screening depth should target the deepest section of the water bearing zone in the Namurian deposits. The cores from BH24 were photographed and logged by Arup.

The borehole was developed by MEHL using a Grundfos MP1 pump with a nominal output of approximately 15m³/day on 21st June 2013 for 60 minutes.

BH25

BH25 is an open-hole borehole in the south-western quadrant in the area of the proposed non-hazardous cell. The Loughshinny Fm in this area extends to surface. BH25 was positioned as far away from the N-S Apex mapped fracture / faulting system as possible. In previous site investigations it was noted that there is an area of ponding water which is potentially hydraulically connected to the exposed Loughshinny Fm in this area.

The borehole was drilled by PDS between the 21st and 22nd May 2013 using a standard open-hole technique with a diameter of 8" OD to 1.5mbgl. The drill bit was then changed to a 6" OD bit and drilled to 25mbgl. The borehole collapsed to 3.6mbgl. The casing was then extended to a depth of 3.8mbgl to maintain stability of the borehole. The drill arisings were logged every meter and stored in chip trays.

The first water strike was at 3.6mbgl with the yield gradually increasing with depth. Once the target depth of 25mbgl was reached, the yield was estimated at circa 3m³/hour. There were some very fractured / weathered layers encountered between depths 15.5-15.7mbgl and 22.6-23.9mbgl which coincided with increases in yield observed during drilling.

HCl testing confirmed the presence of Limestone throughout the entire length of BH25. It is possible that small layer of Donore Fm was encountered at this location, but the method of drilling made interpretation difficult and there are inherent difficulties with distinguishing the Donore Fm anyway.

The hole was grouted from 0.5 – 16mbgl. There were large amounts of grout loss recorded at 3mbgl. A bentonite seal was installed between 16-17mbgl. The aim was to ensure a good seal to prevent any hydraulic connection between screened section of the borehole and the ponding water. Beneath the bentonite a 1m layer of fine sand overlies the (10mm) pea gravel which extended to the base of the borehole. The well was screened from 20-24mbgl with a 4m length of 50mm slotted uPVC pipe. An end cap was fitted. The chippings from BH25 were logged every metre and stored in chip trays.

Once the borehole had been completed as a monitoring well, the well was developed for 60 minutes by airlift.

BH26

BH26 was partially cored and was positioned between boreholes BH19 and BH20. It was originally intended to target the Loughshinny Fm and to establish a well paring with BH20 which is screened in the Namurian. The anticipated depth of the Loughshinny Fm at this location was 60mbgl. This borehole is located in close proximity to the N-S fracture / faulting system. The location of BH26 was selected to provide information on the downthrow on the eastern side of the N-S fault / fracture system.

The borehole was drilled by PDS between the 27th and 29th May 2013 using a standard open-hole technique with a diameter of 8" OD to 1.5mbgl. The drill bit was then changed to a 6" OD bit and drilled to 16mbgl. The Geobore 'S' drilling system was used from 16mbgl to 24mbgl and cores were extracted for these depths. The hole was terminated at 24mbgl not reaching the Loughshinny.

The hole was grouted from 0.5 – 17mbgl. A bentonite seal was installed between 17-18mbgl. A 1m layer of fine sand overlies the (10mm) pea gravel which extended to the base of the borehole. The well was screened from 20-23.5mbgl with a 3.5m length of 50mm slotted uPVC pipe. An end cap was fitted.

The screening depth targeted the base of the Balrickard Fm where an increase in the presence of shales was predicted. The cores from BH26 were photographed and logged by Arup.

BH27

BH27 was partially cored borehole. It was positioned in the south-western quadrant between boreholes BH18 and BH17. It was originally intended to target the base of the Balrickard Fm. and to establish a well pair with BH18 extending to a proposed depth of 25m. BH27 terminated at 14mbgl. It was screened at its base in the Balrickard Fm.

The borehole was drilled by PDS between the 24th and 27th May 2013 using a standard open-hole technique with a diameter of 8" OD to 1.5mbgl. The drill bit was then changed to a 6" OD bit and drilled to 5mbgl. The Geobore 'S' drilling system was used from 5mbgl to 14mbgl and cores were extracted for these depths.

The hole was grouted from 0.5 – 7mbgl as instructed by Arup. A bentonite seal was installed between 7-8mbgl. A 1m layer of fine sand overlies the (10mm) pea gravel which extended to the base of the borehole. The well was screened from 10-13mbgl with a 3m length of 50mm slotted uPVC pipe. An end cap was fitted. The cores from BH27 were photographed and logged by Arup.

BH28

BH28 was constructed to target the Balrickard Fm and groundwater in the south eastern quadrant. Borehole BH28 was constructed between BH15a and BH23. This borehole is situated at the edge of the planned Dense Asphaltic Concrete (DAC) liner and the borehole is designed to form a well paring with BH15a. It was screened in the Balrickard Fm.

The borehole was drilled by PDS between the 22nd and 24th May 2013 using a standard 'hammer down the hole' technique with a diameter of 8" OD to 1.5mbgl. The drill bit was then changed to a 6" OD bit and drilled to 40mbgl. The borehole was cased to 37mbgl due to the highly weathered and unstable nature of the material at this location.

The hole was grouted from 0.5 – 33 mbgl. Heavy grout losses were recorded at approximately 12.5mbgl, potentially at the interface between Made Ground and Dublin Boulder Clay. A bentonite seal was installed between 33-34mbgl. A 1m layer of fine sand overlies the (10mm) pea gravel which extended to the base of the borehole. The well was screened from 36-39mbgl with a 3m length of 50mm slotted uPVC pipe. An end cap was fitted. The drill arisings from BH28 were logged every metre and stored in chip trays.

BH29

BH29 was constructed to establish a well pairing with BH30 in the vicinity of the historic boreholes BH22/BH22a. This borehole was constructed to target the base of the Balrickard Fm where an increase in shales was anticipated while BH30 would target the Loughshinney. This borehole pair were designed to establish the vertical hydraulic gradient (if any) between the underlying Loughshinny Fm and the overlying Namurian Deposits (comprising the Balrickard Fm).

BH29 was drilled by PBS between the 29th May and 4th June 2013 using a standard open-hole drilling method. This borehole was intended to extend to a depth of 60m but terminated at a depth of 58m. Heavy backfall was encountered during drilling from fracture zones located at depths of 44 to 46mbgl and 53 to 54mbgl. The borehole was backfilled to 47.8mbgl due to collapse and sealed with bentonite to 40mbgl. There was substantial bentonite losses at approximately 44-46mbgl owing to cascading during drilling.

Pea gravel was installed from 40mbgl to 32.5mbgl. A 1m layer of fine sand overlies the (10mm) pea gravel. A bentonite seal was installed between 30.5-31.5mbgl. The well was screened from 34-39mbgl with a 5m length of 50mm slotted uPVC pipe. An end cap was fitted. The drill arisings from BH29 were logged every metre and stored in chip trays

The borehole was grouted from 30.5mbgl to 10.9 mbgl. Grout losses were reported at 10.9mbgl, presumed to be at the interface between Made Ground and Dublin Boulder Clay. The annulus of the borehole from 0.5 to 10.9mbgl was filled with arisings.

It was decided that BH29 would become the shallower of the well pairing, targeting the Namurian deposits.

BH30

BH30 was constructed to establish a well pairing with BH29 in the vicinity of the historic boreholes BH22/BH22a. This borehole was constructed to target the Loughshinny Fm and to establish the vertical hydraulic gradient (if any) between the underlying Loughshinny Fm and the overlying Namurian Deposits (comprising the Balrickard Fm).

It was decided to site BH30 a minimum of 5m away from BH29 owing to the weathered / fractured nature of the material encountered at BH29 to avoid any damage to the newly constructed well and attempt to minimize flush losses.

BH30 was drilled by PDS between the 4th and 7th June 2013 using a standard open-hole technique with a diameter of 8" OD to 1.5mbgl. The drill bit was then changed to a 6" OD

bit and drilled to 40mbgl. Drilling switched over to the Geobore 'S' system from 40mbgl to 71.7mbgl and cores were extracted for these depths. 100% flush loss occurred at approximately 40mbgl (a flush of water and polymer gel), the flush was potentially lost at a heavily weathered / fractured layer at 40mbgl. A limestone contact was encountered at 55.7mbgl and in order to make a best attempt at ensuring a good screened seal within the Loughshinny Fm, it was decided to continue coring past the intended target depth of 60mbgl to 61.7mbgl.

The annulus of the borehole from 0.5 to 20mbgl was filled with arisings. The hole was grouted from 20 – 56.2mbgl. A bentonite seal was installed between 56.2-57.2mbgl. A 1m layer of fine sand overlies the (10mm) pea gravel which extends to the base of the borehole. The well was screened from 57.7-61.7mbgl with a 3m length of 50mm slotted uPVC pipe. An end cap was fitted. The cores from BH30 were photographed and logged by Arup.

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Appendix D1

Well logs

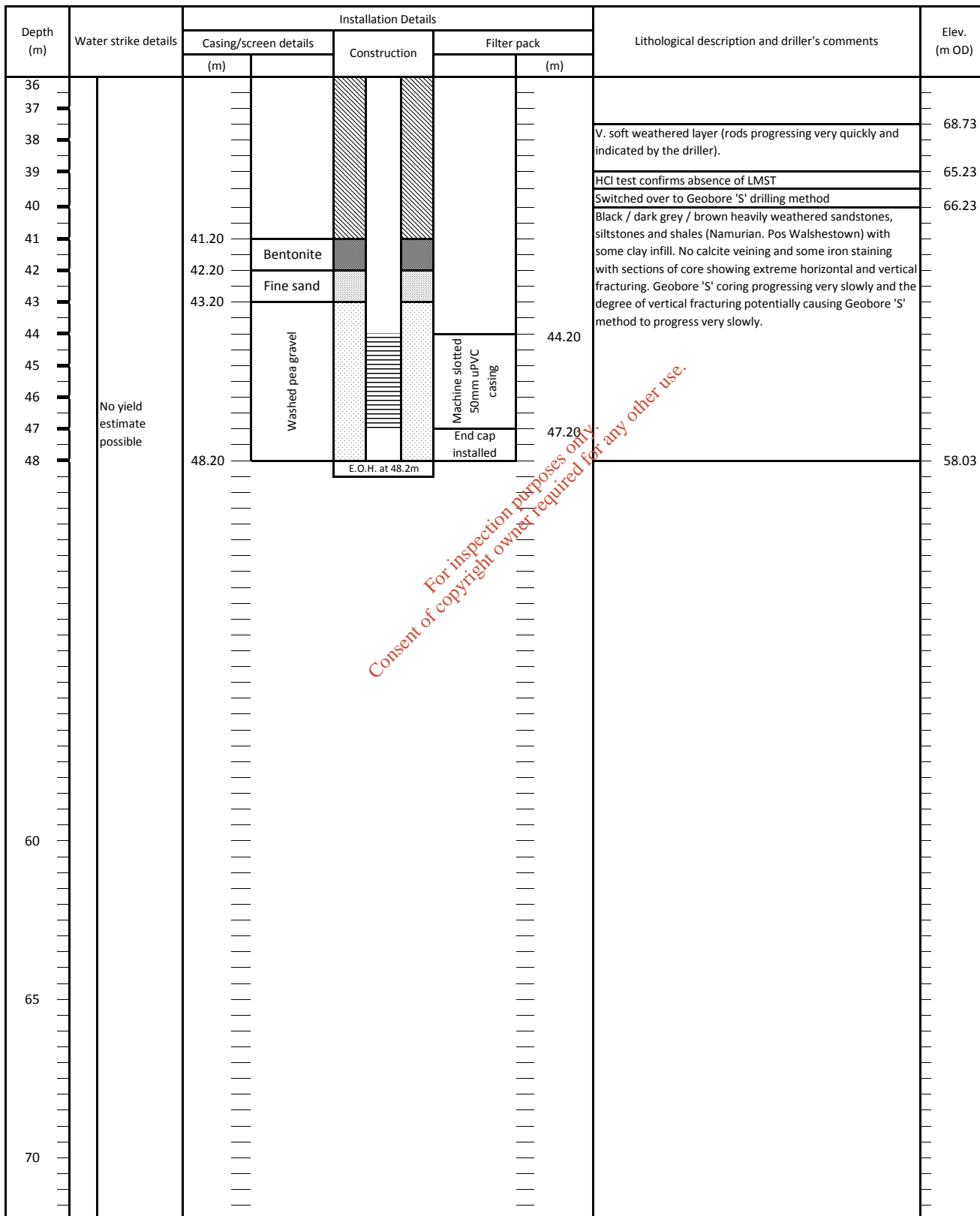
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Project title Integrated Waste Management Facility		Client MEHL	Well No. BH24	Sheet 1 of 2
Date Drilled 10/06/2013 - 13/06/2013	Driller Petersen Drilling Services	Drill method: Air/mist & Geobore 'S'	X: 315954.52	
Date Logged 10/06/2013 - 13/06/2013	Site Engineer/Geologist Lee Chambers	Flush: Air/mist & water/polymer gel	Y: 258209.45	
Comments: Geobore 'S' drilling method between 40-48.2mbgl		Borehole diameter: 146mm (Geobore 'S')	Z (mOD): 106.23	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Filter pack		Construction	Casing/screen details			
		(m)			(m)			
1			Concrete			Black / dark brown sandy gravelly CLAY (Dublin black boulder clay)		
2	<p>Static water level: 3.08 mbgl on 08/07/2013</p> <p>9.8m V. small water strike but difficult to interpret yield</p>							
3								
4								
5								
6								
7								
8								
9								
10						Sand and Gravel layer (possible bed rock contact)	96.43	
11								
12						Black / grey / brown interbedded weathered siltstone, mudstone and shale (Namurian. Possible Walshestown)	94.23	
13								
14								
15								
16								
17								
18								
19						Black / grey / brown interbedded very weathered siltstone, mudstone and shale (Namurian. Possible Walshestown)	87.23	
20								
21								
22								
23						Black / grey / brown interbedded weathered siltstone, mudstone and shale (Namurian. Possible Walshestown)	83.23	
24								
25								
26								
27								
28								
29								
30								
31						Black / grey / brown interbedded very weathered siltstone, mudstone and shale (Namurian. Possible Walshestown)	75.23	
32								
33								
34								
35								

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Project title Integrated Waste Management Facility		Client MEHL	Well No. BH24	Sheet 2 of 2
Date Drilled 10/06/2013 - 13/06/13	Driller Petersen Drilling Services	Drill method: Air/mist & water/polymer gel	X: 315794.7	
Date Logged 10/06/2013 - 13/06/13	Site Engineer/Geologist Lee Chambers	Flush: Air/mist	Y: 258003.1	
Comments: Geobore 'S' drilling method between 40-48.2m bgl		Borehole diameter: 146mm (Geobore 'S')	Z (mOD): 105.4	

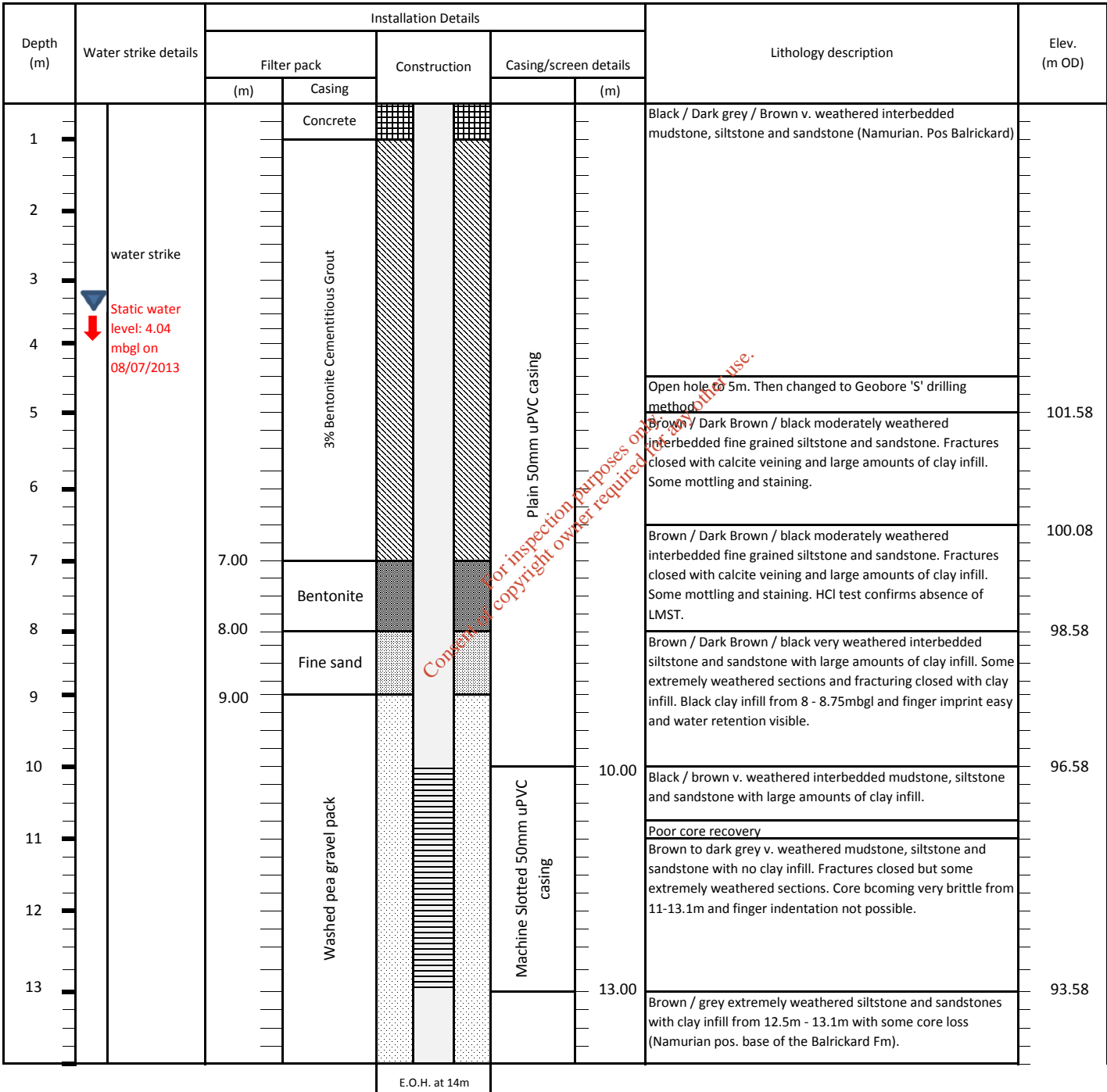


Project title Integrated waste management facility		Client MEHL	Well No. BH25
Date Drilled 21/05/2013 - 22/05/2013	Driller Petersen Drilling Services	Drill method: Super Jaws T117 (Open Hole)	X: 315713.05
Date Logged 21/05/2013 - 22/05/20	Site Engineer/Geologist Lee Chambers	Flush: Air & Water	Y: 257875.54
Comments: Description of chippings from drilling (Loughshinny anticipated)		Hole diameter: 120mm (5")	Z (mOD): 105.41

Depth (m)	Water strike details	Installation Details				Lithology description and driller's comments	Elev. (m OD)	
		Filter Pack		Construction	Casing/screen details			
		(m)	Casing		(m)			
1	Static water level: 3.08 mbgl on 08/07/2013 3.6m Small Water Strike Yield 1.02m ³ /hr		Concrete	3% Bentonite Cementitious Grout plain 50mm uPVC casing			Dark brown to black highly weathered interbedded clay and shaley LIMESTONE (Visean deposits pos Loughshinny Fm) Drill rods progressing very quickly Weathered brown to black interbedded shaley mudstone and LIMESTONE (Loughshinny Fm) Acid test (HCl) confirms presence of LIMESTONE. Clearly visible reaction. Tested drill arisings: pH=9.16 Temp (C)=10.8 Cond (mS)=0.44 ppt=0.22 Black v. weathered shaley mudstone and LIMESTONE (Loughshinny Fm). V. Soft ground and drill rods progressing v. quickly. Possible weathered zone Black v. weathered shaley mudstone and LIMESTONE (Loughshinny Fm). Tested drill arisings: pH=9.22Temp (C)=11.2 Cond (mS)=0.46 ppt=0.23 Black v. weathered shaley mudstone and LIMESTONE (Loughshinny Fm). Further HCl testing confirms presence of LIMESTONE. Hole becoming very difficult to keep open. Very weathered section.	101.41
2								
3								
4	Yield 2.4m ³ /hr Yield 2.4m ³ /hr						94.91	
5								
6								
7								
8	Yield 2.4m ³ /hr Yield 2.4m ³ /hr Yield 3m ³ /hr	16.00	Bentonite				90.41	
9		17.00	Sand					
10		18.00	Washed pea gravel pack					
11		20.00		Machine Slotted 50mm uPVC casing				
12		24.00		End cap installed				
13		25.00	Bentonite backfill				85.91	
14								
15								
16								
17								
18								
19								
20								
21								
22								
23								
24								
25								

E.O.H. at 26m

Project title Integrated waste management facility		Client MEHL	Well No. BH27
Date Drilled 24/05/2013 - 26/05/2013	Driller Petersen Drilling Services	Drill method: "open-hole" & Geobore 'S'	X: 315756.7
Date Logged 24/05/2013 - 26/05/2013	Site Engineer/Geologist Lee Chambers	Flush: Water & Polymer Gel	Y: 258018.21
Comments: Geobore 'S' from 5mBGL to 14mBGL		Hole diameter: 146mm	Z (mOD): 106.58



Project title Integrated Waste Management Facility		Client MEHL	Well No. BH28	Sheet 1 of 2
Date Drilled 22/05/2013 - 24/05/2013	Driller Petersen Drilling Services	Drill method: Super Jaws T117 (Open hole)	X: 315884.33	
Date Logged 22/05/2013 - 24/05/2013	Site Engineer/Geologist Lee Chambers	Flush: Air/mist	Y: 257915.73	
Comments:		Borehole diameter: 120mm (5")	Z (mOD): 125.88	

Depth (m)	Water strike details	Installation Details			Lithological description and driller's comments	Elev. (m OD)	
		Filter pack		Construction			Casing/screen details
		(m)					
1			Concrete				
2			3% Bentonite Cementitious Grout				
3		3.00	Bentonite			122.88	
4							
5		5.00				120.88	
6							
7							
8							
9							
10							
11							
12						123.38	
13							
14							
15						111.08	
16							
17							
18							
19							
20							
21							
22							
23							
24	Static water level: 24.41 mbl on 08/07/2013						
25	Water strike						
26							
27							
28							
29							
30							
31							
32						94.08	
33		33.00					
34		34.00	Bentonite				
35		35.00	Fine sand				

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Project title Integrated Waste Management Facility		Client MEHL	Well No. BH29	Sheet 2 of 2
Date Drilled 29/05/2013	Driller Petersen Drilling Services	Drill method: Super Jaws T117 (Open Hole)	X; 315985.93	
Date Logged 29/05/2013	Site Engineer/Geologist Lee Chambers	Flush: Air/mist	Y: 258071.2	
Comments: Hole collapses from 44-46mbgl and 53-54mbgl		Borehole diameter: 120mm (5")	Z (mOD): 123.72	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)			(m)			
36								
37								
38								
39								
40								
41								
42								
43								
44								
45								
46	▲ Increase in yield							
47								
48								
49								
50								
51								
52								
53								
54								
55								
56								
57	▲ Yield estimate of 86.4m ³ /day							
58								

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Project title Integrated Waste Management Facility		Client MEHL	Well No. BH30	Sheet 1 of 2
Date Drilled 05/06/2013	Driller Petersen Drilling Services	Drill method: "open hole" & Geobore 'S'	X; 315970.4	
Date Logged 05/06/2013	Site Engineer/Geologist Lee Chambers	Flush: Air/Water & Water/Polyme	Y: 258072.55	
Comments: Geobore 'S' from 40mBGL to 61.7mBGL		Borehole diameter: 146mm (Geobore 'S')	Z (mOD): 124.27	

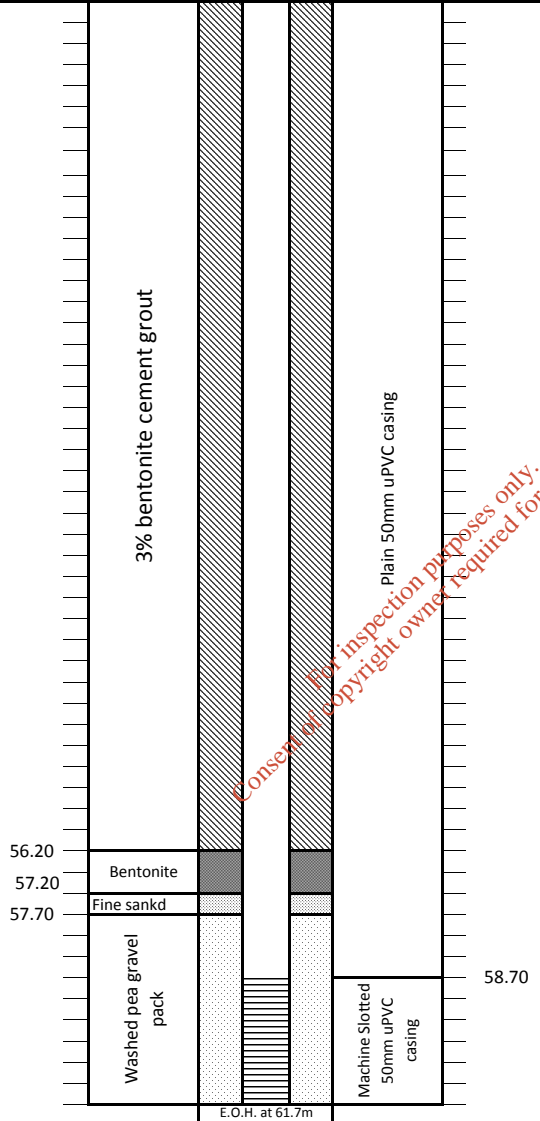
Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Casing/screen details		Construction	Filter pack			
		(m)						(m)
1			Concrete			Orange / Brown sandy gravelly CLAY (Fill). Arisings from quarry.		
2			Backfill with drill arisings					
3								
4								
5								
6								
7							Orange / Brown sandy gravelly CLAY (possible brown boulder CLAY). Possible contact with natural ground.	116.97
8								
9								
10								
11								
12								
13								
14								
15						Black / Grey / Dark Brown sandy gravelly CLAY (Dublin Black Boulder CLAY)	110.27	
16								
17								
18								
19								
20		20.00						
21	Static water level: 22.31 mbgl on 08/07/2013							
22								
23								
24	Water strike							
25						Competent bedrock encountered at 24.50mBGL	99.77	
26								
27						Grey / Dark Brown / Brown weathered shale, siltstone and sandstone with some Fe staining (Namurian. Possible Balrickard)	98.27	
28								
29								
30								
31								
32								
33								
34								
35								

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Project title Integrated Waste Management Facility		Client MEHL	Well No. BH30	Sheet 2 of 2
Date Drilled 05/06/2013	Driller Petersen Drilling Services	Drill method: "open hole" & Geobore 'S'	X: 315970.4	
Date Logged 05/06/2013	Site Engineer/Geologist Lee Chambers	Flush: Air/Water & Water/Polyme	Y: 258072.55	
Comments: Geobore 'S' from 40mBGL to 61.7mBGL		Borehole diameter: 146mm (Geobore 'S')	Z (mOD): 124.27	

Depth (m)	Water strike details	Installation Details				Lithological description and driller's comments	Elev. (m OD)	
		Filter pack		Construction	Casing/screen details			
		(m)			(m)			
36								
37								
38								
39								
40								
41							84.27	
42								
43								
44								
45							79.07	
46								
47								
48								
49							76.07	
50								
51								
52								
53								
54								
55								
56							68.57	
57							67.57	
58								
59								
60								
61								
62								

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Appendix E

Groundwater Monitoring

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