

Claremorris Unregulated Landfill, Site Investigation, Co. Mayo

Mayo County Council

24 January 2011



For inspection purposes only.
Consent of copyright owner required for any other use.

JS DRILLING
Environmental, Geotechnical
& Geothermal Contractors

Email: jim@jsdrilling.ie
wellsolutions@jsdrilling.ie
Tel: 0871776966 / 0877433451
Fax: 0567793887
Website: www.wellsolutions.ie

Contents

Introduction.....	2
Scope of works.....	2
Methodology.....	3
Onsite investigations.....	3
Onsite observations.....	4
Sample Collection and analysis.....	4
Laboratory Results.....	5
Conclusions.....	8
Limitations.....	8
APPENDIX 1.....	Laboratory results
APPENDIX 2.....	Logs and Photographs

For inspection purposes only.
Consent of copyright owner required for any other use.

Introduction

JS Drilling is pleased to present this report summarising the site investigation carried out at a former unregulated waste disposal site in Claremorris Co. Mayo. The site investigation was carried out from the 25th-26th November 2010.

The objectives of the site investigation were to determine depth and lateral extent of waste deposited in the site and to collect samples of the waste encountered in order to characterise the waste body.

Scope of works

The following scope of works was derived by Mayo County Council and carried out by JS Drilling between the 25th and 26th of November 2010.

- Drilling of two (2) boreholes BH01 and BH02 to 4m and 6.3m respectively;
- Excavation of seven (7) trial pits to the full depth of the waste body where possible. Where it was not possible to determine the base of waste body trial pits were excavated to the working limit of the tracked excavator 6-6.5m below ground level
- Insitu monitoring of landfill gas using portable Landfill gas meter GA94
- Collection of soil / waste samples during drilling/trial pitting;
- Conversion of the two (2) boreholes to 50mm diameter groundwater/ leachate wells;
- Collection of groundwater / leachate samples from each of the monitoring wells;

Methodology

Onsite investigations

Boreholes and Monitoring Well Installation

Two (2) no. boreholes were drilled on the site using window sampling drilling methods. One borehole was drilled through the waste body (BH01) and into the underlying natural subsoil. One borehole was drilled on the periphery of the site down gradient of the landfill site into natural ground (BH02).

The two (2) boreholes were converted to monitoring wells. BH01 was converted to a 50 mm diameter leachate monitoring well and BH02 drilled on the periphery of the site was converted to a 50 mm diameter groundwater monitoring well.

After installation the monitoring wells were developed so that any materials introduced during drilling were removed. Monitoring wells were finished using upright metal covers. Borehole and monitoring well logs can be seen as Appendix 2.

Trial Pitting

In order to characterise the waste body and assess for the presence of hazardous waste materials seven (7) no. trial pits TP01, TP02, TP03, TP04, TP05, TP06 and TP07 were excavated on an approximate 80m grid according to the map and GPS positions provided by Mayo County Council. It was attempted to excavate the trial pits through the waste body however in 4 of the 7 trial pits, TP06, TP04, TP02 and TP01 the depth of waste exceeded the maximum excavation limit of the tracked excavator.

Each trial pit was one excavator bucket in width (approximately 1m) and approximately 3m in length. Each trial pit was logged and photographed and types of waste types encountered were noted and photographed and evidence of age of waste was recorded. Trial pits were backfilled upon completion. The location of each trial pit was recorded using a GPS. Trial pit logs can be seen as Appendix 2.

Slit trenches

In order to determine the lateral extent of the waste body slit trenches were excavated along the edge of the landfill. Seven (7) slit trenches ST1, ST2, ST3, ST4, ST5, ST6 and

ST7 were excavated and their location recorded using a hand held GPS. Slit trenches were photographed by the field engineer. Slit trench logs can be seen as Appendix 2.

Onsite observations

Trial Pitting

Of the seven (7) no. trial pits excavated on site, three (3) no., TP03 (6.4m), TP07 (5.5m), TP05 (4.5m) were excavated into natural ground. Due to a greater than estimated depth of waste and poor ground conditions the other four (4) trial pits TP01 (6.4m), TP02 (6.5m), TP04 (5.5m) and TP06 (6.5m) were advanced to the maximum reach of the tracked excavator taking into account varying ground conditions on the site.

Depth of waste varied across the site from 4.0m depth in TP05 to in excess of 6.5m in TP02 and TP06.

Slit trenches

The slit trenches excavated around the periphery of the site located the edge of the waste in all but one ST3 which had waste 3m deep. BH02 was drilled approximately 30m south of this slit trench and waste appears to be tapering to 0.8m at this location indicating the edge of the waste.

Sample Collection and analysis

Soil /Waste samples

Soil samples were collected during drilling at nominal depths of 0.25m 2.0m, 4.0m and 6.0m bgl.

Soil / waste samples were collected during trial pitting at nominal depths of 0.25m, 2.0m, 4.0m and 6.0m bgl.

Sample selection was based on inspection of soil/ waste for visual and olfactory evidence of contamination.

Groundwater sampling

Leachate and groundwater samples were collected from MW01 and MW02 respectively on the 02 December 2010.

A slight odour was noted from the groundwater sample MW02 which could possibly be attributed to the presence of peat as the underlying strata. The water was brown and murky and cleared slightly after purging 3 well volumes.

A strong pungent odour was noted from the black leachate sample collected from MW01. Leachate did not change in odour or colour after purging.

The sample containers were labelled with a unique number and placed in a cooler box for transportation to STL laboratories in the UK, time sensitive analysis (BOD, COD and faecal coliforms in the groundwater) was carried out in local lab CLS laboratories in Galway. The field engineer recorded the sample collection location using a GPS, the sample depth and the sample number. Laboratory results can be seen as appendix 1.

Laboratory Results

Results of laboratory analysis of waste samples are summarised in table 1 below. Water and leachate analysis is summarised in table 2 and particle size distribution and moisture content of material underlying the waste body can be seen in Appendix 1.

Claremorris Unregulated Landfill Site Investigation

Table 1 Waste sample analysis

Analysis				Landfill Waste Acceptance Criteria BS EN 12457-3 Limit Values (mg/Kg) at L:S 10:1		
Liquid:Waste Ratio	10:1	10:01	10:01	Inert Waste	Stable Non- Reactive hazardous waste in non- hazardous	Hazardous Waste
Sample ID	TP01 4m	TP02 4m	TP03 3m			
pH	7.24	7.46	7.17			
Temperature °C	21	21	21			
Conductivity uS/cm	736	1376	632			
	mg/Kg	mg/Kg	mg/Kg			
Arsenic as As	<0.050	<0.050	<0.050	0.5	2	25
Barium as Ba	0.52	0.4	0.29	20	100	300
Cadmium as Cd	<0.0010	<0.0010	<0.0010	0.04	1	5
Chromium as Cr	<0.025	<0.025	<0.025	0.5	10	70
Copper as Cu	<0.10	<0.10	<0.10	2	50	100
Mercury as Hg	<0.0050	<0.0050	<0.0050	0.01	0.2	2
Molybdenum as Mo	<0.020	<0.020	0.05	0.5	10	30
Nickel as Ni	<0.20	<0.20	<0.20	0.4	10	40
Lead as Pb	<0.10	<0.10	<0.10	0.5	10	50
Antimony as Sb	<0.060	<0.060	<0.060	0.06	0.7	5
Selenium as Se	<0.10	<0.10	<0.10	0.1	0.5	7
Zinc as Zn	<0.25	<0.25	<0.25	4	50	200
Chloride as Cl	510	890	170	800	15000	25000
Fluoride as F	2	<2.0	<2.0	10	150	500
Sulphate as SO4	1700	4200	2100	1000	20000	50000
Total Dissolved Solids (TDS)	4200	9700	4600	4000	60000	100000
Phenol Index	<1.5	<1.5	<1.5	1		
Dissolved Organic Carbon (DOC)	170	580	240	500	800	1000
Total Organic Carbon w/w %	10	9.9	7.1	3%	5%	6%
Loss on Ignition %	13	19	16			10%
BTEX mg/Kg				6		
PCBs (7 congeners) mg/Kg	0.045	<0.010	<0.010	1		
Mineral Oil (C10-C40) mg/Kg	540	1000	220	500		
PAHs mg/Kg	5	3.2	1.5	100		
pH	7.8	7.9	8		>6	
Acid Neutralisation Capacity (pH4) mol/Kg	0.029	0.03	0.03		To be evaluated	To be evaluated
Acid Neutralisation Capacity (pH7) mol/Kg	0.0058	0.0046	0.0081		To be evaluated	To be evaluated
Additional Waste Analysis						
Conductivity @ 20 C uS/cm	1100	3200	1100			
Benzene mg/kg	<0.10	<0.10	<0.10			
Toluene mg/kg	<0.10	<0.10	<0.10			
Ethylbenzene mg/kg	<0.10	<0.10	<0.10			
m&p-Xylene mg/kg	<0.20	<0.20	<0.20			
o-Xylene mg/kg	<0.10	<0.10	<0.10			

Claremorris Unregulated Landfill Site Investigation

Table 1 contd: Waste sample analysis

Analysis				Landfill Waste Acceptance Criteria BS EN 12457-3 Limit Values (mg/Kg) at L:S 10:1		
Liquid:Waste Ratio	10:01	10:01	10:01	Inert Waste	Stable Non- Reactive hazardous waste in non- hazardous	Hazardous Waste
Sample ID	TP04 4m	TP05 3.5m	TP06 4m			
pH	7.56	7.63	7.83			
Temperature °C	21	21	21			
Conductivity uS/cm	1189	1535	2670			
	mg/Kg	mg/Kg	mg/Kg			
Arsenic as As	<0.050	<0.050	<0.050	0.5	2	25
Barium as Ba	0.62	0.33	0.2	20	100	300
Cadmium as Cd	<0.0010	<0.0010	<0.0010	0.04	1	5
Chromium as Cr	<0.025	<0.025	<0.025	0.5	10	70
Copper as Cu	<0.10	0.14	0.35	2	50	100
Mercury as Hg	<0.0050	<0.0050	<0.0050	0.01	0.2	2
Molybdenum as Mo	<0.020	0.08	0.65	0.5	10	30
Nickel as Ni	<0.20	<0.20	0.22	0.4	10	40
Lead as Pb	<0.10	<0.10	<0.10	0.5	10	50
Antimony as Sb	<0.060	<0.060	0.08	0.06	0.7	5
Selenium as Se	<0.10	<0.10	<0.10	0.1	0.5	7
Zinc as Zn	<0.25	<0.25	0.76	4	50	200
Chloride as Cl	470	550	3600	800	15000	25000
Fluoride as F	<2.0	<2.0	<2.0	10	150	500
Sulphate as SO4	4400	5100	4800	1000	20000	50000
Total Dissolved Solids (TDS)	8400	9600	16000	4000	60000	100000
Phenol Index	<1.5	<1.5	<1.5	1		
Dissolved Organic Carbon (DOC)	270	320	1100	500	800	1000
Total Organic Carbon w/w %	12	10	19	3%	5%	6%
Loss on Ignition %	20	26	37			10%
BTEX mg/Kg				6		
PCBs (7 congeners) mg/Kg	<0.010	<0.010	<0.010	1		
Mineral Oil (C10-C40) mg/Kg	170	780	310	500		
PAHs mg/Kg	7.3	7.4	4.3	100		
pH	7.8	7.9	8		>6	
Acid Neutralisation Capacity (pH4) mol/Kg	0.043	0.039	0.069		To be evaluated	To be evaluated
Acid Neutralisation Capacity (pH7) mol/Kg	0.0052	0.0045	0.013		To be evaluated	To be evaluated
Additional Waste Analysis						
Conductivity @ 20 C uS/cm	400	3000	<100			
Benzene mg/kg	<0.10	<0.10	<0.10			
Toluene mg/kg	<0.10	<0.10	<0.10			
Ethylbenzene mg/kg	<0.10	<0.10	<0.10			
m&p-Xylene mg/kg	<0.20	<0.20	<0.20			
o-Xylene mg/kg	<0.10	<0.10	<0.10			

Table 2. Groundwater and leachate results

		Sample ID	
Analysis	Units	Groundwater	Leachate
BOD	mg/l	28	2972
COD	mg/l	482	6160
Faecal coliforms	cfu/100ml	<1	-
Total coliforms	cfu/100ml	6,800	-

Conclusions

The extent and nature of the waste body was determined during the site investigation. Seven no. slit trenches determined the lateral extent of the landfill. Trial pits excavated into the waste body were logged and photographed and determined that the waste body is in excess of 6.5 m in 4 of the 7 locations excavated. Representative samples were collected from the trial pits and sent for leachability analysis in accordance with BS EN 12457-3 Limit Values (mg/Kg) at L:S 10:1.

Limitations

JSDrilling prepared this report for the sole use of Mayo County Council. This report is intended to assist Mayo County Council in understanding the ground conditions in relation to the Claremorris Historic Landfill. Field investigations carried out by JSDrilling were restricted to a level of detail appropriate to the presented assessment. It is important that these limitations be clearly recognised when the findings of this report are being interpreted.

To the best of our knowledge information contained in this report is accurate at the time of issue. Subsurface conditions may vary with time. This should be borne in mind if the report is used without further confirmatory testing after significant delay.

APPENDIX 1

STL, CLS and Testconsult Laboratory analysis results

*For inspection purposes only.
Consent of copyright owner required for any other use.*

Claremorris Unregulated Landfill Site Investigation

Waste Acceptance Criteria Testing BS EN 12457
Part 2, Single Stage Process
Issue 1

Sample Details		Test Values	
Sample Number	12125259	Mass of Raw Test Portion (MW) kg	0.092
Job Number	743509	Mass of Dried Test Portion (MD) kg	0.09
Sample ID	TP01 @ 4m	Moisture Content Ratio (MC) %	1.76
Site	Claremorris Landfill	Dry Matter Content Ratio (DR) %	98.27
Job Description	Waste Acceptance Criteria	Moisture Content @ 105c	1.7
Date Sampled	26/11/2010	Leachant Volume (L) Litre	0.898
Date Received	08/12/2010	Eluate Volume (VE) Litre	0.821
Particle Size (<4mm)	>95%		
Method of size reduction	Jaw Crusher.		
Non-crushable matter	1.68g		

Eluate Analysis	Concentration in Eluate	Amount Leached	Landfill Waste Acceptance Criteria		
Liquid:Waste Ratio	10:1	10:1	BS EN 12457-3 Limit Values (mg/Kg) at L.S 10:1		
Sample Number	12125260				
pH	7.24				
Temperature °C	21				
Conductivity uS/cm	736				
	mg/l	mg/Kg	Inert Waste	Stable Non-Reactive hazardous waste in non-hazardous	Hazardous Waste
Arsenic as As	<0.0050	<0.050	0.5	2	25
Barium as Ba	0.052	0.62	20	100	300
Cadmium as Cd	<0.00010	<0.0010	0.04	1	5
Chromium as Cr	<0.0025	<0.025	0.5	10	70
Copper as Cu	<0.010	<0.10	2	50	100
Mercury as Hg	<0.00050	<0.0050	0.01	0.2	2
Molybdenum as Mo	<0.0020	<0.020	0.5	10	30
Nickel as Ni	<0.020	<0.20	0.4	10	40
Lead as Pb	<0.010	<0.10	0.5	10	50
Antimony as Sb	<0.0060	<0.060	0.06	0.7	5
Selenium as Se	<0.010	<0.10	0.1	0.5	7
Zinc as Zn	<0.025	<0.25	4	50	200
Chloride as Cl	50.5	510	800	15000	25000
Fluoride as F	0.2	2	10	150	500
Sulphate as SO4	167	1700	1000	20000	50000
Total Dissolved Solids (TDS)	424	4200	4000	60000	100000
Phenol Index	<0.15	<1.5	1		
Dissolved Organic Carbon (DOC)	17.1	170	500	800	1000
Waste Analysis					
Total Organic Carbon w/w %		10	3%	5%	6%
Loss on Ignition %		13			10%
BTEX mg/Kg			6		
PCBs (7 congeners) mg/Kg		0.045	1		
Mineral Oil (C10-C40) mg/Kg		540	500		
PAHs mg/Kg		5	100		
pH		7.8		>6	
Acid Neutralisation Capacity (pH4) mol/Kg		0.029		To be evaluated	To be evaluated
Acid Neutralisation Capacity (pH7) mol/Kg		0.0058		To be evaluated	To be evaluated

Disclaimer: Eluate concentrations below the detection limit are assumed to be negligible when calculating mg/kg values. The limits quoted for Waste Acceptance are derived from the Landfill (England and Wales) Regulations 2002 (as amended) and are provided as guidance only. STS does not take responsibility for any errors or omissions with regard to these limits.

Additional Eluate Analysis	Concentration in Eluate	Amount Leached
	10:1	10:1
	mg/l	mg/Kg

Additional Waste Analysis	Units	Result
Conductivity @ 20 C	uS/cm	1100
Benzene	mg/kg	<0.10
Toluene	mg/kg	<0.10
Ethylbenzene	mg/kg	<0.10
m&p-Xylene	mg/kg	<0.20
o-Xylene	mg/kg	<0.10

Sample Comments	
12125259	Stainless steel sieve used.
12125259	Method 327 VOC HS Soils, low surrogate standard recovery due to the nature of
12125260	

Severn Trent Services Analytical Services is a trading name of Severn Trent Laboratories Limited.
This communication has been sent to you by Severn Trent Laboratories Limited. Registered in England and Wales. Registered No.2148034.
Registered Office: Severn Trent Centre, 2 St. John's Street, Coventry, CV1 2LZ.

Claremorris Unregulated Landfill Site Investigation

Waste Acceptance Criteria Testing BS EN 12457
Part 2, Single Stage Process
Issue 1

Sample Details		Test Values	
Sample Number	12125262	Mass of Raw Test Portion (MW) kg	0.094
Job Number	743509	Mass of Dried Test Portion (MD) kg	0.09
Sample ID	TP02 @ 4m	Moisture Content Ratio (MC) %	4.02
Site	Claremorris Landfill	Dry Matter Content Ratio (DMR) %	96.14
Job Description	Waste Acceptance Criteria	Moisture Content @ 105c	3.9
Date Sampled	26/11/2010	Leachant Volume (L) Litre	0.896
Date Received	08/12/2010	Eluate Volume (VE) Litre	0.577
Particle Size (<4mm)	>95%		
Method of size reduction	Jaw Crusher		
Non-crushable matter	2.73g		

Eluate Analysis	Concentration in Eluate	Amount Leached	Landfill Waste Acceptance Criteria		
			Inert Waste	Stable Non- Reactive hazardous waste in non-hazardous	Hazardous Waste
Liquid:Waste Ratio	10:1	10:1	BS EN 12457-3 Limit Values (mg/Kg) at L:S 10:1		
Sample Number	12125263				
pH	7.46				
Temperature °C	21				
Conductivity uS/cm	1376				
	mg/l	mg/Kg			
Arsenic as As	<0.0050	<0.050	0.5	2	25
Barium as Ba	0.04	0.4	20	100	300
Cadmium as Cd	<0.00010	<0.0010	0.04	1	5
Chromium as Cr	<0.0025	<0.025	0.5	10	70
Copper as Cu	<0.010	<0.10	2	50	100
Mercury as Hg	<0.00050	<0.0050	0.01	0.2	2
Molybdenum as Mo	<0.0020	<0.020	0.5	10	30
Nickel as Ni	<0.020	<0.20	2	10	40
Lead as Pb	<0.010	<0.10	0.5	10	50
Antimony as Sb	<0.0050	<0.050	0.06	0.7	5
Selenium as Se	<0.010	<0.10	0.1	0.5	7
Zinc as Zn	<0.025	<0.25	4	50	200
Chloride as Cl	79.6	800	800	15000	25000
Fluoride as F	<0.2	<2.0	10	150	500
Sulphate as SO4	419	4200	1000	20000	50000
Total Dissolved Solids (TDS)	969	9700	4000	60000	100000
Phenol Index	<0.15	<1.5	1		
Dissolved Organic Carbon (DOC)	57.5	580	500	800	1000
Waste Analysis					
Total Organic Carbon w/w %		9.9	3%	5%	6%
Loss on Ignition %		19			10%
BTEX mg/Kg			6		
PCBs (7 congeners) mg/Kg		<0.010	1		
Mineral Oil (C10-C40) mg/Kg		1000	500		
PAHs mg/Kg		3.2	100		
pH		7.9		>6	
Acid Neutralisation Capacity (pH4) mol/Kg		0.03		To be evaluated	To be evaluated
Acid Neutralisation Capacity (pH7) mol/Kg		0.0046		To be evaluated	To be evaluated

Disclaimer: Eluate concentrations below the detection limit are assumed to be negligible when calculating mg/kg values. The limits quoted for Waste Acceptance are derived from the Landfill (England and Wales) Regulations 2002 (as amended) and are provided as guidance only. STS does not take responsibility for any errors or omissions with regard to these limits.

Additional Eluate Analysis	Concentration in Eluate	Amount Leached
	10:1	10:1
	mg/l	mg/Kg

Additional Waste Analysis	Units	Result
Conductivity @ 20 C	uS/cm	3200
Benzene	mg/kg	<0.10
Toluene	mg/kg	<0.10
Ethylbenzene	mg/kg	<0.10
m&p-Xylene	mg/kg	<0.20
o-Xylene	mg/kg	<0.10

Sample Comments	
12125262	Stainless steel sieve used
12125262	Method 327 VOC HS Soils, low surrogate standard recovery due to the nature of
12125263	

Severn Trent Services Analytical Services is a trading name of Severn Trent Laboratories Limited.
This communication has been sent to you by Severn Trent Laboratories Limited, Registered in England and Wales, Registered No.2148934.
Registered Office: Severn Trent Centre, 2 St. John's Street, Coventry, CV1 2LZ.

Claremorris Unregulated Landfill Site Investigation

Waste Acceptance Criteria Testing BS EN 12457
Part 2, Single Stage Process
Issue 1

Sample Details		Test Values	
Sample Number	12125265	Mass of Raw Test Portion (MW) kg	0.099
Job Number	743509	Mass of Dried Test Portion (MD) kg	0.09
Sample ID	TP03 @ 3m	Moisture Content Ratio (MC) %	10.17
Site	Claremorris Landfill	Dry Matter Content Ratio (DR) %	90.77
Job Description	Waste Acceptance Criteria	Moisture Content @ 105c	9.2
Date Sampled	26/11/2010	Leachant Volume (L) Litre	0.891
Date Received	08/12/2010	Eluate Volume (VE) Litre	0.837
Particle Size (<4mm)	>95%		
Method of size reduction	Jaw Crusher.		
Non-crushable matter	2.32g		

Eluate Analysis	Concentration in Eluate	Amount Leached	Landfill Waste Acceptance Criteria		
			Inert Waste	Stable Non-Reactive hazardous waste in non-hazardous	Hazardous Waste
Liquid:Waste Ratio	10:1	10:1	BS EN 12457-3 Limit Values (mg/Kg) at L.S 10:1		
Sample Number	12125266				
pH	7.17				
Temperature °C	21				
Conductivity uS/cm	632				
	mg/l	mg/Kg			
Arsenic as As	<0.0050	<0.050	0.5	2	25
Barium as Ba	0.029	0.29	20	100	300
Cadmium as Cd	<0.00010	<0.0010	0.04	1	5
Chromium as Cr	<0.0025	<0.025	0.5	10	70
Copper as Cu	<0.010	<0.10	2	50	100
Mercury as Hg	<0.00050	<0.0050	0.01	0.2	2
Molybdenum as Mo	0.005	0.05	0.5	10	30
Nickel as Ni	<0.020	<0.20	0.4	10	40
Lead as Pb	<0.010	<0.10	10	50	50
Antimony as Sb	<0.0060	<0.060	0.06	0.7	5
Selenium as Se	<0.010	<0.10	0.1	0.5	7
Zinc as Zn	<0.025	<0.25	4	50	200
Chloride as Cl	16.8	170	800	15000	25000
Fluoride as F	<0.2	<2.0	10	150	500
Sulphate as SO4	205	2100	1000	20000	50000
Total Dissolved Solids (TDS)	455	4600	4000	60000	100000
Phenol Index	<0.15	<1.5	1		
Dissolved Organic Carbon (DOC)	24.2	240	500	800	1000
Waste Analysis					
Total Organic Carbon w/w %		7.1	3%	5%	6%
Loss on Ignition %		16			10%
BTEX mg/Kg			6		
PCBs (7 congeners) mg/Kg		<0.010	1		
Mineral Oil (C10-C40) mg/Kg		220	500		
PAHs mg/Kg		1.5	100		
pH		8		>6	
Acid Neutralisation Capacity (pH) mol/Kg		0.03		To be evaluated	To be evaluated
Acid Neutralisation Capacity (pH7) mol/Kg		0.0081		To be evaluated	To be evaluated

Disclaimer: Eluate concentrations below the detection limit are assumed to be negligible when calculating mg/kg values. The limits quoted for Waste Acceptance are derived from the Landfill (England and Wales) Regulations 2002 (as amended) and are provided as guidance only. STS does not take responsibility for any errors or omissions with regard to these limits.

Additional Eluate Analysis	Concentration in Eluate	Amount Leached
	10:1	10:1
	mg/l	mg/Kg

Additional Waste Analysis	Units	Result
Conductivity @ 20 C	uS/cm	1100
Benzene	mg/kg	<0.10
Toluene	mg/kg	<0.10
Ethylbenzene	mg/kg	<0.10
m&p-Xylene	mg/kg	<0.20
o-Xylene	mg/kg	<0.10

Sample Comments	
12125265	Stainless steel sieve used.
12125265	Method 327 VOC HS Soils, low surrogate standard recovery due to the nature of
12125266	

Severn Trent Services Analytical Services is a trading name of Severn Trent Laboratories Limited.
This communication has been sent to you by Severn Trent Laboratories Limited. Registered in England and Wales. Registered No.2148934.
Registered Office: Severn Trent Centre, 2 St. John's Street, Coventry, CV1 2LZ.

Claremorris Unregulated Landfill Site Investigation

Waste Acceptance Criteria Testing BS EN 12457
Part 2, Single Stage Process
Issue 1

Sample Details		Test Values	
Sample Number	12125268	Mass of Raw Test Portion (MW) kg	0.094
Job Number	743509	Mass of Dried Test Portion (MD) kg	0.09
Sample ID	TP04 @ 4m	Moisture Content Ratio (MC) %	4.14
Site	Claremorris Landfill	Dry Matter Content Ratio (DM) %	96.02
Job Description	Waste Acceptance Criteria	Moisture Content @ 105c	4
Date Sampled	25/11/2010	Leachant Volume (L) Litre	0.896
Date Received	08/12/2010	Eluate Volume (VE) Litre	0.556
Particle Size (<4mm)	>95%		
Method of size reduction	Jaw Crusher.		
Non-crushable matter	15.36g		

Eluate Analysis	Concentration in Eluate		Amount Leached		Landfill Waste Acceptance Criteria		
	mg/l	mg/Kg	Inert Waste	Stable Non- Reactive hazardous waste in non-hazardous	Hazardous Waste		
Liquid:Waste Ratio	10:1		10:1				
Sample Number	12125269						
pH	7.56						
Temperature °C	21						
Conductivity uS/cm	1189						
	mg/l	mg/Kg					
Arsenic as As	<0.0050	<0.050	0.5	2	25		
Barium as Ba	0.062	0.62	20	100	300		
Cadmium as Cd	<0.00010	<0.0010	0.04	1	5		
Chromium as Cr	<0.0025	<0.025	0.5	10	70		
Copper as Cu	<0.010	<0.10	2	50	100		
Mercury as Hg	<0.00050	<0.0050	0.01	0.2	2		
Molybdenum as Mo	<0.0020	<0.020	0.5	10	30		
Nickel as Ni	<0.020	<0.20	0.5	10	40		
Lead as Pb	<0.010	<0.10	0.5	10	50		
Antimony as Sb	<0.0060	<0.060	0.06	0.7	5		
Selenium as Se	<0.010	<0.10	0.1	0.5	7		
Zinc as Zn	<0.025	<0.25	4	50	200		
Chloride as Cl	47.3	470	800	15000	25000		
Fluoride as F	<0.2	<2.0	10	150	500		
Sulphate as SO4	438	4400	1000	20000	50000		
Total Dissolved Solids (TDS)	838	8400	4000	60000	100000		
Phenol Index	<0.15	<1.5	1				
Dissolved Organic Carbon (DOC)	26.8	270	500	800	1000		
Waste Analysis							
Total Organic Carbon w/w %		12	3%	5%	6%		
Loss on Ignition %		20			10%		
BTEX mg/Kg			6				
PCBs (7 congeners) mg/Kg		<0.010	1				
Mineral Oil (C10-C40) mg/Kg		170	500				
PAHs mg/Kg		7.3	100				
pH		7.8		>5			
Acid Neutralisation Capacity (pH4) mol/Kg		0.043		To be evaluated	To be evaluated		
Acid Neutralisation Capacity (pH7) mol/Kg		0.0052		To be evaluated	To be evaluated		

Disclaimer: Eluate concentrations below the detection limit are assumed to be negligible when calculating mg/Kg values. The limits quoted for Waste Acceptance are derived from the Landfill (England and Wales) Regulations 2002 (as amended) and are provided as guidance only. STS does not take responsibility for any errors or omissions with regard to these limits.

Additional Eluate Analysis	Concentration in Eluate	Amount Leached
	10:1	10:1
	mg/l	mg/Kg

Additional Waste Analysis	Units	Result
Conductivity @ 20 C	uS/cm	400
Benzene	mg/kg	<0.10
Toluene	mg/kg	<0.10
Ethylbenzene	mg/kg	<0.10
m&p-Xylene	mg/kg	<0.20
o-Xylene	mg/kg	<0.10

Sample Comments	
12125268	Stainless steel sieve used.
12125268	Method 327 VOC HS Soils, low surrogate standard recovery due to the nature of
12125269	

Severn Trent Services Analytical Services is a trading name of Severn Trent Laboratories Limited.
This communication has been sent to you by Severn Trent Laboratories Limited. Registered in England and Wales. Registered No.2148934.
Registered Office: Severn Trent Centre, 2 St. John's Street, Coventry, CV1 2LZ.

Claremorris Unregulated Landfill Site Investigation

Waste Acceptance Criteria Testing BS EN 12457
Part 2, Single Stage Process
Issue 1

Sample Details		Test Values	
Sample Number	12125271	Mass of Raw Test Portion (MW) kg	0.109
Job Number	743509	Mass of Dried Test Portion (MD) kg	0.09
Sample ID	TP05 @ 3.5m	Moisture Content Ratio (MC) %	21.31
Site	Claremorris Landfill	Dry Matter Content Ratio (DR) %	82.43
Job Description	Waste Acceptance Criteria	Moisture Content @ 105c	18
Date Sampled	26/11/2010	Leachant Volume (L) Litre	0.881
Date Received	09/12/2010	Eluate Volume (VE) Litre	0.626
Particle Size (<4mm)	>95%		
Method of size reduction	Jaw Crusher		
Non-crushable matter	1.41g		

Eluate Analysis	Concentration in Eluate		Amount Leached		Landfill Waste Acceptance Criteria		
	mg/l	mg/Kg	mg/l	mg/Kg	Inert Waste	Stable Non- Reactive hazardous waste in non- hazardous	Hazardous Waste
Liquid:Waste Ratio	10:1		10:1		BS EN 12457-3 Limit Values (mg/Kg) at L:S 10:1		
Sample Number	12125272						
pH	7.63						
Temperature °C	21						
Conductivity uS/cm	1535						
	mg/l	mg/Kg					
Arsenic as As	<0.0050	<0.050	0.5	2	25		
Barium as Ba	0.033	0.33	20	100	300		
Cadmium as Cd	<0.00010	<0.0010	0.04	1	5		
Chromium as Cr	<0.0025	<0.025	0.5	10	70		
Copper as Cu	0.014	0.14	2	50	100		
Mercury as Hg	<0.00050	<0.0050	0.01	0.2	2		
Molybdenum as Mo	0.008	0.08	0.5	10	30		
Nickel as Ni	<0.020	<0.20	0.5	10	40		
Lead as Pb	<0.010	<0.10	0.5	10	50		
Antimony as Sb	<0.0060	<0.060	0.06	0.7	5		
Selenium as Se	<0.010	<0.10	0.1	0.5	7		
Zinc as Zn	<0.025	<0.25	4	50	200		
Chloride as Cl	55.3	550	800	15000	25000		
Fluoride as F	<0.2	<2.0	10	150	500		
Sulphate as SO4	513	5100	1000	20000	50000		
Total Dissolved Solids (TDS)	963	9600	4000	60000	100000		
Phenol Index	<0.15	<1.5	1				
Dissolved Organic Carbon (DOC)	32	320	500	600	1000		
Waste Analysis							
Total Organic Carbon w/w %		10	3%	5%	6%		
Loss on Ignition %		26			10%		
BTEX mg/Kg			6				
PCBs (7 congeners) mg/Kg		<0.010	1				
Mineral Oil (C10-C40) mg/Kg		780	500				
PAHs mg/Kg		7.4	100				
pH		7.9		>6			
Acid Neutralisation Capacity (pH4) mol/Kg		0.039			To be evaluated	To be evaluated	
Acid Neutralisation Capacity (pH7) mol/Kg		0.0045			To be evaluated	To be evaluated	

Disclaimer: Eluate concentrations below the detection limit are assumed to be negligible when calculating mg/kg values. The limits quoted for Waste Acceptance are derived from the Landfill (England and Wales) Regulations 2002 (as amended) and are provided as guidance only. STS does not take responsibility for any errors or omissions with regard to these limits.

Additional Eluate Analysis	Concentration in Eluate	Amount Leached
	10:1	10:1
	mg/l	mg/Kg

Additional Waste Analysis	Units	Result
Conductivity @ 20 C	uS/cm	3000
Benzene	mg/kg	<0.10
Toluene	mg/kg	<0.10
Ethylbenzene	mg/kg	<0.10
m&p-Xylene	mg/kg	<0.20
o-Xylene	mg/kg	<0.10

Sample Comments	
12125271	Stainless steel sieve used.
12125271	Method 327 VOC HS Soils, low surrogate standard recovery due to the nature of
12125272	

Severn Trent Services Analytical Services is a trading name of Severn Trent Laboratories Limited.
This communication has been sent to you by Severn Trent Laboratories Limited, Registered in England and Wales, Registered No 2148934.
Registered Office: Severn Trent Centre, 2 St. John's Street, Coventry, CV1 2LZ.

Claremorris Unregulated Landfill Site Investigation

Waste Acceptance Criteria Testing BS EN 12457
Part 2, Single Stage Process
Issue 1



Sample Details		Test Values	
Sample Number	12125274	Mass of Raw Test Portion (MW) kg	0.101
Job Number	743509	Mass of Dried Test Portion (MD) kg	0.09
Sample ID	TP06 @ 4m	Moisture Content Ratio (MC) %	12.2
Site	Claremorris Landfill	Dry Matter Content Ratio (DR) %	89.13
Job Description	Waste Acceptance Criteria	Moisture Content @ 105c	11
Date Sampled	25/11/2010	Leachant Volume (L) Litre	0.889
Date Received	08/12/2010	Eluate Volume (VE) Litre	0.519
Particle Size (<4mm)	>95%		
Method of size reduction	Jaw Crusher		
Non-crushable matter	7.58g		

Eluate Analysis	Concentration in Eluate	Amount Leached	Landfill Waste Acceptance Criteria		
			Inert Waste	Stable Non- Reactive hazardous waste in non-hazardous	Hazardous Waste
Liquid:Waste Ratio	10:1	10:1	BS EN 12457-3 Limit Values (mg/Kg) at L:S 10:1		
Sample Number	12125275				
pH	7.83				
Temperature °C	21				
Conductivity uS/cm	2670				
	mg/l	mg/Kg			
Arsenic as As	<0.0050	<0.050	0.5	2	25
Barium as Ba	0.02	0.2	20	100	300
Cadmium as Cd	<0.00010	<0.0010	0.04	1	5
Chromium as Cr	<0.0025	<0.025	0.5	10	70
Copper as Cu	0.035	0.35	2	50	100
Mercury as Hg	<0.00050	<0.0050	0.01	0.2	2
Molybdenum as Mo	0.065	0.65	0.5	10	30
Nickel as Ni	0.022	0.22	0.5	10	40
Lead as Pb	<0.010	<0.10	0.5	10	50
Antimony as Sb	0.008	0.08	0.06	0.7	5
Selenium as Se	<0.010	<0.10	0.1	0.5	7
Zinc as Zn	0.076	0.76	4	50	200
Chloride as Cl	357	3600	800	15000	25000
Fluoride as F	<0.2	<2.0	10	150	500
Sulphate as SO4	475	4800	1000	20000	50000
Total Dissolved Solids (TDS)	1550	16000	4000	60000	100000
Phenol Index	<0.15	<1.5	1		
Dissolved Organic Carbon (DOC)	113	1100	500	800	1000
Waste Analysis					
Total Organic Carbon w/w %		19	3%	5%	6%
Loss on Ignition %		37			10%
BTEX mg/Kg			6		
PCBs (7 congeners) mg/Kg		<0.010	1		
Mineral Oil (C10-C40) mg/Kg		310	500		
PAHs mg/Kg		4.3	100		
pH		8		>6	
Acid Neutralisation Capacity (pH4) mol/Kg		0.069		To be evaluated	To be evaluated
Acid Neutralisation Capacity (pH7) mol/Kg		0.013		To be evaluated	To be evaluated

Disclaimer: Eluate concentrations below the detection limit are assumed to be negligible when calculating mg/kg values. The limits quoted for Waste Acceptance are derived from the Landfill (England and Wales) Regulations 2002 (as amended) and are provided as guidance only. STS does not take responsibility for any errors or omissions with regard to these limits.

Additional Eluate Analysis	Concentration in Eluate	Amount Leached
	10:1	10:1
	mg/l	mg/Kg

Additional Waste Analysis	Units	Result
Conductivity @ 20 C	uS/cm	<100
Benzene	mg/kg	<0.10
Toluene	mg/kg	<0.10
Ethylbenzene	mg/kg	<0.10
m&p-Xylene	mg/kg	<0.20
o-Xylene	mg/kg	<0.10

Sample Comments	
12125274	Stainless steel sieve used.
12125274	Method 327 VOC HS Soils, low surrogate standard recovery due to the nature of
12125275	

Severn Trent Services Analytical Services is a trading name of Severn Trent Laboratories Limited.
This communication has been sent to you by Severn Trent Laboratories Limited, Registered in England and Wales, Registered No.2148934.
Registered Office: Severn Trent Centre, 2 St. John's Street, Coventry, CV1 2LZ.



Complete Laboratory Solutions
 Ros Muc, Co. Galway.
 [Tel] 091 574355
 [Fax] 091 574356
 [Email] services@cls.ie
 [web] www.completelabsolutions.com

Client	: Ann Marie Ryan	Report No.	: 126112
	: JS Drilling Ltd	Date of Receipt	: 03/12/2010
	: Thomastown	Start Date of Analysis	: 03/12/2010
	: Co Kilkenny	Date of Report	: 14/12/2010
		Order Number	:
		Sample taken by	: Client

CERTIFICATE OF ANALYSIS

Results				
Lab No	Sample Description	Test	Result	Units
290383	Leachate 2/12/10	BOD (sw)	2972	mg/l
		COD	6160	mg/l



Approved by:

Barbara Lee

Barbara Lee
 Environmental Scientist

See reverse for Test Specifications
 This report only relates to items tested and shall not be reproduced but in full with the permission of Complete Laboratory Solutions

For inspection purposes only.
 Consent of copyright owner required for any other use.



Complete Laboratory Solutions
 Ros Muc, Co. Galway.
 [Tel] 091 574355
 [Fax] 091 574356
 [Email] services@cls.ie
 [web] www.completelabsolutions.com

Client	: Ann Marie Ryan JS Drilling Ltd Thomastown Co Kilkenny	Report No.	: 126111
		Date of Receipt	: 03/12/2010
		Start Date of Analysis	: 03/12/2010
		Date of Report	: 21/12/2010
		Order Number	:
		Sample taken by	: Client

CERTIFICATE OF ANALYSIS

Results				
Lab No	Sample Description	Test	Result	Units
290380	GW 1. 2/12/10	BOD (sw)	28	mg/l
		COD	482	mg/l
		Faecal Coliforms (Filtration)	< 1	cfu/100ml
		Total Coliforms (Filtration)	6,800	cfu/100ml



Approved by:

Barbara Lee

Barbara Lee
 Environmental Scientist

See reverse for Test Specifications
 This report only relates to items tested and shall not be reproduced but in full with the permission of Complete Laboratory Solutions.

For inspection purposes only.
 Consent of copyright owner required for any other use.



TESTCONSULT IRELAND LTD
 Materials Laboratory, Clonminam Ind. Est., Portlaoise
 Tel (057) 8664885 Fax (057) 8664380



LABORATORY TEST REPORT

Determination of Particle Size Distribution - BS 1377 : Part 2 : 1990

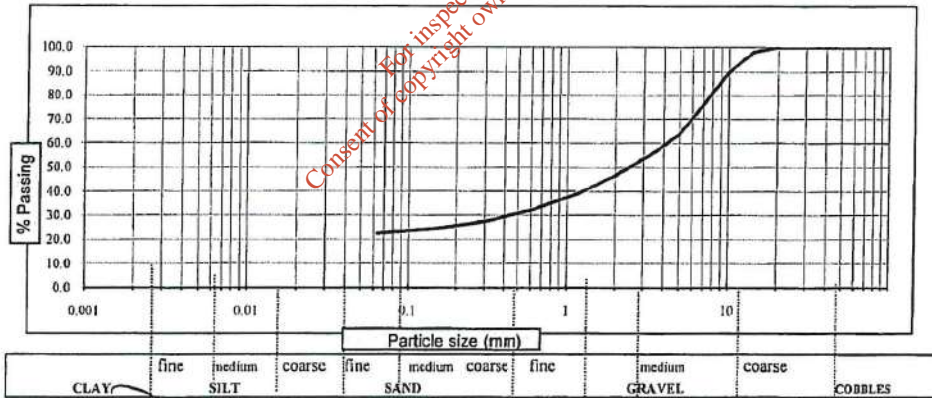
Project:	JS Drilling	Job No:	PL 720
Client:	JS Drilling Thomastown Co. Kilkenny	Lab Ref No.:	ST 50724
		Date Received:	10/12/2010
		Date Reported:	20/12/2010
Order No:	N/A	Material:	Orange/brown SAND, fine rock deposits
Originator:	Jim Stephenson	Visual Description	
		Specification	NRA

Client Ref. Peat
 Location: Client Info.
 Supplier: Client Info.
 Source: Client Info.
 Depth (m): N/A
 Sampling Reason: Routine
 Sampled By: Client
 Specification: NRA
 Preparation Method: Organics Present

BS Sieve Size	% Passing	Specification
125 mm	100.0	
100 mm	100.0	
75 mm	100.0	
63 mm	100.0	
50 mm	100.0	
37.5 mm	100.0	
28 mm	100.0	
20 mm	100.0	
14 mm	97.9	
10 mm	89.6	
6.3 mm	73.0	
5 mm	61.9	
3.35 mm	55.4	
2 mm	46.4	
1.18 mm	39.1	
0.85 mm	32.2	
0.63 mm	26.7	
0.425 mm	27.2	
0.25 mm	24.4	
0.063 mm	22.4	

Additional Test Results

Moisture Content (%) 421.8



Tested in accordance with BS 1377: Part 2 : 1990 Clause 9.2 and 9.5
 Sedimentation by Hydrometer, clause 9.5 - outside scope of UKAS

Approved Signature
 TESTCONSULT IRELAND LIMITED

- Mark Dawkins, Managing Director; Michael Robinson, Director & Lab. Manager
- James Ward, Senior Technician

APPENDIX 2

Logs and photographs

*For inspection purposes only.
Consent of copyright owner required for any other use.*

Claremorris Unregulated Landfill Site Investigation



TP01



Claremorris Unregulated Landfill Site Investigation



MOBILE: 0877433451
 FAX: 056793887
 E-MAIL: jim@jsdrilling.eu
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE 6431197 F

Geological & Environmental Drilling Contractors

JS DRILLING LTD
 20 THE BELFRY
 CHAPEL LANE
 THOMASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record

Location: Claremorris	Site: Claremorris Landfill
Client: Mayo Co Co	Borehole No: TP 02
Date: 25-11-10	Sheet: 1 of 1
Ground Level: 66 m (Ordnance datum)	Engineer: AMR
GPS: 35081 74596	
Rig Type: Tracked excavator	

Depth to base of strata	DESCRIPTION OF STRATA						
	soft firm	loose med.d. dense	colour	clayey silty sandy	fine med. coarse	soil name	with gravel, cobbles, sand bands, etc
0.0	Start of days boring						
0.4	Soft black – brown peat FILL with some plastic and waste content						
6.5	Waste- moderately well rotted, appears to be mainly domestic some construction demolition (concrete insulation) strong pungent odour						
End of Hole @ 6.5m limit of excavator reach							
End of days boring							
							Time

No	Type	Depth (m)		U100 Blows	S.P.T / C.P.T (mm)						Remarks
		From	To		0 to 75	75 to 150	150 to 225	225 to 300	300 to 375	375 to 450	
TP02	D	4	4.5								

For inspection purposes only.
 Consent of copyright owner required for any other use.

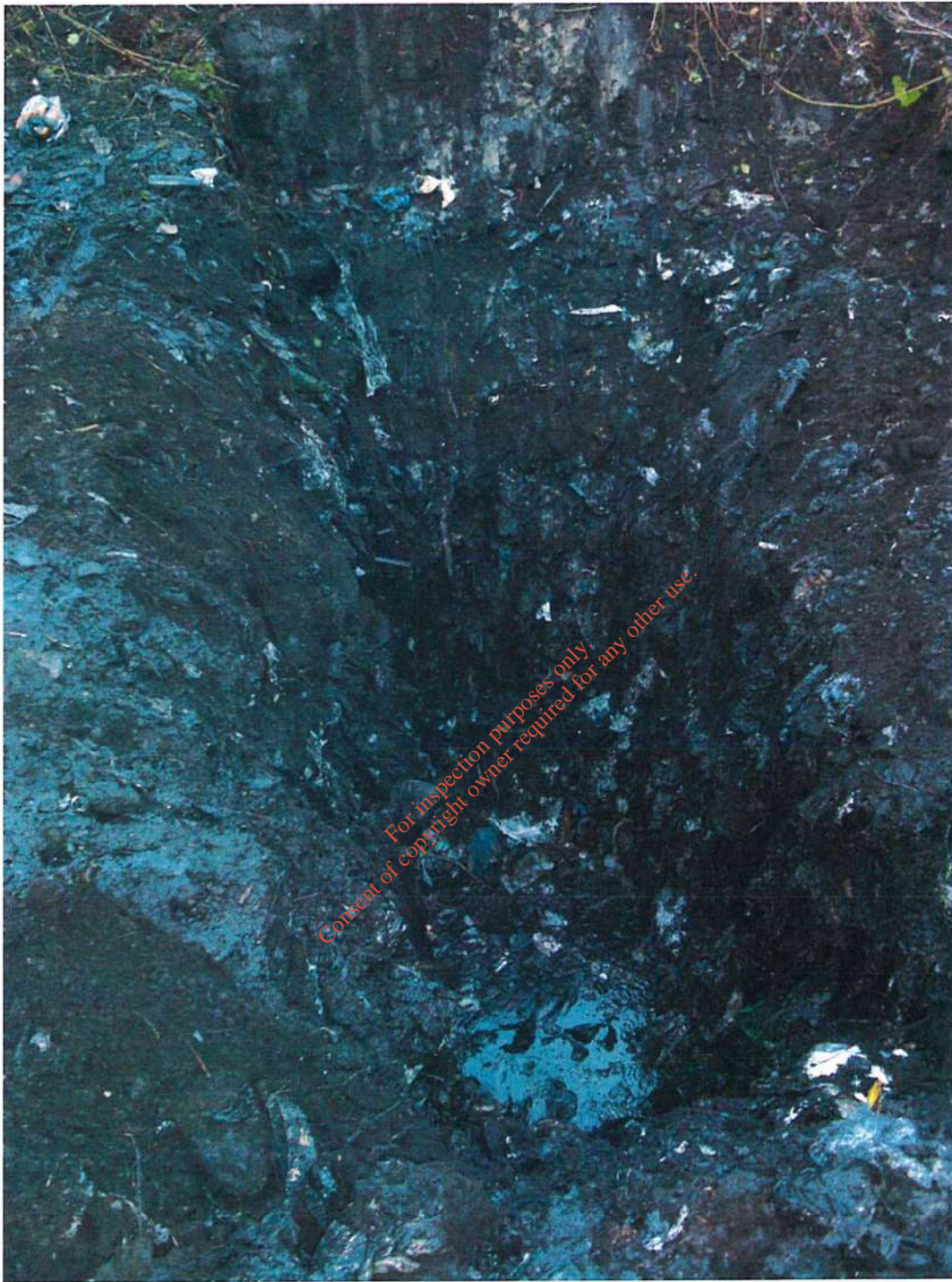
U - Undisturbed D - Disturbed B - Bulk W - Water S - S.P.T. C - C.P.T.

Water Strike (m)	Duration				24hr after pulling casing
	mins	mins	mins	mins	
Depth to water					
Depth cased					
Depth of hole					
Comments					
Leachate in Trial pit standing at approx 6m below ground level, ingress at multiple depths in the waste.					

CASING			
Size (mm)	From (m)	To (m)	
GAS MONITORING			
CH4(%)	CO2(%)	O2 (%)	Atm pressure (MB)
0.1	0.1	20.9	0955

Client.....

Driller.....



TP02



TP03

Claremorris Unregulated Landfill Site Investigation



TP04



TP05



TP06



TP07

For inspection purposes only.
Consent of copyright owner required for any other use.

Claremorris Unregulated Landfill Site Investigation



MOBILE: 0877433451
 FAX: 0567793887
 E-MAIL: jim@jsdrilling.eu
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE6431197 F

JS DRILLING LTD
 20 THE BELFRY
 CHAPEL LANE
 THOMASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record	
Location: Claremorris	Site: Claremorris Landfill
Client: Mayo Co Co	Slit trench No: ST 01
Date: 26-11-10	Sheet: 1 of 1
Ground Level: 64 m (Ordnance datum)	Engineer: AMR
GPS: 135057 274582	
Rig Type: Tracked excavator	

Comments
4m slit trench, edge of waste running into natural peat ground

GAS MONITORING			
CH4(%)	CO2(%)	O2 (%)	Atm pressure (MB)
0.1	0.1	21.0	0954



Client.....

Driller.....

Claremorris Unregulated Landfill Site Investigation



MOBILE: 0877433451
 FAX: 0567793887
 E-MAIL: jim@jsdrilling.eu
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE6431197 F

J S DRILLING LTD
 20 THE BELFRY
 CHAPEL LANE
 THOIRASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record

Location: Claremorris	Site: Claremorris Landfill
Client: Mayo Co Co	Slit trench No: ST 02
Date: 26-11-10	Sheet: 1 of 1
Ground Level: 64 m (Ordnance datum)	Engineer: AMR
GPS: 135080 274545	
Rig Type: Tracked excavator	

Comments
6m slit trench, edge of waste running into natural peat ground

GAS MONITORING			
CH4(%)	CO2(%)	O2 (%)	Atm pressure (MB)
0.1	0.2	21.0	0954



Client.....

Driller.....

Claremorris Unregulated Landfill Site Investigation



MOBILE: 0877433451
 FAX: 0567793887
 E-MAIL: jm@jsdrilling.ie
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE 6431197 F

JS DRILLING LTD
 20 THE BELFRY
 CHAPEL LANE
 THOMASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record

Location: Claremorris	Site: Claremorris Landfill
Client: Mayo Co Co	Slit trench No: ST 03
Date: 26-11-10	Sheet: 1 of 1
Ground Level: 65 m (Ordnance datum)	Engineer: AMR
GPS: 135115 274533	
Rig Type: Tracked excavator	

Comments
5m slit trench, waste 3m deep no edge found

GAS MONITORING			Atm pressure (MB)
CH4(%)	CO2(%)	O2 (%)	
0.1	0.1	21.0	0956



Client.....

Driller.....

Claremorris Unregulated Landfill Site Investigation



MOBILE: 0877433451
 FAX: 0567793887
 E-MAIL: jim@jsdrilling.eu
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE 6431197 F

JS DRILLING LTD
 26 THE BELFRY
 CHAPEL LANE
 THOMASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record	
Location: Claremorris	Site: Claremorris Landfill
Client: Mayo Co Co	Slit trench No: ST 05
Date: 26-11-10	Sheet: 1 of 1
Ground Level: 64 m (Ordnance datum)	Engineer: AMR
GPS: 135237 274538	
Rig Type: Tracked excavator	

Comments
6m slit trench, edge of waste into natural peat very soft saturated ground

GAS MONITORING			
CH4(%)	CO2(%)	O2 (%)	Atm pressure (MB)
0.1	0.1	21.0	0956



For inspection purposes only.
 Consent of EPA required for any other use.

Client.....

Driller.....

Claremorris Unregulated Landfill Site Investigation



MOBILE: 0677433451
 FAX: 0567793887
 E-MAIL: jm@jsdrilling.eu
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE6431197 F

JS DRILLING LTD
 20 THE BELFRY
 CHAPEL LANE
 THOMASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record			
Location: Claremorris		Site: Claremorris Landfill	
Client: Mayo Co Co		Slit trench No: ST 06	
Date: 26-11-10		Sheet: 1 of 1	
Ground Level: 66 m (Ordnance datum)		Engineer: AMR	
GPS: 135257 274573			
Rig Type: Tracked excavator			

Comments
5m slit trench, edge of waste into natural peat

GAS MONITORING			
CH4(%)	CO2(%)	O2 (%)	Atm pressure (MB)
0.1	0.2	21.0	0958



Client.....

Driller.....

Claremorris Unregulated Landfill Site Investigation



MOBILE: 0877433451
 FAX: 0567793887
 E-MAIL: jim@jsdrilling.eu
 WEBSITE: www.jsdrilling.eu
 VAT. NO: IE 6431197 F

JS DRILLING LTD
 20 THE BELFRY
 CHAPEL LANE
 THOMASTOWN
 CO. KILKENNY

Soft Ground Boring: Daily Record

Location: Claremorris	Site: Claremorris Landfill
Client: Mayo Co Co	Silt trenchNo: ST 07
Date: 26-11-10	Sheet: 1 of 1
Ground Level 65 m (Ordnance datum)	Engineer: AMR
GPS: 135031 274643	
Rig Type: Tracked excavator	

Comments
5m slit trench, no lateral edge of waste but vertical depth shallow 0.3-0.4m suggesting close to edge

GAS MONITORING			
CH4(%)	CO2(%)	O2 (%)	Atm pressure (MB)
0.1	0.1	21.0	0958



Client.....

Driller.....