

**Former Gasworks  
Dock Road, Limerick**

**Site Characterisation Factual Report**

November 2011

Report No. 1021927/R/02

*Prepared by*

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For Bord Gais Eireann

## Document Control Sheet

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### Record of Issue

Version	Status	Author	Check	Authorised
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### Distribution

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Mouchel has used reasonable skill, care and diligence in the design and interpretation of the ground investigation, however, the inherent variability of ground conditions allows only definition of the actual conditions at the location and depths of exploratory holes and samples/tests therefrom, while at intermediate locations conditions can only be inferred.

New information, changed practices or new legislation may necessitate revised interpretation of the report after the date of its submission.

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# 1 Introduction

## 1.1 Terms of Reference

Mouchel were appointed by Bord Gais Eireann, on 31st March 2009, to provide engineering consultancy services for the assessment and remediation of the former gasworks site, on Dock Road, Limerick, Ireland. Mouchel (formerly known as Parkman) have had an involvement with the site extending over a period of some nine years having previously undertaken ground investigations at the site.

This report supersedes the previous version B dated February 2010 and has been prepared following the drilling of an additional eleven sonic boreholes in two areas of the site; the former AGI and the former horse pound which were inaccessible during the 2009 characterisation site works.

## 1.2 Objectives and Scope

The Limerick Gasworks site has been identified for remediation in preparation for potential development. It was considered that undertaking the characterisation of the Limerick former gasworks site prior to remediation would be beneficial to the overall remediation design and tendering process. The advantages for undertaking the works at an early stage in the site remediation design/tender process are detailed below;

- A comprehensive data set would be obtained providing significantly increased certainty in relation to depth to rock head and the physical and chemical nature of the material on site.
- The characterisation information would be used to update the quantitative risk assessment (QRA) for the site, and allow more accurate calculations of material volumes that require treatment/disposal to be made.
- The more accurate QRA and assessment of quantities/contamination distribution would assist in the production of a fully robust remediation strategy and facilitate agreement with the EPA.
- The increased accuracy of the QRA and certainty of material composition and volume across the site would result in a comprehensive set of tender documents for issue to contractors to allow for accurate estimating. This should result in minimal opportunity for significant claims by the contractor during the remediation in relation to changes in material composition and quantities.

- Site characterisation is usually the first exercise to be undertaken by the remediation contractor, the costs for undertaking this would be included within the tender price submitted by the contractor. If the characterisation has already been undertaken the contractor would be able to start main remediation works immediately and not have to wait for the investigation and testing works to be undertaken.
- Machine excavated trial holes to assess rates of groundwater inflow to indicate any constraints during remediation works.

This report provides the factual data from the site characterisation undertaken in November 2009 and October 2011.

The results from the characterisation are interpreted and discussed in the 2010 Quantitative Risk Assessment, Options Appraisal and Remedial Strategy Report (1021927/R/03) and the subsequent addendum report, reference 1021927/R/018 dated December 2011.

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## 2 Ground Investigation

### 2.1 Design Rationale

The Site Characterisation was undertaken to supplement the information gained from the previous investigations undertaken at the site, and was designed to test for a wider range of determinands and provide a more comprehensive dataset of physical and chemical characteristics of the site.

The investigation was designed to provide the data needed to:

- Produce a more accurate conceptual ground model, specifically delineation of the former quarry area and underground structures
- Identify significant pollutant linkages
- Update the quantitative risk assessments to assess risks to identified receptors
- Update remediation target values for soils and groundwater.
- Provide an improved data set for remedial options appraisal.
- Allow for the formulation of a robust remediation strategy.

Sonic drilling was proposed for the majority of the site works as this technique is fast and provides good core recovery which is useful to define strata changes and facilitate reliable sample collection. The sonic drills are able to progress through obstructions such as concrete slabs, which would normally halt other methods. Sonic drilling is also generally a cleaner and safer technique than cable percussion drilling.

Window sampling was proposed for areas that could not be accessed by the sonic rigs (inside buildings and some areas along the site boundary)

The proposed characterisation is detailed overleaf;

**Table 2.1: Proposed Site Characterisation Details**

Investigation method	Estimated depth and purpose	Estimated number of holes
100mm diameter Sonic Drill Hole	10m deep (2m into rock) to assess quarry depth and material	57
100mm diameter Sonic Drill Hole	4m deep (1-2m into rock) general site coverage depth to rock	86
Excavator (with breaker) capable of excavating to 5m depth	5m deep trench holes to assess material composition, groundwater and delineate quarry sides	3
50mm diameter Window sample hole (Small Rig including coring through surface concrete)	2-3m deep investigation within structures and areas of difficult access	6
50mm diameter Window sample hole (Hand Held, including coring through concrete floor)	2-3m deep investigation inside former Bord Gais office	3
	<b>Total</b>	155

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## 2.2 Fieldwork

Due to access issues at the former AGI area and the horse pound, the majority of the Characterisation works were undertaken between the 4<sup>th</sup> and 27<sup>th</sup> November 2009. The AGI and horse pound areas were investigated between 25<sup>th</sup> and 27<sup>th</sup> October 2011. Both phases were conducted by ISGL, who sub-contracted Boart Longyear to undertake the sonic drilling. Mouchel were responsible for monitoring the works.

The second phase of investigation was carried out in general accordance with the following standards (it should be noted that the first phase of investigation was carried out in general accordance with the now superseded versions):

- BS5930:1999 (as amended 2010) Code of practice for site investigations;
- BS10175:2011 Code of Practice for the Investigation of Potentially Contaminated Sites;
- Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination, 2001 (Environment Agency).

The details of the characterisation are presented below. The site was divided into 10m x 10m cells, grid referenced alpha-numerically with a borehole proposed for each cell.

The exploratory hole location plan is presented as Drawing 1021927/R02/OD/001B.

**Table 2.2: Summary of Site Activities**

Activity	Dates Undertaken	Exploratory Hole Reference	Maximum Depth
Sonic drilled boreholes	4 <sup>th</sup> November – 24 <sup>th</sup> November 2009	132 locations referenced by alpha-numeric grid cell reference (A1, A2...)	12m bgl
	25 <sup>th</sup> October – 27 <sup>th</sup> October 2011	11 locations referenced by alpha-numeric grid cell reference	5.5m bgl
Window sample holes	25 <sup>th</sup> November – 27 <sup>th</sup> November 2009	13 locations (C12AWS, C12BWS, D12WS, E12WS, F9WS, F10WS, F12WS, L11WS, L12WS, L1WS, M1WS, N1WS, N2WS)	4.0m bgl
Trial pits	9 <sup>th</sup> November – 10 <sup>th</sup> November 2009	3 locations (TP1, TP2, TP3)	5.0m bgl
Soak away pits	9 <sup>th</sup> November 2009	1 location (“soakaway”)	2.1m bgl

During the first phase of characterisation in 2009, an active gas main was located along the north west section of the site (along row A). In all positions which were expected to be in the vicinity of the gas main a hand dug pit was progressed to at least 1.2m bgl before drilling. It is understood from Bord Gais that this main has now been disconnected and there is no live pipe-work associated with the new AGI infrastructure (located adjacent to the boundary wall in cell A9/A8) present on site.

### 2.2.1 Sonic drilled boreholes

143 sonic boreholes were drilled to determine the depth to rock head, and to take chemical samples for analysis, drill holes were terminated within the bedrock. Due to the possibility of limestone boulders within the made ground some holes were progressed for up to 2m into bedrock to provide confidence that the bedrock had been encountered. Total depths drilled varied between 2m bgl to 12m bgl.

24 locations were installed with groundwater monitoring wells, 10 had response zones positioned in the made ground, 14 installations had response zones positioned in the limestone bedrock. The table below shows the installation details at each location.

**Table 2.3: Installation Details**

Location	Response zone depth (m bgl)	Response zone strata
A1	3.0 – 4.0	rock
A3	3.0 - 4.5	rock
A4	2.5 - 4.5	rock
A9	1.0 – 2.5	made ground
A11	1.9 - 2.9	rock
B8	1.0 - 4.5	made ground
C2	1.0 – 2.5	made ground
C7	6.0 - 7.5	rock
C11	1.0 - 2.5	natural / possible made ground
D1	6.0 - 7.5	rock
D5	1.0 - 3.0	made ground
E8	1.0 - 6.0	made ground
F11	3.5 - 5.0	rock
G2	10.0 - 11.5	rock
G3	1.0 - 9.0	made ground
G4	10.0 - 12.0	rock
G5	1.0 - 9.0	made ground
G8	1.0 - 2.5	rock
H12	3.0 - 4.5	rock
J10	1.0 - 3.0	rock
K1	1.0 - 4.5	made ground
K5	1.0 - 6.0	made ground
L7	2.0 - 3.5	rock
M3	5.0 - 6.5	rock

### 2.2.2 Window sample holes

Window samples were located in 13 cells which could not be accessed by the sonic rig. The table below outlines the location of the window sample holes and an explanation of why it was not appropriate to use sonic drilling in these areas. Areas where the window sample was used were the Bord Gais offices, No. 5 Stores, Booster house along the south east boundary.

**Table 2.4: Window Sample Hole Rationale**

Location	Cell numbers	BH numbers	Rationale
Bord Gais Offices	C12 D12 E12 F12	C12AWS, C12BWS D12WS E12WS F12WS	Proposed locations were within the existing office building. Hand held window sampling and hand pits were used to gain information in this area
No. 5 Stores	L01 M01 N01 N02	L1WS M1WS N1WS N2WS	One sonic drilled BH was able to be progressed within the main building. However only a window sample rig could access the other proposed locations
Booster house	F9 F10	F9WS F10WS	The sonic was too large to access the proposed locations. A window sample rig was used to obtain information from within the booster house and just outside it.
South east boundary	L11 L12	L11WS L12WS	The sonic rig was too large to fit into this area. A window sample rig was used to collect samples and locate rock head in these areas.

### 2.2.3 Trial pits / soak away pits

Three trial pits were excavated within the former quarry area.

- TP1 – Cells H05/H06
- TP2 – Cells F03/F04
- TP3 – Cells G01/H01

Trial pits were positioned to help delineate the edge of the former quarry area and give an idea of digging conditions that may be encountered during the potential remediation works. No samples were obtained from the trial pits.

One additional soak away pit was excavated within the quarry area.

- Soakaway – Cells J04/J05

This was positioned to give an idea of the drainage rate in the quarry. One sample was obtained from the soak away pit.

Engineers logs (produced by IGSL) logging the strata encountered are presented in Appendix A. Photographs (taken by IGSL) of the recovered cores are presented as Appendix B.

## 2.3 Chemical Laboratory Testing

Soil samples were collected by IGSL, from sonic drill holes and window sample holes at nominal 1m intervals and strata changes. One sample was recovered from the soak away pit, no samples were obtained from the trial pits. In total 611 soil samples (first phase 582 and second phase 29) were recovered. 358 samples were submitted for chemical analysis (first phase 333 and second phase 25).

Groundwater samples have been obtained at quarterly intervals since the 2009 site works were completed and are reported separately. Only samples of the groundwater are recovered (no DNAPL is included within the samples) as this provides a worst case estimate of the concentration of the more mobile contaminants.

All Samples were stored in airtight containers suitable for the analysis to be undertaken. Containers were appropriately labelled, and transported in cool boxes with ice packs under completed chain of custody documentation to ALcontrol laboratories, who are appropriately accredited for the works required and are an approved supplier under the Mouchel Quality Management System.

### 2.3.1 Soils

A single testing suite (Limerick Suite) was developed to include a wide range of determinands which could be used for most samples to characterise conditions at the site.

Additional samples were also tested (based upon visual and olfactory evidence and historical data) for an asbestos screen, polychlorinated biphenyls (PCBs) and volatile organic compounds (VOCs).



**Table 2.5: Summary of Soils Analysis**

Suite Reference	Analysis Suite	No. samples scheduled
Limerick Suite	Arsenic, cadmium, chromium, copper, lead, mercury, selenium, zinc, cyanide, sulphate, sulphide, ammoniacal nitrogen, speciated phenols, Total Petroleum Hydrocarbons criteria working group split (TPH CWG) (including BTEX and MTBE), Polyaromatic Hydrocarbons (PAHs)	354
Asbestos	Asbestos screen	35
PCBs	US EPA 7 Speciated congeners	79
VOCs	VOCs	175

The testing suite was chosen based upon Mouchel's previous experience from working on former gasworks sites and using guidance provided in DOE industry profile for Gas works, coke works and other coal carbonisation plants.

As well as providing a good site coverage samples suspected of containing asbestos or containing high proportions of demolition rubble were submitted for asbestos screening. Locations positioned near former electrical substations were submitted from PCB analysis. Samples with distinctive odours were submitted for VOC analysis

Soil chemical results are presented in Appendix C and are interpreted in the Mouchel QRA Report (1021927/R/03) and the subsequent addendum report (1021927/R/18) dated December 2011.

For some samples from 2009, ALcontrol were reporting sulphate concentrations in excess of 100%. They conducted an investigation but could not establish the cause of this anomaly. Therefore the sulphate results for the 2009 investigation should be used with extreme caution. A letter detailing the issues regarding the sulphate analysis is included within Appendix C.

### 2.3.2 Groundwater

Groundwater monitoring has been undertaken on a nominal quarterly basis since the 2009 characterisation site works were completed. All 21 installations, installed during the 2009 site investigation have been dipped with an ATEX Dual phase dipmeter to establish the water depth and presence of Non Aqueous Phase Layers (NAPLs). More recent visits only dipped 19 installations as two have been lost (A4 and B8).

Samples are also retrieved from the monitoring wells and submitted to Alcontrol for chemical analysis. The table below summarises the suites of determinands scheduled. All samples are analysed for a limerick suite. VOC analysis is conducted on selected samples to give a spatial coverage of the site and down and up gradient of the suspected groundwater flow direction.

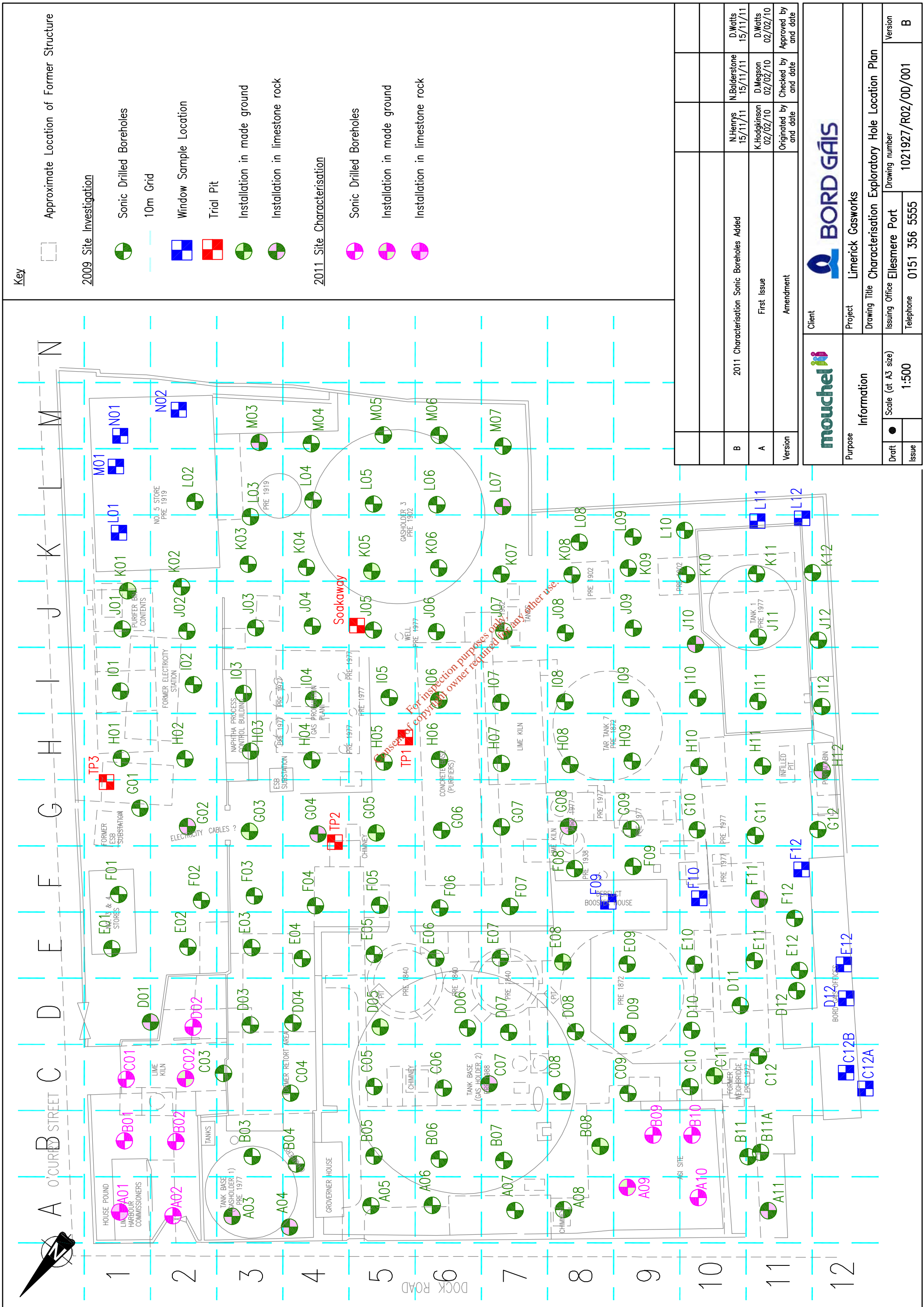
**Table 2.6: Summary of Groundwater Analysis**

Suite Reference	Analysis Suite
Limerick Suite	Arsenic, cadmium, chromium, copper, lead, mercury, selenium, zinc, cyanide, sulphate, sulphide, ammoniacal nitrogen, speciated phenols, Total Petroleum Hydrocarbons criteria working group split (TPH CWG) (including BTEX and MTBE), Polyaromatic Hydrocarbons (PAHs)
VOCs	VOCs

The three monitoring wells installed during 2011 are programmed to be monitored and sampled at the next quarterly visit in January 2012.

The results of the first two monitoring visits (10<sup>th</sup>-11<sup>th</sup> December 2009 and 14<sup>th</sup> – 15<sup>th</sup> January 2010) are interpreted in the 2010 Mouchel QRA Report 1021927/R/03. The subsequent monitoring visits are interpreted in the Mouchel Quarterly Groundwater Monitoring Reports submitted to Bord Gais. Annual Summary Reports are submitted to Bord Gais at the end of the year.

Chemical tests results for the groundwater monitoring are presented in the relevant quarterly monitoring reports.







# TRIAL PIT RECORD

**REPORT NUMBER**

**14463**

<b>CONTRACT</b> Limerick Gasworks		<b>TRIAL PIT NO.</b> <b>TP2</b>
<b>LOGGED BY</b> S. Letch		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> ( <sub>U</sub> ) 156,963.39 E 156,564.36 N		<b>DATE STARTED</b> 10/11/2009
<b>GROUND LEVEL</b> (m) 6.92		<b>DATE COMPLETED</b> 10/11/2009
<b>CLIENT ENGINEER</b> Bord Gais Mouchel	<b>EXCAVATION METHOD</b> 14T Track	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND: Concrete.		0.17	6.75	 (Rapid)					
	MADE GROUND: Brown sandy clay with some red brick and occasional concrete.		0.50	6.42						
	MADE GROUND: Light brown sand.		0.80	6.12						
1.0	MADE GROUND: Dark brown slightly sandy clay with some red brick.		1.80	5.12						
2.0	MADE GROUND: Angular cobbles and boulders.		1.90	5.02						
	End of Trial Pit at 1.90m									

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**Groundwater Conditions**  
Strong odour of hydrocarbons. Strike at 1.8m rising 250mm in 2 minutes.

**Stability**  
Major pit wall collapse at 1.90m

**General Remarks**  
Location: Between H5 & H6.

IGSL TP LOG 14463.GPJ IGSL\_GDT 15/12/09



# TRIAL PIT RECORD

**REPORT NUMBER**

**14463**

<b>CONTRACT</b> Limerick Gasworks		<b>TRIAL PIT NO.</b> <b>TP3</b>	
<b>LOGGED BY</b> S. Letch		<b>SHEET</b> Sheet 1 of 2	
<b>CLIENT ENGINEER</b> Bord Gais Mouchel		<b>DATE STARTED</b> 10/11/2009	
<b>CO-ORDINATES( )</b> 156,995.88 E 156,579.10 N		<b>DATE COMPLETED</b> 10/11/2009	
<b>GROUND LEVEL (m)</b> 7.65		<b>EXCAVATION METHOD</b> 14T Track	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
0.0	MADE GROUND: Dark brown clayey sand with much red brick, ceramics and concrete.									
1.0	MADE GROUND: Brown sandy clay with much red brick and concrete.		1.00	6.65	↓ (Seepage)					
2.0	MADE GROUND: Grey slightly sandy gravelly clay with some sub-angular large cobbles and occasional red brick and steel.		1.80	5.85	↓ (Moderate)					
3.0										
4.0										

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**Groundwater Conditions**  
Water Table at 5.00m

**Stability**  
Minor pit wall collapse on completion of pit

**General Remarks**  
Location: Beside H1.

IGSL TP LOG 14463.GPJ IGSL\_GDT 15/12/09



# TRIAL PIT RECORD

REPORT NUMBER

14463

**CONTRACT** Limerick Gasworks

**TRIAL PIT NO.** TP3

**SHEET** Sheet 2 of 2

**LOGGED BY** S. Letch

**CO-ORDINATES( )** 156,995.88 E  
156,579.10 N

**DATE STARTED** 10/11/2009

**DATE COMPLETED** 10/11/2009

**CLIENT ENGINEER** Bord Gais  
Mouchel

**GROUND LEVEL (m)** 7.65

**EXCAVATION METHOD** 14T Track

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Samples			Vane Test (KPa)	Hand Penetrometer (KPa)
						Sample Ref	Type	Depth		
5.0			5.00	2.65						
6.0										
7.0										
8.0										
9.0										

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**Groundwater Conditions**

**Stability**

Minor pit wall collapse on completion of pit

**General Remarks**

Location: Beside H1.

IGSL TP LOG 14463.GPJ IGSL\_GDT 15/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>C12A WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,877.71 E 156,546.58 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 27/11/2009
<b>GROUND LEVEL (mOD)</b> 5.40	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 27/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE		0.15	5.25					
	MADE GROUND: Dense dark grey, clayey gravel (hardcore). NEC		0.35	5.05					
	MADE GROUND: red brick, concrete and white clay (probable ash). Possible asbestos.		0.50	4.90				0.35-0.50	ENV 001
	MADE GROUND: Slate floor. NEC.		0.55	4.85					
	Stiff brown slightly gravelly CLAY. NEC.					0.00-1.00	20		
1.0	Very stiff brown CLAY with limestone cobble. HC odour and sheen on cobble.		1.20	4.20		1.00-1.30	20	1.25-1.30	ENV 002. Only 1 voc, 1 glass jar.
	Final Depth 1.30m		1.30	4.10					
2.0									
3.0									
4.0									
5.0									

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**General Remarks**  
Hand Pit to 1.20m.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09





# WINDOW SAMPLE RECORD

REPORT NUMBER

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> C12A WSHP
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,877.71 E 156,546.58 N	<b>RIG TYPE</b> Hand Dug	<b>DATE DRILLED</b> 25/11/2009
<b>GROUND LEVEL (mOD)</b> 5.40	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 25/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	Hand dug pit (see WS log)							0.35-0.50	ENV 001
1.0	Final Depth 1.20m		1.20	4.20					

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**General Remarks**  
Hand Pit to 1.20m, 1.00m x 1.50m. ENV samples also on WS logs. Unable to proceed past 1.2m due to limestone, Probable bedrock.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>C12B WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,881.50 E 156,542.58 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 27/11/2009
<b>GROUND LEVEL (mOD)</b> 5.39	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 27/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE with rebar		0.15	5.24					
	MADE GROUND: Dense grey, clayey gravel (possible hardcore). NEC		0.30	5.09					
	MADE GROUND: red brick, concrete and white clay (probable ash). Possible asbestos. Stiff brown CLAY. NEC.		0.50	4.89				0.50-0.50	ENV 001
1.0	Soft dark grey gravelly CLAY. Strong HC odour. Final Depth 1.25m		1.20	4.19		0.00-1.00	100		
			1.25	4.14		1.00-1.25	100	1.20-1.25	ENV 002. Only 1 voc, 1 glass jar.

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**General Remarks**  
Hand Pit to 1.20m.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09





# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>D12 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,888.57 E 156,533.84 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 27/11/2009
<b>GROUND LEVEL (mOD)</b> 4.83	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 27/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	102		0.15	4.68					
	MADE GROUND: Dense grey, clayey gravel (hardcore). NEC.		0.20	4.63				0.20-0.25	ENV 001
	MADE GROUND: Dense grey sandy CLAY with red brick and possible ash. Possible contamination.		0.25	4.58				0.30-0.70	ENV 002
	Stiff brown CLAY with many limestone cobbles. HC odour.							0.30-0.80	ENV 003. Only 1 voc, 1 glass jar.
	Soft brown sandy gravelly CLAY. HC odour.		0.85	3.98		0.00-0.95	25		
1.0	Soft light brown CLAY. NEC.		0.90	3.93		<del>0.95-1.00</del>	<del>100</del>	0.90-1.00	ENV 004. Only 1 voc, 1 glass jar.
	Final Depth 1.00m		1.00	3.83					

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**General Remarks**  
Hand Pit to 0.85m.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> D12 WSHP
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,888.57 E 156,533.84 N	<b>RIG TYPE</b> Hand Dug	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 4.83	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	Hand dug pit (see WS log)							0.20-0.25 0.30-0.70	ENV 001 ENV 002
1.0	Final Depth 0.85m		0.85	3.98	↓ (Slow)				
2.0									
3.0									
4.0									
5.0									

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**General Remarks**  
Hole ended due to boulders, possible variably weathered limestone bedrock. Hand Pit to 0.85m, 1.00m x 1.50m. ENV samples also on WS logs.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>E12 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,892.09 E 156,530.12 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 27/11/2009
<b>GROUND LEVEL (mOD)</b> 5.03	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 27/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE		0.15	4.88					ENV 001
	MADE GROUND: Dense grey, clayey gravel (hardcore). NEC.		0.20	4.83					
	Firm brown slightly gravelly CLAY. NEC.		0.50	4.53					
	Stiff black slightly gravelly CLAY with occasional cobbles. Strong HC odour.		0.95	4.08		0.40-0.95	100	0.50-0.70	
1.0	Final Depth 0.95m								
2.0									
3.0									
4.0									
5.0									

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**General Remarks**  
Hand Pit to 0.95m.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

REPORT NUMBER

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> E12 WSHP
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,892.09 E 156,530.12 N	<b>RIG TYPE</b> Hand Dug	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 5.03	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	Hand dug pit (see WS log)								
					 (Rapid)			0.50-0.70	ENV 001
1.0	Final Depth 0.95m		0.95	4.08					
2.0									
3.0									
4.0									
5.0									

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**General Remarks**  
Hole ended due to egress of water and odour in confined space. Hand Pit to 0.95m, 1.00m x 1.50m. ENV samples also on WS logs.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>F09 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,925.67 E 156,545.24 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 8.17	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	MADE GROUND: Stiff sandy clay with frequent red brick. NEC.					0.00-1.00	100	0.00-1.00	ENV 001
1.70			1.70	6.47					
1.80	CONCRETE		1.80	6.37		1.00-1.80	100		
2.00	Stiff black/grey very clayey SAND with occasional cobbles. High HC impact and odour. Final Depth 2.00m		2.00	6.17				1.80-2.00	ENV 002. Only 1 voc, 1 glass jar, 1 tub.

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09





# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>F10 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,915.33 E 156,536.14 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 7.27	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE		0.10	7.17				0.00-0.75	ENV 001
	MADE GROUND: Stiff black sandy gravelly clay with frequent red brick. NEC.								
	Slightly clayey COBBLES. HC.		0.75	6.52		0.00-1.00	100		
1.0	Very soft sandy CLAY and local cobble (2.00m). HC.		1.00	6.27				1.00-2.00	ENV 002. Only 1 voc, 1 glass jar, 1 tub.
2.0	Final Depth 1.00m		2.00	5.27		1.00-2.00	100		
3.0									
4.0									
5.0									

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>F12 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,906.10 E 156,523.02 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 27/11/2009
<b>GROUND LEVEL (mOD)</b> 5.97	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 27/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE		0.10	5.87					ENV 001
	MADE GROUND: Very stiff to hard, dark grey, very gravelly clay (possible hardcore). NEC		0.20	5.77					
	Stiff brown slightly gravelly CLAY. NEC.		0.50	5.47					
	Stiff dark brown gravelly CLAY with occasional cobbles. Black tar 0.5-1.2m in spots. HC odour. Water with black oily tar. WS ended at 1.1m, Hand pit to 1.20m.								
1.0	Final Depth 1.10m		1.20	4.77		0.00-1.00 1.00-1.10	100 0	0.50-1.00	
2.0									
3.0									
4.0									
5.0									

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**General Remarks**  
Hole ended at 1.10m due to refusal, no recovery 1.00-1.10m. Hand pit to 1.20m

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> F12 WSHP
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,906.10 E 156,523.02 N	<b>RIG TYPE</b> Hand Dug	<b>DATE DRILLED</b> 23/11/2009
<b>GROUND LEVEL (mOD)</b> 5.97	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 23/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	Soft brown very gravelly CLAY. HC sheen.								
1.0	Final Depth 1.20m		1.20	4.77				0.50-1.00	ENV 001
2.0									
3.0									
4.0									
5.0									

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**General Remarks**  
Hand Pit to 1.20m, 1.00m x 1.50m. ENV samples also on WS logs.

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> L01 WS	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,018.22 E 156,548.72 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 25/11/2009	<b>DATE LOGGED</b> 25/11/2009
<b>GROUND LEVEL (mOD)</b> 7.95	<b>HOLE DIAMETER (mm)</b>	<b>SAMPLED BY</b> IGSL	<b>LOGGED BY</b> G. Thornton
<b>CLIENT</b> Bord Gais			
<b>ENGINEER</b> Mouchel			

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE								
	MADE GROUND: Loose clayey gravel with occasional red brick (in 5cm bands brown, dark grey, light grey, brown). Possible ash. Possible contamination		0.20	7.75				0.20-1.00	ENV 001
1.0						0.00-1.00	50	1.00-1.90	ENV 002
2.0	MADE GROUND: Firm white clay (possible ash/asbestos) with some black ash and cinders at 2.0-2.2m. Possible contamination		1.90	6.05		1.00-2.00	70	2.00-2.80	ENV 003
3.0	MADE GROUND: Medium dense brown sandy gravel (possible clinker). Possible contamination.		2.80	5.15		2.00-3.00	100	2.80-3.00	ENV 004. Only 1 voc, 1 glass jar.
	MADE GROUND: Dense grey/dark grey clayey gravel (possible ash in gravel). Possible contamination.		3.00	4.95		3.00-3.40	100	3.00-3.40	
	Final Depth 3.40m		3.40	4.55					ENV 005. Only 1 voc, 1 glass jar.

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> L11 WS
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,944.52 E 156,486.41 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 6.99	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	TOPSOIL - soft black sandy gravelly clay. NEC.		0.10	6.89				0.10-0.40	ENV 001
	Stiff brown sandy gravelly CLAY. NEC.		0.40	6.59					
	Very stiff grey slightly sandy slightly gravelly CLAY. NEC.		0.60	6.39		0.00-0.60	100		
	Final Depth 0.60m								
1.0									
2.0									
3.0									
4.0									
5.0									

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>L12 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,939.56 E 156,481.83 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 7.50	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	Stiff brown sandy gravelly CLAY. NEC.							0.00-0.30	ENV 001
	Very stiff grey very gravelly CLAY. NEC.		0.30	7.20					
	Final Depth 0.60m		0.60	6.90		0.00-0.60	100		
1.0									
2.0									
3.0									
4.0									
5.0									

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>M01 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 157,024.90 E 156,541.25 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 8.07	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type	
0.0	CONCRETE		0.10	7.97						
	MADE GROUND: Concrete and loose sand and gravel (0.10m recovered). NEC.									
	MADE GROUND: Firm white/grey clay (possible ash/asbestos). Possible contamination.			0.50	7.57				0.50-1.00	ENV 001
1.0							0.00-1.00	50		
									1.50-2.00	ENV 002
2.0						1.00-2.00	70			
								2.50-3.00	ENV 003	
3.0						2.00-3.00	100			
								3.50-3.90	ENV 004	
4.0	Black COBBLE (NEC).		3.90	4.17						
	Final Depth 4.00m		4.00	4.07		3.00-4.00	100			

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> <b>N01 WS</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 157,027.33 E 156,537.24 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 7.97	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type
0.0	CONCRETE No recovery		0.10	7.87					
1.0	MADE GROUND: Grey/white/red very clayey sand with red brick (possible ash). Possible contamination.		0.70	7.27		0.00-1.00	40	0.70-1.00	ENV 001
2.0	MADE GROUND: Stiff red gravelly clay (possible cinders). Possible contamination.		1.80	6.17				1.80-2.00	ENV 002. Only 1 voc, 1 glass jar, 1 tub.
	MADE GROUND: Loose grey gravelly sand (0.1m recovery). NEC.		2.00	5.97					
3.0	MADE GROUND: Stiff white clay (possible ash). Possible contamination.		2.70	5.27		1.00-3.00	50	2.70-3.60	ENV 003. Only
			2.00-3.00			2.00-3.00	30		
4.0	Dense grey GRAVEL (possible upper limestone bedrock). NEC. Final Depth 3.70m		3.60 3.70	4.37 4.27		3.00-3.70	30		

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09





# WINDOW SAMPLE RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>PROBE NO.</b> N02 WS
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 157,022.95 E 156,528.61 N	<b>RIG TYPE</b> Dando Terrier	<b>DATE DRILLED</b> 26/11/2009
<b>GROUND LEVEL (mOD)</b> 7.95	<b>HOLE DIAMETER (mm)</b>	<b>DATE LOGGED</b> 26/11/2009
<b>CLIENT</b> Bord Gais		<b>SAMPLED BY</b> IGSL
<b>ENGINEER</b> Mouchel		<b>LOGGED BY</b> G. Thornton

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Water Strike	Depth of Sample Run (m)	Recovery (%)	Disturbed Sample Depth (m)	Sample Type	
0.0	CONCRETE		0.10	7.85					ENV 001. Only 1 voc, 1 glass jar, 1 tub. ENV 002. Only 1 voc, 1 glass jar.  ENV 003. Only 1 voc, 1 glass jar, 1 tub.	
	MADE GROUND: Firm sandy gravelly clay in three layers - dark grey and brown - NEC, white/slightly green, possible ash/cyanide/heavy metal. Sample 0.7-0.9m taken in white/green layer.						0.00-1.00	30		0.70-0.90
1.0	Cavity			1.10	6.85					1.00-2.00
	MADE GROUND: Stiff dark grey/light brown sandy gravelly clay. NEC.			1.40	6.55					
2.0	Loose very clayey gravelly SAND.			2.00	5.95		1.00-2.00	30		2.00-2.60
	Final Depth 2.60m		2.60	5.35		2.00-2.60	80			

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**General Remarks**

**Installations**

LIMERICK WS LOG 14463.GPJ IGSL\_GDT 23/12/09



# SONIC CORE RECORD

**REPORT NUMBER**

**16033**

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> <b>A1</b>	
<b>CO-ORDINATES</b> 156,953.31 E 156,628.24 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.27		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 26/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 26/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	TOPSOIL (grass)		0.05	5.22					
	MADE GROUND (red brick)		0.15	5.12					
	Loose light brown very clayey very gravelly SAND with red brick				0.30-1.00		ENV	0.30-1.00	
1.0	Soft mottled grey brown gravelly CLAY with occasional cobbles. (Hydrocarbon odour)		1.00	4.27			ENV	1.00-2.00	
2.0	No Recovery		2.00	3.27					
	LIMESTONE rock (20-100mm cores, brown staining at 2.8m, hydrocarbon odour upon opening bag)		2.20	3.07					
3.0	Dense gravelly COBBLES. Possible weathered rock (limestone). (hydrocarbon odour, brown staining on rock @3-4m, visible sheen @3.8m)		3.00	2.27					
4.0	LIMESTONE rock 30-200mm cores (some brown staining)		4.00	1.27					
5.0	Final Depth 5.00m		5.00	0.27					

**General Remarks**

**INSTALLATION DETAILS**

Date	Tip Depth	RZ Top	RZ Base	Type
26-10-11	1.00	4.00	5.00	50mm SP
26-10-11	3.00	0.00	3.00	50mm SP

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11

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# SONIC CORE RECORD

**REPORT NUMBER**

**16033**

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> <b>A2</b>	
<b>CO-ORDINATES</b> 156,946.69 E 156,623.59 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 2	
<b>GROUND LEVEL (mOD)</b> 5.17		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 26/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 26/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (concrete)		0.10	5.07			ENV	0.00-1.00	
	Loose brown slightly clayey GRAVEL and cobbles with red brick.				0.00-1.00				
1.0	Soft brown very sandy slightly gravelly CLAY with seashells. (hydrocarbon odour at 1.9m-2.0m)		1.00	4.17			ENV	1.00-2.00	
					1.00-2.00				
2.0	Soft brown gravelly CLAY		2.00	3.17			ENV	2.00-2.50	
					2.00-2.50				
	Dense angular GRAVEL AND COBBLES (possible highly weathered rock)		2.50	2.67					
	LIMESTONE rock (fractured cobbles diameter of core barrel 30-40mm thick)		2.80	2.37					
3.0									
	Stiff grey gravelly CLAY (hydrocarbon odour)		3.80	1.37			ENV	3.80-4.00	
	LIMESTONE rock (30-100mm cores)		4.00	1.17					
4.0									
5.0									
			5.44	-0.27	5.44-5.47		ENV	5.44-5.47	

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**General Remarks**  
 Drillers stopped to oil drilling head @2m. They used biodegradeable Enviro 46.

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# SONIC CORE RECORD

**REPORT NUMBER**

16033

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> <b>A2</b>	
<b>CO-ORDINATES</b> 156,946.69 E 156,623.59 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (mOD)</b> 5.17		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 26/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 26/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
	Stiff grey gravelly CLAY LIMESTONE rock (30mm core) Final Depth 5.50m		5.47 5.50	-0.30 -0.33					
6.0									
7.0									
8.0									
9.0									
10.0									

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**General Remarks**  
 Drillers stopped to oil drilling head @2m. They used biodegradeable Enviro 46.

**INSTALLATION DETAILS**

Date	Tip Depth	RZ Top	RZ Base	Type

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>A03</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,939.89 E 156,617.83 N		<b>RIG TYPE</b>	
<b>GROUND LEVEL (m AOD)</b> 4.16		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	CONCRETE		3.96	0.20						
	MADE GROUND: Sandy gravelly clay with stone blocks and red brick. NEC.				1	ENV	0.50-1.00			
					2	ENV	1.00-1.50			
	MADE GROUND: Medium dense, brown/red, silty gravelly sand with occasional cobbles & concrete. NEC.		2.96	1.20						
					3	ENV	1.80-2.40			
	MADE GROUND: Firm, red/brown/grey mottled, slightly sandy clay with occasional cobbles. NEC.		2.56	1.60						
					4	ENV	2.50-3.00			
	MADE GROUND: Loose, brown, clayey/silty, gravelly cobbles. NEC.		1.76	2.40						
			1.66	2.50						
	MADE GROUND: Loose, black, clayey silty sandy gravelly cobbles. HC		1.16	3.00						
	LIMESTONE. NEC.									
5	End of Borehole at 5.00 m		-0.84	5.00						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
24-11-09	5.00	3.50	5.00	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT 23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>A04</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,931.97 E 156,613.80 N		<b>RIG TYPE</b>	
<b>GROUND LEVEL (m AOD)</b> 4.13		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 4.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 4.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Brown sandy gravelly clay with much red brick, concrete and steel. NEC.  MADE GROUND: Soft grey/brown mottled sandy, slightly gravelly clay with occasional cobbles. Possible HC.  MADE GROUND: Soft light brown sandy, slightly gravelly clay with occasional cobbles. NEC. LIMESTONE. NEC. Possible clay band 4.00-4.10m		2.93	0.00-0.50	1	ENV	0.00-0.50			
0.30-0.80				2	ENV	0.30-0.80				
1.10-1.50				3	ENV	1.10-1.50				
1.50-2.00				4	ENV	1.50-2.00				
2			2.63							
			2.13	2.00						
4.50	End of Borehole at 4.50 m		-0.37	4.50						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
11-11-09	4.50	2.50	4.50	50mm SP					

<b>REMARKS</b> Hand dug pit 0.00-1.20m. Pit dry and stable.	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>A05</b>
<b>CO-ORDINATES</b> 156,924.45 E 156,603.52 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 6.47	<b>RIG TYPE</b>	<b>DATE DRILLED</b> 10/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 10/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 7.50	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 7.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff grey sandy gravelly clay with plastic, red brick and wood. NEC				1	ENV	0.00-0.50			
1	Medium dense light brown clayey sandy GRAVEL. NEC.		5.47	1.00						
	Medium dense light brown very clayey sandy GRAVEL. NEC.		5.27	1.20						
2	Stiff brown sandy gravelly CLAY with occasional cobbles. HC odour.		4.67	1.80	1	ENV	1.50-2.00			
					2	ENV	2.50-3.00			
3	Soft black/dark brown gravelly CLAY with occasional cobbles. HC oil in clay.		3.47	3.00	3	ENV	3.50-3.90			
4	LIMESTONE. NEC.		2.57	3.90						
	SAND. HC odour.		2.17	4.30	4	ENV	4.30-4.50			
	LIMESTONE. NEC, very local HC sheen at 5.50m.		1.97	4.50						
5										
6										
7										
	End of Borehole at 7.50 m		-1.03	7.50						
8										
9										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
<b>REMARKS</b> Hand dug pit 0.00-1.20m					<b>Sample Legend</b> 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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>A06</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,917.31 E 156,597.62 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 10/11/2009
<b>GROUND LEVEL (m AOD)</b> 5.02	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 10/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 6.00	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 6.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown sandy gravelly clay with red and yellow brick. NEC.		4.72	0.30	1	ENV	0.00-0.30			
	MADE GROUND: Soft brown clay with root hairs. NEC.		4.52	0.50	2	ENV	0.00-0.50			
1	Medium dense, light brown very clayey sandy GRAVEL. NEC.				3	ENV	1.50-2.00			
2	Soft grey/black sandy gravelly CLAY. Possible HC.		3.02	2.00	4	ENV	2.50-3.00			
3	Loose light brown, very clayey GRAVEL. NEC.		2.02	3.00	5	ENV	3.50-4.00			
	Stiff brown sandy, gravelly CLAY. NEC.		1.77	3.25						
	Soft black slightly gravelly CLAY. HC odour.		1.52	3.50						
4	LIMESTONE with band of very gravelly brown clay (5.80-6.00m) with phase HC. Slight HC sheen on rock.		1.02	4.00	6	ENV	5.80-6.00			
6	End of Borehole at 6.00 m		-0.98	6.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b> Hand dug pit 0.00-1.20m	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> A07 Sheet 1 of 1
<b>CO-ORDINATES</b> 156,907.13 E 156,590.33 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 11/11/2009
<b>GROUND LEVEL (m AOD)</b> 5.11	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 11/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 6.00	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 6.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose light brown, clayey sandy gravel. NEC.				1	ENV	0.00-0.50			
1	MADE GROUND: Stiff light brown sandy very gravelly clay. NEC.		3.91	1.20	2	ENV	0.50-1.00			
	MADE GROUND: Soft brown gravelly sand. Slight HC.		3.61	1.50	3	ENV	1.50-2.00			
2	Soft dark brown peaty sandy gravelly CLAY. Heavy HC.		3.11	2.00	4	ENV	2.50-3.00			
					5	ENV	3.50-4.00			
4	LIMESTONE with band of angular cobbles and grey clay 5.90-6.00m. Possible HC 5.90-6.00m - not enough material for sample.			4.00						
6	End of Borehole at 6.00 m		-0.89	6.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b> Hand dug pit 0.00-1.20m	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> A08 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,901.53 E 156,585.58 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.14		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Brown slightly clayey sandy gravel. NEC		4.94	0.20	2	ENV	0.00-0.50			
	MADE GROUND: Light brown sandy gravel with occasional wood and steel. NEC				1	ENV	0.20-0.50			
1	Soft brown to dark brown, sandy gravelly CLAY. NEC.		3.94	1.20						
	Stiff dark brown gravelly CLAY. Possible HC. Not enough for sample			3.69	1.45	3	ENV	1.50-2.00		
2	Loose, light brown very clayey GRAVEL. NEC.		3.64	1.50						
	Medium dense brown SAND. NEC.			3.44	1.70					
3	Firm grey, mottled black very gravelly CLAY. Possible HC in black mottling.		2.64	2.50	4	ENV	2.50-3.00			
	Hard grey gravelly CLAY with occasional cobbles. NEC. Possible pulverised limestone boulder.			2.14	3.00					
4	Firm dark grey gravelly CLAY. Strong HC.		1.84	3.30	5	ENV	3.50-4.00			
	LIMESTONE. NEC.			1.74	4.00					
6	End of Borehole at 6.00 m		-0.86	6.00						

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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
									No water strike

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

<b>REMARKS</b> Hand dug pit 0.00-1.20m. Pit dry and stable.	<b>Sample Legend</b> 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
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# SONIC CORE RECORD

**REPORT NUMBER**

**16033**

<b>CONTRACT</b> Limerick Gasworks		<b>DRILLHOLE NO</b> <b>A9</b>	
<b>CO-ORDINATES</b> 156,896.18 E 156,576.88 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.59		<b>DATE DRILLED</b> 25/10/2011	
		<b>DATE LOGGED</b> 25/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>	
		<b>SAMPLED BY</b> Roberts	
		<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (medium dense dark brown very clayey fine to coarse gravel)				0.00-0.70		ENV	0.00-0.70	
	MADE GROUND (medium Ddense light brown very clayey fine gravel)		0.70	4.89	0.70-0.95		ENV	0.70-0.95	
1.0	MADE GROUND (concrete)		0.95	4.64					
2.0									
	LIMESTONE rock (100mm cores with broken core @3.75-4m)		2.50	3.09					
3.0									
4.0	Final Depth 4.00m		4.00	1.59					
5.0									

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
25-10-11	1.00	0.00	1.00	50mm SP
25-10-11	1.50	2.50	4.00	50mm SP

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# SONIC CORE RECORD

**REPORT NUMBER**

16033

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> <b>A10</b>	
<b>CO-ORDINATES</b> 156,886.89 E 156,571.31 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.54		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 25/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 25/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (concrete)								
	Firm brown sandy CLAY		0.50	5.04	0.50-0.70		ENV	0.50-0.70	
	No Recovery		0.70	4.84					
1.0									
2.0									
	Stiff red brown CLAY		2.30	3.24	2.30-2.60		ENV	2.30-2.60	
	Weathered limestone rock, fractured into angular coarse GRAVEL and COBBLES by driller.		2.60	2.94					
3.0									
4.0	LIMESTONE rock		4.00	1.54					
5.0	Final Depth 5.00m		5.00	0.54					

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>A11</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,877.44 E 156,566.16 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 3.74		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.90	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.90	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> S. Letch	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Tarmacadam		3.54	0.20	1	ENV	0.20-0.50			
	MADE GROUND: brown slightly sandy gravelly clay with red brick, concrete, steel and boulders. NEC.									
1	Soft brown slightly gravelly CLAY. NEC.		2.54	1.20	2	ENV	1.50-1.70			
	Soft to firm grey/brown gravelly CLAY. HC.		2.24	1.50						
2	LIMESTONE. Possible slight HC, brown staining at 1.70m.		2.04	1.70						
3	End of Borehole at 2.90 m		0.74	3.00						

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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
					1.20	NR	NS	NR	NR	Seepage
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
23-11-09	2.90	1.90	2.90	50mm SP						
<b>REMARKS</b> Hand dug pit 0.00-1.20m. Walls stable. No recovery 1.75-2.90m - minor sheen on water coming up.					<b>Sample Legend</b> 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					

IGSL BH LOG 14463.GPJ IGSL\_GDT 23/12/09





# SONIC CORE RECORD

**REPORT NUMBER**

**16033**

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> <b>B2</b>	
<b>CO-ORDINATES</b> 156,953.44 E 156,614.62 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.33		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 27/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 27/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	TOPSOIL (grass)	XXXXXX	0.03	5.30					
	MADE GROUND (concrete)	XXXXXX	0.08	5.25			ENV	0.20-0.80	
	MADE GROUND (Very soft brown very gravelly CLAY with red brick)	XXXXXX			0.20-0.80				
1.0	MADE GROUND (Firm light brown slightly gravelly CLAY with occasional cobbles and small pieces of red brick. Cobbles 50mm.)(Slight Hydrocarbon odour)	XXXXXX	0.80	4.53	0.80-1.30		ENV	0.80-1.30	
	Very soft grey slightly sandy SILT with seashells. (Hydrocarbon odour gets stronger as you go deeper, very strong @2m)	XXXXXX	1.30	4.03	1.30-2.00		ENV	1.30-2.00	
2.0	No Recovery	XXXXXX	2.00	3.33					
3.0	LIMESTONE rock	XXXXXX	3.00	2.33					
4.0		XXXXXX							
	Final Depth 4.30m	XXXXXX	4.30	1.03					
5.0		XXXXXX							

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>B03</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,943.08 E 156,609.08 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 12/11/2009
<b>GROUND LEVEL (m AOD)</b> 4.62	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 13/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 4.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 4.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TOPSOIL. NEC. Firm brown slightly sandy, gravelly CLAY with occasional cobbles. NEC.		4.52	0.10	1	ENV	0.10-0.40			
1	Dense light brown clayey COBBLES. NEC.		3.12	1.50						
2	Soft dark grey gravelly CLAY. HC impact - oil in clay. LIMESTONE. NEC.		2.72 2.62	1.90 2.00	2	ENV	1.90-2.00			
4	End of Borehole at 4.50 m		0.12	4.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09





# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>B04</b>	
<b>CO-ORDINATES</b> 156,937.18 E 156,605.75 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 6.41		<b>DATE DRILLED</b> 23/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 24/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 6.00			
<b>CASING DEPTH (m)</b> 6.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm brown sandy gravelly clay. NEC.				1	ENV	0.00-0.50			
1	MADE GROUND: Dense black slightly clayey gravel. NEC.		5.66	0.75	2	ENV	1.00-1.50			
	MADE GROUND: Firm brown sandy slightly gravelly clay with red brick and white sandy zones (possible ash). Possible contamination.		5.36	1.05						
3	Stiff grey/black CLAY. HC impact in black with odour. Limestone. NEC.		3.61	2.80	3	ENV	2.80-3.00			
			3.41	3.00						
4	Soft grey CLAY (band in rock). NEC. Limestone. NEC.		2.01	4.40	4	ENV	4.40-4.45			
		1.91	4.50							
6	End of Borehole at 6.00 m		0.41	6.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> B05 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,928.84 E 156,597.40 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 4.48		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown sandy gravelly clay. NEC.	[Cross-hatch pattern]	4.28	0.20	1	ENV	0.20-0.70			
1	MADE GROUND: Loose light brown very clayey sandy gravel. NEC.									
2	MADE GROUND: Soft grey very gravelly clay. NEC.			2.68	1.80	2	ENV	1.80-2.00		
	CONCRETE			2.48	2.00					
3	MADE GROUND: Stiff grey sandy gravelly clay. HC odour.	[Cross-hatch pattern]	1.98	2.50	3	ENV	2.50-3.00			
3	MADE GROUND: Stiff black gravelly clay with occasional cobbles. HC, free phase oil present in small amounts.			1.48	3.00	4	ENV	3.00-3.50		
4	MADE GROUND: Dense grey gravel. Possible pulverised rock. NEC.			0.98	3.50					
4	LIMESTONE. NEC.			0.48	4.00					
6	End of Borehole at 6.00 m		-1.53	6.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
REMARKS							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		

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> B06 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,920.92 E 156,591.04 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.45		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Concrete. NEC.		5.25	0.20	1	ENV	0.20-0.50			
	MADE GROUND: Loose pale brown very silty sandy gravel. NEC.		4.65	0.80	2	ENV	1.00-1.50			
1	MADE GROUND: Loose, brown silty sandy gravel. NEC.				3	ENV	2.50-3.00			
2					4	ENV	3.50-4.00			
3	MADE GROUND: Loose grey silty gravel. HC 2.80-3.00m, very light 3.00-3.50m.			2.65	2.80					
3	MADE GROUND: Firm, dark brown/black mottled, sandy gravelly clay. Strong HC		1.95	3.50	4	ENV	3.50-4.00			
4	LIMESTONE. NEC.		4.45	4.00						
6	End of Borehole at 6.00 m			-0.55	6.00					

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>B07</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,913.21 E 156,585.54 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 18/11/2009
<b>GROUND LEVEL (m AOD)</b> 5.49	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 19/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 5.00	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 5.00	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Concrete. NEC.		5.29	0.20	1	ENV	0.50-1.00			
1	MADE GROUND: Loose light brown silty sandy gravel. NEC.		3.99	1.50						
2	MADE GROUND: Loose, grey/brown/pale brown, silty gravel. NEC.		2.49	3.00	2	ENV	3.00-3.50			
3	MADE GROUND: Firm, dark brown/grey, slightly sandy gravelly clay with red brick. HC (very strong 3.00-3.20m)		1.99	3.50						
4	Pulverised LIMESTONE. Slight HC odour.		0.49	5.00						
5	End of Borehole at 5.00 m									

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> B08 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,903.27 E 156,574.69 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.49		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose yellow brown silty sandy gravel with root hairs. NEC 0.00-1.50m & slight HC 1.50-1.80m.		3.69	1.80	1	ENV	0.50-1.00			
1					2	ENV	1.50-1.80			
2	MADE GROUND: Loose yellow brown silty sandy gravel with root hairs. Heavy HC.				3	ENV	2.80-3.00			
3	MADE GROUND: Firm to soft mottled brown sandy gravelly clay with red brick. Heavy HC.		2.49	3.00	4	ENV	3.00-3.40			
4	MADE GROUND: Soft dark brown/black sandy very gravelly clay with brick. Very heavy HC.		2.09	3.40	5	ENV	3.50-4.00			
4	MADE GROUND: Firm to locally soft, grey/brown, slightly sandy gravelly clay with frequent cobbles. Strong HC, fading with depth after 4.50m.		1.49	4.00	6	ENV	4.00-4.50			
5	LIMESTONE. NEC.		0.99	4.50						
5	End of Borehole at 5.00 m		0.49	5.00						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
18-11-09	4.50	1.00	4.50	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# SONIC CORE RECORD

**REPORT NUMBER**

**16033**

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> <b>B9</b>	
<b>CO-ORDINATES</b> 156,898.15 E 156,568.32 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.46		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 25/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 25/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (loose grey coarse gravel (804))								
	MADE GROUND (stiff dark brown sandy slightly gravelly CLAY with red and yellow brick)		0.20	5.26	0.30-0.50		ENV	0.30-0.50	
1.0					1.00-1.80		ENV	1.00-1.80	
	MADE GROUND (concrete)		1.85	3.61					
2.0	MADE GROUND consisting of stiff brown sandy slightly gravelly CLAY		2.00	3.46	2.00-2.20		ENV	2.00-2.20	
	MADE GROUND (concrete)		2.20	3.26					
	Very stiff light brown slightly sandy slightly gravelly CLAY with occasional cobbles. (strong hydrocarbon odour)		2.50	2.96	2.50-2.80		ENV	2.50-2.80	
3.0	LIMESTONE rock (fractures every 100-200mm)		2.90	2.56					
5.0	Final Depth 5.00m		5.00	0.46					

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

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# SONIC CORE RECORD

**REPORT NUMBER**

16033

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> B10	
<b>CO-ORDINATES</b> 156,893.58 E 156,564.60 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.56		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 25/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 25/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	Very stiff dark brown grey gravelly sandy CLAY (damp sweet odour)				0.00-0.40		ENV	0.00-0.40	
	MADE GROUND (concrete)		0.40	5.16					
1.0	Dense light grey clayey fine SAND		0.99	4.57					
	MADE GROUND (concrete)		1.00	4.56					
3.0	Highly weathered fractured ROCK (strong hydrocarbon odour, visible sheen, open product)		3.00	2.56					
	ROCK (fractures 100mm apart)		3.50	2.06					
5.0	Final Depth 5.00m		5.00	0.56					

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>B11</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,883.91 E 156,560.06 N	<b>RIG TYPE</b>	<b>DATE DRILLED</b> 10/11/2009
<b>GROUND LEVEL (m AOD)</b> 4.75	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 10/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 0.95	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 2.20	<b>PROCESSED BY</b> S. Letch

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Tarmacadam	[Cross-hatch pattern]	4.60	0.15						
	MADE GROUND: Firm black sandy slightly gravelly clay with frequent redbrick, concrete and steel. NEC.									
1	MADE GROUND: Firm brown sandy slightly gravelly clay with occasional redbrick. NEC.		3.95	0.80						
	End of Borehole at 0.95 m		3.80	0.95						
2										
3										
4										
5										
6										
7										
8										
9										

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<b>HARD STRATA BORING/CHISELLING</b>				<b>WATER STRIKE DETAILS</b>					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike
				<b>GROUNDWATER DETAILS</b>					
<b>INSTALLATION DETAILS</b>				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					
<b>REMARKS</b> Hand dug pit 0.00-0.95m. Pit dry and stable. Location moved due to gas pipe 0.95m blg.					<b>Sample Legend</b> 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				

IGSL BH LOG 14463.GPJ IGSL\_GDT 23/12/09





# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>B11A</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,884.96 E 156,561.79 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 17/11/2009
<b>GROUND LEVEL (m AOD)</b> 4.77	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 17/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 2.20	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 1.20	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Tarmacadam		4.67	0.10	1	ENV	0.40-0.55			
	MADE GROUND: Concrete		4.62	0.15						
	MADE GROUND: Very stiff brown gravelly clay with occasional cobbles and wire. NEC.		4.42	0.35						
	MADE GROUND: Very stiff light brown gravelly clay. NEC.		4.37	0.40						
1	MADE GROUND: Hard clayey black gravel (possible degraded tarmac or black ash cinders). Possible contamination.		4.22	0.55						
	MADE GROUND: Stiff brown clay. NEC.		3.57	1.20						
	MADE GROUND: Observed by driller		3.27	1.50						
2	MADE GROUND. Observed by driller		2.57	2.20						
	LIMESTONE. Observed by driller.									
	End of Borehole at 2.20 m									

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
<b>REMARKS</b> Hand dug pit 0.00-1.20m. Pit dry and stable.					<b>Sample Legend</b> 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				

IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# SONIC CORE RECORD

**REPORT NUMBER**

16033

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> C1	
<b>CO-ORDINATES</b> 156,965.22 E 156,612.05 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.37		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 26/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 26/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (concrete)		0.03	5.34					
	Dense grey angular COBBLES		0.20	5.17			ENV	0.20-1.00	
	Medium dense very clayey GRAVEL				0.20-1.00				
1.0	No Recovery		1.00	4.37					
2.0									
	Loose brown very gravelly CLAY (hydrocarbon odour)		2.80	2.57	2.80-3.00		ENV	2.80-3.00	
3.0	Soft grey slightly gravelly CLAY (hydrocarbon odour, visible veins of tar oil throughout clay)		3.00	2.37			ENV	3.00-3.50	
					3.00-3.50				
	LIMESTONE rock		3.50	1.87					
4.0									
	Final Depth 4.70m		4.70	0.67					
5.0									

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# SONIC CORE RECORD

**REPORT NUMBER**

16033

<b>CONTRACT</b> Limerick Gasworks		<b>DRILLHOLE NO</b> C2	
<b>CO-ORDINATES</b> 156,958.32 E 156,606.32 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.33		<b>DATE DRILLED</b> 26/10/2011	
		<b>DATE LOGGED</b> 26/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>	
		<b>SAMPLED BY</b> Roberts	
		<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (concrete) No Recovery	XXXXXX	0.05	5.28					XXXXXX
1.5	MADE GROUND (soft light brown gravelly CLAY with occasional cobbles and red brick.)	XXXXXX	1.50	3.83	1.50-2.00		ENV	1.50-2.00	XXXXXX
2.0	No Recovery		2.00	3.33					XXXXXX
2.5	LIMESTONE rock	XXXXXX	2.50	2.83					XXXXXX
3.5	Final Depth 3.50m		3.50	1.83					XXXXXX

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type
28-10-11	1.00	2.50	3.50	50mm SP
27-10-11	1.50	1.00	2.50	50mm SP

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C03 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,954.37 E 156,602.09 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 4.20		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 4.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 4.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Concrete over grey/black mottled sandy clay. HC. (0.20m recovered).				1	ENV	0.00-0.50			
1.50	LIMESTONE. NEC. Gravel layer 3.00-3.30m.		2.70	1.50						
4.00	End of Borehole at 4.00 m		0.20	4.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>C04</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,944.63 E 156,597.99 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 12/11/2009
<b>GROUND LEVEL (m AOD)</b> 7.10	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 13/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 4.00	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 4.00	<b>PROCESSED BY</b> D. O'Shea

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose brown/grey clayey sandy gravel with occasional cobbles. NEC.		6.80	0.30	1	ENV	0.30-0.80			
	MADE GROUND: Soft dark brown sandy gravelly clay with occasional cobbles and red brick. Possible HC.		6.30	0.80	2	ENV	1.00-1.50			
	Firm black sandy CLAY. Possible HC.		6.20	0.90						
	Loose brown clayey gravelly SAND. NEC.		5.60	1.50	3	ENV	1.70-2.00			
	Loose brown/grey clayey sandy angular GRAVEL. NEC.		5.40	1.70						
	Soft grey/brown sandy gravelly CLAY with occasional cobbles. NEC.		5.10	2.00						
	LIMESTONE. NEC.									
4	End of Borehole at 4.00 m		3.10	4.00						

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							
REMARKS							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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C05 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,935.48 E 156,589.26 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.37		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 4.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 4.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete with rebar		7.22	0.15	1	ENV	0.15-0.65			
	MADE GROUND: Stiff light brown sandy gravelly clay with wood at 0.80m. NEC.									
1	MADE GROUND: Soft black gravelly clay, very impacted with oil.		6.37	1.00	2	ENV	1.00-1.50			
	MADE GROUND: Loose sandy gravel. Slight HC sheen.		5.87	1.50	3	ENV	2.00-2.50			
2	LIMESTONE. NEC.		4.87	2.50						
3										
4	End of Borehole at 4.50 m		2.87	4.50						
5										
6										
7										
8										
9										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
REMARKS					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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C06 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,927.21 E 156,582.82 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.85		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete		5.65	0.20						
	MADE GROUND: Loose light brown, very clayey gravel. NEC.		5.15	0.70	1	ENV	0.70-0.90			
	MADE GROUND: Stiff dark brown/light brown, sandy gravelly clay with red brick. NEC.		4.95	0.90	2	ENV	1.00-1.50			
	MADE GROUND: Loose very clayey gravel with occasional cobbles and red brick. NEC.		4.35	1.50	3	ENV	1.50-3.00			
	MADE GROUND: Soft black/red very gravelly clay. HC - free phase oil. (20cm recovered)		2.85	3.00	4	ENV	3.00-6.00			
	MADE GROUND: Loose black very clayey gravel with occasional cobbles. HC-free phase oil. 0.50m recovered.		-0.15	6.00	5	ENV	6.00-6.50			
	MADE GROUND: Very soft black clay. HC.		-0.65	6.50						
	LIMESTONE. Slight HC sheen, possible contamination from clay above.									
	End of Borehole at 8.50 m		-2.65	8.50						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
REMARKS							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			

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C07 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,922.26 E 156,577.97 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.55		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
0	MADE GROUND: Loose light brown, very clayey gravel. NEC.		5.35	0.20	1	ENV	0.50-1.00			
1	MADE GROUND: Soft black, gravelly clay with red brick. HC 1.20-1.50m.		4.45	1.10						
1	MADE GROUND: Very soft black, very gravelly clay with occasional cobbles. Tar from 1.5m. HC 2.00-2.70m.		4.05	1.50	2	ENV	1.50-2.00			
2					3	ENV	2.00-2.50			
3	MADE GROUND: Loose grey clayey gravelly sand (possible pulverised boulder). NEC.		2.85	2.70						
3	MADE GROUND: Medium dense, black, very clayey gravel. HC impact - free phase oil.		2.55	3.00	4	ENV	3.00-3.50			
4					5	ENV	4.00-4.50			
4					6	ENV	4.50-6.00			
6	MADE GROUND: No recovery.		-0.45	6.00						
7	LIMESTONE. Slight HC sheen, possible contamination from drilling.		-0.95	6.50						
8										
9	End of Borehole at 8.50 m		-2.95	8.50						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
16-11-09	8.50	7.00	8.50	50mm SP						
<b>REMARKS</b> 2.0 hrs standing - Health and Safety due to very contaminated soils. 1hr extra over delay due to decontaminating rig because of very heavy contaminated					<b>Sample Legend</b> 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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks				<b>BOREHOLE NO. SHEET</b> C08 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,912.94 E 156,571.93 N		<b>RIG TYPE</b> Sonic		<b>DATE DRILLED</b> 18/11/2009	
<b>GROUND LEVEL (m AOD)</b> 5.68		<b>BOREHOLE DIAMETER (mm)</b> 140		<b>DATE LOGGED</b> 18/11/2009	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.00		<b>BORED BY</b> Boart Longyear	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.00		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
0.40	MADE GROUND: Loose pale to dark brown (with depth), silty sandy gravel and occasional cobbles. HC - increasing with depth. Peaty texture at base of run.		5.28	0.40	1	ENV	0.40-1.00			
1.00	MADE GROUND: Black silty sandy gravel with occasional cobbles. Heavy HC.		4.68	1.00	2	ENV	1.00-1.50			
1.50	MADE GROUND: Black silty cobbly gravel. Heavy HC.		4.18	1.50						
2.00	MADE GROUND: Black/grey, very clayey gravel with frequent cobbles. Very heavy free phase oil.		3.18	2.50	4	ENV	2.50-3.00			
2.50	MADE GROUND: Black slightly silty gravel and cobbles. Free phase oil		2.68	3.00	5	ENV	3.00-3.30			
3.00	Limestone GRAVEL and COBBLES. HC. Possible variably weathered rock.		2.38	3.30						
4.50	LIMESTONE. NEC. Slight HC at top of rock.		1.18	4.50						
5.00	End of Borehole at 5.00 m		0.68	5.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C09 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,905.07 E 156,565.82 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.96		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown gravelly clay. NEC.	[Cross-hatch pattern]	5.81	0.15	1	ENV	0.25-0.75			
	MADE GROUND: Loose black clayey gravel (possible cinders). Possible contamination.		5.21	0.75						
1	MADE GROUND: Loose black clayey gravel. NEC.		4.76	1.20	2	ENV	1.50-2.00			
	MADE GROUND: Small Boulder		4.46	1.50						
	MADE GROUND: Very soft very gravelly clay. HC with free phase oil.		3.96	2.00						
2	MADE GROUND: Firm brown slightly gravelly clay. HC.	[Horizontal lines pattern]	2.96	3.00	3	ENV	2.00-2.50			
	Very stiff brown CLAY with frequent cobbles. NEC.									
3					4	ENV	3.00-3.50			
4		[Vertical lines pattern]			5	ENV	4.50-5.00			
5	LIMESTONE. Some brown staining, possible HC.		0.96	5.00						
	End of Borehole at 5.50 m		0.46	5.50						

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							
<b>REMARKS</b> End hole at 5.50m - water required to drill through rock, high risk of contamination spread					<b>Sample Legend</b>						
					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			

IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>C10</b>	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,898.43 E 156,559.10 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 4.89		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.20	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.20	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose dark brown very clayey gravel. NEC.									
0.75	Soft to firm light brown slightly gravelly CLAY. NEC.		4.14	0.75	1	ENV	0.75-1.00			
1.50	Stiff grey slightly gravelly CLAY with occasional cobbles. Local HC spots in clay.		3.39	1.50	2	ENV	1.50-2.00			
2.95					3	ENV	2.50-2.95			
2.95	LIMESTONE. NEC.		1.94	2.95						
3.20	End of Borehole at 3.20 m		1.69	3.20						

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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
									No water strike

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

<b>REMARKS</b> End hole at 3.20m - water required to drill through rock, high risk of contamination spread	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C11 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,896.62 E 156,555.51 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 4.36		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TARMAC		4.26	0.10	1	ENV	0.25-0.70			
	MADE GROUND: Stiff dark grey gravel. NEC.		4.16	0.20						
	MADE GROUND: Very stiff light brown gravelly clay. NEC.		4.11	0.25						
1	MADE GROUND: Very stiff dark brown gravelly clay. Possible HC.		3.66	0.70	2	ENV	1.50-2.00			
	MADE GROUND: Hard black gravel (possible tarmac). NEC		3.36	1.00						
	MADE GROUND: Stiff brown gravelly CLAY. NEC.		3.16	1.20						
2	Stiff black and light brown sandy CLAY with frequent cobbles. HC impact in black.		2.86	1.50	3	ENV	2.00-2.50			
	Soft grey sandy slightly gravelly CLAY. HC odour.		1.86	2.50						
3	LIMESTONE. NEC.		1.36	3.00						
3	End of Borehole at 3.00 m		1.36	3.00						

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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
					0.25	NR	NS	NR	NR	Seepage
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
23-11-09	2.50	1.00	2.50	50mm SP						
<b>REMARKS</b> Hand dug pit 0.00-1.20m. Water seeping in at 0.25m, water has visible sheen and hc odour. End hole at 3.00m - water required to drill through rock, high risk of contamination spread					<b>Sample Legend</b> 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					

IGSL BH LOG 14463.GPJ IGSL\_GDT 23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> C12 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,893.36 E 156,548.99 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 4.53		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	TARMAC									
	CONCRETE		4.23	0.30						
	MADE GROUND: Red soft gravelly clay on one side of pit and stone blocks on other side.		3.98	0.55	1	ENV	0.55-1.00			
	MADE GROUND: Wet cobbles. HC sheen on water		3.33	1.20						
	Very stiff grey gravelly CLAY. HC odour.		3.03	1.50	2	ENV	1.50-2.00			
	Soft black very gravelly CLAY. HC - oil tar		2.53	2.00	3	ENV	2.00-2.30			
	LIMESTONE with local clay bands. Possible HC impact in clay.		2.23	2.30						
	End of Borehole at 2.50 m		2.03	2.50						

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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
				1.00	NR	NS	NR	NR	Rapid
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
<b>REMARKS</b> Hand dug pit 0.0-1.2m.				<b>Sample Legend</b> 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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> D01 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,967.83 E 156,603.03 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.06		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 7.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 7.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, brown/dark brown, sandy gravelly silt/clay with occasional cobbles & root hairs. NEC.		6.56	0.50	1	ENV	0.00-0.50			
1	MADE GROUND: Soft, brown/grey mottled, sandy gravelly clay with occasional cobbles, red brick & root hairs. NEC.			1.00-1.50	2	ENV				
2				2.50-3.00	3	ENV				
3	MADE GROUND: Loose, brown clayey silty gravelly sand with occasional cobbles. NEC.			3.00	4	ENV				
4	MADE GROUND: Soft brown/black mottled, very sandy gravelly silt. HC			4.00	5	ENV				
5	MADE GROUND: Loose black very clayey sandy cobbly gravel. Strong HC.			4.50	6	ENV				
6	LIMESTONE. HC.		5.50	5.50						
7										
8	End of Borehole at 7.50 m		-0.44	7.50						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
23-11-09	5.50	1.00	5.50	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# SONIC CORE RECORD

**REPORT NUMBER**

16033

<b>CONTRACT</b> Limerick Gasworks				<b>DRILLHOLE NO</b> D2	
<b>CO-ORDINATES</b> 156,962.34 E 156,599.57 N		<b>RIG TYPE</b>		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (mOD)</b> 5.44		<b>HOLE DIAMETER (mm)</b>		<b>DATE DRILLED</b> 26/10/2011	
<b>CLIENT</b> Bord Gais Networks		<b>FLUSH MEDIUM</b>		<b>DATE LOGGED</b> 26/10/2011	
<b>ENGINEER</b> Mouchel		<b>CASING DIAMETER (mm)</b>		<b>SAMPLED BY</b> Roberts	
				<b>LOGGED BY</b> G.Doyle	

Depth (m)	Geotechnical Description	Legend	Depth (m)	Elevation	Sample Run (m)	Recovery (%)	Sample Type	Depth (m)	Standpipe Details
0.0	MADE GROUND (concrete)	XXXXXX	0.05	5.39					
	MADE GROUND (soft dark brown slightly gravelly CLAY with red brick)(Slight hydrocarbon Odour)				0.50-1.00		ENV	0.50-1.00	
1.0	MADE GROUND (soft light brown gravelly CLAY with some red brick)(Slight hydrocarbon odour)		1.00	4.44			ENV	1.00-1.50	
	Loose black very clayey GRAVEL with occasional angular cobbles. (Visable sheen and strong hydrocarbon odour)	(Symbol: irregular shapes)	1.50	3.94	1.00-1.50				
2.0	LIMESTONE rock (300mm core lenghts with sheen. Most likely contamination from 1.5 to 2.4)	(Symbol: brick pattern)	2.40	3.04	2.00-2.50			ENV	2.00-2.50
3.0	Final Depth 3.50m		3.50	1.94					
4.0									
5.0									

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**General Remarks**

INSTALLATION DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type

IGSL SONIC WITH SAMPLES 16033.GPJ IGSL.GDT 11/11/11



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> D03 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,955.84 E 156,593.85 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.32		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
0.40	MADE GROUND: Soft to firm orange/brown/black mottled, very clayey sandy gravel with local red and yellow brick. Local slight HC.		5.92	0.40	1	ENV	0.50-1.00			
1.50				2	ENV	1.50-2.00				
2.00	MADE GROUND: Soft brown black very gravelly cobbly clay. Heavy HC.		4.32	2.00						
2.50	MADE GROUND: Brown/black, very clayey, angular cobbly gravel (limestone). HC impact increasing with depth.		3.82	2.50	3	ENV	2.50-3.00			
3.70				2.62	3.70	4	ENV	3.70-4.00		
4.00	MADE GROUND: Grey black heavily clay smeared, angular limestone gravel and cobbles. HC.		2.32	4.00						
4.00	MADE GROUND: limestone. Slight HC. Possible boulder.									
5.00	MADE GROUND: Angular gravel and few cobbles of varying lithologies and some fill material. NEC.		1.32	5.00						
5.40				0.92	5.40					
5.40	LIMESTONE. NEC.									
6.00	End of Borehole at 6.00 m		0.32	6.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
REMARKS					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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> D04 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,951.05 E 156,589.55 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.37		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 4.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 4.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Medium dense red/brown clayey, gravelly sand. NEC.		4.87	1.50	1	ENV	1.00-1.50			
1	LIMESTONE. NEC. Gravel layer 3.00-3.50m.									
4	End of Borehole at 4.00 m			4.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>D05</b>
<b>CO-ORDINATES</b> 156,940.44 E 156,581.70 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 6.80	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 09/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 11/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 5.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 5.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete with rebar MADE GROUND: Loose slightly clayey gravel. HC odour and sheen.		6.65	0.15	1	ENV	0.15-3.00			
3	LIMESTONE. NEC.		3.80	3.00						
5	End of Borehole at 5.00 m		1.80	5.00						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
09-11-09	5.00	1.00	3.00	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>D06</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,930.11 E 156,573.47 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 06/11/2009
<b>GROUND LEVEL (m AOD)</b> 5.75	<b>BOREHOLE DIAMETER (mm)</b> 112	<b>DATE LOGGED</b> 06/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 4.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 4.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
0.25	MADE GROUND: No recovery. Loose material		5.50	0.25						
2.50	LIMESTONE. HC sheen to 4.00m.		3.25	2.50						
4.50	End of Borehole at 4.50 m		1.25	4.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

**REMARKS** No recovery - no samples.

**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

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>D07</b>
<b>CO-ORDINATES</b> 156,924.88 E 156,570.05 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 6.30	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 06/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 112	<b>DATE LOGGED</b> 06/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 7.50	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 7.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
1	MADE GROUND: Loose, light brown clayey gravelly sand. NEC.		5.50	0.80	1	ENV	1.00-1.50			
2	MADE GROUND: Firm black slightly sandy gravelly clay. HC odour.		4.60	1.70	2	ENV	1.70-2.00			
	MADE GROUND: Loose grey slightly clayey gravelly sand. NEC. (possible pulverised by sonic drilling).		4.30	2.00	3	ENV	2.00-2.30			
3	MADE GROUND: Firm grey sandy gravelly clay. HC odour.		4.00	2.30	4	ENV	2.30-2.70			
	MADE GROUND: Limestone boulder		3.60	2.70						
4	MADE GROUND: Stiff black sandy gravelly clay. HC odour (tarry).		2.50	3.80	5	ENV	3.50-4.00			
	MADE GROUND: Soft, multi-layered dark brown, yellow, grey, sandy clay. HC odour (possible ash). LIMESTONE. NEC.		2.30	4.00	6	ENV	4.00-4.50			
5			1.80	4.50						
8	Loose grey/black GRAVEL. HC. Soft grey CLAY. NEC.		-1.10	7.40	7	ENV	7.40-7.50			
			-1.11	7.41						
8	End of Borehole at 7.50 m		-1.20	7.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> D08 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,917.11 E 156,563.60 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.22		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown to black (with depth) sandy gravelly clay. HC - slight to heavy with depth.		5.12	1.10	1	ENV	0.00-0.30			
					2	ENV	0.60-1.10			
1	MADE GROUND: Soft brown, slightly gravelly clay. HC - heavy at top and bottom of run.				3	ENV	1.10-1.40			
	MADE GROUND: Loose black silty cobbly gravel. Heavy HC.				4	ENV	1.50-2.00			
2	LIMESTONE. NEC.		4.22	2.00						
3	End of Borehole at 3.00 m			3.22	3.00					
4										
5										
6										
7										
8										
9										

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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
									No water strike

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

<b>REMARKS</b> Stopped drilling 1m into rock as driller bringing up contaminants.	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>D09</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,910.80 E 156,558.82 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 17/11/2009
<b>GROUND LEVEL (m AOD)</b> 6.15	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 17/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 6.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 6.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff dark brown very gravelly clay. NEC.				1	ENV	0.00-1.50			
1										
	MADE GROUND: Loose black clayey gravel (possible cinders). HC odour.		4.65	1.50	2	ENV	1.50-2.00			
2	MADE GROUND: Soft dark grey/black sandy clay. HC odour.		4.15	2.00	3	ENV	2.00-2.50			
3	MADE GROUND: Loose dark grey clayey gravelly sand. HC - concentrated sheen on water - possible free phase.		3.45	2.70	4	ENV	3.00-3.50			
4										
	MADE GROUND: Very soft grey/black sandy clay (black - tar). NEC.		1.65	4.50	5	ENV	4.50-5.00			
5	MADE GROUND: Soft grey clay. NEC.		1.15	5.00						
	MADE GROUND: Loose grey/red clayey gravel with red brick. NEC.		0.65	5.50	6	ENV	5.50-6.00			
6	LIMESTONE. NEC except slight spots of HC (6.00-6.10m)		0.15	6.00						
	End of Borehole at 6.50 m		-0.36	6.50						
7										
8										
9										

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>D10</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,903.63 E 156,552.36 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 17/11/2009
<b>GROUND LEVEL (m AOD)</b> 6.09	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 17/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 2.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 2.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Stiff black very gravelly CLAY. NEC.		5.99	0.10	1	ENV	0.10-0.50			
	Loose wet dark brown clayey GRAVEL. NEC.									
	Very stiff light brown CLAY with many cobbles. NEC.		5.59	0.50						
1	Stiff light brown, slightly sandy CLAY. NEC.		5.09	1.00	2	ENV	1.50-2.00			
	Soft black slightly gravelly CLAY. Possible HC impact.		4.59	1.50						
2	LIMESTONE with some black clay - possible HC impact.		4.09	2.00						
	End of Borehole at 2.50 m		3.59	2.50						
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike

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

<b>REMARKS</b> End hole at 2.50m - water required to drill through rock, high risk of contamination spread	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> D11 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,900.28 E 156,544.81 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.40		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.70	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.70	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Hardcore	XXXXXX	5.30	0.10	1	ENV	0.40-0.70			
	Stiff light brown gravelly CLAY. NEC.	o-----	5.20	0.20						
	Stiff dark grey/brown gravelly CLAY. NEC.	o-----	5.00	0.40						
	Stiff grey gravelly CLAY. Possible HC.	o-----	4.70	0.70						
1	Firm brown CLAY. NEC.	o-----	4.20	1.20	2	ENV	1.00-1.50			
	Soft grey slightly gravelly CLAY. Slight HC impact.	o-----								
2		o-----								3
	LIMESTONE with local soft clack clay. NEC except for HC impact in clay bands.	o-----	3.00	2.40						
3	End of Borehole at 2.70 m		2.70	2.70						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
<b>REMARKS</b> Hand dug pit 0.00-1.20m. Water seeping approx. 0.40-0.70m, water has visible sheen and hc odour. End hole at 2.60m - water required to drill through rock, high risk of contamination spread					<b>Sample Legend</b> 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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>D12</b>
<b>CO-ORDINATES</b> 156,895.10 E 156,537.68 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 5.03	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 18/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 18/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 4.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 4.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Soft dark grey gravelly CLAY with roots. NEC.				1	ENV	0.00-0.50			
	Stiff light brown gravelly CLAY. NEC.		4.53	0.50						
1	Firm brown slightly gravelly CLAY. NEC.		3.83	1.20	2	ENV	1.20-1.50			
	LIMESTONE. NEC.		3.53	1.50						
2										
3	Soft brown/grey CLAY band in limestone. NEC.		2.23	2.80	3	ENV	2.80-3.00			
	LIMESTONE. NEC.		2.03	3.00						
4	End of Borehole at 4.00 m		1.03	4.00						

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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
				0.40	NR	NS	NR	NR	Rapid
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b> Hand dug pit 0.0-1.2m.	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>E01</b>	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,979.37 E 156,598.12 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.42		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Concrete. NEC.		7.32	0.10						
	MADE GROUND: Firm, red/white/yellow/black, sandy gravelly clay/silt with red brick. HC 0.40-0.60m, slight HC throughout.				1	ENV	0.40-0.60			
					2	ENV	0.90-1.10			
1										
2	MADE GROUND: Soft/firm, light brown/dark brown, sandy slightly gravelly clay. NEC.			5.82	1.60					
					3	ENV	2.30-2.80			
3	MADE GROUND: Soft, dark grey very sandy gravelly silt with occasional cobbles. Slight HC		4.42	3.00						
				4	ENV	3.80-4.30				
4										
5										
				5	ENV	5.20-5.50				
6	MADE GROUND: Loose, black, silty very gravelly cobbly sand. HC		1.72	5.70						
	LIMESTONE. NEC.		1.42	6.00						
					6	ENV	5.70-6.00			
7										
8	End of Borehole at 8.00 m		-0.58	8.00						
9										

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>E02</b>	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,970.59 E 156,590.68 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.38		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, dark brown/black, sandy gravelly silt with occasional cobbles & red brick. NEC 0.00-2.70m, HC 2.70-3.00m.				1	ENV	0.00-0.50			
1					2	ENV	1.00-1.50			
2					3	ENV	2.00-2.50			
3	MADE GROUND: Soft brown sandy silt. NEC.		4.38	3.00		4	ENV	3.50-4.00		
4										
5	MADE GROUND: Loose, dark brown/black, silty very sandy gravel. HC increasing with depth.		2.58	4.80		5	ENV	5.00-5.50		
6	MADE GROUND: Loose, black, silty sandy gravelly cobbles. HC.		1.68	5.70						
	LIMESTONE. NEC.		1.38	6.00						
7										
8	End of Borehole at 8.00 m		-0.62	8.00						
9										

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E03 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,963.03 E 156,584.64 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.87		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 7.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 7.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details									
					Ref. Number	Sample Type	Depth (m)	Recovery											
0	MADE GROUND: Firm dark brown sandy gravelly clay. NEC.		6.77	0.10	1	ENV	0.70-1.00												
	MADE GROUND: Light brown clayey sand with some concrete. NEC.		6.57	0.30															
	MADE GROUND: Firm brown slightly gravelly clay with wood. NEC.		6.37	0.50															
	MADE GROUND: Firm brown slightly gravelly clay. NEC.		6.17	0.70															
1	MADE GROUND: Stiff dark grey/brown sandy gravelly clay with some yellow brick. Slight HC 1.30-1.50m.		5.37	1.50						3	ENV	2.00-2.70							
	MADE GROUND: Soft black gravelly clay. HC.		4.17	2.70															
2	MADE GROUND: Loose red to white/grey to grey clayey sandy gravel (possibly layers of ash). Possible HC.		3.87	3.00															
	MADE GROUND: Soft grey slightly gravelly clay. HC.		3.72	3.75															
3	MADE GROUND: Medium dense yellow/grey/black very clayey GRAVEL with occasional cobbles. HC in black.		3.00	3.75											5	ENV	4.00-4.50		
			3.00	3.75															
4		3.00	3.75																
		3.00	3.75																
5		3.00	3.75																
		3.00	3.75																
6		3.00	3.75																
		3.00	3.75																
6	LIMESTONE (pulverised). HC odour.		1.07	5.80	6	ENV	5.30-5.80												
	LIMESTONE. NEC to 7.10m, HC sheen on rock 7.10-7.50m.		0.87	6.00															
7	End of Borehole at 7.50 m		-0.63	7.50															

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							
REMARKS							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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E04 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,956.11 E 156,581.12 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.28		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.80	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.80	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	OIL with some fill material				1	ENV	0.00-0.50			
1										
2	MADE GROUND: Grey, slightly brown, sandy gravelly clay with yellow brick and root hairs. HC. LIMESTONE. Slight HC at top of rock.		4.68 4.48	1.60 1.80	2	ENV	1.60-1.80			
3										
4	End of Borehole at 3.80 m		2.48	3.80						
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E05 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,948.07 E 156,573.75 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.12		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Brown sandy gravelly clay. NEC.		6.02	0.10	1	ENV	0.50-1.00			
	MADE GROUND: Medium dense clayey sandy gravel. NEC.		5.87	0.25						
	MADE GROUND: Firm brown sandy gravelly clay. NEC.		5.62	0.50						
1	MADE GROUND: Medium dense clayey sandy gravel. NEC.		5.02	1.10	2	ENV	1.10-1.50			
	MADE GROUND: Stiff brown sandy gravelly clay. HC odour.		4.32	1.80	3	ENV	2.00-2.50			
2	MADE GROUND: Dense black very clayey gravelly cobbles. HC in clay.									
3	LIMESTONE. NEC.		3.12	3.00						
4										
5										
6	End of Borehole at 5.50 m			0.62	5.50					

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>E06</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,940.48 E 156,568.32 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 10/11/2009
<b>GROUND LEVEL (m AOD)</b> 6.33	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 11/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 7.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 7.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown gravelly clay. HC odour and visible at 1.00m. (0.50m recovered)				1	ENV	0.00-0.50			
1										
2	MADE GROUND: Soft black gravelly clay with occasional cobbles. Free phase oil.		4.83	1.50	2	ENV	1.50-2.00			
3					3	ENV	2.50-3.00			
4	MADE GROUND: Stiff mottled brown/grey gravelly clay. HC impact in grey mottling.		3.13	3.20	4	ENV	3.00-3.50			
4	MADE GROUND: Very stiff grey/cream clay with occasional cobbles. NEC.		2.83	3.50	5	ENV	4.00-4.50			
5	LIMESTONE. NEC.		1.83	4.50						
7	LIMESTONE with very thin band of clay. NEC.		-0.67	7.00						
8	End of Borehole at 7.50 m		-1.17	7.50						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E07 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,932.94 E 156,562.16 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.92		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown slightly sandy, slightly gravelly clay. NEC.	<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.5; font-size: 10px; color: red;">                     For inspection purposes only.                      Consent of copyright owner required for any other use.                 </div>	5.72	0.20						
1	MADE GROUND: Medium dense, slightly clayey gravel. NEC.				1	ENV	0.50-1.00			
2					2	ENV	1.50-2.00			
3					3	ENV	2.50-3.00			
4				4	ENV	3.50-4.00				
5	MADE GROUND: Stiff brown/grey sandy, gravelly clay with occasional cobbles. Strong HC odour.		1.12	4.80	5	ENV	4.80-5.00			
6				6	ENV	5.50-6.00				
6	LIMESTONE with soft grey clay band (8.90m-9.00m NEC). Local HC sheen on rock.	<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.5; font-size: 10px; color: red;">                     For inspection purposes only.                      Consent of copyright owner required for any other use.                 </div>	-0.08	6.00						
7										
9	End of Borehole at 9.00 m		-3.08	9.00	7	ENV	8.90-9.00			

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E08 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,925.23 E 156,556.66 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.84		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 7.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 7.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm dark brown, very gravelly clay. NEC.		5.74	0.10	1	ENV	0.40-0.80			
	MADE GROUND: Loose light brown clayey gravel. NEC.		5.44	0.40						
1	MADE GROUND: Loose grey clayey gravelly sand (possible pulverised cobbles). NEC.		5.04	0.80						
	MADE GROUND: Stiff light brown, slightly gravelly clay. NEC.		4.34	1.50	2	ENV	1.50-2.00			
2	MADE GROUND: Very soft light brown clay. NEC within clay. Slight HC sheen on outside of clay.									
3	MADE GROUND: Very soft light brown clay. NEC 3.00-5.00m. HC odour 5.00-6.00m.		2.84	3.00	4	ENV	3.00-3.50			
4										
5					6	ENV	5.50-6.00			
6	LIMESTONE. HC - black tar 6.00-6.20m, hc sheen 6.00-6.50m. NEC 6.50-7.00m		-0.16	6.00						
7	End of Borehole at 7.00 m		-1.16	7.00						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
18-11-09	6.00	1.00	6.00	50mm SP					

<b>REMARKS</b> End hole at 7.00m - water required to drill through rock, high risk of contamination spread, HC coming up with water.	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>E09</b>	
<b>CO-ORDINATES</b> 156,917.51 E 156,550.74 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 5.42		<b>DATE DRILLED</b> 17/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 17/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> A. Mahony	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 6.00			
<b>CASING DEPTH (m)</b> 6.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, alternating from dark brown/red/brown/pale brown, sandy, gravelly cobbly silt/clay with red brick. NEC.		4.42	1.00	1	ENV	0.80-0.90			
1	MADE GROUND: Soft, brown, locally mottled black, very sandy, gravelly silt/clay with red brick. NEC.				2	ENV	1.00-1.50			
2	MADE GROUND: Soft, black, silty clayey, very sandy gravel with red brick. Heavy HC with free phase oil.				3	ENV	2.90-3.10			
3				5.00	4	ENV	4.70-5.00			
4					5	ENV	5.00-5.20			
5					6	ENV	5.30-5.50			
5	Soft dark grey to black silty CLAY. Heavy HC with free phase oil.		0.12	5.30						
6	Firm blackened, grey CLAY (high plasticity). Heavy HC covering core (black) (not fully penetrating core). LIMESTONE (pulverised). Very clayey 5.50-5.70m. NEC.		-0.08	5.50						
6	LIMESTONE (pulverised). Very clayey 5.50-5.70m. NEC.		-0.58	6.00						
	End of Borehole at 6.00 m									

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

**14463**

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>E10</b>	
<b>CO-ORDINATES</b> 156,909.57 E 156,544.34 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 5.58		<b>DATE DRILLED</b> 04/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 04/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 3.00			
<b>CASING DEPTH (m)</b> 3.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Tarmac		5.53	0.05						
	MADE GROUND consisting of very stiff, grey gravelly clay. NEC.		5.28	0.30	1	ENV	0.30-0.65			
	MADE GROUND consisting of brown gravelly clay with fragments of red and yellow brick and wood. NEC.		4.93	0.65						
	MADE GROUND consisting of brown gravelly clay with fragments of red and yellow brick and wood. NEC.		4.73	0.85						
1	Very stiff, black gravelly CLAY. NEC.		4.48	1.10	2	ENV	1.10-1.50			
	Very stiff, light brown CLAY. NEC.		4.08	1.50						
2	Stiff black gravelly CLAY with cobbles. Degraded hydrocarbon in black.									
	LIMESTONE. NEC.									
3	End of Borehole at 3.00 m		2.58	3.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
<b>REMARKS</b> 1.25 hrs standing - Health and Safety due to very contaminated soils.					<b>Sample Legend</b> 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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E11 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,902.93 E 156,538.21 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.49		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Dense dark grey clayey gravel. NEC.	[Cross-hatch pattern]	5.24	0.25	1	ENV	0.35-0.50			
	MADE GROUND: Medium dense light brown clayey gravel with red brick. NEC.		5.14	0.35						
	MADE GROUND: Medium dense dark brown clayey gravel (possible cinders). Possible contamination.		4.99	0.50						
1	MADE GROUND: Stiff light brown gravelly clay with red brick. NEC.	[Horizontal lines]	4.29	1.20	2	ENV	1.50-2.00			
	MADE GROUND: Soft brown slightly gravelly CLAY. HC impact in gravel.									
2	Soft grey gravelly CLAY. HC (especially at 2.50m)	[Horizontal lines]	3.49	2.00	3	ENV	2.00-2.50			
	LIMESTONE with local very thin clay bands. HC - brown staining & impacted in clay.									
3	End of Borehole at 3.00 m		2.99	2.50						
			2.49	3.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
<b>REMARKS</b> End hole at 3.00m - water required to drill through rock, high risk of contamination spread					<b>Sample Legend</b> 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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> E12 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,896.73 E 156,535.05 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 4.83		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Soft dark brown slightly sandy CLAY. NEC.									
	Stiff red brown slightly gravelly CLAY with occasional cobbles. NEC		4.53	0.30	1	ENV	0.30-0.70			
	Very stiff light brown sandy slightly gravelly CLAY. NEC.		3.33	1.50	2	ENV	1.50-2.00			
					3	ENV	2.00-2.40			
	LIMESTONE. NEC.		2.43	2.40						
5	End of Borehole at 5.00 m		-0.17	5.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

**REMARKS** Hand dug pit 0.00-1.20m.

**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

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>F01</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,983.71 E 156,591.13 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.47		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose light brown, clayey slightly sand. NEC.		6.27		1	ENV	0.50-1.00			
1	MADE GROUND: Loose black/orange/brown, clayey gravelly sand. Slight HC impact.			1.20	2	ENV	1.20-1.50			
2	MADE GROUND: Firm (soft at 3.00-4.00m), brown/grey, sandy gravelly clay. Possible HC.			1.50	3	ENV	2.00-2.50			
4	MADE GROUND: Firm grey slightly sandy clay. Possible HC.			3.47	4	ENV	4.50-5.00			
6	MADE GROUND: Soft grey slightly sandy slightly gravelly clay. Possible HC.			1.47	5	ENV	6.00-6.50			
7	MADE GROUND: Soft grey sandy gravelly clay with occasional cobbles. NEC.			0.67	6	ENV	6.80-7.30			
8	Loose, grey clayey cobbly gravel - probable weathered rock. NEC. LIMESTONE. NEC.	0.17 -0.03	7.30 7.50							
9	End of Borehole at 9.00 m		-1.53	9.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
REMARKS					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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> F02 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,973.46 E 156,583.93 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.51		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft/firm, brown/grey/black, sandy gravelly clay. Possible HC.				1	ENV	0.50-1.00			
1										
2	MADE GROUND: Loose black/orange/brown, clayey gravelly sand. Possible HC.		5.81	1.70	2	ENV	1.70-2.00			
	MADE GROUND: Soft/firm, brown/black, sandy gravelly clay. Possible HC.		5.51	2.00						
3	No recovery - observed by driller as made ground		4.51	3.00						
4										
5	MADE GROUND: Loose, black, clayey sandy gravelly cobbles. Strong HC.		3.01	4.50						
	MADE GROUND: Loose, black, clayey gravelly sand. Possible HC.		2.51	5.00	3	ENV	5.00-5.50			
6										
7	Loose clayey sandy gravelly cobbles - probable weathered rock. Strong HC - free phase oil.		1.01	6.50	4	ENV	7.00-7.50			
	LIMESTONE. NEC.		0.01	7.50						
8	End of Borehole at 8.00 m		-0.49	8.00						
9										

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>F03</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,967.69 E 156,578.36 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.85		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft black/brown gravelly clay. NEC.				1	ENV	0.50-1.00			
1	MADE GROUND: Loose light brown clayey gravelly sand. NEC.		6.85	1.00						
	MADE GROUND: Firm brown slightly sandy slightly gravelly clay. NEC.		6.35	1.50	2	ENV	1.50-2.00			
2	MADE GROUND: Boulder		5.35	2.50						
3	MADE GROUND: Loose black very clayey gravelly sand with red brick. HC odour.		4.95	2.90	3	ENV	2.90-3.00			
	MADE GROUND: Firm dark grey clay with occasional cobbles. NEC.		4.75	3.10	4	ENV	3.00-3.10			
					5	ENV	3.50-4.00			
4	MADE GROUND: Very soft dark grey clay. HC increasing with depth.		3.35	4.50	6	ENV	4.50-5.00			
					7	ENV	5.50-6.00			
5	MADE GROUND: Very soft black very gravelly clay with wood. Free phase oil.		1.35	6.50	8	ENV	6.50-7.00			
				9	ENV	7.00-7.50				
6	LIMESTONE. Local sheen of HC 9.80m within band of clayey gravel otherwise NEC.		0.35	7.50						
7										

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<b>HARD STRATA BORING CHISELLING</b>				<b>WATER STRIKE DETAILS</b>					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike
				<b>GROUNDWATER DETAILS</b>					
<b>INSTALLATION DETAILS</b>				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					
<b>REMARKS</b>					<b>Sample Legend</b> 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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>F03</b>	
		<b>SHEET</b> Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,967.69 E 156,578.36 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 12/11/2009	<b>DATE LOGGED</b> 14/11/2009
<b>GROUND LEVEL (m AOD)</b> 7.85	<b>BOREHOLE DIAMETER (mm)</b> 140		
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 10.00	<b>BORED BY</b> Boart Longyear	
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 10.00	<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10			-2.15	10.00						
11										
12										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>F04</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,959.59 E 156,573.67 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.50		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown, slightly grey very sandy gravelly silt. NEC.				1	ENV	0.20-0.70			
1	MADE GROUND: Soft dark grey/grey, slightly clayey, very sandy, slightly gravelly silt with occasional cobbles. Possible slight HC.		5.50	1.00	2	ENV	1.00-1.50			
	MADE GROUND: Soft black, very silty, very sandy gravel with occasional cobbles. Heavy HC.		5.00	1.50	3	ENV	1.50-2.00			
2	MADE GROUND: Soft dark brown mottled, slightly clayey, sandy gravelly cobbly silt. HC.		4.50	2.00	4	ENV	2.50-3.00			
3	Grey black silty sandy CLAY with some gravel and cobbles. Heavy HC.		3.50	3.00	5	ENV	3.00-3.50			
4	LIMESTONE (pulverised due to sonic drilling without water). NEC.		2.80	3.70						
6	End of Borehole at 6.00 m		0.50	6.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
REMARKS							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		

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>F05</b>	
<b>CO-ORDINATES</b> 156,952.13 E 156,567.49 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 6.47		<b>DATE DRILLED</b> 12/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 13/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 4.00			
<b>CASING DEPTH (m)</b> 4.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown gravelly clay. NEC.				1	ENV	0.50-0.80			
1	MADE GROUND: Stiff brown gravelly clay with occasional cobbles. NEC. LIMESTONE. NEC.		5.67 5.47	0.80 1.00						
4	End of Borehole at 4.00 m		2.47	4.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>F06</b>
<b>CO-ORDINATES</b> 156,944.81 E 156,562.05 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 6.56	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 12/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 12/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 4.50	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 4.50	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft dark brown, very silty/clayey sandy gravel with occasional cobbles. Possible slight HC. MADE GROUND: Black carbonaceous gravel and peaty silt with occasional cream marl. HC. MADE GROUND: Loose dark brown silty sandy gravel. Slight HC. MADE GROUND: Loose black very silty/clayey sandy, fine to medium gravel with occasional cobbles with some wood. High HC impact. LIMESTONE. NEC.		6.36	0.20	1	ENV	0.00-0.20			
			6.16	0.40	2	ENV	0.20-0.40			
				5.76	0.80	3	ENV	0.40-0.80		
				5.06	1.50	4	ENV	0.80-1.50		
2										
4										
5	End of Borehole at 4.50 m		2.06	4.50						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>F07</b>
<b>CO-ORDINATES</b> 156,936.74 E 156,555.18 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 7.32	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 12/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 13/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 4.50	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 4.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown very gravelly clay. HC impact visible from 0.50m-1.10m.				1	ENV	0.50-1.00			
1	MADE GROUND: Stiff grey gravelly clay. HC odour.		6.22	1.10	2	ENV	1.10-1.50			
2	LIMESTONE. Local HC sheen and local thin clay band.		5.82	1.50						
4.50	End of Borehole at 4.50 m		2.82	4.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>F08</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,932.78 E 156,544.58 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.98		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, dark brown/brown mottled, clayey gravelly cobbly silt with rootlets. Possible HC.				1	ENV	0.00-0.50			
1	MADE GROUND: Soft, dark brown/black, clayey slightly sandy very gravelly silt with red brick. Possible HC.		6.98	1.00	2	ENV	1.00-1.50			
	LIMESTONE. Slight HC on occasional surfaces.		6.48	1.50						
2	End of Borehole at 2.50 m		5.48	2.50						
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>F09</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,926.13 E 156,538.73 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.17		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose black gravelly silt/sand. HC				1	ENV	0.00-0.50			
	MADE GROUND: Soft, dark brown peaty sandy gravelly silt with red brick & root hairs. Possible HC.		7.67	0.50	2	ENV	0.50-1.00			
1	MADE GROUND: Soft, black peaty sandy very gravelly silt with glass, wood & root hairs. Strong HC		7.17	1.00	3	ENV	1.00-1.50			
	LIMESTONE. HC decreasing with depth.		6.67	1.50						
2										
3										
4	End of Borehole at 3.50 m		4.67	3.50						
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> F11 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,908.22 E 156,530.52 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.22		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 5.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 5.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft/firm, dark brown/black, silty sandy gravelly (locally very gravelly 0.20-0.30m) clay with occasional concrete cobbles. NEC.				1	ENV	0.00-0.50			
1					2	ENV	1.00-1.50			
2	MADE GROUND: Soft/firm, dark grey/black mottled, sandy gravelly silt/clay. HC increasing with depth.		3.92	2.30	3	ENV	2.50-3.00			
3										
3	LIMESTONE. NEC.		3.22	3.00						
4										
5	End of Borehole at 5.00 m		1.22	5.00						
6										
7										
8										
9										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
20-11-09	5.00	3.50	5.00	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> F12 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,902.25 E 156,529.41 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 5.60		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.70	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.70	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm light brown sandy gravelly clay. NEC.				1	ENV	0.00-0.50			
	MADE GROUND: Dense grey gravel. Possible HC.		4.90	0.70	2	ENV	0.50-1.00			
	MADE GROUND: Firm light brown sandy gravelly clay. NEC.		4.80	0.80						
	MADE GROUND: Very soft, brown, sandy very gravelly silt/clay with occasional cobbles & root hairs. NEC		4.40	1.20						
	MADE GROUND: Very soft, brown, sandy very gravelly silt/clay with occasional cobbles & root hairs. Slight HC increasing with depth.		4.20	1.40						
	MADE GROUND: Very soft, brown, sandy very gravelly silt/clay with occasional cobbles & root hairs. Slight HC increasing with depth.		3.80	1.80	3	ENV	1.80-2.10			
	MADE GROUND: Soft, black, sandy very gravelly clay/silt with occasional cobbles. Strong HC		3.50	2.10	4	ENV	2.10-2.30			
	MADE GROUND: Soft/firm, brown/grey/black mottled, sandy gravelly silt/clay with occasional cobbles. HC increasing with depth.		3.30	2.30						
	LIMESTONE. NEC.		1.80	3.70						
4	End of Borehole at 3.70 m									

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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
									No water strike

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

<b>REMARKS</b> Hand dug pit 0.00-1.20m. Water coming in fast from surface, water has visible sheen and hc odour.	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>G01</b>
<b>CO-ORDINATES</b> 156,989.48 E 156,579.00 N		<b>SHEET</b> Sheet 1 of 2
<b>GROUND LEVEL (m AOD)</b> 7.92	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 19/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 20/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 11.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 11.00	<b>PROCESSED BY</b> D. O'Shea

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, brown/red/black sandy gravelly clay with occasional cobbles. NEC.				1	ENV	0.00-0.50			
1	MADE GROUND: Stiff, dark brown, sandy clay. NEC.		7.12	0.80	2	ENV	1.00-1.50			
	MADE GROUND: Loose light brown, clayey slightly gravelly sand with occasional cobbles. NEC.		6.92	1.00						
2					3	ENV	2.50-3.00			
3	MADE GROUND: Stiff, dark brown/grey/black, sandy clay. Possible HC.		5.42	2.50						
4	MADE GROUND: Loose light brown, clayey slightly gravelly sand with occasional cobbles. NEC.		4.92	3.00	4	ENV	4.50-5.00			
5	MADE GROUND: Soft (firm 5.00-6.00m), brown/grey, sandy slightly gravelly clay. NEC.		3.92	4.00						
6					5	ENV	7.00-7.50			
7										
8	MADE GROUND: Soft, grey/brown/black, sandy slightly gravelly clay. Possible HC.		-0.08	8.00	6	ENV	8.50-9.00			
9	LIMESTONE. NEC.		-1.08	9.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G01</b> Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,989.48 E 156,579.00 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.92		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11	End of Borehole at 11.00 m		-3.08	11.00						
12										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G02</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,982.14 E 156,576.61 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.99		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, dark brown, sandy gravelly silt/clay with many cobbles & red brick. Slight HC, at top and bottom of strata.				1	ENV	0.00-0.50			
1					2	ENV	1.00-1.50			
2	MADE GROUND: Soft/firm, brown (becoming black with depth), sandy gravelly clay with occasional cobbles. NEC.		6.49	1.50	3	ENV	2.00-2.50			
3	No recovery.		4.99	3.00						
4										
5	MADE GROUND: Soft/firm, dark brown/black mottled, sandy slightly gravelly silt/clay with occasional cobbles, red brick & wood.		3.49	4.50	4	ENV	5.00-5.50			
6	MADE GROUND: Soft/firm, green/yellow mottled, sandy slightly gravelly silt/clay with occasional cobbles, red brick & wood. No recovery.		2.19 1.99	5.80 6.00	5	ENV	5.80-6.00			
7										
8	MADE GROUND: Medium dense, brown, clayey, silty gravelly sand with occasional cobbles. Slight HC		0.49	7.50	6	ENV	8.00-8.50			
9	LIMESTONE. NEC.		-1.01	9.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
19-11-09	11.50	10.00	11.50	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G02</b> Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,982.14 E 156,576.61 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.99		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
11.50	End of Borehole at 11.50 m		-3.51	11.50						
12										
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
19-11-09	11.50	10.00	11.50	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G03</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,974.42 E 156,571.25 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.92		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, dark brown, slightly sandy gravelly clay with occasional cobbles, wood, concrete, red brick & root hairs. NEC.		6.42	1	ENV	0.00-0.50				
1				2	ENV	1.00-1.50				
	MADE GROUND: Soft, brown, very sandy gravelly clay with occasional cobbles. Possible HC.			3	ENV	1.50-2.00				
2	MADE GROUND: Loose, grey, very sandy gravelly cobbly silt. NEC.			4	ENV	2.10-2.50				
	MADE GROUND: Soft/firm, grey/black/brown mottled, slightly sandy gravelly clay with occasional cobbles. HC			5	ENV	2.50-3.00				
3	No recovery.		5.42	2.50						
			4.92	3.00						
4										
5										
6	MADE GROUND: Loose, grey, clayey silty gravelly cobbles. HC		1.92	6.00						
7										
8	MADE GROUND: Soft/firm, grey/brown mottled, slightly sandy gravelly clay with many cobbles. HC		0.42	7.50						
9	LIMESTONE. NEC.		-1.08	9.00	6	ENV	8.50-9.00			

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
24-09-09	1.00	1.00	9.00	50mm SP						
REMARKS					Sample Legend					
2.0 hrs standing - Health and Safety due to very contaminated soils.					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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>G03</b>	
<b>CO-ORDINATES</b> 156,974.42 E 156,571.25 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.92		<b>DATE DRILLED</b> 24/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 24/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> A. Mahony	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 11.00			
<b>CASING DEPTH (m)</b> 11.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11	End of Borehole at 11.00 m		-3.08	11.00						
12										
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
24-09-09	1.00	1.00	9.00	50mm SP						

**REMARKS** 2.0 hrs standing - Health and Safety due to very contaminated soils.

**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

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G04</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,966.14 E 156,565.03 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.45		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff very sandy gravelly black clay. NEC.		7.15	0.30	1	ENV	0.30-0.50			
	MADE GROUND: Loose red/black gravelly clay. Possible cinders. Possible contamination.		6.95	0.50						
	MADE GROUND: Soft dark grey clay. NEC.		6.70	0.75						
1	MADE GROUND: Loose grey/white clayey gravel (possible ash). Possible contamination.		6.45	1.00	2	ENV	1.00-1.50			
	MADE GROUND: Soft black very sandy very gravelly clay (ash). Possible contamination.		5.95	1.50						
2	MADE GROUND: Soft dark grey gravelly clay. NEC.				3	ENV	2.50-3.00			
3	MADE GROUND: Soft brown/grey clay. NEC.		4.45	3.00	4	ENV	3.50-4.00			
4					5	ENV	4.50-5.00			
5	MADE GROUND: Soft grey clay. HC odour.		2.45	5.00	6	ENV	5.50-6.00			
6	MADE GROUND: No recovery.	1.45	6.00							
7										
8	MADE GROUND: Soft slightly gravelly clay. Slight HC sheen. 0.30m recovery.	-0.05	7.50	7	ENV	7.50-9.00				
9	MADE GROUND: Loose slightly clayey gravel with occasional cobbles. HC-free phase oil.	-1.55	9.00	8	ENV	9.50-10.00				

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
12-11-09	12.00	10.00	12.00	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>G04</b>	
<b>CO-ORDINATES</b> 156,966.14 E 156,565.03 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.45		<b>DATE DRILLED</b> 12/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 13/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 12.00			
<b>CASING DEPTH (m)</b> 12.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. HC, Recovery predominantly oil.		-2.55	10.00						
11										
12	End of Borehole at 12.00 m		-4.55	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
12-11-09	12.00	10.00	12.00	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G05</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,959.42 E 156,559.33 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.24		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft to firm brown mottled black sandy, gravelly silt/clay with red brick and occasional cobbles. Possible slight HC.				1	ENV	0.00-0.50			
1	MADE GROUND: Soft reddish black sandy, gravelly silt/clay. Slight HC - free phase oil.		6.24	1.00	2	ENV	1.00-1.50			
2	MADE GROUND: Soft reddish black sandy, gravelly silt/clay. Only 0.10m recovered - free phase oil.		5.74	1.50						
3	MADE GROUND: Soft to slightly firm, grey, very sandy, very gravelly silt with occasional cobbles. Slight HC.		4.24	3.00						
4	MADE GROUND: Grey silty sand. Water washed away much of recovery (only 1.00m recovered). Free phase oil in water.		2.74	4.50	3	ENV	4.00-4.50			
5	MADE GROUND: cobble with some silty sand. HC.		1.34	5.90						
6	MADE GROUND: No recovery.		1.24	6.00	4	ENV	5.50-6.00			
7										
8	MADE GROUND: Soft to firm grey, clayey, very sandy silt. Heavy HC with free phase oil.		-0.26	7.50	5	ENV	8.00-8.50			
9	LIMESTONE. Heavy HC with free phase oil.		-1.56	8.80						

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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
					1.50	NR	NS	NR	NR	Rapid
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
17-11-09	9.00	1.00	9.00	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> G05 Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,959.42 E 156,559.33 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.24		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. Heavy HC with free phase oil. <i>(continued)</i>	[Brick Pattern]								[Hatched Pattern]
11	End of Borehole at 11.00 m		-3.76	11.00						
12										
13										
14										
15										
16										
17										
18										
19										

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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
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
17-11-09	9.00	1.00	9.00	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G06</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,952.02 E 156,552.79 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.20		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose sandy cobbly gravel - possible powdered concrete NEC.		6.20	1.00	1	ENV	1.50-2.00			
1	MADE GROUND: Loose, brown/red, clayey gravelly sand. Possible HC.									
2	MADE GROUND: Loose black/brown, clayey gravelly sand with occasional cobbles. Strong HC - free phase oil.									
3	MADE GROUND: Firm (soft 6.00-7.00m), brown, very sandy clay with occasional cobbles. Possible HC.									
4	MADE GROUND: Firm (soft 6.00-7.00m), brown, very sandy clay with occasional cobbles. Possible HC.									
5	MADE GROUND: Firm (soft 6.00-7.00m), brown, very sandy clay with occasional cobbles. Possible HC.									
6	MADE GROUND: Firm (soft 6.00-7.00m), brown, very sandy clay with occasional cobbles. Possible HC.	-0.60	7.80	5	ENV	8.00-8.50				
7	MADE GROUND: Firm, brown sandy clay. Possible HC.	-1.50	8.70	6	ENV	8.70-8.90				
8	MADE GROUND: Soft, black, sandy gravelly clay. Strong HC.	-1.70	8.90							
9	MADE GROUND: Soft, black, sandy gravelly clay. Strong HC.	-1.80	9.00							
	LIMESTONE. NEC.									

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>G06</b>	
		<b>SHEET</b> Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,952.02 E 156,552.79 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.20		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11	End of Borehole at 11.00 m		-3.80	11.00						
12										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> G07 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,945.33 E 156,546.67 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.24		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: 0.1m recovered of medium dense clayey gravel with occasional cobbles. NEC.				1	ENV	0.00-1.50			
1										
2	MADE GROUND: Stiff brown very gravelly clay with red brick. NEC.		5.74	1.50	2	ENV	1.50-2.00			
3	MADE GROUND: Loose dark grey/brown clayey sand with free phase oil.		4.74	2.50	3	ENV	2.50-3.00			
4	MADE GROUND: No recovery.		4.24	3.00						
5	MADE GROUND: Loose dark grey/brown clayey sand with free phase oil.		2.74	4.50	4	ENV	4.50-5.00			
6	Dense black gravelly COBBLES. HC-oil. Possible variably weathered limestone. LIMESTONE. NEC.		1.54	5.70	5	ENV	5.50-6.00			
7			1.24	6.00						
8										
9	End of Borehole at 9.00 m		-1.76	9.00						

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>G08</b>	
<b>CO-ORDINATES</b> 156,937.52 E 156,540.22 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.28		<b>DATE DRILLED</b> 18/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 18/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> A. Mahony	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 2.50			
<b>CASING DEPTH (m)</b> 2.50			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown sandy gravelly clay. Slight HC odour.		6.88	0.40	1	ENV	0.00-0.40			
	LIMESTONE. NEC.									
2.50	End of Borehole at 2.50 m		4.78	2.50						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
18-11-09	2.50	1.00	2.50	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>G09</b>
<b>CO-ORDINATES</b> 156,929.91 E 156,534.60 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 7.20	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 18/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 18/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 2.50	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 2.50	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft dark brown/black sandy gravelly clay with red brick. Very slight HC odour. LIMESTONE. NEC.		6.90	0.30	1	ENV	0.00-0.30			
1										
2										
2.50	End of Borehole at 2.50 m		4.70	2.50						
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G10</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,922.11 E 156,528.34 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.88		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose brown (dark brown - top and bottom of run) slightly silty, slightly gravelly fine to medium sand. NEC.		6.38	0.50	1	ENV	0.00-0.50			
1	LIMESTONE. NEC.									
2										
2.50	End of Borehole at 2.50 m		4.38	2.50						
3										
4										
5										
6										
7										
8										
9										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>G11</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,914.76 E 156,523.46 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.63		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft black/dark brown clayey sandy, very gravelly SILT. HC.				1	ENV	0.00-0.50			
1	MADE GROUND: Soft grey/brown very gravelly SILT/CLAY. HC increasing with depth.		6.03	0.60	2	ENV	1.00-1.60			
2	LIMESTONE, locally very silty. HC in silty zone 1.80-1.90m.		5.03	1.60	3	ENV	1.80-1.90			
2	End of Borehole at 2.00 m		4.63	2.00						
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> G12 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,908.01 E 156,516.78 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.85		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Concrete. NEC.		6.75	0.10						
	MADE GROUND: Loose, grey/black, clayey gravelly sand with occasional cobbles. Possible HC.		1	ENV	0.50-1.00					
1	MADE GROUND: Soft, red/brown/orange, sandy gravelly clay. NEC.		2	ENV	1.00-1.50					
	MADE GROUND: Soft/firm, brown/black, sandy gravelly clay. Strong HC - free phase oil.		3	ENV	1.50-2.00					
2	MADE GROUND: Loose sandy cobby gravel - possible powdered boulder. NEC.		4	ENV	2.50-3.00					
	MADE GROUND: Soft, brown, sandy gravelly clay with occasional cobbles. NEC.		5	ENV	3.00-3.30					
3	MADE GROUND: Soft, black/brown, sandy gravelly clay. Strong HC - free phase oil.		6	ENV	3.30-3.80					
	MADE GROUND: Firm, orange/brown, clayey gravelly sand with occasional cobbles. Possible HC.		3.05		3.80					
4	Loose grey clayey sandy gravelly COBBLES - probable weathered rock. NEC.		2.85		4.00					
	LIMESTONE. NEC.									
6	End of Borehole at 6.00 m		0.85	6.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
REMARKS					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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H01 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,996.40 E 156,574.93 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.77		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete		7.67	0.10						
	MADE GROUND: Stiff brown slightly sandy gravelly clay with yellow brick. NEC.		7.27	0.50						
	MADE GROUND: Limestone cobble. NEC		6.97	0.80	1	ENV	0.80-1.00			
1	MADE GROUND: Stiff black slightly sandy, slightly gravelly clay. HC odour.		6.67	1.10	2	ENV	1.50-2.00			
	MADE GROUND: Firm grey slightly gravelly clay. NEC.				3	ENV	2.50-3.00			
					4	ENV	3.50-4.00			
				5	ENV	4.50-5.00				
6	MADE GROUND: Clayey sand with cobbles. NEC. (0.50m recovery)		1.77	6.00	6	ENV	6.00-6.50			
7										
8	LIMESTONE. NEC.		0.27	7.50						
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H01 Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,996.40 E 156,574.93 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.77		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)	[Brick Pattern]								
	End of Borehole at 10.50 m		-2.73	10.50						
11										
12										
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H02 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,988.90 E 156,568.91 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.79		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete	<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); color: red; font-size: 12pt; opacity: 0.5;">                     For inspection purposes only.                      Consent of copyright owner required for any other use.                 </div>	7.69	0.10	1	ENV	0.10-0.50			
	MADE GROUND: Stiff grey/brown sandy gravelly clay with red brick. NEC.		7.29	0.50	2	ENV	0.50-1.00			
	MADE GROUND: Loose black clayey gravel (possible cinders). Possible contamination.		6.79	1.00						
	MADE GROUND: Soft grey/white slightly gravelly clay (probable ash). Possible contamination.				3	ENV	1.50-2.00			
	MADE GROUND: Soft black clay impacted with HC odour.		5.79	2.00	4	ENV	2.00-2.10			
	MADE GROUND: Soft light brown slightly gravelly clay impacted with HC odour.		5.69	2.10						
					5	ENV	3.00-3.50			
					6	ENV	4.00-4.50			
					7	ENV	5.00-5.50			
					8	ENV	6.00-6.50			
				9	ENV	7.00-7.50				
				10	ENV	8.00-8.50				
9	LIMESTONE. NEC.		-1.21	9.00						

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> H02	
<b>CO-ORDINATES</b> 156,988.90 E 156,568.91 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.79		<b>DATE DRILLED</b> 09/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 09/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 12.00			
<b>CASING DEPTH (m)</b> 12.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-4.21	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H03 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,981.95 E 156,561.75 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.64		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
0.25	MADE GROUND: 0.10m recovered of loose fill		7.39	0.25	1	ENV	0.25-3.00			
3.00	MADE GROUND: Stiff brown slightly gravelly clay with occasional cobbles. NEC except slight odour of HC at 6.75m.		4.64	3.00	2	ENV	3.00-3.50			
4.00					3	ENV	4.00-4.50			
5.00					4	ENV	5.00-5.50			
6.50					5	ENV	6.50-7.00			
7.50					6	ENV	7.50-8.00			
8.50	Stiff brown/black slightly gravelly CLAY with occasional cobbles. Possible TOC.		-0.86	8.50	7	ENV	8.50-9.00			
9.00	LIMESTONE. NEC.		-1.36	9.00						

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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
									No water strike

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

<b>REMARKS</b> 0.25-3.00m concrete in barrel pushed out loose material. 0.1m recovery.	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09





# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>H03</b>
<b>CO-ORDINATES</b> 156,981.95 E 156,561.75 N		<b>SHEET</b> Sheet 2 of 2
<b>GROUND LEVEL (m AOD)</b> 7.64	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 09/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 09/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 12.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 12.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-4.36	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
<b>REMARKS</b> 0.25-3.00m concrete in barrel pushed out loose material. 0.1m recovery.					<b>Sample Legend</b> 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					

IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H04 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,973.94 E 156,556.92 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.40		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete. Returns of pulverised (probable) concrete (powdered rock with cobbles)				1	ENV	0.00-0.50			
1					2	ENV	1.50-2.00			
2					3	ENV	2.50-3.00			
3	MADE GROUND: 0.10m recovered. Soft black gravelly clay with occasional cobbles and red brick. HC odour.		4.40	3.00	4	ENV	3.00-6.00			
4										
5										
6	MADE GROUND: Soft grey slightly gravelly clay. NEC.		1.40	6.00	5	ENV	6.00-6.50			
7					6	ENV	7.00-7.50			
8	MADE GROUND: Soft black, slightly gravelly clay with occasional cobbles. HC odour.		-0.60	8.00	7	ENV	8.50-9.00			
9	LIMESTONE. NEC.		-1.60	9.00						

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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
									No water strike

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

<b>REMARKS</b> 0.75 hrs standing - Health and Safety due to very contaminated soils.	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>H04</b>
<b>CO-ORDINATES</b> 156,973.94 E 156,556.92 N		<b>SHEET</b> Sheet 2 of 2
<b>GROUND LEVEL (m AOD)</b> 7.40	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 09/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 09/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 12.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 12.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-4.60	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

**REMARKS** 0.75 hrs standing - Health and Safety due to very contaminated soils.

**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

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H05 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,965.27 E 156,550.29 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.87		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete		6.72	0.15	1	ENV	0.15-0.40			
	MADE GROUND: Soft grey sandy gravelly clay. HC odour.		6.47	0.40						
	MADE GROUND: Loose cream fine clayey sand (possible ash). NEC.		6.07	0.80						
1	MADE GROUND: Loose red very clayey gravel. NEC.		5.87	1.00						
	MADE GROUND: Soft, grey gravelly clay with layers of cream, brown and black. HC at black zones from 2.00-3.00m.				2	ENV	1.50-2.00			
					3	ENV	2.50-3.00			
3	MADE GROUND: Soft grey slightly sandy clay with occasional cobbles and red brick. HC odour.		3.87	3.00						
					4	ENV	3.50-4.00			
					5	ENV	4.50-5.00			
					6	ENV	5.50-6.00			
6	MADE GROUND: Loose grey/black clayey sand. NEC.		0.87	6.00						
	LIMESTONE. HC sheen.		0.57	6.30	7					
9	LIMESTONE. NEC.		-2.13	9.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b> Possibly no recovery 0.15-1.50m.	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>H05</b>
<b>CO-ORDINATES</b> 156,965.27 E 156,550.29 N		<b>SHEET</b> Sheet 2 of 2
<b>GROUND LEVEL (m AOD)</b> 6.87	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 06/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 06/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 12.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 12.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-5.13	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

**REMARKS** Possibly no recovery 0.15-1.50m.

**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

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H06 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,959.01 E 156,544.70 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.95		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete with rebar		6.80	0.15	1	ENV	0.50-1.00			
1	MADE GROUND: Medium dense, light brown, clayey, slightly sandy gravel. NEC.		5.65	1.30	2	ENV	1.30-1.50			
2	MADE GROUND: Firm reddish brown sandy gravelly clay with red brick. NEC.		5.45	1.50	3	ENV	2.00-2.50			
3	MADE GROUND: Medium dense, clayey gravel with occasional cobbles. Heavy HC.		3.95	3.00	4	ENV	3.50-4.00			
4	MADE GROUND: Soft black, slightly sandy slightly gravelly clay. Heavy HC.		2.45	4.50	5	ENV	4.50-5.00			
5	MADE GROUND: Soft grey brown, slightly sandy slightly gravelly clay with 3mm-10mm lenses of HC impacted gravel. HC throughout.		0.95	6.00	6	ENV	5.50-6.00			
6	MADE GROUND: Medium dense, grey clayey gravelly sand with many cobbles. AEC.				7	ENV	6.50-7.00			
7					8	ENV	7.50-8.00			
8	MADE GROUND: Stiff grey/brown slightly sandy gravelly clay. NEC.		-1.55	8.50	9	ENV	8.50-9.00			
9	LIMESTONE with stiff grey, slightly gravelly clay band at 10.60-10.90m. NEC. (2.00m recovered - sonic drilling pulverising rock.)		-2.05	9.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H06 Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,959.01 E 156,544.70 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.95		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE with stiff grey, slightly gravelly clay band at 10.60-10.90m. NEC. (2.00m recovered - sonic drilling pulverising rock.) (continued)				10	ENV	10.60-10.90			
12	End of Borehole at 12.00 m		-5.05	12.00						
11										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>H07</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,951.40 E 156,539.25 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 06/11/2009
<b>GROUND LEVEL (m AOD)</b> 6.99	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 06/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 7.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 7.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown sandy, slightly gravelly clay. NEC.				1	ENV	0.00-0.50			
1	MADE GROUND: Hard to very hard, cream/white, sandy gravelly clay (probable concrete pulverised by sonic drilling). NEC.		6.24	0.75						
2	MADE GROUND: Firm dark brown slightly sandy slightly gravelly clay. HC especially in gravel bands at 2.70-2.80m and 3.80m.		5.49	1.50	2	ENV	1.50-2.00			
3					ENV	2.50-3.00				
4					ENV	3.50-4.00				
5	MADE GROUND: Stiff dark grey, slightly sandy, slightly gravelly clay. HC.		2.49	4.50	5	ENV	4.50-5.00			
6					ENV	5.00-5.50				
6	LIMESTONE with soft grey clay band 7.20-7.40m. NEC.		1.49	5.50						
7	End of Borehole at 7.50 m		-0.51	7.50	7	ENV	7.20-7.40			
8										
9										

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
INSTALLATION DETAILS					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type	06-11-09	7.50			Soil damp at 1.50m		
<b>REMARKS</b> 1.0 hrs standing - Health and Safety due to very contaminated soils.					<b>Sample Legend</b> 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			

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>H08</b>
<b>CO-ORDINATES</b> 156,943.23 E 156,532.83 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 7.07	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 05/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 05/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 2.30	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 2.30	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Loose dark brown very clayey gravelly SAND				1	ENV	0.00-0.30			
0.30	LIMESTONE. NEC. (1.00m recovered - sonic drilling pulverising rock.)		6.77	0.30						
2.30	End of Borehole at 2.30 m		4.77	2.30						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>H09</b>	
<b>CO-ORDINATES</b> 156,936.29 E 156,526.49 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.15		<b>DATE DRILLED</b> 05/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 05/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 9.00			
<b>CASING DEPTH (m)</b> 9.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Very stiff grey sandy gravelly clay. NEC.		6.75	0.40	1	ENV	0.00-0.40			
1	MADE GROUND: Soft grey/brown slightly sandy, slightly gravelly clay with occasional cobbles. NEC.			1.50	2	ENV	1.00-1.50			
2	MADE GROUND: Medium dense grey, slightly clayey gravel with many cobbles (10cm). Many spots of tar. HC odour. (0.65m recovery).			3.00	3	ENV	2.00-3.00			
3	MADE GROUND: Loose grey clayey, gravelly sand with occasional cobbles. Made up of approx. 20% globules of tar. HC odour.			3.65	4	ENV	3.00-3.50			
4	MADE GROUND: Soft to firm, sandy slightly gravelly clay. HC odour.			3.15	5	ENV	4.00-4.20			
5	MADE GROUND: Very stiff slightly sandy, slightly gravelly clay with red brick and grass			2.95	4.20					
6	Very stiff grey gravelly CLAY with many cobbles. NEC.		1.95	5.20	6	ENV	5.50-6.00			
7	Very stiff mottled grey brown slightly sandy, slightly gravelly CLAY with occasional cobbles. HC odour, no visible evidence.			6.00						
9	LIMESTONE. HC odour and sheen.		1.15	6.00						
9	End of Borehole at 9.00 m		-1.86	9.00						

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
				0.10	NR	NS	NR	NR	NR

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

<b>REMARKS</b> Pic1 & pic2	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H10 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,927.95 E 156,520.73 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.96		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Stiff grey/brown slightly sandy gravelly CLAY. NEC.				1	ENV	0.00-0.50			
	Very stiff to hard gravelly CLAY. NEC.		6.26	0.70						
1	LIMESTONE. HC odour and sheen 1.00-2.00m. NEC 2.00-3.00m.		5.96	1.00	2	ENV	1.50-2.00			
3	End of Borehole at 3.00 m		3.96	3.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

**REMARKS** Pic1 0.00-2.00m & pic2 2.00-3.00m

**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

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H11 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,920.54 E 156,514.62 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.77		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Soft black, very sandy, very gravelly SILT with occasional cobbles. Heavy HC.				1	ENV	0.50-1.00			
1	Soft to locally firm, grey/black mottled, very gravelly SILT/CLAY with occasional cobbles. Predominantly gravel with very heavy HC at 1.30m.		5.77	1.00	3	ENV	1.30-1.35			
	LIMESTONE. Heavy HC.		5.27	1.50	2	ENV	1.35-1.50			
2	End of Borehole at 2.00 m		4.77	2.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> H12 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,913.09 E 156,509.48 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 6.76		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 4.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 4.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Soft grey/brown sandy gravelly SILT/CLAY. HC.		6.56	0.20	1	ENV	0.20-0.40			
	Black silty GRAVEL. Heavy HC.		6.36	0.40						
1	Soft grey/brown sandy gravelly SILT/CLAY. Slight HC.		6.06	0.70	2	ENV	0.70-1.50			
	Soft to firm grey mottled brown silty sandy gravelly CLAY. HC.									
2	Limestone BOULDER (pulverised with silt)		5.26	1.50	3	ENV	1.50-2.00			
	Limestone BOULDER		4.76	2.00						
3	Soft (crumbly) to locally stiff, grey/brown gravelly SILT. Very bad odour, not HC.		4.26	2.50	4	ENV	2.70-3.00			
	Limestone GRAVEL. NEC.		3.76	3.00						
4	LIMESTONE. NEC.		3.26	3.50						
	End of Borehole at 4.50 m		2.26	4.50						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
17-09-09	4.50	3.00	4.50	50mm SP						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>101</b>	
		<b>SHEET</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 157,002.93 E 156,567.12 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.81		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete	<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); color: red; font-size: 10px; opacity: 0.5;">                     For inspection purposes only.                      Consent of copyright owner required for any other use.                 </div>	7.66	0.15	1	ENV	0.00-0.50			
1	MADE GROUND: Firm brown slightly sandy gravelly clay. NEC.					2	ENV	1.00-1.50		
2						3	ENV	2.50-3.00		
3	MADE GROUND: Soft grey slightly gravelly clay. NEC.			5.31	2.50	4	ENV	3.50-4.00		
4						5	ENV	4.50-5.00		
5						6	ENV	5.50-6.00		
6	MADE GROUND: Loose grey slightly gravelly sand with occasional cobbles. NEC.			1.81	6.00	7	ENV	6.00-6.50		
7	LIMESTONE. NEC.		0.81	7.00						
8										
9										

HARD STRATA BORING/CASELLING				WATER STRIKE DETAILS					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>101</b>	
<b>CO-ORDINATES</b> 157,002.93 E 156,567.12 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.81		<b>DATE DRILLED</b> 12/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 13/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 10.00			
<b>CASING DEPTH (m)</b> 10.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10			-2.19	10.00						
11										
12										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

**14463**

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>102</b>	
<b>CO-ORDINATES</b> 156,994.98 E 156,559.40 N		<b>SHEET</b> Sheet 1 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.78		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 14/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 12.00			
<b>CASING DEPTH (m)</b> 12.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete		7.63	0.15						
	MADE GROUND: Firm brown sandy gravelly clay. NEC.		7.43	0.35	1	ENV	0.35-0.55			
	MADE GROUND: Loose light brown sand. NEC.		7.23	0.55	2	ENV	0.55-0.70			
	MADE GROUND: Loose black clayey sand and gravel - possible cinders. Possible contamination.		7.08	0.70	3	ENV	1.00-1.25			
	MADE GROUND: Stiff white/light brown sandy clay - possible ash. Possible contamination.		6.88	0.90	4	ENV	1.25-1.50			
	MADE GROUND: Firm black slightly gravelly clay. Possible HC.		6.53	1.25						
	MADE GROUND: Medium dense white clayey sand - possible ash. Possible HC.		6.28	1.50						
	MADE GROUND: Firm brown mottled black/grey slightly gravelly clay. Possible HC impact in grey/black.				5	ENV	2.00-2.50			
					6	ENV	3.00-3.50			
					7	ENV	4.00-4.50			
					8	ENV	5.50-6.00			
6	MADE GROUND: No recovery.		1.78	6.00						
					9	ENV	7.50-8.00			
	MADE GROUND: Very soft grey sandy clay. NEC.		0.28	7.50						
					10	ENV	8.50-9.00			
9	LIMESTONE. NEC.		-1.22	9.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT 23/12/09





# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>102</b>	
<b>CO-ORDINATES</b> 156,994.98 E 156,559.40 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.78		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 14/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 12.00			
<b>CASING DEPTH (m)</b> 12.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-4.22	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>103</b>	
		<b>SHEET</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,988.29 E 156,555.67 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.73		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete									
	No recovery.		7.23	0.50						
	MADE GROUND: Firm brown slightly gravelly clay with local loose light brown clayey sand (0.10m). NEC. 0.50m recovered		6.23	1.50	1	ENV	1.50-3.00			
	MADE GROUND: Very soft brown slightly gravelly clay. NEC.		4.73	3.00	2	ENV	3.00-3.50			
					3	ENV	4.00-4.50			
					4	ENV	5.50-6.00			
	MADE GROUND: No recovery.		1.73	6.00						
	MADE GROUND: Very soft brown slightly gravelly clay. NEC.		0.23	7.50	5	ENV	7.50-8.00			
					6	ENV	8.00-8.50			
	MADE GROUND: Very soft brown very gravelly clay. NEC.		-0.87	8.60						
9	LIMESTONE. NEC.	-0.92	8.65							

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>103</b>	
<b>CO-ORDINATES</b> 156,988.29 E 156,555.67 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.73		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 14/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 12.00			
<b>CASING DEPTH (m)</b> 12.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-4.27	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<p><b>Sample Legend</b></p> <p>D - Small Disturbed (tub)          B - Bulk Disturbed          LB - Large Bulk Disturbed          Env - Environmental Sample (Jar + Vial + Tub)</p> <p style="font-size: 8pt;">U - Undisturbed 100mm Diameter Sample          P - Undisturbed Piston Sample</p>
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

**14463**

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>104</b>	
		<b>SHEET</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,979.48 E 156,549.68 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.58		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete. No recovery									
1	Concrete. NEC.		6.08	1.50						
2										
3	MADE GROUND: Very soft dark brown/black clay. Possible HC in black, no odour.		4.78	2.80	1	ENV	2.80-3.00			
					2	ENV	3.00-3.50			
4	MADE GROUND: Very soft black gravelly clay. HC odour.		3.58	4.00	3	ENV	4.00-4.50			
	MADE GROUND: Very soft black very gravelly clay. HC impact.		3.08	4.50						
			2.88	4.70						
5	MADE GROUND: Very soft dark brown/black slightly gravelly clay with wood at 5.00m. Possible HC impact.				4	ENV	5.50-6.00			
6	MADE GROUND: Very soft black very gravelly clay. HC impact.		1.58	6.00	5	ENV	6.00-6.50			
	MADE GROUND: Very soft black/dark brown gravelly clay. HC impact.		1.18	6.40						
7	MADE GROUND: Very soft dark brown very gravelly clay. HC impact.		0.58	7.00						
	MADE GROUND: Very soft black slightly gravelly clay with occasional cobbles. HC impact.		0.08	7.50	6	ENV	7.50-8.00			
8	LIMESTONE. NEC.		-0.42	8.00						
9										

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>104</b>	
<b>CO-ORDINATES</b> 156,979.48 E 156,549.68 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 7.58		<b>DATE DRILLED</b> 14/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 15/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 11.00			
<b>CASING DEPTH (m)</b> 11.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11	End of Borehole at 11.00 m		-3.42	11.00						
12										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>105</b>	
<b>CO-ORDINATES</b> 156,970.81 E 156,542.23 N		<b>SHEET</b> Sheet 1 of 2	
<b>GROUND LEVEL (m AOD)</b> 6.98		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 15/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 112			
<b>BOREHOLE DEPTH (m)</b> 10.50			
<b>CASING DEPTH (m)</b> 10.50			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete. MADE GROUND: No recovery. Possible cavity from 1.00-3.00m		6.88	0.10						
3	MADE GROUND: Medium dense, brown/black mottled, very clayey gravel. HC impact in black.		3.98	3.00						
3.5	MADE GROUND: Soft dark brown/black gravelly clay. HC odour.		3.48	3.50	1	ENV	3.50-4.00			
4					2	ENV	4.00-4.50			
4.5	MADE GROUND: Very soft, dark brown sandy clay. NEC. Mostly washed away by fast waterstrike at 4.50m - little recovery.		2.48	4.50	3	ENV	5.00-5.50			
5.6	MADE GROUND: Loose dark brown very clayey sand. NEC.		1.38	5.60						
5.8	MADE GROUND: cobble. NEC.		1.18	5.80	4	ENV	5.90-6.00			
5.9	MADE GROUND: Soft dark brown very clayey gravel. Possible HC.		1.08	5.90						
6.0	MADE GROUND: Loose dark grey slightly clayey sand. NEC.		0.98	6.00						
6.6	MADE GROUND: Very soft grey very gravelly clay. NEC.		0.38	6.60	5	ENV	6.70-7.00			
6.7	MADE GROUND: Very soft grey very gravelly clay. NEC.		0.28	6.70	6	ENV	7.00-7.20			
7.2	MADE GROUND: Very soft grey clay. HC.		-0.22	7.20						
7.5	Dense grey very clayey COBBLES. HC impact. Possible variably weathered limestone.		-0.52	7.50						
8	LIMESTONE. NEC.									

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
				4.50	NR	NS	2.00	NR	Rapid

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

<b>REMARKS</b>					<b>Sample Legend</b> 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				
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>105</b>	
<b>CO-ORDINATES</b> 156,970.81 E 156,542.23 N		<b>SHEET</b> Sheet 2 of 2	
<b>GROUND LEVEL (m AOD)</b> 6.98		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 15/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 112			
<b>BOREHOLE DEPTH (m)</b> 10.50			
<b>CASING DEPTH (m)</b> 10.50			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)	□								
	End of Borehole at 10.50 m		-3.52	10.50						
11										
12										
13										
14										
15										
16										
17										
18										
19										

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>106</b>	
<b>CO-ORDINATES</b> 156,964.77 E 156,537.80 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.06		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 15/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 112			
<b>BOREHOLE DEPTH (m)</b> 9.00			
<b>CASING DEPTH (m)</b> 9.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete with rebar		6.91	0.15						
	MADE GROUND: Firm brown gravelly clay. Free phase oil from 1.50m-1.90m.				1	ENV	0.50-1.00			
1					2	ENV	1.50-1.90			
2	MADE GROUND: Very soft gravelly very sandy clay. Free phase oil.		5.16	1.90						
	MADE GROUND: Loose dark grey clayey sand. HC - free phase oil.		4.56	2.50	3	ENV	2.50-3.00			
3	MADE GROUND: Firm brown mottled black clay. HC in black.		4.06	3.00						
	MADE GROUND: Loose black very clayey gravel. HC-free phase oil.		3.76	3.30	4	ENV	3.30-3.50			
	MADE GROUND: Soft brown/black mottled gravelly clay with cobbles at 4.30m. HC impact - free phase oil.		3.56	3.50	5	ENV	4.00-4.50			
4	MADE GROUND: Loose clayey grey sand. HC.		2.56	4.50						
	MADE GROUND: Soft black clay. Heavy HC and free phase oil.		2.36	4.70	6	ENV	5.00-5.50			
5										
6	MADE GROUND: Firm brown/dark grey gravelly clay. HC in dark grey mottling.		1.36	5.70						
	LIMESTONE. NEC except for local staining at start of run.		1.06	6.00						
7										
8										
9	End of Borehole at 9.00 m		-1.94	9.00						

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>107</b>	
<b>CO-ORDINATES</b> 156,957.30 E 156,532.14 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.04		<b>DATE DRILLED</b> 11/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 12/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> D. O'Shea	
<b>BOREHOLE DIAMETER (mm)</b> 112			
<b>BOREHOLE DEPTH (m)</b> 8.00			
<b>CASING DEPTH (m)</b> 8.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft to firm light brown sandy gravelly clay. NEC.		6.64	0.40	1	ENV	0.40-1.00			
	MADE GROUND: Soft black/dark brown sandy gravelly clay. Possible HC.		6.04	1.00	2	ENV	1.00-1.50			
1	MADE GROUND: Loose light brown, clayey sandy gravel with occasional cobbles. Possible HC.		5.54	1.50						
	MADE GROUND: Soft brown, sandy gravelly clay. NEC.		5.04	2.00	3	ENV	2.00-3.00			
2	MADE GROUND: Soft black/grey sandy gravelly clay. High HC with free phase oil.		4.04	3.00	4	ENV	3.00-4.00			
3	MADE GROUND: Soft black sandy clay. High HC with free phase oil.	3.04	4.00	5	ENV	4.00-5.00				
4	MADE GROUND: Soft brown/black mottled sandy gravelly clay. High HC impact									
5	LIMESTONE. Local spots of HC 5.20-5.30m.		2.04	5.00						
6										
7										
8	End of Borehole at 8.00 m		-0.96	8.00						
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>108</b>	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,949.84 E 156,525.97 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.11		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 7.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 7.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft dark brown/black sandy gravelly clay. NEC.		6.81	0.30	1	ENV	0.50-1.00			
	MADE GROUND: Soft dark brown sandy slightly gravelly clay. Possible HC.				2	ENV	1.00-1.50			
1										
2	MADE GROUND: No recovery.			5.61	1.50					
3	MADE GROUND: Soft dark brown sandy slightly gravelly clay. High HC with free phase oil.			4.11	3.00	3	ENV	3.00-3.50		
	MADE GROUND: Soft black sandy slightly gravelly clay. High HC with free phase oil.			3.61	3.50	4	ENV	3.50-3.90		
4	MADE GROUND: Stiff brown/black clay. Possible HC.			3.21	3.90	5	ENV	3.90-4.30		
	MADE GROUND: Loose sandy gravel and brick. Possible HC.		2.81	4.30	6	ENV	4.30-4.40			
	Soft black sandy CLAY. High HC.		2.71	4.40	7	ENV	4.40-4.50			
5	LIMESTONE. NEC.		2.61	4.50						
8	End of Borehole at 7.50 m		-0.39	7.50						

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							
REMARKS					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						

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

**14463**

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>109</b>	
<b>CO-ORDINATES</b> 156,942.49 E 156,519.27 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.15		<b>DATE DRILLED</b> 11/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 13/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> A. Mahony	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 7.00			
<b>CASING DEPTH (m)</b> 7.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft to firm dark brown/black mottled, sandy gravelly silt/clay. Possible slight HC.		6.45	0.70	1	ENV	0.00-0.50			
1	MADE GROUND: Soft to firm dark brown/brown/black mottled, gravelly clay. Possible slight HC.				2	ENV	1.00-1.50			
2	MADE GROUND: Soft dark brown mottled red/black, sandy gravelly clay with occasional cobbles. HC.				3	ENV	2.00-2.50			
3	MADE GROUND: Soft dark brown mottled red/black, sandy gravelly clay (high plasticity) with occasional cobbles. Heavy HC, very sticky and visible oil.				4	ENV	3.00-3.50			
4	MADE GROUND: Soft to locally firm orange/brown mottled, sandy gravelly clay. HC.				5	ENV	4.00-4.50			
4	LIMESTONE (with grey silty/clayey limestone gravel 6.900-7.00m). NEC.		3.15	4.00	6	ENV	6.90-7.00			
7	End of Borehole at 7.00 m				0.15	7.00				

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
					11-11-09	1.50			Soil very wet 1.50m-2.00m

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>I10</b>	
<b>CO-ORDINATES</b> 156,934.64 E 156,512.86 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.04		<b>DATE DRILLED</b> 13/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 14/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 3.00			
<b>CASING DEPTH (m)</b> 3.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. NEC.									
3	End of Borehole at 3.00 m		4.04	3.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>I11</b>	
<b>CO-ORDINATES</b> 156,927.25 E 156,507.49 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.21		<b>DATE DRILLED</b> 06/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 06/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 112			
<b>BOREHOLE DEPTH (m)</b> 4.50			
<b>CASING DEPTH (m)</b> 4.50			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft slightly sandy, slightly gravelly CLAY with straw/manure and metal. TOC.				1	ENV	0.00-0.50			
0.5	Very stiff mottled grey/ reddish brown slightly sandy, slightly gravelly CLAY with occasional cobbles. HC odour.		6.71	0.50	2	ENV	1.00-1.20			
1.2	LIMESTONE. NEC.		6.01	1.20						
4.5	End of Borehole at 4.50 m		2.71	4.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
06-11-09					06-11-09	4.50			0.00-0.50m Damp soil, 0.50-1.20m Dry.

<b>REMARKS</b> 0.00-0.50m Damp soil, 0.50-1.20m Dry.	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>112</b>	
<b>CO-ORDINATES</b> 156,919.26 E 156,501.99 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.19		<b>DATE DRILLED</b> 16/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 16/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> A. Mahony	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 6.00			
<b>CASING DEPTH (m)</b> 6.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Dark brown black mottled silty sandy cobbly gravel. NEC.				1	ENV	0.00-0.50			
0.5	Soft brown mottled grey sandy gravelly SILT/CLAY with occasional cobbles. NEC.		6.69	0.50	2	ENV	0.70-1.00			
1.3	Firm to stiff brown mottled grey sandy gravelly SILT/CLAY with occasional cobbles. NEC.		5.89	1.30	3	ENV	1.50-2.00			
1.6	Soft to firm sandy gravelly cobbly /SILTCLAY. NEC.		5.59	1.60						
3.0	Sub-angular to sub-rounded limestone GRAVEL and COBBLES. (possibly variably weathered limestone bedrock). NEC.		4.19	3.00	4	ENV	2.80-3.00			
4.0	Soft grey/brown mottled gravelly cobbly CLAY (Possible clay band within rock). NEC.		3.19	4.00	5	ENV	4.00-4.30			
4.3	LIMESTONE (pulverised) with brown/grey silt/clay layer at 5.80m. NEC.		2.89	4.30						
6.0	End of Borehole at 6.00 m		1.19	6.00	6	ENV	5.80-5.85			

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks				<b>BOREHOLE NO. SHEET</b> J01 Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,008.64 E 156,559.67 N		<b>RIG TYPE</b> Sonic		<b>DATE DRILLED</b> 09/11/2009	
<b>GROUND LEVEL (m AOD)</b> 7.93		<b>BOREHOLE DIAMETER (mm)</b> 112		<b>DATE LOGGED</b> 11/11/2009	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00		<b>BORED BY</b> Boart Longyear	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00		<b>PROCESSED BY</b> S. Letch	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: dark brown clayey sandy gravel with clay pipe. NEC.									
	MADE GROUND: Grey slightly gravelly clay (possible ash). Possible contamination.		7.43	0.50	1	ENV	0.50-1.00			
1	MADE GROUND: Grey slightly sandy gravelly clay (possible ash). Possible contamination.		6.93	1.00	2	ENV	1.00-1.50			
	MADE GROUND: Grey slightly sandy gravelly clay with occasional cobbles. NEC.		6.43	1.50	3	ENV	2.00-2.50			
					4	ENV	3.00-3.50			
					5	ENV	4.00-4.50			
6	MADE GROUND: Grey gravelly clay with some cobbles and red brick. NEC.		2.13	5.80	6	ENV	5.80-6.00			
	MADE GROUND: Grey angular cobbles and red brick. NEC.		1.93	6.00						
7	LIMESTONE. NEC.		0.93	7.00						
9	End of Borehole at 9.00 m			-1.07	9.00					

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> J02 Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,000.86 E 156,553.79 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.95		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Concrete		7.75	0.20	1	ENV	0.20-0.70			
1	MADE GROUND: Loose black/grey/white (layered) clayey gravel (possible ash & cinders). Possible contamination.				2	ENV	1.50-2.00			
2	MADE GROUND: Stiff dark grey/black slightly gravelly clay. NEC.		5.95	2.00	3	ENV	2.00-2.50			
3	MADE GROUND: Brown to grey (with depth) slightly gravelly clay. NEC.		5.45	2.50	4	ENV	3.00-3.50			
4					5	ENV	4.00-4.50			
5					6	ENV	5.50-6.00			
6	MADE GROUND: limestone cobbles and red brick. NEC.		1.95	6.00						
7	LIMESTONE. NEC.		1.45	6.50						
8										
9	End of Borehole at 9.00 m		-1.06	9.00						

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<b>HARD STRATA BORING/CHISELLING</b>					<b>WATER STRIKE DETAILS</b>					
From (m)	To (m)	Time (h)	Comments		Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
										No water strike
					<b>GROUNDWATER DETAILS</b>					
<b>INSTALLATION DETAILS</b>					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
<b>REMARKS</b>							<b>Sample Legend</b> 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			

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> J03 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,993.13 E 156,546.82 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.63		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff brown gravelly clay. NEC									
0.50	MADE GROUND: Soft brown very gravelly clay. HC odour		7.13	0.50	1	ENV	0.50-1.00			
1.00	MADE GROUND: Soft black very gravelly clay. Strong HC odour.		6.63	1.00	2	ENV	1.00-1.20			
1.20	MADE GROUND: Stiff slightly gravelly clay. HC odour.		6.43	1.20						
1.50	MADE GROUND: Soft black very gravelly clay. HC odour.		6.13	1.50	3	ENV	2.00-2.50			
3.50	MADE GROUND: Firm brown (grey at 6.00m) clay. NEC.		4.13	3.50	4	ENV	3.00-3.50			
4.50					5	ENV	4.00-4.50			
6.00	MADE GROUND: Stiff grey very gravelly clay with many cobbles. NEC.		1.63	6.00	6	ENV	5.50-6.00			
7.00	MADE GROUND: Stiff brown clay. NEC.		0.63	7.00	7	ENV	6.50-7.00			
7.10	MADE GROUND: Hard brown very gravelly clay with occasional cobbles. NEC.	0.53	7.10	8	ENV	7.10-7.50				
7.50	LIMESTONE. NEC.	0.13	7.50							
8.80	Very stiff grey slightly gravelly CLAY. NEC.	-1.17	8.80	9	ENV	8.80-9.00				
9.00	End of Borehole at 9.00 m		-1.37	9.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>J04</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,986.64 E 156,541.20 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.86		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft dark grey, very gravelly clay. NEC.	<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.5; font-size: 0.8em;">                     Consent of copyright owner required for any other use.                 </div>	7.36	0.50	1	ENV	0.55-1.00			
	MADE GROUND: Loose black sandy gravel (possible cinders) Possible contamination.		7.31	0.55						
1	MADE GROUND: Soft sandy clay in layers of white/grey/light brown/red (possible ash). NEC.				2	ENV	1.50-2.00			
2	MADE GROUND: Very soft dark grey to black (with depth) slightly gravelly clay. NEC.			5.86	2.00	3	ENV	2.50-3.00		
3	MADE GROUND: Very soft black gravelly clay. HC odour.			4.86	3.00	4	ENV	3.50-4.00		
4						5	ENV	4.30-4.80		
5	MADE GROUND: Loose black clayey gravel. HC odour.		3.06	4.80	6	ENV	5.50-6.00			
	MADE GROUND: Very soft dark grey clay. HC odour.		2.86	5.00						
	MADE GROUND: Soft black gravelly clay with occasional cobbles. HC odour.		2.36	5.50						
6	LIMESTONE. NEC.		1.86	6.00						
8	End of Borehole at 8.00 m		-0.14	8.00						

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>J05</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,979.13 E 156,535.84 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.18		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose brown/dark brown, clayey sandy gravel with occasional cobbles. Possible HC.				1	ENV	0.00-0.50			
	MADE GROUND: Loose brown clayey sandy gravel. NEC.		7.68	0.50						
1	MADE GROUND: Dark brown/green/black clayey sand. Possible HC.		7.18	1.00	2	ENV	1.00-1.20			
	MADE GROUND: Light brown clayey sand. NEC.		6.98	1.20						
	MADE GROUND: Soft grey sandy gravelly clay. Possible HC.		6.68	1.50	3	ENV	1.50-2.50			
2	MADE GROUND: Soft, light yellow/brown sandy gravelly clay. NEC.		5.68	2.50						
3	MADE GROUND: No recovery.		5.18	3.00						
4	MADE GROUND: Soft grey sandy gravelly clay. NEC.		3.68	4.50	4	ENV	4.50-5.00			
5	MADE GROUND: Soft grey/brown, clayey, gravelly sand. NEC.		3.18	5.00						
	MADE GROUND: Soft black sandy gravelly clay. High HC content.		2.88	5.30	5	ENV	5.30-6.00			
6	LIMESTONE. NEC except local HC spots between 7.50-8.00m.		2.18	6.00						
8	End of Borehole at 8.00 m		0.18	8.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>J06</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,971.57 E 156,530.02 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.98		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm brown sandy topsoil. NEC.		7.78	0.20	1	ENV	0.20-0.70			
	MADE GROUND: Soft dark brown sandy gravelly clay. Possible HC.									
1	MADE GROUND: Stiff dark brown/black sandy slightly gravelly clay. Possible HC.			6.88	1.10	2	ENV	1.10-1.30		
	MADE GROUND: Loose brown clayey gravelly cobbles. NEC.			6.68	1.30					
	MADE GROUND: Loose grey cobbles. NEC.			6.48	1.50					
2	MADE GROUND: Loose black clayey sandy gravelly cobbles. High HC impact.		3.48	4.50	3	ENV	5.00-5.50			
5	MADE GROUND: Loose black clayey sandy gravelly cobbles. High HC impact.									
6	LIMESTONE. NEC.		1.98	6.00						
7										
8										
9	End of Borehole at 9.00 m		-1.02	9.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
REMARKS					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					

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>J07</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,963.72 E 156,523.53 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 10/11/2009
<b>GROUND LEVEL (m AOD)</b> 8.04	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 13/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 7.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 7.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Grass and topsoil. NEC.		7.94	0.10	1	ENV	0.10-0.30			
	MADE GROUND: Firm brown, slightly sandy gravelly clay with occasional cobbles. NEC.		7.74	0.30						
1	MADE GROUND: No recovery (loose material).									
2	MADE GROUND: Loose dark brown to black very clayey gravel (possibly with cinders). Possible HC.		6.54	1.50	2	ENV	1.50-1.70			
	MADE GROUND: Stiff brown sandy clay. NEC.		6.34	1.70						
3	MADE GROUND: Soft grey slightly gravelly clay with occasional cobbles. Strong HC.		5.74	2.30	3	ENV	2.50-3.00			
	MADE GROUND: Soft black very gravelly clay with occasional cobbles. Strong HC.	5.04	3.00							
4	MADE GROUND: Stiff grey gravelly clay with occasional cobbles (possible pulverised rock). HC odour.		3.94	4.10	4	ENV	3.50-4.00			
	LIMESTONE. NEC.		3.54	4.50						
5										
6										
7										
8	End of Borehole at 7.50 m		0.54	7.50						
9										

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>J08</b>
<b>CO-ORDINATES</b> 156,956.35 E 156,517.85 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 7.47	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 11/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 12/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 3.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 3.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Dark brown clayey sandy gravelly silt. NEC.		7.07	0.40	1	ENV	0.00-0.40			
	Pale grey sandy gravelly SILT. NEC.		6.97	0.50	2	ENV	0.10-0.50			
1										
2										
3	End of Borehole at 3.00 m		4.47	3.00						
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>J09</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,948.85 E 156,510.81 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 16/11/2009
<b>GROUND LEVEL (m AOD)</b> 7.23	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 16/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 2.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 2.50	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0 1 2 3 4 5 6 7 8 9	LIMESTONE. NEC.									
	End of Borehole at 2.50 m		4.73	2.50						

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>J10</b>	
<b>CO-ORDINATES</b> 156,940.02 E 156,506.75 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 6.95		<b>DATE DRILLED</b> 05/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 05/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 3.00			
<b>CASING DEPTH (m)</b> 3.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Firm grey/brown very gravelly CLAY. NEC.				1	ENV	0.00-0.30			
0	LIMESTONE. NEC.		6.65	0.30						
3	End of Borehole at 3.00 m		3.95	3.00						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	
05-11-09	3.00	1.00	3.00	50mm SP						

**REMARKS** pic1 0.30-3.00m of rock?. Sample 001ENV taken by hand excavation due to core barrel getting no recovery between 0.00m-0.30m.

**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

IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09





# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>J11</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,933.36 E 156,499.93 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 05/11/2009
<b>GROUND LEVEL (m AOD)</b> 7.43	<b>BOREHOLE DIAMETER (mm)</b> 112	<b>DATE LOGGED</b> 05/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 2.50	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 2.50	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	Stiff dark grey, slightly sandy gravelly CLAY. NEC.									
	Very stiff brown slightly sandy, slightly gravelly CLAY. NEC.		7.03	0.40						
	Loose black, slightly clayey, slightly gravelly SAND. HC odour.		6.58	0.85	1	ENV	0.85-0.95			
	Very stiff brown slightly sandy, gravelly CLAY. NEC.		6.48	0.95						
	Very stiff to hard sandy gravelly CLAY with occasional cobbles. NEC.		6.43	1.00						
	LIMESTONE. NEC.		6.23	1.20						
2	End of Borehole at 2.50 m		4.93	2.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>J12</b>	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,926.01 E 156,494.56 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.43		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Black gravelly fill. MADE GROUND: Soft light brown sandy gravelly silt/clay. NEC.		7.38	0.05	1	ENV	0.50-1.00			
1										
2	Very sandy GRAVEL with occasional cobbles. Gravel starts fine becoming coarse with depth. NEC.		5.93	1.50						
2	LIMESTONE. NEC.		5.43	2.00						
3										
4	End of Borehole at 3.50 m		3.93	3.50						
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
REMARKS							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		

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>K01</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,011.65 E 156,554.69 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.96		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft white/brown mottled sandy gravelly silt with red brick. NEC.				1	ENV	0.30-0.80			
1	MADE GROUND: Firm, grey/brown/black mottled, slightly sandy gravelly clay with occasional cobbles. NEC.		7.16	0.80	2	ENV	1.00-1.50			
2	MADE GROUND: Soft/firm, dark brown/grey mottled (black 4.00-4.50m), slightly sandy gravelly clay with occasional cobbles. NEC.		6.46	1.50	3	ENV	2.50-3.00			
3					4	ENV	3.50-4.00			
4										
5	LIMESTONE. NEC.		3.46	4.50						
6										
7	End of Borehole at 6.50 m		1.46	6.50						
8										
9										

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
19-11-09	4.50	1.00	4.50	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>K02</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,005.74 E 156,549.10 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.05		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm, brown/white, sandy gravelly silt with red brick. NEC.		6.85	1.20	1	ENV	0.00-0.50			
1	MADE GROUND: Firm, orange/cream, sandy gravelly silt. NEC.				2	ENV	1.00-1.50			
2					3	ENV	2.00-2.50			
3	MADE GROUND: Firm, dark brown, sandy gravelly silt/clay with red brick. NEC.				4	ENV	3.00-3.50			
4	MADE GROUND: Soft, grey/black mottled clay. NEC.				5	ENV	4.00-4.50			
5	LIMESTONE. NEC.		3.55	4.50						
6										
7	End of Borehole at 6.50 m		1.55	6.50						

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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	
										No water strike	
INSTALLATION DETAILS					GROUNDWATER DETAILS						
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments		
Date	Tip Depth	RZ Top	RZ Base	Type							
REMARKS							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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>K03</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,000.08 E 156,540.07 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.99		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 7.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 7.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose dark grey/black very clayey gravel.		6.99	1.00	1	ENV	0.50-1.00			
1	MADE GROUND: Very soft gravelly clay in layers of white/dark grey/black (possible ash, cinders, clinker, asbestos).				2	ENV	1.00-1.50			
2					3	ENV	2.50-3.00			
3	MADE GROUND: Stiff grey to black (with depth) gravelly clay. NEC.				4	ENV	3.50-4.00			
4	MADE GROUND: Stiff black clay with frequent cobbles. Possible HC in black, no odour.				5	ENV	4.50-5.00			
5	LIMESTONE. NEC.		2.99	5.00						
7	End of Borehole at 7.00 m		0.99	7.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>K04</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,992.94 E 156,534.88 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.88		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose brown clayey gravel (possible ash & cinders). Possible contamination.	<div style="position: absolute; top: 50%; left: 50%; transform: translate(-50%, -50%); opacity: 0.5; font-size: 10px;">                     For inspection purposes only.                      Consent of copyright owner required for any other use.                 </div>			1	ENV	0.00-0.50			
1					2	ENV	1.00-1.50			
2	MADE GROUND: Very loose material. No recovery		6.38	1.50						
3										
4										
5	MADE GROUND: Medium dense, slightly gravelly sand. Strong HC odour. 1.00m recovered.		3.38	4.50	3	ENV	5.50-6.00			
6	MADE GROUND: Firm black very gravelly clay. HC odour and thick tar like substance.		1.88	6.00	4	ENV	6.25-6.75			
7	MADE GROUND: Stiff grey very sandy gravelly clay. Very strong HC. Tar like substance is on outside of core from 6.00-7.00m and may contaminate sample.		0.88	7.00	5	ENV	7.50-8.00			
8	MADE GROUND: Limestone cobbles and red brick and plastic. HC sheen on rock.		-0.13	8.00						
9	LIMESTONE. HC.	-1.13	9.00							

<b>HARD STRATA BORING/CASELLING</b>				<b>WATER STRIKE DETAILS</b>					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike
				<b>GROUNDWATER DETAILS</b>					
<b>INSTALLATION DETAILS</b>				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					
<b>REMARKS</b>						<b>Sample Legend</b> 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			

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# GEOTECHNICAL BORING RECORD

REPORT NUMBER

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> K04 Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,992.94 E 156,534.88 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.88		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10			-2.13	10.00						
11										
12										
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>K05</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,984.92 E 156,529.10 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.64		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Stiff grey gravelly clay. NEC.		8.44	0.20	1	ENV	0.25-0.75			
	MADE GROUND: Stiff black gravelly clay with occasional cobbles and vegetation. Slight HC impact.		7.64	1.00	2	ENV	1.25-1.50			
1	MADE GROUND: Soft brown/black gravelly clay. HC, strong between 1.25-1.50m.		7.14	1.50						
	MADE GROUND: No recovery.									
3	MADE GROUND: Soft black gravelly clay. Heavy HC.		5.64	3.00	3	ENV	3.00-3.50			
					4	ENV	4.00-4.50			
6	LIMESTONE. Slight HC sheen.		2.64	6.00	5	ENV	5.50-6.00			
7	LIMESTONE. NEC.		1.64	7.00						
					6	ENV	8.70-9.00			
9	Very stiff black & grey CLAY. NEC.		-0.06	8.70						
	End of Borehole at 9.00 m		-0.36	9.00						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
10-11-09	6.00	1.00	6.00	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09





# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>K06</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,977.38 E 156,522.33 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.32		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 7.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 7.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm brown sandy gravelly clay. Possible HC.		8.02	0.30	1	ENV	0.00-0.30			
1	MADE GROUND: Stiff dark brown sandy gravelly clay with occasional cobbles. Possible HC.		6.82	1.50	2	ENV	1.00-1.50			
2	MADE GROUND: Soft brown/black mottled, sandy gravelly clay. Heavy HC impact.		4.82	3.70	3	ENV	3.00-3.50			
4	MADE GROUND: Firm black (becoming brown from 4.00m), sandy gravelly clay with wood fragments. Possible HC.		4.02	4.30	4	ENV	3.70-4.00			
5	MADE GROUND: Angular gravel - concrete and limestone. NEC.		2.32	6.00						
6	LIMESTONE. NEC.		1.82	6.50						
7	End of Borehole at 7.50 m		0.82	7.50						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>K07</b>
<b>CO-ORDINATES</b> 156,969.48 E 156,517.09 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 8.21	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 10/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 112	<b>DATE LOGGED</b> 12/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 9.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 9.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft to firm dark brown mottled, slightly clayey, gravelly SAND. NEC.		7.71	0.50	1	ENV	0.00-0.50			
1	MADE GROUND: Soft to firm orange/brown mottled, clayey sandy gravelly silt. NEC.			2	ENV	1.00-1.50				
3	MADE GROUND: Dark brown black mottled sandy cobbly gravel. Heavy HC.		5.21	3.00	3	ENV	2.90-3.00			
4				4	ENV	3.00-6.00				
6	LIMESTONE with clay band 8.70-8.90m. Heavy HC.		2.21	6.00						
9	End of Borehole at 9.00 m				-0.79	9.00	5	ENV	8.70-8.90	

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>K08</b>
<b>CO-ORDINATES</b> 156,961.12 E 156,510.40 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 7.90	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 16/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 16/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 2.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 2.00	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. Slight odour of HC.									
2	End of Borehole at 2.00 m		5.90	2.00						
1										
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>K09</b>
<b>CO-ORDINATES</b> 156,955.17 E 156,504.24 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 7.60	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 16/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 16/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 2.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 2.00	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. NEC.									
2	End of Borehole at 2.00 m		5.60	2.00						
1										
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> K10 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,947.71 E 156,499.44 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 16/11/2009	<b>DATE LOGGED</b> 16/11/2009
<b>GROUND LEVEL (m AOD)</b> 7.53	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>BORED BY</b> Boart Longyear	<b>PROCESSED BY</b> A. Mahony
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 2.00		
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 2.00		

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. NEC.									
1										
2	End of Borehole at 2.00 m		5.53	2.00						
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>K11</b>	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,939.61 E 156,492.66 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.41		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 3.80	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 3.80	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND consisting of very dense, grey angular limestone gravel. NEC		7.21	0.20	1	ENV	0.20-0.70			
	Stiff brown slightly sandy, slightly gravelly CLAY. NEC.		6.71	0.70	2	ENV	1.00-1.50			
	Very stiff, grey, slightly sandy, slightly gravelly CLAY. NEC.		5.91	1.50						
	LIMESTONE. NEC.									
4	End of Borehole at 3.80 m		3.81	3.80						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>K12</b>	
<b>CO-ORDINATES</b> 156,933.15 E 156,487.21 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 7.53		<b>DATE DRILLED</b> 16/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 16/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> A. Mahony	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 3.00			
<b>CASING DEPTH (m)</b> 3.00			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft light brown, very sandy gravelly cobbly silt. NEC.				1	ENV	0.00-0.50			
1	MADE GROUND: Slightly silty and sandy, gravel and cobbles. NEC.		6.73	0.80	2	ENV	1.20-1.30			
	Coarse GRAVEL with local gravelly sand 1.20-1.30m. NEC.		6.53	1.00						
	LIMESTONE. NEC.		6.03	1.50						
3	End of Borehole at 3.00 m		4.53	3.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> L02	
		<b>SHEET</b> Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,012.29 E 156,537.81 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.97		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, brown, sandy gravelly clay. NEC.		7.77	0.20	1	ENV	0.00-0.20			
1	MADE GROUND: Loose brown/grey, gravelly sand. NEC.				2	ENV	1.00-1.50			
2	MADE GROUND: Loose brown/grey, clayey sandy gravel with brick (becoming very clayey 3.00-3.50m). NEC.			6.47	1.50					
4	MADE GROUND: Loose, black, clayey gravelly cobbly sand. Strong HC.		4.47	3.50	3	ENV	4.50-5.00			
5	MADE GROUND: Loose brown/grey/purple, sandy gravel with brick. NEC.		2.97	5.00						
6	LIMESTONE. NEC.		2.47	5.50						
6	End of Borehole at 6.00 m		1.97	6.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>L03</b>
<b>CO-ORDINATES</b> 157,004.35 E 156,534.30 N		<b>SHEET</b> Sheet 1 of 1
<b>GROUND LEVEL (m AOD)</b> 8.01	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 19/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 19/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 7.50	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 7.50	<b>PROCESSED BY</b> D. O'Shea

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Loose black/brown/grey clayey gravelly sand. Possible HC.		7.51	0.50	1	ENV	0.00-0.50			
1	MADE GROUND: Soft, grey/brown, sandy gravelly clay with occasional cobbles. Possible HC.			1.00-1.50	2	ENV				
2	MADE GROUND: Soft, grey/brown, very sandy clay. NEC.			2.00	3	ENV	2.50-3.00			
3	MADE GROUND: Loose grey/brown clayey very sandy gravel with occasional cobbles. NEC.			3.00	4	ENV	4.00-4.50			
4	MADE GROUND: Firm, grey/brown/black, sandy gravelly clay. Strong HC - free phase oil.			4.50	5	ENV	4.50-5.00			
5	LIMESTONE. NEC.		2.51	5.50						
6	End of Borehole at 7.50 m			7.50						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> L04 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,998.58 E 156,526.38 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.26		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 10.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 10.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details		
					Ref. Number	Sample Type	Depth (m)	Recovery				
0	MADE GROUND: Soft light brown to grey (with depth from 3.00m) gravelly clay. HC, high from 3.00m.	[Cross-hatch pattern]			1	ENV	0.50-1.00					
2					ENV	1.00-1.50						
3					ENV	1.50-3.00						
4					ENV	3.00-3.50						
4	MADE GROUND: Soft dark brown gravelly clay. HC odour.	[Cross-hatch pattern]	4.76	3.50								
5	MADE GROUND: Medium dense, grey, clayey sand. HC impact.		3.76	4.50	5	ENV	4.50-4.90					
5	MADE GROUND: Loose black clayey gravel with few cobbles and red brick. Pure Tar product present.		3.36	4.90	6	ENV	5.50-6.00					
6					7	ENV	6.50-7.00					
7	MADE GROUND: Stiff mottled brown/black sandy gravelly clay. HC in black mottling.	[Cross-hatch pattern]	0.96	7.30								
8	MADE GROUND: Loose black slightly clayey sand. Pure Tar product present.		0.76	7.50						8	ENV	7.50-7.90
8	MADE GROUND: Loose black cobbles and red brick. Pure Tar product present.		0.36	7.90						9	ENV	8.00-8.30
9	MADE GROUND: Stiff dark grey/black sandy gravelly CLAY. HC with odour.		-0.04	8.30								
9	LIMESTONE. 8.50-9.00m gross pure tar in rock, 9.00-10.00m HC sheen (possible cross contamination from layer above).	[Brick pattern]	-0.24	8.50								

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<b>HARD STRATA BORING CHISELLING</b>				<b>WATER STRIKE DETAILS</b>					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike
				<b>GROUNDWATER DETAILS</b>					
<b>INSTALLATION DETAILS</b>				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					
<b>REMARKS</b> Clean drilling technique used but no concrete base encountered.						<b>Sample Legend</b> 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			

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> L04 Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,998.58 E 156,526.38 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 19/11/2009	<b>DATE LOGGED</b> 20/11/2009
<b>GROUND LEVEL (m AOD)</b> 8.26	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>BORED BY</b> Boart Longyear	<b>PROCESSED BY</b> G. Thornton
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 10.00		
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 10.00		

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10			-1.74	10.00						
11										
12										
13										
14										
15										
16										
17										
18										
19										

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<b>HARD STRATA BORING/CHISELLING</b>				<b>WATER STRIKE DETAILS</b>					
From (m)	To (m)	Time (h)	Comments	Water Strike	Casing Depth	Sealed At	Rise To	Time (min)	Comments
									No water strike
				<b>GROUNDWATER DETAILS</b>					
<b>INSTALLATION DETAILS</b>				Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type					
<b>REMARKS</b> Clean drilling technique used but no concrete base encountered.					<b>Sample Legend</b> 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				

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks				<b>BOREHOLE NO. SHEET</b> L05 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,991.13 E 156,521.05 N		<b>RIG TYPE</b> Sonic		<b>DATE DRILLED</b> 19/11/2009	
<b>GROUND LEVEL (m AOD)</b> 8.41		<b>BOREHOLE DIAMETER (mm)</b> 140		<b>DATE LOGGED</b> 19/11/2009	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 8.00		<b>BORED BY</b> Boart Longyear	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 8.00		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown, sandy gravelly silt/clay. Slight HC		7.91	0.50	1	ENV	0.50-1.00			
1	MADE GROUND: Medium dense, pale brown/brown sand. HC getting stronger with depth.									
2	MADE GROUND: Loose, black, very silty, sandy gravel. Strong HC - free phase oil.									
3	MADE GROUND: Soft, black/brown/grey mottled, sandy gravelly silt/clay with occasional cobbles. Strong HC - free phase oil.									
4										
5			5.61	2.80	3	ENV	3.00-3.50			
6	Pulverised LIMESTONE. Slight HC, decreasing with depth.		2.41	6.00	6	ENV	6.50-7.00			
7	LIMESTONE. NEC.									
8	End of Borehole at 8.00 m									
9			0.41	8.00						

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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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks				<b>BOREHOLE NO. SHEET</b> L06 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,983.64 E 156,515.10 N		<b>RIG TYPE</b> Sonic		<b>DATE DRILLED</b> 19/11/2009	
<b>GROUND LEVEL (m AOD)</b> 8.41		<b>BOREHOLE DIAMETER (mm)</b> 140		<b>DATE LOGGED</b> 19/11/2009	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 9.00		<b>BORED BY</b> Boart Longyear	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 9.00		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Standpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, brown, sandy gravelly clay. NEC.									
0.50	MADE GROUND: Firm, black/brown, sandy gravelly clay with occasional cobbles. Possible HC.		7.91	0.50	1	ENV	0.50-0.80			
1.50	MADE GROUND: Loose, brown/black, clayey sandy gravel with occasional cobbles. Strong HC - free phase oil.		6.91	1.50	2	ENV	1.50-1.80			
1.80	MADE GROUND: Firm, brown/black sandy gravelly clay with occasional cobbles. Possible HC.		6.61	1.80						
2.50	MADE GROUND: Soft, brown/black, sandy gravelly clay with occasional cobbles. Strong HC - free phase oil.		5.91	2.50	3	ENV	2.50-3.00			
3.50	MADE GROUND: Firm, mid brown sandy slightly gravelly clay. NEC.		4.91	3.50						
4.50	MADE GROUND: Soft, brown/black, sandy gravelly clay with occasional cobbles. Strong HC - free phase oil.		3.91	4.50	4	ENV	4.50-5.00			
5.00	MADE GROUND: Soft/firm, brown/black, sandy gravelly clay. Possible HC.		3.41	5.00						
6.00	MADE GROUND: Soft, black, sandy gravelly clay with occasional cobbles. Strong HC - free phase oil.		2.41	6.00	5	ENV	6.00-6.50			
6.80	MADE GROUND: Soft, grey/brown, sandy gravelly clay with occasional cobbles. Possible HC.		1.61	6.80	6	ENV	7.00-7.50			
7.50	LIMESTONE. NEC.		0.91	7.50						
9.00	End of Borehole at 9.00 m			-0.59	9.00					

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> L07 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,975.76 E 156,509.04 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.65		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 4.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 4.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft, brown, sandy gravelly clay with occasional cobbles. NEC.				1	ENV	0.00-0.50			
	MADE GROUND: Stiff, dark brown/black, slightly sandy clay. Possible HC.		8.15	0.50	2	ENV	0.50-0.80			
	MADE GROUND: Soft brown sandy gravelly clay. NEC.		7.85	0.80						
	MADE GROUND: Firm, grey/brown, sandy gravelly clay with cobbles. NEC.		7.65	1.00	3	ENV	1.00-1.40			
	Returns of limestone COBBLES, possible rock. NEC.		7.25	1.40						
	LIMESTONE. Spots of HC from 1.50-4.50m		7.15	1.50						
4.50	End of Borehole at 4.50 m		4.15	4.50						

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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
									No water strike

INSTALLATION DETAILS					GROUNDWATER DETAILS				
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
19-11-09	3.50	2.00	3.50	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>L08</b>
		<b>SHEET</b> Sheet 1 of 1
<b>CO-ORDINATES</b> 156,963.39 E 156,505.90 N	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 23/11/2009
<b>GROUND LEVEL (m AOD)</b> 8.15	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 23/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DEPTH (m)</b> 2.00	<b>BORED BY</b> Boart Longyear
<b>ENGINEER</b> Mouchel	<b>CASING DEPTH (m)</b> 2.00	<b>PROCESSED BY</b> A. Mahony

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. NEC.									
2	End of Borehole at 2.00 m		6.15	2.00						
1										
3										
4										
5										
6										
7										
8										
9										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> L09 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,957.59 E 156,500.15 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.98		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. NEC.									
2	End of Borehole at 2.00 m		5.98	2.00						
1										
3										
4										
5										
6										
7										
8										
9										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> L10 Sheet 1 of 1	
<b>CO-ORDINATES</b> 156,952.16 E 156,494.45 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 7.73		<b>BOREHOLE DIAMETER (mm)</b> 112	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 2.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 2.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	LIMESTONE. NEC.									
2	End of Borehole at 2.00 m		5.73	2.00						
1										
3										
4										
5										
6										
7										
8										
9										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> M03 Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,010.40 E 156,524.75 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.23		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> D. O'Shea	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Returns of grey/brown, clayey cobbly gravel. NEC.		7.73	0.50	1	ENV	0.50-0.60			
	MADE GROUND: Soft, black, sandy gravelly clay. Possible HC.		7.63	0.60	2	ENV	0.60-1.00			
1	MADE GROUND: Stiff, brown, sandy gravelly clay. NEC.		7.23	1.00						
	MADE GROUND: Loose, light brown, clayey gravelly sand. NEC.				3	ENV	1.50-2.00			
2					4	ENV	3.50-4.00			
4	MADE GROUND: Loose brown clayey sandy GRAVEL with occasional cobbles. NEC.		4.03	4.20						
	LIMESTONE. NEC.		3.73	4.50						
6	No recovery - observed by driller as rock		2.23	6.00						
	End of Borehole at 6.50 m		1.73	6.50						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments
19-11-09	5.00	5.00	6.50	50mm SP					

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> M04 Sheet 1 of 1	
<b>CO-ORDINATES</b> 157,004.19 E 156,519.92 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.09		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 6.50	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 6.50	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> A. Mahony	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown/black peaty sandy gravelly clay with rootlets. NEC.		7.89	0.20	1	ENV	0.00-0.20			
				0.60	2	ENV	0.20-0.60			
1	MADE GROUND: Loose, grey/brown, clayey silty very gravelly sand. NEC.		7.49	0.60	3	ENV	0.60-1.30			
				1.30						
2	MADE GROUND: Soft/firm, brown, silty sandy gravelly clay with red brick. NEC.		6.79	1.30						
				1.50						
3	MADE GROUND: Cobbles. NEC.		6.59	1.50						
				2.30-2.80	4	ENV				
4	MADE GROUND: Soft, grey/brown mottled, sandy very gravelly clay with occasional cobbles. NEC.		5.09	3.00	5	ENV	3.00-3.50			
				4.00						
5	MADE GROUND: Loose, grey/black gravelly cobbly sand. Possible HC.		4.09	4.00						
				4.50						
6	MADE GROUND: Grey, very silty sandy gravelly cobbles. NEC.		3.59	4.50						
				5.00						
7	LIMESTONE. NEC.		1.59	6.50						
				6.50						
8	End of Borehole at 6.50 m									

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date					Date	Hole Depth	Casing Depth	Depth to Water	Comments	
Date	Tip Depth	RZ Top	RZ Base	Type						
REMARKS							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			

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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> <b>M05</b> Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,996.57 E 156,512.02 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.35		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm brown sandy slightly gravelly clay with occasional cobbles. NEC.		7.65	0.70	1	ENV	0.70-1.00			
1	MADE GROUND: Firm brown sandy slightly gravelly clay. HC.									2
2	MADE GROUND: Firm brown clay. NEC.		6.35	2.00	3	ENV	2.00-2.50			
3										4
4	MADE GROUND: Soft dark brown clay with vegetative matter (possible original topsoil level). NEC.			4.35	4.00	5	ENV	4.50-5.00		
5	MADE GROUND: Soft brown slightly gravelly clay. Slight HC impact.									
6	MADE GROUND: Very soft dark grey to black (at 8.00m) slightly gravelly clay. HC increases with depth.			2.35	6.00	7	ENV	6.50-7.00		
7			8							
8	MADE GROUND: Very soft black slightly clayey gravel (possible cinders). HC.			0.35	8.00	9	ENV	8.50-9.00		
9	LIMESTONE. NEC.									

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
									No water strike

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

<b>REMARKS</b>	<b>Sample Legend</b> 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
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# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> M05 Sheet 2 of 2	
<b>CO-ORDINATES</b> 156,996.57 E 156,512.02 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.35		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 11.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 11.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11	End of Borehole at 11.00 m		-2.65	11.00						
12										
13										
14										
15										
16										
17										
18										
19										

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO. SHEET</b> M06 Sheet 1 of 2	
<b>CO-ORDINATES</b> 156,990.01 E 156,506.74 N		<b>RIG TYPE</b> Sonic	
<b>GROUND LEVEL (m AOD)</b> 8.35		<b>BOREHOLE DIAMETER (mm)</b> 140	
<b>CLIENT</b> Bord Gais		<b>BOREHOLE DEPTH (m)</b> 12.00	
<b>ENGINEER</b> Mouchel		<b>CASING DEPTH (m)</b> 12.00	
		<b>BORED BY</b> Boart Longyear	
		<b>PROCESSED BY</b> G. Thornton	

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Soft brown slightly sandy, slightly gravelly clay wit root hairs. NEC.		8.15	0.20	1	ENV	0.20-0.50			
	MADE GROUND: Firm dark brown gravelly clay. NEC.		7.85	0.50						
1	CONCRETE. HC odour from water used to drill through.									
3	MADE GROUND: Stiff light grey very sandy gravelly clay with occasional cobbles. NEC.		5.35	3.00	2	ENV	3.50-4.00			
4					3	ENV	4.50-5.00			
5					4	ENV	5.00-5.50			
6	CONCRETE. NEC.			2.85	5.50					
9	LIMESTONE with local soft grey clay. NEC except for HC impact at 8.90m.		-0.15	8.50	5	ENV	8.90-8.90			
9	LIMESTONE. NEC.		-0.65	9.00						

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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
									No water strike
INSTALLATION DETAILS				GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments

<b>REMARKS</b> 0.0-2.5m 20/11/09. 2.5-12m 23/11/09	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT 23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>M06</b>
<b>CO-ORDINATES</b> 156,990.01 E 156,506.74 N		<b>SHEET</b> Sheet 2 of 2
<b>GROUND LEVEL (m AOD)</b> 8.35	<b>RIG TYPE</b> Sonic	<b>DATE DRILLED</b> 20/11/2009
<b>CLIENT</b> Bord Gais	<b>BOREHOLE DIAMETER (mm)</b> 140	<b>DATE LOGGED</b> 23/11/2009
<b>ENGINEER</b> Mouchel	<b>BOREHOLE DEPTH (m)</b> 12.00	<b>BORED BY</b> Boart Longyear
	<b>CASING DEPTH (m)</b> 12.00	<b>PROCESSED BY</b> G. Thornton

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
10	LIMESTONE. NEC. (continued)									
11										
12	End of Borehole at 12.00 m		-3.65	12.00						
13										
14										
15										
16										
17										
18										
19										

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

**REMARKS** 0.0-2.5m 20/11/09. 2.5-12m 23/11/09

**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

IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# GEOTECHNICAL BORING RECORD

**REPORT NUMBER**

14463

<b>CONTRACT</b> Limerick Gasworks		<b>BOREHOLE NO.</b> <b>M07</b>	
<b>CO-ORDINATES</b> 156,981.49 E 156,501.92 N		<b>SHEET</b> Sheet 1 of 1	
<b>GROUND LEVEL (m AOD)</b> 8.26		<b>DATE DRILLED</b> 20/11/2009	
<b>CLIENT</b> Bord Gais		<b>DATE LOGGED</b> 20/11/2009	
<b>ENGINEER</b> Mouchel		<b>BORED BY</b> Boart Longyear	
<b>RIG TYPE</b> Sonic		<b>PROCESSED BY</b> G. Thornton	
<b>BOREHOLE DIAMETER (mm)</b> 140			
<b>BOREHOLE DEPTH (m)</b> 2.50			
<b>CASING DEPTH (m)</b> 2.50			

Depth (m)	Description	Legend	Elevation	Depth (m)	Samples				Field Test Results	Stacpipe Details
					Ref. Number	Sample Type	Depth (m)	Recovery		
0	MADE GROUND: Firm brown/grey gravelly clay with some plastic. NEC.		7.86	0.40	1	ENV	0.00-0.40			
	LIMESTONE. NEC.									
2.50	End of Borehole at 2.50 m		5.76	2.50						

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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
										No water strike
INSTALLATION DETAILS					GROUNDWATER DETAILS					
Date	Tip Depth	RZ Top	RZ Base	Type	Date	Hole Depth	Casing Depth	Depth to Water	Comments	

<b>REMARKS</b>	<b>Sample Legend</b> 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
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IGSL BH LOG 14463.GPJ IGSL\_GDT\_23/12/09



# Soakaway Design f -value from field tests IGSL

Contract: Limerick Gas Works	Contract No. 14463
Test No. 1	
Client Bord Gais	Coordinates: E156981.454 N156536.878
Engineer Mouchel	Elevation: 7.972
Date: 09/11/09	

**Summary of ground conditions**

from	to	Description	Ground water
0.00	1.70	MADE GROUND: Brown slightly sandy gravelly clay with many red brick, steel and concrete fragments	No groundwater encountered
1.70	2.10	MADE GROUND: Firm blue slightly sandy clay with suspected blue billy.	

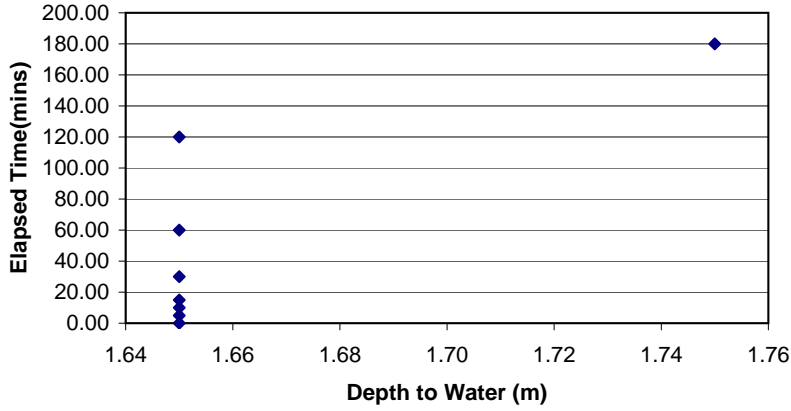
Notes: Pit walls stable.  
Pit extended due to obstruction and brick wall.  
Test left overnight - pit dry after 1140mins

**Field Data** **Field Test**

Depth to Water (m)	Elapsed Time (min)				
		Depth of Pit (D)	2.10	m	
		Width of Pit (B)	1.00	m	
		Length of Pit (L)	3.00	m	
1.65	0.00	Initial depth to Water =	1.65	m	
1.65	5.00	Final depth to water =	2.10	m	
1.65	10.00	Elapsed time (mins)=	1140.00		
1.65	15.00				
1.65	30.00	Top of permeable soil	0.00	m	
1.65	60.00	Base of permeable soil	2.10	m	
1.65	120.00				
1.75	180.00				
		Base area=	3	m <sup>2</sup>	
		*Av. side area of permeable stratum over test period=	1.8	m <sup>2</sup>	
		Total Exposed area =	4.8	m <sup>2</sup>	
		Infiltration rate (f) =	Volume of water used/unit exposed area / unit time		
		<b>f =</b>	<b>0.00025 m/min</b>	<b>or</b>	<b>4.112E-06 m/sec</b>

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**Depth of water vs Elapsed Time (mins)**



# Limerick Gasworks - Photography

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TP1\_a.JPG



TP1\_b.JPG

# Limerick Gasworks - Photography

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TP1\_c.JPG



TP1\_d.JPG



# Limerick Gasworks - Photography

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TP1\_e.JPG



TP2 i.JPG

# Limerick Gasworks - Photography

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TP2ii.JPG



TP2iii.JPG



# Limerick Gasworks - Photography

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TP2iv.JPG



TP3\_i.JPG

# Limerick Gasworks - Photography

---



TP3\_ii.JPG



TP3\_iii.JPG

# Limerick Gasworks - Photography

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TP3\_iv.JPG

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# Limerick Gasworks - Photography

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C12AWS.JPG



C12AWS\_handpit\_a.JPG

# Limerick Gasworks - Photography

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C12AWS\_handpit\_b.JPG



C12BWS.JPG



# Limerick Gasworks - Photography

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C12BWS\_handpit\_a.JPG



C12BWS\_handpit\_b.JPG

# Limerick Gasworks - Photography

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D12WS.JPG



D12WS\_handpit\_a.JPG



# Limerick Gasworks - Photography

---



D12WS\_handpit\_b.JPG



E12WS.JPG

# Limerick Gasworks - Photography

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E12WS\_handpit\_a.JPG



E12WS\_handpit\_b.JPG



# Limerick Gasworks - Photography

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F10WS.JPG



F12WS.JPG

# Limerick Gasworks - Photography

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F12WS\_handpit\_a.JPG



F12WS\_handpit\_b.JPG



# Limerick Gasworks - Photography

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F9WS.JPG



L11WS.JPG

# Limerick Gasworks - Photography

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L12WS.JPG



L1WS.JPG



# Limerick Gasworks - Photography

---



M1WS.JPG



N1WS.JPG

# Limerick Gasworks - Photography

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N2WS.JPG

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Limerick Gasworks – Core Photography

A03 Inspection Pit



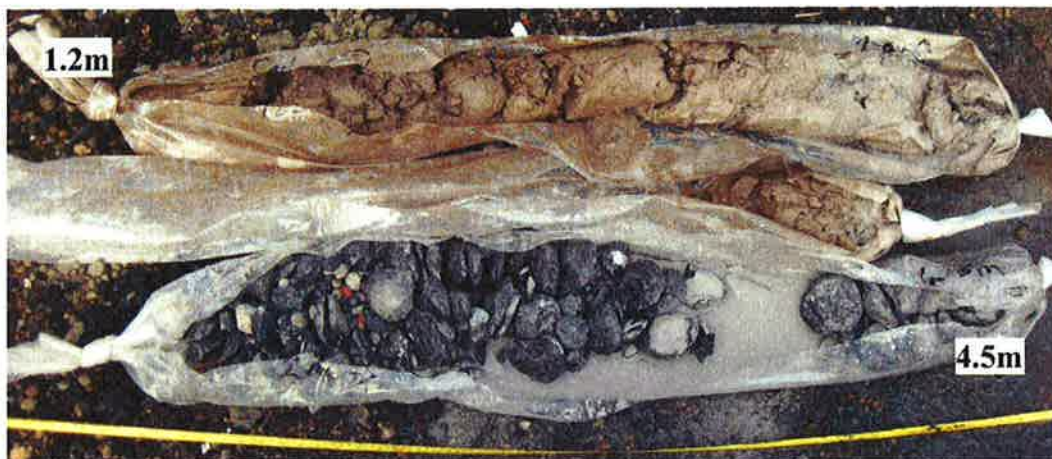
A03



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Limerick Gasworks – Core Photography

A04



A05 Inspection Pit

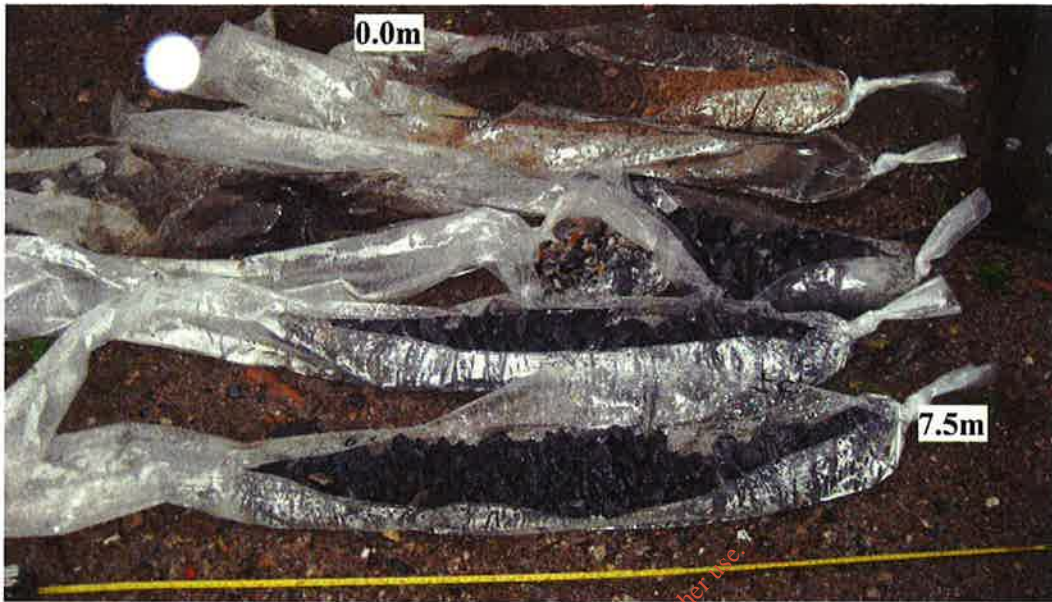


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Limerick Gasworks – Core Photography

A05



A06 Inspection Pit

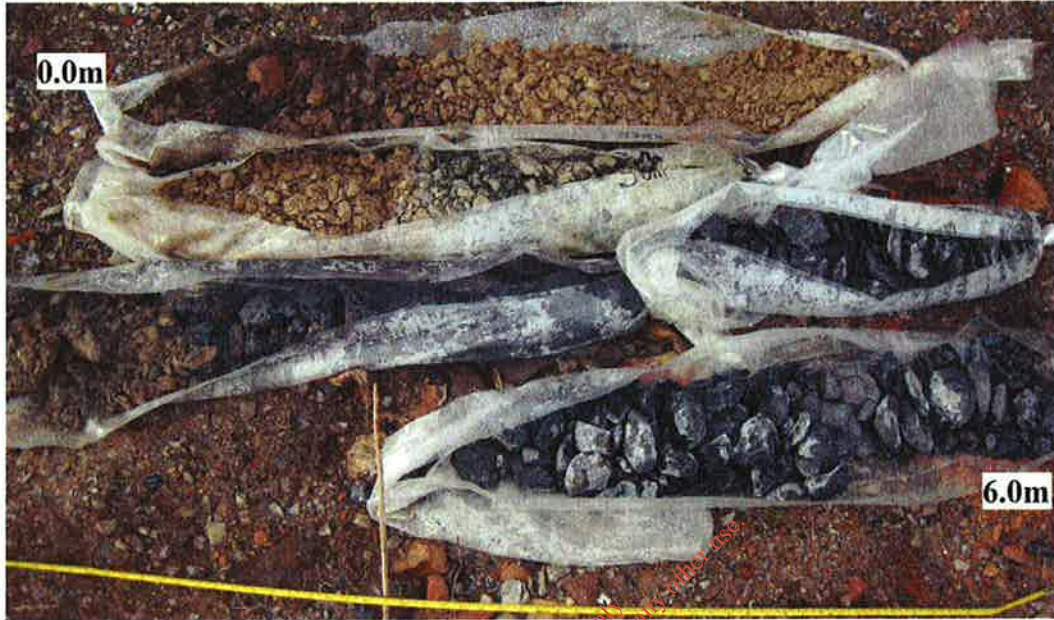


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Limerick Gasworks – Core Photography

A06



A07 Inspection Pit



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Limerick Gasworks – Core Photography

A07



A08



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Limerick Gasworks – Core Photography

A11



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B03



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**B04**



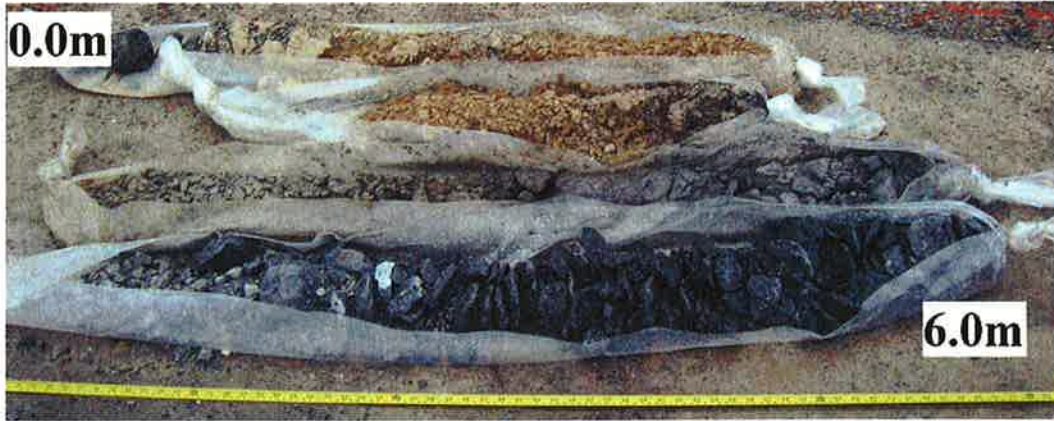
**B05**



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Limerick Gasworks – Core Photography

**B06**



**B07**





Limerick Gasworks – Core Photography

**B08**



**B11 Inspection Pit**



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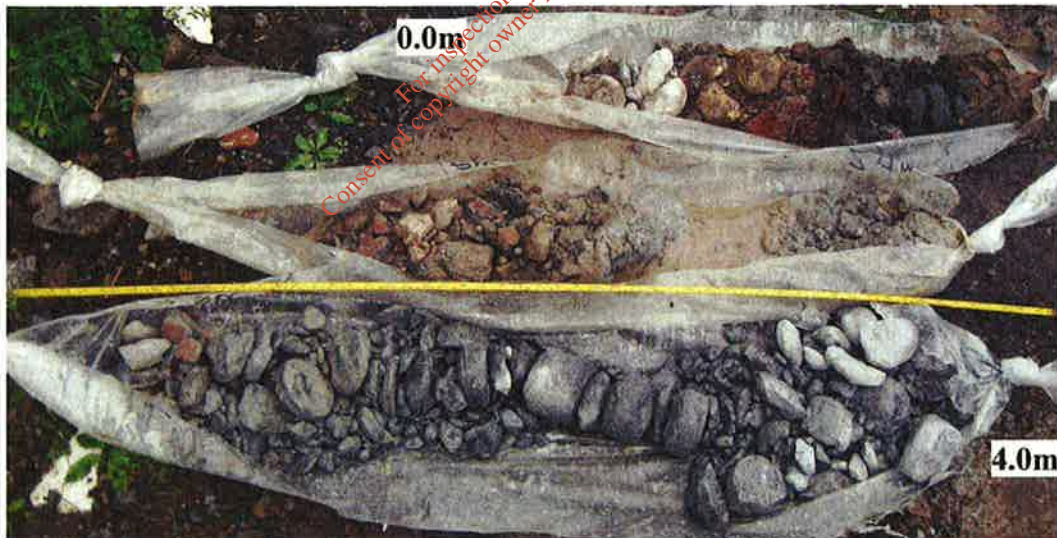


Limerick Gasworks – Core Photography

C03



C04

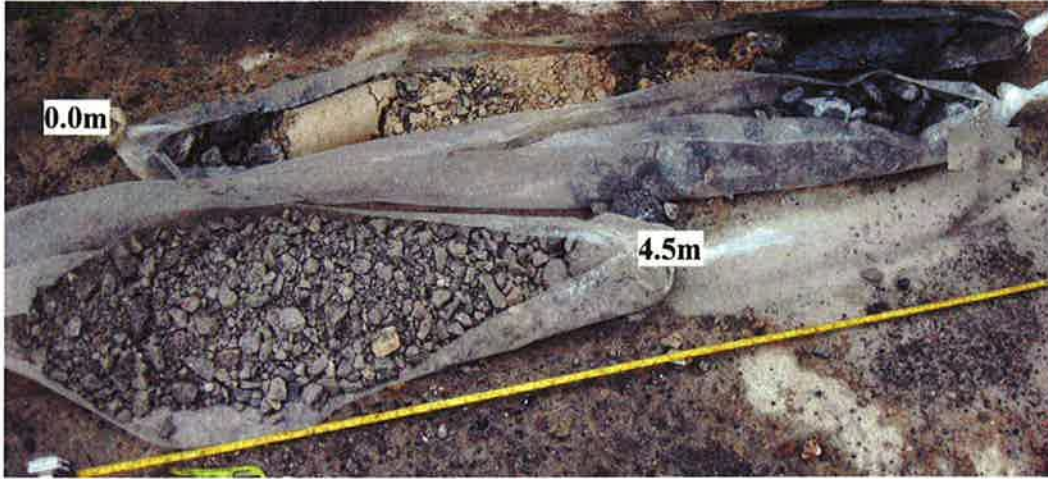


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Limerick Gasworks – Core Photography

C05



C06 Photo 1 of 2



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Limerick Gasworks – Core Photography

C06 Photo 2 of 2



C07 Photo 1 of 2



C07 Photo 2 of 2

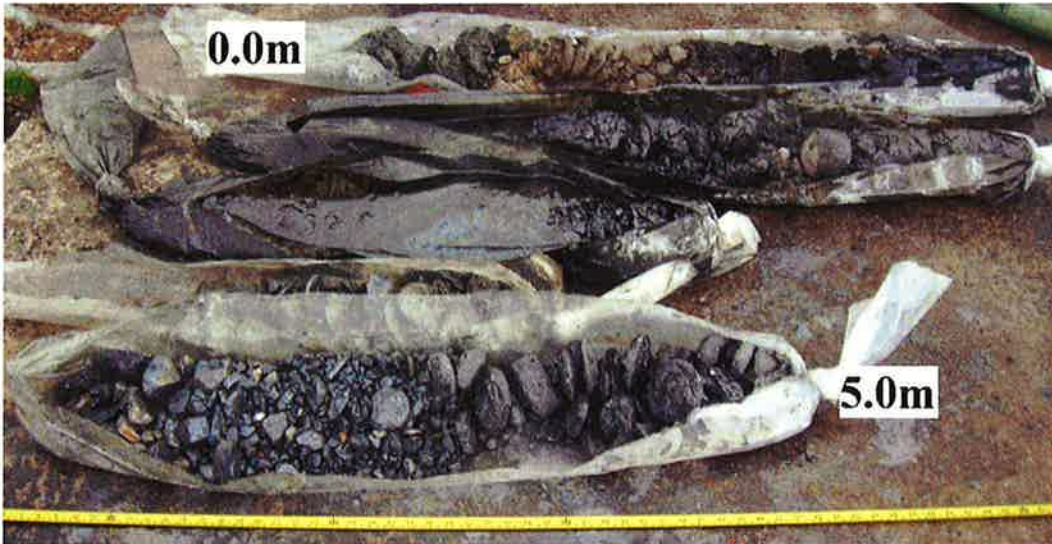


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Limerick Gasworks – Core Photography

C08



C09



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Limerick Gasworks – Core Photography

C10



C11 Inspection Pit

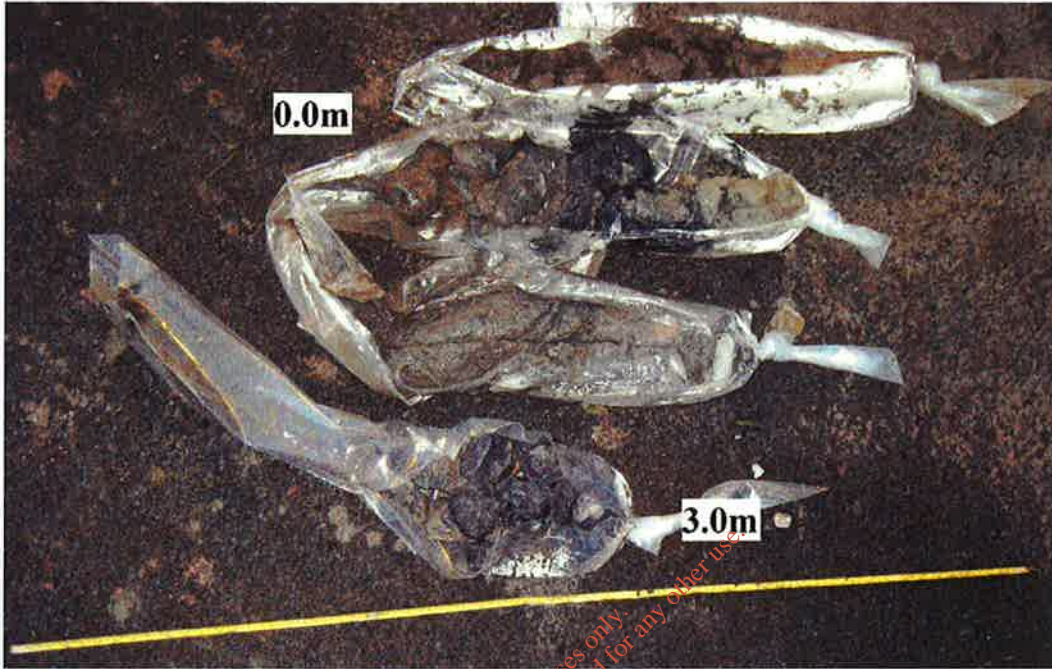


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Limerick Gasworks – Core Photography

C11



C12 Inspection Pit



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Limerick Gasworks – Core Photography

C12



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Limerick Gasworks – Core Photography

D03



D04



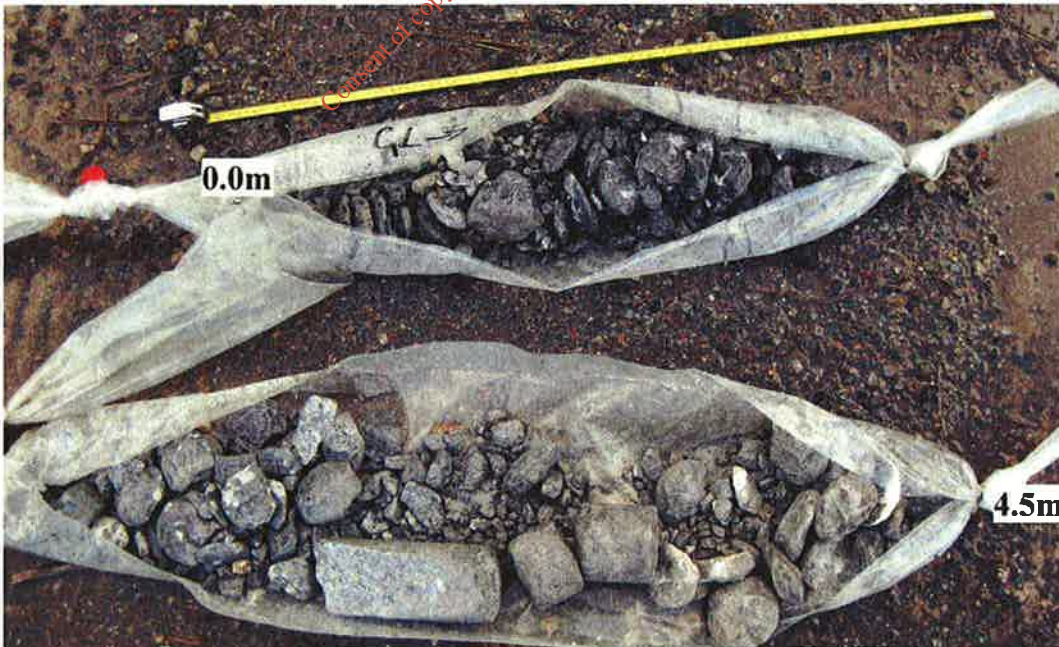
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Limerick Gasworks – Core Photography

D05



D06

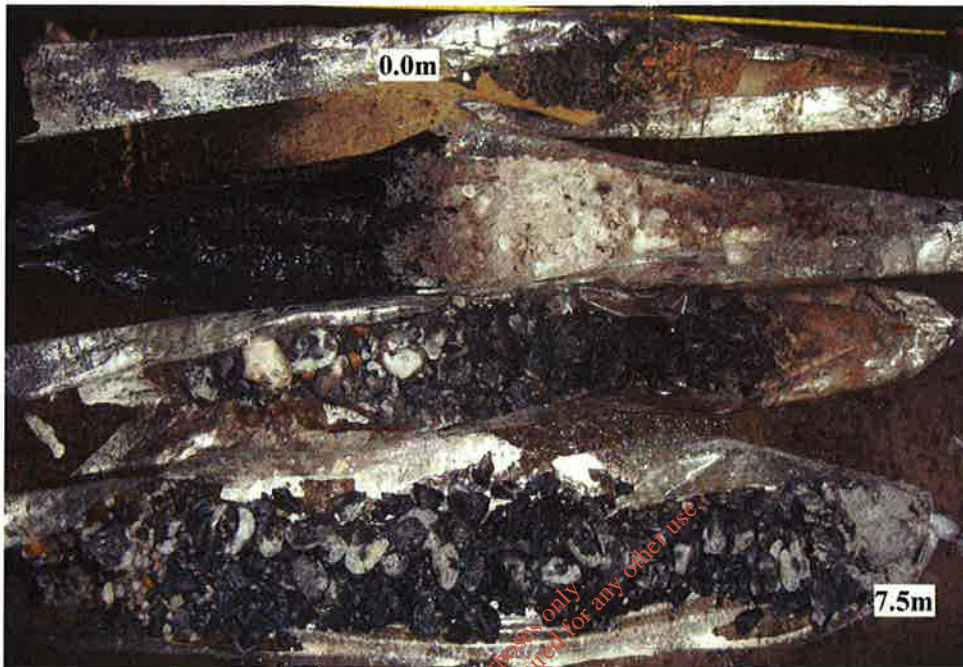


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Limerick Gasworks – Core Photography

D07



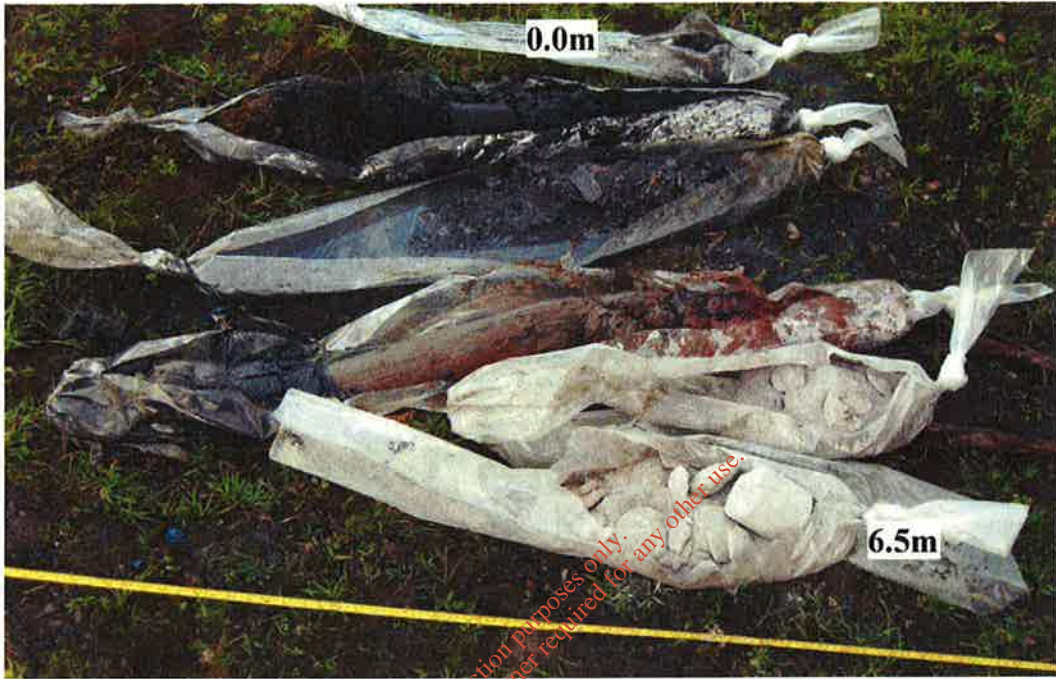
D08



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Limerick Gasworks – Core Photography

D09



D10



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Limerick Gasworks – Core Photography

**D11 Inspection Pit**



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**D11**



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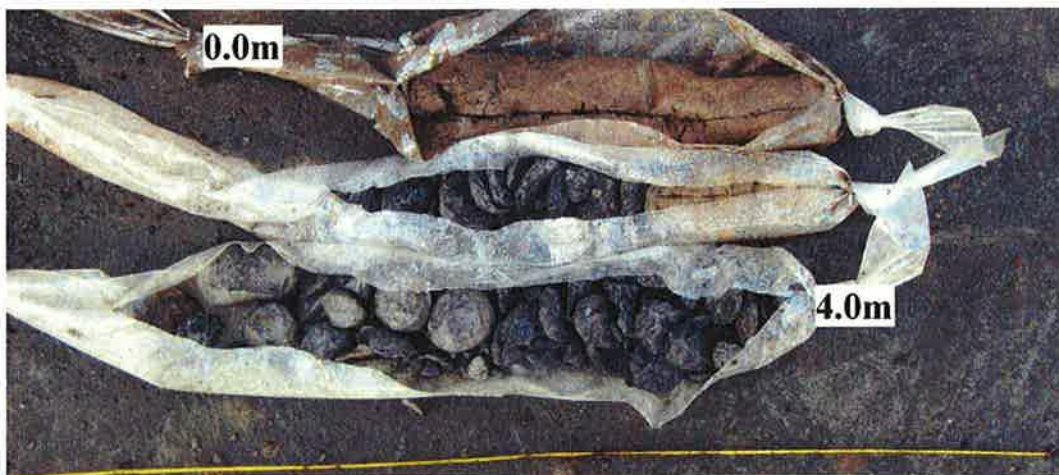
Limerick Gasworks – Core Photography

**D12 Inspection Pit**



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**D12**

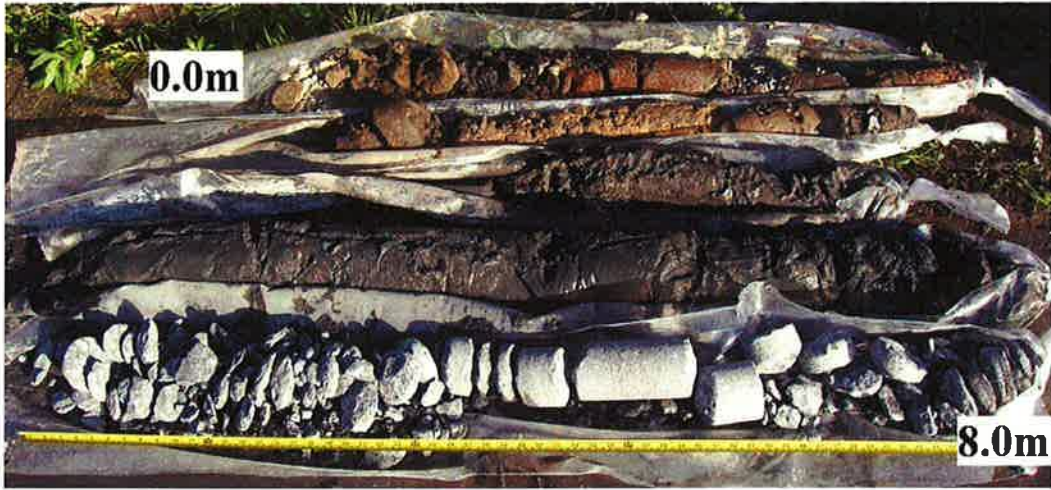


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Limerick Gasworks – Core Photography

E01



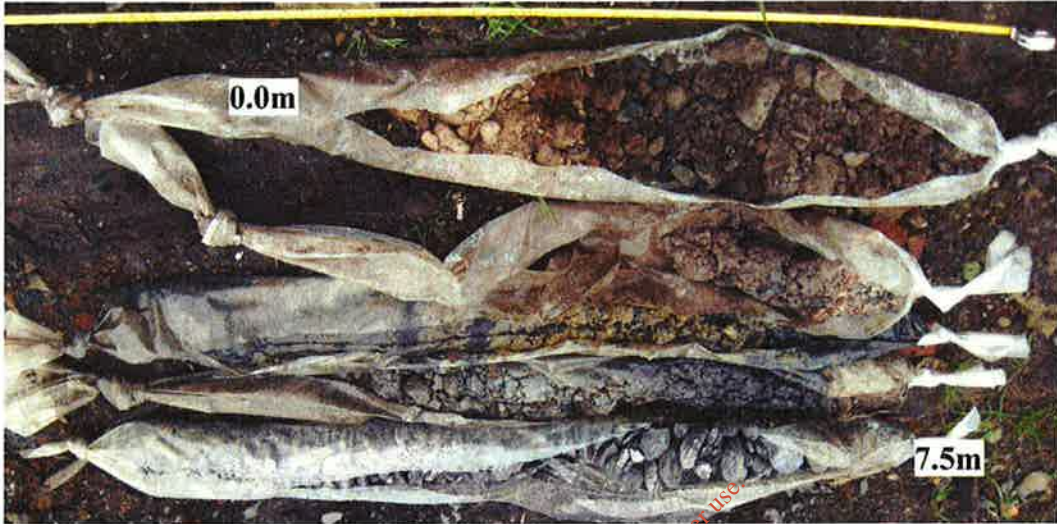
E02



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Limerick Gasworks – Core Photography

E03



E04

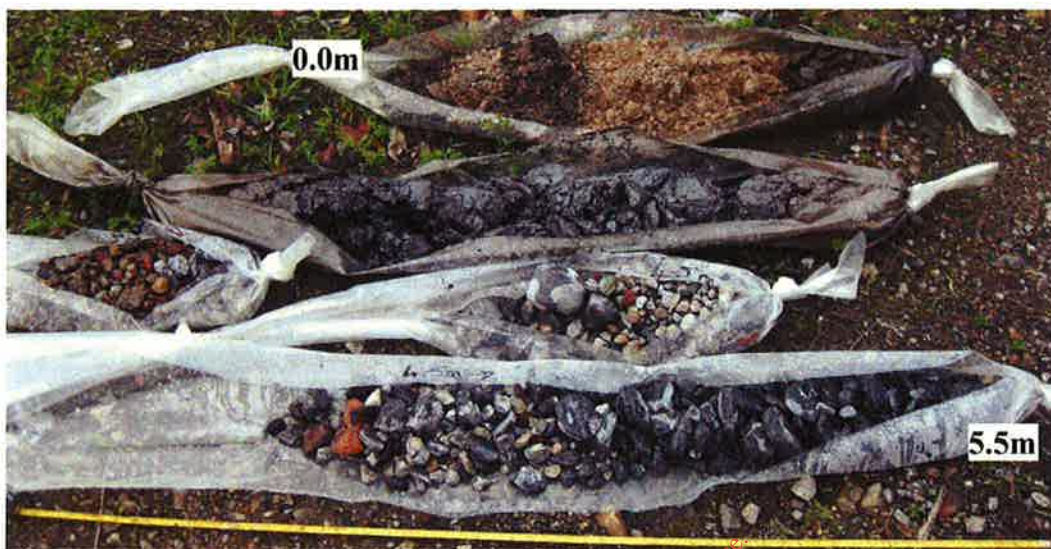


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**E05**



**E06**

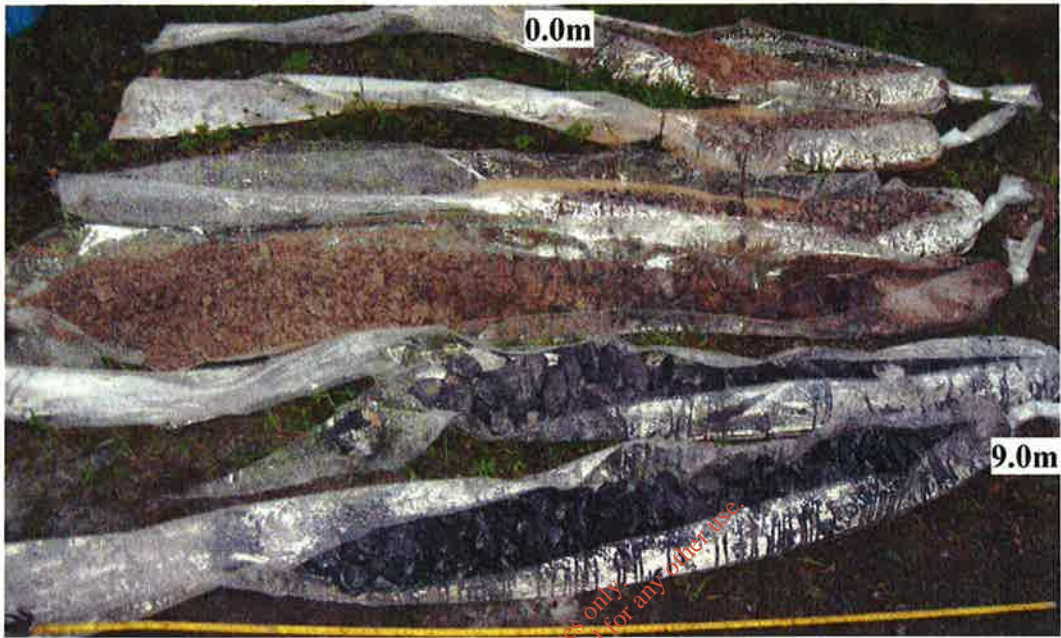


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Limerick Gasworks – Core Photography

**E07**



**E08**



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Limerick Gasworks – Core Photography

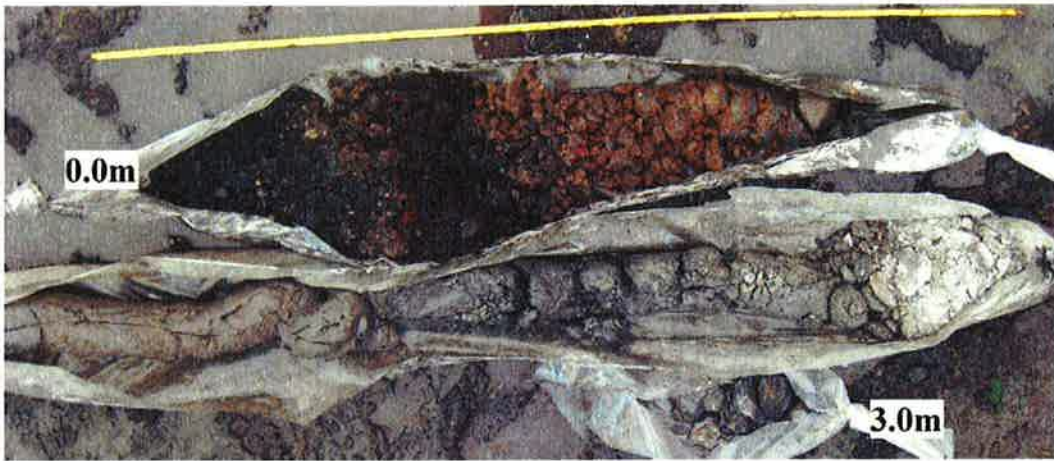
E09



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Limerick Gasworks – Core Photography

**E11**



**E12 Inspection Pit**



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Limerick Gasworks – Core Photography

E12



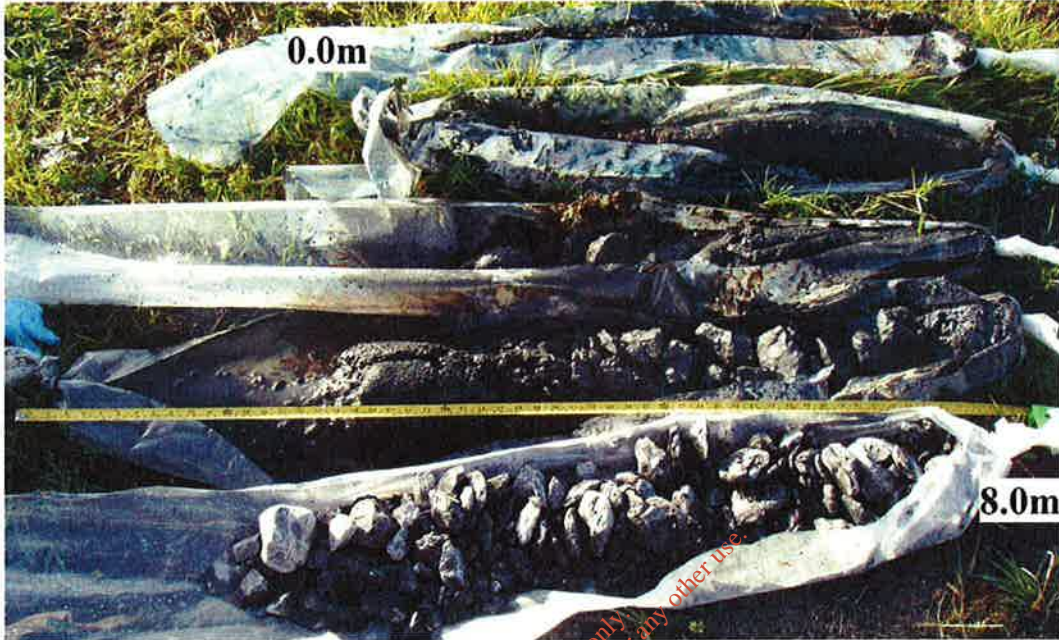
F01



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Limerick Gasworks – Core Photography

**F02**



**F03**



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Limerick Gasworks – Core Photography

F04



F05



F06

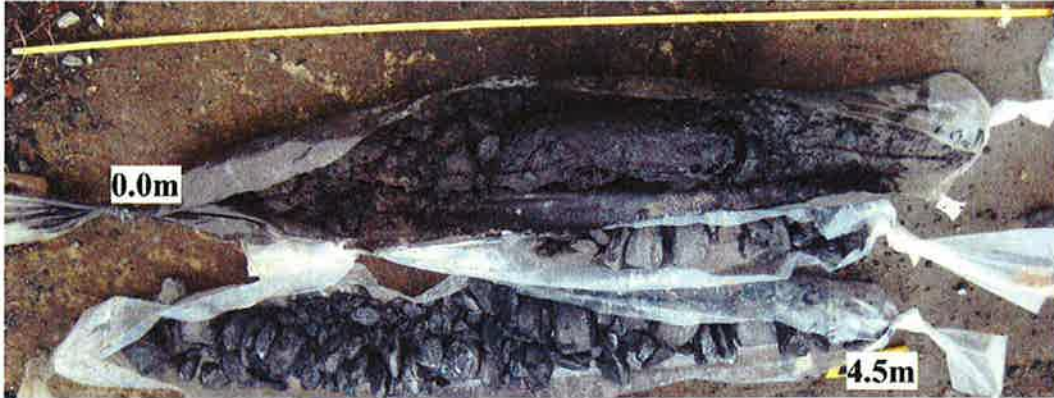


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**F07**



**F08**



**F09**



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Limerick Gasworks – Core Photography

**F11**



**F12 Inspection Pit**



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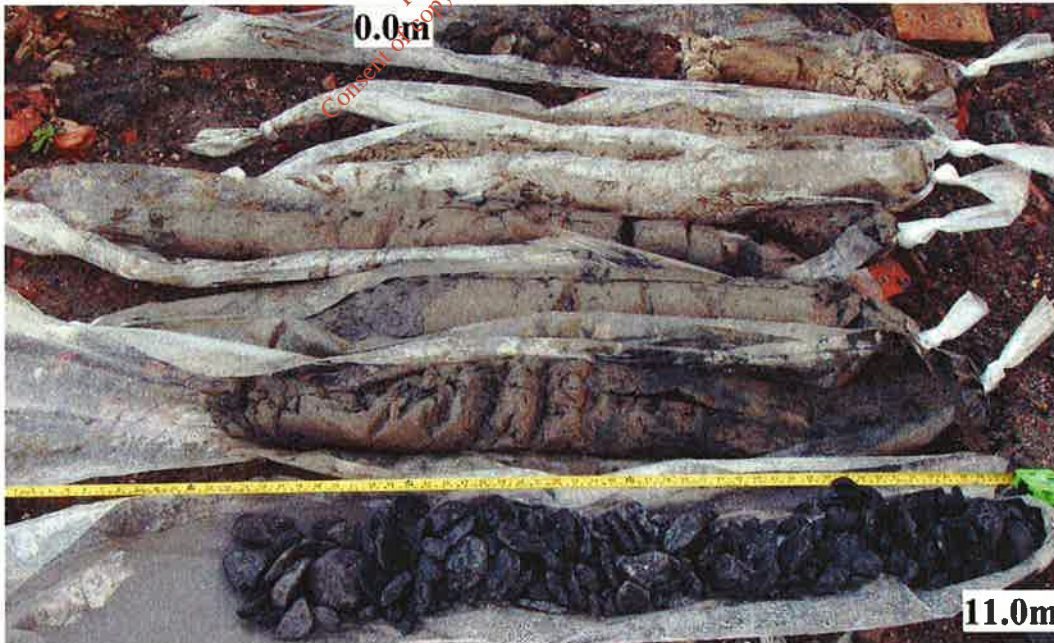
Limerick Gasworks – Core Photography

F12



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G01



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Limerick Gasworks – Core Photography

G02



G03



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Limerick Gasworks – Core Photography

G04 Photo 1 of 2



G04 Photo 2 of 2



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Limerick Gasworks – Core Photography

G05



G06

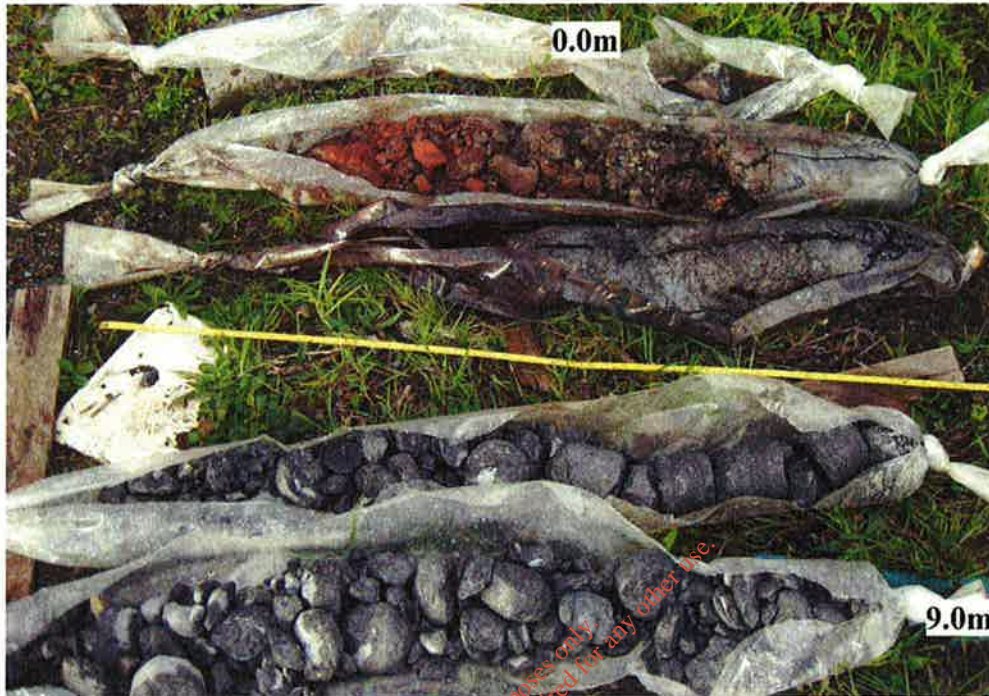


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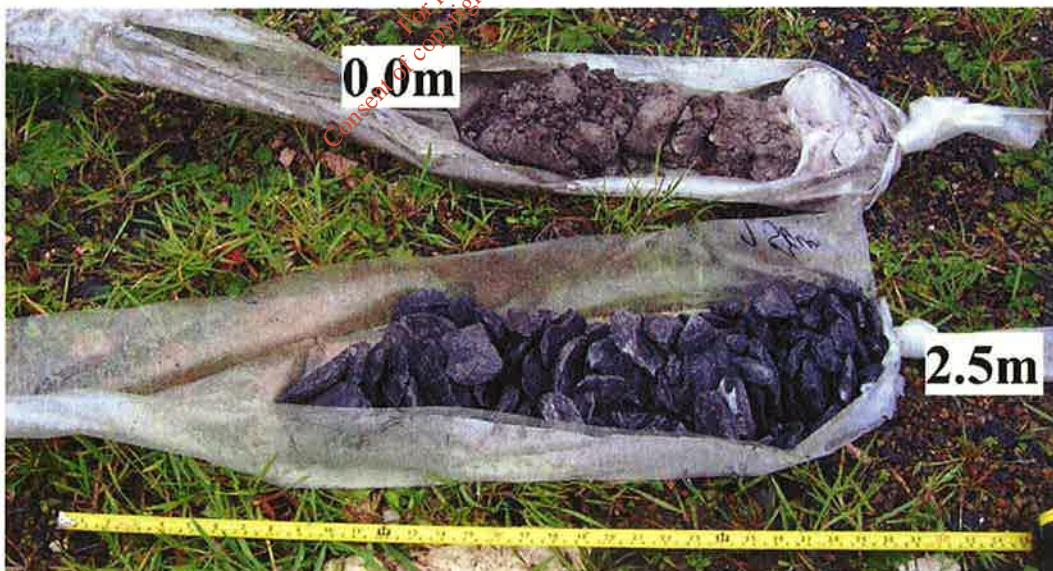


Limerick Gasworks – Core Photography

G07



G08

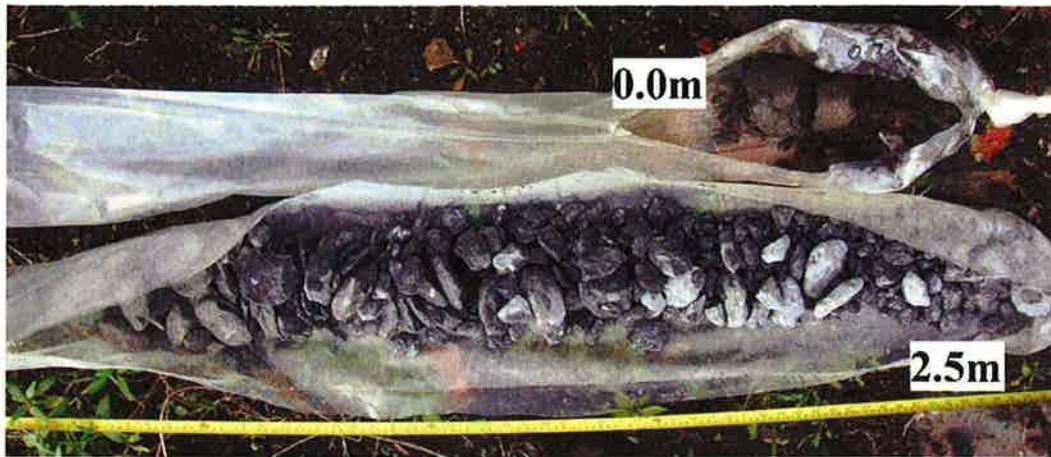


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Limerick Gasworks – Core Photography

G09



G10



G11



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Limerick Gasworks – Core Photography

**G12**



**H01**



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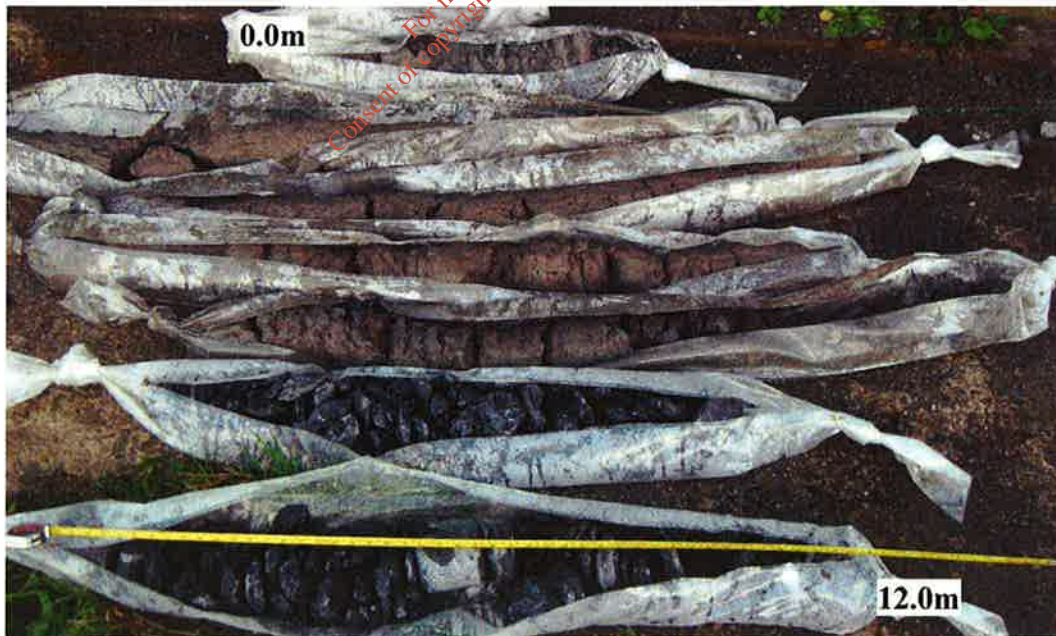


Limerick Gasworks – Core Photography

H02



H03



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Limerick Gasworks – Core Photography

H04



H05

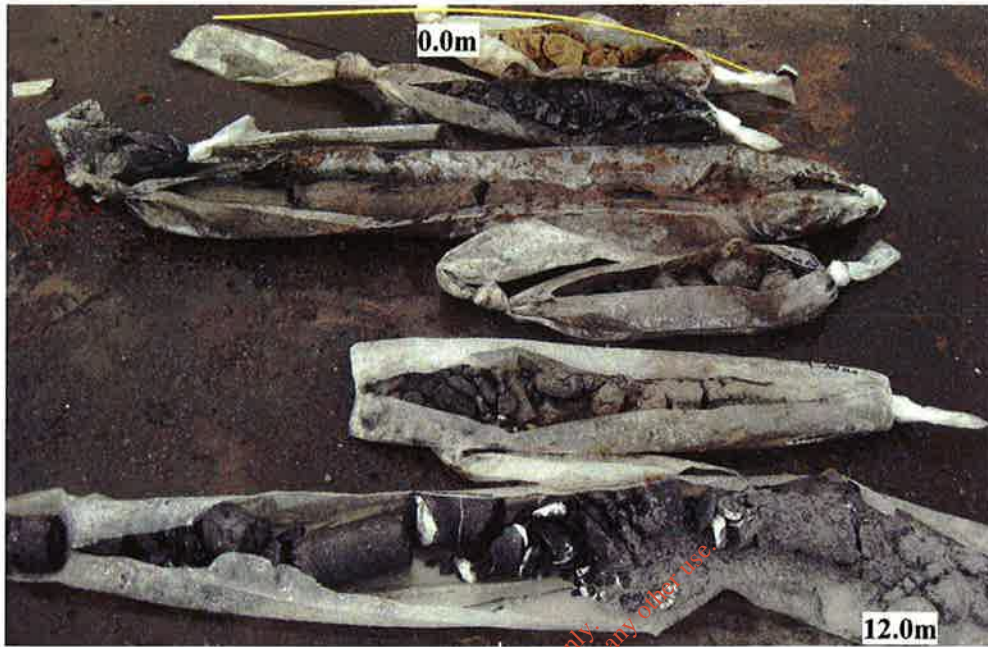


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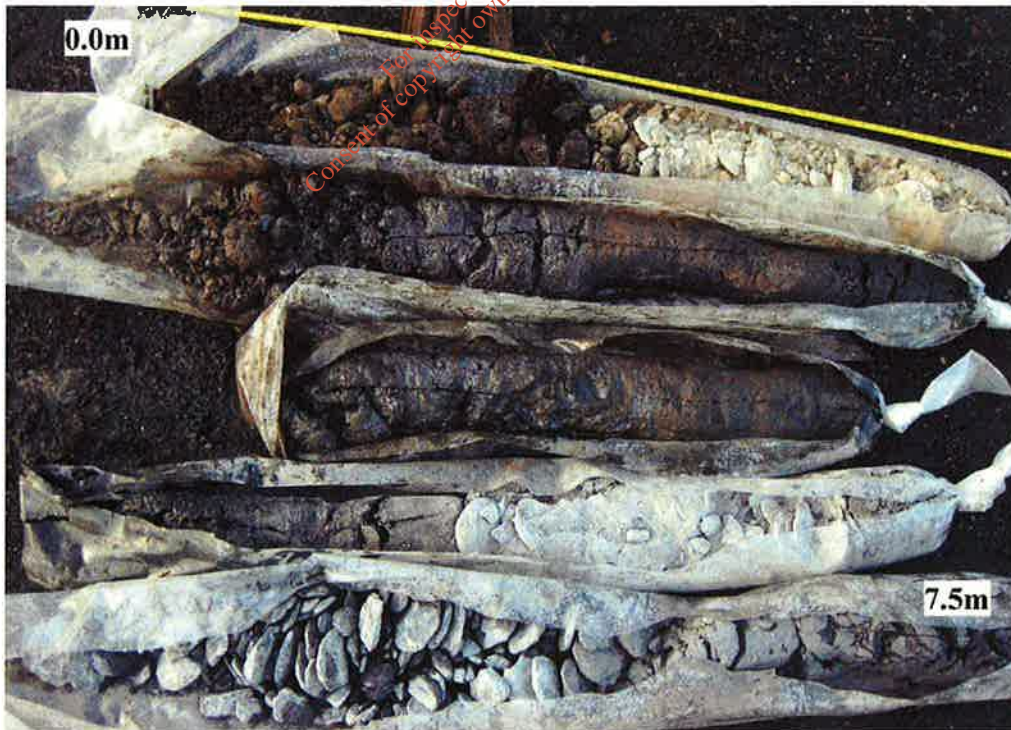


Limerick Gasworks – Core Photography

H06



H07

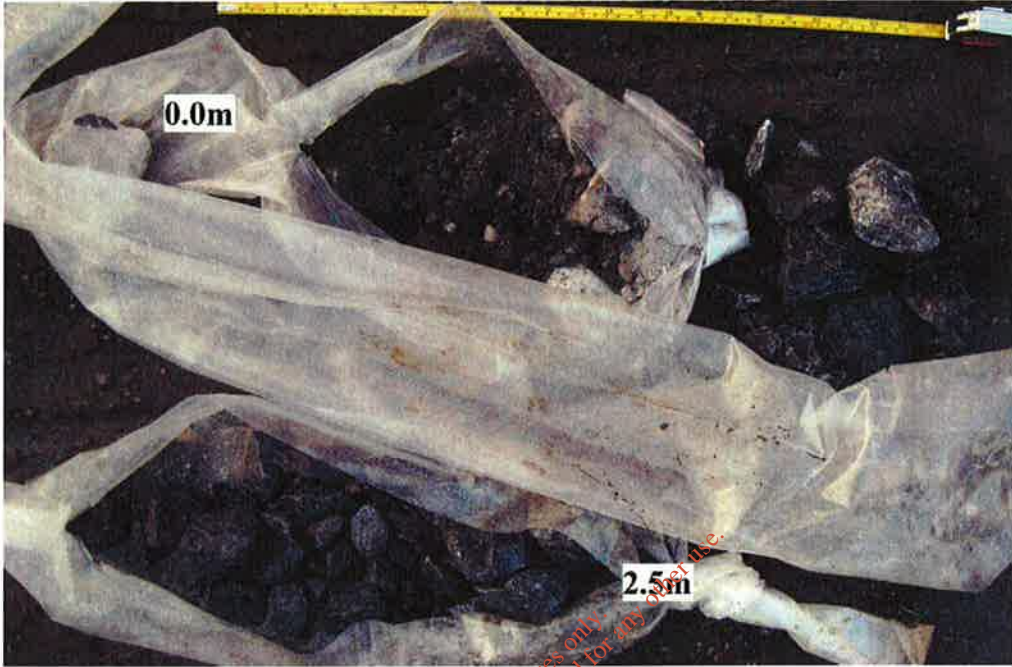


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Limerick Gasworks – Core Photography

**H08**



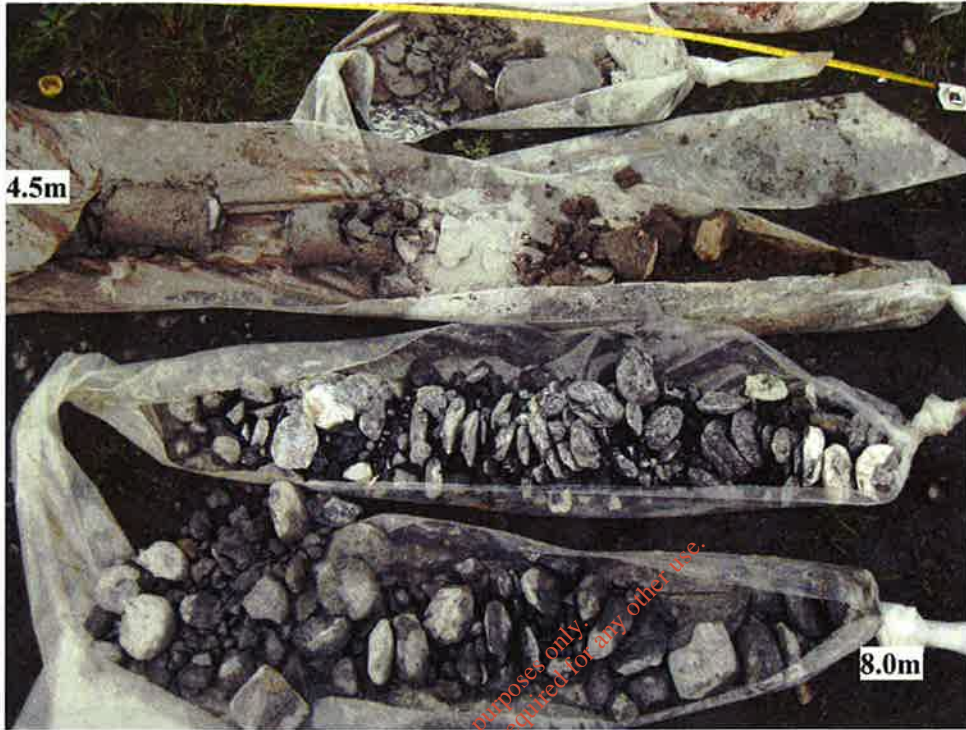
**H09 Picture 1 of 2**



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Limerick Gasworks – Core Photography

**H09 Picture 2 of 2**



**H10**



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Limerick Gasworks – Core Photography

H11



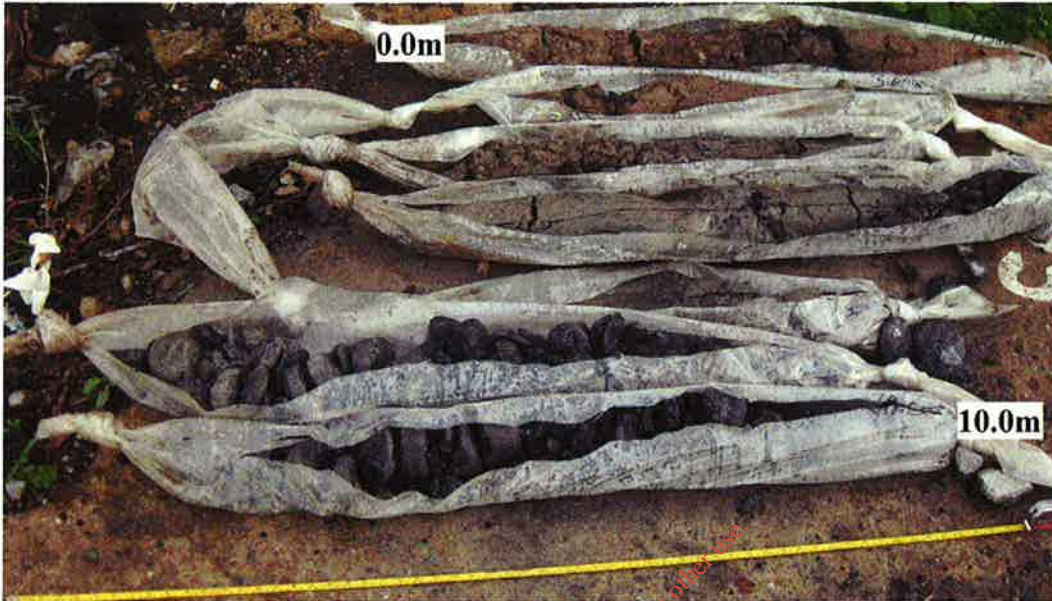
H12





Limerick Gasworks – Core Photography

I01



I02



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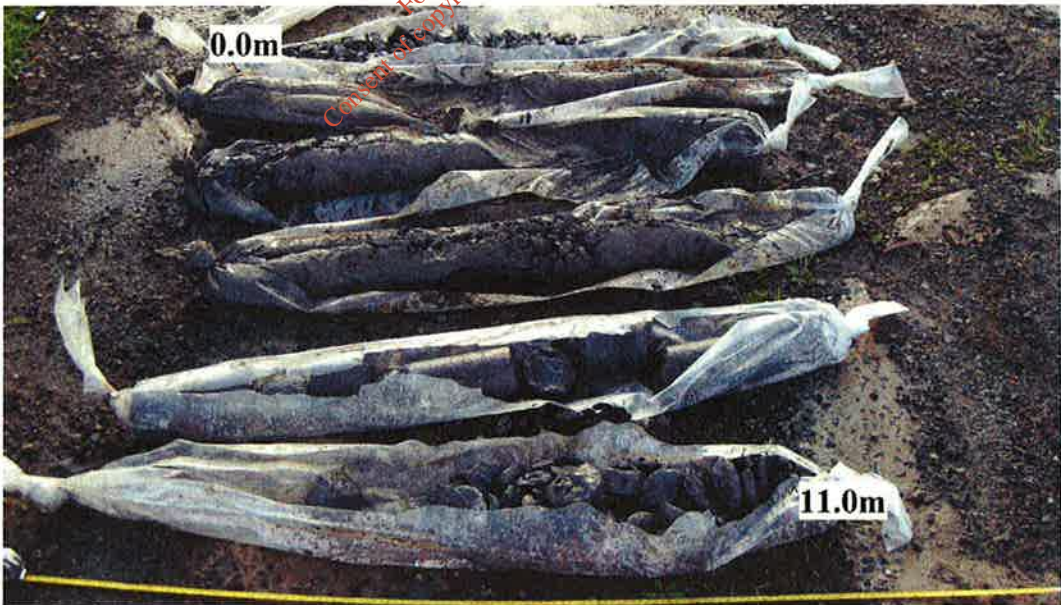


Limerick Gasworks – Core Photography

**I03**



**I04**



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Limerick Gasworks – Core Photography

105



106



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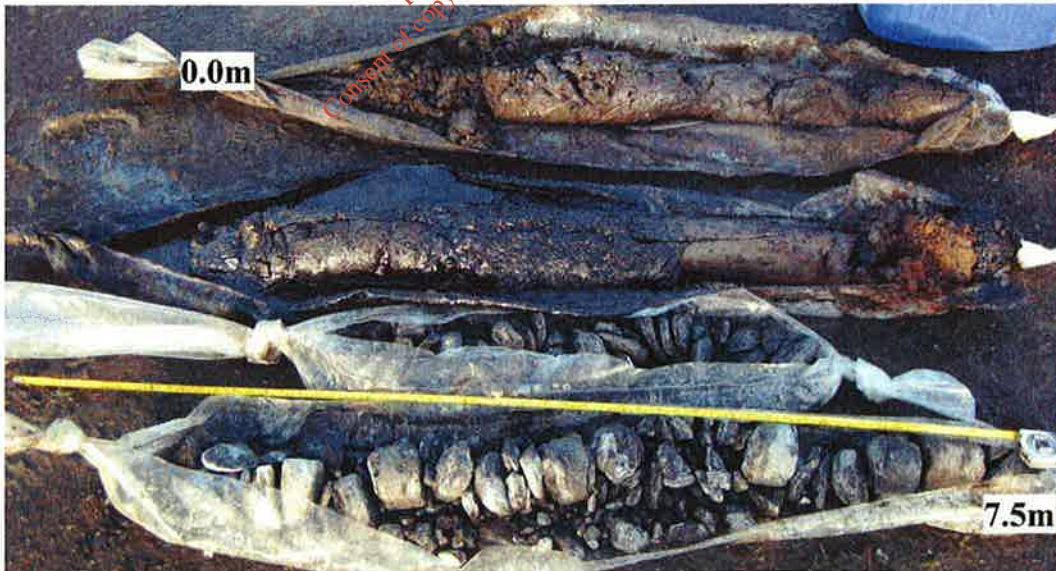


Limerick Gasworks – Core Photography

**I07**



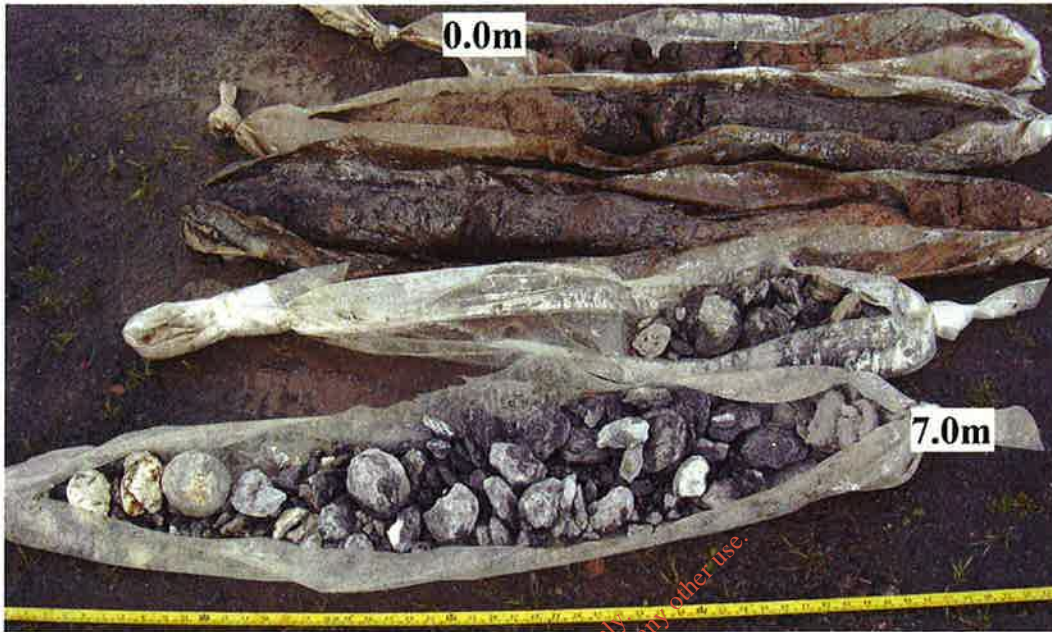
**I08**



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Limerick Gasworks – Core Photography

109



110



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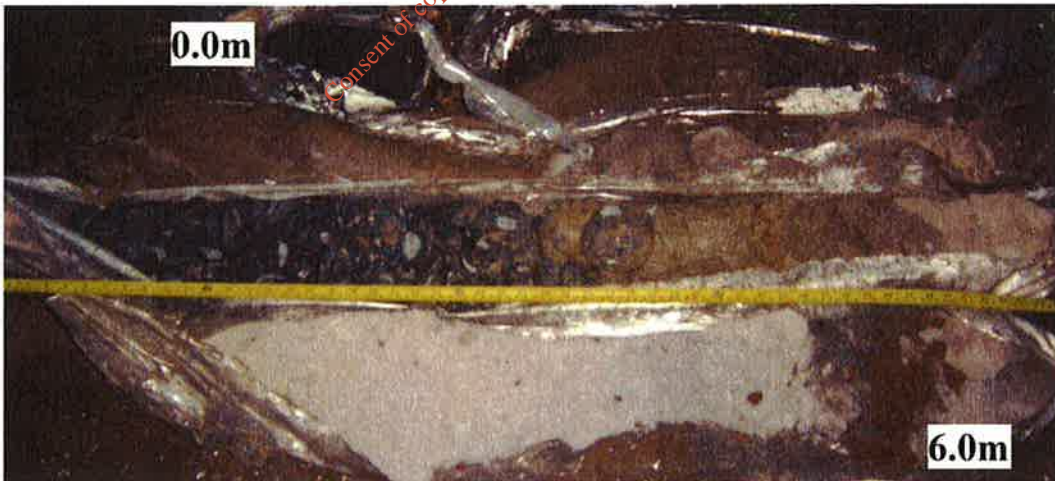


Limerick Gasworks – Core Photography

I11



I12



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Limerick Gasworks – Core Photography

J01



J02



IGSL Ltd



Limerick Gasworks – Core Photography

J03



J04



IGSL Ltd

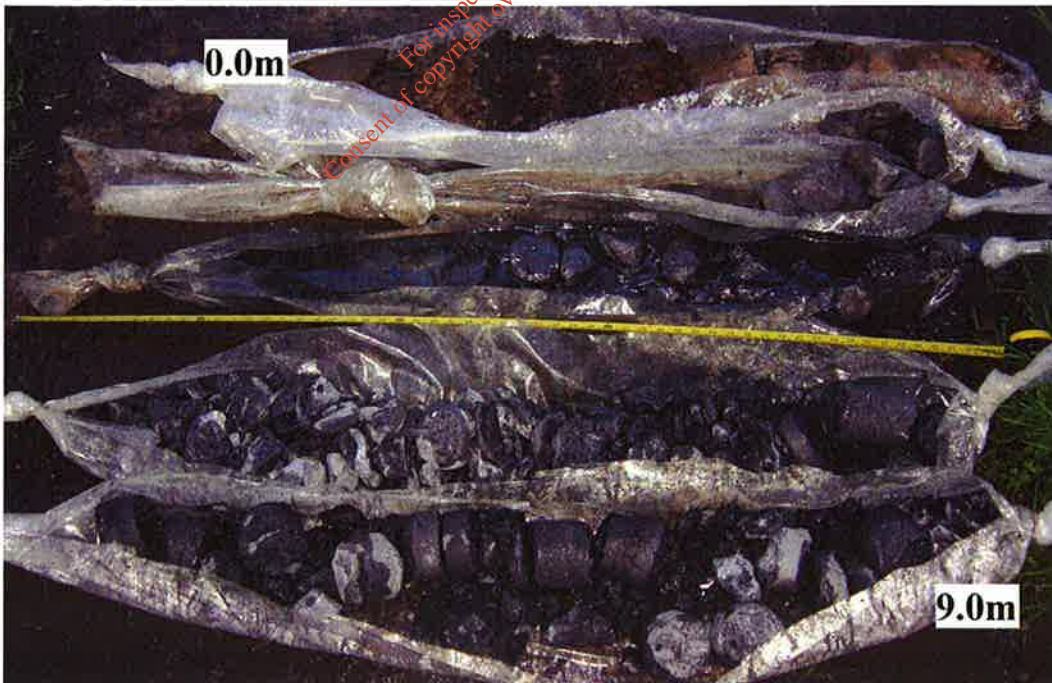


Limerick Gasworks – Core Photography

J05



J06



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Limerick Gasworks – Core Photography

J07



J08



IGSL Ltd



Limerick Gasworks – Core Photography

J09



J10



J11



IGSL Ltd



Limerick Gasworks – Core Photography

J12



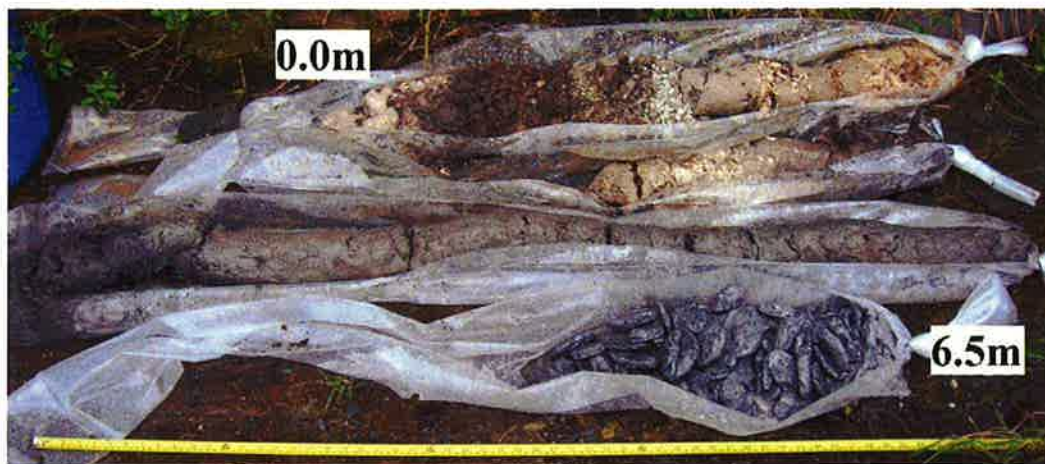
K01



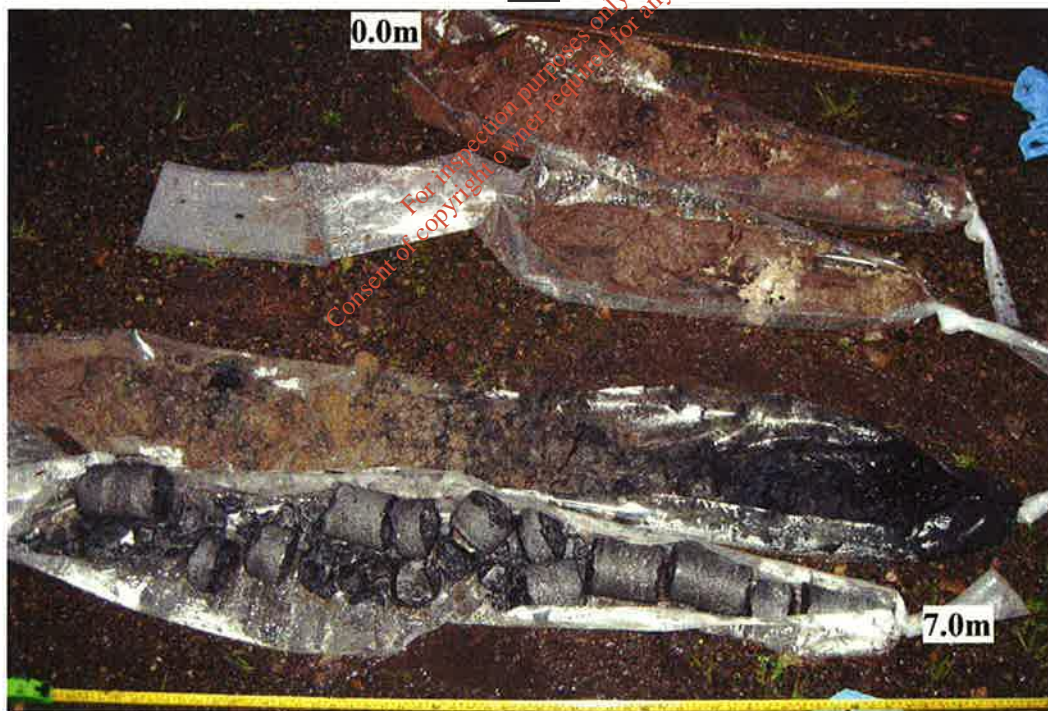
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Limerick Gasworks – Core Photography

**K02**



**K03**

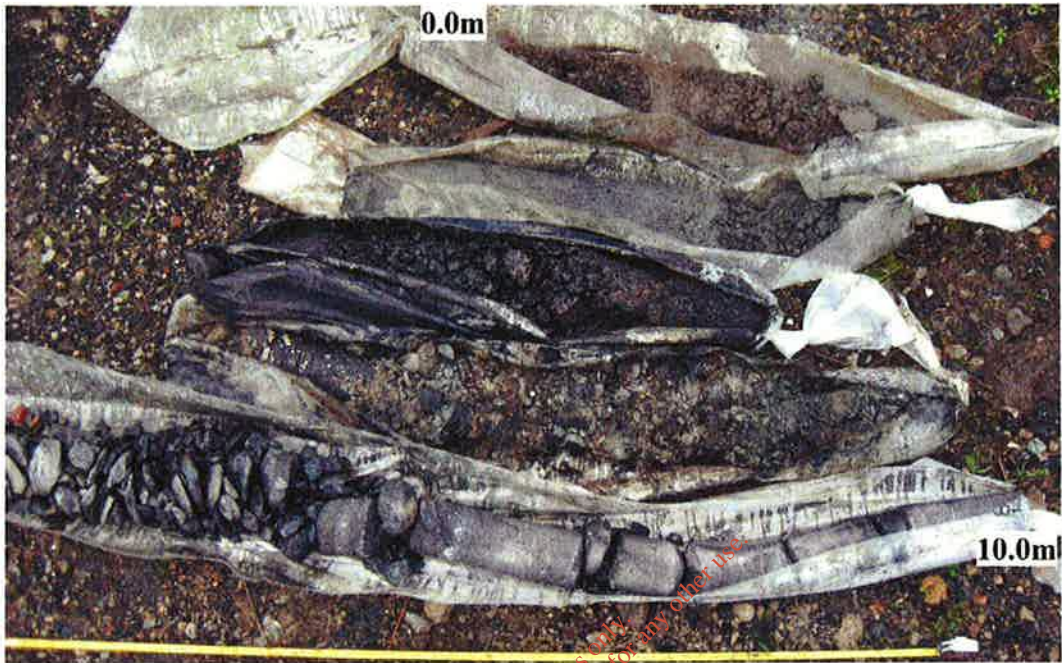


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Limerick Gasworks – Core Photography

**K04**



**K05**



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Limerick Gasworks – Core Photography

**K06**



**K07**



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Limerick Gasworks – Core Photography

K08



K09



K10



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Limerick Gasworks – Core Photography

K11



K12



L02

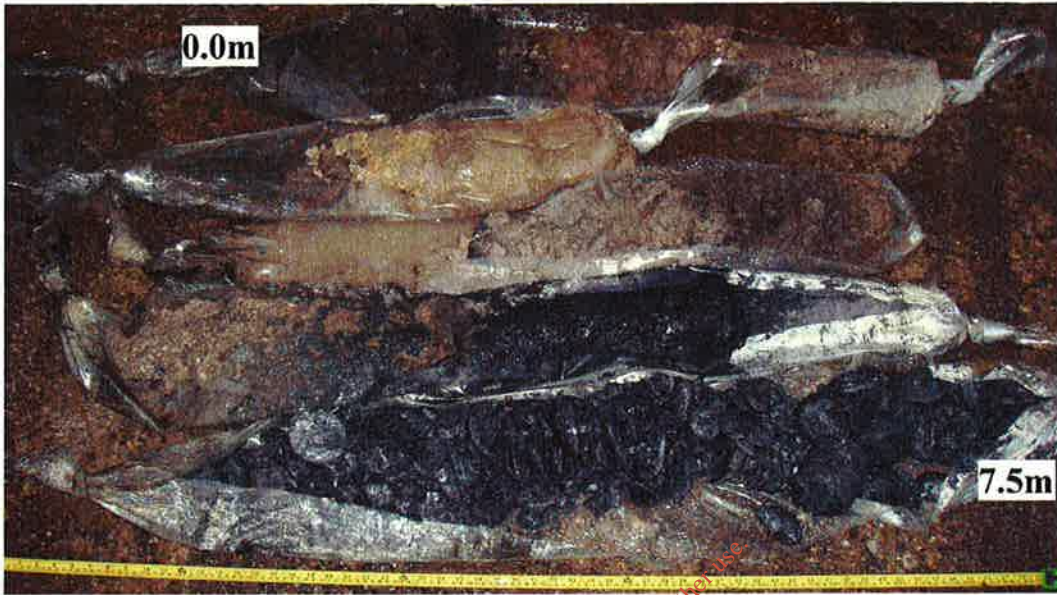


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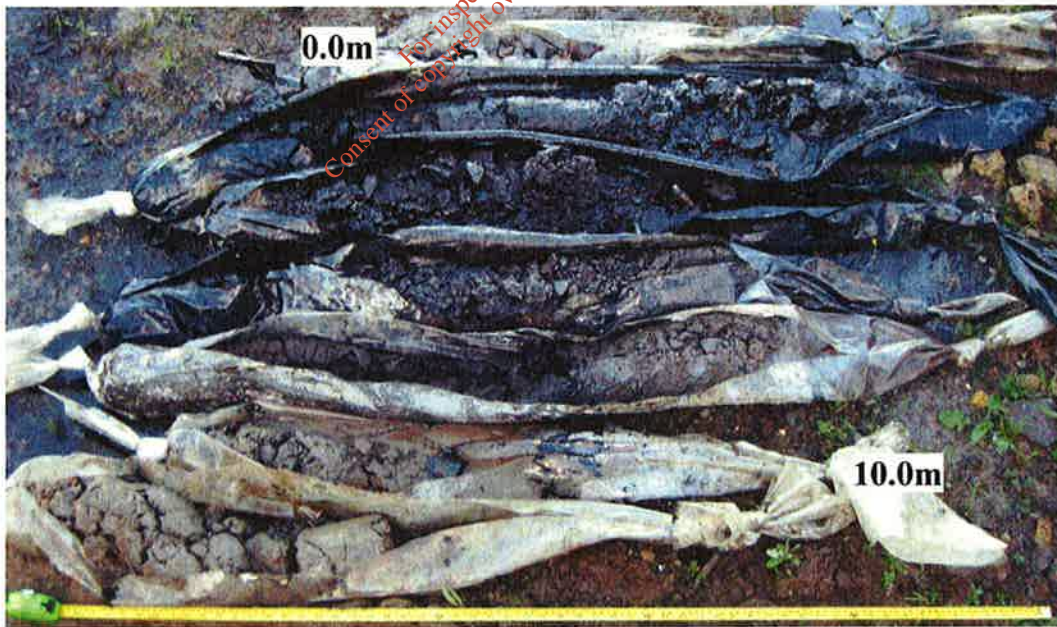


Limerick Gasworks – Core Photography

L03



L04



IGSL Ltd

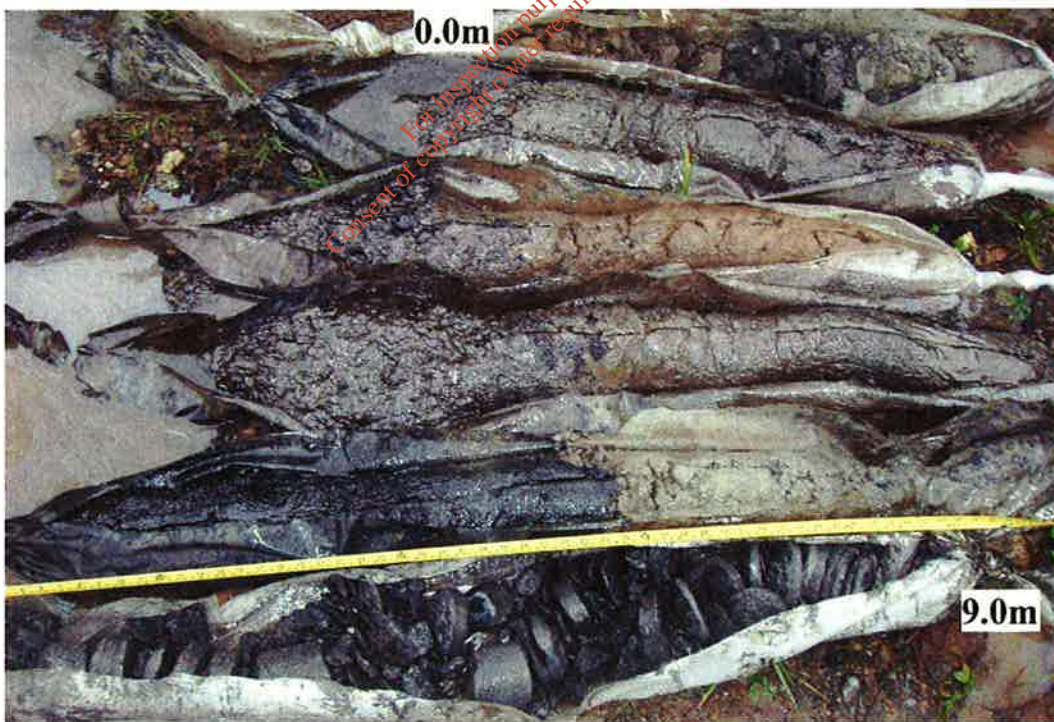


Limerick Gasworks – Core Photography

L05



L06



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Limerick Gasworks – Core Photography

L07



L08



L09



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Limerick Gasworks – Core Photography

L10



M03



M04



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**M05**



**M06 Picture 1 of 2**



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Limerick Gasworks – Core Photography

**M06 Picture 2 of 2**



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**M07**



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Limerick Gasworks - Sonic Core Photography

A1 0-2



A1 2-3



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Limerick Gasworks - Sonic Core Photography

A1 3-4



A1 4-5



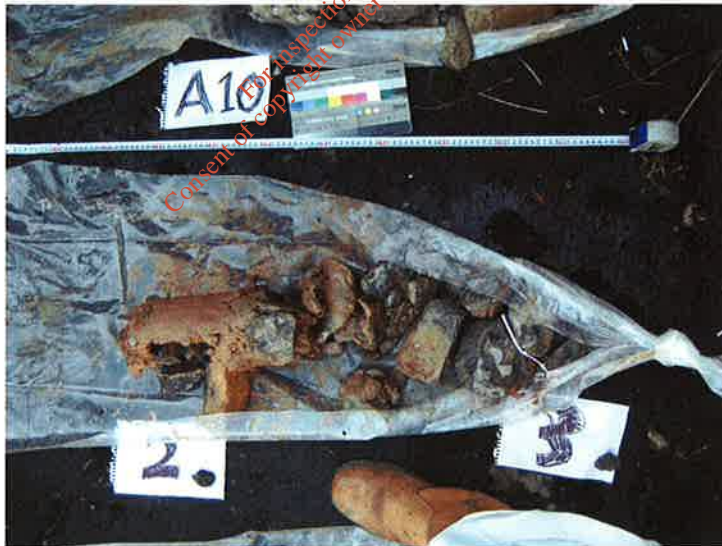
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Limerick Gasworks - Sonic Core Photography

A10 0-2



A10 2-3



IGSL Project No. 16033



Limerick Gasworks - Sonic Core Photography

A10 3-4



A10 4-5



Limerick Gasworks - Sonic Core Photography

A2 0-2



A2 2-4



IGSL Project No. 16033



Limerick Gasworks - Sonic Core Photography

A2 4-5.5



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Limerick Gasworks - Sonic Core Photography

A9 1-2



IGSL Project No. 16033



Limerick Gasworks - Sonic Core Photography

A9 3-4



B1 0-1



IGSL Project No. 16033

Limerick Gasworks - Sonic Core Photography

B1 1-2.5



B1 2.5-4



IGSL Project No. 16033

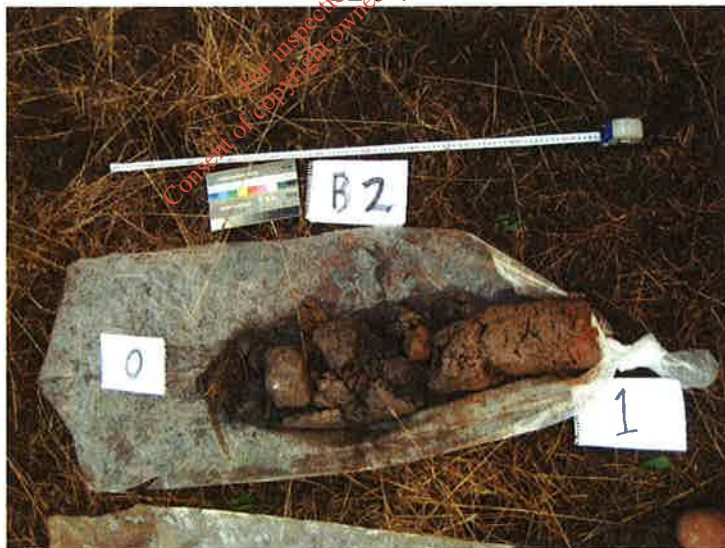


Limerick Gasworks - Sonic Core Photography

B10 0-2 and 2-5



B2 0-1



IGSL Project No. 16033

Limerick Gasworks - Sonic Core Photography

B2 1-2



B2 3-4.3





Limerick Gasworks - Sonic Core Photography

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B9 0-2



B9 0-5



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Limerick Gasworks - Sonic Core Photography

B9 2-3



IGSL Project No. 16033

Limerick Gasworks - Sonic Core Photography

C1 1-3.5



C1 3.5-4.7



IGSL Project No. 16033



Limerick Gasworks - Sonic Core Photography

C2 0-2



C2 2-3.5



IGSL Project No. 16033



Limerick Gasworks - Sonic Core Photography

D2 0-1.5



D2 1.5-2.5



IGSL Project No. 16033

Limerick Gasworks - Sonic Core Photography

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D2 2.5-3.5



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