Appendix 16

Dredge Material Analysis Reports

TECHNICAL NOTE

Reusability of Soil at the Slang

DARGLE FLOOD DEFENCE SCHEME QUERIES

Doc Number	Report Title	Revision	Date	Authored	Checked
14016-15	Reusability of Soil at the Slang	REV0	24/03/2015	MD/CB/SOC	PD
14016-15	Reusability of Soil at the Slang	REV1	31/03/2015	MD/CB/SOC	PD

1 Introduction

Gavin and Doherty Geosolutions Ltd. (GDG) were requested by Wicklow County Council (through Bray Town Council and TKFM Ltd.) to supervise trial pitting at the area along the River Dargle in Bray known as the Slang (Figure 1) with a view to assessing the reusability of soil material stockpiled there.

Figure 1 Location of Relevant Area

2 Scope of Work

A total of 10 trial pits were performed in February 2015. The locations are illustrated in drawing 14016-003 and in Figure 2.

A suite of soil laboratory tests were undertaken in accordance with BS 1377 *Methods of test for Soils for Civil Engineering Purposes*. The laboratory tests included Moisture Content, Atterberg limits, PSD curves, dry density and MCV tests. These are included in Appendix B.

A suite of Waste Acceptance Criteria (WAC) chemical tests were also undertaken, with the test methodology in compliance with EC Decision of 19 December 2002 (2003/33/EC). The test results are included in Appendix C.

3 WAC Results

The WAC results show that all waste elements and compounds are below the level of detection (LOD – using the Murphy's Suite criteria) or within the inert criteria limits.

4 Ground Conditions

The pits logs are included in the Appendix A. In situ classification was confirmed by the laboratory testing (Appendix B).

Three stockpiles marked S1, S2 and S3 respectively in Figure 2 below are manmade. The soils observed within these three nearby pits are discussed below:

- The top of the Stockpile S1 is at a level of 16.0 mOD, bottom at approximately 11.8 mOD. TP4 is representative of this stockpile. Stiff to very stiff sandy clay was observed and classified as made ground. Gabion basket fractions have been detected along with a large angular boulder at 1.5 m below the ground level.
- The top of Stockpile S2 is at 12.7 mOD, bottom at approximately 11.2 mOD. TP 7 is representative for this compound. Sandy, gravelly clay was determined along with some organic matter.
- The top of the Stockpile S3 is at 16.0 mOD, bottom at approximately 11.1 mOD. No trial pits were performed in S3, the closest one is TP8 which contains clayey sandy gravel with fine sand and occasional cobbles and part of reinforced concrete which confirm this area to be made ground.

Since the stockpiles are of irregular shape it is hard to determine exact volumes, but approximate volumes for the stockpiles are as following: S1= 4100m^3, S2= 770m^3, S3=1700 m^3.

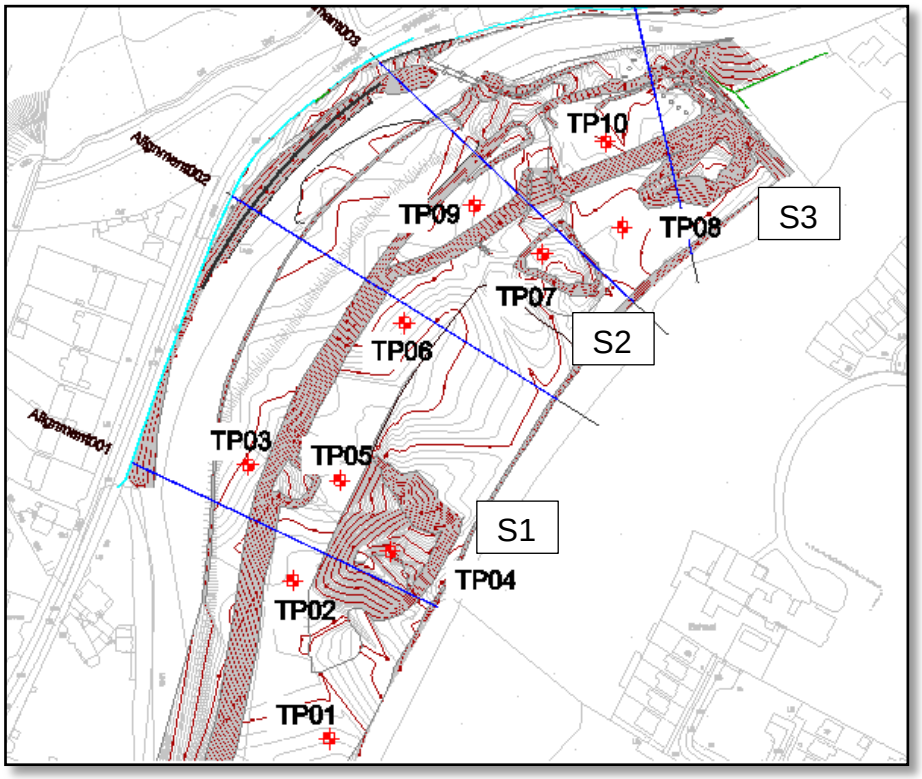

Figure 2 Location of the trial pits

In Chapter 5.4.4.1 of the EIS it is stated that:

> *It is currently proposed to place approximately 50% of the excavated soil/subsoil/riverbed sediment at the Slang, which is currently zoned for development. This will result in the level of the Slang being raised by approximately 1m to 1.25m. The Slang will then be landscaped and the remaining 50% transported off-site for authorised disposal...Suitable environmental testing of the excavated material will be undertaken prior to its placement on the Slang to confirm that it is suitable for its proposed use.*

According to Drawings B237-120 to B237-123 of the EIS, the ground levels in the area prior to construction were typically 8.0 mOD (at Section 004) to 10.0 mOD (at Section 001). Thus the final ground level would be typically 9.0 mOD or 9.25 mOD at Section 004 increasing upstream to 11.0 mOD or 11.25 mOD. This "plateau" is at the back of the embankment should range is illustrated in EIS Drawings B237-130, B237-131 and B237-166.

It should be noted that this "plateau" is well above the flood defence level (aside from the area marked as the secondary flood channel), and that if the levels were greater than those indicated in the EIS, it would not interfere with the water level of the flooded river.

To match the EIS requirements, the stockpiles need to be stripped away along with approximately another metre of the existing soil at the location in order to accommodate the planned heights.

The rest of the trial pits exhibit different types of soil, mostly classified as made ground. The lower part of the slang, TP1 and TP2, contained gravel as made ground in the upper area of the trial pits, followed by either sand or clay. Similar can be found in TP3. TP 5 consisted of a clay with cobbles followed by clayey gravelly fine sand. TP 6, located in the central part of the area, shows sandy clayey gravel, followed by fine, clayey gravelly sand. In the upper part of the Slang TP 9 shows clayey sandy gravel followed by very clayey gravelly coarse sand and in TP 10 cobbles and gravel were detected.

5 Conclusion and Recommendation

Although the WAC tests for stockpiles were favourable, the material is mostly inhomogeneous made ground with fragments of gabion baskets, reinforced concrete and organic material. It is suggested for this soil only to be used in landscaping, and not for an embankment construction or specifically for the bund in the Slang area. However the gravels underneath the stockpiles are favourable and fit for other purposes.

It is suggested that the stockpiles to be removed; the gravel underneath should be excavated and the stockpile material placed back instead of the gravel. This would create usable fill material for other purposes. Quantities should correspond to the prescribed levels by the EIS.

APPENDIX A

Site Logs and Photos

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Trial Pit No.

TP 1

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725007.96m - N 717992.35m **Level:** 12.92m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation ----------> SSW (Digger) Depth: 3.65m m E D A B C	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Medium to loose brown clayey very sandy angular to rounded medium to coarse GRAVEL. Sand is fine to medium. Occasional timber fragments, roots, rare steel rods and frequent frayed cable. (MADE GROUND). Gravel of mixed lithologies: sandstone, quartzite and greywacke.	
		1.20 1.20	B B	TP1-1b TP1-1a			Below 1.25m subangular boulders of granite.	
							Below 2.2m frequent subangular to rounded cobbles.	
	10.47	2.45 2.45	B B	TP1-2b TP1-2a		2.45	Dense grey silty slightly gravelly medium to coarse SAND with boulder size pockets of fine yellow brown mottled orange sand with occasional rootlets and iron laminations.(BEACH DEPOSIT). Occasional rounded boulders. Below 3.3m becoming brown slightly silty gravelly cobbly medium SAND with boulder size pockets of grey clay. Gravel is subangular to rounded, fine to medium. Cobbles are subangular to rounded of quartzite, grey shale, granite and red sandstone.	
							Below 3.3m becoming brown clayey very sandy GRAVEL with frequent cobbles and boulder size pockets of grey clay. Gravel is subangular to rounded, fine to medium. Cobbles are subangular to rounded of quartzite, grey shale, granite and red sandstone.	
		3.50 3.50	B B	TP1-3b TP1-3a				
	9.27					3.65	Trial pit completed at 3.65m	

Stability: Good-Moderate

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

TP terminated at 3.65mbgl.

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Trial Pit No.

TP 2

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 724990.59m - N 718068.01m **Level:** 11.99m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation ----------> SSW (Digger) Depth: 3.20m 4.10m, 2.10m D A B C	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
		0.90	B	TP2-1b			Loose to medium dense brown clayey sandy cobbly subangular to subrounded medium to coarse GRAVEL. Sand is medium to coarse of mixed lithologies. Cobbles of granite. Large grey boulder at face D (NNE orientation).	
		0.90	B	TP2-1a				
		1.20	B	TP2-2b			Below 1.2m: Becoming sandy slightly gravelly CLAY.	
		1.20	B	TP2-2a			Tabular angular boulder at 1.5m depth.	
	10.29					1.70	Firm brown slightly sandy CLAY with abundant rootlets.	
	8.79					3.20	Trial pit completed at 3.20m	

Stability: Moderate becoming good beneath 1.4m

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

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Trial Pit No.

TP 3

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 724969.08m - N 718123.27m **Level:** 5.59m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Depth: 4.20m Orientation -------> SSW (Digger) 4.60m, 1.80m, A, B, C, D	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Brown clayey sandy GRAVEL with abundant cobbles. (MADE GROUND-construction fill). Cobbles are subrounded to rounded of fresh to slightly weathered granite. Shallow subvertical discontinutity along face A (ESE orientation) at 0.1mgbl. Occasional subangular boulders. At 0.2mbgl, water pipe at face D (NNE orientation).	
							Below 1.8m stiff brown slightly sandy, slightly gravelly CLAY with occasional fine gravel.	
							Roots at 1.9 mbgl	
		2.50	B	TP3-1b				
		2.50	B	TP3-1a				
	2.94					2.65	Dense light yellow brown, mottled orange (iron stains) fine SAND with rare rootlets (finger sized) and rare rounded coarse gravel.	
		3.35	B	TP3-2b				
		3.35	B	TP3-2a				
	1.39					4.20	Trial pit completed at 4.20m	

Stability: Good

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

TP terminated at 4.2mgbl - Client instructions.

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Trial Pit No.

TP 4

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725037.11m - N 718082.02m **Level:** 13.94m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation ----------> NW (Digger) Depth: 1.60m 5.30m 3.00m D A C B	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Stiff to very stiff brown grey slightly sandy CLAY with rare subrounded coarse gravel of dark grey mudstone/greywacke. (MADE GROUND).	
	12.34					1.60	Gabion basket at 1.5mbgl. Large tabular angular boulder at 1.6mbgl. Trial pit completed at 1.60m	

Stability: Very poor

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

Terminated on client instructions due to excavation instability.

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Trial Pit No.

TP 5

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725013.09m - N 718115.97m **Level:** 11.57m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation ENE (Digger) Depth: 2.50m 4.80m × 1.80m (A, B, C, D)	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Brown cobbly CLAY with frequent subangular boulders. Fragments of gabion basket and cobbles . Cobbles of mixed lithologies. (MADE GROUND).	
	9.12 9.07	2.50 2.50	B B	TP5-1b TP5-1a		2.45 2.50	Slightly clayey sandy subangular to rounded medium to coarse GRAVEL. Trial pit completed at 2.50m	

Stability: Moderate

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

Terminated at 2.5mbgl due to sidewall discontinuities at surface and instability.

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Trial Pit No.

TP 6

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725043.80m - N 718191.34m **Level:** 11.07m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation -------> SSW (Digger) Depth: 3.37m 3.50m, 1.90m D A B C	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Loose brown clayey sandy cobbly subrounded medium to coarse GRAVEL. Cobbles are subrounded of green tabular psammite/ schist, purple sandstone, quartzite and orange weathered sandstone.	
							Frequent boulders below 0.7m.	
		0.95	B	TP6-1b				
		0.95	B	TP6-1a				
							Becoming finer gravel below 1.9m.	
	8.42					2.65	Medium dense brown clayey gravelly fine SAND. Gravel is medium to coarse, subrounded to rounded. Frequent cobbles of quartzite and greywacke.	
		3.30	B	TP6-2b				
	7.70	3.30	B	TP6-2a		3.37	Trial pit completed at 3.37m	

Stability:	Good; Poor below 3.3m
Plant:	20T tracked excavator
Backfill:	

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

Terminated at 3.37mbgl: sides collapsing at base.

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Trial Pit No.

TP 7

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725110.01m - N 718224.26m **Level:** 12.37m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation ENE (Digger) Depth: 4.25m 4.10m, 1.90m A, B, C, D	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Stiff brown slightly gravelly CLAY with abundant rootlets. Gravel is medium to coarse, subangular to rounded. Occasionally a tabular cobble. Rare medium gravel size fragments of organic matter.	
		2.00 2.00	B B	TP7-1b TP7-1a				
							Below 3.3m occasional frequent subrounded cobbles.	
	8.12					4.25	Trial pit completed at 4.25m	

Stability: Very good

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

Terminated at 4.25mbgl.

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Trial Pit No.

TP 8

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725148.21m - N 718237.00m **Level:** 11.02m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Depth: 3.28m Orientation: NW (Digger) 4.00m × 1.90m A, B, C, D	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Brown clayey very sandy GRAVEL. Sand is fine. Occasional subrounded boulders and frequent subangular to subrounded cobbles of mixed lithologies. Rare cobble of concrete with steel (MADE GROUND). Discontinuity on face A (ground surface).	
		2.05 2.05	B B	TP8-1b TP8-1a				
							Boulder at 3mbgl.	
	7.74					3.28	Trial pit completed at 3.28m	

Stability: Poor to 2mbgl; Good below 2m.

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

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Trial Pit No.

TP 9

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725077.33m - N 718247.62m **Level:** 7.32m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation -------> SSW (Digger) Depth: 2.80m 3.90m, 1.70m D A C B	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Brown clayey sandy GRAVEL. Sand is fine. Occasional subrounded boulders and frequent subangular to subrounded cobbles of mixed lithologies.	
	6.22					1.10	Dense very clayey gravelly coarse SAND with pockets of fine sand and layers of wood fragments. Gravel is subrounded to rounded of mixed lithologies.	
							1.6mbgl: Hardpan. Below 1.6m: iron laminations.	
▼	4.52	2.80 2.80	B B	TP9-1b TP9-1a		2.80	Trial pit completed at 2.80m	

Stability: Moderate

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike: 2.80 — Type/ Rate of flow

Remarks:
Terminated at 2.8mbgl due to water influx.

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Trial Pit No.

TP 10

Sheet 1 of 1

Project Name: River Dargle Flood Defence Scheme	**Project No.** 14016	**Co-ords:** E 725140.27m - N 718278.03m **Level:** 6.41m	**Date** 16/02/2015
Location: Bray (Co. Wicklow)		**Dimensions:** Orientation ENE (Digger) Depth: 2.50m 4.80m, 2.10m, A, B, C, D	**Scale** 1:25
Client: TKFM Ltd. / Wicklow County Council			**Logged by:** SOC/GM

Water	Level (m AOD)	Samples & In Situ Testing: Depth (m)	Type	Sample ID	Results	Depth (m)	Stratum Description	Legend
							Loose brown slightly clayey COBBLES and GRAVELS. Cobbles are subrounded to rounded of granite and grey/ green psammite. Gravel is subangular.	
							0.9mbgl: Black hardpan.	
	3.91					2.50	Trial pit completed at 2.50m	

Stability: Poor

Plant: 20T tracked excavator

Backfill:

Groundwater: Depth Strike Type/ Rate of flow

Remarks:

Terminated at 2.5mbgl: Unstable side wall, surface fissures. No samples required.

Figure 1 Trial Pit 1

Figure 2 Trial Pit 2

Figure 3 Trial Pit 3

Figure 4 Trial Pit 4

Figure 5 Trial Pit 5

Figure 6 Trial Pit 6

Figure 7 Trial Pit 7

Figure 8 Trial Pit 8

Figure 9 Trial Pit 9

Figure 10 Trial Pit 10

APPENDIX B

Soil Classification Results

IGSL Ltd
Materials Laboratory
Unit J5, M7 Business Park
Newhall, Naas
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045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2, 4.3, 4.4 & 5.3

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1331

Report No. **R63502** Contract No. 18217 Contract Name: River Dargle Flood Defence Scheme

Customer GDG

Samples Received: 20/02/15 Date Tested: 20/02/15

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
TP01	1B	1.2	A15/0592	B	9.7					WS	4.4		Brown clayey/silty, very sandy, GRAVEL
TP01	3B	3.5	A15/0593	B	10					WS	4.4		Brown clayey/silty, very sandy, GRAVEL
TP02	1B	0.9	A15/0594	B	11					WS	4.4		Brown clayey/silty, very sandy, GRAVEL
TP02	2B	1.2	A15/0595	B	31					WS	4.4		Brown sandy, slightly gravelly, SILT/CLAY
TP03	1B	2.5	A15/0596	B	18					WS	4.4		Brown slightly sandy, slightly gravelly, SILT/CLAY
TP05	1B	2.5	A15/0597	B	10					WS	4.4		Brown slightly clayey/silty, sandy, GRAVEL with some cobbles
TP06	1B	0.95	A15/0599	B	5.6					WS	4.4		Brown clayey/silty, very sandy, GRAVEL
TP06	2B	3.3	A15/0600	B	13					WS	4.4		Brown clayey/silty, very gravelly, SAND
TP07	1B	2	A15/0601	B	38	50	30	20	68	WS	4.4	M I	Brown silty, very sandy, GRAVEL
TP08	1B	2.05	A15/0602	B	7.1					WS	4.4		Brown clayey/silty, very sandy, GRAVEL with some cobbles
TP09	1B	2.8	A15/0603	B	24					WS	4.4		Brown clayey/silty, very gravelly, SAND

Notes: Preparation: WS - Wet sieved; AR - As received; NP - Non plastic

Sample Type: B - bulk disturbed; U - Undisturbed

Liquid Limit Clause: 4.3 Cone Penetrometer definitive method; 4.4 Cone Penetrometer one point method

Remarks:

Opinions and interpretations are outside the scope of accreditation.

The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

Approved by	Date	Page
H Byrne	25/03/15	1 of 1

TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	90	GRAVEL
37.5	85	
28	80	
20	73	
14	67	
10	63	
6.3	58	
5	56	
3.35	53	
2	47	
1.18	42	SAND
0.6	34	
0.425	31	
0.3	27	
0.15	20	
0.063	13	SILT/CLAY

Contract No: 18217 Report No. R63496

Contract: River Dargle Flood Defence Scheme

Bh: TP01

Sample No. 1B Lab. Sample No. A15/0592

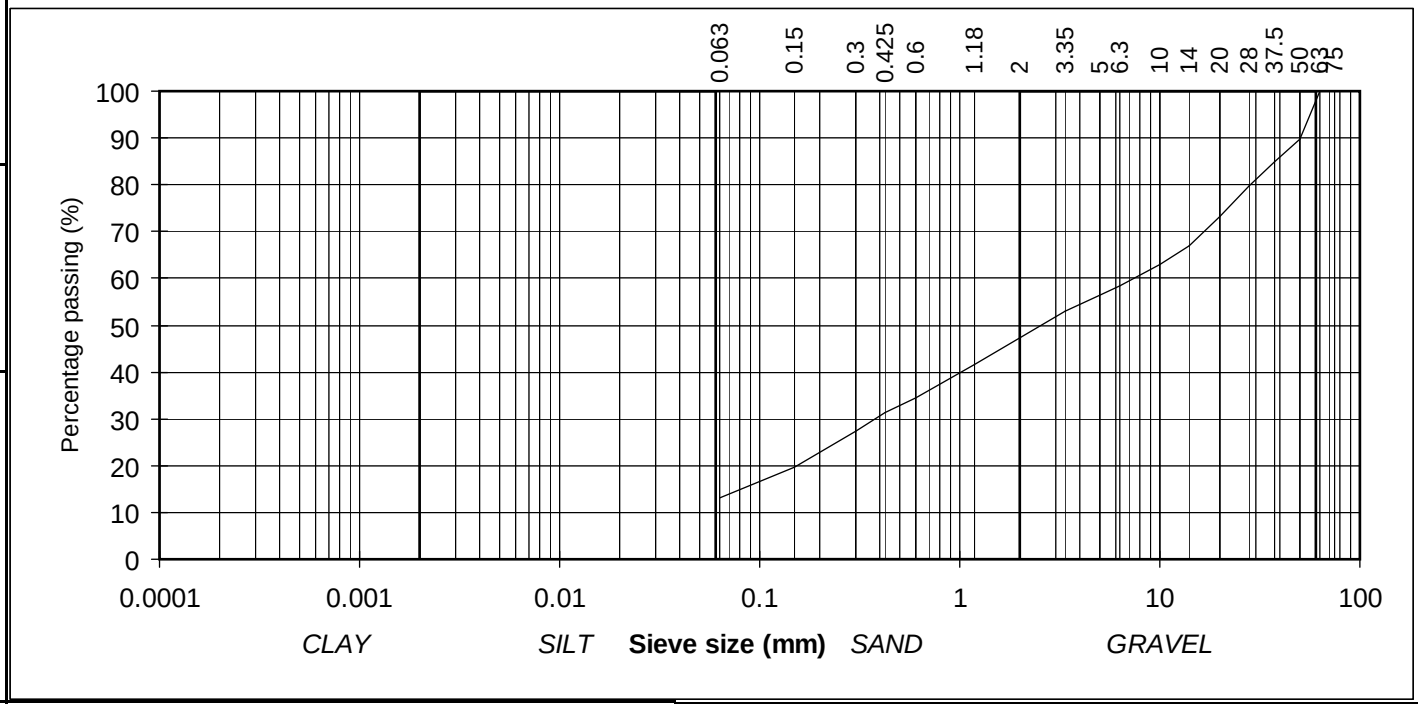
Sample Type: B

Depth (m) 1.20m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown clayey/silty, very sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

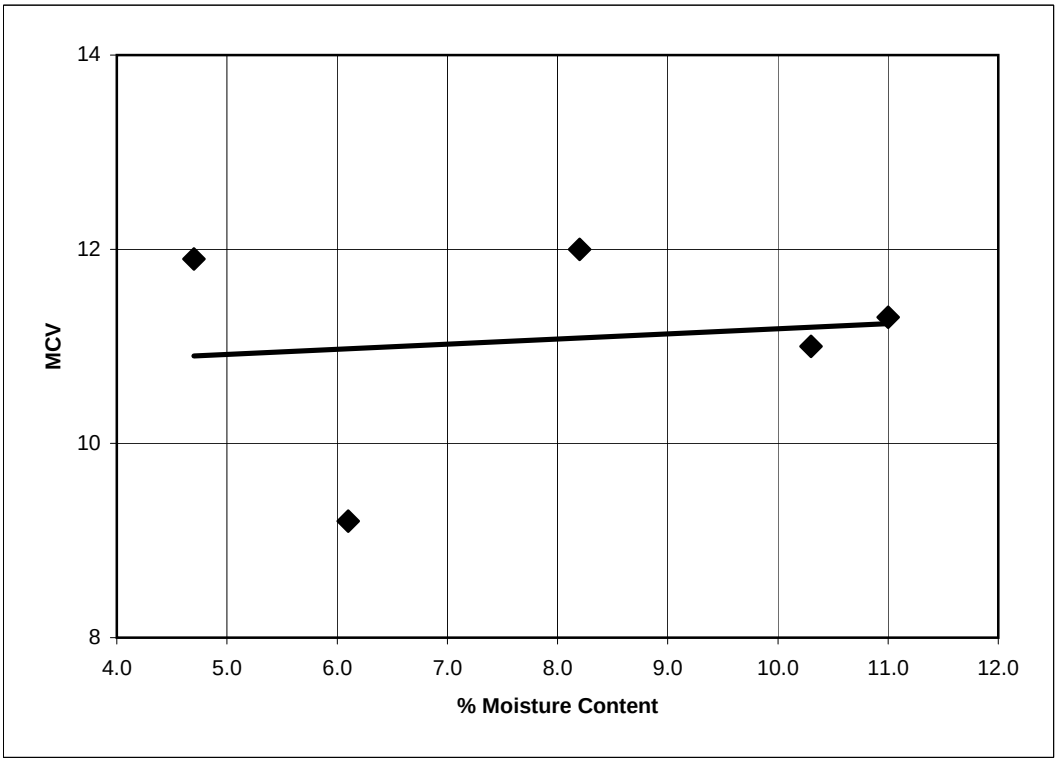
Approved by:	Date:	Page no:
Hugh Byrne	25/03/15	1 of 1

IGSL Ltd Materials Laboratory M7 Business Park Naas Co.Kildare 045 846176	TEST REPORT Determination of MCV / moisture content Relation of a soil Tested in accordance with BS1377-4:1990, clause 5.5	

Report No.	R63841	Contract	River Dargle Flood Defence System
Contract No.	18217	Customer	GDG
Date received	20/02/15	Date Tested	19/03/15
BH/TP No.	TP01	Sample No.	1B Type: B
Depth (m)	1.20m	Lab sample No.	A15/0592

Description: Brown clayey/silty, very sandy, GRAVEL

MC%	4.7	6.1	8.2	10.3	11
MCV	11.9	9.2	12	11	11.3



% material >20mm 25

Persons authorized to approve reports

J Barrett (Deputy Quality Manager)
H Byrne (Quality Manager)

IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

Report No. R63757 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP01

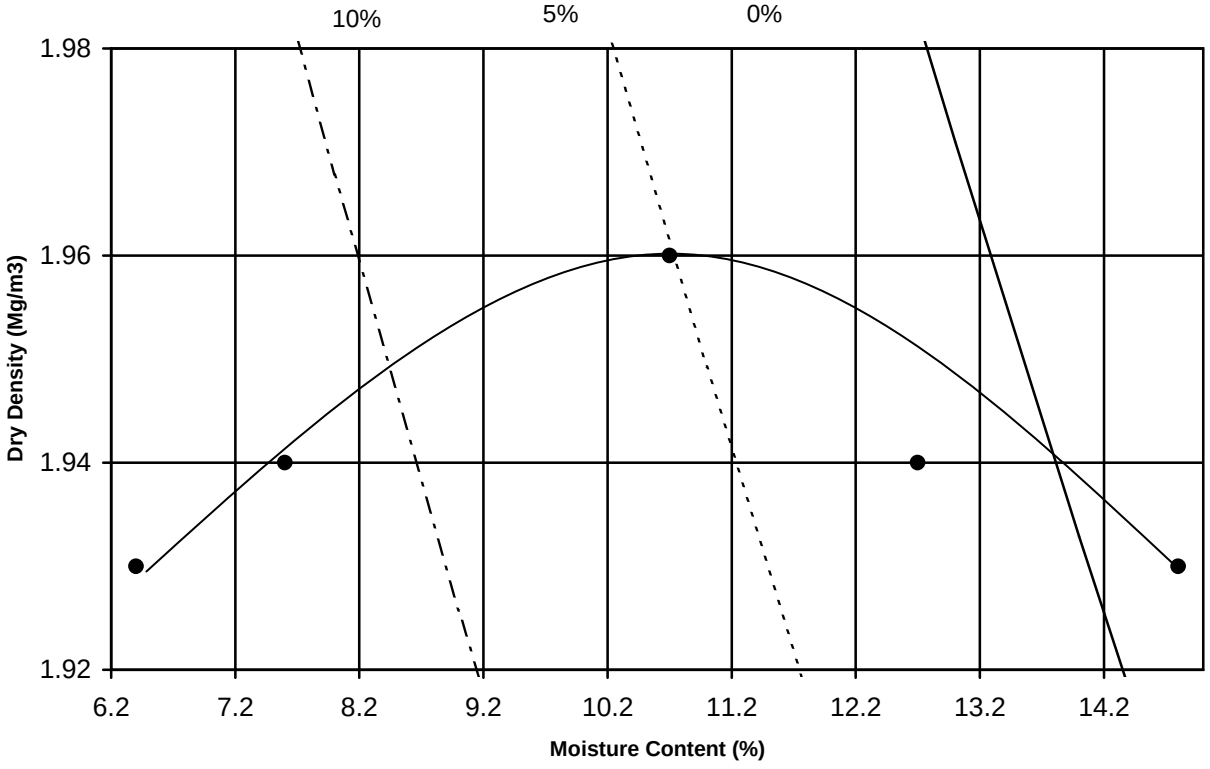
Sample No. TP01-1B Depth (m) 1.20m Material Type B

Lab sample no. A15/0592 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 03/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.96	1.94	1.94	1.93	1.93		
Moisture Content (%)	11	7.6	13	6.4	15		



Maximum Dry Density (Mg/m^3): 1.96 Optimum Moisture Content (%): 11

Description: Brown clayey/silty, very sandy, GRAVEL

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 31

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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TEST REPORT
Determination of Particle Size Distribution

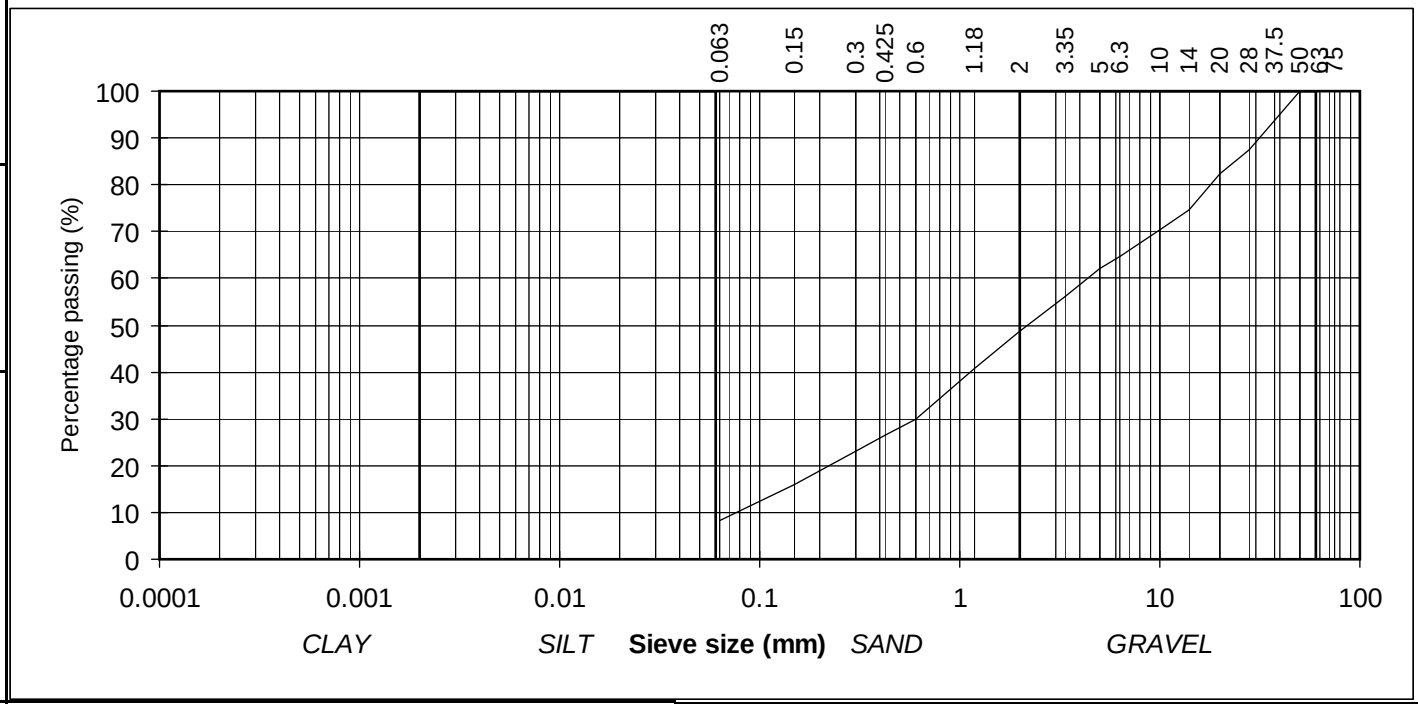
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	94	
28	87	
20	82	
14	75	
10	70	
6.3	65	
5	62	
3.35	56	
2	49	
1.18	41	SAND
0.6	30	
0.425	26	
0.3	23	
0.15	16	
0.063	8	SILT/CLAY

Contract No:	18217	Report No.	R63497
Contract:	River Dargle Flood Defence Scheme		
Bh:	TP01		
Sample No.	3B	Lab. Sample No.	A15/0593
Sample Type:	B		
Depth (m)	3.50m	Customer:	CDG
Date Received	20/01/2015	Date Testing started	20/02/2015
Description:	Brown clayey/silty, very sandy, GRAVEL		

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R63551**
Contract No.	18217
Contract Name:	River Dargle Flood Relief Scheme
Customer:	CDG
BH/TP	TP01
Sample No.	3B
Depth (m)	3.50m
Sample Type:	B
Lab Sample No.	A15/0593
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	20/02/15
Date Tested:	25/02/15
Sample Cert:	N/A
Moisture Content (%):	10
% Particles > 20mm (By dry mass):	27.2
MCV:	15.6
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63688 Contract No. River Dargle Flood Defence Schem

Contract Name: River Dargle Flood Defence Schem

Lab Contract No. 18217 Location: TP01

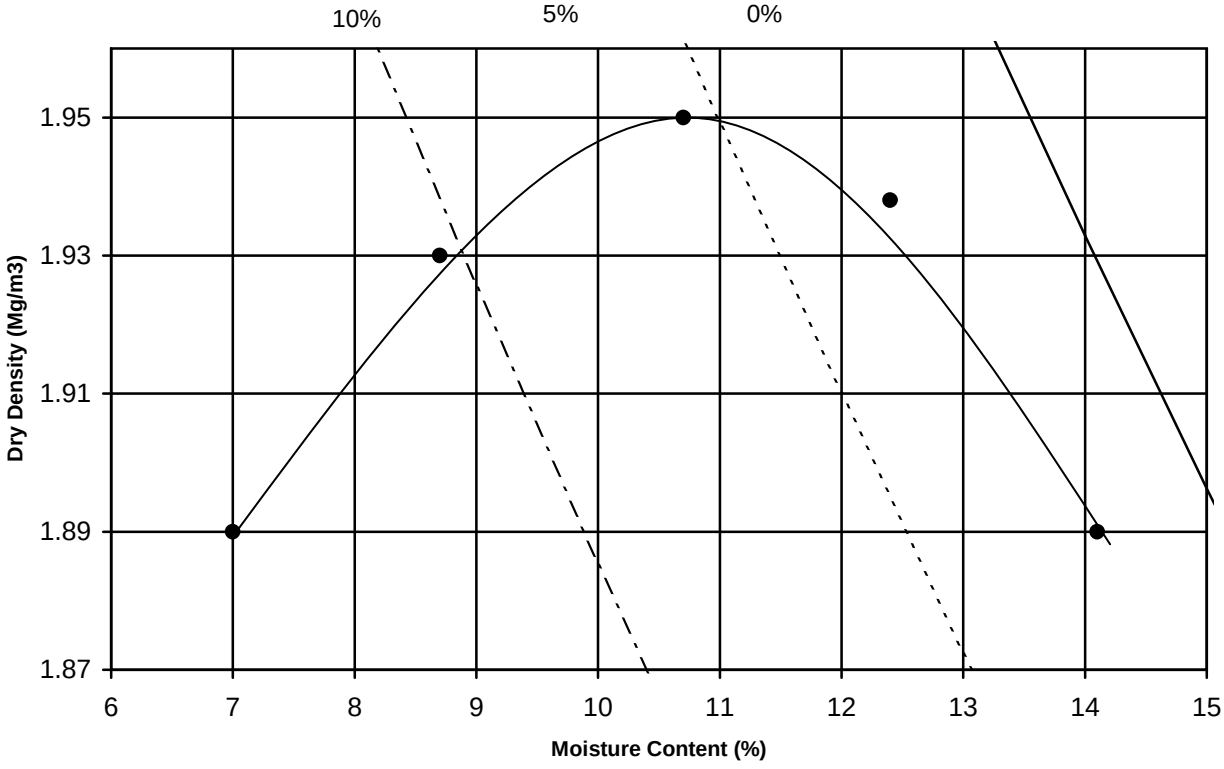
Sample No. TP01-3B Depth (m) 3.5 Material Type B

Lab sample no. A15/0593 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.95	1.94	1.93	1.89	1.89		
Moisture Content (%)	11	12	8.7	14	7.0		



Maximum Dry Density (Mg/m^3): 1.95 Optimum Moisture Content (%): 12

Description: Brown clayey/silty, very sandy, GRAVEL

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 15.3

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	96	GRAVEL
37.5	85	
28	75	
20	71	
14	65	
10	61	
6.3	56	
5	53	
3.35	49	
2	43	
1.18	38	SAND
0.6	30	
0.425	27	
0.3	24	
0.15	17	
0.063	12	SILT/CLAY

Contract No: 18217 Report No. R63545

Contract: River Dargle Flood Defence Scheme

Bh: TP02

Sample No. 1B Lab. Sample No. A15/0594

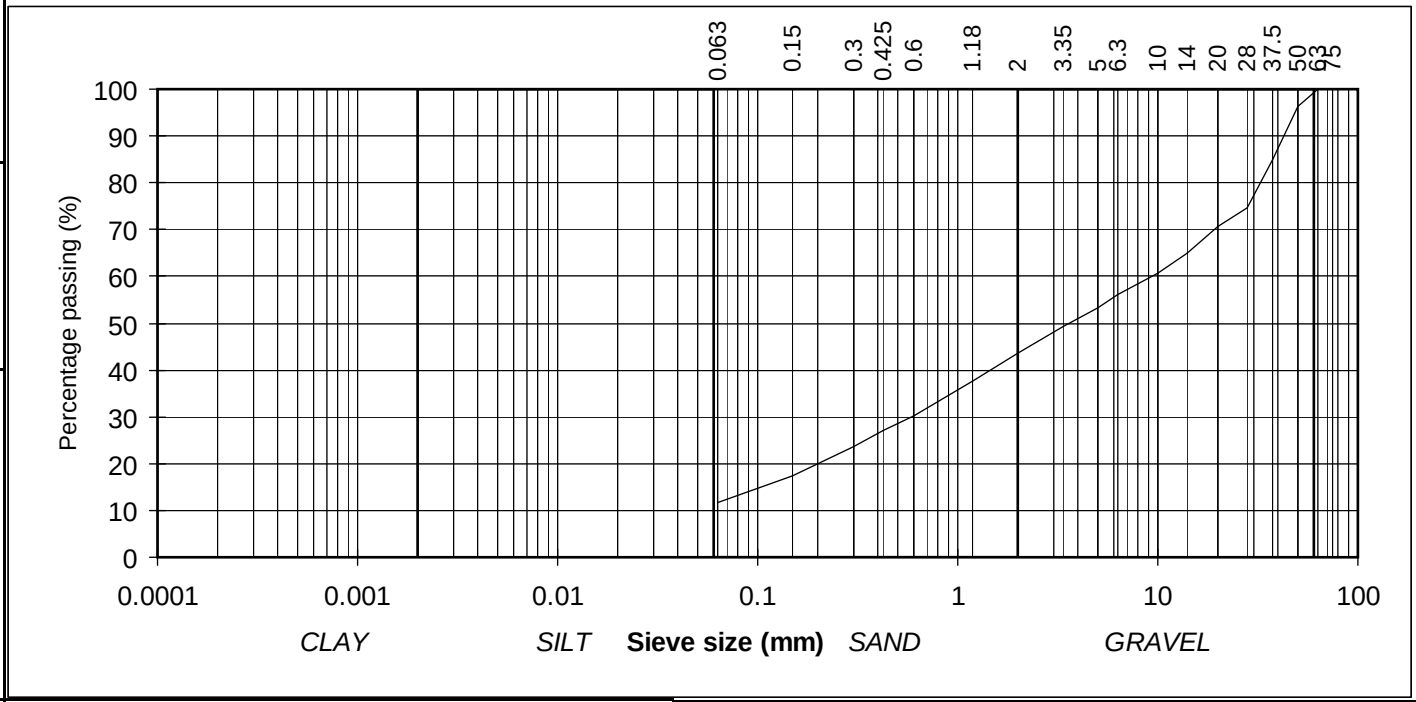
Sample Type: B

Depth (m) 0.90m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown clayey/silty, very sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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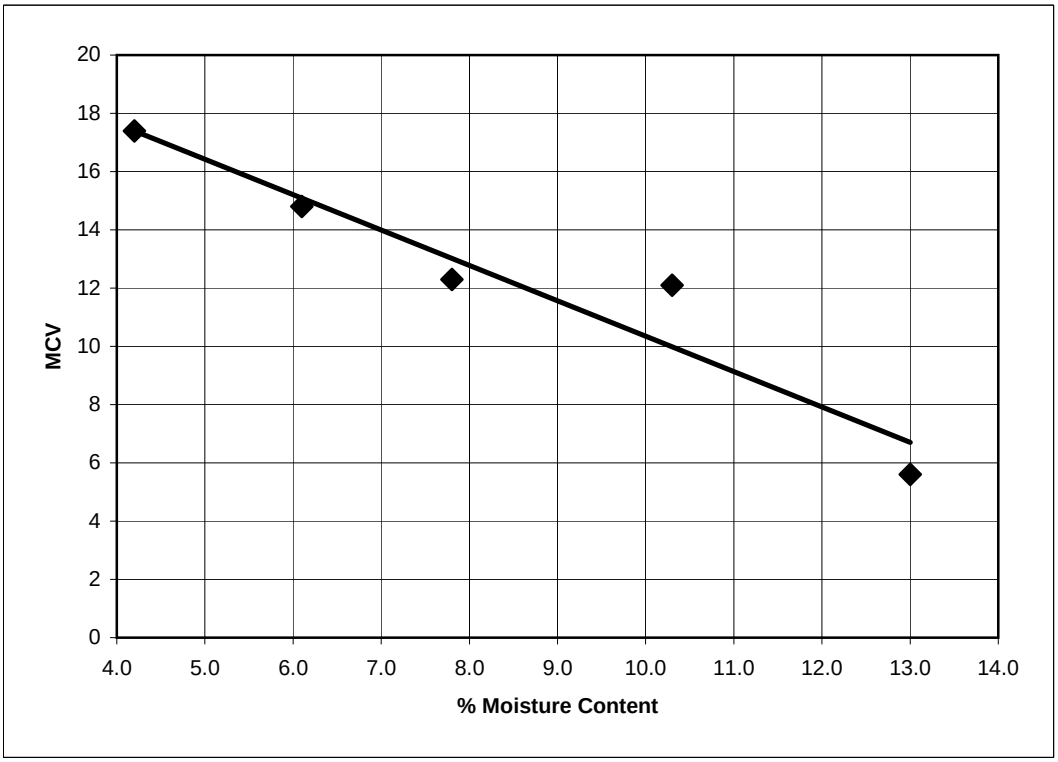
IGSL Ltd Materials Laboratory M7 Business Park Naas Co.Kildare 045 846176	TEST REPORT Determination of MCV / moisture content Relation of a soil Tested in accordance with BS1377-4:1990, clause 5.5	

Report No.	R63843	Contract	River Dargle Flood Defence System
Contract No.	18217	Customer	GDG
Date received	20/02/15	Date Tested	19/03/15
BH/TP No.	TP02	Sample No.	TP2 1B Type: B
Depth (m)	0.90	Lab sample No.	A15/0594

MC%	4.2	6.1	7.8	10	13
MCV	17.4	14.8	12.3	12.1	5.6



% material >20mm 41

Persons authorized to approve reports

J Barrett (Deputy Quality Manager)
H Byrne (Quality Manager)

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TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	100	
20	98	
14	98	
10	98	
6.3	97	
5	96	
3.35	95	
2	93	
1.18	91	SAND
0.6	88	
0.425	84	
0.3	80	
0.15	57	
0.063	31	SILT/CLAY

Contract No: 18217 Report No. R63546

Contract: River Dargle Flood Defence Scheme

Bh: TP02

Sample No. 2B Lab. Sample No. A15/0595

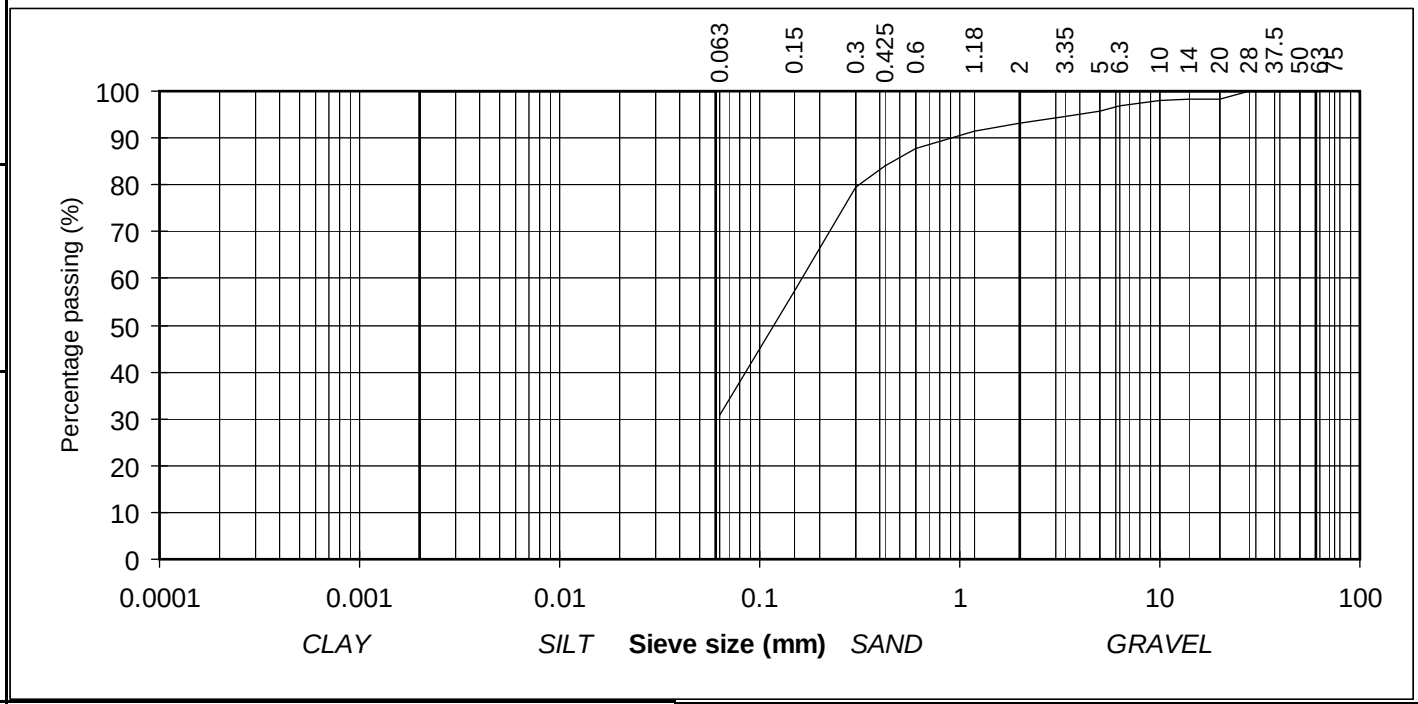
Sample Type: B

Depth (m) 1.20m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown sandy, slightly gravelly, SILT/CLAY

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R63576**
Contract No.	18217
Contract Name:	River Dargle Flood Relief Scheme
Customer:	GDG
BH/TP	TP07
Sample No.	1B
Depth (m)	2.00m
Sample Type:	B
Lab Sample No.	A15/601
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	20/02/15
Date Tested:	26/02/15
Sample Cert:	N/A
Moisture Content (%):	36
% Particles > 20mm (By dry mass):	28.1
MCV:	7.7
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown sandy, slightly gravelly, SILT/CLAY

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63689 Contract No. River Dargle Flood Defence Schem

Contract Name: River Dargle Flood Defence Schem

Lab Contract No. 18217 Location: TP02

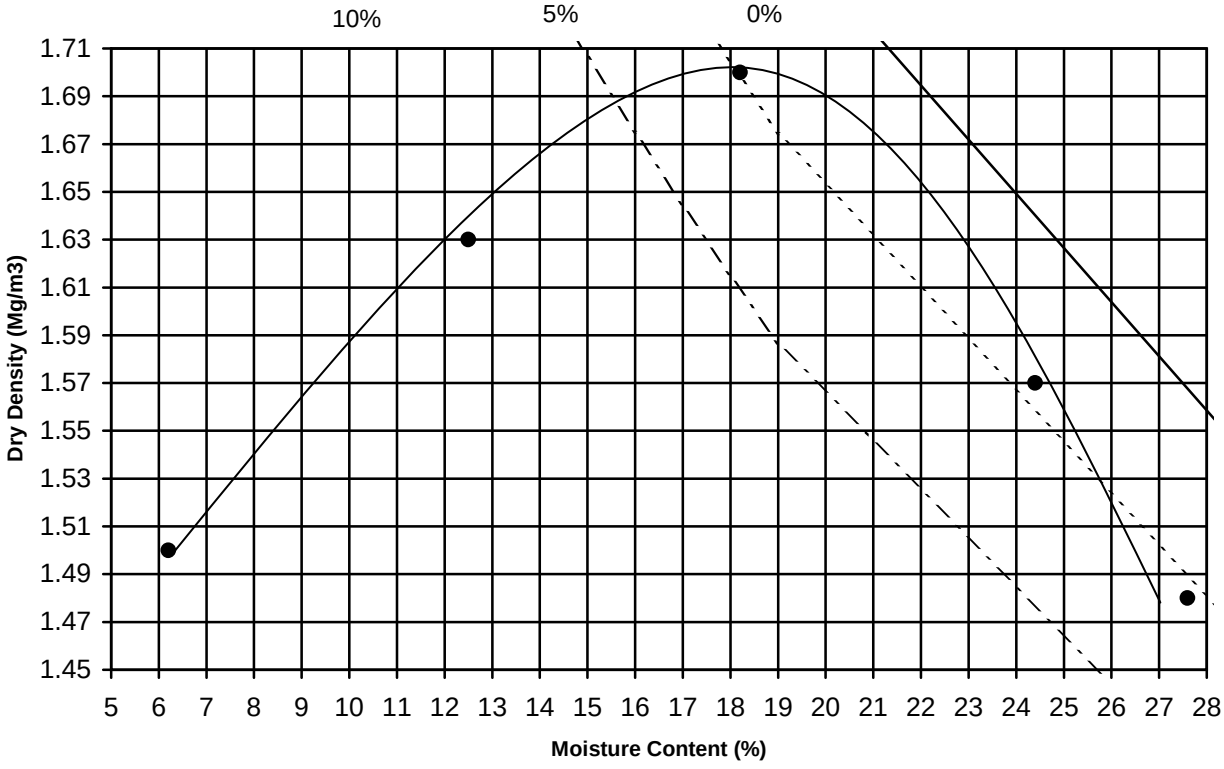
Sample No. TP02-2B Depth (m) 1.20m Material Type B

Lab sample no. A15/1595 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.48	1.50	1.63	1.70	1.57		
Moisture Content (%)	28	6	13	18.2	24		



Maximum Dry Density (Mg/m^3): 1.70 Optimum Moisture Content (%): 18

Description: Brown sandy, slightly gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 28

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	99	
20	97	
14	95	
10	94	
6.3	92	
5	90	
3.35	89	
2	86	
1.18	83	SAND
0.6	78	
0.425	75	
0.3	70	
0.15	62	
0.063	52	SILT/CLAY
0.037	46	
0.027	40	
0.017	36	
0.010	31	
0.007	26	
0.005	22	
0.002	16	

Contract No: 18217 Report No. R63498

Contract: River Dargle Flood Defence Scheme

Bh: TP03

Sample No. 1B Lab. Sample No. A15/0596

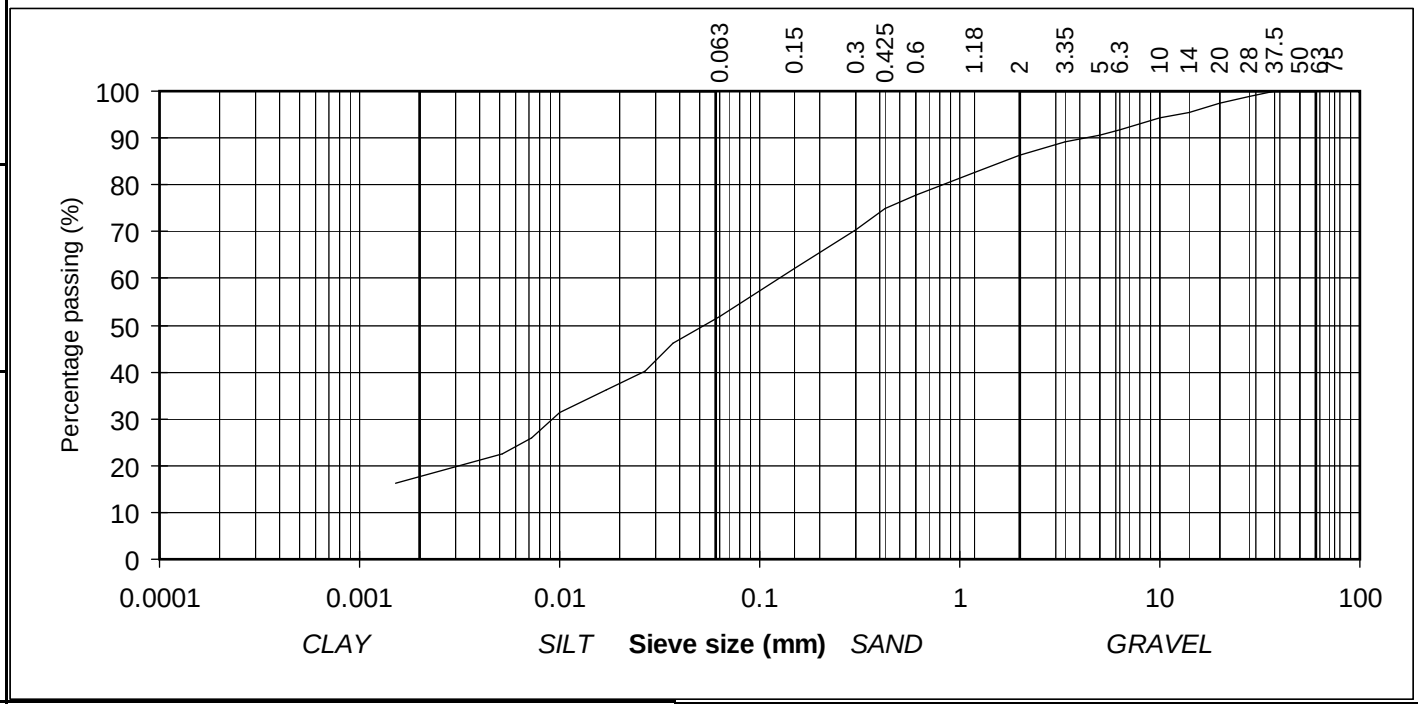
Sample Type: B

Depth (m) 2.50m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown slightly sandy, slightly gravelly, SILT/CLAY

Remarks



IGSL Ltd Materials Laboratory

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63690 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP03

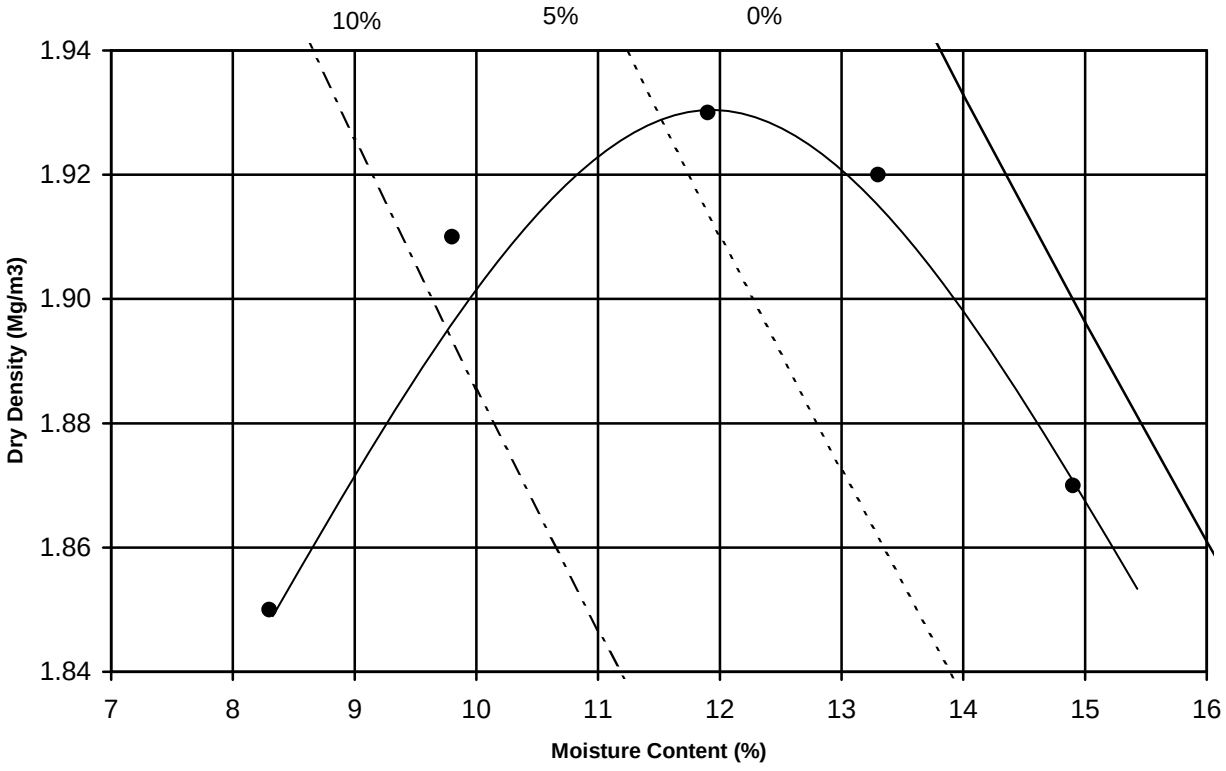
Sample No. TP03-1B Depth (m) 2.50m Material Type B

Lab sample no. A15/596 Customer:

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.93	1.92	1.91	1.85	1.87		
Moisture Content (%)	12	13	10	8.3	15		



Maximum Dry Density (Mg/m^3): 1.93 Optimum Moisture Content (%): 11

Description: Brown slightly sandy, slightly gravelly, SILT/CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 26.8

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	84	
50	84	GRAVEL
37.5	54	
28	36	
20	22	
14	20	
10	20	
6.3	18	
5	18	
3.35	17	
2	15	
1.18	14	SAND
0.6	12	
0.425	11	
0.3	9	
0.15	7	
0.063	4	SILT/CLAY

Contract No: 18217 Report No. R63499

Contract: River Dargle Flood Defence Scheme

Bh: TP05

Sample No. 1B Lab. Sample No. A15/0597

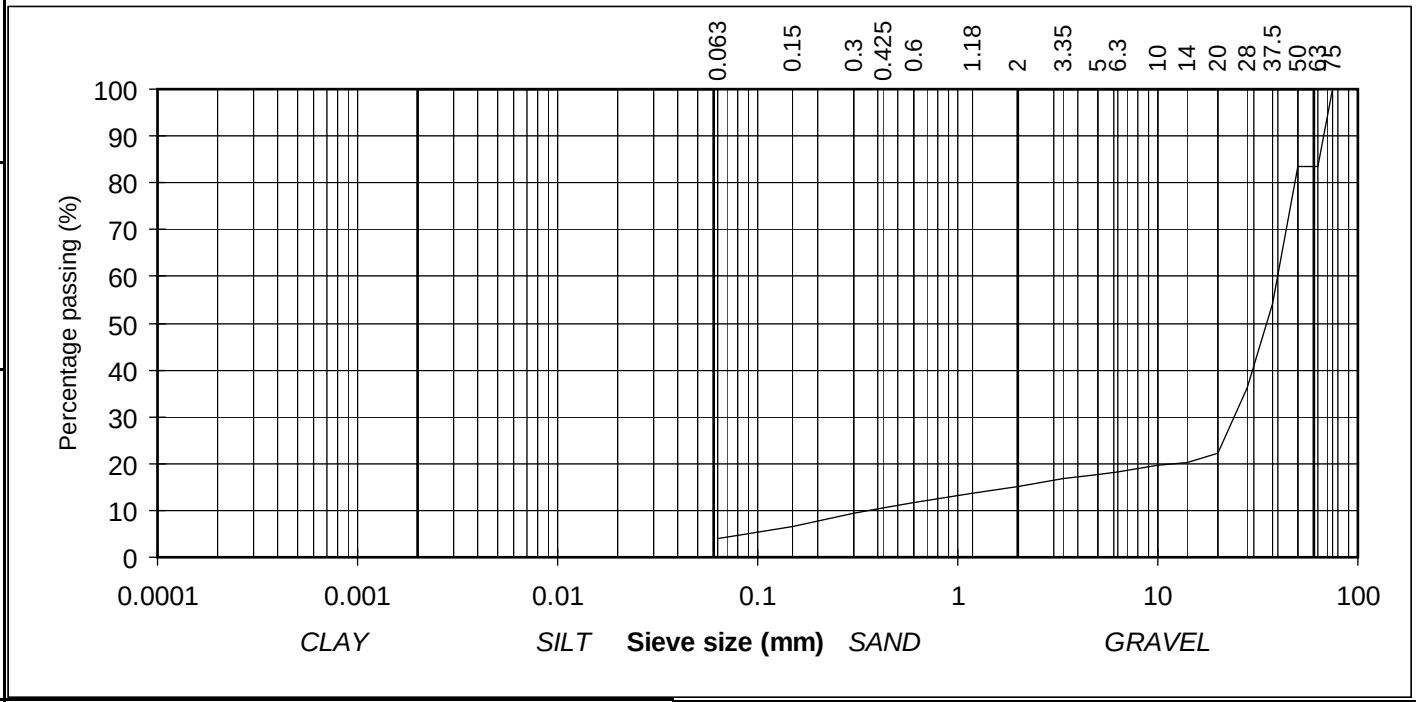
Sample Type: B

Depth (m) 2.50m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown slightly clayey/silty, sandy, GRAVEL with some cobbles

Remarks Sample size did not meet the requirements of BS1377



IGSL Ltd Materials Laboratory

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R63554**
Contract No.	18217
Contract Name:	River Dargle Flood Relief Scheme
Customer:	GDG
BH/TP	TP05
Sample No.	1B
Depth (m)	2.50m
Sample Type:	B
Lab Sample No.	A15/0597
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	20/02/15
Date Tested:	25/02/15
Sample Cert:	N/A
Moisture Content (%):	12
% Particles > 20mm (By dry mass):	20.8
MCV:	8.1
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly clayey/silty, sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63691 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP05

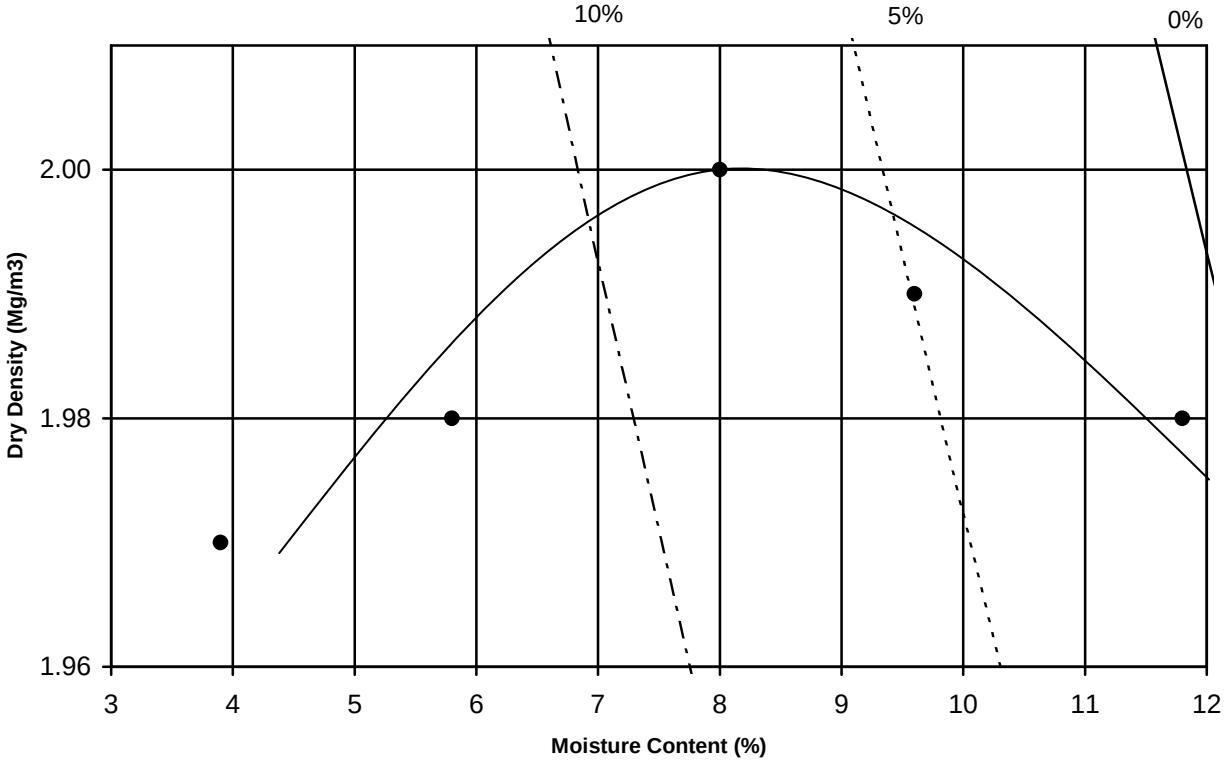
Sample No. TP05-1B Depth (m) 2.50m Material Type B

Lab sample no. A15/0597 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.00	1.99	1.98	1.98	1.97		
Moisture Content (%)	8.0	9.6	5.8	12	3.9		



Maximum Dry Density (Mg/m^3): 2.00 Optimum Moisture Content (%): 8

Description: Brown sandy very gravelly CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.62 Particle Density: Assumed

% retained on 20/37.5mm sieve: 25.3

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

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TEST REPORT
Determination of Particle Size Distribution

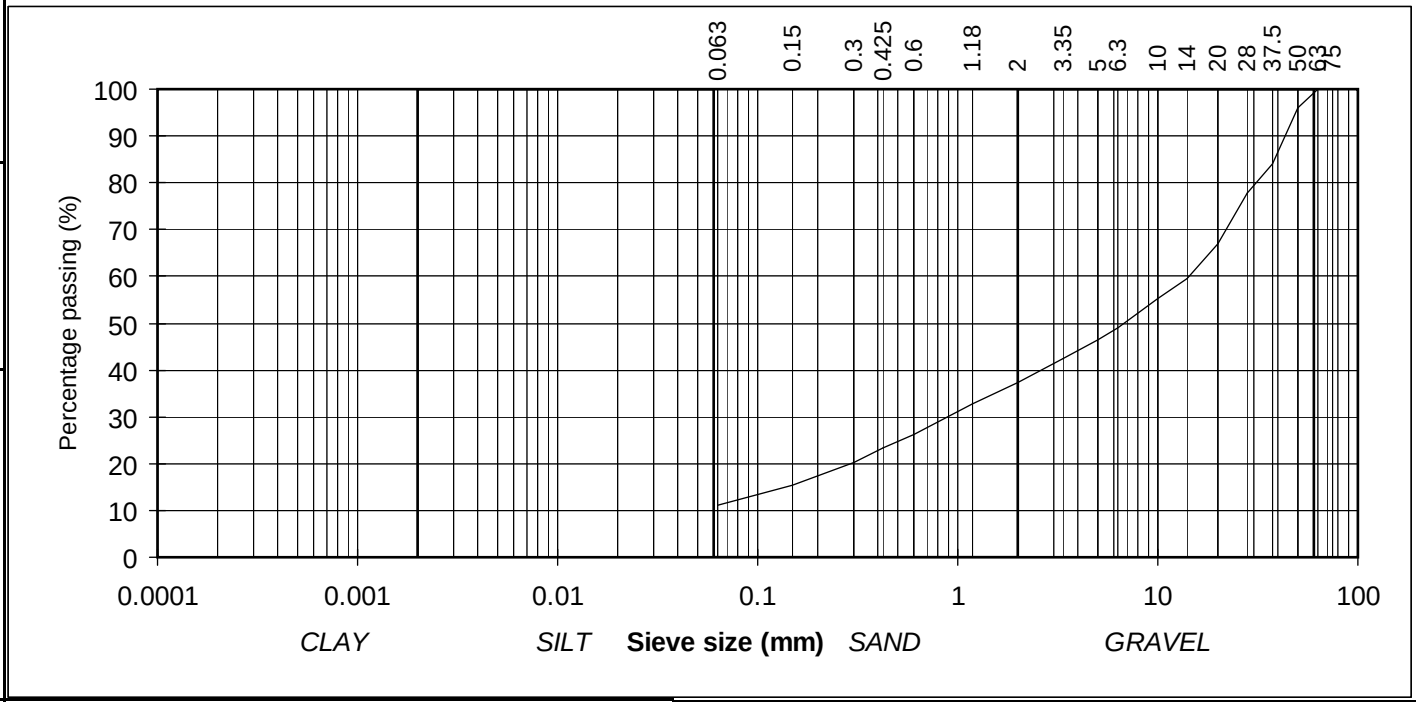
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	96	GRAVEL
37.5	84	
28	78	
20	67	
14	60	
10	55	
6.3	49	
5	47	
3.35	42	
2	37	
1.18	33	SAND
0.6	26	
0.425	23	
0.3	20	
0.15	15	
0.063	11	SILT/CLAY

Contract No:	18217	Report No.	R63547
Contract:	River Dargle Flood Defence Scheme		
Bh:	TP06		
Sample No.	1B	Lab. Sample No.	A15/0599
Sample Type:	B		
Depth (m)	0.95m	Customer:	CDG
Date Received	20/01/2015	Date Testing started	20/02/2015
Description:	Brown clayey/silty, very sandy, GRAVEL		

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63979 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP06

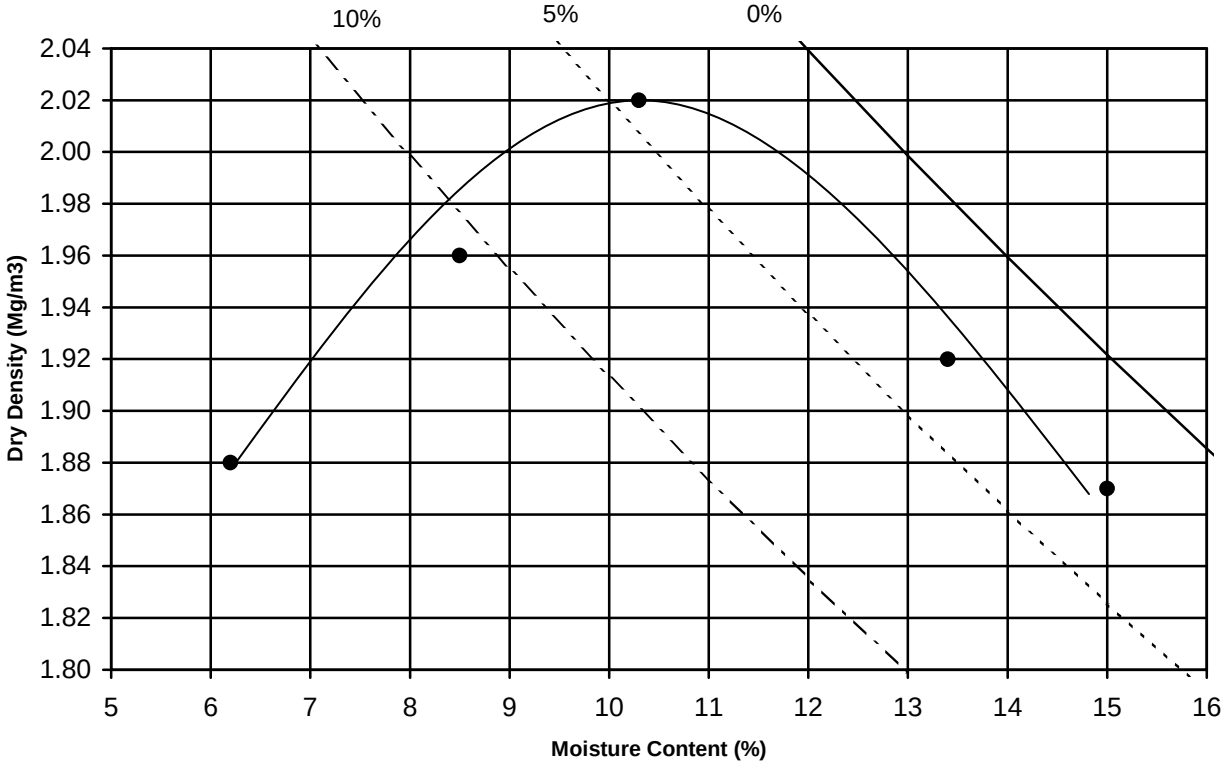
Sample No. TP06-1B Depth (m) 0.95m Material Type B

Lab sample no. A15/599 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 25/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.92	2.02	1.96	1.88	1.87		
Moisture Content (%)	13	10	8.5	6.2	15		



Maximum Dry Density (Mg/m^3): 2.02 Optimum Moisture Content (%): 10

Description: Brown clayey/silty, very sandy, GRAVEL

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.70 Particle Density: Assumed

% retained on 20/37.5mm sieve: 18

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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	H Byrne	10/03/15	1 of 1

TEST REPORT
Determination of Particle Size Distribution

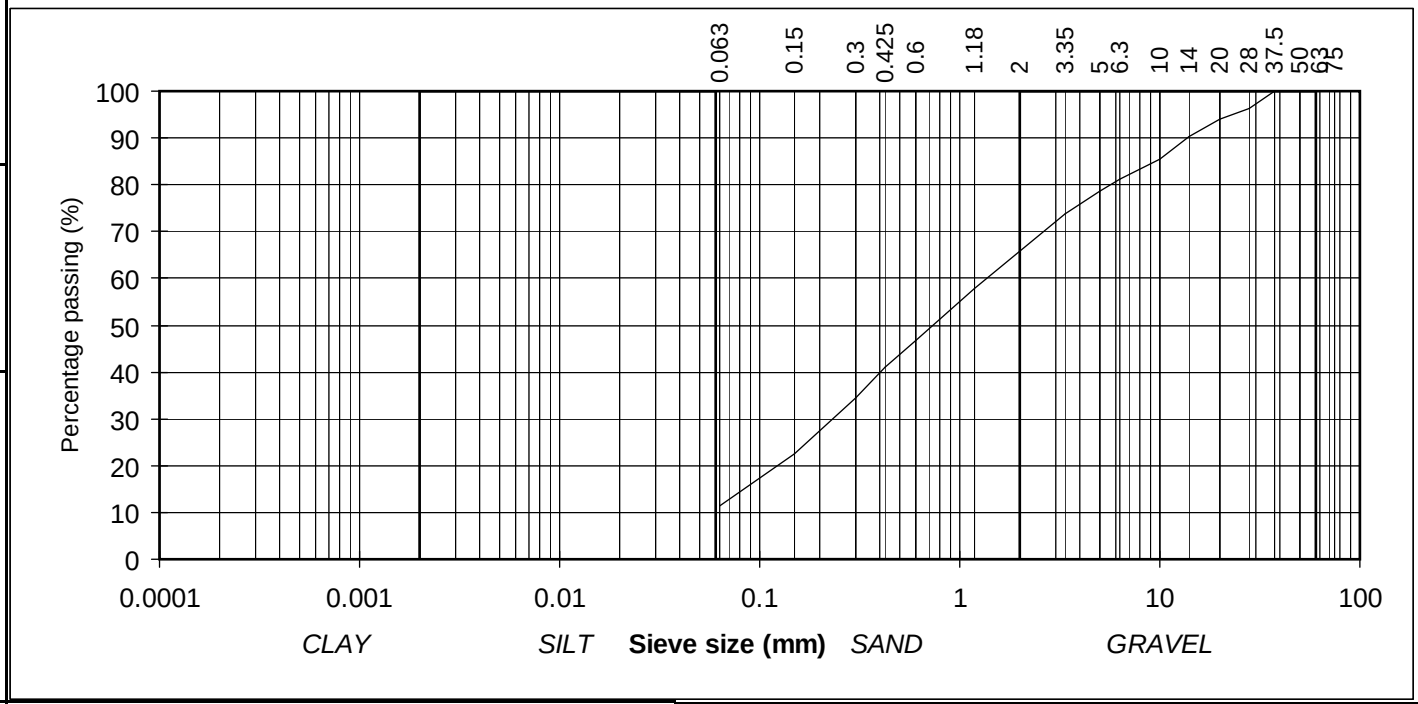
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	96	
20	94	
14	90	
10	85	
6.3	81	
5	79	
3.35	74	
2	66	
1.18	58	SAND
0.6	47	
0.425	41	
0.3	34	
0.15	22	
0.063	11	SILT/CLAY

Contract No:	18217	Report No.	R63500
Contract:	River Dargle Flood Defence Scheme		
Bh:	TP06		
Sample No.	2B	Lab. Sample No.	A15/0600
Sample Type:	B		
Depth (m)	3.30m	Customer:	CDG
Date Received	20/01/2015	Date Testing started	20/02/2015
Description:	Brown clayey/silty, very gravelly, SAND		

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63692 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP06

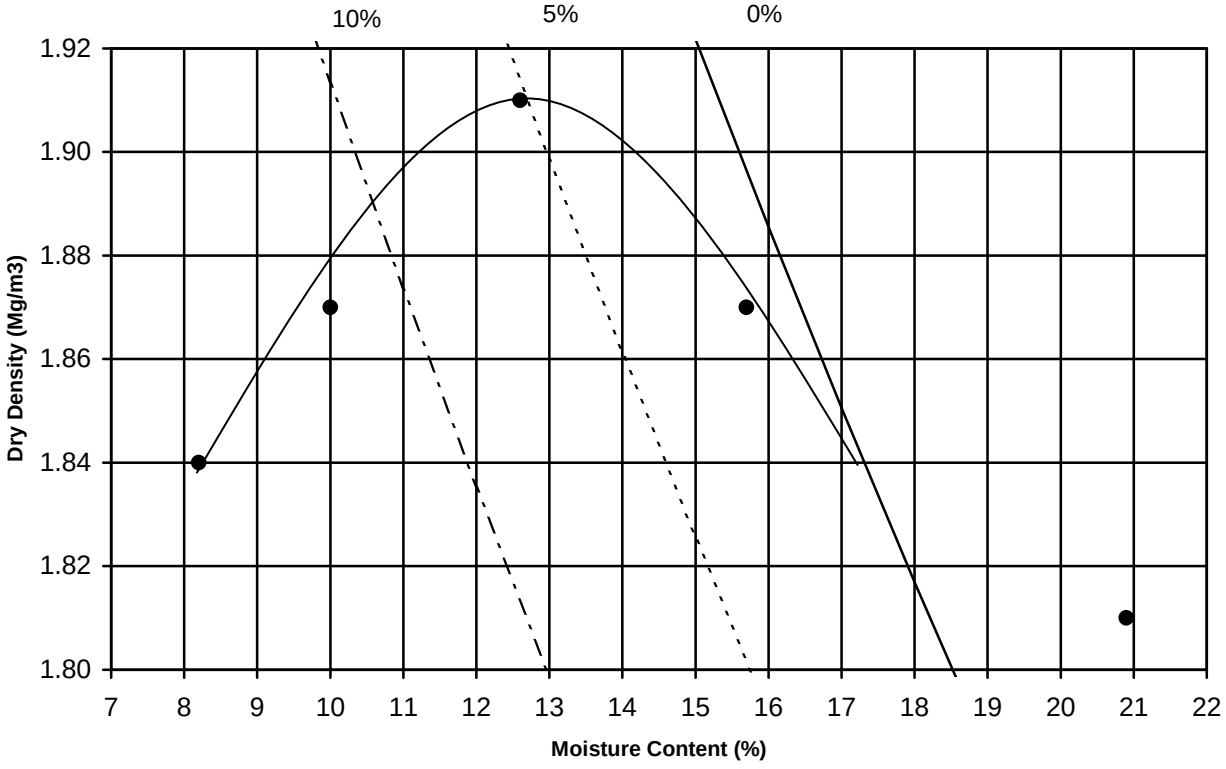
Sample No. TP06-2B Depth (m) 3.30m Material Type B

Lab sample no. A15/600 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.91	1.87	1.87	1.84	1.81		
Moisture Content (%)	13	10	16	8.2	21		



Maximum Dry Density (Mg/m^3): 1.91 Optimum Moisture Content (%): 13

Description: Brown clayey/silty, very gravelly, SAND

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.70 Particle Density: Assumed

% retained on 20/37.5mm sieve: 20.5

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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TEST REPORT
Determination of Particle Size Distribution

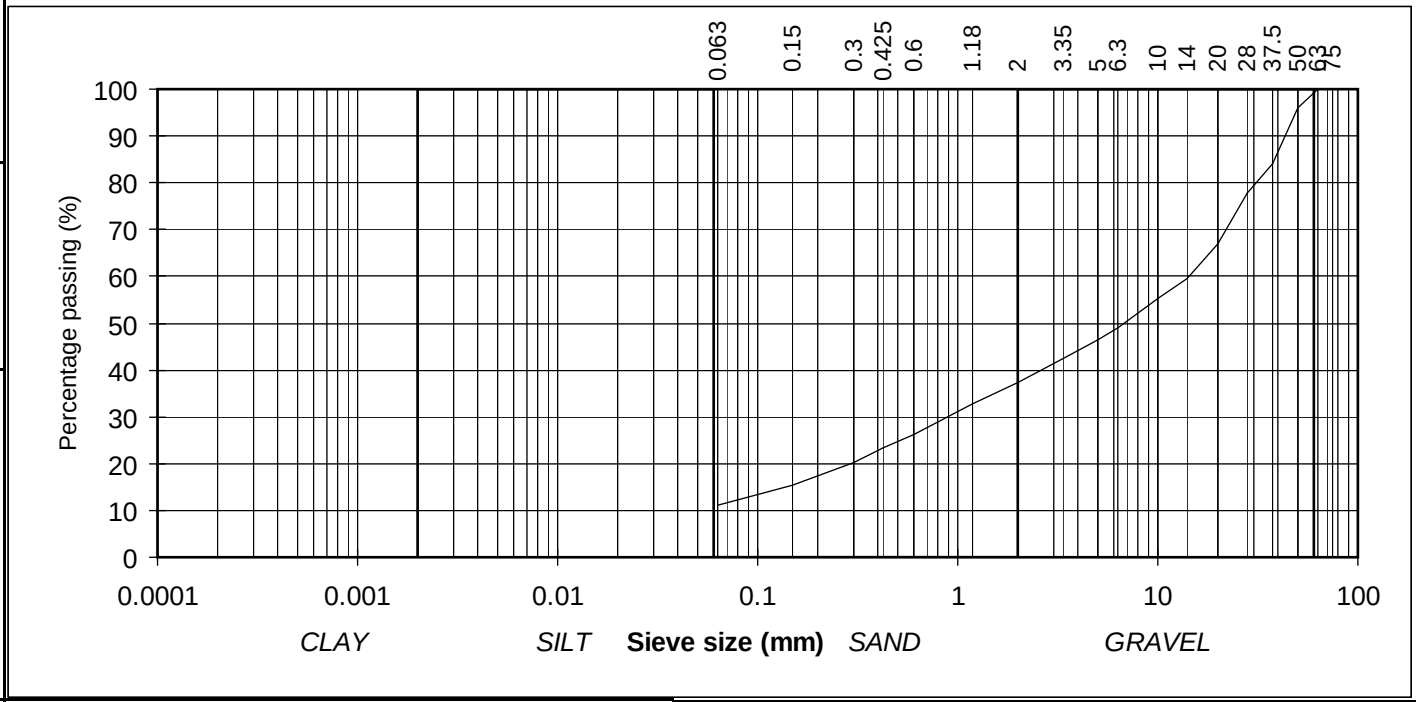
Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	96	GRAVEL
37.5	84	
28	78	
20	67	
14	60	
10	55	
6.3	49	
5	47	
3.35	42	
2	37	
1.18	33	SAND
0.6	26	
0.425	23	
0.3	20	
0.15	15	
0.063	11	SILT/CLAY

Contract No:	18217	Report No.	R63547
Contract:	River Dargle Flood Defence Scheme		
Bh:	TP06		
Sample No.	1B	Lab. Sample No.	A15/0599
Sample Type:	B		
Depth (m)	0.95m	Customer:	CDG
Date Received	20/01/2015	Date Testing started	20/02/2015
Description:	Brown silty, very sandy, GRAVEL		

Remarks



IGSL Ltd Materials Laboratory

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R63576**
Contract No.	18217
Contract Name:	River Dargle Flood Relief Scheme
Customer:	GDG
BH/TP	TP07
Sample No.	1B
Depth (m)	2.0m
Sample Type:	B
Lab Sample No.	A15/0601
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	20/02/15
Date Tested:	26/02/15
Sample Cert:	N/A
Moisture Content (%):	36
% Particles > 20mm (By dry mass):	28
MCV:	7.7
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

IGSL Ltd Materials Laboratory	Approved by	Date	Page
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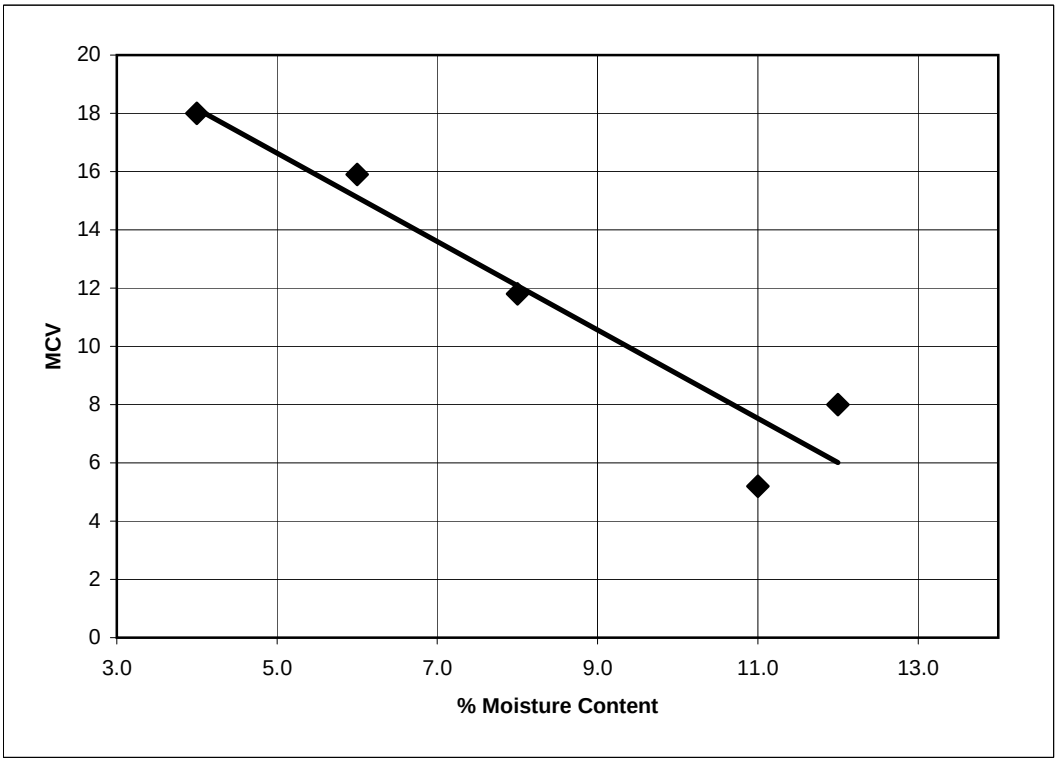
IGSL Ltd Materials Laboratory M7 Business Park Naas Co.Kildare 045 846176	TEST REPORT Determination of MCV / moisture content Relation of a soil Tested in accordance with BS1377-4:1990, clause 5.5	

Report No.	R63842	Contract	River Dargle Flood Defence System
Contract No.	18217	Customer	GDG
Date received	20/02/15	Date Tested	19/03/15
BH/TP No.	TP07	Sample No.	1B Type: B
Depth (m)	2.00m	Lab sample No.	A15/0601

MC%	4.0	6.0	8.0	11	12
MCV	18	15.9	11.8	5.2	8



% material >20mm 28

Persons authorized to approve reports

J Barrett (Deputy Quality Manager)
H Byrne (Quality Manager)

IGSL Ltd Materials Laboratory	Approved by	Date	Page No.
	H Byrne	20/03/15	1 of 1

IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63693 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP07

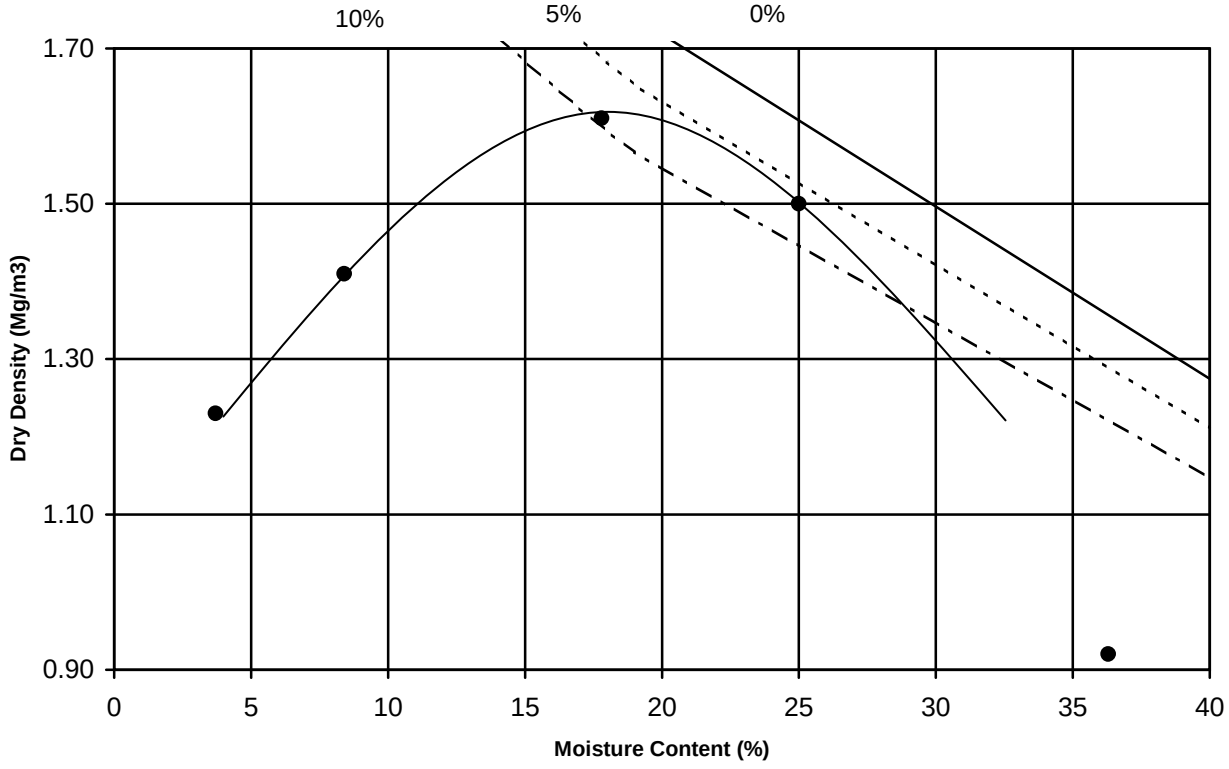
Sample No. TP07-1B Depth (m) 2.00m Material Type B

Lab sample no. A15/601 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	0.92	1.41	1.61	1.50	1.23		
Moisture Content (%)	36	8.4	18	25	3.7		



Maximum Dry Density (Mg/m^3): 1.61 Optimum Moisture Content (%): 18

Description: Brown silty, very sandy, GRAVEL

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.60 Particle Density: Assumed

% retained on 20/37.5mm sieve: 14

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

IGSL Materials Laboratory	Approved by	Date	Page
	H Byrne	10/03/15	1 of 1

TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	82	COBBLES
63	82	
50	76	GRAVEL
37.5	71	
28	64	
20	59	
14	53	
10	50	
6.3	45	
5	43	
3.35	39	
2	33	
1.18	28	SAND
0.6	23	
0.425	21	
0.3	18	
0.15	12	
0.063	6	SILT/CLAY

Contract No: 18217 Report No. R63501

Contract: River Dargle Flood Defence Scheme

Bh: TP08

Sample No. 1B Lab. Sample No. A15/0602

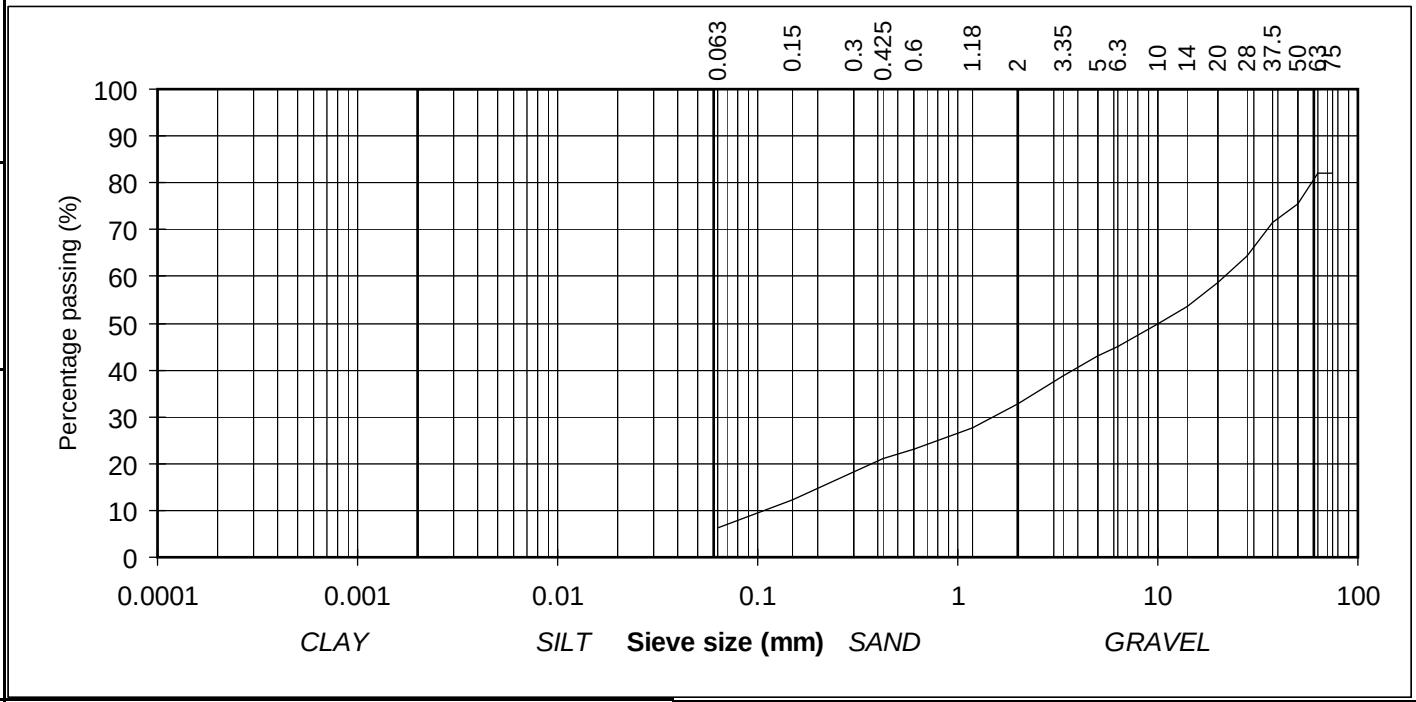
Sample Type: B

Depth (m) 2.05m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown clayey/silty, very sandy, GRAVEL with some cobbles

Remarks Sample size did not meet the requirement of BS1377



IGSL Ltd Materials Laboratory

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63738 Contract No. River Dargle Flood Defence Schem

Contract Name: River Dargle Flood Defence Schem

Lab Contract No. 18217 Location: TP08

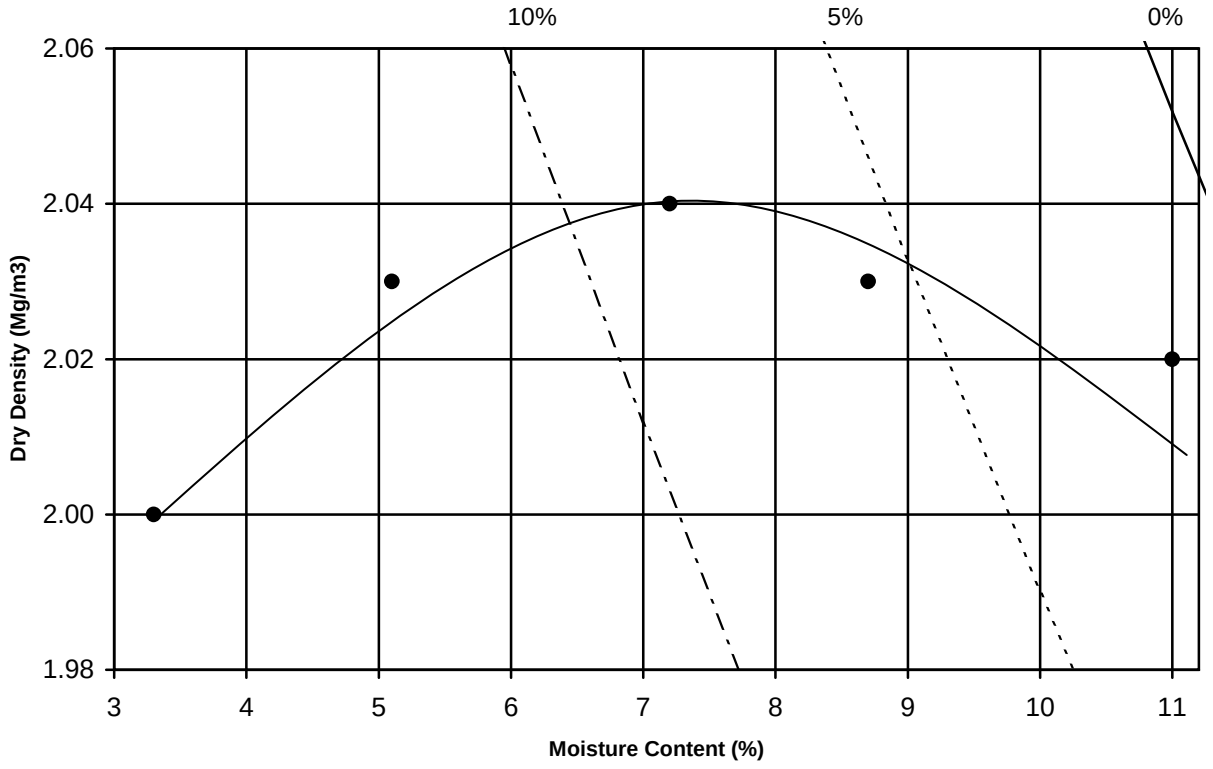
Sample No. TP08-1B Depth (m) 2.05m Material Type B

Lab sample no. A15/602 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 03/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.04	2.03	2.03	2.00	2.02		
Moisture Content (%)	7.2	8.7	5.1	3.3	11		



Maximum Dry Density (Mg/m^3): 2.04 Optimum Moisture Content (%): 7

Description: Brown clayey/silty, very sandy, GRAVEL with some cobbles

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 53

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	98	
20	93	
14	90	
10	88	
6.3	85	
5	83	
3.35	78	
2	66	
1.18	53	SAND
0.6	38	
0.425	29	
0.3	20	
0.15	10	
0.063	7	SILT/CLAY

Contract No: 18217 Report No. R63549

Contract: River Dargle Flood Defence Scheme

Bh: TP09

Sample No. 1B Lab. Sample No. A15/0603

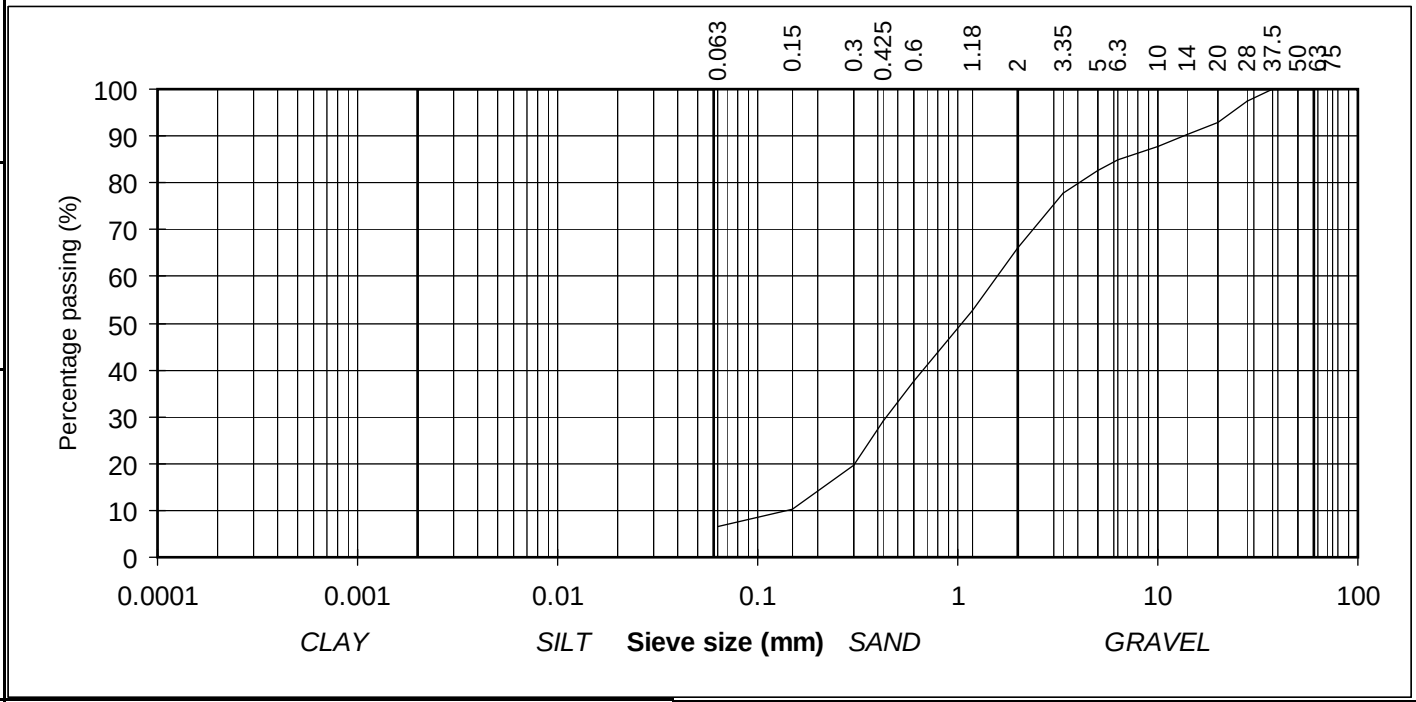
Sample Type: B

Depth (m) 2.80m Customer: CDG

Date Received 20/01/2015 Date Testing started 20/02/2015

Description: Brown clayey/silty, very gravelly, SAND

Remarks



IGSL Ltd Materials Laboratory

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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R63577**
Contract No.	18217
Contract Name:	River Dargle Flood Relief Scheme
Customer:	GDG
BH/TP	TP09
Sample No.	1B
Depth (m)	2.80m
Sample Type:	B
Lab Sample No.	A15/0603
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	20/02/15
Date Tested:	26/02/15
Sample Cert:	N/A
Moisture Content (%):	23
% Particles > 20mm (By dry mass):	41
MCV:	8.1
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown clayey/silty, very gravelly, SAND

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

IGSL Ltd Materials Laboratory	Approved by	Date	Page
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IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R63694 Contract No. River Dargle Flood Defence Scheme

Contract Name: River Dargle Flood Defence Scheme

Lab Contract No. 18217 Location: TP09

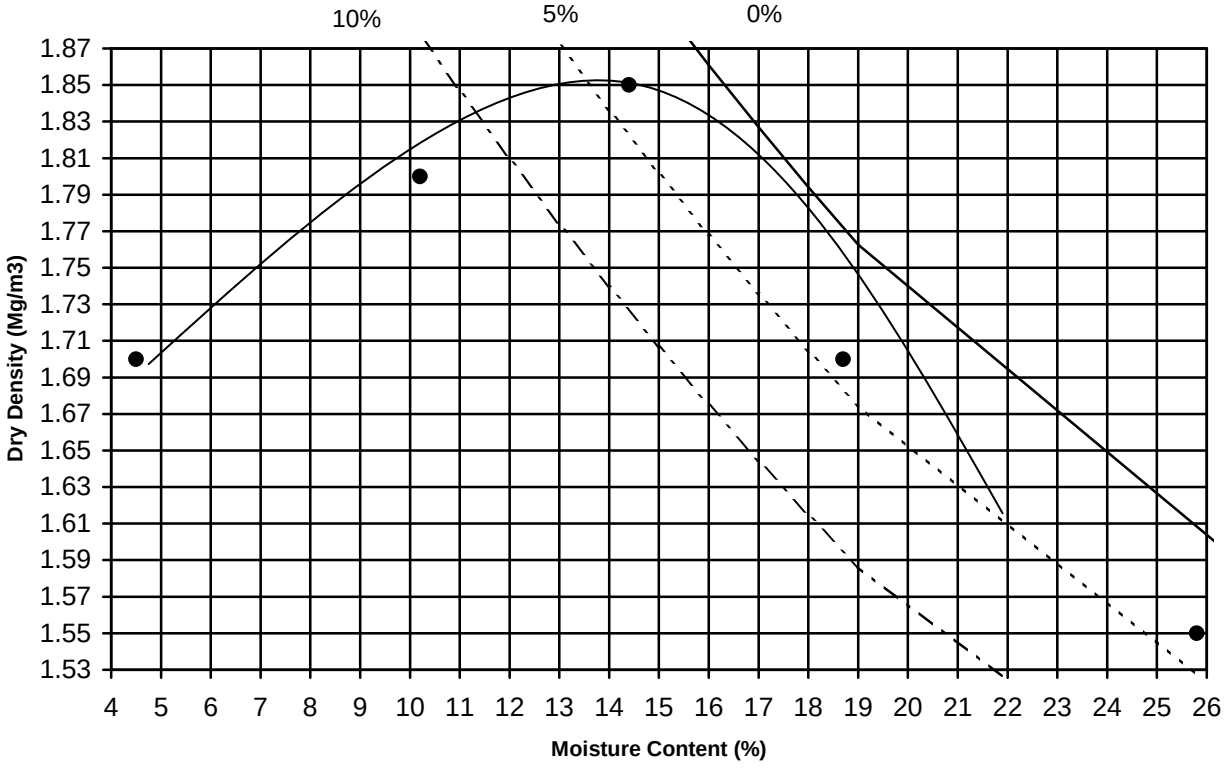
Sample No. TP09-1B Depth (m) 2.80m Material Type B

Lab sample no. A15/603 Customer: GDG

Date Received: 20/02/2015 Test Method: 2.5 KG Rammer

Date Tested: 02/03/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	1.55	1.70	1.85	1.80	1.70		
Moisture Content (%)	26	19	14	10	4.5		



Maximum Dry Density (Mg/m^3): 1.85 Optimum Moisture Content (%): 14

Description: Grey brown very sandy gravelly CLAY

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 2.8

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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APPENDIX C

WAC Results

Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

IGSL
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

4225

Attention :	Darren Keogh
Date :	9th March, 2015
Your reference :	
Our reference :	Test Report 15/4014 Batch 1
Location :	River Dargle
Date samples received :	24th February, 2015
Status :	Final report
Issue :	1

Ten samples were received for analysis on 24th February, 2015 of which ten were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Bruce Leslie
Project Co-ordinator

Bob Millward BSc FRSC
Principal Chemist

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 15/4014

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	LOD/LOR	Units	Method No.
Sample ID	TP1	TP1	TP2	TP2	TP3	TP6	TP6	TP7	TP8	TP9			
Depth	1.10	3.50	0.90	1.2	2.50	0.95	3.30	2.00	2.05	2.80			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015			
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.09	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.90	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.52	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	0.19	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	6.34	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.93	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.22	<0.03	<0.03	<0.03	0.05	0.05	<0.03	6.84	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	0.18	<0.03	<0.03	<0.03	0.04	0.04	<0.03	5.97	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	0.12	<0.06	<0.06	<0.06	0.06	0.06	<0.06	2.48	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	0.11	<0.02	<0.02	<0.02	0.03	0.03	<0.02	2.90	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	0.11	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	3.52	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	0.06	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	1.93	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	1.14	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.15	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.96	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	0.10	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	0.39	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	14.39	<0.22	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	1.03	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	34.77	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	0.08	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	2.53	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.99	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	95	89	93	106	104	103	104	97	88	102	<0	%	TM4/PM8
Mineral Oil >C8-C10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/kg	TM5/PM16
Mineral Oil >C10-C12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C12-C16	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C16-C21	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C21-C40	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C8-C40	<45	<45	<45	<45	<45	<45	<45	<45	<45	<45	<45	mg/kg	TM5/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene #	27	<5	<5	<5	<5	<5	<5	36	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	28	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 15/4014

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	LOD/LOR	Units	Method No.
Sample ID	TP1	TP1	TP2	TP2	TP3	TP6	TP6	TP7	TP8	TP9			
Depth	1.10	3.50	0.90	1.2	2.50	0.95	3.30	2.00	2.05	2.80			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015			
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	11.8	14.6	13.7	12.0	7.4	5.7	14.1	27.9	7.1	18.6	<0.1	%	PM4/PM0
% Dry Matter 105°C	87.9	90.3	88.4	88.3	93.2	92.6	79.3	71.2	91.4	84.3	<0.1	%	NONE/PM4
Total Organic Carbon #	0.82	0.46	0.47	0.46	0.28	1.34	0.60	3.19	0.20	0.20	<0.02	%	TM21/PM24
Mass of raw test portion	0.1024	0.0999	0.1015	0.102	0.0964	0.097	0.1137	0.1265	0.0981	0.1063		kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 15/4014

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-2	3-4	5-6	7-8	9-10	11-12	13-14	15-16	17-18	19-20	LOD/LOR	Units	Method No.
Sample ID	TP1	TP1	TP2	TP2	TP3	TP6	TP6	TP7	TP8	TP9			
Depth	1.10	3.50	0.90	1.2	2.50	0.95	3.30	2.00	2.05	2.80			
COC No / misc													
Containers	V J	V J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015	23/02/2015			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015	24/02/2015			
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	<0.0025	<0.0025	<0.0025	<0.0025	0.0026	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	<0.025	<0.025	<0.025	<0.025	0.026	<0.025	<0.025	<0.025	<0.025	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	0.011	0.004	0.007	0.007	0.005	0.004	0.006	0.021	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	0.11	0.04	0.07	0.07	0.05	0.04	0.06	0.21	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	0.03	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.06	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.03	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	0.00021	0.00011	0.00012	0.00013	0.00006	0.00025	0.00057	0.00028	0.00007	0.00018	<0.00001	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	0.0021	0.0011	0.0012	0.0013	0.0006	0.0025	0.0057	0.0028	0.0007	0.0018	<0.0001	mg/kg	TM61/PM38
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM27/PM0
Fluoride	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	mg/kg	TM27/PM0
Chloride	0.5	0.5	0.3	0.3	<0.3	0.7	<0.3	2.1	<0.3	<0.3	<0.3	mg/l	TM27/PM0
Chloride	5	5	<3	<3	<3	7	<3	21	<3	<3	<3	mg/kg	TM27/PM0
Sulphate	3.29	1.38	2.66	2.42	3.06	7.79	0.99	3.77	0.56	1.03	<0.05	mg/l	TM27/PM0
Sulphate	32.9	13.8	26.6	24.2	30.6	77.9	9.9	37.7	5.6	10.3	<0.5	mg/kg	TM27/PM0
Mass of raw test portion	0.1024	0.0999	0.1015	0.102	0.0964	0.097	0.1137	0.1265	0.0981	0.1063		kg	NONE/PM17
Leachant Volume	0.888	0.89	0.888	0.888	0.893	0.893	0.877	0.864	0.892	0.883		l	NONE/PM17
Eluate Volume	0.85	0.85	0.8	0.85	0.85	0.88	0.76	0.78	0.87	0.85		l	NONE/PM17
Dissolved Organic Carbon	6	6	4	5	4	4	5	10	3	2	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	60	60	40	50	40	40	50	100	30	<20	<20	mg/kg	TM60/PM0
Total Dissolved Solids #	153	92	94	47	84	181	102	148	163	83	<10	mg/l	TM20/PM0
Total Dissolved Solids #	1531	920	940	470	840	1810	1021	1481	1631	830	<100	mg/kg	TM20/PM0

Mass of sample taken (kg)	0.1024	Dry Matter Content Ratio (%) =	87.9
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.888
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**2**			
Client Sample No	**TP1**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**1.10**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.82	3	5	6
Sum of BTEX (mg/kg)	0.027	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	0.39	-	-	-
PAH Sum of 17 (mg/kg)	1.03	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.11	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0021	0.01	0.2	2
Molybdenum	0.03	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	5	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	32.9	1000	20000	50000
Total Dissolved Solids	1531	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	60	500	800	1000

Mass of sample taken (kg)	0.0999	Dry Matter Content Ratio (%) =	90.3
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.89
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**4**			
Client Sample No	**TP1**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**3.50**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.46	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.04	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0011	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	5	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	13.8	1000	20000	50000
Total Dissolved Solids	920	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	60	500	800	1000

Mass of sample taken (kg)	0.1015	Dry Matter Content Ratio (%) =	88.4
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.888
Particle Size <4mm =	>95%	Eluate Volume (l)	0.8

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**6**			
Client Sample No	**TP2**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**0.90**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.47	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.07	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0012	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	26.6	1000	20000	50000
Total Dissolved Solids	940	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	40	500	800	1000

Mass of sample taken (kg)	0.102	Dry Matter Content Ratio (%) =	88.3
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.888
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**15/4014**			
Sample No	**8**			
Client Sample No	**TP2**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**1.2**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.46	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.07	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0013	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	24.2	1000	20000	50000
Total Dissolved Solids	470	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	50	500	800	1000

Mass of sample taken (kg)	0.0964	Dry Matter Content Ratio (%) =	93.2
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.893
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**10**			
Client Sample No	**TP3**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**2.50**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.28	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.026	0.5	2	25
Barium	0.05	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0006	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	30.6	1000	20000	50000
Total Dissolved Solids	840	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	40	500	800	1000

Mass of sample taken (kg)	0.097	Dry Matter Content Ratio (%) =	92.6
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.893
Particle Size <4mm =	>95%	Eluate Volume (l)	0.88

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**15/4014**			
Sample No	**12**			
Client Sample No	**TP6**			
Depth/Other	**0.95**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	1.34	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.04	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0025	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	7	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	77.9	1000	20000	50000
Total Dissolved Solids	1810	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	40	500	800	1000

Mass of sample taken (kg)	0.1137	Dry Matter Content Ratio (%) =	79.3
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.877
Particle Size <4mm =	>95%	Eluate Volume (l)	0.76

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**14**			
Client Sample No	**TP6**			
Depth/Other	**3.30**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.60	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.06	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0057	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	9.9	1000	20000	50000
Total Dissolved Solids	1021	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	50	500	800	1000

Mass of sample taken (kg)	0.1265	Dry Matter Content Ratio (%) =	71.2
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.864
Particle Size <4mm =	>95%	Eluate Volume (l)	0.78

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**15/4014**			
Sample No	**16**			
Client Sample No	**TP7**			
Depth/Other	**2.00**	**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	3.19	3	5	6
Sum of BTEX (mg/kg)	0.064	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	14.39	-	-	-
PAH Sum of 17 (mg/kg)	34.77	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	0.21	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0028	0.01	0.2	2
Molybdenum	0.06	0.5	10	30
Nickel	0.03	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	21	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	37.7	1000	20000	50000
Total Dissolved Solids	1481	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	100	500	800	1000

Mass of sample taken (kg)	0.0981	Dry Matter Content Ratio (%) =	91.4
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.892
Particle Size <4mm =	>95%	Eluate Volume (l)	0.87

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**18**			
Client Sample No	**TP8**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**2.05**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.20	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0007	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	5.6	1000	20000	50000
Total Dissolved Solids	1631	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.1063	Dry Matter Content Ratio (%) =	84.3
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.883
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

JEFL Job No	**15/4014**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**20**			
Client Sample No	**TP9**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other	**2.80**			
Sample Date	**23/02/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.20	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0018	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	10.3	1000	20000	50000
Total Dissolved Solids	830	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	<20	500	800	1000

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
No deviating sample report results for job 15/4014						

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.
Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 15/4014

SOILS

Please note we are only MCERTS accredited for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary. If we are instructed to keep samples, a storage charge of £1 (1.5 Euros) per sample per month will be applied until we are asked to dispose of them.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

WATERS

Please note we are not a Drinking Water Inspectorate (DWI) Approved Laboratory . It is important that detection limits are carefully considered when requesting water analysis.

UKAS accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	UKAS accredited.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
OC	Outside Calibration Range

JE Job No: 15/4014

Test Method No.	Description	Prep Method No. (if appropriate)	Description	UKAS	MCERTS (soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified USEPA 8163. Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes

JE Job No: 15/4014

Test Method No.	Description	Prep Method No. (if appropriate)	Description	UKAS	MCERTS (soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.

River Dargle, Bray
Appraisal of fill material stockpiled at Bray Golf Course

GDG
GAVIN & DOHERTY
GEOSOLUTIONS

Project Title:

River Dargle Flood Protection Scheme

Report Title:

Assessment of the fill material stockpiled at Bray Golf Course

Client:

Wicklow County Council

Ultimate Client:

Wicklow County Council

Confidentiality:

N/A

Guidelines of use of report:

This report has been commissioned by Wicklow County Council for the material stockpiled at Bray Golf Course in September 2015. Third Parties using this report should independently satisfy themselves that the information contained in this report remains valid for their own purposes.

Doc Number	Revision	Date	Authored	Checked
15019-6	0	19 November 2015	PQ	PD

Executive Summary

The soil extracted from the River Dargle appears to be inert material and is suitable as a general fill material. Over time the material may wet up slightly. Some conditioning of the soil may be required at the point of deposition to ensure that adequate compaction of the material is achieved.

Table of Contents

1 Introduction

The River Dargle Flood Alleviate scheme in Bray, Co Wicklow has generated surplus material excavated from the river. This material is stockpiled on the north bank of the River Dargle on Bray Golf Course alongside Ravenswell Road and the fill is currently acting as a temporary flood defence measure while the permanent works are being designed and constructed. Wicklow County Council has requested Gavin and Doherty Geosolutions (GDG) to review the constituents of the fill material and comment on the potential reuse of the material once the permanent flood defence measures are in place.

GDG has inspected the stockpiles and agreed a sampling plan with Wicklow County Council. Bulk samples were taken from the site and tested at IGSL to determine the geotechnical and chemical properties.

This report summarises the results from the testing phases and provides:

- Geotechnical assessment of the material
- A commentary on the degree of contamination of the soil
- Possible uses of the material.

2 Sampling

Sampling of the fill material was undertaken by Wicklow County Council on 21 October, 2015. The samples were sent to IGSL and then issued to Jones Environmental Laboratory for environmental testing. The test reports from IGSL and Jones Environmental are appended to this report in Appendices A and B.

3 Geotechnical characterisation

3.1 Soil indices

The moisture content of the material was measured on 15 specimens and the results varied between 3.7 and 7.1%. These are indicative of sandy, Gravel materials. The organic content measured by a loss of ignition test are less than 2% and the maximum value measured was 1.3%.

3.2 Grading

Particle size distribution tests were undertaken on ten samples. The soil could be described as a slightly clayey/silty, very sandy Gravel with cobbles. The deposition regime in the river has produced a very similar grading distribution in the various samples. The grading curves have been plotted against the grading requirements for Class 1A from the National Road Authority (NRA) Specification for Road Works 600 Series.

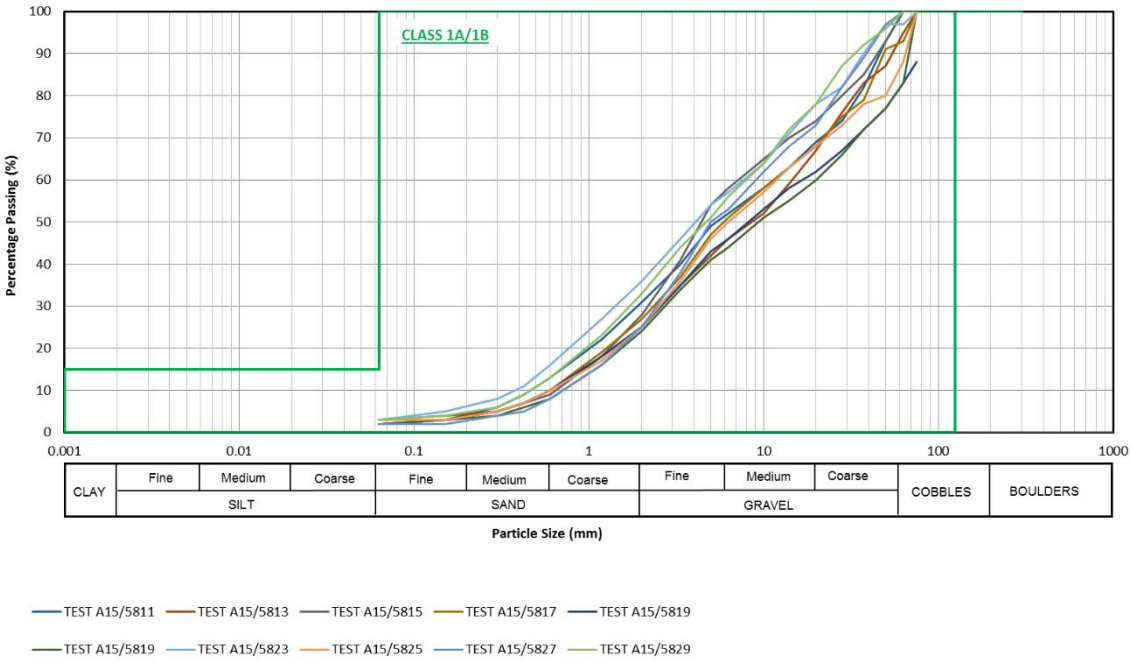

Figure 1 Particle size distribution analyses

3.3 Compaction tests

Dry density versus moisture content relationships were undertaken on five samples using a 2.5kg rammer. The results suggest that the optimum moisture content varied between 5 and 7% with an average value of 6%. The natural moisture content is typically 1 to 2% wet of optimum.

3.4 Moisture Condition Value

The Moisture Condition Value (MCV) test was undertaken on 20 samples. The very sandy Gravel nature of the soil is not readily suitable for the MCV test. The results vary from <1 to 14. The results are summarised on Figure 2.

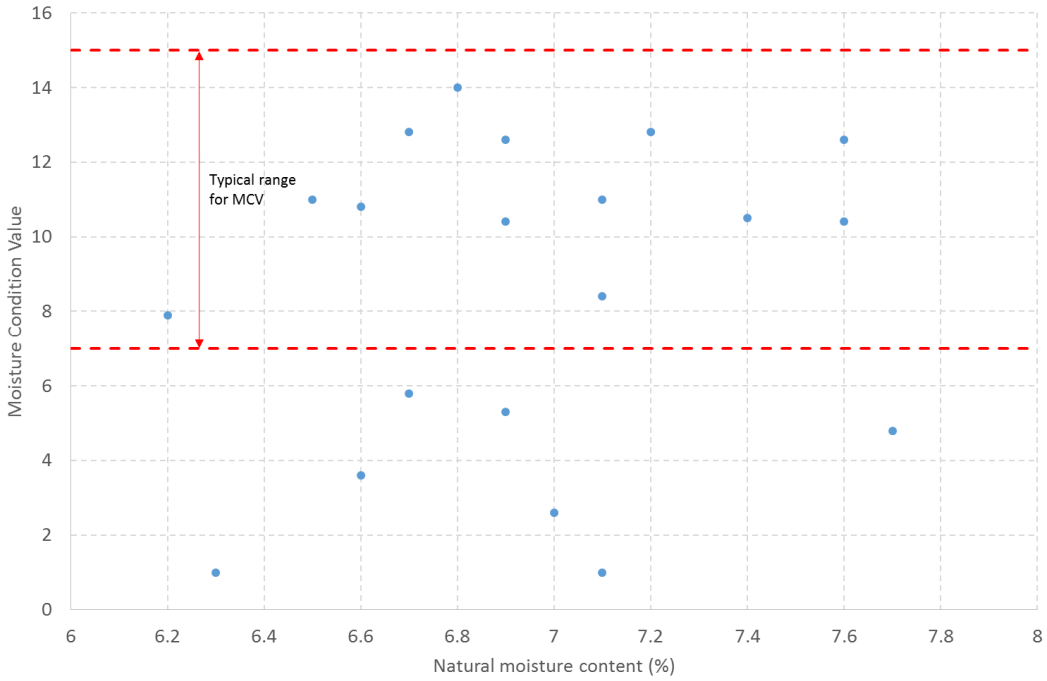

Figure 2 Moisture Condition Value versus natural moisture content

4 Environmental results

4.1 Criteria for Assessment

Soil analysis for contamination was carried out in accordance with two sets of criteria relevant to the environmental assessment of a site depending on whether soils are to remain in-situ or are being reused on site of origin, or are to be removed from site. These are:

a) Does the soil have properties that deems it hazardous under the Waste Framework Directive
b) Waste Acceptance Criteria (WAC) – for soils to be removed/disposed offsite. In accordance with the parameters for disposal of excavated material to landfill (European Council decision of 19 December 2002 pursuant to Article 16 and Annex II to Directive 1999/31/EC). This Council Decision sets limit values on waste for each landfill type based on total pollutant contents and leachate concentrations.

4.1.1 Waste Acceptance Criteria (WAC)

For soils which are to be removed off-site for disposal in a landfill, the EU has set criteria for the acceptance of waste at a land fill. These are referred to as the Waste Acceptance Criteria (WAC) and are set out in Directive 1999/31/EC (The Landfill Directive) and the Council Decision of 19 December 2002. This decision classifies landfills as Inert, Non-hazardous or Hazardous based on total pollutant contents and leachate concentrations.

4.2 Test Results

4.2.1 Soils to be removed/disposal off site – Waste Acceptance Criteria (WAC)

Excavated soils from construction sites can be disposed to a number of facilities, depending on the concentration of contaminants present in the soils. The main disposal options are as follows:

- Inert Natural Ground, suitable for permitted site (category A)
- Soils suitable for disposal to an Inert Licenced Landfill (category B)
- Soils suitable for disposal to a Non Hazardous Licenced Landfill (category C)
- Soils suitable for disposal to a Hazardous Licenced Landfill (category D)

The results indicate that the materials classify as inert (category A) and are suitable for reuse as construction materials.

5 Conclusions and recommendations

The material extracted from the River Dargle is a slightly silty/clayey, very sandy Gravel with cobbles. The material is suitable for use as a general fill material. The material is current at or slightly wet (1 – 2%) of the optimum moisture content for compaction. Over time some of the outer material may wet up and require some mixing or drying to improve the material and make it suitable for placement as general fill. The moisture contents should be checked before the material is reused.

APPENDIX A – IGSL Test Results

IGSL Ltd
Materials Laboratory
Unit J5, M7 Business Park
Newhall, Naas
Co. Kildare
045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1331

Report No. **R68395** Contract No. 18804 Contract Name: Ravenswell Road

Customer GDGeo

Samples Received: 21/10/15 Date Tested: 27/10/15

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
Sample No.01	A	N/A	A15/5811	B	5.5								Grey brown slightly clayey/silty, very sandy, GRAVEL
Sample No.01	B	N/A	A15/5812	B	6.1								Grey brown slightly clayey/silty, very sandy, GRAVEL
Sample No.02	A	N/A	A15/5813	B	5.1								Brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles
Sample No.02	B	N/A	A15/5814	B	5								Brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles
Sample No.03	A	N/A	A15/5815	B	5.9								Grey brown slightly clayey/silty, very sandy, GRAVEL
Sample No.03	B	N/A	A15/5816	B	7.1								Grey brown slightly clayey/silty, very sandy, GRAVEL
Sample No.04	A	N/A	A15/5817	B	4.8								Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.04	B	N/A	A15/5818	B	5.3								Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.05	A	N/A	A15/5819	B	5.3								Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.05	B	N/A	A15/5820	B	6.7								Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.06	A	N/A	A15/5821	B	5.6								Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.06	B	N/A	A15/5822	B	4.8								Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.07	A	N/A	A15/5823	B	5								Grey brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles
Sample No.07	B	N/A	A15/5824	B	3.7								Grey brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles
Sample No.08	A	N/A	A15/5825	B	6.2								Grey brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Notes:
Preparation: WS - Wet sieved; AR - As received; NP - Non plastic
Sample Type: B - bulk disturbed; U - Undisturbed
Liquid Limit Clause: 4.3 Cone Penetrometer definitive method; 4.4 Cone Penetrometer one point method

Remarks:

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014
Opinions and interpretations are outside the scope of accreditation.
The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Quality Manager)

Approved by	Date	Page
H Byrne	29/10/15	1 of 1

IGSL Ltd
Materials Laboratory
Unit J5, M7 Business Park
Newhall, Naas
Co. Kildare
045 846176

Test Report

Determination of Moisture Content, Liquid & Plastic Limits

Tested in accordance with BS1377:Part 2:1990, clauses 3.2*, 4.3, 4.4 & 5.3

ISO 17025 IVNAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 1331

Report No. **R68396** Contract No. Contract Name: Ravenswell Road

Customer GDGeo

Samples Received: 21/10/15 Date Tested: 27/10/15

BH/TP	Sample No.	Depth (m)	Lab. Ref	Sample Type	Moisture Content %	Liquid Limit %	Plastic Limit %	Plasticity Index	% <425µm	Preparation	Liquid Limit Clause	Classification (BS5930)	Description
Sample No.08	B	N/A	A15/5826	B	6.2								Grey brown slightly clayey/silty, very sandy, GRAVEL with some cobbles
Sample No.09	A	N/A	A15/5827	B	5.9								Brown slightly clayey/silty, very sandy, GRAVEL
Sample No.09	B	N/A	A15/5828	B	6.3								Brown slightly clayey/silty, very sandy, GRAVEL
Sample No.10	A	N/A	A15/5829	B	5.1								Grey brown slightly clayey/silty, very sandy, GRAVEL
Sample No.10	B	N/A	A15/5830	B	6.7								Grey brown slightly clayey/silty, very sandy, GRAVEL

Notes: Preparation: WS - Wet sieved; AR - As received; NP - Non plastic

Liquid Limit Clause: 4.3 Cone Penetrometer definitive method; 4.4 Cone Penetrometer one point method

Sample Type: B - bulk disturbed; U - Undisturbed

Remarks:

NOTE: *Clause 3.2 of BS1377 is a "withdrawn" standard due to publication of ISO17892-1:2014

Opinions and interpretations are outside the scope of accreditation.

The results relate to the specimens tested. Any remaining material will be retained for one month.

IGSL Ltd Materials Laboratory

Persons authorized to approve reports

H Byrne (Quality Manager)

Approved by: H Byrne

Date: 29/10/15

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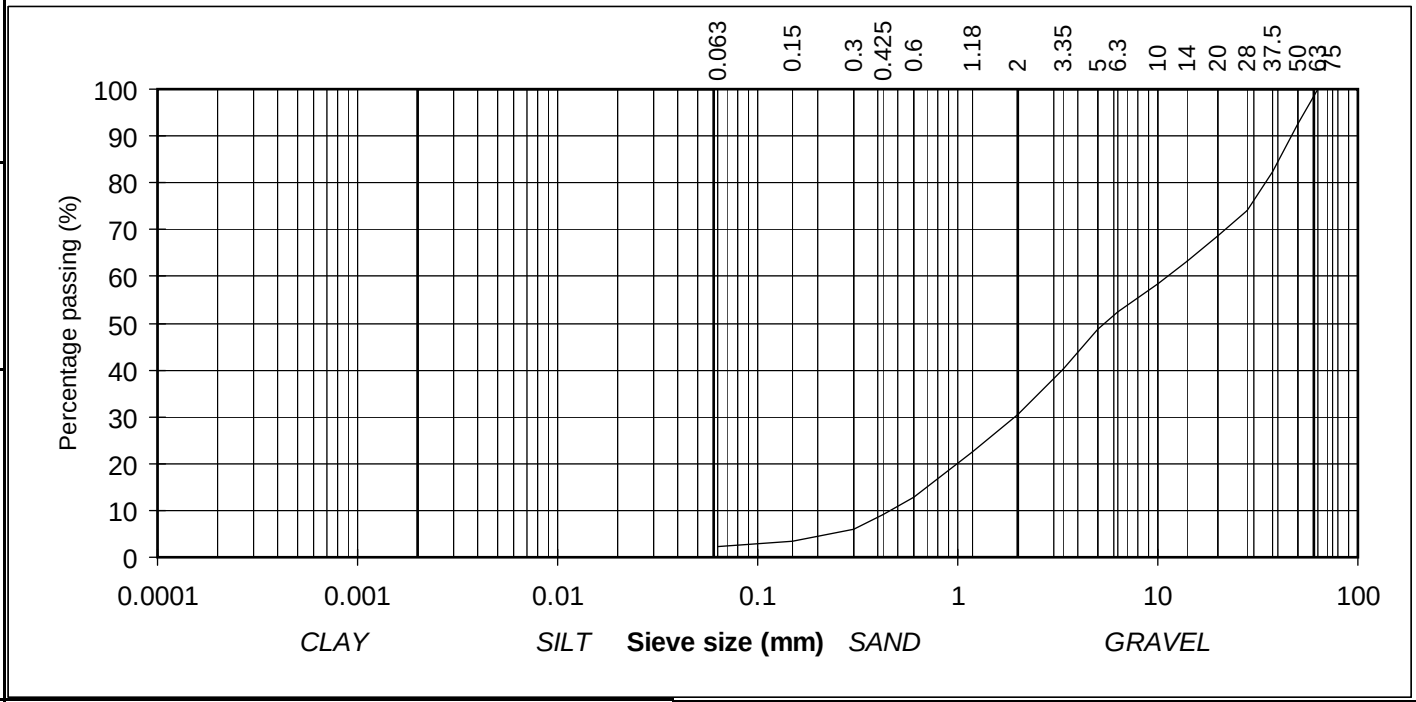
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	93	GRAVEL
37.5	82	
28	74	
20	69	
14	63	
10	58	
6.3	52	
5	49	
3.35	40	
2	31	
1.18	22	SAND
0.6	13	
0.425	9	
0.3	6	
0.15	3	
0.063	2	SILT/CLAY

Contract No: 18804 Report No. R68548
Contract: Ravenswell Road
Bh: Sample No. 01
Sample No. No. 1 Lab. Sample No. A15/5811
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Grey brown slightly clayey/silty, very sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	06/11/15	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

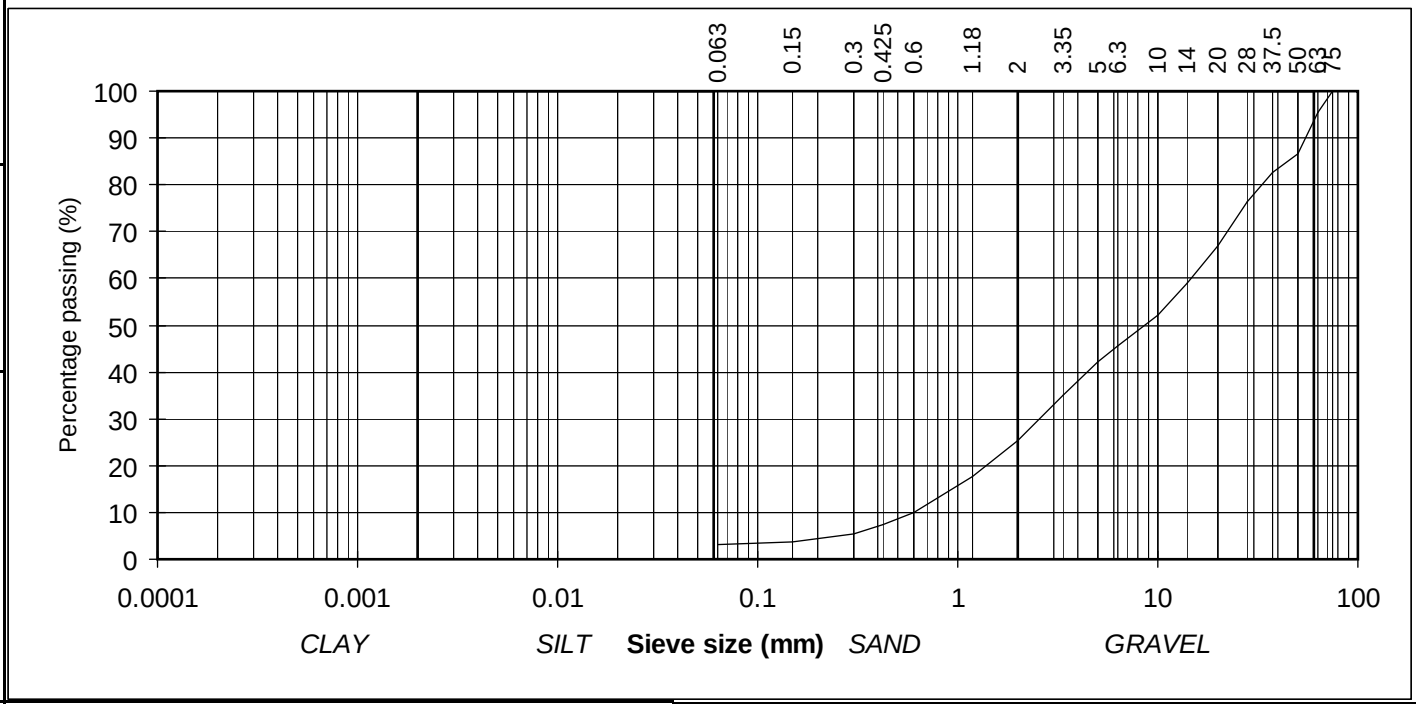
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	95	
50	87	GRAVEL
37.5	83	
28	76	
20	67	
14	59	
10	52	
6.3	46	
5	42	
3.35	35	
2	25	
1.18	18	SAND
0.6	10	
0.425	7	
0.3	5	
0.15	4	
0.063	3	SILT/CLAY

Contract No: 18804 Report No. R68549
Contract: Ravenswell Road
Bh: Sample 02
Sample No. No.2 Lab. Sample No. A15/5813
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

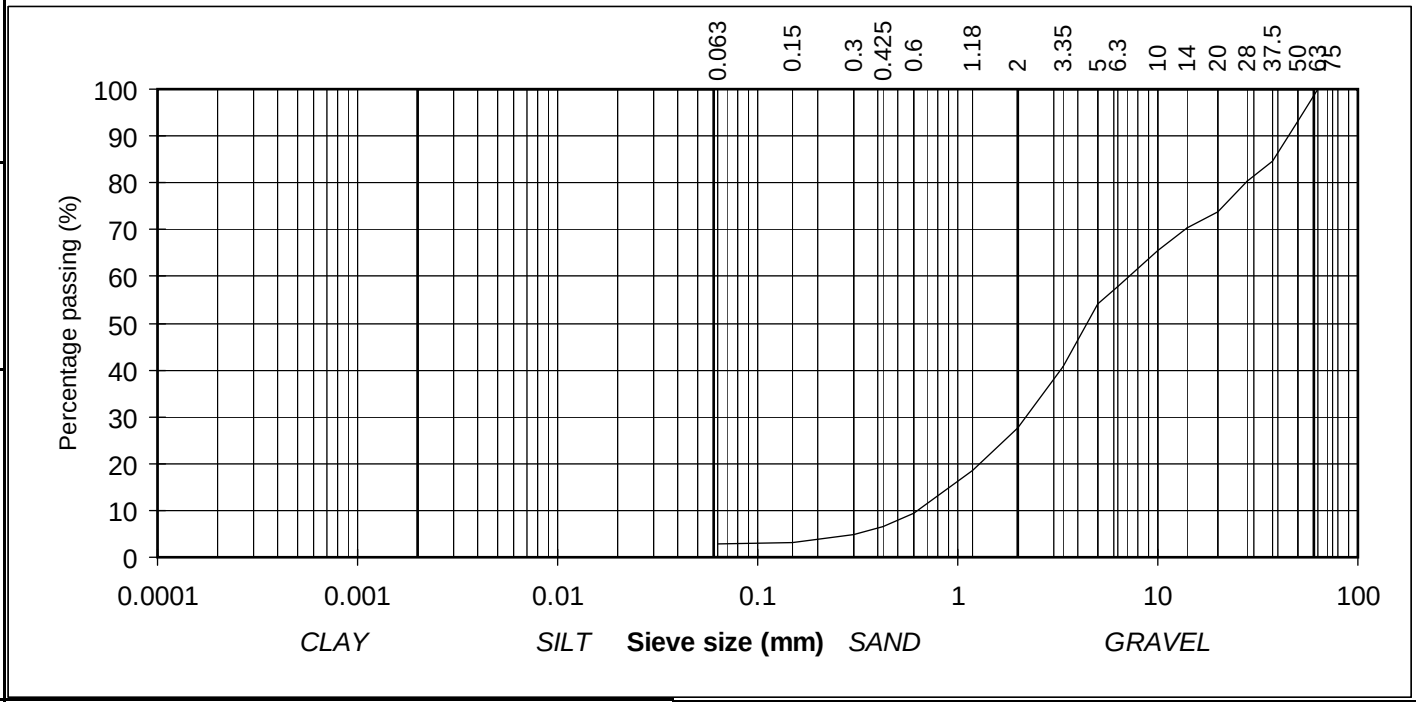
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	93	GRAVEL
37.5	85	
28	80	
20	74	
14	70	
10	65	
6.3	58	
5	54	
3.35	41	
2	28	
1.18	18	SAND
0.6	9	
0.425	7	
0.3	5	
0.15	3	
0.063	3	SILT/CLAY

Contract No: 18804 Report No. R68422
Contract: Ravenswell Road
Bh: Sample No.03
Sample No. No.3 Lab. Sample No. A15/5815
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Grey brown slightly clayey/silty, very sandy, GRAVEL

Remarks



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Approved by:	Date:	Page no:
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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	93	
50	91	GRAVEL
37.5	79	
28	75	
20	68	
14	63	
10	58	
6.3	51	
5	47	
3.35	37	
2	27	
1.18	19	SAND
0.6	10	
0.425	7	
0.3	5	
0.15	3	
0.063	2	SILT/CLAY

Contract No: 18804 Report No. R68550

Contract: Ravenswell Road

Bh: Sample 04

Sample No. No. 4 Lab. Sample No. A15/5817

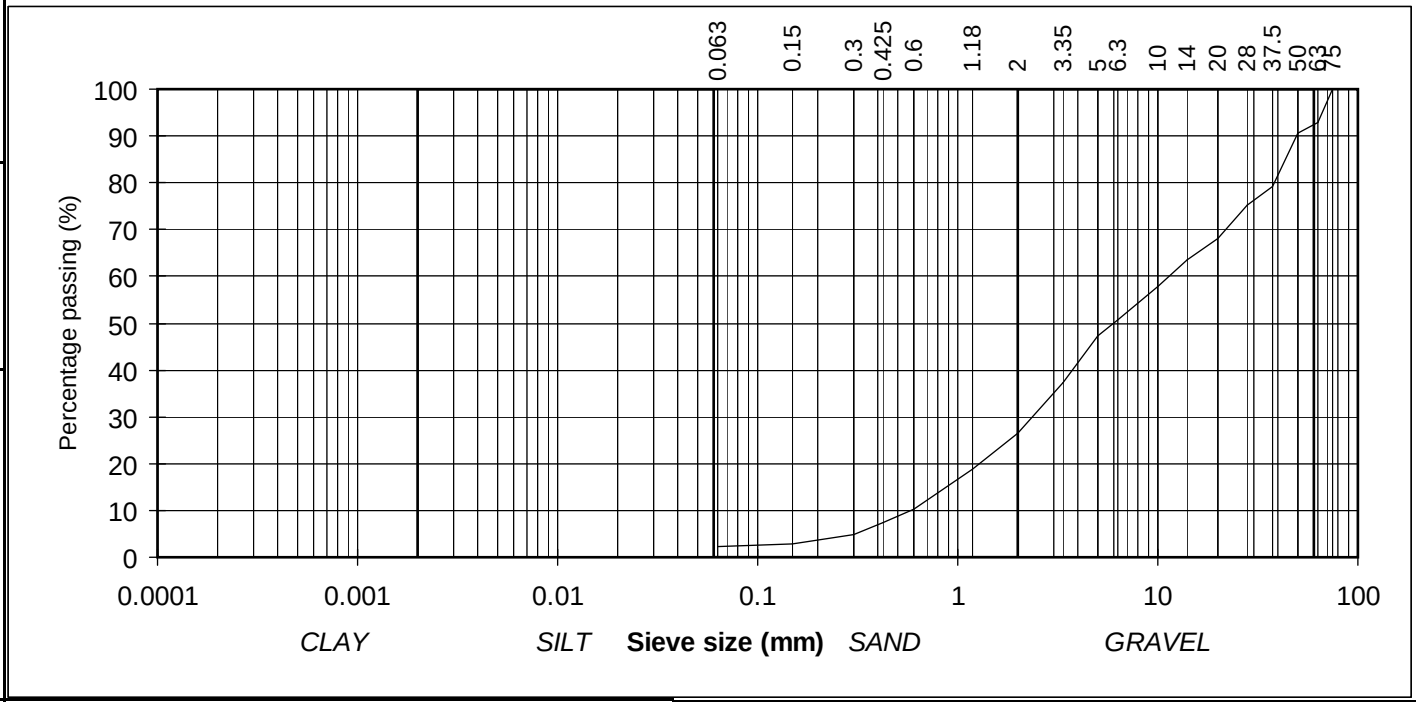
Sample Type: B

Depth (m) N/A Customer: GDGeo

Date Received 21/10/2015 Date Testing started 27/10/2015

Description: Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Remarks



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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

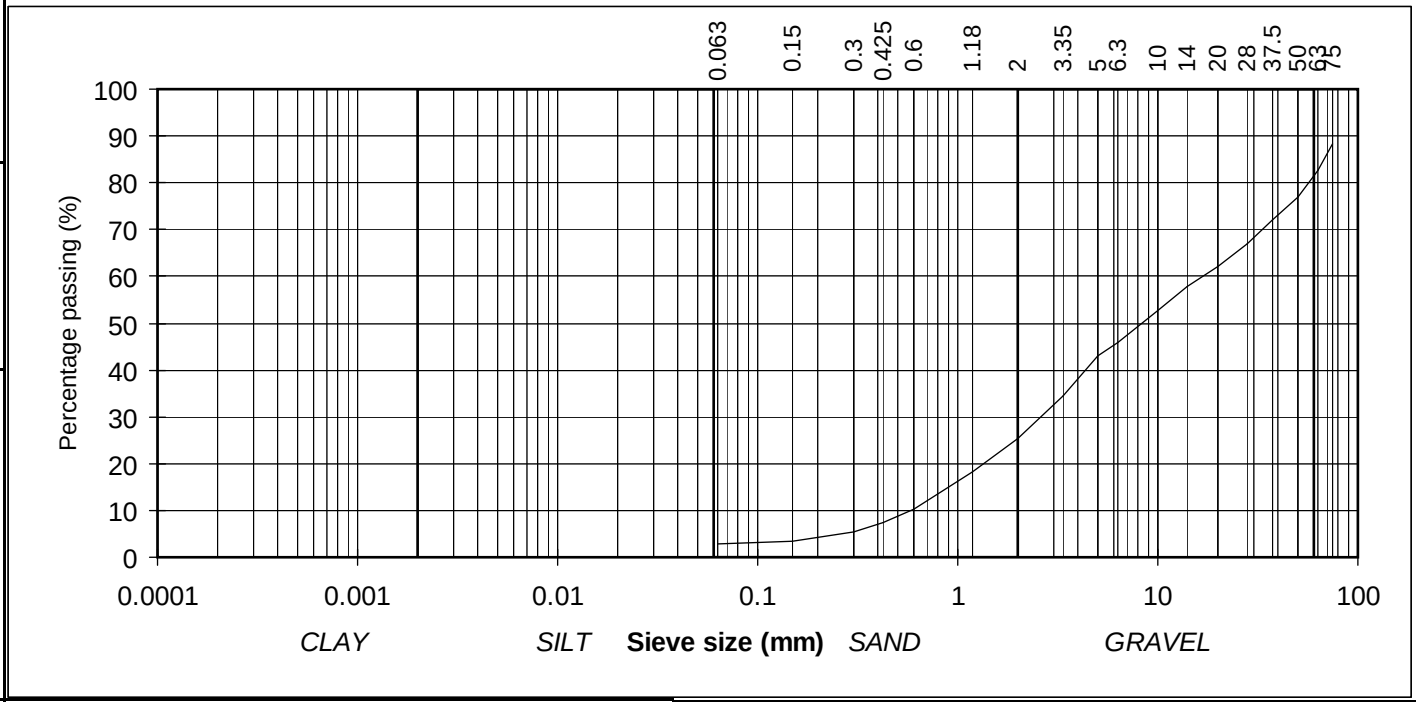
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	88	COBBLES
63	83	
50	77	GRAVEL
37.5	72	
28	67	
20	62	
14	58	
10	53	
6.3	46	
5	43	
3.35	35	
2	25	
1.18	18	SAND
0.6	10	
0.425	7	
0.3	5	
0.15	3	
0.063	3	SILT/CLAY

Contract No: 18804 Report No. R68551
Contract: Ravenswell Road
Bh: Sample 05
Sample No. No.5 Lab. Sample No. A15/5819
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Remarks Sample size did not meet the requirements of BS1377



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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

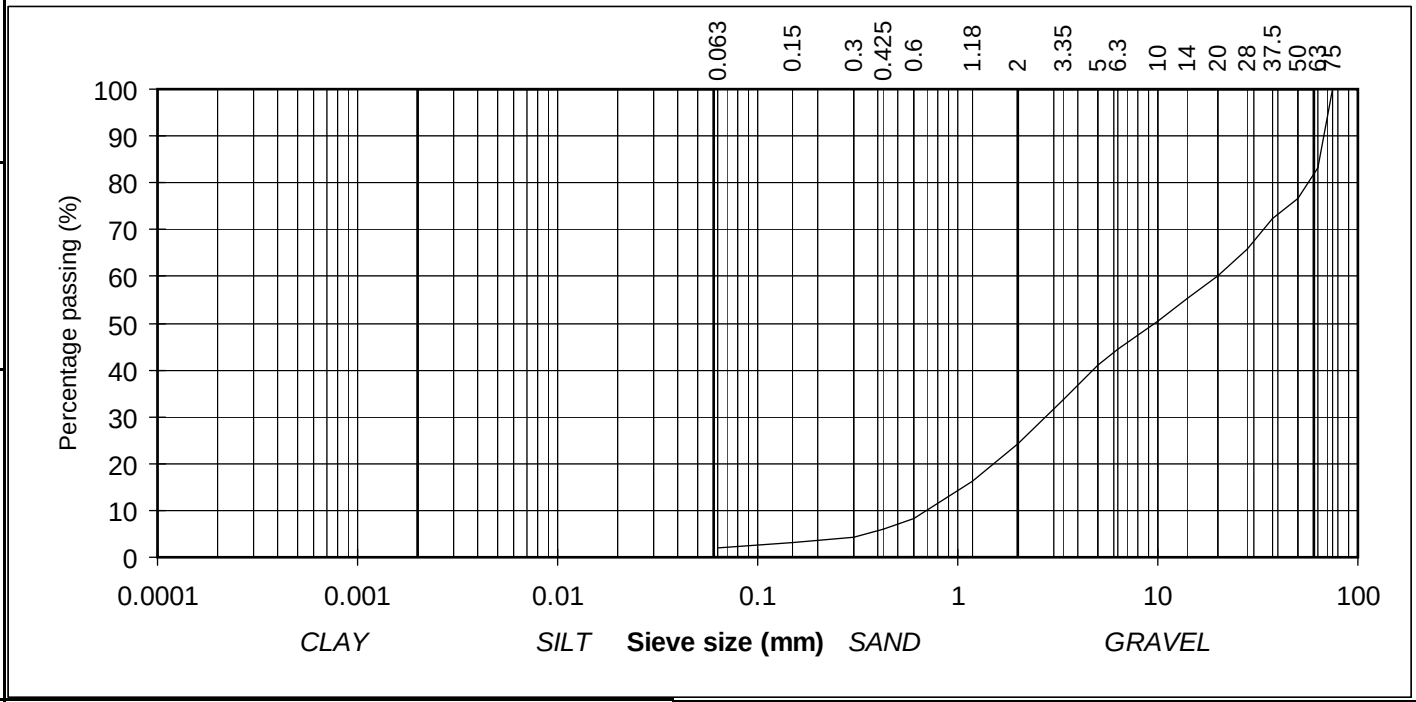
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	83	
50	77	GRAVEL
37.5	72	
28	66	
20	60	
14	55	
10	51	
6.3	44	
5	41	
3.35	34	
2	24	
1.18	16	SAND
0.6	8	
0.425	6	
0.3	4	
0.15	3	
0.063	2	SILT/CLAY

Contract No: 18804 Report No. R68551
Contract: Ravenswell Road
Bh: Sample 06
Sample No. No.6 Lab. Sample No. A15/5819
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Remarks Sample size did not meet the requirements of BS1377



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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5

(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	97	
50	97	GRAVEL
37.5	90	
28	82	
20	78	
14	71	
10	64	
6.3	57	
5	54	
3.35	46	
2	36	
1.18	27	SAND
0.6	16	
0.425	11	
0.3	8	
0.15	5	
0.063	3	SILT/CLAY

Contract No: 18804 Report No. R68423

Contract: Ravenswell Road

Bh: Sample No.07

Sample No. No.7 Lab. Sample No. A15/5823

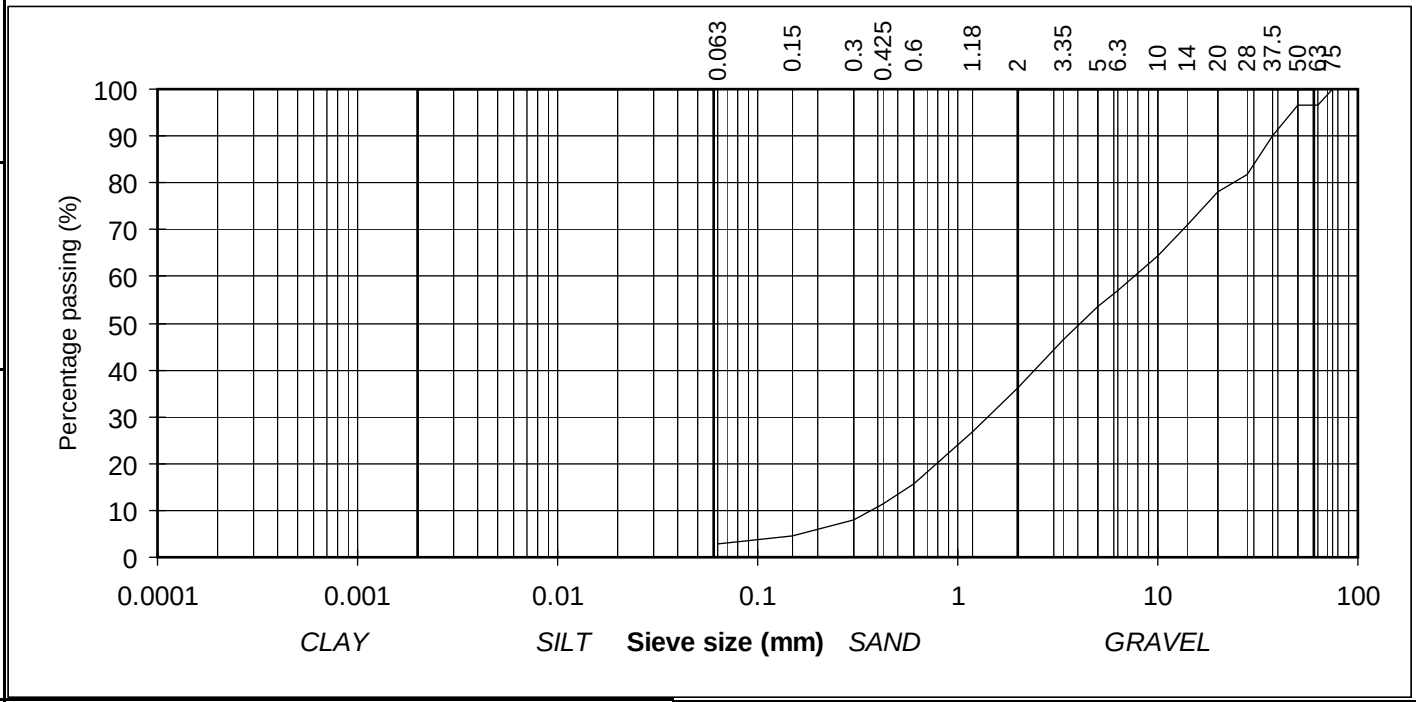
Sample Type: B

Depth (m) N/A Customer: GDGeo

Date Received 21/10/2015 Date Testing started 27/10/2015

Description: Grey brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

Remarks



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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

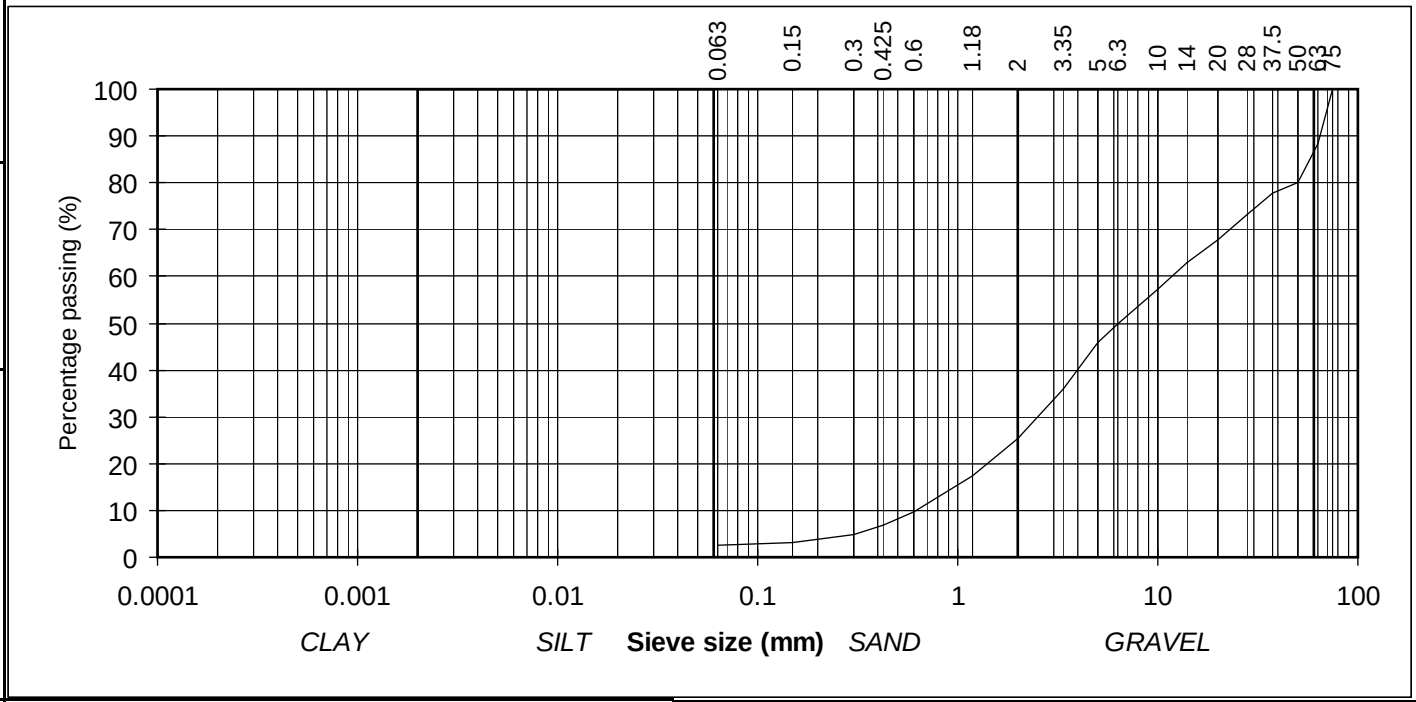
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	88	
50	80	GRAVEL
37.5	78	
28	73	
20	68	
14	63	
10	57	
6.3	50	
5	46	
3.35	36	
2	25	
1.18	17	SAND
0.6	10	
0.425	7	
0.3	5	
0.15	3	
0.063	3	SILT/CLAY

Contract No: 18804 Report No. R68449
Contract: Ravenswell Road
Bh: Sample No.08
Sample No. No 8 Lab. Sample No. A15/5825
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Grey brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Remarks Sample size did not meet the requirements of BS1377



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Approved by:	Date:	Page no:
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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

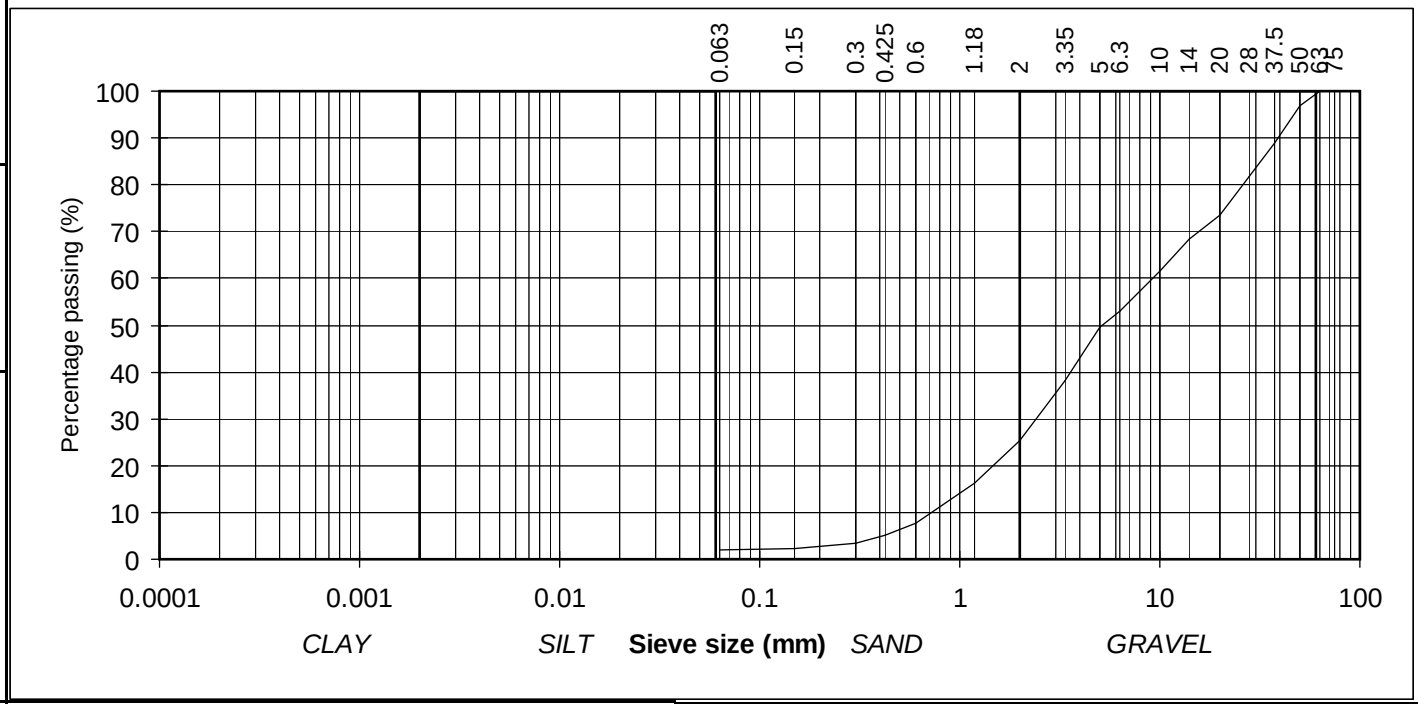
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	97	GRAVEL
37.5	89	
28	82	
20	73	
14	68	
10	62	
6.3	53	
5	50	
3.35	38	
2	25	
1.18	16	SAND
0.6	8	
0.425	5	
0.3	4	
0.15	2	
0.063	2	SILT/CLAY

Contract No:	18804	Report No.	R68424
Contract:	Ravenswell Road		
Bh:	Sample 09		
Sample No.	No. 9	Lab. Sample No.	A15/5827
Sample Type:	B		
Depth (m)	N/A	Customer:	GDGeo
Date Received	21/10/2015	Date Testing started	27/10/2015
Description:	Brown slightly clayey/silty, very sandy, GRAVEL		

Remarks



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Approved by:	Date:	Page no:
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Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

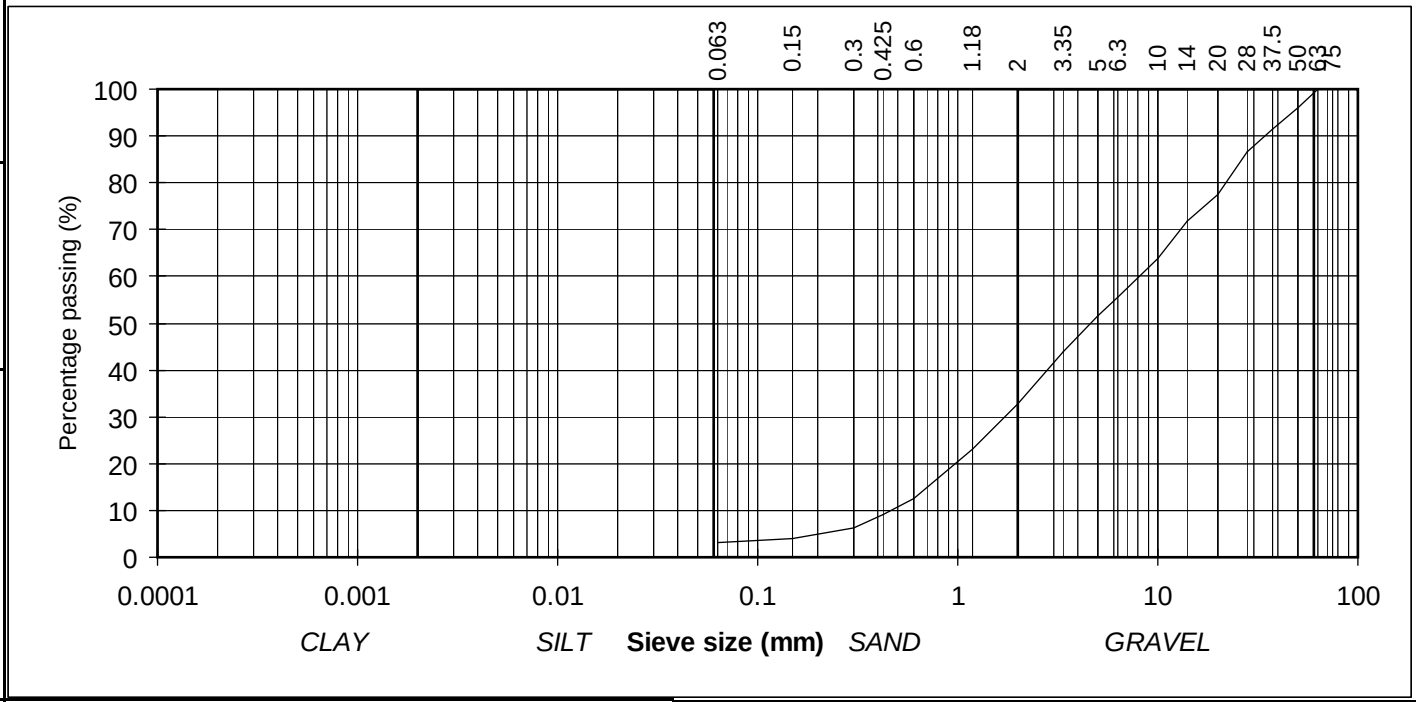
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	96	GRAVEL
37.5	92	
28	87	
20	78	
14	72	
10	64	
6.3	56	
5	51	
3.35	44	
2	33	
1.18	23	SAND
0.6	13	
0.425	9	
0.3	6	
0.15	4	
0.063	3	SILT/CLAY

Contract No: 18804 Report No. R68450
Contract: Ravenswell Road
Bh: Sample No.10
Sample No. No.10 Lab. Sample No. A15/5829
Sample Type: B
Depth (m) N/A Customer: GDGeo
Date Received 21/10/2015 Date Testing started 27/10/2015
Description: Grey brown slightly clayey/silty, very sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	02/11/15	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

IGSL Ltd
Materials Laboratory
Unit J5,M7 Business Park
Naas
Co. Kildare
045 899324

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68470**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 01
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5811
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	7.1
% Particles > 20mm (By dry mass):	26
MCV:	11
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

IGSL Ltd
Materials Laboratory
Unit J5,M7 Business Park
Naas
Co. Kildare
045 899324

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R68471**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 01
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5812
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.5
% Particles > 20mm (By dry mass):	26
MCV:	11
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

IGSL Ltd
Materials Laboratory
Unit J5,M7 Business Park
Naas
Co. Kildare
045 899324

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R68472**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 02
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5813
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.9
% Particles > 20mm (By dry mass):	26
MCV:	5.3
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

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	H Byrne	03/11/15	1 of 1

IGSL Ltd
Materials Laboratory
Unit J5,M7 Business Park
Naas
Co. Kildare
045 899324

Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No.	**R68473**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 2
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5814
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.7
% Particles > 20mm (By dry mass):	26
MCV:	12.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

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Materials Laboratory
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68474**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 3
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5815
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	7.4
% Particles > 20mm (By dry mass):	26
MCV:	10.5
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68475**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 03
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5816
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.2
% Particles > 20mm (By dry mass):	25
MCV:	7.9
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68476**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 4
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5817
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.9
% Particles > 20mm (By dry mass):	26
MCV:	12.6
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68477**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 4
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5818
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	7.2
% Particles > 20mm (By dry mass):	26
MCV:	12.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
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Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68478**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 05
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5819
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.8
% Particles > 20mm (By dry mass):	26
MCV:	14
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
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Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68479**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 5
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5820
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.6
% Particles > 20mm (By dry mass):	26
MCV:	3.6
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
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Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68480**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 6
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5821
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	6.7
% Particles > 20mm (By dry mass):	26
MCV:	5.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
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Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68481**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 6
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5822
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	28/10/15
Sample Cert:	N/A
Moisture Content (%):	7.1
% Particles > 20mm (By dry mass):	26
MCV:	8.4
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

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Report No.	**R68500**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 7
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5823
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	6.6
% Particles > 20mm (By dry mass):	26
MCV:	10.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

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Report No.	**R68501**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 7
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5824
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	6.3
% Particles > 20mm (By dry mass):	25
MCV:	<1
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
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Persons authorised to approve reports
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68502**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 8
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5825
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	6.9
% Particles > 20mm (By dry mass):	26
MCV:	10.4
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68503**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 8
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5826
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	7.7
% Particles > 20mm (By dry mass):	26
MCV:	4.8
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

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Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68504**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 9
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5827
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	7.1
% Particles > 20mm (By dry mass):	26
MCV:	<1
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Tested in accordance with BS1377:Part 4:1990, clause 5.4

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Report No.	**R68505**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 9
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5828
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	7.0
% Particles > 20mm (By dry mass):	26
MCV:	2.6
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68506**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 10
Sample No.	A
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5829
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	02/11/15
Sample Cert:	N/A
Moisture Content (%):	7.6
% Particles > 20mm (By dry mass):	26
MCV:	10.4
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Test Report

Determination of Moisture Condition Value at Natural Moisture Content

Tested in accordance with BS1377:Part 4:1990, clause 5.4

Report No.	**R68602**
Contract No.	18804
Contract Name:	Ravensell Road
Customer:	GDGeo
BH/TP	Sample 10
Sample No.	B
Depth (m)	N/A
Sample Type:	B
Lab Sample No.	A15/5830
Source (if applicable)	unknown
Material Type (if applicable):	B
Sample Received:	21/10/15
Date Tested:	03/11/15
Sample Cert:	N/A
Moisture Content (%):	7.6
% Particles > 20mm (By dry mass):	26
MCV:	12.6
Interpretation of Plot:	Steepest Straight Line
Description of Soil:	Grey brown slightly clayey/silty, very sandy, GRAVEL

The result relates to the specimen tested.
Any remaining material will be retained for one month.
Sampling and opinions and interpretations are outside the scope of accreditation.

Persons authorised to approve reports
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Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R68507 Contract No. 18804

Contract Name: Ravenswell Road

Lab Contract No. 18804 Location: Sample 1

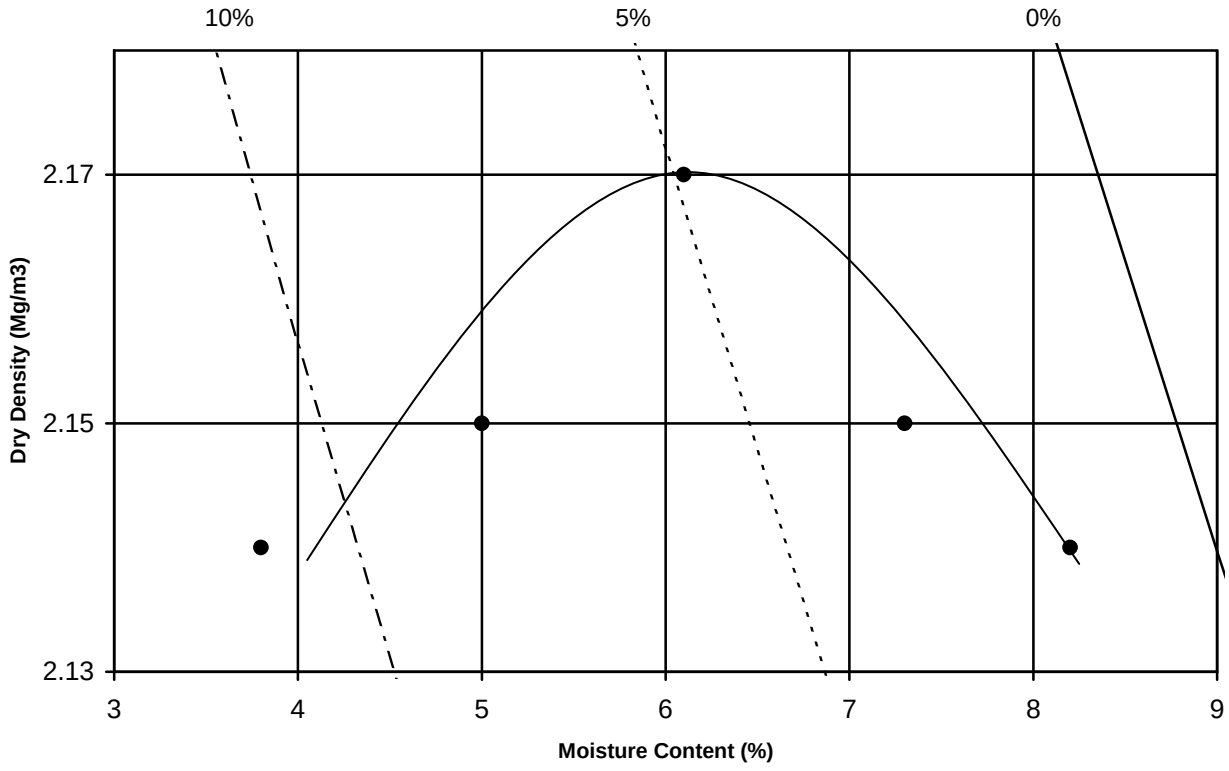
Sample No. A Depth (m) N/A Material Type B

Lab sample no. A15/5811 Customer: GDGeo

Date Received: 21/10/2015 Test Method: 2.5 KG Rammer

Date Tested: 28/10/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.17	2.14	2.15	2.15	2.14		
Moisture Content (%)	6.1	3.8	5.0	7.3	8.2		



Maximum Dry Density (Mg/m^3): 2.17 Optimum Moisture Content (%): 6

Description: Grey brown slightly clayey/silty, very sandy, GRAVEL

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 6.4

Persons authorised to approve reports
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The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

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Report No. R68508 Contract No. 18804

Contract Name: Ravenswell Road

Lab Contract No. 18804 Location: Sample 3

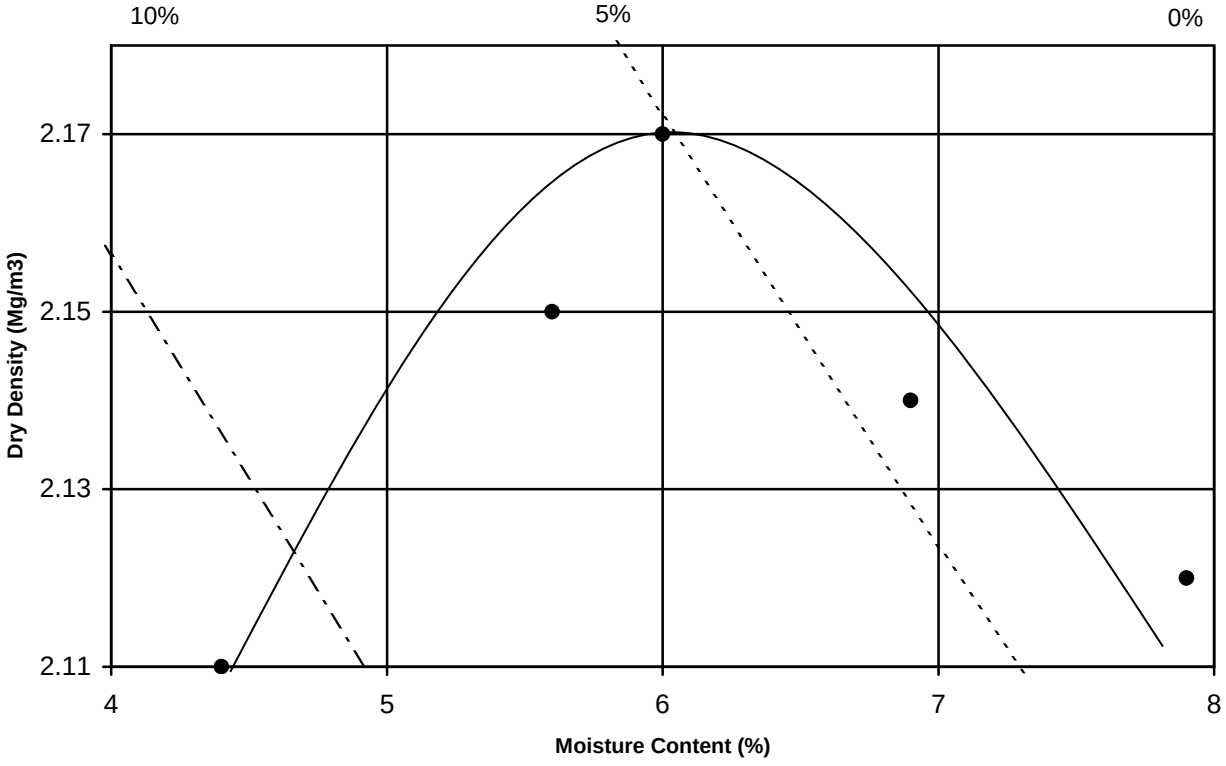
Sample No. A Depth (m) N/A Material Type B

Lab sample no. A15/5815 Customer: GDGeo

Date Received: 21/10/2015 Test Method: 2.5 KG Rammer

Date Tested: 28/10/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.17	2.11	2.15	2.14	2.12		
Moisture Content (%)	6.0	4.4	5.6	6.9	7.9		



Maximum Dry Density (Mg/m^3): 2.17 Optimum Moisture Content (%): 6

Description: Grey brown slightly clayey/silty, very sandy, GRAVEL

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 14.3

Persons authorised to approve reports
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The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

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Report No. R68509 Contract No. 18804

Contract Name: Ravenswell Road

Lab Contract No. 18804 Location: Sample 5

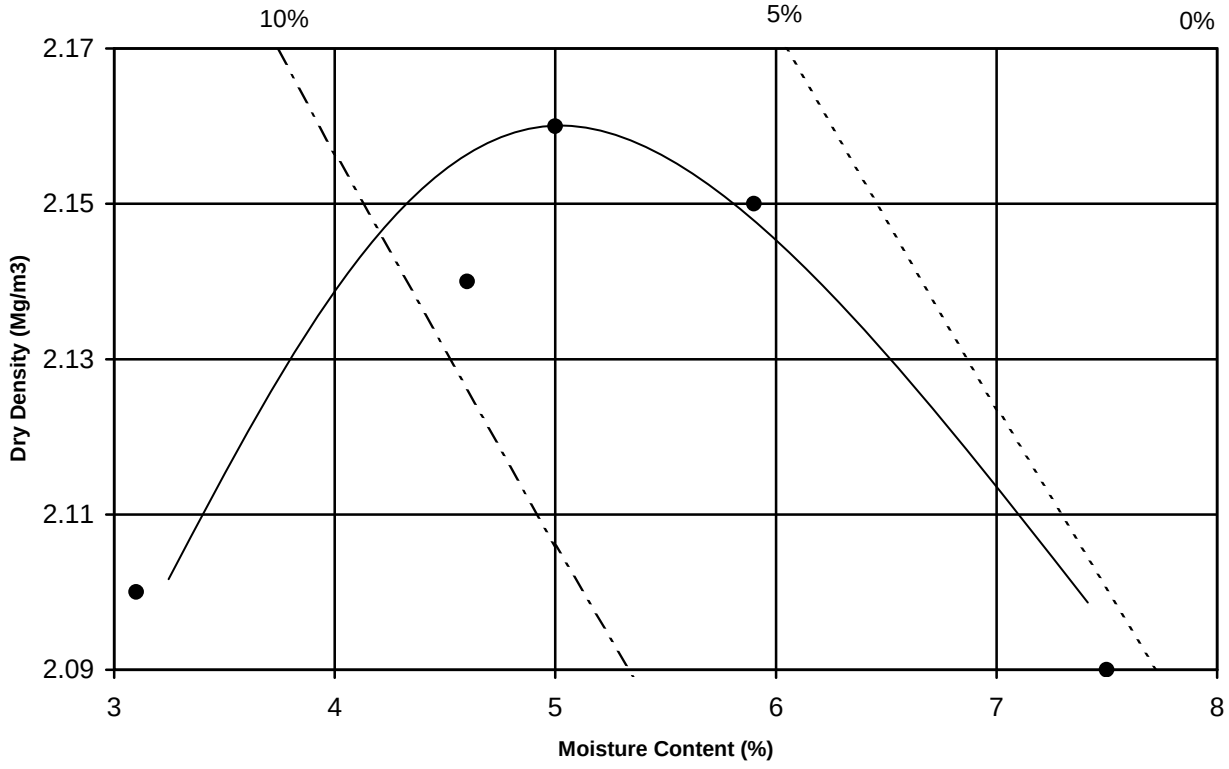
Sample No. A Depth (m) N/A Material Type B

Lab sample no. A15/5819 Customer: GDGeo

Date Received: 21/10/2015 Test Method: 2.5 KG Rammer

Date Tested: 27/10/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.15	2.14	2.16	2.09	2.10		
Moisture Content (%)	5.9	4.6	5.0	7.5	3.1		



Maximum Dry Density (Mg/m^3): 2.16 Optimum Moisture Content (%): 5

Description: Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 3.4

Persons authorised to approve reports
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The result relates to the specimen tested.
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Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

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Report No. R68510 Contract No. 18804

Contract Name: Ravenswell Road

Lab Contract No. 18804 Location: Sample 6

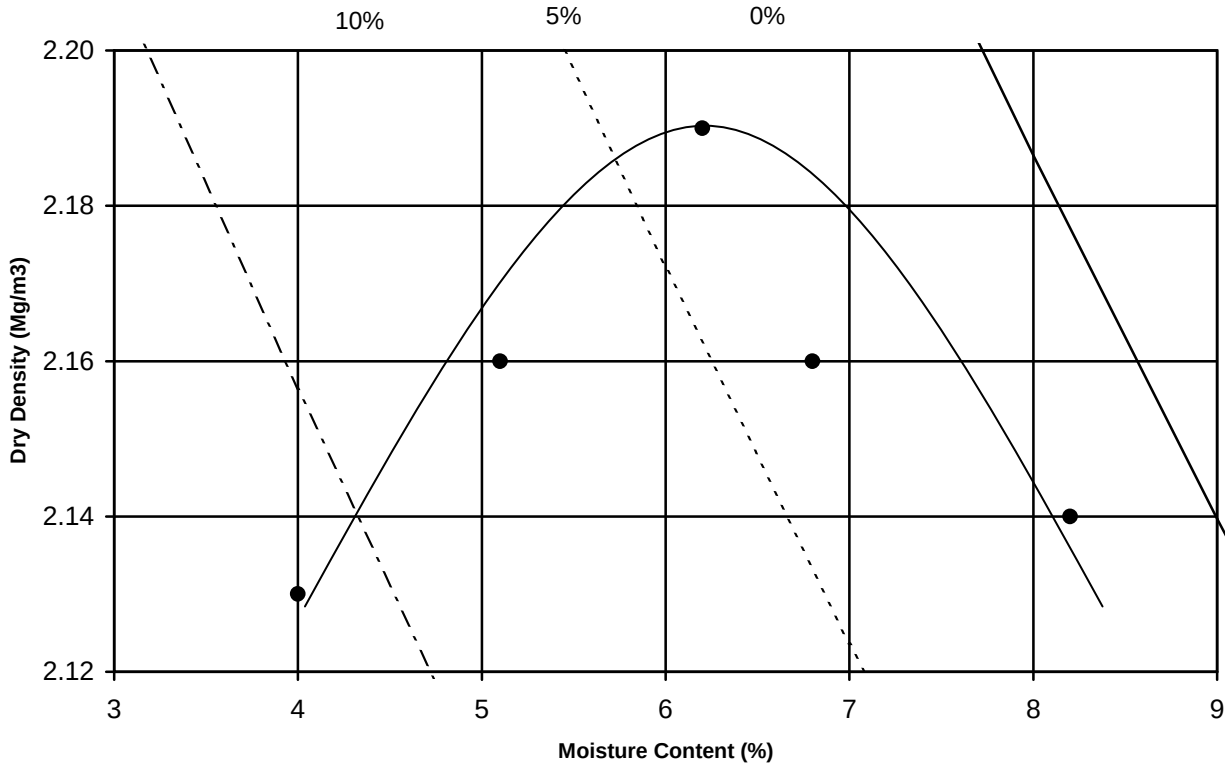
Sample No. A Depth (m) N/A Material Type B

Lab sample no. A15/5821 Customer: GDGeo

Date Received: 21/10/2015 Test Method: 2.5 KG Rammer

Date Tested: 27/10/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.16	2.13	2.16	2.19	2.14		
Moisture Content (%)	6.8	4.0	5.1	6.2	8.2		



Maximum Dry Density (Mg/m^3): 2.19 Optimum Moisture Content (%): 6

Description: Grey/brown slightly clayey/silty, very sandy, GRAVEL with some cobbles

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 8.5

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

IGSL Materials Laboratory	Approved by	Date	Page
	H Byrne	05/11/15	1 of 1

IGSL Ltd
Materials Laboratory
M7 Business Park
Naas
Co. Kildare

Test Report

Dry Density/Moisture Content Relationship

Tested in accordance with BS1377:Part 4:1990

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 133T

Report No. R68511 Contract No. 18804

Contract Name: Ravenswell Road

Lab Contract No. 18804 Location: Sample 7

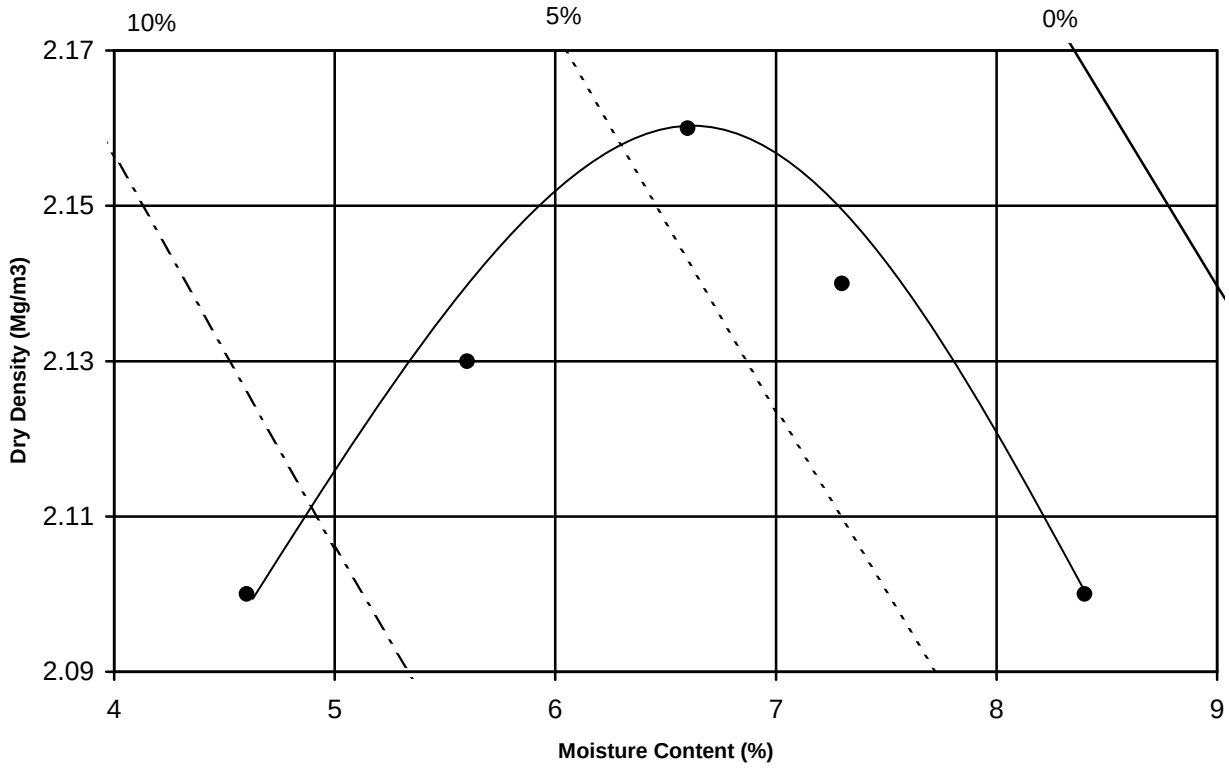
Sample No. A Depth (m) N/A Material Type B

Lab sample no. A15/5823 Customer: GDGeo

Date Received: 21/10/2015 Test Method: 2.5 KG Rammer

Date Tested: 28/10/2015 BS1377:Part 4:1990 3.3

Dry Density (Mg/m^3)	2.16	2.10	2.13	2.14	2.10		
Moisture Content (%)	6.6	4.6	5.6	7.3	8.4		



Maximum Dry Density (Mg/m^3): 2.16 Optimum Moisture Content (%): 7

Description: Grey brown slightly clayey/silty, very sandy, GRAVEL with occasional cobbles

Sample Preparation: Material passing 20mm ~~Single~~ / Separate samples used

Particle Density (Mg/m^3): 2.65 Particle Density: Assumed

% retained on 20/37.5mm sieve: 9

Persons authorised to approve reports
J Barrett (Dep. Quality Manager)
H Byrne (Quality Manager)

The result relates to the specimen tested.
Opinions and interpretations are outside the scope of accreditation

IGSL Materials Laboratory	Approved by	Date	Page
	H Byrne	05/11/15	1 of 1

APPENDIX B – Jones Environmental Laboratory Results

Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

IGSL
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

4225

Attention :	Darren Keogh
Date :	3rd November, 2015
Your reference :	
Our reference :	Test Report 15/15115 Batch 1
Location :	Ravenswell Road
Date samples received :	22nd October, 2015
Status :	Final report
Issue :	1

Five samples were received for analysis on 22nd October, 2015 of which five were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Phil Sommerton BSc
Project Manager

Client Name: IGSL
Reference:
Location: Ravenswell Road
Contact: Darren Keogh
JE Job No.: 15/15115

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	1-2	3-4	5-6	7-8	9-10						LOD/LOR	Units	Method No.
Sample ID	SAMPLE 1	SAMPLE 3	SAMPLE 5	SAMPLE 7	SAMPLE 9								
Depth													
COC No / misc													
Containers	V J	V J	V J	V J	V J								
Sample Date	21/10/2015	21/10/2015	21/10/2015	21/10/2015	21/10/2015								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	22/10/2015	22/10/2015	22/10/2015	22/10/2015	22/10/2015								
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	0.03	<0.03	0.03	<0.03						<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Fluoranthene #	0.03	0.05	0.03	0.05	<0.03						<0.03	mg/kg	TM4/PM8
Pyrene #	0.03	0.05	0.03	0.04	<0.03						<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06						<0.06	mg/kg	TM4/PM8
Chrysene #	0.02	0.03	0.02	0.04	<0.02						<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07						<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	0.04	<0.04	0.04	<0.04						<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04						<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<0.22	<0.22	<0.22	<0.22						<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64						<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	117	106	100	107	108						<0	%	TM4/PM8
Mineral Oil >C8-C10	<5	<5	<5	<5	<5						<5	mg/kg	TM5/PM16
Mineral Oil >C10-C12	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM16
Mineral Oil >C12-C16	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM16
Mineral Oil >C16-C21	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM16
Mineral Oil >C21-C40	<10	<10	<10	<10	<10						<10	mg/kg	TM5/PM16
Mineral Oil >C8-C40	<45	<45	<45	<45	<45						<45	mg/kg	TM5/PM16
MTBE #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5						<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5						<5	ug/kg	TM17/PM8

Client Name: IGSL
Reference:
Location: Ravenswell Road
Contact: Darren Keogh
JE Job No.: 15/15115

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3-4	5-6	7-8	9-10						LOD/LOR	Units	Method No.
Sample ID	SAMPLE 1	SAMPLE 3	SAMPLE 5	SAMPLE 7	SAMPLE 9								
Depth													
COC No / misc													
Containers	V J	V J	V J	V J	V J								
Sample Date	21/10/2015	21/10/2015	21/10/2015	21/10/2015	21/10/2015								
Sample Type	Soil	Soil	Soil	Soil	Soil								
Batch Number	1	1	1	1	1								
Date of Receipt	22/10/2015	22/10/2015	22/10/2015	22/10/2015	22/10/2015								
Total 7 PCBs #	<35	<35	<35	<35	<35						<35	ug/kg	TM17/PM8
Natural Moisture Content	4.7	6.3	4.1	4.4	6.3						<0.1	%	PM4/PM0
% Dry Matter 105°C	92.6	93.6	93.4	93.7	93.7						<0.1	%	NONE/PM4
Chloride #	72	-	90	-	-						<2	mg/kg	TM38/PM20
Sulphate as SO4 (2:1 Ext) #	0.0474	-	0.0837	-	-						<0.0015	g/l	TM38/PM20
Total Organic Carbon #	0.15	0.16	0.22	0.19	0.17						<0.02	%	TM21/PM24
Organic Matter	0.3	0.3	0.4	0.3	0.3						<0.2	%	TM21/PM24
Loss on Ignition #	<1.0	<1.0	1.1	1.3	<1.0						<1.0	%	TM22/PM0
pH #	8.32	-	8.35	-	-						<0.01	pH units	TM73/PM11
Mass of raw test portion	0.0973	0.0958	0.0967	0.0964	0.0956							kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09							kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Client Name: IGSL
Reference:
Location: Ravenswell Road
Contact: Darren Keogh
JE Job No.: 15/15115

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3-4	5-6	7-8	9-10							
Sample ID	SAMPLE 1	SAMPLE 3	SAMPLE 5	SAMPLE 7	SAMPLE 9							
Depth												
COC No / misc												
Containers	V J	V J	V J	V J	V J							
Sample Date	21/10/2015	21/10/2015	21/10/2015	21/10/2015	21/10/2015							
Sample Type	Soil	Soil	Soil	Soil	Soil							
Batch Number	1	1	1	1	1							
Date of Receipt	22/10/2015	22/10/2015	22/10/2015	22/10/2015	22/10/2015							

Please see attached notes for all abbreviations and acronyms

											LOD/LOR	Units	Method No.
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	0.0063	<0.0025	0.0037	<0.0025	0.0044						<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	0.063	<0.025	0.037	<0.025	0.044						<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	<0.003	<0.003	<0.003	<0.003						<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005						<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005						<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015						<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015						<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007						<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07						<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005						<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05						<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002						<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02						<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003						<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03						<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	0.004	0.004	0.003	<0.003	<0.003						<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	0.04	0.04	0.03	<0.03	<0.03						<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	0.00004	0.00004	0.00003	0.00006	0.00004						<0.00001	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	0.0004	0.0004	0.0003	0.0006	0.0004						<0.0001	mg/kg	TM61/PM38
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01						<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1						<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3						<0.3	mg/l	TM27/PM0
Fluoride	<3	<3	<3	<3	<3						<3	mg/kg	TM27/PM0
Chloride	6.4	7.4	6.6	6.6	8.5						<0.3	mg/l	TM27/PM0
Chloride	64	74	66	66	85						<3	mg/kg	TM27/PM0
Sulphate	13.32	14.13	12.85	12.79	15.13						<0.05	mg/l	TM27/PM0
Sulphate	133.2	141.3	128.5	127.9	151.3						<0.5	mg/kg	TM27/PM0
Mass of raw test portion	0.0973	0.0958	0.0967	0.0964	0.0956							kg	NONE/PM17
Leachant Volume	0.893	0.894	0.894	0.894	0.894							l	NONE/PM17
Eluate Volume	0.9	0.89	0.86	0.87	0.9							l	NONE/PM17
Dissolved Organic Carbon	3	3	3	2	3						<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	30	30	20	30						<20	mg/kg	TM60/PM0
Total Dissolved Solids #	78	81	71	104	84						<10	mg/l	TM20/PM0
Total Dissolved Solids #	780	810	710	1040	840						<100	mg/kg	TM20/PM0

Mass of sample taken (kg)	0.0973	Dry Matter Content Ratio (%) =	92.6
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.893
Particle Size <4mm =	>95%	Eluate Volume (l)	0.9

JEFL Job No	**15/15115**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**2**			
Client Sample No	**SAMPLE 1**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**21/10/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.15	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.063	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0004	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.04	4	50	200
Chloride	64	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	133.2	1000	20000	50000
Total Dissolved Solids	780	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0958	Dry Matter Content Ratio (%) =	93.6
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.894
Particle Size <4mm =	>95%	Eluate Volume (l)	0.89

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**15/15115**			
Sample No	**4**			
Client Sample No	**SAMPLE 3**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**21/10/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.16	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0004	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.04	4	50	200
Chloride	74	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	141.3	1000	20000	50000
Total Dissolved Solids	810	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0967	Dry Matter Content Ratio (%) =	93.4
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.894
Particle Size <4mm =	>95%	Eluate Volume (l)	0.86

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**15/15115**			
Sample No	**6**			
Client Sample No	**SAMPLE 5**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**21/10/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.22	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.037	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0003	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	0.03	4	50	200
Chloride	66	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	128.5	1000	20000	50000
Total Dissolved Solids	710	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0964	Dry Matter Content Ratio (%) =	93.7
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.894
Particle Size <4mm =	>95%	Eluate Volume (l)	0.87

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**15/15115**			
Sample No	**8**			
Client Sample No	**SAMPLE 7**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**21/10/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.19	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0006	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	66	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	127.9	1000	20000	50000
Total Dissolved Solids	1040	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	20	500	800	1000

Mass of sample taken (kg)	0.0956	Dry Matter Content Ratio (%) =	93.7
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.894
Particle Size <4mm =	>95%	Eluate Volume (l)	0.9

JEFL Job No	**15/15115**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**10**			
Client Sample No	**SAMPLE 9**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**21/10/2015**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.17	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.044	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0004	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	85	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	151.3	1000	20000	50000
Total Dissolved Solids	840	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Notification of Deviating Samples

Client Name: IGSL

Matrix : Solid

Reference:

Location: Ravenswell Road

Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
15/15115	1	SAMPLE 1		1-2	GRO	Solid Samples were received at a temperature above 9°C.
15/15115	1	SAMPLE 3		3-4	GRO	Solid Samples were received at a temperature above 9°C.
15/15115	1	SAMPLE 5		5-6	GRO	Solid Samples were received at a temperature above 9°C.
15/15115	1	SAMPLE 7		7-8	GRO	Solid Samples were received at a temperature above 9°C.
15/15115	1	SAMPLE 9		9-10	GRO	Solid Samples were received at a temperature above 9°C.

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 15/15115

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 15/15115

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified USEPA 8163. Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.			AD	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified USEPA 160.4. Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (450°C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes

JE Job No: 15/15115

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM0	No preparation is required.			AR	Yes
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM20	Extraction of dried and ground samples with deionised water in a 2:1 water to solid ratio for anions. Extraction of as received samples with deionised water in a 2:1 water to solid ratio for ammoniacal nitrogen. Samples are extracted using an orbital shaker.	Yes		AD	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
TM73	Modified US EPA methods 150.1 and 9045D. Determination of pH by Metrohm automated probe analyser.	PM11	Extraction of as received solid samples using one part solid to 2.5 parts deionised water.	Yes		AR	No
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	

JE Job No: 15/15115

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.

River Dargle,
Appraisal of dredge material

GDG
GAVIN & DOHERTY
GEOSOLUTIONS

Project Title:

River Dargle Flood Defence Scheme

Report Title:

River Dargle, Appraisal of dredge material

Client:

Wicklow County Council

Ultimate Client:

Wicklow County Council

Confidentiality:

N/A

Guidelines of use of report:

This report has been commissioned by Wicklow County Council for dredge material sampled from along the River Dargle in Bray. Third Parties using this report should independently satisfy themselves that the information contained in this report remains valid for their own purposes.

Doc Number	Revision	Date	Authored	Checked
16020-02	0	13 May 2016	EFF	PQ/PD

Table of Contents

1 Introduction

Gavin and Doherty Geosolutions Ltd. (GDG) was requested by Wicklow County Council to assess dredge material sampled from along the River Dargle in Bray and to review the constituents of the material and comment on the potential reuse of the soil.

Bulk samples were taken from the site and tested to determine the geotechnical and chemical properties. The locations are illustrated in Figure .

Figure 1– Location of the samples

This report summarises the results from the testing phases and provides:

- Geotechnical assessment of the material
- A commentary on the degree of contamination of the soil
- Possible uses of the material.

2 Sampling

The samples were sent to IGSL for classification purposes and then issued to Jones Environmental Laboratory for environmental testing.

A suite of Particle Size Distributions were undertaken in accordance with BS 1377 Methods of test for Soils of Civil Engineering Purposes and a suit of Waste Acceptance Criteria (WAC) chemical tests were also undertaken, with the test methodology in compliance with EC Decision of 19 December 2002 (1999/31/EC).

The test reports from IGSL and Jones Environmental are appended to this report in Appendices A and B.

3 Geotechnical characterisation

3.1 Grading

Particle size distribution tests were undertaken on six samples. The soil could be described as a well/uniformly graded granular material. The deposition regime in the river has produced a very similar grading distribution in the various samples, with most of the material determined to be sandy GRAVEL.

The grading curves (Figure 2) have been plotted against the grading requirements for Class 1A/1B from the National Road Authority (NRA) Specification for Road Works 600 Series.

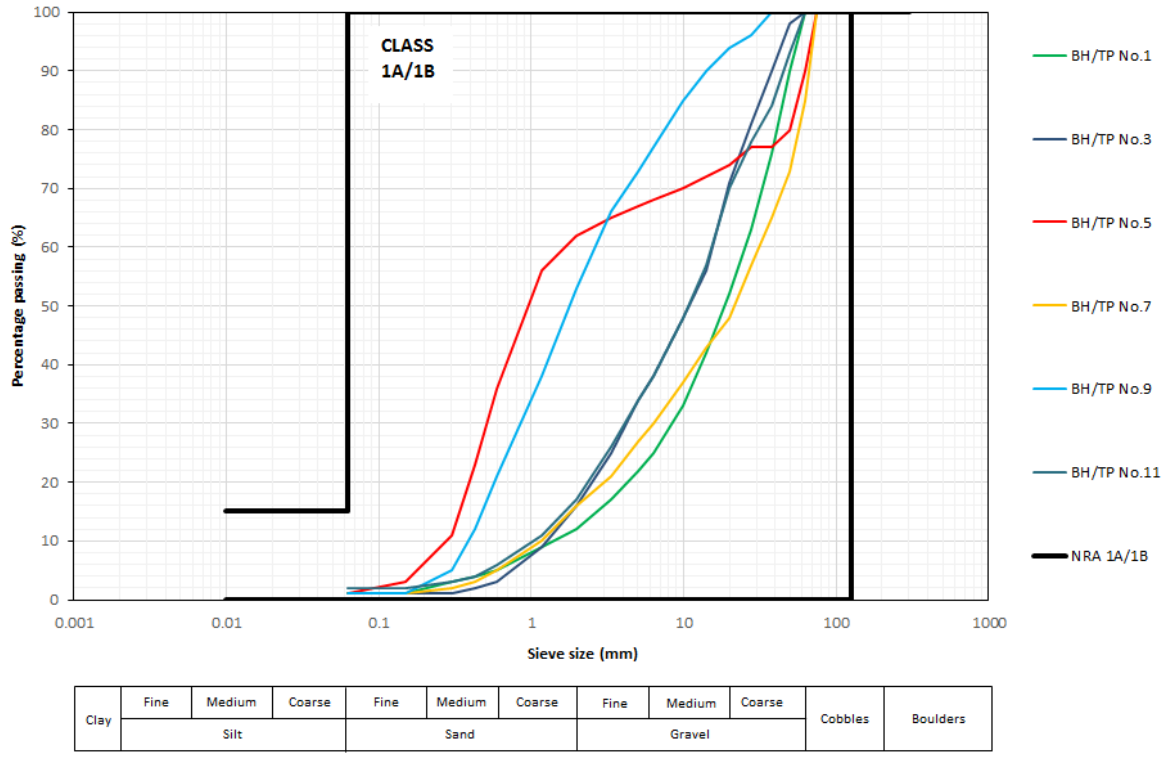


Figure 2– Grading curves and NRA SRW limits for selected materials.

3.2 Criteria for Assessment

Soil analysis for contamination was carried out in accordance with two sets of criteria relevant to the environmental assessment of a site depending on whether soils are to remain in-situ or are being reused on site of origin, or are to be removed from site. These are:

a) Does the soil have properties that deems it hazardous under the Waste Framework Directive, and
b) Waste Acceptance Criteria (WAC) – for soils to be removed/disposed offsite. In accordance with the parameters for disposal of excavated material to landfill (European Council decision of 19 December 2002 pursuant to Article 16 and of and Annex II to Directive 1999/31/EC). This Council Decision sets limit values on waste for each landfill type based on total pollutant contents and leachate concentrations.

3.2.1 Waste Acceptance Criteria (WAC)

For soils which are to be removed off-site for disposal in a landfill, the EU has set criteria for the acceptance of waste at a land fill. These are referred to as the Waste Acceptance Criteria (WAC) and are set out in Directive 1999/31/EC (The Landfill Directive) and the Council Decision of 19 December 2002. This decision classifies landfills as Inert, Non-hazardous or Hazardous based on total pollutant contents and leachate concentrations.

3.3 Test Results

3.3.1 Soils to be removed/disposal off site – Waste Acceptance Criteria (WAC)

Excavated soils from construction sites can be disposed to a number of facilities, depending on the concentration of contaminants present in the soils. The main disposal options are as follows:

- Inert Natural Ground, suitable for permitted site (category A)
- Soils suitable for disposal to an Inert Licenced Landfill (category B)
- Soils suitable for disposal to a Non Hazardous Licenced Landfill (category C)
- Soils suitable for disposal to a Hazardous Licenced Landfill (category D)

The results indicate that the materials classify as inert (category A) and are suitable for reuse as construction materials.

4 Conclusions and recommendations

The dredge material sampled from along the River Dargle in Bray consists of granular materials that could be described as a well/uniformly graded granular material, with samples determined to be sandy GRAVEL / gravelly SAND.

The material suitability for a number of applications is assessed below.

4.1 General Fill

The material is suitable for use as a general fill material. We have assessed the material on the classifications presented in the NRA Specification for Road Works. The material would meet the grading requirements for Class 1A/1B General Fill.

The granular material is likely to require minimal processing to be suitable for compaction. Over time some of the outer material may wet up and require some mixing or drying to improve the material and make it suitable for placement as general fill.

4.2 Capping material for landfill tips

The material is a sandy gravel material and could be used in some landfill operations. For example the material could be used as a daily cover to be spread over deposited waste at the end of every working day. The daily cover should ideally be permeable to allow water to pass through thereby preventing ponding / perched water build up.

The material would be less useful as an intermediate or long term capping material as the capping material should significantly reduce the rainfall infiltration.

4.3 Beach nourishment

GDG was asked to review the suitability of the material stockpiled for beach nourishment at the Bray Beach.

The requirements for a suitable material for beach nourishment at Bray are:

- The material should match the existing material as closely as possible,
- It should be natural stone only and similar in colour and texture to the existing beach deposits and
- It should be rounded and ideally somewhat flat.

A comparison between the materials is shown in the table below.

Source	Colour	Flat?	Roughness	Rounded / angular	Broken stones / sharp edges	Size	Overall comment
Bray beach	Predominantly Grey and Yellowish Brown, with pink brown & off white	Yes	All smooth	Rounded	None	Note shingle is finer further south and more sand (medium to coarse gravel)	Original
Dredge material from River Dargle	Light Brown/Grey	The stone is predominately more flat than round	Smooth	Rounded to sub rounded	Very limited	The material is graded within an envelope with D50 from 1mm to 20mm	Possible

APPENDIX A
IGSL Test Results

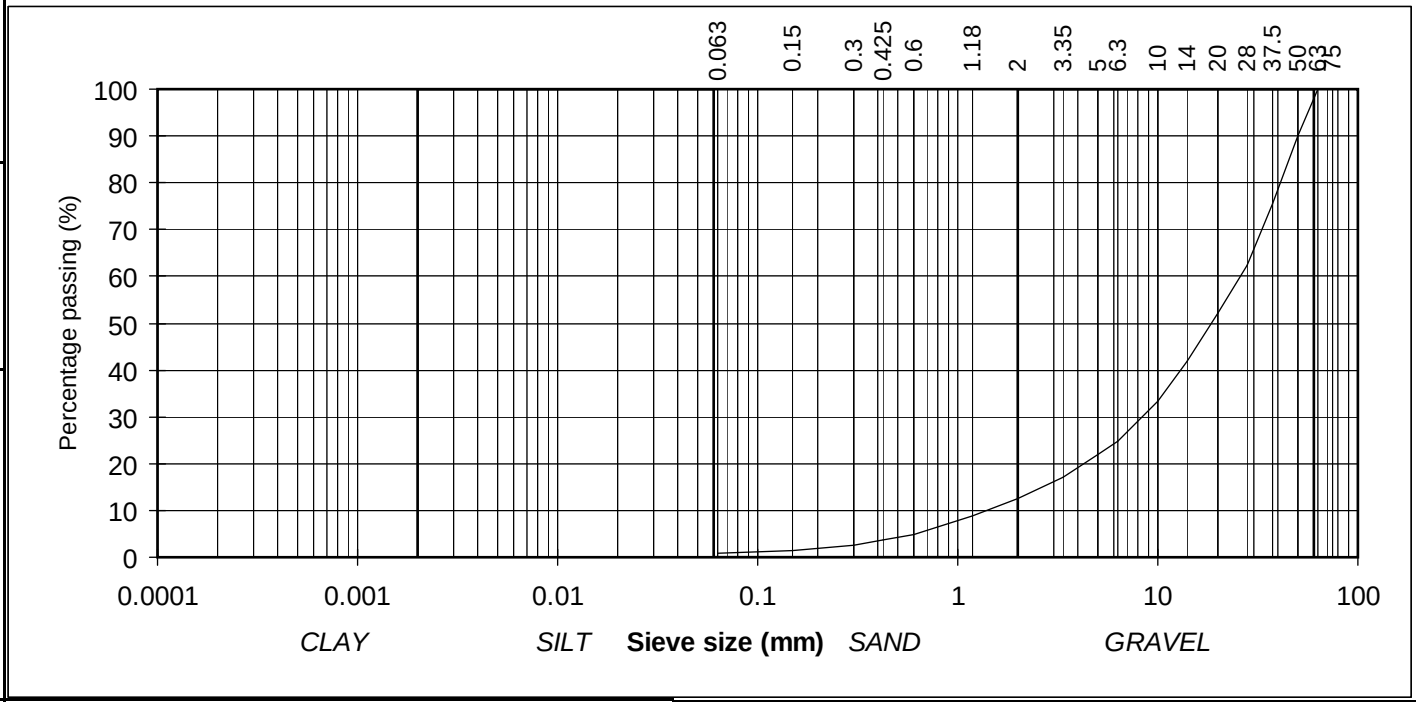
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	90	GRAVEL
37.5	76	
28	63	
20	52	
14	42	
10	33	
6.3	25	
5	22	
3.35	17	
2	12	
1.18	9	SAND
0.6	5	
0.425	4	
0.3	3	
0.15	1	
0.063	1	SILT/CLAY

Contract No: 19183 Report No. R71974
Contract: River Dargle , Bray
BH/TP : No.1
Sample No. N/A Lab. Sample No. A16/1644
Sample Type: B
Depth (m) N/A Customer: Gavin & Doherty Geosolutions, Office 1B Parkview House, Beech Hill Office Campus, Clonskeagh.
Date Received 29-04-16 Date Testing started 04-05-16
Description: Brown slightly clayey/silty, sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11-05-16	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

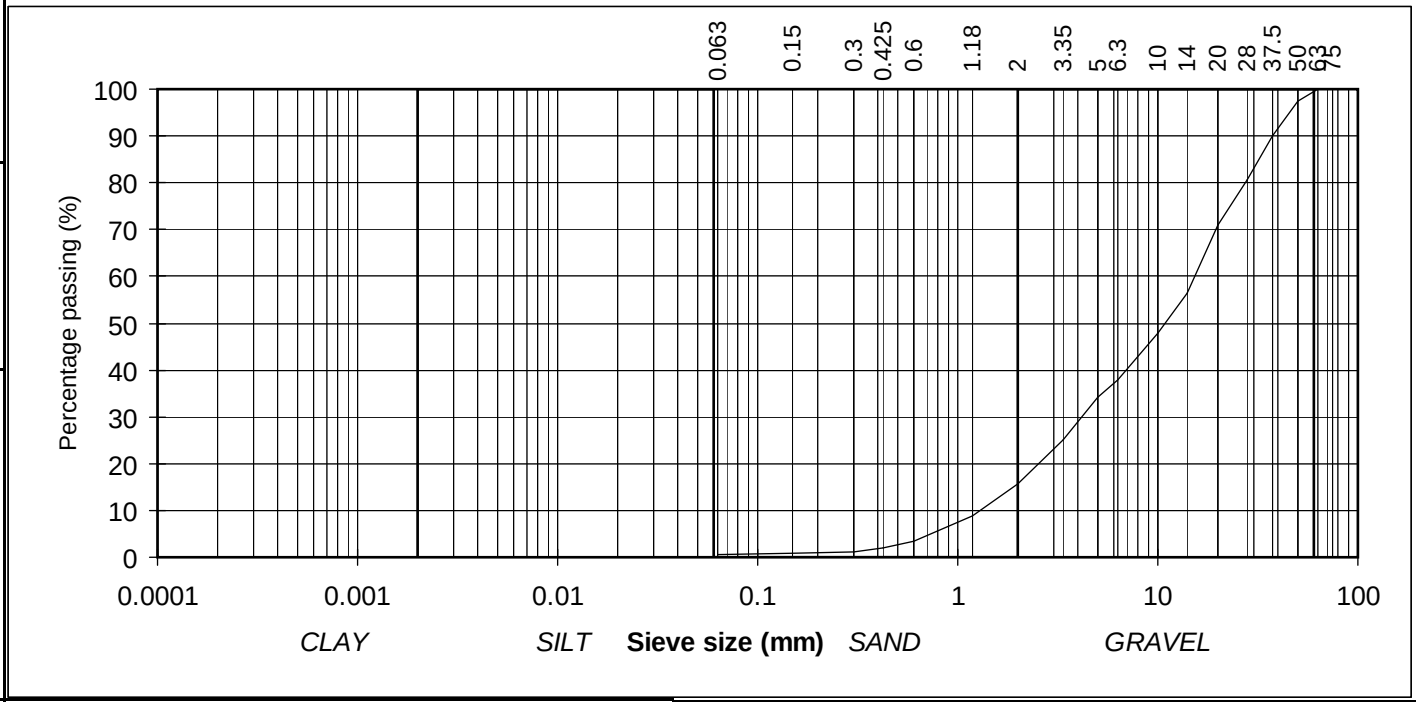
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	98	GRAVEL
37.5	90	
28	81	
20	71	
14	56	
10	48	
6.3	38	
5	34	
3.35	25	
2	16	
1.18	9	SAND
0.6	3	
0.425	2	
0.3	1	
0.15	1	
0.063	1	SILT/CLAY

Contract No: 19183 Report No. R71972
Contract: River Dargle , Bray
BH/TP : No.3
Sample No. N/A Lab. Sample No. A16/1645
Sample Type: B
Depth (m) N/A Customer: Gavin & Doherty Geosolutions, Office 1B Parkview House, Beech Hill Office Campus, Clonskeagh.
Date Received 29-04-16 Date Testing started 04-05-16
Description: Brown slightly clayey/silty, sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11-05-16	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

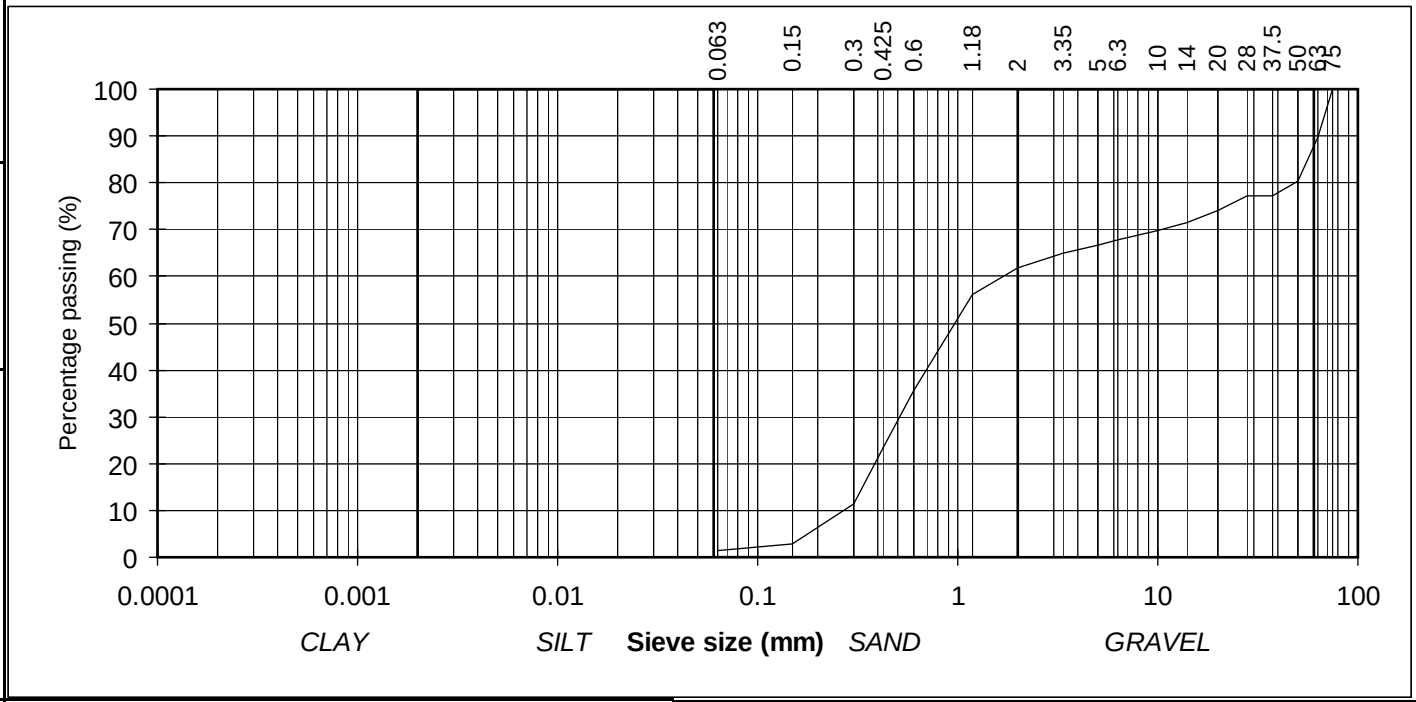
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	90	
50	80	GRAVEL
37.5	77	
28	77	
20	74	
14	72	
10	70	
6.3	68	
5	67	
3.35	65	
2	62	
1.18	56	SAND
0.6	36	
0.425	23	
0.3	11	
0.15	3	
0.063	1	SILT/CLAY

Contract No: 19183 Report No. R71973
Contract: River Dargle , Bray
BH/TP : No.5
Sample No. N/A Lab. Sample No. A16/1646
Sample Type: B
Depth (m) N/A Customer: Gavin & Doherty Geosolutions, Office 1B Parkview House, Beech Hill Office Campus, Clonskeagh.
Date Received 29-04-16 Date Testing started 04-05-16
Description: Brown slightly clayey/silty, very gravelly, SAND with some cobbles

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11-05-16	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

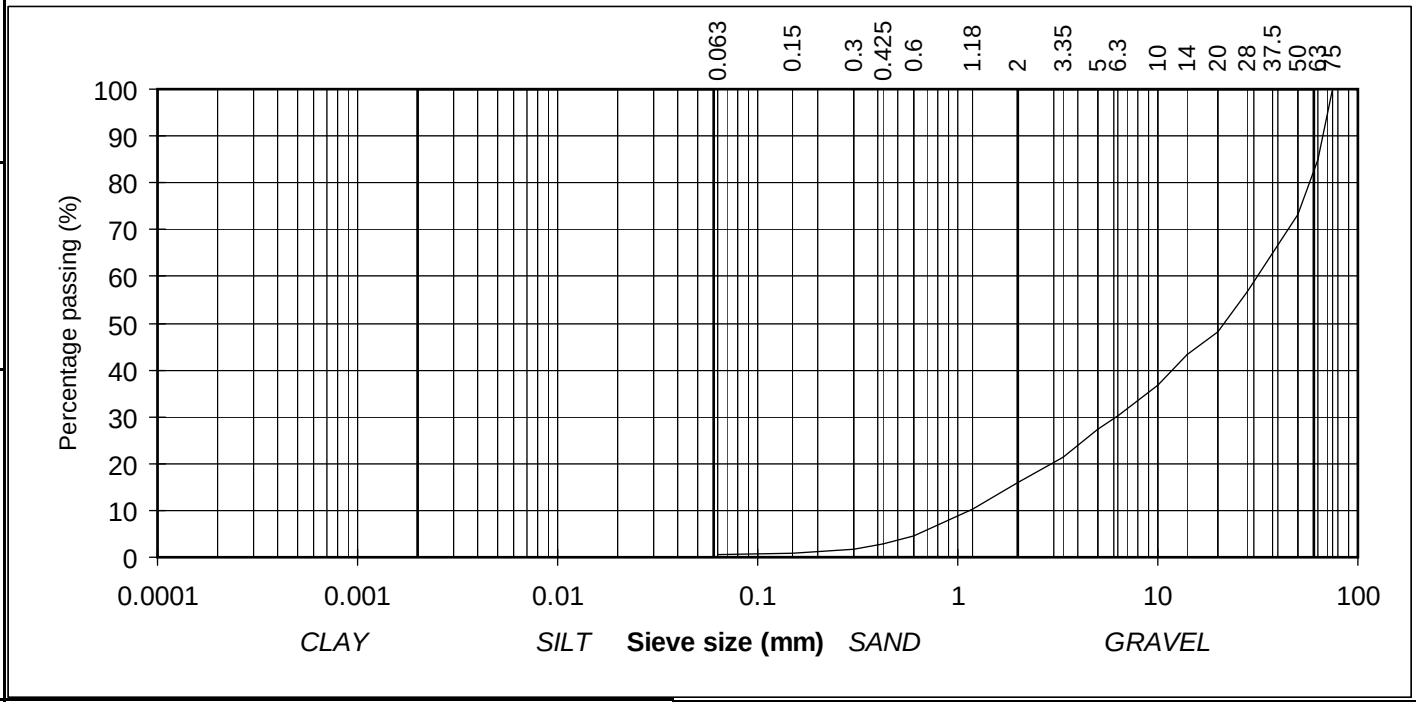
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	85	
50	73	GRAVEL
37.5	65	
28	57	
20	48	
14	43	
10	37	
6.3	30	
5	27	
3.35	21	
2	16	
1.18	10	SAND
0.6	5	
0.425	3	
0.3	2	
0.15	1	
0.063	1	SILT/CLAY

Contract No: 19183 Report No. R71975
Contract: River Dargle , Bray
BH/TP : No.7
Sample No. N/A Lab. Sample No. A16/1647
Sample Type: B
Depth (m) N/A Customer: Gavin & Doherty Geosolutions, Office 1B Parkview House, Beech Hill Office Campus, Clonskeagh.
Date Received 29-04-16 Date Testing started 04-05-16
Description: Brown slightly clayey/silty, sandy, GRAVEL with some cobbles

Remarks Sample size did not meet the requirements of BS1377



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11-05-16	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

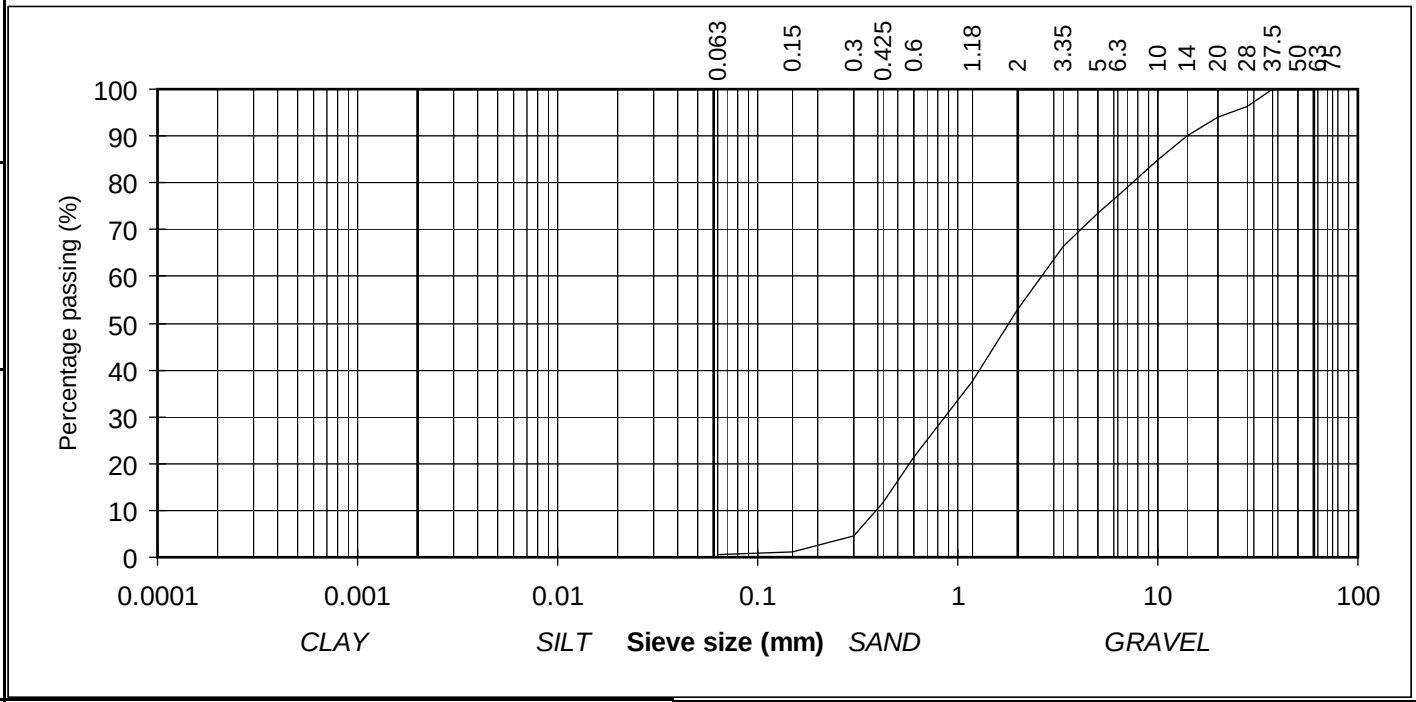
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	100	GRAVEL
37.5	100	
28	96	
20	94	
14	90	
10	85	
6.3	77	
5	73	
3.35	66	
2	53	
1.18	38	SAND
0.6	21	
0.425	12	
0.3	5	
0.15	1	
0.063	1	SILT/CLAY

Contract No: 19183 Report No. R71973
Contract: River Dargle , Bray
BH/TP : No.9
Sample No. N/A Lab. Sample No. A16/1648
Sample Type: B
Depth (m) N/A Customer: Gavin & Doherty Geosolutions, Office 1B Parkview House, Beech Hill Office Campus, Clonskeagh.
Date Received 29-04-16 Date Testing started 04-05-16
Description: Brown slightly clayey/silty, very gravelly, SAND

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11-05-16	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

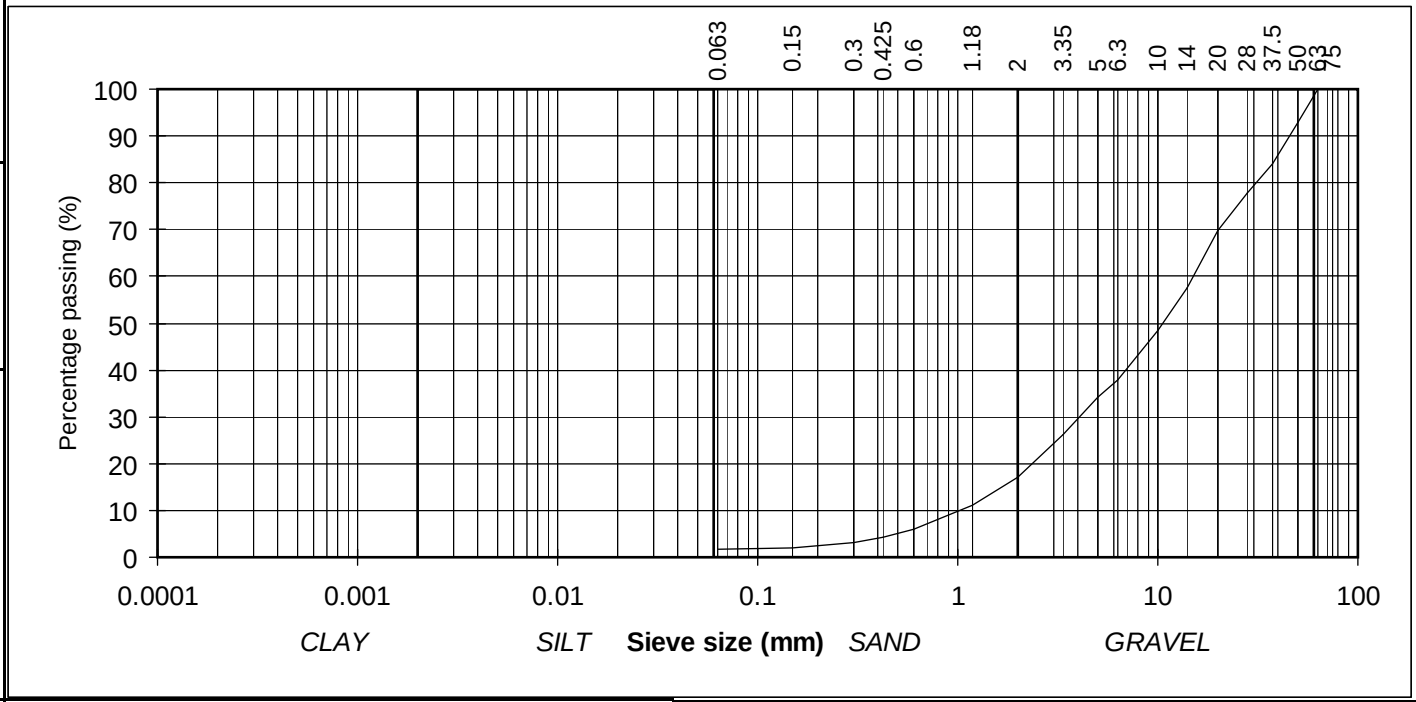
TEST REPORT
Determination of Particle Size Distribution

Tested in accordance with: BS1377:Part2:1990 , clause 9.2 & 9.5
(note: Sedimentation stage not accredited)

particle size	% passing	
75	100	COBBLES
63	100	
50	93	GRAVEL
37.5	84	
28	78	
20	70	
14	57	
10	48	
6.3	38	
5	34	
3.35	26	
2	17	
1.18	11	SAND
0.6	6	
0.425	4	
0.3	3	
0.15	2	
0.063	2	SILT/CLAY

Contract No: 19183 Report No. R71976
Contract: River Dargle , Bray
BH/TP : No.11
Sample No. N/A Lab. Sample No. A16/1649
Sample Type: B
Depth (m) N/A Customer: Gavin & Doherty Geosolutions, Office 1B Parkview House, Beech Hill Office Campus, Clonskeagh.
Date Received 29-04-16 Date Testing started 04-05-16
Description: Brown slightly clayey/silty, sandy, GRAVEL

Remarks



IGSL Ltd Materials Laboratory

Approved by:	Date:	Page no:
H Byrne	11-05-16	1 of 1

Persons authorised to approve report: J Barrett (Dep. Quality Manager) H Byrne (Quality Manager)

APPENDIX B
Jones Environmental Laboratory Results

Jones Environmental Laboratory

Registered Address : Unit 3 Deeside Point, Zone 3, Deeside Industrial Park, Deeside, CH5 2UA. UK

Unit 3 Deeside Point
Zone 3
Deeside Industrial Park
Deeside
CH5 2UA

Tel: +44 (0) 1244 833780
Fax: +44 (0) 1244 833781

IGSL
Unit F
M7 Business Park
Naas
Co Kildare
Ireland

4225

Attention :	Darren Keogh
Date :	26th April, 2016
Your reference :	
Our reference :	Test Report 16/7524 Batch 1
Location :	River Dargle
Date samples received :	13th April, 2016
Status :	Final report
Issue :	1

Eleven samples were received for analysis on 13th April, 2016 of which eleven were scheduled for analysis. Please find attached our Test Report which should be read with notes at the end of the report and should include all sections if reproduced. Interpretations and opinions are outside the scope of any accreditation, and all results relate only to samples supplied.
All analysis is carried out on as received samples and reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected.

Where Waste Acceptance Criteria Suite (EC Decision of 19 December 2002 (2003/33/EC)) has been requested, all analyses have been performed using the relevant EN methods where they exist.

Compiled By:

Bruce Leslie
Project Co-ordinator

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 16/7524

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	LOD/LOR	Units	Method No.
Sample ID	1	2	3	4	5	6	7	8	9	10			
Depth													
COC No / misc													
Containers	V J	J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	<>	<>	<>	<>	<>	<>	<>	<>	<>	<>			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016			
PAH MS													
Naphthalene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03	<0.03	<0.03	<0.03	0.07	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03	<0.03	<0.03	<0.03	0.06	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02	<0.02	<0.02	<0.02	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
Coronene	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	117	106	106	107	109	106	110	114	114	114	<0	%	TM4/PM8
Mineral Oil >C8-C10	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	mg/kg	TM5/PM16
Mineral Oil >C10-C12	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C12-C16	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C16-C21	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C21-C40	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10	mg/kg	TM5/PM16
Mineral Oil >C8-C40	<45	<45	<45	<45	<45	<45	<45	<45	<45	<45	<45	mg/kg	TM5/PM16
MTBE #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Benzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Toluene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
Ethylbenzene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
m/p-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
o-Xylene #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM31/PM12
PCB 28 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 52 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 101 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 118 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 138 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 153 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8
PCB 180 #	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	ug/kg	TM17/PM8

Please see attached notes for all abbreviations and acronyms

Jones Environmental Laboratory

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 16/7524

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	LOD/LOR	Units	Method No.
Sample ID	1	2	3	4	5	6	7	8	9	10			
Depth													
COC No / misc													
Containers	V J	J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	<>	<>	<>	<>	<>	<>	<>	<>	<>	<>			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016			
Total 7 PCBs #	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	6.1	7.5	2.7	7.0	20.8	20.8	5.2	4.5	8.7	8.7	<0.1	%	PM4/PM0
% Dry Matter 105°C	93.1	90.2	94.1	96.7	83.4	83.5	94.0	91.8	92.5	91.6	<0.1	%	NONE/PM4
Total Organic Carbon #	0.20	0.16	0.12	0.14	0.22	0.18	0.16	0.20	0.14	0.05	<0.02	%	TM21/PM24
Loss on Ignition #	1.1	1.0	<1.0	<1.0	1.8	1.2	<1.0	1.3	<1.0	1.4	<1.0	%	TM22/PM0
Mass of raw test portion	0.097	0.1003	0.0958	0.0929	0.1074	0.1078	0.0954	0.0984	0.0969	0.0984		kg	NONE/PM17
Mass of dried test portion	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09		kg	NONE/PM17

Please see attached notes for all abbreviations and acronyms

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 16/7524

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	20-21										LOD/LOR	Units	Method No.
Sample ID	11												
Depth													
COC No / misc													
Containers	V J												
Sample Date	<>												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	13/04/2016												
PAH MS													
Naphthalene #	<0.04										<0.04	mg/kg	TM4/PM8
Acenaphthylene	<0.03										<0.03	mg/kg	TM4/PM8
Acenaphthene #	<0.05										<0.05	mg/kg	TM4/PM8
Fluorene #	<0.04										<0.04	mg/kg	TM4/PM8
Phenanthrene #	<0.03										<0.03	mg/kg	TM4/PM8
Anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Fluoranthene #	<0.03										<0.03	mg/kg	TM4/PM8
Pyrene #	<0.03										<0.03	mg/kg	TM4/PM8
Benzo(a)anthracene #	<0.06										<0.06	mg/kg	TM4/PM8
Chrysene #	<0.02										<0.02	mg/kg	TM4/PM8
Benzo(bk)fluoranthene #	<0.07										<0.07	mg/kg	TM4/PM8
Benzo(a)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Indeno(123cd)pyrene #	<0.04										<0.04	mg/kg	TM4/PM8
Dibenzo(ah)anthracene #	<0.04										<0.04	mg/kg	TM4/PM8
Benzo(ghi)perylene #	<0.04										<0.04	mg/kg	TM4/PM8
Coronene	<0.04										<0.04	mg/kg	TM4/PM8
PAH 6 Total #	<0.22										<0.22	mg/kg	TM4/PM8
PAH 17 Total	<0.64										<0.64	mg/kg	TM4/PM8
Benzo(b)fluoranthene	<0.05										<0.05	mg/kg	TM4/PM8
Benzo(k)fluoranthene	<0.02										<0.02	mg/kg	TM4/PM8
PAH Surrogate % Recovery	116										<0	%	TM4/PM8
Mineral Oil >C8-C10	<5										<5	mg/kg	TM5/PM16
Mineral Oil >C10-C12	<10										<10	mg/kg	TM5/PM16
Mineral Oil >C12-C16	<10										<10	mg/kg	TM5/PM16
Mineral Oil >C16-C21	<10										<10	mg/kg	TM5/PM16
Mineral Oil >C21-C40	<10										<10	mg/kg	TM5/PM16
Mineral Oil >C8-C40	<45										<45	mg/kg	TM5/PM16
MTBE #	<5										<5	ug/kg	TM31/PM12
Benzene #	<5										<5	ug/kg	TM31/PM12
Toluene #	<5										<5	ug/kg	TM31/PM12
Ethylbenzene #	<5										<5	ug/kg	TM31/PM12
m/p-Xylene #	<5										<5	ug/kg	TM31/PM12
o-Xylene #	<5										<5	ug/kg	TM31/PM12
PCB 28 #	<5										<5	ug/kg	TM17/PM8
PCB 52 #	<5										<5	ug/kg	TM17/PM8
PCB 101 #	<5										<5	ug/kg	TM17/PM8
PCB 118 #	<5										<5	ug/kg	TM17/PM8
PCB 138 #	<5										<5	ug/kg	TM17/PM8
PCB 153 #	<5										<5	ug/kg	TM17/PM8
PCB 180 #	<5										<5	ug/kg	TM17/PM8

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 16/7524

Report : Solid

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	20-21												
Sample ID	11												
Depth													
COC No / misc													
Containers	V J												
Sample Date	<>												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	13/04/2016												

Please see attached notes for all abbreviations and acronyms

		LOD/LOR	Units	Method No.
Total 7 PCBs #	<35	<35	ug/kg	TM17/PM8
Natural Moisture Content	2.6	<0.1	%	PM4/PM0
% Dry Matter 105°C	94.9	<0.1	%	NONE/PM4
Total Organic Carbon #	0.17	<0.02	%	TM21/PM24
Loss on Ignition #	<1.0	<1.0	%	TM22/PM0
Mass of raw test portion	0.0948		kg	NONE/PM17
Mass of dried test portion	0.09		kg	NONE/PM17

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 16/7524

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

J E Sample No.	1-2	3	4-5	6-7	8-9	10-11	12-13	14-15	16-17	18-19	LOD/LOR	Units	Method No.
Sample ID	1	2	3	4	5	6	7	8	9	10			
Depth													
COC No / misc													
Containers	V J	J	V J	V J	V J	V J	V J	V J	V J	V J			
Sample Date	<>	<>	<>	<>	<>	<>	<>	<>	<>	<>			
Sample Type	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil	Soil			
Batch Number	1	1	1	1	1	1	1	1	1	1			
Date of Receipt	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016	13/04/2016			
Dissolved Antimony #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	0.0054	<0.0025	0.0033	<0.0025	<0.0025	<0.0025	<0.0025	<0.0025	0.0032	<0.0025	<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	0.054	<0.025	0.033	<0.025	<0.025	<0.025	<0.025	<0.025	0.032	<0.025	<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	0.00049	0.00049	0.00043	0.00046	0.00049	0.00063	0.00045	0.00001	0.00003	0.00003	<0.00001	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	0.0049	0.0049	0.0043	0.0046	0.0049	0.0063	0.0045	0.0001	0.0003	0.0003	<0.0001	mg/kg	TM61/PM38
Phenol	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	mg/l	TM26/PM0
Phenol	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	mg/kg	TM26/PM0
Fluoride	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM27/PM0
Fluoride	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	<3	mg/kg	TM27/PM0
Sulphate #	4.04	1.34	2.37	1.71	1.56	1.47	1.51	1.72	3.50	1.96	<0.05	mg/l	TM38/PM0
Sulphate #	40.4	13.4	23.7	17.1	15.6	14.7	15.1	17.2	35.0	19.6	<0.5	mg/kg	TM38/PM0
Chloride #	1.0	<0.3	<0.3	<0.3	<0.3	0.4	<0.3	<0.3	<0.3	<0.3	<0.3	mg/l	TM38/PM0
Chloride #	10	<3	<3	<3	<3	4	<3	<3	<3	<3	<3	mg/kg	TM38/PM0
Mass of raw test portion	0.097	0.1003	0.0958	0.0929	0.1074	0.1078	0.0954	0.0984	0.0969	0.0984		kg	NONE/PM17
Leachant Volume	0.893	0.89	0.894	0.897	0.882	0.882	0.894	0.892	0.893	0.892		l	NONE/PM17
Eluate Volume	0.86	0.82	0.83	0.85	0.88	0.89	0.88	0.84	0.87	0.89		l	NONE/PM17
Dissolved Organic Carbon	3	3	3	3	3	3	3	4	3	3	<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30	30	30	30	30	30	30	40	30	30	<20	mg/kg	TM60/PM0
Total Dissolved Solids #	12	80	72	62	72	104	66	52	<10	54	<10	mg/l	TM20/PM0
Total Dissolved Solids #	120	800	720	620	720	1040	660	520	<100	540	<100	mg/kg	TM20/PM0

Please see attached notes for all abbreviations and acronyms

Client Name: IGSL
Reference:
Location: River Dargle
Contact: Darren Keogh
JE Job No.: 16/7524

Report : CEN 10:1 1 Batch

Solids: V=60g VOC jar, J=250g glass jar, T=plastic tub

Please see attached notes for all abbreviations and acronyms

J E Sample No.	20-21												
Sample ID	11												
Depth													
COC No / misc													
Containers	V J												
Sample Date	<>												
Sample Type	Soil												
Batch Number	1												
Date of Receipt	13/04/2016												
											LOD/LOR	Units	Method No.
Dissolved Antimony #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Antimony (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Arsenic #	0.0035										<0.0025	mg/l	TM30/PM17
Dissolved Arsenic (A10) #	0.035										<0.025	mg/kg	TM30/PM17
Dissolved Barium #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Barium (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Dissolved Cadmium #	<0.0005										<0.0005	mg/l	TM30/PM17
Dissolved Cadmium (A10) #	<0.005										<0.005	mg/kg	TM30/PM17
Dissolved Chromium #	<0.0015										<0.0015	mg/l	TM30/PM17
Dissolved Chromium (A10) #	<0.015										<0.015	mg/kg	TM30/PM17
Dissolved Copper #	<0.007										<0.007	mg/l	TM30/PM17
Dissolved Copper (A10) #	<0.07										<0.07	mg/kg	TM30/PM17
Dissolved Lead #	<0.005										<0.005	mg/l	TM30/PM17
Dissolved Lead (A10) #	<0.05										<0.05	mg/kg	TM30/PM17
Dissolved Molybdenum #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Molybdenum (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Nickel #	<0.002										<0.002	mg/l	TM30/PM17
Dissolved Nickel (A10) #	<0.02										<0.02	mg/kg	TM30/PM17
Dissolved Selenium #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Selenium (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Dissolved Zinc #	<0.003										<0.003	mg/l	TM30/PM17
Dissolved Zinc (A10) #	<0.03										<0.03	mg/kg	TM30/PM17
Mercury Dissolved by CVAF #	0.00002										<0.00001	mg/l	TM61/PM38
Mercury Dissolved by CVAF #	0.0002										<0.0001	mg/kg	TM61/PM38
Phenol	<0.01										<0.01	mg/l	TM26/PM0
Phenol	<0.1										<0.1	mg/kg	TM26/PM0
Fluoride	<0.3										<0.3	mg/l	TM27/PM0
Fluoride	<3										<3	mg/kg	TM27/PM0
Sulphate #	1.85										<0.05	mg/l	TM38/PM0
Sulphate #	18.5										<0.5	mg/kg	TM38/PM0
Chloride #	<0.3										<0.3	mg/l	TM38/PM0
Chloride #	<3										<3	mg/kg	TM38/PM0
Mass of raw test portion	0.0948											kg	NONE/PM17
Leachant Volume	0.895											l	NONE/PM17
Eluate Volume	0.85											l	NONE/PM17
Dissolved Organic Carbon	3										<2	mg/l	TM60/PM0
Dissolved Organic Carbon	30										<20	mg/kg	TM60/PM0
Total Dissolved Solids #	86										<10	mg/l	TM20/PM0
Total Dissolved Solids #	860										<100	mg/kg	TM20/PM0

Mass of sample taken (kg)	0.097	Dry Matter Content Ratio (%) =	93.1
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.893
Particle Size <4mm =	>95%	Eluate Volume (l)	0.86

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/7524**			
Sample No	**2**			
Client Sample No	**1**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.20	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-
Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.054	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0049	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	10	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	40.4	1000	20000	50000
Total Dissolved Solids	120	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.1003	Dry Matter Content Ratio (%) =	90.2
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.89
Particle Size <4mm =	>95%	Eluate Volume (l)	0.82

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/7524**			
Sample No	**3**			
Client Sample No	**2**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.16	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-
Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0049	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	13.4	1000	20000	50000
Total Dissolved Solids	800	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0958	Dry Matter Content Ratio (%) =	94.1
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.894
Particle Size <4mm =	>95%	Eluate Volume (l)	0.83

JEFL Job No	**16/7524**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**5**			
Client Sample No	**3**			
Depth/Other		**Inert**	**Stable Non-reactive**	**Hazardous**
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.12	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.033	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0043	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	23.7	1000	20000	50000
Total Dissolved Solids	720	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0929	Dry Matter Content Ratio (%) =	96.7
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.897
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/7524**			
Sample No	**7**			
Client Sample No	**4**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.14	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0046	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	17.1	1000	20000	50000
Total Dissolved Solids	620	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.1074	Dry Matter Content Ratio (%) =	83.4
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.882
Particle Size <4mm =	>95%	Eluate Volume (l)	0.88

JEFL Job No	**16/7524**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**9**			
Client Sample No	**5**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.22	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0049	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	15.6	1000	20000	50000
Total Dissolved Solids	720	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.1078	Dry Matter Content Ratio (%) =	83.5
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.882
Particle Size <4mm =	>95%	Eluate Volume (l)	0.89

JEFL Job No	**16/7524**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**11**			
Client Sample No	**6**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.18	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0063	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	4	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	14.7	1000	20000	50000
Total Dissolved Solids	1040	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0954	Dry Matter Content Ratio (%) =	94.0
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.894
Particle Size <4mm =	>95%	Eluate Volume (l)	0.88

JEFL Job No	**16/7524**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**13**			
Client Sample No	**7**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.16	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0045	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	15.1	1000	20000	50000
Total Dissolved Solids	660	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0984	Dry Matter Content Ratio (%) =	91.8
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.892
Particle Size <4mm =	>95%	Eluate Volume (l)	0.84

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/7524**			
Sample No	**15**			
Client Sample No	**8**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.20	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-
Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0001	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	17.2	1000	20000	50000
Total Dissolved Solids	520	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	40	500	800	1000

Mass of sample taken (kg)	0.0969	Dry Matter Content Ratio (%) =	92.5
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.893
Particle Size <4mm =	>95%	Eluate Volume (l)	0.87

JEFL Job No	**16/7524**	**Landfill Waste Acceptance Criteria Limits**		
Sample No	**17**			
Client Sample No	**9**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.14	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-

Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.032	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0003	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	35.0	1000	20000	50000
Total Dissolved Solids	<100	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0984	Dry Matter Content Ratio (%) =	91.6
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.892
Particle Size <4mm =	>95%	Eluate Volume (l)	0.89

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/7524**			
Sample No	**19**			
Client Sample No	**10**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.05	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-
Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	<0.025	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0003	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	19.6	1000	20000	50000
Total Dissolved Solids	540	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Mass of sample taken (kg)	0.0948	Dry Matter Content Ratio (%) =	94.9
Mass of dry sample (kg) =	0.09	Leachant Volume (l)	0.895
Particle Size <4mm =	>95%	Eluate Volume (l)	0.85

		Landfill Waste Acceptance Criteria Limits		
JEFL Job No	**16/7524**			
Sample No	**21**			
Client Sample No	**11**	**Inert**	**Stable Non-reactive**	**Hazardous**
Depth/Other				
Sample Date	**<>**			
Batch No	**1**			
Solid Waste Analysis				
Total Organic Carbon (%)	0.17	3	5	6
Sum of BTEX (mg/kg)	<0.025	6	-	-
Sum of 7 PCBs (mg/kg)	<0.035	1	-	-
Mineral Oil (mg/kg)	<45	500	-	-
PAH Sum of 6 (mg/kg)	<0.22	-	-	-
PAH Sum of 17 (mg/kg)	<0.64	100	-	-
Eluate Analysis	**10:1 concn leached**	**Limit values for compliance leaching test using BS EN 12457-2 at L/S 10 l/kg**		
	A10			
	mg/kg	**mg/kg**		
Arsenic	0.035	0.5	2	25
Barium	<0.03	20	100	300
Cadmium	<0.005	0.04	1	5
Chromium	<0.015	0.5	10	70
Copper	<0.07	2	50	100
Mercury	0.0002	0.01	0.2	2
Molybdenum	<0.02	0.5	10	30
Nickel	<0.02	0.4	10	40
Lead	<0.05	0.5	10	50
Antimony	<0.02	0.06	0.7	5
Selenium	<0.03	0.1	0.5	7
Zinc	<0.03	4	50	200
Chloride	<3	800	15000	25000
Fluoride	<3	10	150	500
Sulphate as SO4	18.5	1000	20000	50000
Total Dissolved Solids	860	4000	60000	100000
Phenol	<0.1	1	-	-
Dissolved Organic Carbon	30	500	800	1000

Client Name: IGSL **Matrix : Solid**

Reference:

Location: River Dargle

Contact: Darren Keogh

J E Job No.	Batch	Sample ID	Depth	J E Sample No.	Analysis	Reason
16/7524	1	1		1-2	All analyses	No sampling date given
16/7524	1	2		3	All analyses	No sampling date given
16/7524	1	3		4-5	All analyses	No sampling date given
16/7524	1	4		6-7	All analyses	No sampling date given
16/7524	1	5		8-9	All analyses	No sampling date given
16/7524	1	6		10-11	All analyses	No sampling date given
16/7524	1	7		12-13	All analyses	No sampling date given
16/7524	1	8		14-15	All analyses	No sampling date given
16/7524	1	9		16-17	All analyses	No sampling date given
16/7524	1	10		18-19	All analyses	No sampling date given
16/7524	1	11		20-21	All analyses	No sampling date given

Please note that only samples that are deviating are mentioned in this report. If no samples are listed it is because none were deviating.

Only analyses which are accredited are recorded as deviating if set criteria are not met.

NOTES TO ACCOMPANY ALL SCHEDULES AND REPORTS

JE Job No.: 16/7524

SOILS

Please note we are only MCERTS accredited (UK soils only) for sand, loam and clay and any other matrix is outside our scope of accreditation.

Where an MCERTS report has been requested, you will be notified within 48 hours of any samples that have been identified as being outside our MCERTS scope. As validation has been performed on clay, sand and loam, only samples that are predominantly these matrices, or combinations of them will be within our MCERTS scope. If samples are not one of a combination of the above matrices they will not be marked as MCERTS accredited.

It is assumed that you have taken representative samples on site and require analysis on a representative subsample. Stones will generally be included unless we are requested to remove them.

All samples will be discarded one month after the date of reporting, unless we are instructed to the contrary.

If you have not already done so, please send us a purchase order if this is required by your company.

Where appropriate please make sure that our detection limits are suitable for your needs, if they are not, please notify us immediately.

All analysis is reported on a dry weight basis unless stated otherwise. Results are not surrogate corrected. Samples are dried at 35°C ±5°C unless otherwise stated. Moisture content for CEN Leachate tests are dried at 105°C ±5°C.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

Where a CEN 10:1 ZERO Headspace VOC test has been carried out, a 10:1 ratio of water to wet (as received) soil has been used.

% Asbestos in Asbestos Containing Materials (ACMs) is determined by reference to HSG 264 The Survey Guide - Appendix 2 : ACMs in buildings listed in order of ease of fibre release.

Negative Neutralization Potential (NP) values are obtained when the volume of NaOH (0.1N) titrated (pH 8.3) is greater than the volume of HCl (1N) to reduce the pH of the sample to 2.0 - 2.5. Any negative NP values are corrected to 0.

WATERS

Please note we are not a UK Drinking Water Inspectorate (DWI) Approved Laboratory .

ISO17025 (UKAS) accreditation applies to surface water and groundwater and one other matrix which is analysis specific, any other liquids are outside our scope of accreditation.

As surface waters require different sample preparation to groundwaters the laboratory must be informed of the water type when submitting samples.

Where Mineral Oil or Fats, Oils and Grease is quoted, this refers to Total Aliphatics C10-C40.

DEVIATING SAMPLES

Samples must be received in a condition appropriate to the requested analyses. All samples should be submitted to the laboratory in suitable containers with sufficient ice packs to sustain an appropriate temperature for the requested analysis. If this is not the case you will be informed and any test results that may be compromised highlighted on your deviating samples report.

SURROGATES

Surrogate compounds are added during the preparation process to monitor recovery of analytes. However low recovery in soils is often due to peat, clay or other organic rich matrices. For waters this can be due to oxidants, surfactants, organic rich sediments or remediation fluids. Acceptable limits for most organic methods are 70 - 130% and for VOCs are 50 - 150%. When surrogate recoveries are outside the performance criteria but the associated AQC passes this is assumed to be due to matrix effect. Results are not surrogate corrected.

DILUTIONS

A dilution suffix indicates a dilution has been performed and the reported result takes this into account. No further calculation is required.

NOTE

Data is only reported if the laboratory is confident that the data is a true reflection of the samples analysed. Data is only reported as accredited when all the requirements of our Quality System have been met. In certain circumstances where all the requirements of the Quality System have not been met, for instance if the associated AQC has failed, the reason is fully investigated and documented. The sample data is then evaluated alongside the other quality control checks performed during analysis to determine its suitability. Following this evaluation, provided the sample results have not been effected, the data is reported but accreditation is removed. It is a UKAS requirement for data not reported as accredited to be considered indicative only, but this does not mean the data is not valid.
Where possible, and if requested, samples will be re-extracted and a revised report issued with accredited results. Please do not hesitate to contact the laboratory if further details are required of the circumstances which have led to the removal of accreditation.

ABBREVIATIONS and ACRONYMS USED

#	ISO17025 (UKAS) accredited - UK.
B	Indicates analyte found in associated method blank.
DR	Dilution required.
M	MCERTS accredited.
NA	Not applicable
NAD	No Asbestos Detected.
ND	None Detected (usually refers to VOC and/SVOC TICs).
NDP	No Determination Possible
SS	Calibrated against a single substance
SV	Surrogate recovery outside performance criteria. This may be due to a matrix effect.
W	Results expressed on as received basis.
+	AQC failure, accreditation has been removed from this result, if appropriate, see 'Note' on previous page.
++	Result outside calibration range, results should be considered as indicative only and are not accredited.
*	Analysis subcontracted to a Jones Environmental approved laboratory.
AD	Samples are dried at 35°C ±5°C
CO	Suspected carry over
LOD/LOR	Limit of Detection (Limit of Reporting) in line with ISO 17025 and MCERTS
ME	Matrix Effect
NFD	No Fibres Detected
BS	AQC Sample
LB	Blank Sample
N	Client Sample
TB	Trip Blank Sample
OC	Outside Calibration Range

JE Job No: 16/7524

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.	PM0	No preparation is required.				
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.			AR	Yes
TM4	Modified USEPA 8270 method for the solvent extraction and determination of 16 PAHs by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM5	Modified USEPA 8015B method for the determination of solvent Extractable Petroleum Hydrocarbons (EPH) with carbon banding within the range C8-C40 GC-FID.	PM16	Fractionation into aliphatic and aromatic fractions using a Rapid Trace SPE.			AR	Yes
TM17	Modified US EPA method 8270. Determination of specific Polychlorinated Biphenyl congeners by GC-MS.	PM8	End over end extraction of solid samples for organic analysis. The solvent mix varies depending on analysis required.	Yes		AR	Yes
TM20	Modified USEPA 8163. Gravimetric determination of Total Dissolved Solids/Total Solids	PM0	No preparation is required.	Yes		AR	Yes
TM21	Modified USEPA 415.1. Determination of Total Organic Carbon or Total Carbon by combustion in an Eltra TOC furnace/analyser in the presence of oxygen. The CO2 generated is quantified using infra-red detection.	PM24	Dried and ground solid samples are washed with hydrochloric acid, then rinsed with deionised water to remove the mineral carbon before TOC analysis.	Yes		AD	Yes
TM22	Modified USEPA 160.4. Gravimetric determination of Loss on Ignition by temperature controlled Muffle Furnace (450°C)	PM0	No preparation is required.	Yes		AD	Yes
TM26	Determination of phenols by Reversed Phased High Performance Liquid Chromatography and Electro-Chemical Detection.	PM0	No preparation is required.			AR	Yes
TM27	Modified US EPA method 9056.Determination of water soluble anions using Dionex (Ion-Chromatography).	PM0	No preparation is required.			AR	Yes

JE Job No: 16/7524

Test Method No.	Description	Prep Method No. (if appropriate)	Description	ISO 17025 (UKAS)	MCERTS (UK soils only)	Analysis done on As Received (AR) or Dried (AD)	Reported on dry weight basis
TM30	Determination of Trace Metal elements by ICP-OES (Inductively Coupled Plasma - Optical Emission Spectrometry). Modified US EPA Method 200.7	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.	Yes		AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.			AR	Yes
TM31	Modified USEPA 8015B. Determination of Methyltertbutylether, Benzene, Toluene, Ethylbenzene and Xylene by headspace GC-FID.	PM12	Modified US EPA method 5021. Preparation of solid and liquid samples for GC headspace analysis.	Yes		AR	Yes
TM38	Soluble Ion analysis using the Thermo Aquakem Photometric Automatic Analyser. Modified US EPA methods 325.2, 375.4, 365.2, 353.1, 354.1	PM0	No preparation is required.	Yes		AR	Yes
TM60	Modified USEPA 9060. Determination of TOC by calculation from Total Carbon and Inorganic Carbon using a TOC analyser, the carbon in the sample is converted to CO2 and then passed through a non-dispersive infrared gas analyser (NDIR).	PM0	No preparation is required.			AR	Yes
TM61	Modified US EPA methods 245.7 and 200.7. Determination of Mercury by Cold Vapour Atomic Fluorescence.	PM38	Samples are brominated to reduce all mercury compounds to Mercury (II) which is analysed using method TM061.	Yes		AR	Yes
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.				
NONE	No Method Code	PM17	Modified method EN12457-2 As received solid samples are leached with water in a 10:1 water to soil ratio for 24 hours, the moisture content of the sample is included in the ratio.			AR	
NONE	No Method Code	PM4	Gravimetric measurement of Natural Moisture Content and % Moisture Content at either 35°C or 105°C. Calculation based on ISO 11465 and BS1377.			AR	

Appendix - Methods used for WAC (2003/33/EC)

Leachate tests	
10l/kg; 4mm	I.S. EN 12457-2:2002 Specified particle size; water added to L/S ratio; capped; agitated for 24 ± 0.5 hours; eluate settled and filtered over 0.45 µm membrane filter.
Eluate analysis	
As	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ba	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cd	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cr total	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Cu	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Hg	I.S. EN 13370 rec. EN 1483 (CVAAS)
Mo	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Ni	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Pb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Sb	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Se	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Zn	I.S. EN 12506 : EN ISO 11885 (ICP-OES)
Chloride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Fluoride	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Sulphate	I.S. EN 12506 rec. EN ISO 10304-part 1 (liquid chromatography of ions)
Phenol index	I.S. EN 13370 rec. ISO 6439 (4-Aminoantipyrine spectrometic methods after distillation)* (BY HPLC - Jones Env)
DOC	I.S. EN 1484
TDS	I.S. EN 15216
Compositional analysis	
TOC	I.S. EN 13137 Method B: carbonates removed with acid; TOC by combustion.
BTEX	GC-FID
PCB7**	I.S. EN 15308 analysis by GC-ECD.
Mineral oil	I.S. EN 14039 C10 to C40 analysis by GC-FID.
PAH17***	I.S. EN 15527 PAH17 analysis by GC-MS
Metals	I.S. EN 13657 - Aqua regia digestion: EN ISO 11885 (ICP-OES)
Other	
Dry matter	I.S. EN 14346 sample is dried to a constant mass in an oven at 105 ± 3 °C; Method B Water content by direct Karl-Fischer-titration and either volumetric or coulometric detection.
LOI	I.S. EN 15169 Difference in mass after heating in a furnace up to 550 ± 25 °C.
ANC	CEN/TS 15364 Determined by amouns of acid or base needed to cover the pH range

Notes:

*If not suitable due to LOD, precision, etc., any other suitable method can be used, e.g. AFS, ICP-MS

**PCB-28, PCB-52, PCB-101, PCB-118, PCB-138, PCB-153 and PCB-180

***Naphthalene, Acenaphthylene, Acenaphthene, Anthracene, Benzo(a)anthracene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, Benzo(g,h,i)perylene, Benzo(a)pyrene, Chrysene, Coronene, Dibenzo(a,h)anthracene, Fluorene, Fluoranthene, Indeno(1,2,3-c,d)pyrene, Phenanthrene and Pyrene.